

Electronic Timers

Time Switches

Sensing, Control \& Monitoring Relays

Plug in Relays $\&$ Sockets, Latching Relays, Sequence Relays

Alarm Integrators \& Annunciator Systems, Panel Audibles

MCB's, RCBO's \& Fuse Holders

DC Power Supplies $\&$ DC to DC Converters
Voltage Transformers
Hour Counters $\mathbb{\&}$ Operation Counters

Current Transformers

Din 48/72/96mm Analogue Meters

Digital Panel Meters

KWh \& Multi Display Energy Meters

Electrical Transducers

Analogue Signal Isolators,
Converters \& Generators, Trip Amplifiers
Lightning \& Voltage Surge Arresters


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## INTRODUCTION

FOXTAM

## CONTROLS



Foxtam Controls is a proud British designer and manufacturer of low voltage control and instrumentation products. We are delighted to introduce our latest all-encompassing catalogue, featuring all our latest innovations.

Founded in 1977 Foxtam Controls has an enviable reputation for engineering well designed, quality constructed products in line with latest market requirements. Our well funded research and development department, in conjunction with our external sales team, liaises closely with our customers and prospects within their relevant market sectors, bringing well executed products to market in a timely manner.

Supplying control panel and switchgear manufacturers along with OEM's and end users, many products have been developed for specific applications in industries such as railways and transportation, clean water supply and sewage treatment, telecommunications and PV solar installations.

We further support our own British manufactured products with some carefully selected complimenting products from quality overseas partners. These partners are generally located within Europe and Taiwan, our partners are carefully and continuously vetted to ensure quality and continuity of supply is maintained. Many of our partner relationships have been in existence in excess of 25 years.

Prior to April 2015 Foxtam Controls was known as Nortonics Foxtam Ltd. Nortonics Foxtam Ltd was in April 2015 purchased by Midland Automation Ltd, with the name reverting to Foxtam Controls. We trade as an autonomous division of Midland Automation Ltd, whilst maintaining the same ethos and disciplines that our customers expect.

The team at Foxtam Controls trusts that you will find our new catalogue an interesting and useful engineering aid to your control circuit and system design. We look forward to both welcoming new customers and serving our existing customers in the manner that they have come to expect.

Foxtam Controls can also give our customers access to another Midland Automation Ltd "group" business, Kempston Controls. Kempston Controls are franchised distributors for many international industry brand names within the fuses, sensors and industrial control sectors. The Foxtam Controls team can assist in making an introduction to our colleagues at our sister business as required.

FRANCHISE LIST


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## DIMENSIONS \& ACCESSORIES

- CLASSIC DIN RAIL

TYPES: YRxx

- CLASSIC PLUG IN TYPES: 8Rxx \& 11Rxx

MODULAR DIN RAIL TYPES: UNI-xxx

Classic DIN rail: Maximum cable size $4 \mathrm{~mm}^{2}$ Modular DIN rail: Maximum cable size $2.5 \mathrm{~mm}^{2}$


- PANEL MOUNTING ADAPTOR - P

Material: Auto-extinguishable poly-carbonate Colour: Black

- Mounting by M4 screws to DIN 46121
- Timer is mounted by clipping on
- ASYMMETRICAL DIN ADAPTOR - A

Material: Auto-extinguishable poly-carbonate Colour: Black

- Timer is mounted by clipping on
- SCREW TERMINAL SOCKET PF-083BE PF-113BE
Material: Auto-extinguishable poly-carbonate Colour: Black
- Mounting on a symmetric din or by single M4 Screw and locator
- RETAINING SPRINGS

For 8 \& 11 Series: NBS
$\square$ FREE SOCKET 8 PIN US-08 11 PIN US-11
Material: Auto-extinguishable poly-carbonate Colour: Black

- Connection for timers in through panel mounting Adaptor 8/11
- THROUGH PANEL MOUNTING ACCESSORY 8/11 ADAPTOR
Material: Auto-extinguishable ABS Colour: Black
- Permits through panel mounting of 8 \& 11 pin timers



# DIN RAIL MODULAR MULTI VOLTAGE, MULTI TIME RANGE, MULTI FUNCTION TIMERS 

## TYPES: UNI-1M (spco) \& UNI-4M (4рсо)

- Din rail mounted
- Modern modular design
- Width 27 mm (1.5 modules)
- SPCO version
- Unique 4PCO version
- Multi voltage 12-250VAC/DC
- Multi time range 0.1 sec to 10 days
- Eight selectable functions
- Dual LED indication
- CE marked



## DESCRIPTION \& MODE OF OPERATION

An attractive modern designed multi "everything" timer in a din rail mounted modular style housing of 1.5 modules width ( 27 mm ). The timer features the facility of double deck terminals thus enabling the timer to be available also in a unique 4PCO version. A selector switch is provided to select eight different time ranges from 0.1 sec to 10 days, fine time selection on a selected range is then achieved via a percentage potentiometer. A further selector switch is then used to select one of eight different functions. A green supply on LED is featured along with a red LED to indicate relay output status. All terminal details and the function selection information along with the CE mark is clearly marked on the sides of the housing.
On functions utilising the trigger input " S ", this input should preferably be clean. However, within reason small loads can be connected between " S " \& "A2", such as relay coils or indicator lights.


## SPECIFICATIONS

Timing:
Time ranges: Repeat accuracy: Reset time:

Relay outputs: Output contacts:

Max breaking capacity:
Mechanical life: Electrical life:

Supply voltage:
Supply voltage:
Max power consumption:
Insulation:
Trigger Input (S):
Max consumption:
Min input time:
Max input time:
General:
Operating temperature: $\quad-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
Storage temperature: $\quad-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
Max cable size:
CE marked:
In accordance with:

Housing material:
0.1 sec to 10 days $\pm 0.5 \%$ of set value Max 100 mSec

UNI-1M 16Amps/250V AC1
UNI 4M 8Amps/250V AC1
UNI-1M 4000VA
UNI-4M 2000VA
30 Million ops
200K ops at max rated load

12-250V AC/DC
5VA / 2.8 W
2.5 KV 50 Hz impulse

5 mA
25 mSec
Continuous
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
2.5 mm

Yes
EN61000-6-1: 2007
EN61000-6-3: 2007
EN61010-1: 2002
Polycarbonate, Auto extinguishable to UL 94 V-0


# DIN RAIL MODULAR MULTI VOLTAGE, MULTI TIME RANGE, MULTI FUNCTION TIMERS 

## TYPES: UNI-1M (spco) \& UNI-4M (4pco)

## TIME RANGES

| Position 1: | $0.1-1$ sec |
| :--- | :--- |
| Position 2: | $1-10$ secs |
| Position 3: | $10-100$ secs |
| Position 4: | $1-10$ mins |

Position 5:
10-100 mins
Position 6: $\quad 1-10 \mathrm{hr}$
Position 7: $\quad 10-100 \mathrm{hrs}$
Position 8: 1-10 days

## TIMING FUNCTIONS

Function A: On delay - initiated by supply on terminals A1 \& A2, which commences timing, the relay contacts energise after the timing period. Removal of the supply after timing has been completed and the relay contacts will de-energise, if removal of the supply is before timing has been completed the remaining time will be cancelled.

Function H: Interval timer - initiated by supply on terminals A1 \& A2. Relay contacts energise immediately on connection of the supply. On completion of timing relay contacts de-energise. If the supply is removed during the timing period the relay contacts will de-energise immediately.
Function C: Delay off with trigger input (trailing edge) - a permanent supply is required at all times on terminals A1 \& A2, however this is not the controlling factor. The controlling factor is a trigger input from A1 onto terminal S. On an input being made to terminal $S$ the relay contacts energise, on removal of the trigger input (trailing edge) the relay contacts time to deenergise. If the trigger input is reinstated after timing has commenced it will immediately cancel any remaining delay time and the trigger will need to be removed again for timing to commence once again. If the supply on terminals A1 \& A2 is removed at any point when the relay contacts are energised irrespective of what state the trigger input is at, the relay contacts will de-energise. If the trigger input to terminal S is present before the connection of the supply to terminals A1 \& A2, when the supply is connected the relay contacts will immediately energise and as above removal of S will commence timing.
Function B: Single shot timer / delay off with trigger input (leading edge) - as function " $C$ " but the relay contacts energise and timing commences on the immediate input to terminal $S$ (leading edge). Also
unlike function " C " if the trigger is still present after timing has been completed this will not have any effect, in all circumstances the trigger will need to be removed and reinstated for the function to happen again. If the trigger input to terminal S is present before the connection of the supply to terminals A1 \& A2, when the supply is connected the relay contacts will immediately energise and timing commences.
Function Q: Delayed pulse (once only) - initiated by supply on terminals A1 \& A2. The relay contacts will energise (pulse) briefly after the timing period and then de-energise. For the function to happen again the supply will have to be removed and re-connected. If the supply is removed before the pulse the set time will be cancelled. The pulse length is fixed at 300 mSec .
Function D: Flasher (pause first) - initiated by supply on terminals A1 \& A2. Timing commences to energise relay contacts and then times to de-energise relay contacts. This cycle continues so long as the supply is connected. The time period on both energisation and deenergisation will be the same. If the supply is removed at any point within the cycle any remaining time will be cancelled and if the relay contacts are energised they will de-energise.
Function DI: Flasher (pulse first) - exactly as function "D" but on the connection of the supply to terminals A1 \& $A 2$ the relay contacts immediately energise and then time to de-energise.
Function I: Latching relay "pulse on, pulse off.' via trigger input - a permanent supply is required at all times on terminals A1 \& A2, however this is not the controlling factor. The controlling factor is a trigger input from A1 onto terminal S . On an input being made to terminal $S$ the relay contacts will immediately energise, on a new trigger input the relay contacts will immediately de-energise. In brief the unit works as a "pulse on, pulse off' relay.


# SLIM LINE DIN RAIL MODULAR MULTI VOLTAGE, MULTI TIME RANGE, MULTI FUNCTION TIMER 

## TYPES: MINI-1M (spco)

## FEATURES

- Din rail mounted
- Modern modular design
- Width 18 mm (1 module)
- SPCO output
- Multi voltage $12-240 \mathrm{VAC} / \mathrm{DC}$
- Multi time range 0.1 sec to $\mathbf{1 0 0}$ hours
- 10 selectable functions
- Dual LED indication
- Low power consumption
- CE marked



## DESCRIPTION \& MODE OF OPERATION

An attractive modern designed multi "everything" timer in a din rail mounted modular style housing of 1 module width ( 18 mm ). The timer features large double deck terminals suitable for up to $4 \mathrm{~mm}^{2}$ cable. A selector switch is provided to select one of seven different time ranges from 0.1 sec to 100 hours, fine time selection on a selected range is then achieved via a percentage potentiometer. A further selector switch is then used to select one of ten different functions. A green supply on LED is featured along with a yellow LED to indicate relay output status. The green supply LED flashes to indicate timing. All terminal details and the function selection information along with the CE mark is clearly marked on the sides of the housing.


## SPECIFICATIONS

## Timing:

Time ranges:
Setting accuracy:
Repeat accuracy: Initiate time: Reset time:

Relay outputs: Output contacts: Max breaking capacity: Mechanical life: Electrical life:

## Supply voltage:

Supply voltage:
Supply tolerance: $\quad-15 \%$ to $+10 \%$
Max power consumption: 2VA
Insulation (I/P \& O/P): $\quad 2 \mathrm{KV} 50 \mathrm{~Hz}$ impulse
Insulation (terminal to case): 4KV 50Hz impulse
Trigger Input (S):
Max consumption:
Min input time:
Max input time:
General:
Operating temperature: $\quad-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
Storage temperature: $\quad-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
Max cable size:
CE marked:
In accordance with:

Housing material:
0.1 sec to 100 hours $\pm 5 \%$ of full scale $\pm 1 \%$ Max 100mSec Max 200mSec

8Amps/250V AC1
2000VA
10 Million ops
500 K ops at max rated load

12-240V AC/DC

2 KV 50 Hz impulse
.5 mA
$>=60 \mathrm{mSec}$
Continuous

## $4 \mathrm{~mm}^{2}$

Yes
EN61000-3-2, EN61000-4-2, EN61000-4-3
EN61000-4-4, EN61000-4-5, EN61000-4-11 CISPR 14.1
Flame retardant (UL94-V0)

## TYPES: MINI-1M (spco)

## TIME RANGES

Position 1: 0.1-1Sec Position 2: 1-10Secs Position 3: 0.1-1Min Position 4: 1-10Mins Position 5: 0.1-1Hr
Position 6: 1-10Hrs Position 7: $10-100 \mathrm{Hrs}$

## TIMING FUNCTIONS

Function AT: Delay on with trigger input (leading edge) - a permanent supply is required at all times on terminals A1 \& A2 indicated via an illuminated green LED, however this is not the controlling factor. The controlling factor is a trigger input from A1 on to terminal $S$. On a permanent input being made to terminal $S$ the green LED will start to flash as timing commences and at the end of the set time the relay contact will energise, (indicated via an illuminated amber LED) and remain energise until the $S$ input is removed or the permanent supply voltage is removed. If the $S$ input is removed during the timing period the set time period will be cancelled and a new $S$ input will be required.
Function DI: Flasher (pulse first) - initiated by a supply on terminals A1 \& A2, on initial connection of the supply voltage the relay contact will energise (indicated via an illuminated amber LED) and then time to de-energise and then time to energise, as timing is continuous the green LED flashes continuously. This cycle continues so long as the supply is connected. The time period for both energisation and deenergisation will be the same. If the supply is removed at any point within the cycle any remaining time will be cancelled and if the relay contacts are energised they will de-energise.
Function D: Flasher (pause first) - exactly as function DI, but on connection of the supply to terminals A1 \& A2 timing commences to energise the relay contact followed by timing to de-energise the relay contact and the cycle continues.
Function C: Delay off with trigger input (trailing edge) - a permanent supply is required at all times on terminals A1 \& A2 indicated via an illuminated green LED, however this is not the controlling factor. The controlling factor is a trigger input from A1 on to terminal S . On an input being made to terminal S the relay contact energises (indicated via an illuminated amber LED), on removal of the trigger input (trailing edge) the relay contact times to de-energise, timing will be indicated via the green LED flashing. If the trigger input is reinstated after timing has commenced it will immediately cancel any remaining delay time and the trigger will need to be removed again for timing to commence once more. If the supply on terminals A1 \& $A 2$ is removed at any point when the relay contact is energised irrespective of what state the trigger input is at, the relay contact will de-energise. If the trigger input to terminal S is present before the connection of the supply to terminals A1 \& A2, when the supply is connected the relay contact will immediately energise and as above removal of S will commence timing.
Function ATC: Delay on and delay off with trigger input - a permanent supply is required at all times on terminals A1 \& A2 indicated via an illuminated green LED, however this is not the controlling factor. The controlling factor is a trigger input from A1 on to terminal S. On a permanent input being made to terminal S (leading edge) the relay contact will time to energise indicated via the green LED flashing, after timing the relay contact will energise indicated via an illuminated amber LED. Then on removal of the trigger input from $S$ (trailing edge) the relay contact will time to de-energise again indicated via the green LED flashing. If during the "on" timing period the trigger input is removed from terminal $S$ timing will be cancelled and will need to be connected again for timing to commence one more. During the "off" timing period if after removal of the trigger input from terminal $S$ it is reconnected again timing will also be cancelled and the trigger will need to be removed for timing to commence again. If at any time the supply from terminals A1 \& A2 is removed any timing will be cancelled and if the output relay is energised the relay will immediately deenergise.
Function A: On delay-Straight on delay - initiated by supply on terminals A1 \& A2, which commences timing (indicated via the green LED flashing). The relay contact energises after the timing period, indicated via an illuminated amber LED.
Removal of the supply after timing has been completed and the relay contact will de-energise, if removal of the supply is before timing has been completed the remaining time will be cancelled.

Accumulative memory on delay - It is also possible to temporary interrupt the delay timing by making a maintained link between terminals A1 \& S, when the link is then opened timing will pause. When the link is then closed timing will re-commence from where it left off. A permanent supply must be maintained at all times on terminals A1 \& A2.
Function BT: Impulse on and off with time via trigger input - a permanent supply is required at all times on terminals A1 \& A2 indicated via an illuminated green LED, however this is not the controlling factor. The controlling factor is a trigger input from A1 to terminal S. On a momentary trigger being made to terminal S (leading edge) the relay contact will immediately energise (indicated via an illuminated amber LED) and timing commences, at the end of timing the relay contact will deenergise, energisation will happen again with a new trigger input to terminal S. If however, the trigger input to terminal S is not momentary and is maintained for greater than the set time the relay contact will immediately energise and then de-energise after the set time exactly as above. But then once this has occurred on removal of the trigger input from terminal S (trailing edge) the relay contact will immediately energise and start to time to de-energise. If during either of the above scenarios the trigger input to terminal $S$ is interrupted or uninterrupted as the case maybe this has no effect on the output contact but will reset the set time on each interruption back to zero. Removal of the supply at any time will immediately de-energise the relay contact if energised and reset totally the timing.
Function HT: Interval timer with optional trigger input Control. Without using trigger input - initiated by a supply on terminals A1 \& A2 with a fixed link in place between terminals A1 \& S. The relay contact will energise immediately on connection as above, indicated via an illuminated amber LED. Timing commences immediately indicated via the green LED flashing, on completion of timing the relay contact deenergises. If the supply is removed during timing the relay contact will de-energise immediately.
Using trigger input control - it is possible to use the input from terminal A1 to $S$ as a trigger input, if the link is open on connection of the supply to terminals A1 \& A2 the relay contact will not energise and will only energise when the link (trigger) is closed. If during the energised (timing state) the link (trigger) is opened the relay contact will de-energise.
Function CT: Delay off via impulse trigger input -a permanent supply is required at all times on terminals A1 \& A2 indicated via an illuminated green LED however this is not the controlling factor. The controlling factor is a trigger input from A1 to terminal $S$. On an input being made to terminal $S$ the relay contact will remain de-energise, but then on removal of the trigger input (trailing edge) the relay contact will immediately energise indicated via an illuminated amber LED. Timing will also immediately commence and the green LED will start flashing, after the set time the relay contact will de-energise. If the trigger input to S is reconnected during timing this will cause the energised relay to immediately de-energise and timing to be reset to zero, removal of the trigger will need to happen for the function to commence. If the supply on terminals A1 \& A2 is removed at any point if energised the relay contact will de-energise and any timing will reset to zero.
Function I: Latching relay "pulse on, pulse off" via trigger input - a permanent supply is required at all times on terminals A1 \& A2 indicated via an illuminated green LED however this is not the controlling factor. The controlling factor is a trigger input from from A1 to terminal S. On an input being made to terminal $S$ the relay contact will immediately energise, on a new trigger input the relay contact will immediately de-energise. In brief the unit works as a "pulse on, pulse off" relay with no timing element involved.

## 8 \& 11 PIN PLUG IN MULTI VOLTAGE, MULTI TIME RANGE, MULTI FUNCTION TIMERS

## TYPES: UNI-8-1M (spco) \& UNI-11-1M (spco) \& UNI-11-2M (dpco)

## FEATURES

- 8 \& 11 pin plug in


## - SPCO versions

- DPCO versions
- Multi voltage $12-250 \mathrm{VAC} / \mathrm{DC}$
- Multi time range $\mathbf{0 . 1} \mathbf{~ s e c}$ to $\mathbf{1 0}$ days
- Eight selectable functions
- Dual LED indication
- CE marked


## DESCRIPTION \& MODE OF OPERATION

8 \& 11 pin plug in versions of our multi "everything" timers. Available in either 8 or 11 pin SPCO or as an 11 pin DPCO. A selector switch is provided to select eight different time ranges from 0.1 sec to 10 days, fine time selection on a selected range is then achieved via a percentage potentiometer. A further selector switch is then used to select one of eight different functions. A green supply on LED is featured along with a red LED to indicate relay output status. All terminal details and the function selection information along with the CE mark is clearly marked on the sides of the housing.
On functions utilising the trigger input " S " this input should preferably be clean. However, within reason small loads can be connected between " S " \& "A2", such as relay coils or indicator lights.
Please see page 5 for full function descriptions.

## SPECIFICATIONS

## Timing:

Time ranges:
Repeat accuracy: Reset time:
0.1 sec to 10 days

Relay outputs: Output contacts:

Max breaking capacity:
Mechanical life: Electrical life:

Supply voltage:
Supply voltage:
Max power consumption:
Insulation:
Trigger Input (S):
Max consumption: Min input time: Max input time: Clean contact input:
General:
Operating temperature:
Storage temperature:
CE marked:
In accordance with:
Housing material:

Max 100 val
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$ $\pm 0.5 \%$ of set value
Max 100mSec

UNI-8-1M \& UNI-11-1M 10Amps/250V AC1 UNI-11-2M 8Amps/250V AC1 UNI-8-1M \& UNI-11-1M 4000VA UNI-11-2M 2000VA
30 Million ops
200K ops at max rated load

12-250V AC/DC
5VA / 2.8 W
2.5KV 50 Hz impulse to UL94VO

5 mA
25 mSec
Continuous
Not required

Yes
EN61000-6-1: 2007 EN61000-6-3: 2007 EN61010-1: 2002
Polycarbonate, Auto extinguishable to UL 94 V-0




## 14 PIN 4PCO DELAY ON TIMER, MULTI TIME RANGE

## TYPE: TB48

## - FEATURES

- 14 pin 4PCO
- Plugs into standard 14 pin sockets
- Delay on
- Multi time range $\mathbf{0 . 0 2}$ Secs to $\mathbf{6 0 0}$ hours
- LED indication


## D DESCRIPTION \& MODE OF OPERATION

14 pin plug in 4PCO delay on timer, plugging into standard pin out 14 pin sockets. The timers are multi time range via eight selectable time ranges from 1 Sec to 600 hours selectable via dip switches behind a cover on the side of the timer. A dip switch can also change the function from delay on, to flasher mode. A choice of supply voltages are available in both AC and DC. The timers come complete with a red LED that on connection of the supply voltage flashes as timing immediately commences, on the completion of the timing period the output contacts energise and the LED illuminates steady. On removal of the supply voltage the output contacts de-energise and the LED extinguishes.

## ORDERING INFORMATION

## Type

Supply voltage*
TB48
12, 24VDC
TB48
$12,24,110,240 \mathrm{VAC}$
*Specify supply voltage


## SPECIFICATIONS

Supply
Supply voltages: $\quad 12,24,110,240 \mathrm{VAC} 50-60 \mathrm{~Hz}$ 12, 24VDC
$-15 \% /+15 \%$ ( 12 VDC $\pm 10 \%$ )
DC max 1.6W
AC max 2.9VA
Timing
Time ranges (selectable): $1 \mathrm{sec}, 10$ secs, $1 \mathrm{~min}, 10 \mathrm{mins}$
1 hr, 10 hrs, 60 hrs, 600 hrs
$+1 \%$
$\leq 200 \mathrm{mSec}$
4PCO
5 Amps / 250VAC AC1
100K ops
5 M ops
$-10^{\circ} \mathrm{C}$ to $+50^{\circ} \mathrm{C}$
85\% RH
Yes

## DIMENSIONS \& CONNECTIONS



## 14 PIN RELAY SOCKETS FOR TB48 TIMERS

## TYPES: PYF-14BE/3, PYF-14BE, PYF-14AEW

## PYF-14AEW

Our most popular 14 pin socket, complete with a fixed marker tab and a screwdriver release tab.

## PYF-14BE \& PYF-14BE/3

"High sided" 14 pin sockets with tunnel clamps. A triple deck version, the PYF-14BE/3 allows segregation of voltages, coil terminals being on one side with two A2 terminals. All changeover terminals on the opposite side. Both socket types have a removable marker tab and screwdriver release tab.


# DIN RAIL MODULAR MULTI VOLTAGE, MULTI TIME RANGE, DELAY ON TIMERS 

## TYPES: UNI-1A (spco) \& UNI-4A (4pco)

- Din rail mounted
- Modern modular design
- Width 27 mm ( 1.5 modules)
- SPCO version
- Unique 4PCO version
- Multi voltage $12-250 \mathrm{VAC} / \mathrm{DC}$
- Multi time range 0.1 sec to $\mathbf{1 0}$ days
- Dedicated delay on
- Dual LED indication
- CE marked



## DESCRIPTION \& MODE OF OPERATION

A attractive modern designed multi voltage and multi time range delay on dedicated function timer in a din rail mounted modular style housing of 1.5 modules width ( 27 mm ). The timer features the facility of double deck terminals thus enabling the timer to be available as a unique 4PCO version. A selector switch is provided to select eight different time ranges from 0.1 sec to 10 days, fine time selection on a selected range is then achieved via a percentage potentiometer. A green supply on LED is featured along with a red LED to indicate relay output status. All terminal details and the function information along with the CE mark is clearly marked on the sides of the housing.
The function is initiated by a supply on terminals A1 \& A2 which commences the timing, the relay contacts will then energise after the timing period. Removal of the supply after timing has been completed and the relay contacts will de-energise, if removal of the supply is before timing has been completed the remaining time will be cancelled.

## SPECIFICATIONS

## Timing:

Time ranges:
Repeat accuracy: Reset time:

Relay outputs:
Output contacts:
Max breaking capacity:
Mechanical life: Electrical life:

## Supply voltage:

Supply voltage:
Max power consumption:
Insulation:
General:
Operating temperature:
Storage temperature:
CE marked:
In accordance with:

Housing material:
0.1 sec to 10 days $\pm 0.5 \%$ of set value Max 100 mSec

UNI-1A 16Amps/250V AC1 UNI-4A 8Amps/250V AC1
UNI-1A 4000VA
UNI-4A 2000VA
30 Million ops
200K ops at max rated load

12-250V AC/DC
5VA / 2.8 W
2.5KV 50Hz impulse
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
Yes
EN61000-6-1: 2007
EN61000-6-3: 2007
EN61010-1: 2002
Polycarbonate, Auto extinguishable to UL 94 V-0

## CONNECTIONS



UNI-1A


UNI- 4A

## DIN RAIL, 8 \& 11 PIN PLUG IN DEDICATED VOLTAGE,

 DEDICATED TIME RANGE, DELAY ON TIMERSTYPES: YRAF, 8RAF, 11 RAF (spco) \& 8R2AF, 11R2AF (dpco)

- FEATURES
- Din rail \& plug in versions
- SPCO \& DPCO versions
- Simple \& economic
- Ideal for OEM applications
- Single coil voltages 12VDC to 400VAC
- Single adjustable time ranges
- Option for fixed times
- LED indication
- CE marked


## - DESCRIPTION \& MODE OF OPERATION

Simple din rail mounted or 8 \& 11 pin plug in delay on timers, with dedicated coil voltage and time range. These timers are ideal for mass production OEM applications, or for any application where operator interference must be kept to a minimum. These timers can also on request, subject to a minimum quantity of 10 pieces, be factory set with an exact time, thus ensuring absolutely no operator interference. The timers feature a red LED to indicate relay output status. All terminal details along with the CE mark is clearly marked on the sides of the housing.
The function is initiated by a supply on terminals A1 \& A2 which commences the timing, the relay contacts will then energise after the timing period. Removal of the supply after timing has been completed and the relay contacts will de-energise, if removal of the supply is before timing has been completed the remaining time will be cancelled.

| ORDERING INFORMATION |  |  |  |
| :---: | :---: | :---: | :---: |
| TYPE | time range |  | coil |
| YRAF (Din rail SPCO) | 0.1 to 1 sec | 3 to 300 sec | 12VD |
| 8RAF (8 pin plug in SPC0) | 0.1 to 3 sec | 0.11 to 10 mins | $24 \mathrm{AC} / \mathrm{DC}$ |
| 11RAF (11 pin plug in SPCO) | 0.1 to 10 sec | 0.2 to 20 mins | $48 \mathrm{VaC} / \mathrm{CC}$ |
| 8R2AF (8 pin plug in DPCO) | 0.3 to 30 sec | 0.35030 mins | 110 VAC |
| 11R2AF (11 pin plug in DPCO) | 0.6 to 60 sec | 0.6 to60 mins | 230 VAC |
|  | 1 to 100 sec | 1 to 100 mi | 400 VAC |
| Factory preset version remove " $F$ " from type code and insert " $P$ " then specify exact fixed time required |  |  |  |




## SPECIFICATIONS

Timing:
Repeat accuracy: constant ambient: across temp range: Setting accuracy: Reset time: during timing: after timing: $\pm 0.5 \%$ of set value $\pm 3 \%$ 0 to $+30 \%$

Relay outputs: Output contacts:

100 mSec
50 mSec

SPCO units 5Amps/250V AC1 DPCO units $8 \mathrm{Amps} / 250 \mathrm{~V}$ AC1 250VAC, 30VDC
Max switching voltage:
Mechanical life: Electrical life:

20 Million ops
50 K ops at max rated load
Supply voltage:
Supply voltage tolerance: $\pm 15 \%$
Frequency: $\quad 50 / 60 \mathrm{~Hz}$
Max power consumption: 10VA

## General:

Operating temperature: $\quad-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
Storage temperature: $\quad-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
CE marked:
In accordance with:

Housing material:

Yes
EN61000-6-1: 2007
EN61000-6-3: 2007
EN61010-1: 2002
Polycarbonate, Auto extinguishable to UL 94 V-0

# DIN RAIL, 8 \& 11 PIN PLUG IN DUAL VOLTAGE, MULTI TIME RANGE, DELAY ON TIMERS 

## TYPES: YRA, 8RA, 11 RA (spco) \& 8R2A, 11R2A (dpco)

## - FEATURES

- Din rail \& plug in versions SPCO \& DPCO versions
- Dual core voltages
- Choice of three multi time ranges
- LED indication
- CE marked


## DESCRIPTION \& MODE OF OPERATION

Din rail mounted or 8 \& 11 pin plug in dedicated delay on timers, with dual core voltage (SPCO versions* via a link can be selected for 24 V AC/DC). A choice of one of three multi time ranges can be requested. The timers feature a red LED to indicate relay output status. All terminal details along with the CE mark is clearly marked on the sides of the housing.
The function is initiated by a supply on terminals A1 \& A2 which commences the timing, the relay contacts will then energise after the timing period. Removal of the supply after timing has been completed and the relay contacts will de-energise, if removal of the supply is before timing has been completed the remaining time will be cancelled.

## *Except 12VDC coil versions

## ORDERING INFORMATION

## TYPE

YRA (Din rail SPCO)
8RA (8 pin plug in SPCO)
11RA (11 pin plug in SPCO)
8R2A (8 pin plug in DPCO)
11R2A (11 pin plug in DPCO)

TIME RANGE (specify S, M or L)
$\mathbf{S}(0.06$ to 160 secs$) \quad \mathrm{M}(0.5 \mathrm{sec}$ to 21 mins$)$
0.06 to $0.6 \mathrm{sec} \quad 0.5$ to 5 sec
0.25 to 2.5 sec

2 to 20 sec
16 to 160 sec

2 to 20 sec
16 to 160 sec
2 to 21 mins


## SPECIFICATIONS

Timing:
Repeat accuracy: constant ambient: across temp range: Reset time:

| during timing: | 50 mSec |
| :--- | :--- |
| after timing: | 25 mSec |

Relay outputs:
Output contacts:
Max switching voltage: Mechanical life:
Electrical life:
Supply voltage:
Supply voltage tolerance: $\pm 15 \%$
Frequency:
Max power consumption:
General:
Operating temperature: $\quad-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
Storage temperature: $\quad-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
CE marked:
In accordance with:

Housing material: 250VAC, 250VDC
30 Million ops
$50 / 60 \mathrm{~Hz}$
7VA

Yes
EN61000-6-1: 2007
EN61000-6-3: 2007
EN61010-1: 2002
$\pm 0.5 \%$ of set value $\pm 3 \%$

50 mSec
25 mSec

SPCO units 10Amps/250V AC1 DPCO units $8 \mathrm{Amps} / 250 \mathrm{~V}$ AC1

200K ops at max rated load

Polycarbonate, Auto extinguishable to UL 94 V-0

$L(15 \sec$ to 640 mins$)$
15 to 150 sec
1 to 10 mins
8 to 80 mins
64 to 640 mins
coil voltage
12VDC
24VAC/DC
48V AC/DC
110 VAC
230VAC
400 VAC
48 V AC/DC \& 24 V AC/DC*
110 V AC\& 24 V AC/DC*
230 V AC \& 24 V AC/DC*
400 VAC \& 24 V AC/DC*

# DIN RAIL, 8 \& 11 PIN PLUG IN, IN SERIES THYRISTOR / TRIAC DELAY ON TIMERS 

## TYPES: YSA, 8SA, 11SA



## - Din rail \& plug in versions

- Connects in series with the load
- Ideal for refrigeration compressors
- Operates on any supply 20-260V AC/DC
- Choice of three multi time ranges
- Single time ranges \& fixed times
- LED indication
- CE marked

D DESCRIPTION \& MODE OF OPERATION
Din rail mounted or 8 \& 11 pin plug in, in series thyristor / triac delay on timers. Operates on any supply from $20-$ 260 V AC/DC and is connected in series with the load. For these timers to operate there must be a load of at least 5 mA , they cannot be used for "volt free" control. These timers are available in a choice of one of three multi time ranges, single time ranges or as a fixed time setting. The timers feature a red LED to indicate output status. All terminal details along with the CE mark is clearly marked on the sides of the housing.
The function is initiated by a supply on terminals 15 \& 18 or pins 1 \& 3 which commences the timing. The output will then switch after the timing period. Removal of the supply after timing has been completed and the output will open, if removal of the supply is before timing has been completed the remaining time will be cancelled.

## Timing:

Repeat accuracy:

| constant ambient: | $\pm 0.5 \%$ of set value |
| :---: | :---: |
| across temp range: | $\pm 3 \%$ |
| Reset time: |  |
| during timing: | 100 mSec |
| after timing: | 25 mSec |
| Output: |  |
| Output rating Imax: | 0.7Amps continuous ( $20^{\circ} \mathrm{C}$ ) |
| Peak current: | 20Amps <10mSec |
| Output rating Imin: | 5 mA |
| Leakage during timing: | 5 mA max (can cause buzzing during timing) |
| Voltage drop after timing: | 3.5 V |
| Transient protection: | 1400 V for 100uSec |
| Supply voltage: |  |
| Supply voltage: | 20-260V AC/DC (on request 10-130V AC/DC) |

General:
Operating temperature:
Storage temperature:
CE marked:
In accordance with:
Housing material:
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
EN61000-6-1: 2007 EN61000-6-3: 2007
EN61010-1: 2002
Polycarbonate, Auto extinguishable to UL 94 V-0

# DIN RAIL, MODULAR MULTI VOLTAGE, MULTI TIME RANGE, ON DELAY WITH INSTANTANEOUS CONTACT TIMERS 

## TYPES: UNI-2X (2 x spco) \& UNI-4X (2 x dpco)

- Din rail mounted
- Modern modular design
- Width 27 mm ( 1.5 modules)
- $2 \times$ SPCO version
- Unique $2 \times$ DPCO version
- Multi voltage 12-250V AC/DC
- Multi time range $0.1 \mathbf{~ s e c}$ to $\mathbf{1 0}$ days
- Dual LED indication
- CE marked


## DESCRIPTION \& MODE OF OPERATION

An attractive modern designed on delay with instantaneous contact/s timer in a din rail mounted modular style housing of 1.5 modules width ( 27 mm ). The timer features the facility of double deck terminals thus enabling the timer to be available also in a unique 2 x DPCO version. A selector switch is provided to select eight different time ranges from 0.1 sec to 10 days, fine time selection on a selected range is then achieved via a percentage potentiometer A green supply on LED is featured along with a red LED to indicate the timed relay output status. All terminal details and the function selection information along with the CE mark is clearly marked on the sides of the housing.

## TIMING FUNCTION

Initiated by supply on terminals A1 \& A2, which immediately energises the instant contact/s and commences the timing of the timed contact/s, after the timing period these contacts energise. Removal of supply after timing has been completed and the relay contacts will de-energise, if removal of supply is before timing has been completed remaining time will be cancelled and the instantaneous contact/s will also de-energise.


## SPECIFICATIONS

Timing:
Time ranges:
Repeat accuracy: Reset time:
Relay outputs:
Output contacts UNI-2X.

Electrical life:
Supply voltage:
Supply voltage:
Max power consumption:
Insulation:
General:
Operating temperature:
Storage temperature:
Max cable size:
CE marked:
In accordance with:

Housing material:

UNI $2 \times$ x
$2 \times$ DPCO 8Amps/250V AC1
UNI-2X 4000VA
UNI-4X 2000VA
30 Million ops
200K ops at max rated load
0.1 sec to 10 days $\pm 0.5 \%$ of set value Max 100mSec

12-250V AC/DC
5VA / 2.8 W
2.5KV 50Hz impulse
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
2.5 mm

Yes
EN61000-6-1: 2007
EN61000-6-3: 2007
EN61010-1: 2002
Polycarbonate, Auto extinguishable to UL 94 V-0

## TIME RANGES

Position 1: $\quad 0.1-1 \mathrm{sec} \quad$ Position 5: $\quad 10-100 \mathrm{mins}$
Position 2: $\quad 1-10 \mathrm{sec} \quad$ Position 6: $\quad 1-10 \mathrm{hrs}$
Position 3: $\quad 10-100 \mathrm{sec}$ Position 7: $\quad 10-100 \mathrm{hrs}$
Position 4: $\quad 1-10 \mathrm{mins} \quad$ Position 8: $\quad 1-10$ days


## 8 \& 11 PIN PLUG IN SINGLE VOLTAGE, SINGLE TIME RANGE, ON DELAY WITH INSTANTANEOUS CONTACT TIMERS

## TYPES: 8RAXF, 11 RAXF (2 x spco)

FEATURES

- 8 \& 11 pin plug in versions
- $2 \times$ SPCO outputs
- Single coil voltages
- Single adjustable time ranges
- LED indication

CE marked

## DESCRIPTION \& MODE OF OPERATION

8 \& 11 pin plug in, delay with an instantaneous contact timer. Single coil voltage with a single adjustable time range. Initiated by the supply to the coil, which immediately energises the instant contact, and timing commences after the set time delay the timed contact energises. Removal of the coil supply after timing has been completed, then both relay contacts will deenergise. If the coil supply is removed before timing has been completed, the remaining time will be cancelled and the instantaneous contact will also de-energise. The timers feature a red LED to indicate the timed relay output status. All terminal details along with the CE mark is clearly marked on the sides of the housing.

## SPECIFICATIONS

## Timing:

| Repeat accuracy: |  |
| :---: | :---: |
| constant ambient: | $\pm 0.5 \%$ of set value |
| across temp range: | $\pm 3 \%$ |
| Setting accuracy: | 0 to 30\% |
| Reset time: |  |
| during timing: | 100 mSec |
| after timing: | 50 mSec |
| Relay outputs: |  |
| Output contacts: | $2 \times$ SPCO 5Amps/250V AC1 |
|  | DPCO 5Amps/250V AC1 |
| Max switching voltage: | 250VAC, 30VDC |
| Max power rating: | 960VA, 120W |
| Peak current: | 20Amps <10mSec |
| Mechanical life: | 20 Million ops |
| Electrical life: | 50 K ops at max rated load |
| Supply voltage: |  |
| Supply voltage: | $\pm 15 \%$ |
| Frequency: | 50/60Hz |
| Max power consumption: | 11VA |
| General: |  |
| Operating temperature: | $-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$ |
| Storage temperature: | $-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$ |
| CE marked: | Yes |
| In accordance with: | EN61000-6-1: 2007 |
|  | EN61000-6-3: 2007 |
|  | EN61010-1: 2002 |
| Housing material: | Polycarbonate, Auto extinguishable to UL 94 V-0 |

ORDERING INFORMATION

TIME RANGE

| 0.1 to 1 sec | 0.6 to 60 sec |
| :--- | :--- |
| 0.1 to 3 sec | 1 to 100 sec |
| 0.1 to 10 sec | 3 to 300 sec |
| 0.3 to 30 sec | 0.1 to 10 min |

COIL VOLTAGE
0.2 to 20 mins
0.3 to 30 mins 0.6 to 60 mins 1 to 100 mins

12VDC
24V AC/DC
48V AC/DC
110V AC
230 VAC

# DIN RAIL, 8 \& 11 PIN PLUG IN DEDICATED VOLTAGE, DEDICATED TIME RANGE, INTERVAL TIMERS 

## TYPES: YRHF, 8RHF, 11 RHF (spco) \& 8R2HF, 11R2HF (dpco)

## FEATURES

- Din rail \& plug in versions
- SPCO \& DPCO versions
- Simple \& economic
- Ideal for OEM applications
- Single coil voltages 12VDC to 400 VAC
- Single adjustable time ranges
- Option for fixed times
- LED indication
- CE marked

DESCRIPTION \& MODE OF OPERATION
Simple din rail mounted or 8 \& 11 pin plug in dedicated interval timers, with dedicated coil voltage and time range. The function is initiated by the connection of the coil supply, the relay contact/s energise immediately, on completion of timing the relay contact/s de-energise. If the supply is removed during the timing period, the relay contact/s will de-energise immediately. These timers are ideal for mass production of OEM applications, or for any application where operator interference must be kept to a minimum. These timers can also on request, subject to a minimum quantity of 10 pieces, be factory set with an exact time, thus ensuring absolutely no operator interference. The timers feature a red LED to indicate relay output status. All terminal details along with the CE mark is clearly marked on the sides of the housing.


## SPECIFICATIONS

Timing:
Repeat accuracy:
constant ambient:
across temp range: Setting accuracy: Reset time: during timing: after timing:
$\pm 0.5 \%$ of set value $\pm 3 \%$ 0 to 30\%

Relay outputs: Output contacts:

Max switching voltage:
Mechanical life:
Electrical life:
Supply voltage:
Supply voltage:
Frequency: $\quad 50 / 60 \mathrm{~Hz}$
Max power consumption: 10VA
General:
Operating temperature: $\quad-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
Storage temperature: $\quad-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
CE marked:
Yes
In accordance with:

Housing material:

EN61000-6-1: 2007
EN61000-6-3: 2007
EN61010-1: 2002
Polycarbonate, Auto extinguishable to UL 94 V-0

## ORDERING INFORMATION

| TYPE | TIME RANGE |
| :--- | :--- |
| YRHF (Din rail SPCO) | 0.1 to 1 sec |
| 8RHF (8 pin plug in SPCO) | 0.3 to 3 sec |
| 11RHF (11 pin plug in SPCO) | 0.6 to 10 sec |
| 8R2HF (8 pin plug in DPCO) | 0.3 to 30 sec |
| 11R2HF (11 pin plug in DPCO) | 0.6 to 60 sec |
|  | 1 to 100 sec |

3 to 300 sec
0.1 to 10 mins
0.2 to 20 mins 0.3 to 30 mins 0.6 to 60 mins

1 to 100 mins


## FUNCTION

TIME RANGE 0.3 to 3 sec 0.6 to 10 sec 30 sec 1 to 100 sec

## COIL VOLTAGE

12VDC
24V AC/DC
48V AC/DC
110 VAC
230 VAC
400 V AC

# DIN RAIL, 8 \& 11 PIN PLUG IN DUAL VOLTAGE, MULTI TIME RANGE, INTERVAL TIMERS 

TYPES: YRH, 8RH, 11 RH (spco) \& 8R2H, 11R2H (dpco)

## - FEATURES

- Din rail \& plug in versions
- SPCO \& DPCO versions
- Dual coil voltages
- Choice of three multi time ranges
- LED indication
- CE marked

DESCRIPTION \& MODE OF OPERATION
Din rail mounted or 8 \& 11 pin plug in dedicated interval timers, with dual coil voltage (SPCO versions* via a link can be selected for 24 V AC/DC), along with a choice of one of three multi time ranges. The function is initiated by the connection of the coil supply, the relay contact/s energise immediately, on completion of timing the relay contacts de-energise. If the supply is removed during the timing period, the relay contact/s will de-energise immediately. The timers feature a red LED to indicate relay output status. All terminal details along with the CE mark is clearly marked on the sides of the housing.
*Except 12VDC coil versions


## SPECIFICATIONS

## Timing:

Repeat accuracy: constant ambient:
across temp range:
Reset time:
during timing: $\quad 50 \mathrm{mSec}$
after timing:
Relay outputs:
Output contacts:
Max switching voltage:
Mechanical life:
Electrical life:
Supply voltage:
Supply voltage:
Frequency:
Max power consumption:
General:
Operating temperature:
Storage tem perature:
CE marked:
In accordance with:

Housing material:

50160
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
$\pm 0.5 \%$ of set value
$\pm 3 \%$

25 mSec

SPCO units 10Amps/250V AC1
DPCO units 8Amps/250V AC1
250VAC, 250VDC
30 Million ops
200K ops at max rated load
$\pm 15 \%$
$50 / 60 \mathrm{~Hz}$
7VA

Yes
EN61000-6-1: 2007
EN61000-6-3: 2007
EN61010-1: 2002
Polycarbonate, Auto extinguishable to UL 94 V-0


## ORDERING INFORMATION

TYPE
YRH (Din rail SPCO)
8RH (8 pin plug in SPCO)
11RH (11 pin plug in SPCO)
8R2H (8 pin plug in DPCO)
11R2H (11 pin plug in DPCO)

TIME RANGE (specify S, M or L)

| $\mathbf{S}(0.06$ to 160 secs $)$ | $\mathbf{M}(0.5 \mathrm{sec}$ to 21 mins$)$ |
| :--- | :--- |
| 0.06 to 0.6 sec | 0.5 to 5 sec |
| 0.25 to 2.5 sec | 2 to 20 sec |
| 2 to 20 sec | 16 to 160 sec |
| 16 to 160 sec | 2 to 21 mins |


|  | COIL VOLTAGE |
| :---: | :---: |
| L ( 15 sec to 640 mins) | 12VDC |
| 15 to 150 sec | 24V AC/DC |
| 1 to 10 mins | 48V AC/DC |
| 8 to 80 mins | 110 V AC |
| 64 to 640 mins | 230V AC |
|  | 400 VAC |
|  | 48V AC/DC \& 24 V AC/DC* |
|  | 110 V AC\& 24 V AC/DC* |
|  | 230V AC \& 24V AC/DC* |
|  | 400 VAC \& 24 V AC/DC* |

# DIN RAIL, 8 \& 11 PIN PLUG IN, IN SERIES TRIAC INTERVAL TIMERS 

## TYPES: YSH, 8SH, 11SH

## - FEATURES

- Din rail \& plug in versions
- Connects in series with the load
- Ideal product for refrigeration compressors
- Operates on any supply $\mathbf{2 4 - 2 5 0 V}$ AC
- Choice of three multi time ranges
- Single time ranges \& fixed times
- LED indication
- CE marked

DESCRIPTION \& MODE OF OPERATION
Din rail mounted or 8 \& 11 pin plug in, in series triac interval timers. Operates on any supply from $24-250 \mathrm{~V}$ AC and is connected in series with the load. For these timers to operate there must be a load of at least 5 mA , they cannot be used for "volt free" control. These timers are available in a choice of one of three multi time ranges, single time ranges or as a fixed time setting. The timers feature a red LED to indicate output status. All terminal details along with the CE mark is clearly marked on the sides of the housing.
The function is initiated by a supply on terminals 15 \& 18 or pins 1 \& 3 , at this point the output will immediately switch and timing commences. After the delay time the output will open. For the function to occur again the supply has to be removed and re-applied. Removal of the supply during timing will cause the switch to immediately open and any remaining set time will be cancelled.

## SPECIFICATIONS

Timing:
Repeat accuracy:

| constant ambient: <br> across temp range: | $\pm 0.5 \%$ of set value |
| :--- | :--- |
| Reset time: <br> during timing: |  |
| after timing: | 200 mSec |

## Output:

Output rating Imax:
0.7 Amps continuous $\left(20^{\circ} \mathrm{C}\right)$

Peak current:
20Amps $<10 \mathrm{mSec}$
Output rating Imin:
5 mA
Voltage drop during timing: 8.2 V
Transient protection: 1400 V for $100 \mu \mathrm{Sec}$

| Supply voltage: |  |
| :--- | :--- |
| Supply voltage: | $24-250 \mathrm{~V}$ AC |
| General: |  |
| Operating temperature: | $-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$ |
| Storage temperature: | $-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$ |
| CE marked: | Yes |
| In accordance with: | EN61000-6-1: 2007 |
|  | EN61000-6-3: 2007 |
|  | EN61010-1: 2002 <br> Pousing material: |
|  | Polycarbonate, Auto extinguishable <br> to UL 94 V-0 |



## ORDERING INFORMATION

TYPE
YSH (Din rail)
8SH(8 pin plug in)
11SH (11 pin plug in)

TIME RANGE (specify $F$ then time range, or $P$ and factory set time, or $S$, $M$ or $L$ multi range version)
$\mathbf{S}$ ( 0.06 to 160 secs) $\quad \mathbf{M}(0.5 \mathrm{sec}$ to 21 mins$) \quad \mathbf{L}(15 \mathrm{sec}$ to 640 mins$)$
0.06 to $0.6 \mathrm{sec} \quad 0.5$ to $5 \mathrm{sec} \quad 15$ to 150 sec
0.25 to $2.5 \mathrm{sec} \quad 2$ to $20 \mathrm{sec} \quad 1$ to 10 mins

2 to $20 \mathrm{sec} \quad 16$ to $160 \mathrm{sec} \quad 8$ to 80 mins
16 to $160 \mathrm{sec} \quad 2$ to $21 \mathrm{mins} \quad 64$ to 640 mins
F 0.1 to 1 sec $\quad 0.1$ to 3 sec 0.1 to 10 sec
0.3 to $30 \mathrm{sec} \quad 0.6$ to $60 \mathrm{sec} \quad 1$ to 100 sec

3 to $300 \mathrm{sec} \quad 0.1$ to $10 \mathrm{mins} \quad 0.2$ to 20 mins
0.3 to $30 \mathrm{mins} \quad 0.6$ to $60 \mathrm{mins} \quad 1$ to 100 mins

P Specify factory fixed time required, max 10 mins (min qty 10 pieces)

# DIN RAIL MODULAR, MULTI VOLTAGE, MULTI TIME RANGE, DELAY OFF TIMERS VIA TRIGGER INPUT (trailing edge) 

TYPES: UNI-1C (spco) \& UNI-4C (4pco)

- FEATURES
- Din rail mounted
- Modern modular design
- Width 27 mm ( 1.5 modules)
- SPCO version \& unique 4PCO version
- Multi voltage 12-250V AC/DC
- Multi time range 0.1 sec to 10 days
- Dedicated delay off (via trigger input)
- Dual LED indication
- CE marked

DESCRIPTION \& MODE OF OPERATION
An attractive modern designed multi voltage and multi time range delay off (via trigger input, trailing edge) dedicated function timer in a din rail mounted modular style housing of 1.5 modules width ( 27 mm ). The timer features the facility of double deck terminals thus enabling the timer to be available also in a unique 4PCO version. A selector switch is provided to select eight different time ranges from 0.1 sec to 10 days, fine time selection on a selected range is then achieved via a percentage potentiometer. A green supply on LED is featured along with a red LED to indicate relay output status. All terminal details and the function information along with the CE mark is clearly marked on the sides of the housing.
A permanent supply is required at all times on terminals A1 \& A2, however this is not the controlling factor. The controlling factor is a trigger input from A1 onto terminal S . On an input being made to terminal S the relay contacts energise, on removal of the trigger input (trailing edge) the relay contacts time to de-energise. If the trigger input is reinstated after timing has commenced, it will immediately cancel any remaining time delay and the trigger will need to be removed for timing to commence again. If the supply on terminals A1 \& A2 is removed at any point when the relay contacts are energised, irrespective of what state the trigger is at, the relay contacts will deenergise. If the trigger input to terminal S is present before the connection of the supply to terminals A1 \& A2 when the supply is connected, the relay contacts will immediately energise and as before removal of $S$ will commence timing.
The trigger input " S ", this input should preferably be clean. However, within reason small loads can be connected between " S " \& "A2", such as relay coils or indicator lights.


## SPECIFICATIONS

Timing:
Time ranges Repeat accuracy: Reset time:

| Relay output: |  |
| :---: | :---: |
| Output contacts: | UNI-1C 16Amps/250V AC1 |
|  | UNI-4C 8Amps/250V AC1 |
| Max breaking capacity: | UNI-1C 4000VA, UNI-4C 2000VA |
| Mechanical life: | 30 Million ops |
| Electrical life: | 200K ops at max rated load |
| Supply voltage: |  |
| Supply voltage: | 12-250V AC/DC |
| Max power consumption: | 5VA / 2.8 W |
| Insulation: | 2.5 KV 50 Hz impulse |
| Trigger input (S): |  |
| Max consumption: | 5 mA |
| Min input time: | 25 mSec |
| Max input time: | Continuous |
| Clean contact input: | Not required |
| General: |  |
| Operating temperature: | $-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$ |
| Storage temperature: | $-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$ |
| CE marked: | Yes |
| In accordance with: | EN61000-6-1: 2007 |
|  | EN61000-6-3: 2007 |
|  | EN61010-1: 2002 |
| Housing material: | Polycarbonate, Auto extinguishable to UL 94 V-0 |




# DIN RAIL, 8 \& 11 PIN PLUG IN DEDICATED VOLTAGE, DEDICATED TIME RANGE, DELAY OFF TIMERS VIA TRIGGER INPUT (trailing edge) 

## TYPES: YRCF, 8RCF, 11 RCF (spco) \& 11R2CF (dpco)

- FEATURES
- Din rail \& plug in versions
- SPCO \& DPCO versions
- Simple \& economic
- Ideal for OEM applications
- Single coil voltages 12VDC to 230VAC
- Single adjustable time ranges
- Option for fixed times
- LED indication
- CE marked


## DESCRIPTION \& MODE OF OPERATION

Simple din rail mounted or 8 \& 11 pin plug in dedicated delay off via a trailing edge trigger input timers, with dedicated coil voltage and time range. These timers are ideal for mass production of OEM applications, or for any application where operator interference must be kept to a minimum. These timers can also on request, subject to a minimum quantity of 10 pieces, be factory set with an exact time, thus ensuring absolutely no operator interference. The timers feature a red LED to indicate relay output status. All terminal details along with the CE mark is clearly marked on the sides of the housing.
A permanent supply is required at all times on to the coil terminals, however this is not the controlling factor. The controlling factor is a trigger input S2, on S2 closing the relay contacts energise, on removal of S2 (trailing edge) the relay contacts time to de-energise. If S2 is reinstated after timing has commenced, it will immediately cancel any remaining time delay and S2 will need to be removed for timing to commence again. If the coil supply is removed at any point when the relay contacts are energised, irrespective of what state the trigger is at, the relay contacts will de-energise. If S 2 is closed before the connection of the coil supply, on the connection of the coil supply the relay contacts will immediately energise and on the opening of S 2 timing will commence.
The command contact $\mathbf{S 2}$ should be isolated from other circuits and must only be connected to the same supply as the coil voltage to the timer. If this cannot be achieved, use UNI-1C or UNI-4C on page 18. Or for 8/11 pin plug in units see page 8.

## ORDERING INFORMATION

| TYPE | TIME RANGE |  | COIL VOLTAGE |
| :---: | :---: | :---: | :---: |
| YRCF (Din rail SPCO) | 0.1 to 1 sec | 3 to 300 sec | 12V DC |
| 8RCF (8 pin plug in SPCO) | 0.3 to 3 sec | 0.1 to 10 mins | 24V AC/DC |
| 11RCF (11 pin plug in SPCO) | 0.6 to 10 sec | 0.2 to 20 mins | 48V AC/DC |
| 11R2CF (11 pin plug in DPCO) | 0.3 to 30 sec | 0.3 to 30 mins | 110 V AC |
|  | 0.6 to 60 sec | 0.6 to 60 mins | 230 V AC |
|  | 1 to 100 sec | 1 to 100 mins |  |

Factory preset version remove " $F$ " from type code and insert " $P$ ", then specify exact fixed time required


## SPECIFICATIONS

Timing:
Repeat accuracy: constant ambient: across temp range: Setting accuracy: Reset time: during timing:
$\pm 0.5 \%$ of set value
$\pm 3 \%$
0 to $+30 \%$

Trigger input (S2):
Max power consumption: 5 mA
Min input time:
Max input time:
25 mSec

Relay outputs:
Output contacts
Max switching voltage:
Mechanical life:
Electrical life:
50 mSec

Supply voltage:
Supply voltage tolerance: $\pm 15 \%$
Frequency:
50/60Hz
Max power consumption: 10VA
General:
Operating temperature: $\quad-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
Storage temperature: $\quad-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
CE marked:
In accordance with:

Housing material: Polycarbonate, Auto extinguishable to UL 94 V-0


## DIN RAIL, 8 \& 11 PIN PLUG IN DEDICATED VOLTAGE, DEDICATED TIME RANGE, DELAY OFF TIMERS VIA TRIGGER INPUT (trailing edge)

TYPES: YRC, 8RC, 11 RC (spco) \& 11R2C (dpco)

- FEATURES
- Din rail \& plug in versions
- SPCO \& DPCO versions
- Single coil voltages 12VDC to 230VAC
- Choice of three multi time ranges
- LED indication
- CE marked


## DESCRIPTION \& MODE OF OPERATION

Din rail mounted or 8 \& 11 pin plug in dedicated delay off via a trailing edge trigger input timers, with dedicated coil voltage. The timers are SPCO output with a DPCO option for an 11 pin plug in. A choice of one of three multi time ranges can be requested. The timers feature a red LED to indicate relay output status. All terminal details along with the CE mark is clearly marked on the sides of the housing.
A permanent supply is required at all times on to the coil terminals, however this is not the controlling factor. The controlling factor is a trigger input S2, on S2 closing the relay contacts energise, on removal of S2 (trailing edge) the relay contacts time to de-energise. If S2 is reinstated after timing has commenced, it will immediately cancel any remaining time delay and S2 will need to be removed for timing to commence again. If the coil supply is removed at any point when the relay contacts are energised, irrespective of what state the trigger is at, the relay contacts will de-energise. If S 2 is closed before the connection of the coil supply, on the connection of the coil supply the relay contacts will immediately energise and on the opening of S 2 timing will commence.
The command contact S2 should be isolated from other circuits and must only be connected to the same supply as the coil voltage to the timer. If this cannot be achieved, use UNI-1C or UNI-4C on page 19. Or for $8 / 11$ pin plug in units see page 8.

## SPECIFICATIONS

## Timing:

Repeat accuracy:
constant ambient:
across temp range:
Reset time:
during timing:
$\pm 3 \%$

Trigger input (S2):
Max power consumption: 5 mA
Min input time: $\quad 25 \mathrm{mSec}$
Max input time: Continuous
Relay outputs:
Output contacts:
Max switching voltage:
Mechanical life:
Electrical life:
Supply voltage:
Supply voltage tolerance: $\pm 15 \%$
Frequency: $50 / 60 \mathrm{~Hz}$
Max power consumption: 10VA
General:
Operating temperature: $\quad-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
Storage temperature: $\quad-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
CE marked:
In accordance with:

Housing material:

Yes
EN61000-6-1: 2007
EN61000-6-3: 2007
EN61010-1: 2002
Polycarbonate, Auto extinguishable to UL 94 V-0

## ORDERING INFORMATION

## TYPE

YRC (Din rail SPCO)
8RC (8 pin plug in SPCO)
11RC (11 pin plug in SPCO)
11R2C (11 pin plug in DPCO)

TIME RANGE (specify S, M or L)
S ( 0.06 to 160 secs) $\quad$ M ( 0.5 sec to 21 mins ) 0.06 to $0.6 \mathrm{sec} \quad 0.5$ to 5 sec 0.25 to $2.5 \mathrm{sec} \quad 2$ to 20 sec 2 to $20 \mathrm{sec} \quad 16$ to 160 sec 16 to 160 sec

16 to 160 sec
2 to 21 mins


# DIN RAIL, 8 \& 11 PIN PLUG IN DEDICATED VOLTAGE, DEDICATED TIME RANGE DELAY OFF TIMERS VIA TRIGGER INPUT (leading edge) <br> PRODUCT GROUP 

## TYPES: YRBF, 8RBF, 11 RBF (spco) \& 11R2BF (dpco)

- Din rail \& plug in versions
- SPCO \& DPCO versions
- Simple \& economic
- Ideal for OEM applications
- Single coil voltages 12VDC to 230VAC
- Single adjustable time ranges
- Option for fixed times

- LED indication
- CE marked


## DESCRIPTION \& MODE OF OPERATION

Simple din rail mounted or 8 \& 11 pin plug in dedicated delay off via a leading edge trigger input timer, with dedicated coil voltage and time range. The timers are SPCO output with a DPCO option on an 11 pin plug in. These timers are ideal for mass production OEM applications, or for any application where operator interference must be kept to a minimum. These timers can also on request, subject to a minimum quantity of 10 pieces, be factory set with an exact time, thus ensuring absolutely no operator interference. The timers feature a red LED to indicate relay output status. All terminal details along with the CE mark is clearly marked on the sides of the housing.
A permanent supply is required at all times on the coil terminals, however this is not the controlling factor. The controlling factor is a trigger input S2, on S2 closing the relay contacts energise and timing immediately commences (leading edge), after the set delay time the contacts de-energise. If the coil supply is removed during the timing period the contacts immediately de-energise. If the trigger input S 2 is present before the connection of the coil supply the contacts will not energise, the coil supply has to be present before the timer sees the leading edge of the trigger input. If S 2 is initiated again during timing this will have no effect, timing has to be completed before another leading edge of the trigger takes effect.
The command contact S2 should be isolated from other circuits and must only be connected to the same supply as the coil voltage to the timer. If this cannot be achieved, use UNI-1M or UNI-4M on page 4. Or for 8/11 pin plug in units see page 8.

## FUNCTION



## ORDERING INFORMATION

| TYPE | TIME RANGE |  | COIL VOLTAGE |
| :---: | :---: | :---: | :---: |
| YRBF (Din rail SPCO) | 0.1 to 1 sec | 3-300 sec | 12VDC |
| 8RBF (8 pin plug in SPCO) | 0.3-3 sec | 0.1 to 10 mins | 24VAC/DC |
| 11RBF (11 pin plug in SPCO) | 0.6 to 10 sec | 0.2 to 20 mins | 48V AC/DC |
| 11R2BF (11 pin plug in DPCO) | 0.3 to 30 sec | 0.3 to 30 mins | 110 V AC |
|  | 0.6 to 60 sec | 0.6 to 60 mins | 230V AC |
|  | 1 to 100 sec | 1 to 100 mins |  |

## DIN RAIL, 8 \& 11 PIN PLUG IN DEDICATED VOLTAGE, MULTI TIME RANGE, DELAY OFF TIMERS VIA TRIGGER INPUT (leading edge) <br> PRODUCT GROUP

## TYPES: YRB, 8RB, 11 RB (spco) \& 11R2B (dpco)

FEATURES<br>- Din rail \& plug in versions<br>- SPCO \& DPCO versions<br>- Single coil voltages 12VDC to 230VAC<br>- Choice of three multi time ranges<br>- LED indication<br>- CE marked

## D DESCRIPTION \& MODE OF OPERATION

Simple din rail mounted or 8 \& 11 pin plug in dedicated delay off via a leading edge trigger input timer, with dedicated coil voltage and time range. The timers are SPCO output with a DPCO option for an 11 pin plug in. A choice of one of three multitime ranges can be requested. The timers feature a red LED to indicate relay output status. All terminal details along with the CE mark is clearly marked on the sides of the housing.
A permanent supply is required at all times on to the coil terminals, however this is not the controlling factor. The controlling factor is a trigger input S2, on S2 closing the relay contacts energise and timing immediately commences (leading edge), after the set delay time the contacts de-energise. If the coil supply is removed during the timing period the contacts immediately de-energise. If the trigger input S2 is present before the connection of the coil supply, the contacts will not energise, the coil supply has to be present before the timer sees the leading edge of the trigger input. If S 2 is initiated again during timing this will have no effect, timing has to be completed before another leading edge of the trigger takes effect.
The command contact S2 should be isolated from other circuits and must only be connected to the same supply as the coil voltage to the timer. If this cannot be achieved, use UNI-1M or UNI-4M on page 4. Or for 8/11 pin plug in units see page 8.


SPECIFICATIONS<br>Timing:<br>Repeat accuracy: constant ambient: across temp range: Setting accuracy: Reset time: during timing:<br>Trigger input (S2): Max consumption: Min input time: Max input time: Relay outputs: Output contacts:<br>Max switching voltage:<br>Mechanical life: Electrical life: Supply voltage:<br>Supply voltage tolerance: $\pm 15 \%$<br>Frequency: $50 / 60 \mathrm{~Hz}$<br>Max power consumption:<br>General:<br>Operating temperature<br>Storage temperature:<br>CE marked:<br>In accordance with:<br>Housing material:<br>10VA<br>$\pm 0.5 \%$ of set value<br>$\pm 3 \%$<br>0 to $+30 \%$<br>50mSec<br>5 mA<br>25 mSec<br>Continuous<br>SPCO units 10Amps/250V AC1<br>DPCO units 8Amps/250V AC1<br>250VAC, 30VDC<br>30 Million ops<br>200K ops at max rated load<br>$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$<br>$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$<br>Yes<br>EN61000-6-1: 2007<br>EN61000-6-3: 2007<br>EN61010-1: 2002<br>Polycarbonate, Auto extinguishable<br>to UL 94 V-0

## ORDERING INFORMATION




# MULTI VOLTAGE, MULTI TIME RANGE TRUE DELAY 

 OFF TIMERS
# TYPES: UNI-1K (spco) \& UNI-2K (dpco) 

- Din rail mounted
- Modern modular design
- Width 27 mm ( 1.5 modules)
- SPCO \& DPCO version
- Tri voltage 24VACDC, 110VAC, 230VAC
- Multi time range $0.1 \mathbf{s e c}$ to $\mathbf{3 0}$ mins
- LED indication
- CE marked


## DESCRIPTION \& MODE OF OPERATION

An attractive modern designed true delay off timer (capacitor discharge timer) in a din rail mounted modular style housing of 1.5 modules width ( 27 mm ). The units are supply voltage selectable via the connection of different terminals. The timer is available in both SPCO and DPCO formats. Two selector switches are provided to select four different time ranges from 0.1 sec to 30 mins , fine time selection on a selected range is then achieved via a percentage potentiometer. Two green supply on LED's are featured which indicate supply healthy. On removal of the supply voltage and therefore the commencing of timing both LED's on this timer will extinguish. All terminal details and the function information along with the CE mark is clearly marked on the sides of the housing.
The relay energises immediately the supply voltage is applied to terminals A1 \& A2, A3 or A4 depending on the supply voltage. When the supply voltage is removed the relay is held energised by a charged capacitor, the removal of the supply voltage instigates the timing period. After the timing period has elapsed the relay will de-energise. A break in the supply of less than the set time will therefore be ignored. Since the relay is held energised after the removal of the supply by a charged capacitor it is necessary that the initial connection of the supply voltage must be at least 300 m Sec to facilitate the charging of the capacitor.
By nature a true delay off timer uses different relay technology, by the means of a magnetically latching mechanism. However, if subjected to undue physical shock, for example "in transit" the contacts maybe on initial connection be in the incorrect state. If this is the case this can be easily rectified by the connection and removal of the auxiliary supply voltage. Thus allowing the contacts to time out and return to the correct state.

## CONNECTIONS



## DIN RAIL 8 \& 11 PIN PLUG IN DEDICATED VOLTAGE, DEDICATED TIME RANGE, CAPACITOR DISCHARGE TRUE DELAY OFF TIMERS

## TYPES: YRKF, 8RKF, 11 RKF (spco) \& 8R2KF, 11 R2KF (dpco)

- FEATURES
- Din rail \& plug in versions
- SPCO \& DPCO versions
- Simple \& economic
- Ideal for OEM applications
- Single coil voltages 12VDC to 230VAC
- Single adjustable time ranges
- Option for fixed times
- LED indication
- CE marked


## DESCRIPTION \& MODE OF OPERATION

Simple din rail mounted or 8 \& 11 pin plug in dedicated true delay off timers (capacitor discharge type), with dedicated coil voltage and time range. These timers are SPCO output with a DPCO option on the 8 and 11 pin plug in versions. These timers are ideal for mass production of OEM applications, or for any application where operator interference must be kept to a minimum. These timers can also on request, subject to a minimum quantity of 10 pieces, be factory set with an exact time, thus ensuring absolutely no operator interference. The timers feature a red LED to indicate supply healthy. All terminal details along with the CE mark is clearly marked on the sides of the housing.

The relay energises immediately the supply voltage is applied, when the supply voltage is removed the relay is held energised by a charged capacitor, the removal of the power supply voltage instigates the timing period. After the timing period has elapsed the relay will de-energise. A break in the supply of less than the set time will therefore be ignored. Since the relay is held energised after the removal of the supply by a charged capacitor, it is necessary that the initial connection of the supply voltage must be at least 300 mSec to facilitate the full charging of the capacitor.
By nature a true delay off timer uses different relay technology, by the means of a magnetically latching mechanism. However, if subjected to undue physical shock, for example "in transit" the contacts maybe on initial connection be in the incorrect state. If this is the case this can be easily rectified by the connection and removal of the auxiliary supply voltage. Thus allowing the contacts to time out and return to the correct state.


## SPECIFICATIONS

Timing:
Repeat accuracy: constant ambient: across $\quad \pm \%$ of set value across temp range.
Relay outputs:
Output contacts:
Max switching voltage: Mechanical life: Supply voltage:
Min supply on time:
Supply voltage tolerance:
Frequency:
Max power consumption:
General:
Operating temperature: $\quad-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
Storage temperature: $\quad-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
CE marked:
In accordance with:

Housing material:
Yes
EN61000-6-1: 2007
EN61000-6-3: 2007
EN61010-1: 2002
Polycarbonate, Auto extinguishable
to UL 94 V-0

## ORDERING INFORMATION

| TYPE | TIME RANG |  | COIL VOLTAGE |
| :---: | :---: | :---: | :---: |
| YRKF (Din rail SPCO) | 0.1 to 1 sec | 0.1 to 10 mins | 12VDC |
| 8RKF (8 pin plug in SPCO) | 0.3 to 3 sec | 0.2 to 20 mins | 24V AC/DC |
| 11RKF (11 pin plug in SPCO) | 0.6 to 10 sec | 0.3 to 30 min | 48V AC/DC |
| 8R2KF (8 pin plug in DPCO) | 3 to 300 sec |  | 110 V AC |
| 11R2KF (11 pin plug in DPCO) |  |  | 230V AC |
| Factory preset version remove " $F$ " from type code and insert " $P$ ", then specify exact fixed time required |  |  |  |



# DIN RAIL 8 \& 11 PIN PLUG IN DEDICATED VOLTAGE, MULTI TIME RANGE, CAPACITOR DISCHARGE TRUE DELAY OFF TIMERS <br> PRODUCT GROUP 

## TYPES: YRKM, 8RKM, 11 RKM (spco) \& 8R2KM, 11 R2KM (dpco)

## FEATURES

- Din rail \& plug in versions
- SPCO \& DPCO versions
- Single coil voltages 12VDC to 230VAC
- Multi time range 0.5 sec to 21 mins
- LED indication
- CE marked


## D DESCRIPTION \& MODE OF OPERATION

Din rail mounted or 8 \& 11 pin plug in dedicated true delay off timers (capacitor discharge type), with dedicated coil voltage but multi time range. The timers are SPCO output with a DPCO option on the 8 and 11 pin plug in versions. These timers are multi time range, with four adjustable time ranges from 0.5 secs to 21 mins. The timers feature a red LED to indicate supply healthy. All terminal details along with the CE mark is clearly marked on the sides of the housing.
The relay energises immediately the supply voltage is applied, when the supply voltage is removed the relay is held energised by a charged capacitor, the removal of the power supply voltage instigates the timing period. After the timing period has elapsed the relay will de-energise. A break in the supply of less than the set time will therefore be ignored. Since the relay is held energised after the removal of the supply by a charged capacitor, it is necessary that the initial connection of the supply voltage must be at least 300 m Sec to facilitate the full charging of the capacitor.
By nature a true delay off timer uses different relay technology, by the means of a magnetically latching mechanism. However, if subjected to undue physical shock, for example "in transit" the contacts maybe on initial connection be in the incorrect state. If this is the case this can be easily rectified by the connection and removal of the auxiliary supply voltage. Thus allowing the contacts to time out and return to the correct state

## SPECIFICATIONS

## Timing:

Repeat accuracy: constant ambient: across temp range:
Relay outputs: Output contacts:

Max switching voltage:
Mechanical life:

## Supply voltage:

Min supply on time:
Supply voltage tolerance:
Frequency:
Max power consumption:
General:
Operating temperature: Storage temperature:
CE marked:
In accordance with:

Housing material:
$\pm 1 \%$ of set value
$\pm 4 \%$

SPCO units 10Amps/250V AC1
DPCO units 8Amps/250V AC1
250VAC, 30VDC
5 Million ops
300 mSec
$\pm 15 \%$
50/60Hz
10VA
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
Yes
EN61000-6-1: 2007
EN61000-6-3: 2007
EN61010-1: 2002
Polycarbonate, Auto extinguishable to UL 94 V-0


## ORDERING INFORMATION

TYPE
YRK (Din rail SPCO)
8RK (8 pin plug in SPCO)
11RK (11 pin plug in SPCO)
8R2K (8 pin plug in DPCO)
11R2K (11 pin plug in DPCO)

TIME RANGE (specify M M ( 0.5 sec to 21 mins ) COIL VOLTAGE 12V DC
0.5 to 5 sec

24V AC/DC 48V AC/DC
110 V AC
230V AC

# MULTI VOLTAGE, MULTI TIME RANGE, STAR DELTA 

 TIMERSTYPES: UNI-2Q (2 x spco) \& UNI-4O (2 x dpco)

- FEATURES
- Din rail mounted
- Modern modular design
- Width 27 mm (1.5 modules)
- 2 x SPCO version
- Unique $2 \times$ DPCO version
- Multi voltage 12-250VACDC
- Multi time range 0.1 sec to 10 mins
- Dwell time 100mSec
- Dual LED indication
- CE marked


## D DESCRIPTION \& MODE OF OPERATION

An attractive modern designed star delta timer in a din rail mounted modular style housing of 1.5 modules width ( 27 mm ). The timer features the facility of double deck terminals thus enabling the timer to be available also in a unique $2 \times$ DPCO version. A selector switch is provided to select four different "star" time ranges from 0.1 sec to 10 mins, fine time selection on a selected range is then achieved via a percentage potentiometer. A green supply on LED is featured along with a red LED to indicate relay output status. All terminal details and the function information along with the CE mark is clearly marked on the sides of the housing.

## TIMING FUNCTION

Initiated by supply on terminals A1 \& A2, which immediately starts the "star" time during which the "star" contacts remain closed. After expiry of the "star" time the "star" contacts open. This is followed by a pause of 100 mSec and the "delta" contacts then close. Removal of supply after timing has been completed and the "delta" relay contacts will de-energise, if removal of supply is before timing has been completed remaining time will be cancelled.


## SPECIFICATIONS

Timing:
Time ranges: Repeat accuracy: Reset time: Relay outputs: Output contacts:

Max breaking capacity:
Mechanical life: Electrical life: Supply voltage: Supply voltage:
Max power consumption: Insulation:
General:
Operating temperature: Storage temperature: CE marked: In accordance with:

Housing material:
0.1 sec to 10 mins $\pm 0.5 \%$ of set value Max 100 mSec

UNI-20 $2 \times$ SPCO 16Amps/250V AC1 UNI $402 \times$ DPCO 8Amps/250V AC1 UNI-20 4000VA UNI-4Q 2000VA 30 Million ops 200K ops at max rated load 12-250VACDC
5VA / 2.8W
2.5 KV 50 Hz impulse
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
Yes
EN61000-6-1: 2007
EN61000-6-3: 2007
EN61010-1: 2002
Polycarbonate, Auto extinguishable to UL 94 V-0

## TIME RANGES

| Position 1: | $0.1-1$ sec | Position 3: | $10-100$ secs |
| :--- | :--- | :--- | :--- |
| Position 2: | $1-10$ secs | Position 4: | $1-10$ mins |



# DIN RAIL 8 \& 11 PIN PLUG IN, DEDICATED VOLTAGE, SINGLE TIME RANGE, STAR DELTA TIMERS 

## TYPES: YR2Q, 8R2Q, 11 R2Q

## - FEATURES

- Din rail \& plug in versions
- Separate contact output for star
- Separate contact output for delta
- Single coil voltages 12VDC to 415VAC
- Single adjustable time ranges
- With dwell time
- LED indication
- CE marked

DESCRIPTION \& MODE OF OPERATION
Din rail mounted or 8 \& 11 pin plug in star delta timers, dedicated coil voltage and dedicated adjustable time range. The timers have two independent contact outputs, one designed as Star and one as Delta. The timers are with a single adjustable time range and feature a red LED to indicate completion of the "Star" time. All terminal details along with the CE mark is clearly marked on the sides of the housing.
On connection of the supply voltage the "Star" contact remains closed and timing immediately commences, after the expiry of the set delay time the "Star" contact opens. There then follows a dwell time of 100 mSec (on request 30 mSec ) and the separate "Delta" contact then closes. On loss of the supply voltage during timing, the elapsed time is immediately cancelled and after timing the "Delta" contact will open.

## SPECIFICATIONS

## Timing:

Repeat accuracy:
constant ambient:
across temp range:
Setting accuracy:
Time ranges:
Dwell time:
Reset time:
during timing:
after timing:
Relay outputs:
YR2Q:
8R2O \& 11R20
Output contacts:
Max switching voltage: Mechanical life:
Electrical life:
Supply voltage:
$\begin{array}{ll}\text { Supply voltage tolerance: } & \pm 15 \% \\ \text { Frequency: } & 50 / 60 \mathrm{H}\end{array}$
Frequency: $\quad 50 / 60 \mathrm{~Hz}$
Max power consumption: 11VA
General:
Operating temperature: $\quad-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
Storage temperature: $\quad-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
CE marked:
In accordance with:

Housing material:
$\pm 1 \%$ of set value
$\pm 3 \%$
0 to $+30 \%$
0.3 to 30 sec or 1 to 100 sec

100 mSec standard ( 30 mSec on request)
100 mSec
100 mSec
Star 1NC, Delta 1NO
$2 \times$ SPCO
5Amps/250V AC1
250VAC, 30VDC
20 Million ops
50K ops at max rated load

Yes
EN61000-6-1: 2007
EN61000-6-3: 2007
EN61010-1: 2002
Polycarbonate, Auto extinguishable
to UL 94 V-0

## ORDERING INFORMATION

| TYPE | TIME RANGE (specify) | COIL VOLTAGE |
| :---: | :---: | :---: |
| YR20 (Din rail) | 0.3 to 30 sec | 12VDC |
| 8R20 (8 pin plug in) | 1 to 100 sec | 24V AC/DC |
| 11R20(11 pin plug in) |  | 48 V AC/DC |
|  |  | 110 VAC |
|  |  | 230V AC |
|  |  | 400 V AC |
| Tel: 01616265316 / 0127625858 |  | 415 V AC |

DWELLTIME
30mSec optional
(If not requested 100 mSec will be supplied)

# MULTI VOLTAGE, DUTY CHANGEOVER RELAY, RANGE SELECTABLE 

## TYPES: UNI-1B (spco) \& UNI-4B (4pco)

- FEATURES
- Din rail mounted
- Modern modular design
- Width 27 mm ( 1.5 modules)
- Unique product
- SPCO \& unique 4PCO versions
- Multi voltage 12-250VACDC
- Range selectable
- 10 second proving function
- Daily, weekly, fortnightly, monthly changeover
- Dual LED indication
- CE marked


## - DESCRIPTION \& MODE OF OPERATION

An attractive modern designed "duty changeover relay" in a din rail mounted modular style housing of 1.5 modules width ( 27 mm ). A selector switch is provided to select one of four different fixed time ranges from 1 day to 1 month, (there is also a 10 second "circuit proving" setting). This is an ideal simple product to achieve a daily, weekly, fortnightly or monthly duty changeover on pumps, fans and similar equipment especially in the HVAC and pumping industry. A green supply on LED is featured along with a red LED to indicate relay output status. All terminal details and the function information along with the CE mark is clearly marked on the sides of the housing.

## TIMING FUNCTION

Initiated by supply on terminals A1 \& A2. Timing commences to energise relay contacts (pause first) and then times to de-energise relay contacts. This cycle continues so long as the supply is connected. The time period on both energisation and de-energisation (T1 \& T2) are both fixed. If the supply is removed at any point within the cycle any remaining time will be cancelled and if the relay contacts are energised they will de-energise.


## SPECIFICATIONS

## Timing:

Time ranges (fixed): Proving function (fixed): Repeat accuracy: Reset time: Relay outputs: Output contacts:

Max breaking capacity:
Mechanical life:
Electrical life: Supply voltage:
Supply voltage:
Max consumption:
Insulation:
General:
Operating temperature: $\quad-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
Storage temperature: $\quad-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
Max cable size:
CE marked:
In accordance with:

Housing material: 10 sec $\pm 0.5 \%$ of set value Max 100mSec UNI-4B 8Amps/250V AC1 UNI-1B 4000VA UNI-4B 2000VA
30 Million ops

12-250VACDC
5 mA
2.5 KV 50 Hz impulse
2.5 mm

Yes
EN61000-6-1: 2007
EN61000-6-3: 2007
EN61010-1: 2002 to UL 94 V-0

1 day, 7 days, 14 days, 30 days

UNI-1B 16Amps/250V AC1

200K ops at max rated load

Polycarbonate, Auto extinguishable

## TIME RANGES

| Position 1: | 10 secs fixed | Position 4: | 14 days fixed |
| :--- | :--- | :--- | :--- |
| Position 2: | 1 day fixed | Position 5: | 30 days fixed |
| Position 3: | 7 days fixed |  |  |



# DIN RAIL 8 \& 11 PIN PLUG IN, DEDICATED VOLTAGE, FIXED OR ADJUSTABLE CYCLE TIME, FLASHER RELAYS 

## TYPES: YRDB(F), 8RDB(F), 11 RDB(F) (spco) 8R2DB(F), 11 R2DB(F) (dpco)

## - FEATURES

- Din rail \& plug in versions
- SPCO \& DPCO versions
- Simple \& economic
- Ideal for OEM applications
- Single coil voltages 12 VDC to 400 VAC
- Fixed or adjustable cycle times
- LED indication
- CE marked

DESCRIPTION \& MODE OF OPERATION
Din rail mounted or \& \& 11 pin plug in SPCO with a DPCO option on plug in units dedicated flasher relays, with dedicated coil voltages. The flashers are available as a standard fixed 1 sec On and 1 sec Off cycle ("DB" version) or with an adjustable cycle time, a set cycle time equates to " $50 \%$ On \& $50 \%$ Off". The relays can also on request, subject to a minimum quantity of 10 pieces, be factory set with any fixed cycle time, thus ensuring absolutely no operator interference. The timers feature a red LED to indicate relay output status. All terminal details with the CE mark is clearly marked on the sides of the housing.
On connection of the supply voltage the relay contact/s immediately energise (pulse start) and remain energised for $50 \%$ of the cycle time, followed by a de-energisation for the next $50 \%$ of the cycle time. If the supply voltage is removed at any point, any remaining elapsed time is cancelled and if the relay contact/s are energised they will de-energise immediately.


## FUNCTION



## ORDERING INFORMATION

## TYPE

YRDB (Din rail SPCO)
8RDB (8 pin plug in SPCO)
11RDB (11 pin plug in SPCO)
8R2DB (8 pin plug in DPCO)
11R2DB (11 pin plug in DPCO)

TIME RANGE (F if required)

| 0.1 to 1 sec | 3 to 300 sec |
| :--- | :--- |
| 0.3 to 3 sec | 0.1 to 10 mins |
| 0.6 to 10 sec | 0.2 to 20 mins |
| 0.3 to 30 sec | 0.3 to 30 mins |
| 0.6 to 60 sec | 0.6 to 60 mins |
| 1 to 100 sec | 1 to 100 mins |

$\pm 0.5 \%$ of set value
$\pm 3 \%$
0 to $+30 \%$ ( F versions)

100 mSec
50 mSec
SPCO units 5Amps/250V AC1 DPCO units 8Amps/250V AC1 250VAC, 30VDC 20 Million ops 50K ops at max rated load
anical life:
Electrical life: Supply voltage:
Supply voltage tolerance: $\pm 15 \%$
Frequency: $\quad 50 / 60 \mathrm{~Hz}$
Max power consumption: 10VA
General:
Operating temperature: $\quad-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
Storage temperature: $\quad-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
CE marked:
In accordance with:

Housing material:

Yes
EN61000-6-1: 2007
EN61000-6-3: 2007
EN61010-1: 2002
Polycarbonate, Auto extinguishable
to UL 94 V-0

If an adjustable version is required, enter suffix " $F$ " into the order code and then the adjustable time range required, if time set to 10 sec this will equate to a cycle of: $5 \mathrm{sec} 0 \mathrm{n} \& 5 \mathrm{sec} 0 \mathrm{ff}$.
If suffix " $F$ " is not entered a standard fixed " $D B$ " version will be supplied with a 2 second cycle: $1 \sec 0 \mathrm{n}$ \& 1 sec 0 ff .
On request other factory fixed cycles can be supplied enter suffix " $P$ " after "DB" then specify exact fixed cycle time required.

# DIN RAIL 8 \& 11 PIN PLUG IN SOLID STATE ELECTRONIC FLASHERS 

## TYPES: YSDB, 8SDB, $11 S D B$ (Triac output AC circuits) YSDFPT, 8SDFPT, 11 SDFPT (Transitor output DC circuits)

FEATURES
Din rail \& plug in versions
Triac \& Transitor output versions
Triac version connects in series with the load
Transitor version three wire PNP
Simple \& economic
Simple \& economic, ideal for OEM applications
CE marked
DESCRIPTION \& MODE OF OPERATION

Din rail mounted or 8 \& 11 pin plug in solid state output electronic flashers, available in either Triac output for AC circuits, or as a Transistor output for DC circuits. These devices are most suitable for applications where there is a prolonged flash rate and relay wear is of a concern. All terminal details with the CE mark is clearly marked on the sides of the housing.
The AC Triac version is a "pause start" and of a fixed 1 sec cycle ( 0.5 sec Off \& 0.5 sec On). The DC Transistor version is also a "pause start" and is available with a choice of adjustable cycle times. A set cycle time equates to $50 \%$ of the time as On and $50 \%$ of the time as Off. If the supply voltage is removed at any point, any remaining elapsed time is cancelled and if the output is On it will immediately switch to Off.

## SPECIFICATIONS

AC Triac output:

## Supply voltage:

Max output rating: Derating with temp rise:
Min operating current:
Start:
LED indication:
Timing:
DC Transistor output:
Supply voltage:
Supply voltage tolerance:
Max output rating: Min operating current: Start:
LED indication:
Timing:
General:
Operating temperature:
Storage temperature:
CE marked:
In accordance with:

Housing material:

20-260V AC
1 Amp at $20^{\circ} \mathrm{C}$
$10 \mathrm{~mA} / 1^{\circ} \mathrm{C}$
10 mA
Pause first
No
1 sec cycle fixed
12 or 24V DC
$\pm 15 \%$
1 Amp at $20^{\circ} \mathrm{C}$
3 mA
Pause first
Yes
Choice of adjustable settings
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
Yes
EN61000-6-1: 2007
EN61000-6-3: 2007
EN61010-1: 2002
Polycarbonate, Auto extinguishable to UL 94 V - 0

## ORDERING INFORMATION

DC TRANSISTOR OUTPUT

| TYPE | CYCLE RANGE |  | SUPPLY VOLTAGE |
| :--- | :--- | :--- | :--- |
| YSDFPT (Din rail) | 0.1 to 1 sec | 3 to 300 sec | 12VDC |
| 8SDFPT (8 pin plug in) | 0.3 to 3 sec | 0.1 to 10 mins | 24VDC |
| 11SDFPT(11 pin plug in) | 0.6 to 10 sec | 0.2 to 20 mins |  |
|  | 0.3 to 30 sec | 0.3 to 30 mins |  |
|  | 0.6 to 60 sec | 0.6 to 60 mins |  |
|  | 1 to 100 sec | 1 to 100 mins |  |

AC TRIAC OUTPUT

TYPE
YSDB(Din rail) 8SDB (8 pin plug in) 11SDB (11 pin plug in)


# MULTI VOLTAGE, MULTI TIME RANGE, ASYMMETRICAL CYCLIC TIMERS 

## TYPES: UNI-1D (spco) \& UNI-4D (4pco)

- Din rail mounted
- Modern modular design
- Width 27 mm ( 1.5 modules)
- SPCO version
- Unique 4PCO version
- Multi voltage 12-250VACDC
- T1 \& T2 both multi time range $\mathbf{1}$ sec to $\mathbf{1 0 0}$ days
- Selectable "pulse first" or "pause first"
- Dual LED indication
- CE marked


## DESCRIPTION \& MODE OF OPERATION

An attractive modern designed asymmetrical cyclic timer in a din rail mounted modular style housing 1.5 modules width $(27 \mathrm{~mm})$. The timer features the facility of double deck terminals thus enabling the timer to be available also in a unique 4PCO version. A selector switch is provided to select eight different time ranges from 1 sec to 100 days independently on both T1 \& T2, fine time selection on a selected range is then achieved via the two percentage potentiometers. The timer can be selected to be "pulse first" via an external link fitted between terminals A1 and Y 1 , leaving the link open results in "pause first". A green supply on LED is featured along with a red LED to indicate relay output status. All terminal details and the function information along with the CE mark is clearly marked on the sides of the housing.

## TIMING FUNCTION

Asymmetrical cyclic (pause first) - initiated by supply on terminals A1 \& A2 and the volt free link between terminals A1 \& Y1 left open. Timing commences to energise relay contacts and then times to de-energise relay contacts. This cycle continues so long as the supply is connected. The time period on both energisation and de-energisation (T1 \& T2) are independently selectable. If the supply is removed at any point within the cycle any remaining time will be cancelled and if the relay contacts are energised they will de-energise.
Asymmetrical cyclic (pulse first) - exactly the same as above, but a volt free link needs to be fitted externally across terminals A1 \& Y1. On the connection of the supply to terminals A1 \& A2 the relay contacts immediately energise and then time to de-energise.


# DIN RAIL 8 \& 11 PIN PLUG IN DEDICATED VOLTAGE, MULTI TIME RANGE, ASYMMETRICAL CYCLIC TIMERS 

TYPES: YRD, 8RD, 11 RD (spco) \& 11R2D (dpco)

- FEATURES
- Din rail \& pin plug in versions
- SPCO \& DPCO versions
- Single coil voltages 12VDC to 230VAC
- Selectable "pulse first" or "pause first"
- T1 \& T2 both multi time range 1 sec to 100 days
- Dual colour LED indication
- CE marked


## - DESCRIPTION \& MODE OF OPERATION

Asymmetrical cyclic output timers available as either din rail mounted or 8 \& 11 pin plug in with a DPCO output version also as an 11 pin. Two selector switches are provided to select one of eight different time ranges from 1 sec to 100 days independently for both T1 \& T2, fine time adjustment on a selected range is then achieved via the two percentage potentiometers. The plug in version the time can be selected to be "pulse first" or "pause first" via an external wired link between pins $5 \& 6$. This is an option available on the din rail version but has to be specified when ordering. The timers feature a bi-colour LED to indicate output relay status, green when timing red when energised. All terminal details along with the CE mark is clearly marked on the sides of the housing.
Pause first (Standard din rail version YRD) - initiated by the connection of the supply voltage and the link between pins $5 \& 6$ left open. Timing commences to energise relay contacts and then times to de-energise relay contacts. This cycle continues so long as the supply is connected. The time period for both energisation and de-energisation (T1 \& T2) are independently selectable. If the supply is removed at any point within the cycle any remaining time will be cancelled and if the relay contacts are energised they will de-energise.
Pulse first (Inverted din rail version YRD I) - exactly as above but the link between pin $5 \& 6$ needs to be closed. On connection of the supply voltage the relay contacts immediately energise and then time to de-energise.

## SPECIFICATIONS

Timing:
Time ranges:
Repeat accuracy:
Reset time:
Pulse first:
Pause first:
Relay outputs:
Output contacts:
Max switching voltage:
Mechanical life:
Electrical life:
Supply voltage:
Supply voltage tolerance:
Frequency:
Max power consumption:
Insulation:
General:
Operating temperature: Storage temperature:
CE marked:
In accordance with:

Housing material:

1 sec to 100 days (T1 \& T2)
$\pm 0.5 \%$ of set value
Max 100mSec
Via a wired link Closed
Via a wired link Open
SPCO units 10Amps/250V AC1
DPCO units 8Amps/250V AC1
250VAC, 30VDC
30 Million ops
200K ops at max rated load
$\pm 15 \%$
50/60Hz
7VA
2.5 KV 50 Hz impulse
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
Yes
EN61000-6-1: 2007
EN61000-6-3: 2007
EN61010-1: 2002
Polycarbonate, Auto extinguishable


| ORDERING INFORMATION |  |
| :---: | :---: |
| TYPE | coilvoltage |
| YRD (Din rail SPCO) | 12 VDC |
| YRDI (Din rail SPCO Inverted 0/P) | $24 \mathrm{VAC} / \mathrm{DC}$ |
| 8RD (8 pin plug in SPCO) | 48V AC/DC |
| 11RD (11 pin plug in SPCO) | 110 VAC |
| 11R2D (11 pin plug in DPCO) | 230 VAC |

## TIME RANGES

| Position 1: | $1-10$ secs | Position 5: | $1-10$ hrs |
| :--- | :--- | :--- | :--- |
| Position 2 | $10-100$ secs | Position 6: | $10-100$ days |
| Position 3: | $1-10$ mins | Position:7 | $1-10$ days |
| Positon 4: | $10-100$ mins | Position 8: | $10-100$ days |

## TYPE: 11R2ES

## FEATURES

11 pin plug in

- Start time adjustable 3-30 secs
- Recovery time adjustable 6-60 secs
- Supply voltage 9-30VDC
- LED indication
- Separate start relay output
- Separate alarm relay output


## DESCRIPTION \& MODE OF OPERATION

An 11 pin plug in engine start attempt relay for use in starting combustion engines connected to generators. The number of start attempts is selected by the middle selector switch 1-8. The start time is set by the top potentiometer between $3-30$ secs and the recovery time by the bottom potentiometer between $6-60$ secs.
When the auxiliary supply (9-30VDC) is first applied ( +2 \& -10) the "Start" relay energises immediately for the "Start" time. After expiration of the "Start" time the relay de-energises for the "Recovery" time. This cycle continues for $1-8$ times as set by the number on the "Attempts" switch. If the engine starts the power supply to terminals 2 \& 10 should be thus wired so that it is interrupted. The "Alarm" relay will energise after the last start attempt thus an "engine fail to start alarm", this status will remain until the auxiliary supply is removed.

## SPECIFICATIONS

## Supply \& time:

Supply voltage: 9-30VDC
Power consumption: $\quad 0.6 \mathrm{~W}$
Number start attempts: $1-8$
Start time:
Recovery time: $\quad 6-60$ secs
Reset time: $\quad 50 \mathrm{mSec}$
General:
$\begin{array}{ll}\text { Operating temperature: } & -20^{\circ} \mathrm{C} \text { to }+65^{\circ} \mathrm{C} \\ \text { Storage }\end{array}$
Storage temperature: $\quad-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
Max cable size: 4 mm
CE marked: Yes
In accordance with: EN61000-6-1: 2007
EN61000-6-3: 2007
EN61010-1: 2002
$\pm 0.5 \%$
Polycarbonate, Auto extinguishable to UL 94 V-0

Relay $2 \times$ SPCO
10A/250VAC AC1
30 Million ops
200 K at $10 \mathrm{~A} / 250 \mathrm{VAC}$


# DIN RAIL 8 \& 11 PIN PLUG IN DEDICATED VOLTAGE, <br> MAINS RESTORATION "BROWN OUT" RELAYS <br> <br> TYPES: LYRAPTU, L8RAPTU, L11RAPTU (spco) <br> <br> TYPES: LYRAPTU, L8RAPTU, L11RAPTU (spco) \& L8R2APTU, L11R2APTU (dpco) 

 \& L8R2APTU, L11R2APTU (dpco)}

## - FEATURES

- Din rail \& plug in versions
- SPCO \& DPCO versions
- Relay resets when voltage dips below $\mathbf{8 0 \%}$ of Un
- Fast response 20 mSec detects 1 cycle loss of supply
- Super fast response version 1 mSec also available
- Monitors is its own supply
- Bi-colour LED indication
- Ideal for water authority applications
- CE marked


## D DESCRIPTION \& MODE OF OPERATION

Din rail mounted or 8 \& 11 pin plug in SPCO and DPCO "mains restoration auto restart relays". The voltage and supply sensing built into these units are designed to sense voltage dips and momentary loss of supply referred to as "Brown Outs". This phenomena is a particular threat in the water industry and regularly occurs at remote pumping locations, especially during electrical storms. Left unchecked, a supply dip can "lock out" all or part of a control system, causing system malfunctions over a wide area necessitating engineers' site visits, just to reset and restart a control system. By monitoring the supply these tried and proven Foxtam units will provide the "auto restart" signal to reset and restart the control system without the need for a site visit. For added convenience DPCO units are also available with the extra contact used as say a telemetry output to notify an operations centre that an incident has occurred.

These relays are designed to operate in such a way that they reset as quick, if not quicker, than standard contactor and relay coils.

On the application of the supply voltage the relay will energise after a fixed delay of 100 mSec . Should the supply then be lost for 1 cycle ( 20 mSec$)^{*}$ and/or dip below $80 \%$ of the nominal supply voltage, the relay will de-energise and will energise again after 100 mSec when the supply voltage is restored.
*1mSec version also available on request.



## SPECIFICATIONS

## Timing:

Repeat accuracy: constant ambient: across temp range: Response time:

## $\pm 0.5 \%$

$\pm 3 \%$
Better than 20 mSec
Better than 1 mSec option on request

## Supply voltage:

Supply voltage tolerance: $-20 \%$ to $+15 \%$
Frequency:
$50 / 60 \mathrm{~Hz}$ or DC
10VA
Relay outputs:
Output contacts:
Max switching voltage:
Mechanical life:
Electrical life:
General:
Operating temperature:
Storage temperature:
CE marked:
In accordance with:

RoHS compliant:
Housing material:

## ORDERING INFORMATION

| TYPE | COIL VOLTAGE |
| :--- | :--- |
| LYRAPTU (Din rail SPCO) | 12VDC |
| L8RAPTU (8 pin plug in SPCO) | 24 V DC |
| L11RAPTU (11 pin plug in SPCO) | 48 V DC |
| L8R2APTU (8 pin plug in DPCO) | 24 V AC |
| L11R2APTU (11 pin plug in DPCO) | 48 V AC |
|  | 110 V AC |
|  | 230 V AC |

## OPTION

1 mSec (Request if required super fast reset)

# DIN RAIL 8 \& 11 PIN PLUG IN DEDICATED VOLTAGE, SINGLE TIME RANGE, MAINS RESTORATION "BROWN OUT" TIMERS 

## TYPES:

# LYRAFTU, L8RAFTU, L11RAFTU (spco) L8R2AFTU, L11R2AFTU (dpco) LYRHFTU, L8RHFTU, L11RHFTU (spco) L8R2HFTU, L11R2HFTU (dpco) LYRQFTU, L8RQFTU, L11RQFTU (spco) L8R2QFTU, L11R2QFTU (dpco) 



## DESCRIPTION \& MODE OF OPERATION

Din rail mounted or 8 \& 11 pin plug in SPCO and DPCO "mains restoration auto restart timers". The voltage and supply sensing built into these units are designed to sense voltage dips and momentary loss of supply referred to as "Brown Outs". This phenomena is a particular threat in the water industry and regularly occurs at remote pumping locations, especially during electrical storms. Left unchecked, a supply dip can "lock out" all or part of a control system, causing system malfunctions over a wide area necessitating engineers' site visits, just to reset and restart a control system. By monitoring the supply these tried and proven Foxtam units will provide the "auto restart" signal to reset and restart the control system without the need for a site visit. For added convenience DPCO units are also available with the extra contact used as say a telemetry output to notify an operations centre that an incident has occurred.

These timers are designed and operate in such a way that they reset as quick, if not quicker, than standard contactor and relay coils. They are offered in a choice of three functions:

Delay On " A " function - on the application of the supply voltage the relay will energise after the set time delay. Should the supply then be lost for 1 cycle ( 20 mSec )* and/or dip below $80 \%$ of the nominal supply voltage, the relay will de-energise and will commence timing again when the supply voltage is restored.

Pulse " H " function - on the application of the supply voltage the relay will energise for the set delay time and then deenergise. The timer will then remain de-energised until reset by switching off normally, or by the loss of the supply for 1 cycle ( 20 mSec )* and/or dip below $80 \%$ of the nominal supply voltage. The relay will again energise for the set delay time on restoration of a healthy supply voltage.

Delayed Pulse " $\mathbf{Q}$ " function - on the application of the supply voltage the relay will after the set delay time pulse on for a fixed time of 300 mSec . Should the supply be lost for 1 cycle $(20 \mathrm{mSec})^{*}$ and/or dip below $80 \%$ of the nominal supply voltage the timer will be reset and after restoration of the supply the timer will commence another set delay time after which the relay will energise for 300 mSec .
*1mSec version also available on request.

## SPECIFICATIONS

Timing:
Repeat accuracy:
constant ambient:
across temp range:
Setting accuracy:
Response time:
$\pm 0.5 \%$ of set value
$\pm 3 \%$
0 to $+30 \%$
Better than 20 mSec
Better than 1 mSec option on request
Supply voltage:
Supply voltage tolerance:
Frequency:
Max power consumption:
$-20 \%$ to $+15 \%$
$50 / 60 \mathrm{~Hz}$
10VA

## Relay outputs:

Output contacts:

Max switching voltage:
Mechanical life:
Electrical life:
General:
Operating temperature:
Storage temperature:
CE marked:
In accordance with:
" 0 \& A" SPCO units 5Amps/250V AC1 " H " SPCO units 10Amps/250V AC1 All DPCO units 8Amps/250V AC1 250VAC, 250VDC
20 Million ops 50 K ops at max rated load
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
Yes
EN61000-6-1: 2007
EN61000-6-3: 2007
EN61010-1: 2002
Polycarbonate, Auto extinguishable to UL 94 V-0

PRODUCT
GROUP
A


COIL VOLTAGE
12VDC
24VDC
48VDC
24V AC
48V AC
110 V AC
230V AC

## INTERVAL

TYPE
LYRHFTU (Din rail SPCO)
L8RHFTU ( 8 pin plug in SPCO)
L11RHFTU ( 11 pin plug in SPCO)
L8R2HFTU (8 pin plug in DPCO)
L11R2HFTU (11 pin plug in DPCO)
DELAYED PULSE
TYPE
LYROFTU (Din rail SPCO)
L8ROFTU (8 pin plug in SPCO)
L11 ROFTU ( 11 pin plug in SPCO)
L8R20FTU (8 pin plug in DPCO)
L11R20FTU ( 11 pin plug in DPCO)

TIME RANGE (specify)
0.1 to 1 sec
0.1 to 3 sec
0.1 to 10 sec 0.3 to 30 sec 0.6 to 60 sec 1 to 100 sec

3 to 300 sec 0.1 to 10 mins 0.2 to 20 mins 0.3 to 30 mins 0.6 to 60 mins 1 to 100 mins

## OPTION

1 mSec
(Request if required super fast reset)

# KL̉midiand Jay MAINS RESTORATION "BROWN OUT" TIMERS 

## TYPES: GBPxxxx (spco)

## FEATURES

- Din rail mounted
- Timer resets when voltage dips below $\mathbf{8 0} \%^{*}$ of Un
- Ultra fast response 1 mSec reset time (also 5 mSec reset)
- Monitors the supply which is its own supply
- Three function options: delay on, pulse, delayed pulse
- Bi-colour LED indication
- Ideal for water authority applications
- CE marked


## DESCRIPTION \& MODE OF OPERATION

Din rail mounted SPCO "mains restoration auto restart timers". The voltage and supply sensing built into these units are designed to sense voltage dips and momentary loss of supply referred to as "Brown Outs". This phenomena is a particular threat in the water industry and regularly occurs at remote pumping locations, especially during electrical storms. Left unchecked, a supply dip can "lock out" all or part of a control system, causing system malfunctions over a wide area necessitating engineer's site visits, just to reset and restart a control system. By monitoring the supply these tried and proven units will provide the "auto restart" signal to reset and restart the control system without the need for a site visit.

These timers are designed and operate in such a way that they reset far quicker ( 1 mSec ), than standard contactor and relay coils. They are offered in a choice of three functions:

Delay On "function 4" - on the application of the supply voltage the relay will energise after the set time delay. Should the supply be momentarily lost or dip below $80 \%$ * of the nominal supply voltage, the relay will de-energise and will commence timing again when the supply voltage is restored within $85 \%^{*}$ or better of the nominal supply.

Pulse "function 5" - on the application of the supply voltage the relay will energise for the set delay time and then de-energise. The timer will then remain de-energised until reset by switching off normally, or by a momentary loss of the supply or dip below $80 \%$ * of the nominal supply voltage. The relay will again energise for the set delay time on restoration of a supply voltage within $85 \%^{*}$ or better of the nominal supply.

Delayed Pulse "function 6" - on the application of the supply voltage the relay will after the set delay time pulse on for a fixed time of 500 mSec . Should a momentary loss of the supply occur, or dips below $80 \%$ * of the nominal supply voltage the timer will be reset and on restoration of a supply voltage within $85 \%$ * or better of the nominal supply, the timer will commence with another set delay time after which the relay will energise for 500 mSec .
*5mSec response time version - the voltage dip level is 70\% of Un and the reset level is $\mathbf{8 0 \%}$


Timing:
Repeat accuracy:
constant ambient: across temp range: Setting accuracy: Response time:
$\pm 0.5 \%$ of set value
$\pm 3 \%$
0 to $+30 \%$
1 mSec (also 5 mSec version available)

Supply volts tolerance: $+15 \%$
Power consumption: 4VA
Trip level: $\quad 80 \%$ of Un
Reset level: $\quad 85 \%$ of Un
Relay output:
Output contact:
Contact rating:
SPCO
8 Amps/250V AC1
Max switching voltage: 250VAC, 250VDC
Mechanical life:
Electrical life: Isolation voltage: General
Green LED:
Red LED:
Operating temp:
CE marked:
Housing material:
20 Million ops
50 K ops at max rated load 2KV AC for 1 min

Supply healthy
Supply fault or
Unit timing
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
Polycarbonate, Auto extinguishable to UL 94 V-0

## ORDERING INFORMATION

| TYPE | TIME RANGE | FUNCTION | VOLTAGE |
| :---: | :---: | :---: | :---: |
| GBP | $10.3-3 \mathrm{sec}$ | 4 Delay on | 37 24VDC |
|  | $21-10 \mathrm{sec}$ | 5 Pulse | 41 48VDC |
|  | 3 3-30 sec | 6 Delayed pulse | 07 24VAC |
|  | 4 6-60 sec |  | 11 48VAC |
|  | $512-120 \mathrm{sec}$ | 1 Delay on ( 5 mS ) | 01 110VAC |
|  | $618-180 \mathrm{sec}$ | 2 Pulse (5mS) | 50 230VAC |
|  | $71-10 \mathrm{mins}$ | 3 Delayed pulse |  |
|  | $83-30 \mathrm{mins}$ | (5mS) |  |
|  | 96 -60 mins | Example: GBP140 | 1: 0.3-3Sec, |
|  |  | Delay on, 110VA | 1 mS reset |



CONNECTIONS


## DIN 48 FRONT PANEL MOUNTED ANALOGUE SETTING PROCESS TIMER

## TYPE: AH5N

- FEATURES
- Multi voltage 24-240VAC/DC
- Multi time range 1 sec to $\mathbf{6 0 0}$ hrs
- Dual function
- LED indication


## DESCRIPTION \& MODE OF OPERATION

A Din standard 48mm front panel mounted electronic timer. The AH5N is multi time range from 1 sec to 600 hours, time range setting is facilitated by removing the large front plastic potentiometer time setting knob and using the two small thumbwheel switches at the bottom of the scale plate the range can be set. The timer is also multi voltage $24-240 \mathrm{VAC} / \mathrm{DC}$. The AH5N has $2 \times$ SPCO contacts both rated at 5 Amps. The AH5N can be used for either delay on or delay off applications, depending on what side the output contacts are wired. A mode switch (mode A or B), mode A will facilitate two timed contacts and mode B one timed and one instant contact. The AH5N is ideal for many process control applications where the set time needs to be easily adjusted by an operator.

 GROUP

## SPECIFICATIONS

Dimensions:
Selectable time ranges:
Timing accuracy: Reset time: Supply voltage: Power consumption: Contact output: Contact ratings: Mechanical life: Operating temp: CE marked:
$48 \mathrm{H} \times 48 \mathrm{~W} \times 84 \mathrm{D}$
$1 \mathrm{sec}, 10$ secs, $1 \mathrm{~min}, 10 \mathrm{mins}$, $1 \mathrm{hr}, 10 \mathrm{hrs}, 60 \mathrm{hrs}, 600 \mathrm{hrs}$ $\leq \pm 1 \%$
200 mSec max
24-240V AC/DC
2VA
$2 \times$ SPCO
5 Amps / 250V AC1
5 M ops
$-10^{\circ} \mathrm{C}$ to $+55^{\circ} \mathrm{C}$
Yes

## ORDERING INFORMATION

TYPE
AH5N
US-08 8 pin in line gland
P3G-08 8 pin reversed socket

## CONNECTIONS

The AH4CN-RG has a standard octal 8 pin terminal arrangement and cab be fitted if desired into a standard 8 pin socket. However for front of panel mounting, we can offer two neat wiring solutions:-
US-08 8 pin in-line socket gland P3G-08 8 pin reversed socket


# DIN 48 FRONT PANEL MOUNTED DIGITAL PROCESS 

TIMER

## TYPE: AH4CN-RG

- Multi voltage 12-48VAC/DC version
- Multi voltage 100-240VAC/DC version
- Very accurate time setting
- Multi time range 0.01 Secs to 9990 hours
- Timing hold input \& reset input facility


## DESCRIPTION \& MODE OF OPERATION

A Din standard 48mm front panel mounted digital electronic timer. The AH4CN-RG is multi time range from 0.01 sec to 9990 hours, the time setting along with the time range is set via thumbwheel switches on the front of the timer, facilitating the setting of very accurate and precise times. The timer is multi voltage, a low voltage version 12$48 \mathrm{VAC} / \mathrm{DC}$ and a high voltage version $100-240 \mathrm{VAC} / \mathrm{DC}$. The AH4CN-RG has a SPCO output contact rated at 5 Amps. The AH4CN-RG can be used for either delay on or delay off applications, depending on what side the output contact is wired. On application of the supply voltage to terminals 2 \& 7 the three digit LED display will illuminate and start to count. On reaching the set time, as per the thumbwheel switches, the relay contact will switch. Featured also is a "GATE" input across terminals 1 \& 4, when this is made this will hold the time, when broken the timing will recommence from where it left off. The "RESET" input across terminals 1 \& 3 will, if made, resets the timer and display back to zero, when 1 \& 3 is then opened timing will commence afresh from zero. Once timing has completed and the relay has switched, resetting can be either by removal of the supply voltage from terminals 2 \& 7 or by the "RESET" facility as described above. The AH4CN-RG is an ideal timer for process control applications where the set time needs to be easily and very accurately set by an operator. Unlike other timers, operators will have a visual indication of the timing period as it times up via the LED display. Applications requiring a process to be interrupted, but a memory of the "elapsed time so far" will find the "GATE" input very useful.


PRODUCT
GROUP
$C$

## SPECIFICATIONS

Dimensions:
Selectable time ranges:

Timing accuracy: Reset time: Supply voltage: Power consumption: Contact output: Contact ratings: Mechanical life: Operating temp: CE marked:
$48 \mathrm{H} \times 48 \mathrm{~W} \times 84 \mathrm{D}$
9.99 secs, 99.9 secs, 999 secs,
99.9 mins, 999 mins, 99.9 hrs,
$999 \mathrm{hrs}, 9990$ hrs
$\leq \pm 0.03 \%$
$100 \mathrm{mSec} \max$
$12-48 \mathrm{VAC} / D \mathrm{C}$ or $100-240 \mathrm{VAC} / D \mathrm{C}$
2 VA
SPCO
$5 \mathrm{Amps} / 250 \mathrm{~V}$ AC1
5 M ops
$-10^{\circ} \mathrm{C}$ to $+55^{\circ} \mathrm{C}$
Yes

## ORDERING INFORMATION

## TYPE

AH4CN-RG / 12-48VACDC
AH4CN-RG / 100-240VACDC
US-08 8 pin in line socket gland
P3G-08 8 pin reversed socket

## CONNECTIONS

The AH4CN-RG has a standard octal 8 pin terminal arrangement and cab be fitted if desired into a standard 8 pin socket. However for front of panel mounting, we can offer two neat wiring solutions:-
US-08 8 pin in-line socket gland
P3G-08 8 pin reversed socket

## DIMENSIONS \& CONNECTIONS



P3G-08



US-08

# MECHANICAL PLANT EXTENSION "OVERRIDE" TIMERS 

TYPES: $134 / 5 \mathrm{~m}, 134 / 15 \mathrm{~m}, 134 / 60 \mathrm{~m}, 134 / 120 \mathrm{~m}$ 136.2/6hr, 136.2/12hr, 136.2/24hr 136.2.1/6hr, $136.2 .1 / 12 \mathrm{hr}, 136.2 .1 / 24 \mathrm{hr}$
(SPCO)
(SPCO) (2NO)

- FEATURES
- No supply voltage required
- Clockwork spring driven
- Easy screw fixing
- Rugged construction
- Ideal for BMS override applications


## DESCRIPTION

Mechanical plant extension timers, also known as "override timers" or "caretaker timers". Totally mechanically driven by a clockwork spring, therefore no auxiliary supply is required. The moment the setting knob is turned passed zero to the set time required, the output contact/s switch, the timer will then start running back to zero. When zero is reached the output contact/s will switch back. If after the initial time has been set, it is required that the set time, or remaining time needs to be lengthened, shortened or cancelled back to zero, the knob can be turned without harming the mechanical mechanism. The timers benefit from $16 \mathrm{Amp} / 250 \mathrm{~V}$ contacts and is easily fitted to the front of a control panel via screw fixings.

## APPLICATIONS

This simple but rugged timer is an ideal override unit for HVAC systems. For example, "caretaker" override to a BMS system in schools, public buildings etc. Also ideal for simple process control applications, including bakery equipment, oven controls and mixing systems.

## SPECIFICATIONS

| Movement: | Spring clockwork |
| :--- | :--- |
| Run down times: | Type $134 / 5,15,60,120$ mins |
|  | Type $136.2 / 6,12,24$ hours |
|  | Type $136.2 .1 / 6,12,24$ hours |
| Fixing: | Via two screws $3.5 \times 8 \mathrm{~mm}$ |
| Output: | Type 134 SPCO |
|  | Type 136.2 SPCO |
|  | Type $136.2 .1 \quad$ 2NO |
| Contact rating: | 16 Amps $/ 250 \mathrm{~V}$ |
| Connections: | Via $6.3 \times 0.8 \mathrm{~mm}$ fast on terminals |
| Operating temp: | $-10^{\circ} \mathrm{C}$ to $+70^{\circ} \mathrm{C}$ |
| CE marked: | Yes |

## ORDERING INFORMATION

| TYPE | TIME RANGE | OUTPUT |
| :--- | :--- | :--- |
| $\mathbf{1 3 4}$ | $5 \mathrm{~m}, 15 \mathrm{~m}, 60 \mathrm{~m}, 120 \mathrm{~m}$ | SPCO |
| $\mathbf{1 3 6 . 2}$ | $6 \mathrm{hr}, 12 \mathrm{hr}, 24 \mathrm{hr}$ | SPCO |
| $\mathbf{1 3 6 . 2 . 1}$ | $6 \mathrm{hr}, 12 \mathrm{hr}, 24 \mathrm{hr}$ | 2NO |

*Specify time range


DIMENSIONS \& CONNECTIONS


## ELECTRO MECHANICAL TIME SWITCHES

## TYPES: ALPHA QRD, UNO QRD <br> (Daily) ALPHA QRS, UNO QRS

## FEATURES

- Din rail, front panel or surface mounting
- With battery reserve
- Daily types, 15 min captive tappets
- Weekly types, 2 hours captive tappets
- Wide choice of supply voltages


## DESCRIPTION

Electro mechanical peg type time clocks. The ALPHA range is suitable for Din rail mounting, front panel mounting or surface mounting, when front panel mounted the front bezel size is a standard Din 72 mm (panel cut out 68 mm square). The UNO range is a slimline 17.5 mm wide (single module) Din rail mounted unit. Both the ALPHA and UNO are available either as a daily time clock or weekly time clock. On the daily time clocks each setting peg equals 15 mins and on weekly time clocks each setting peg equals 2 hours. Both the ALPHA and UNO time clocks feature captive time setting pegs, an override switch designated ON / OFF / AUTO. The ALPHA range has a SPCO output, whilst the UNO range is a 1 NO contact, in both types the contact rating is $16 \mathrm{Amps} / 250 \mathrm{~V}$ with a quartz movement and a battery reserve. A wide choice of both AC and DC supply voltages are available.

## SPECIFICATIONS

| Supply voltages: | $12,24,110,230 \mathrm{VAC} 50-60 \mathrm{~Hz}$ $12,24,48 \mathrm{VDC}$ |
| :---: | :---: |
| Battery reserve: | ALPHA $\geq 100$ hours |
|  | UNO $\geq 150$ hours |
| Manual override: | ON / OFF / AUTO |
| Output: | ALPHA SPCO |
|  | UNO 1NO |
| Contact rating: | 16 Amps / 250V AC1 |
| Connections: | Front panel: $6.3 \times 0.8 \mathrm{~mm}$ fast on |
|  | Din rail or surface: 4 mm screw |
| Operating temp: | $-10^{\circ} \mathrm{C}$ to $+50^{\circ} \mathrm{C}$ |
| CE marked: | Yes |

## ORDERING INFORMATION

TYPE

| ALPHA ORD | 12VAC, 24VAC, 110VAC, 230VAC* |
| :--- | :--- |
| ALPHA ORD | 12VDC, 24VDC, 48VVC* |
| ALPHA ORS | 12VAC, 24VAC, 110VAC, 230VAC* |
| ALPHA ORS | 12VDC, 24VDC, 48VDC* |

Daily with 100 hour reserve Daily with 100 hour reserve Weekly with 100 hour reserve Weekly with 100 hour reserve

Daily with 150 hour reserve Daily with 150 hour reserve Weekly with 150 hour reserve Weekly with 150 hour reserve


## DIMENSIONS \& CONNECTIONS


*Specify supply voltage


TYPES: SC28.11PRO, SC28.21PRO SC28.13PRO, SC28.23PRO SC44.11PRO, SC44.21PRO
(Din rail mounting) (Din rail mounting ASTRO) (Front panel mounting)

## - FEATURES

- Din rail or panel mounting
- Single channel or double channel
- Daily \& weekly programmable
- With 6 year battery reserve
- 46 switching instructions ( 60 ASTRO versions)
- Block programming on days (equals 1 instruction)
- Minimum switching interval 1 min
- Pulse function minimum switching 1 Sec
- SPCO or DPCO output contacts rated 16 Amps
- Holiday function by date
- Fully automatic summertime function
- Manual override function, permanently ON or OFF
- Automatic sorting of switching times on readout


## DESCRIPTION

Digital time clocks in either single or double channel, Din rail mounted or front panel mounted. The Din rail mounted units are 2 modules wide 35 mm , whilst the front panel mounted units have a front bezel size of 72 mm fitting into a 68 mm square cut out. All types facilitate very accurate to the minute and if the pulse function is used, to the second switching accuracy. 46 switching instructions are possible, but via using block programming on days, a common instruction on more than one day counts as only one instruction. Manual permanent ON or OFF is possible along with by date holiday override periods. Summertime adjustment by location in the world can also be programmed. All programmed in instructions are supported by a 6 year battery back up. A wide choice of both AC and DC supply voltages are available.
ASTRO versions, available in Din rail either as a single or double channel, by telling the ASTRO time switches via programming a city code or longitude and latitude the in built ASTRO look up table tells the clock the DUSK and DAWN times accordingly at the programmed location. The primary application for ASTRO time switches is the automatic control of lighting systems, so that systems automatically advance and retard with the lengthening and shortening of days in accordance with the lunar cycle. If required offset times can be programmed and applied to both the DUSK and DAWN times. Further switching can be programmed also between the DUSK and DAWN times. ASTRO time switches do not feature the pulse function and are only available with a 230VAC supply voltage.

## ORDERING INFORMATION

## SUPPLY VOLTAGE

$$
\begin{array}{ll}
\hline \text { SC28.11PRO } & \text { 12VAC/DC, 24VACDC, 110VAC, 230VAC* } \\
\text { SC28.21PRO } & \text { 12VAC/DC, 24VACDC, 110VAC, 230VAC* } \\
\text { SC44.11PRO } & \text { 12VAC/DC, 24VACDC, 110VAC, 230VAC* } \\
\text { SC44.21PRO } & \text { 12VAC/DC, 24VACDC, 110VAC, 230VAC* } \\
\text { SC28.13PRO } & \text { 230VAC } \\
\text { SC28.23PRO } & \text { 230VAC }
\end{array}
$$

Din rail 1 channel Din rail 2 channel Front panel 1 channel Front panel 2 channel Din rail 1 channel (ASTRO) Din rail 2 channel (ASTRO)

Also available in Din rail mounting format are yearly programmable time clocks up to 4 channels, please contact our sales office for further information.


## SPECIFICATIONS

Supply voltages

Power consumption: Battery reserve: Instructions:

Minimum switching: Pulse function: Accuracy: Output/s: Contact/s rating: Operating temp: CE marked:

12VAC/DC, 24VAC/DC
110, 230VAC $50-60 \mathrm{~Hz}$
ASTRO versions 230VAC only
Approx 1.5VA
$\sim 6$ years
46
60 ASTRO versions
1 min
1 sec to 59 m 59 sec (not on ASTRO versions)
$\leq \pm 1 \mathrm{sec}$ a day
SPCO or DPCO
16 Amps / 250V AC1
$-10^{\circ} \mathrm{C}$ to $+55^{\circ} \mathrm{C}$
Yes


## SENSING CONTROL \& MONITORING RELAYS

| PAGES | P/No. | DESCRIPTION |
| :---: | :---: | :---: |
| 46 | MOD-P \& MOD-PN | Din rail SPCO \& DPCO, 3 wire \& 4 wire phase failure \& sequence relays |
| 47 | BXP | Midland Jay Din rail voltage monitoring relays |
| 48 | 8/11/YWRP | 8,11 pin \& Din rail SPCO \& DPCO, 3 wire \& 4 wire phase failure \& sequence relays |
| 49 | YWRUP \& YWRUPS | Din rail SPCO \& DPCO phase failure \& sequence relays with adjustable voltage monitoring |
| 50 | YWRKPTU(S) | Din rail SPCO \& DPCO phase failure \& sequence relays with adjustable voltage monitoring and delay on tripping timer, true delay off |
| 51 | YWR2AKPTU(S) | Din rail DPCO phase failure \& sequence relays with adjustable voltage monitoring and delay on tripping timer, true delay off $\&$ delay on reinstatement timer |
| 52 to 54 | BAE, BAP, BBE, BBP | Midland Jay single \& three phase monitoring relays for heavy |
|  | BCE, BDE, BDP, BMP | industrial \& electrically noisy applications featuring phase |
|  | BPP, BQE, BQP, BRP | imbalance \& asymmetry control |
|  | BWP |  |
| 55 | BFP | Midland Jay Din rail frequency monitoring relay |
| 56 to 59 | MOD-TC-2 \& YWRTC YWR2TC7 | Din rail SPCO \& DPCO thermistor relays |
|  | 8/11/YRTC |  |
| 60 | YWR2TR7 | Din rail DPCO PT100 temperature monitoring relay |
| 61 | 11WRSTC | 11 pin plug in $2 \times$ SPCO combined pump seal leak and thermistor |
|  | 11WRSTCT | monitoring relay |
| 62 \& 63 | YWRPTC4 \& MOD-PTC | Din rail $2 \times$ SPCO combined phase failure, sequence \& thermistor relay |
| 64 | YRTCA | Lift room temperature relay |
| 65 | FOX.CS-200 | "CT" style current proving switch |
| 66 \& 67 | YRI-41 \& MOD-I | Current proving switches |
| 68 to 75 | YWRI, YWRI.H, 11WRIA, 11WRID | Current sensing relays |
| 76 \& 77 | CLA | Midland Jay current sensing relays |
| 78 \& 79 | YWRI/EF | AC Earth leakage relays \& core balance CT's |
| 80 \& 81 | YWRI.DEF | DC Earth leakage relay \& DC Earth leakage CT |
| 82 | Yxxx4-20i | Adjustable 4-20mA output signal generator |
| 83 | 8/11/YRTP | $4-20 \mathrm{~mA}$ out of range trip Amp relay |
| 84 | 11/YWRIT | 1(4)-20mA adjustable trip Amps |
| 85 | YWRU2T/10VDC | 0.1-10VDC adjustable dual setpoint relay |
| 86 | YxxA0-10D | Adjustable 0-10VDC output BMS power supply |
| 87 \& 88 | 11/YWRU | AC/DC voltage monitoring relays |
| 89 | YWROUV, YWR2OUV YWROUV2 | Self powered AC voltage over \& under control relays |
| 90 | 8/11/YWRTU | Self powered DC voltage control relays |
| 91 \& 92 | 8/11/YWRW \& MOD-W-1 | Conductive probe level control relays |
| 93 | YWRWS | Pump seal leak or water leak detection relay |
| 94 | MOD-SAP-1 | PNP signal amplifier |
| 95-97 | 8/11RVL, YWRVL | Underspeed or pulse continuity "Watchdog" relays |



## DIMENSIONS FOR SENSING, CONTROL \& MONITORING RELAYS



Series YW


## Modular Series



Mounting on a symmetric din or by single M4
Screw and locator
Retaining springs
For 8W \& 11W Series: WBS


## PHASE FAILURE \& SEQUENCE RELAYS

## TYPES: MOD-P-1 (3 wire spco) \& MOD-PN-1 (4 wire spco) MOD-P-2 (3 wire dpco) \& MOD-PN-2 (4 wire dpco)

- FEATURES
- Din rail mounted
- Modern modular design
- Width 27 mm ( 1.5 modules)
- SPCO \& DPCO versions
- Available 3 wire or 4 wire
- Self powered
- Transformer technology
- Dual LED indication

■ CE marked

## - DESCRIPTION \& MODE OF OPERATION

An attractive modern designed range of combined phase failure and sequence relays in a din rail mounted modular style housing of 1.5 modules width ( 27 mm ). Utilising transformer technology the units are available in either 3 wire or 4 wire versions, the 4 wire version also trips on loss of the Neutral. Both types are available with either a SPCO or DPCO output. On power up with all three phases present (plus the Neutral if applicable) and in the correct sequence the output relay/s will energise, the green and red LED's also illuminate. On loss of a phase, (or Neutral 4 wire versions), drop in voltage below Umin levels, or incorrect phase sequencing the output relay/s after a fixed time delay of 0.5 secs will drop out and the red LED will be extinguished. A green supply on LED only illuminated means that there is a supply to the unit but there is a supply fault of phase loss, under volts, or sequence. All terminal details and information along with the CE mark is clearly marked on the sides of the housing.

## SPECIFICATIONS

| Supply \& Measuring |  |
| :---: | :---: |
| Nominal supply: | 400V-415V L-L (3wire) |
|  | 230V-240V L-N (4 wire) |
| Nominal Umin (fixed): | 80\% on all 3 phases |
|  | 60\% on 1 phase drop |
| Delay on tripping: | 0.5 sec fixed |
| Max power consumption: | $<3 \mathrm{VA}$ |
| Insulation: | 2.5KV 50Hz impulse |
| Relay outputs: |  |
| Output contacts: | SPCO 16Amps/250V AC1 |
|  | DPCO 8Amps/250V AC1 |
| Max breaking capacity: | SPCO 4000VA |
|  | DPCO 2000VA |
| Mechanical life: | 30 Million ops |
| Electrical life: | 200K ops at max rated load |
| General: |  |
| Operating temperature: | $-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$ |
| Storage temperature: | $-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$ |
| Max cable size: | 2.5 mm |
| CE marked: | Yes |
| In accordance with: | EN61000-6-1: 2007 |
|  | EN61000-6-3: 2007 |
|  | EN61010-1: 2002 |
| Housing material: | Polycarbonate, Auto extinguishable to UL 94 V-0 |

ORDERING INFORMATION

| TYPE | COIL VOLTAGE | SYSTEM |
| :--- | :--- | :--- |
| MOD-P-1 (Din Rail, SPCO) | $3 \times 400 \mathrm{~V}-415 \mathrm{~V}$ | 3 Wire |
| MOD-PN-1 (Din Rail, SPCO) | $3 \times 400 \mathrm{~V}-415 \mathrm{~V}$ | 4 Wire |
| MOD-P-2 (Din Rail, DPCO) | $3 \times 400 \mathrm{~V}-415 \mathrm{~V}$ | 3 Wire |
| MOD-PN-2(Din Rail, DPCO) | $3 \times 400 \mathrm{~V}-415 \mathrm{~V}$ | 4 Wire |



## FUNCTION



4 WIRE VERSIONS ALSO TRIP ON LOSS OF NEUTRAL


On request the units can be supplied without sequence monitoring by inserting (-S) after the part number ie, MOD-P-2(-S)

## TYPES: BXP xx0x

## FEATURES

- Din rail mounted Modular housing
- Monitors phase failure \& Neutral loss
- Optional phase sequence detection
- Optional phase imbalance detection
- Calibrated voltage scale on adjustable units
- Single phase \& three phase 3 wire or 4 wire units
- Adjustable time delay on tripping $0.5-10$ secs
- Dual LED indication


## DESCRIPTION \& MODE OF OPERATION

A range of Din rail mounted Modular voltage supply monitoring relays available in either single phase or three phase configuration and if three phase a choice of 3 wire or 4 wire. Monitoring phase loss and if applicable Neutral loss, along with under voltage.
Single phase units have a nominal supply of 240VAC and three phase units 415VAC. All units are available either with a fixed under voltage trip level or an adjustable trip level. Fixed tripping levels are 170 V for single phase units and 300 V for three phase units. If adjustable it is on a calibrated voltage scale of $170-250 \mathrm{~V}$ for a single phase unit and $300-440 \mathrm{~V}$ for a three phase unit.

On three phase units both 3 wire or 4 wire phase sequence can be specified as an option.
On three phase 4 wire units phase imbalance and Neutral shift can be specified as an option. Phase imbalance is based on voltage amplitude of the phases and is fixed at $15 \%$ of imbalance.
All units have an adjustable delay on tripping timer of $0.5-10$ secs (not True Delay Off), to ride through short term voltage dips, short term phase loss and if optionally specified phase sequence and phase imbalance errors.
Two LED's are provided. The green LED illuminates to indicate power is on the unit. The red LED illuminates to indicate the output relay/s is energised. The output relay/s energises when the monitored supply is healthy, that is; all phases and if applicable the Neutral present, if applicable in the correct sequence, the voltage level is within parameters and if applicable within balance.
Standard output contact configuration is SPCO as an option 2NO contacts is available (on request as a special $1 \mathrm{NO} \& 1 \mathrm{NC}$ is also possible).

## ORDERING INFORMATION

## Type Configuration \& Version Options

BXP 200 Single phase adjustable U/V 0 No option
210 Single phase fixed U/V 1 Phase sequence
300 3P3W adjustable U/V 2 Phase imbalance + Neutral shift *
3103 P3W fixed U/V 3 Phase sequence \& phase imbalance +
400 3P4W adjustable U/V Neutral shift *
410 3P4W fixed U/V

4 2NO output contacts
5 2NO output contacts \& phase sequence
6 2NO output contacts \& phase imbalance + Neutral shift *
7 2NO output contacts, phase sequence \& phase imbalance + Neutral shift *

[^0]

## SPECIFICATIONS



## PHASE FAILURE \& SEQUENCE RELAYS

TYPES: YWRP, 11WRP, 8WRP (spco) YWR2P, 11WR2P (dpco)

- Din rail or plug in
- Available SPCO or DPCO output
- Available 3 wire or 4 wire
- Self powered
- Transformer technology


## ■ DESCRIPTION \& MODE OF OPERATION

Combined phase failure and sequence relays, available in either a din rail or $8 / 11$ pin plug housing. The output is SPCO with an option of DPCO on either the din rail or 11 pin version. Utilising transformer technology the units are available in either 3 or 4 wire versions, the 4 wire version tripping on loss of the Neutral. On power up with all three phases present (plus the Neutral if applicable) and in the correct sequence the output relay will energise, the green and red LEDs also illuminate. On loss of a phase, (or Neutral 4 wire versions), drop in voltage below Umin levels, or incorrect phase sequencing the output relay/s after a fixed time delay of 0.5 secs will drop out and the red LED will be extinguished. A green supply on LED only illuminated means that there is a supply to the unit but there is a supply fault or either a combination of; phase loss, under volts or sequence error. All terminal details and information along with the CE mark is clearly marked on the sides of the housing.

## SPECIFICATIONS

| Supply \& Measuring: |  |
| :---: | :---: |
| Nominal supply: | $3 \times 110 \mathrm{VAC}, 3 \times 220 \mathrm{~V}$ AC |
|  | $3 \times 380 \mathrm{VAC}, 3 \times 400 \mathrm{~V}$ AC |
|  | $3 \times 415 \mathrm{~V}$ AC, $3 \times 440 \mathrm{~V}$ AC |
| Tolerance: | +15\% |
| System: | 3 or 4 wire option |
| Frequency: | 50/60Hz |
| Nominal Umin (fixed): | 80\% on all 3 phases |
|  | $60 \%$ on 1 phase drop |
| Delay on tripping: | 0.5 sec fixed (wrong sequence) |
|  | 50 mSec (phase loss) |
| Max power consumption: | $<3 \mathrm{VA}$ |
| Insulation: | 2.5KV 50Hz impulse |
| Relay outputs: |  |
| Output contacts: | SPCO 10Amps/250V AC1 |
|  | DPC0 8Amps/250V AC1 |
| Mechanical life: | 30 Million ops |
| Electrical life: | 200K ops at max rated load |
| General: |  |
| Operating temperature: | $-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$ |
| Storage temperature: | $-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$ |
| Max cable size: | 4 mm |
| CEmarked | Yes |
| In accordance with: | EN61000-6-1: 2007 |
|  | EN61000-6-3: 2007 |
|  | EN61010-1: 2002 |
| Housing material | Polycarbonate, Auto extinguishable to UL 94 V-0 |



## ORDERING INFORMATION

| TYPE | VOLTAGE | SYSTEM |
| :--- | :--- | :--- |
| YWRP(Din railSPCO) | $3 \times 110 \mathrm{~V}$ | $3 \mathrm{~W}(3$ wire) |
| 8WRP(8 pinSPCO) | $3 \times 220 \mathrm{~V}$ | $4 \mathrm{~W}(4$ wire) |
| 11WRP(11 pinSPCO) | $3 \times 380 \mathrm{~V}$ |  |
| YWR2P(Din railDPCO) | $3 \times 400 \mathrm{~V}$ |  |
| 11WR2P(11 pinDPCO) | $3 \times 415 \mathrm{~V}$ |  |
|  | $3 \times 440 V^{*}$ |  |
|  | SPECIAL** |  |
| *440V only possible as a 3 wire version |  |  |
| OPTION |  |  |

On 3 wire variants as a no cost option a separate AC auxiliary supply can be specified. This gives the possibility of additional "control circuit" voltage monitoring. If this is lost or is not present, the unit will de-energise or not energise as applicable. 24VAC, 48VAC, 110VAC.
${ }^{* *}$ Available on request special high voltage versions i.e 690V L-L. (Separate auxiliary supply required).

# PHASE FAILURE RELAYS WITH OVER \& UNDER VOLTAGE CONTROL, WITH OPTIONAL SEQUENCE, TIME DELAYS 

# TYPES: YWRUPxx, 11WRUPxx, 8WRUPxx (spco) YWR2UPxx (dpco) 

## FEATURES

## - Din rail mounted

- Available SPCO or DPCO output
- Available 3 wire or 4 wire
- Adjustable over \& under voltage control
- Specify with or without phase sequence
- Optional adjustable time delay
- Self powered


## - LED fault indication

- Transformer technology


## - DESCRIPTION \& MODE OF OPERATION

Phase failure relays with independent over and under voltage control, with the option of additional sequence control. Available in either a din rail or 8 \& 11 pin plug in housing SPCO with a DPCO option in the din rail housing. All units can be specified as 3 wire or 4 wire. As an option in the din rail housing an adjustable time delay can be specified (not true delay off), which is effective against voltage control, phase sequence (if applicable), but not phase loss or Neutral loss on 4 wire versions (loss of L3 only would produce a time delay). The units are transformers based and thus will ignore transients and harmonic distortions.
The output relay is energised when all three phases are connected and in sequence (if applicable) and within the set voltage limits. The output relay/s will de-energise if one or more voltages between phases are under the value of the minimum set level or above the value of the maximum set level, less any set time delay (if applicable). The units will also de-energise on loss of a phase or incorrect sequence (if applicable). Separate red LED indicators indicate over and under voltage conditions. If both are illuminated this indicates a phase sequence error (if applicable). A green LED indicates output relay status.

## ORDERING INFORMATION

| TYPE | SEQUENCE | TIME DELAY |  | VOLTAGE |
| :--- | :--- | :--- | :--- | :--- | SYSTEM

OPTION
On 3 wire variants as a no cost option a separate AC auxiliary supply can be specified 24VAC, 48VAC, 110VAC. This gives the possibility of additional "control circuit" voltage monitoring. If this is lost or is not present, the unit will de-energise or not energise as applicable.

* Insert S if sequence is required
** Insert Txxx if an adjustable time delay is required (din rail versions only)
*** 440 V only available as a 3 wire version
**** Available on request special high voltage versions i.e 690V L-L. (Separate auxiliary supply required).



## SPECIFICATIONS

Supply \& Measuring

Nominal supply:

Permanent tolerance:
System:
Frequency:
Umin adjustable:
Umax adjustable:
Hysteresis:
Delay on tripping:
Repeat accuracy:
Max power consumption:
Insulation:
Relay outputs:
Output contacts:

Max breaking capacity:

Mechanical life:
Electrical life:
General:
Operating temperature: Storage temperature:
Max cable size:
CEmarked
In accordance with:

Housing material
$3 \times 110 \mathrm{VAC}, 3 \times 220 \mathrm{~V}$ AC $3 \times 380 \mathrm{VAC}, 3 \times 400 \mathrm{VAC}$ $3 \times 415 \mathrm{VAC}, 3 \times 440 \mathrm{VAC}$ $\pm 15 \%$
3 or 4 wire option
50/60Hz
0-30\% of nominal (phase to phase)
$0-20 \%$ of nominal (phase to phase)
Fixed 3\%
Optional 0.1-10sec, 0.2-20sec, 0.3-30sec
Otherwise fixed at 100 mSec
$+2 \%$ of set values
$<3$ VA
2.5KV 50Hz impulse

SPCO 10Amps/250V AC1
DPCO 8Amps/250V AC1
SPCO 4000VA
DPCO 2000VA
30 Million ops
200K ops at max rated load
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
4 mm
Yes
EN61000-6-1: 2007
EN61000-6-3: 2007
EN61010-1: 2002
Polycarbonate, Auto extinguishable
to UL 94 V-0

## CONNECTIONS



8WRUPxx



Without Optional Time Delay


With Optional Time Delay

# PHASE FAILURE RELAYS WITH UNDER VOLTAGE CONTROL \& TRUE DELAY OFF ON TRIPPING TIME DELAY, WITH OPTIONAL PHASE SEQUENCE CONTROL 

# TYPES: YWRKPTUxx (spco) \& YWR2KPTUxx (dpco) 

## - FEATURES

- Din rail mounted
- Available SPCO or DPCO output
- Available 3 wire or 4 wire
- Adjustable under voltage control
- Optional phase sequence
- Adjustable true delay off time delay
- Self powered
- LED indication


## ■ DESCRIPTION \& MODE OF OPERATION

Phase failure relays with adjustable under voltage control, with the option of additional sequence control. Available in a din rail housing with a SPCO or DPCO output option. Both units can be specified as 3 wire or 4 wire and are self powered (no separate auxiliary supply is required). A range of nominal L-L input voltages can be specified from 110 V L-L to 440 V L-L, an under voltage setpoint can be set adjustable $5-25 \%$ of the specified nominal. The units will also trip on phase sequence (if specified), phase loss and on 4 wire units deviation of the Neutral. All tripping eventualities are subject to a delay, the delay being True Delay Off, adjustable 0.1-10secs as standard. If you loose everything you will still benefit from the delay timer, unlike many other types of phase failure relays. This makes these units ideal for mains to generator changeover systems where short supply interruptions are best ignored, thus eliminating false engine starts.
On the initial connection of the monitored supply the green LED will illuminate. On the supply being within the set levels, in the correct sequence (if applicable) and the Neutral connected on 4 wire units, the output relay will energise and the red LED will illuminate. On a phase loss, sequence error (if applicable), or under voltage situation after the set time delay the output relay will de-energise and the red LED will extinguish. However, note on a low voltage scenario the red LED will extinguish before the relay output have timed out and de-energised. If in a timing situation the fault condition corrects itself, any remaining delay time will be cancelled and the output relay will remain energised.

## ORDERING INFORMATION

| TYPE | SEQUENCE |  | TIME DELAY | VOLTAGE |
| :--- | :--- | :--- | :--- | :--- | SYSTEM

[^1]By nature a true delay off timer uses different relay technology, by the means of a magnetically latching mechanism. However, if subjected to undue physical shock, for example "in transit" the contacts maybe on initial connection be in the incorrect state. If this is the case this can be easily rectified by the connection and removal of the auxiliary supply voltage. Thus allowing the contacts to time out and return to the correct state.

## SPECIFICATIONS

Supply \& Measuring Nominal supply:

Permanent tolerance:
System:
Frequency:
Umin adjustable: Hysteresis:
Delay on tripping:
Min on time:
Max power consumption: Insulation:

Relay outputs:
Output contacts:
Max breaking capacity:
Mechanical life: Electrical life:

General:
Operating temperature: Storage temperature: Max cable size: CE marked
In accordance with:

Housing material
$3 \times 110 \mathrm{VAC}, 3 \times 220 \mathrm{~V}$ AC $3 \times 380 \mathrm{VAC}, 3 \times 400 \mathrm{~V}$ AC $3 \times 415 \mathrm{VAC}$
+15\%
3 or 4 wire option
50/60Hz
$5-25 \%$ of nominal (phase to phase)
Fixed 2\%
True delay off adjustable $0.1-10 \mathrm{sec}$ (standard) $1-100 \mathrm{sec}, 0.1-10 \mathrm{~min}$ (on request) 300 mSec required to fully charge true delay off timing capacitor
$<2$ VA
2.5KV 50Hzimpulse

SPCO 10Amps/250V AC1
DPCO 8Amps/250V AC1
SPCO 4000VA
DPCO 2000VA
30 Million ops
200K ops at max rated load
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
4 mm
Yes
EN61000-6-1: 2007
EN61000-6-3: 2007
EN61010-1: 2002
Polycarbonate, Auto extinguishable
to UL 94 V-0

## TYPES: YWR2AKPTUx (dpco) <br> - FEATURES <br> - Din rail mounted <br> - DPCO output <br> - Available 3 wire or 4 wire <br> - Adjustable under voltage control - Adjustable hysteresis <br> - Optional phase sequence <br> - Adjustable true delay off time delay <br> - Adjustable delay on reinstatement timer <br> - Self powered <br> - LED indication <br> - Transformer technology <br> D DESCRIPTION \& MODE OF OPERATION

PHASE FAILURE RELAYS WITH UNDER VOLTAGE CONTROL \& TRUE DELAY OFF ON TRIPPING TIME DELAY, DELAY ON REINSTATEMENT TIMER, WITH OPTIONAL PHASE SEQUENCE CONTROL

Phase failure relays with adjustable under voltage control and hysteresis, with the option of additional sequence control. In a din rail housing and DPCO output, can be specified as 3 wire or 4 wire and is self powered (no separate auxiliary supply is required). A range of nominal L-L input voltages can be specified from 110 V L-L to 440 V L-L, an under voltage setpoint can be set adjustable 5-25\% of the specified nominal and a return hysteresis adjustable $5-50 \%$ of the setpoint. For example, if a 400 V unit is set with an under voltage control of $10 \%$, the unit will trip (deenergise) at 360 V , if the hysteresis is set at $50 \%$, the return point equates to $+50 \%$ of the under voltage control, i.e. $+50 \%$ of $40 \mathrm{~V}=20 \mathrm{~V}$, therefore the unit will re-energise at 380 V . The units will also trip on phase sequence (if specified), phase loss and on 4 wire units deviation of the Neutral. All tripping eventualities are subject to a delay, the delay being True Delay Off, adjustable 0.1-10secs as standard. If you loose everything you will still benefit from the delay timer, unlike many other types of phase failure relays. This makes these units ideal for mains to generator changeover systems where short supply interruptions are best ignored, thus eliminating false engine starts, further enhanced with a generator "run down" period on the return of a healthy supply.
On the initial connection of the monitored supply the green LED will illuminate. On the supply being within the set levels, in the correct sequence (if applicable) and the Neutral connected on 4 wire units, the output relay will energise and the red LED will illuminate, after the reinstatement time has elapsed. On a phase loss, sequence error (if applicable), or under voltage situation after the set time delay the output relay will de-energise and the red LED will extinguish. However, note on a low voltage scenario the red LED will extinguish before the relay output have timed out and de-energised. If in a timing situation the fault condition corrects itself, any remaining delay time will be cancelled and the output relay will remain energised.


## SPECIFICATIONS

Supply \& Measuring
Nominal supply:

Permanent tolerance:
System:
Frequency:
Umin adjustable: Hysteresis adjustable: Min on time:

Delay on reinstatement:
Max power consumption: Insulation:
Relay outputs:
Output contacts:
Mechanical life: Electrical life:
General:
Operating temperature:
Storage temperature:
Max cable size:
CE marked
In accordance with:

Housing material
$3 \times 110 \mathrm{VAC}, 3 \times 220 \mathrm{VAC}$
$3 \times 380 \mathrm{VAC}, 3 \times 400 \mathrm{~V}$ AC
$3 \times 415 \mathrm{VAC}, 3 \times 440 \mathrm{VAC}$
+15\%
3 or 4 wire option**
$50 / 60 \mathrm{~Hz}$
$5-25 \%$ of nominal (phase to phase) 5-50\% of Umin
300 mSec required to fully charge true delay off timing capacitor
Adjustable 0.3-30mins after return of a healthy supply $<6 \mathrm{VA}$
2.5KV 50Hz impulse

DPCO 10Amps/250V AC1
30 Million ops
200K ops at max rated load
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
4 mm
Yes
EN61000-6-1: 2007
EN61000-6-3: 2007
EN61010-1: 2002
Polycarbonate, Auto extinguishable to UL 94 V-0
By nature a true delay off timer uses different relay technology, by the means of a magnetically latching mechanism. However, if subjected to undue physical shock, for example "in transit" the contacts maybe on initial connection be in the incorrect state. If this is the case this can be easily rectified by the connection and removal of the auxiliary supply voltage. Thus allowing the contacts to time out and return to the correct state.

## ORDERING INFORMATION

| TYPE | SEQUENCE | VOLTAGE | SYSTEM |
| :---: | :---: | :---: | :---: |
| YWR2AKPTU (Din rail SPCO) | *S | $3 \times 110 \mathrm{~V}$ | 3W (3 wire) |
|  |  | $3 \times 220 \mathrm{~V}$ | 4W (4 wire) |
|  |  | $3 \times 380 \mathrm{~V}$ |  |
|  |  | $3 \times 400 \mathrm{~V}$ |  |
|  |  | $3 \times 415 \mathrm{~V}$ |  |
| * InsertS if sequence is required |  | $3 \times 440 V^{* *}$ |  |

[^2]
# WJMidind Jay SINGLE \& THREE PHASE VOLTAGE SUPPLY MONITORING RELAYS FOR HEAVY INDUSTRIAL \& ELECTRICALLY NOISY APPLICATIONS FEATURING PHASE IMBALANCE \& ASYMMETRY CONTROL 

TYPES: BAE, BAP, BBE, BBP, BCE, BDE, BDP, BMP, BPP, BQE, BQP, BRP, BWP

## $\square$ FEATURES

- Din rail mounted $\mathcal{G}$ surface mounting housings
- Monitors phase failure \& Neutral loss
- Optional phase sequence detection
- Optional phase imbalance detection
- Calibrated voltage scale on adjustable units
- Single phase \& three phase 3 wire or 4 wire units
- Adjustable time delay on tripping 0.5 - $\mathbf{3 0}$ secs (most True Delay Off)
- Dual LED indication



## DESCRIPTION AND MODE OF OPERATION

A range of Din rail mounted and surface mounted enclosures, voltage supply monitoring relays for particularly harsh industrial applications and electrically noisy environments.

Construction of most three phase units are based around an internally fitted transformer, not only does this transformer coupled with active filters facilitate a high degree of protection from harmonics and supply irregularities but also enables units to monitor Phase Imbalance and Asymmetry Control as all phases are referenced to the Star point.

These monitoring devices offer protection both from monitoring accuracy and product survival against the following supply phenomenon:-

Harmonic voltage distortion by large non-linear loads such as; soft starts under starting, large variable speed drives and a large number of computers. These effects are exaggerated under weak supply conditions. All product types except for products with prefix BDE are particularly suited for such conditions.

Notching (momentary supply loss / negative transient), caused by large thyristor controlled three phase rectifiers found in DC drives, current source inverters, again the effects are exaggerated under weak supply conditions. Product types with prefix BCE, BMP, BOE, BOP, BAE, BAP, BBP, BWP and BBE are particularly suited for such conditions.

Spikes, caused by switching transients and electrical storms disturbances, supplies in remote locations are particularly prone. Product types with prefix BCE, BMP, BQE and BOP are particularly suited for such conditions.

## SPECIFICATIONS

## Single Phase units

Nominal voltage: Voltage range: Adjustable UN setpoint: Fixed units U/N setpoint:
Hysteresis:
Repeat accuracy: Three Phase units Nominal voltage: Voltage range: Adjustable U $/$ setpoint: Fixed units setpoint: Hysteresis:
Repeat accuracy:
Phase imbalance:

## Relay outputs

Rating:
General
Isolation:
Power consumption:
Trip delay time: Operating temp: CE marked:

240VAC L-N*** 170-265VAC 170-250VAC 170VAC Adjustable* < $1 \%$

415VAC L-L*** 300-460VAC 300-440VAC 300VAC Adjustable* < 1\%
Adj. 15\% of nominal phase amplitude** Fixed $15 \%, 25 \%, 35 \%, 40 \%$ of nominal phase amplitude**

See table
2KV for 1 min
< 12VA
Adjustable 0.5 to 30 secs
$-40^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
Yes
*Most units, please request individual data sheets for specific details, please call for assistance.
**Depending on exact model type, see ordering information and selection table.
***Other system voltages are available, please call for assistance

## ORDERING INFORMATION \& SELECTION TABLE

| Type | Phase Imbalance | Under Voltage | Over Voltage | Phase <br> Sequence | Time Delay | Supply Type | Supply <br> Voltage | Supply Hz | Output | Output Rating | Enclosure ** |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| BAE 0203 | 5-15\% | 25\% | - | Yes | 0.5 s | 3 phase | 415V | 50 | DPCO | 3A / 415V | 3 |
| BAE 0503 | 5-15\% | 25\% | - | Yes | 0.5-30s* | 3 phase | 415 V | 50 | DPCO | 1A / 415V | 3 |
| BAE 0703 | 5-15\% | 5-50\% | - | Yes | 0.5-30s* | 3 phase | 415 V | 50 | DPCO | 1A / 415V | 3 |
| BAE 3203 | 5-15\% | 25\% | - | Yes | 0.5s | 3 phase | 415 V | 50 | DPCO | 3A / 415V | 4 |
| BAE 3503 | 5-15\% | 25\% | - | Yes | 0.5-30s* | 3 phase | 415 V | 50 | DPCO | 1A / 415V | 4 |
| BAE 3703 | 5-15\% | 5-50\% | - | Yes | 0.5-30s* | 3 phase | 415V | 50 | DPCO | 1A / 415V | 4 |
| BAP 1203 | 15\% | 25\% | - | Yes | 0.5s | 3 phase | 415 V | 50 | SPCO | 3A / 230V | 1 |
| BAP 1403 | 5-15\% | 25\% | - | Yes | 0.5s | 3 phase | 415V | 50 | SPCO | 3A / 230V | 1 |
| BAP 1603 | 15\% | 25\% | - | Yes | 0.5s | 3 phase | 415V | 50 | DPCO | 3A / 230V | 1 |
| BAP 1703 | 5-15\% | 25\% | - | Yes | 0.5s | 3 phase | 415 V | 50 | DPCO | 3A / 230V | 1 |
| BAP 1903 | 5-15\% | 5-25\% | - | Yes | 0.5s | 3 phase | 415 V | 50 | DPCO | 3A / 230V | 1 |
| BAP 2703 | 5-15\% | 5-50\% | - | Yes | 0.5-30s* | 3 phase | 415V | 50 | DPCO | 3A / 230V | 2 |
| BBE 0703 | 5-15\% | 5-50\% | 12\% | Yes | 0.5-30s* | 3 phase | 415V | 50 | DPCO | 1A / 415V | 3 |
| BBP 1203 | 15\% | 25\% | 12\% | Yes | 0.5s | 3 phase | 415V | 50 | SPCO | 3A / 230V | 1 |
| BBP 1403 | 5-15\% | 25\% | 12\% | Yes | 0.5s | 3 phase | 415V | 50 | SPCO | 3A / 230V | 1 |
| BBP 1603 | 15\% | 25\% | 12\% | Yes | 0.5s | 3 phase | 415 V | 50 | DPCO | 3A / 230V | 1 |
| BBP 1703 | 5-15\% | 25\% | 12\% | Yes | 0.5s | 3 phase | 415 V | 50 | DPCO | 3A / 230V | 1 |
| BBP 2703 | 5-15\% | 5-50\% | 12\% | Yes | 0.5-30s* | 3 phase | 415V | 50 | DPCO | 3A / 230V | 2 |
| BCE 3103 | - | 2-30\% | - | No | 0.5s | 3 phase | 415V | 40-70 | DPCO | 1A / 415V | 3 |
| BCE 3603 | - | 2-30\% | - | Yes | 0.5s | 3 phase | 415 V | 50 | DPCO | 1A / 415V | 3 |
| BDP 1403 | 35\% | 25\% | - | Yes | 0.5s | 3 phase | 415V | 50 | SPCO | 1A / 415V | 1 |
| BDP 1603 | 35\% | 25\% | - | Yes | 0.5s | 3 phase | 415V | 50 | DPCO | 3A / 230V | 1 |
| BDP 2403 | 25\% | 25\% | - | Yes | 0.5s | 3 phase | 415 V | 50 | SPCO | 3A / 230V | 1 |
| BDP 2603 | 25\% | 25\% | - | Yes | 0.5s | 3 phase | 415V | 50 | DPCO | 3A / 230V | 1 |
| BDE 0403 | 35\% | 25\% | - | Yes | 0.5s | 3 phase | 415V | 50 | SPCO | 1A / 415V | 3 |
| BMP 1903 | - | 5-30\% | 5-20\% | Yes | 0.5-30s* | 3 phase | 415 V | 50 | 2xDPCO | 3A / 230V | 2 |
| BMP 2003 | - | 5-30\% | 5-20\% | No | 0.5-30s* | 3 phase | 415V | 40-70 | 2xDPCO | 3A / 230V | 2 |
| BMP 2103 | - | 5-30\% | 5-20\% | No | 0.5s | 3 phase | 415 V | 40-70 | DPCO | 3A / 230V | 2 |
| BMP 2203 | - | 5-30\% | 5-20\% | Yes | 0.5s | 3 phase | 415 V | 50 | DPCO | 3A / 230V | 2 |
| BMP 2303 | - | 5-30\% | 5-20\% | Yes | 0.5-30s* | 3 phase | 415 V | 50 | DPCO | 3A / 230V | 2 |
| BMP 2403 | - | 5-30\% | 5-20\% | No | 0.5-30s* | 3 phase | 415 V | 40-70 | DPCO | 3A / 230V | 2 |
| BMP 2503 | - | 5-30\% | 5-20\% | Yes | 0.5 s | 3 phase | 415 V | 50 | 2xDPCO | 3A / 230V | 2 |
| BMP 2603 | - | 5-30\% | 5-20\% | No | 0.5s | 3 phase | 415 V | 40-70 | 2xDPCO | 3A / 230V | 2 |
| BQE 0702 | - | 15\% | - | - | 0.5-30s* | 1 phase | 240 V | 50 | DPCO | 3A / 230V | 3 |
| BQE 3702 | - | 15\% | - | - | 0.5-30s* | 1 phase | 240 V | 50 | DPCO | 3A / 230V | 4 |
| BQP 1102 | - | - | 0-30\% | - | 0.5s | 1 phase | 240 V | 50 | SPCO | 3A / 230V | 1 |
| BQP 1202 | - | 0-30\% | - | - | 0.5s | 1 phase | 240 V | 50 | SPCO | 3A / 230V | 1 |
| BQP 1402 | - | 0-30\% | - | - | 0.5s | 1 phase | 240 V | 50 | DPCO | 3A / 230V | 1 |
| BQP 1502 | - | - | 0-30\% | - | 0.5s | 1 phase | 240 V | 50 | DPCO | 3A / 230V | 1 |
| BRP 0103 | 40\% | 40\% | - | Yes | 0.5s | 3 phase | 415V | 50 | SPCO | 1A / 415V | 1 |
| BRP 1103 | 40\% | 40\% | - | Yes | 0.5s | 3 phase | 415V | 50 | DPCO | 1A / 415V | 1 |
| BWP 0103 | - | 3-20\% | 3-15\% | No | 0.5-30s | 4 wire | 415V | 50 | SPCO | 3A / 230V | 1 |

## NOTES

## *True Delay Off

Special voltages and frequencies in many of the above products are available on request, please call for assistance.
Individual data sheets specifically on each of the above detailed variations are available, please call for assistance.

[^3]
## ENCLOSURE TYPE: 1



ENCLOSURE TYPE: 2


ENCLOSURE TYPE: 3


ENCLOSURE TYPE: 4


## MJMidiand jay FREQUENCY MONITORING RELAYS

## TYPES: BFP

```
FEATURES
\square Din Rail Mounted
\square Monitors mains frequency deviation
\square Available as nominal 50Hz,60Hz & 400Hz
\square Wide choice of nominal supply options
- Output DPCO
\square Dual LED indication
```


## - DESCRIPTION

Din rail mounted frequency monitoring relays available in a choice of nominal frequencies of $50 \mathrm{~Hz}, 60 \mathrm{~Hz}$ and 400 Hz on a wide choice of supply voltages either referenced L-N or L-L (L-L units only require the connection of two phases). The frequency relays are in effect self-powered and do not require a separate auxiliary supply.
Providing the monitored supply frequency is between the lower and upper (fixed*) limits the output relay will energise, indicated via a green LED. If the frequency deviates outside these limits the output relay will de-energise, indicated via a red LED. The unit resets automatically when the frequency returns to within the limits.
*The limits are fixed:-
$50 \mathrm{~Hz}(47.5 \mathrm{~Hz}$ to 52.5 Hz$)$
$60 \mathrm{~Hz}(57 \mathrm{~Hz}$ to 63 Hz$)$
$400 \mathrm{~Hz}(380-420 \mathrm{~Hz})$

## SPECIFICATIONS

Supply Voltage:
Frequency:
Lower limit:
Upper limit:
Stability:
Response time:
Output:
Rating:
Mechanical life:
Electrical life:
Isolation:
Power consumption:
Temperature range:

110VAC, 230VAC, 415VAC, 440VAC
Other voltages on request
$50 \mathrm{~Hz}, 60 \mathrm{~Hz}, 400 \mathrm{~Hz}$
Other nominal frequencies on request
$50 \mathrm{~Hz}(47.5 \mathrm{~Hz}), 60 \mathrm{~Hz}(57 \mathrm{~Hz}), 400 \mathrm{~Hz}(380 \mathrm{~Hz})$
$50 \mathrm{~Hz}(52.5 \mathrm{~Hz}), 60 \mathrm{~Hz}(63 \mathrm{~Hz}), 400 \mathrm{~Hz}(420 \mathrm{~Hz})$
< 1\%
0.5 secs

DPCO
3 Amps / 250V
30 Million ops
200K ops at max rated load
2KVA for 1 min
< 5VA
$-15^{\circ} \mathrm{C}$ to $+60^{\circ} \mathrm{C}$

ORDERING INFORMATION

| Type | $\frac{\text { Voltage** }}{}$ |  |
| :--- | :--- | :--- |
| BFP | Frequency** |  |
|  | 110VAC | 50 Hz |
|  | 230VAC | 60 Hz |
|  | 415VAC | 400 Hz |
|  | 440VAC | Special Hz |
|  | Special VAC |  |

[^4]

DIMENSIONS \& CONNECTIONS


## THERMISTOR MONITORING RELAY

TYPE: MOD-TC-2 (dpco)

■ Din rail mounted

- Modern modular design

■ Width 27 mm ( 1.5 modules)

- DPCO output
- Tri voltage 24VACDC, 110VAC, 230VAC
- Selectable manual or auto reset
- Tri LED status indication

■ CE marked

## ■ DESCRIPTION \& MODE OF OPERATION

An attractive modern designed thermistor relay in a din rail mounted modular style housing of 1.5 modules width ( 27 mm ). The units are supply voltage selectable via the connection of different terminals. On the connection of the supply voltage the two LED's illuminate green and the output relay will energise. Should the PTC sensor embedded within the motor windings resistance rise above 3.3 KOhms due to a rise in motor temperature the output relay will de-energise and one of the LED's will illuminate orange. Once tripped the motor temperature would have to cool sufficiently for the resistance to drop below 1.8 KOhms to allow the output relay to re-energise again. The fixed tripping and reset values are industry recognised acceptable values.

Should the input resistance short circuit or go low below 30 Ohms this will be regarded as a fault and will be indicated by one green and one red LED, the output relay will be de-energised. Likewise, should the sensor go open circuit this will be infinity resistance and therefore high which will be indicated by one green and one orange LED, the output relay will be de-energised.
Via terminals Y1 \& Y2 a volt free link can be placed thus causing the unit to have a latched function. Once tripped and the input resistance has fallen back below 1.8 KOhms the unit will need to be reset. This can be done by opening the link between Y1 \& Y2 manual reset, resetting can also be achieved by removing the supply voltage. Leaving Y1 \& Y2 open will result in auto resetting.
All terminal details and information along with the CE mark is clearly marked on the sides of the housing.

## CONNECTIONS




PRODUCT
GROUP

## SPECIFICATIONS

Supply \& Measuring
Supply voltage:

A1 to A2 (230VAC)
A1 to A3 (110VAC)
A1 to A4 (24VAC)
A1 to A4 + (24VDC)
Max power consumption:
Insulation:
Sensor voltage:
Trip level:
Resetlevel:
Min cold sensor:
Accuracy
Repeat accuracy: $\quad<0.5 \%$
$\begin{array}{ll}\text { Repeataccuracy: } & \quad<0.5 \% \\ \text { Temperature dependance: } & <0.1 \% \text { per } 1^{\circ} \mathrm{C}\end{array}$
LED indication
2 green LED's:
1 green \& 1 red LED:
1 green \& 1 orange LED:
Relay output
Output contacts: Mechanical life: Electrical life:

## General

Operating temperature:
Storage temperature:
Max cable size:
CEmarked
In accordance with:

Housing material

## 11VA

2.5KV 50 Hz impulse

Max 2.5VDC (open circuit 12VDC)
3.3 KOhms
1.8 KOhms

30 Ohms

Healthy \& relay energised
Short circuited thermistor or low resistance $<30$ hms, relay de-energised Open circuit thermistor or high resistance $>3.3 \mathrm{KOhms}$, relay de-energised

DPCO 8Amps/250V AC1
30 Million ops
200K ops at max rated load
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
4 mm
Yes
EN61000-6-1: 2007
EN61000-6-3: 2007
EN61010-1: 2002
Polycarbonate, Auto extinguishable to UL 94 V - 0


## THERMISTOR MONITORING RELAY

## TYPES: YWRTC (spco) YWR2TC (dpco)

- FEATURES
- Din rail mounted
- Available SPCO or DPCO output
- Selectable manual or auto reset
- Optional test \& reset buttons
- Optional Klixon versions
- Dual LED indication
- Isolation via transformer


## D DESCRIPTION \& MODE OF OPERATION

Thermistor monitoring relays, in a din rail housing available as SPCO or DPCO. The relays will monitor a series circuit of up to 6 thermistors having a total "healthy" resistance not exceeding 1500 Ohms, the output relay/s will be energised indicated also by a red LED. Should overheating occur the individual resistance of a thermistor will rapidly rise above 3.3 KOhms at which point the normally energised relay/s will de-energise, accompanied by the red LED extinguishing. In non latched mode (the link between terminals Y1 \& Y2 left open) the relay/s will re-energise when the circuit resistance drops below 1.8 KOhms. In latch mode (the link between terminals Y1 \& Y2) the unit can be reset when this closed link is opened, provided the circuit resistance is below 1.8 KOhms . In the event of a short circuit or auxiliary supply loss the unit will de-energise.

As an option the units can be specified with built in reset or test push buttons, or if desired, both. Also available is a Klixon switch input option. However, short circuit protection is omitted on versions for use with Klixon switches.


## ORDERING INFORMATION

YWRTC (Din rail SPCO)<br>YWR2TC (Din rail DPCO)<br>KLIXON<br>* Insert T if Klixon version is required<br>** Insert 4 if Test \& Reset buttons are required<br>** Insert 5 if Reset button is required<br>** Insert 6 if Test button is required<br>*** No isolation on DC versions

OPTIONS


COILVOLTAGE

| 440VAC |  | 230VAC | ${ }^{* * *} 48 \mathrm{VDC}$ |
| :--- | :--- | :--- | :--- |
| 415VAC | 110VAC | ${ }^{* * *} 24 \mathrm{VDC}$ |  |
| 400VAC | 48VAC | ${ }^{* * *} 12 \mathrm{VDC}$ |  |
| 380VAC | $24 V A C$ | $* * 12 \mathrm{VDC}$ |  |

Supply \& Measuring
Nominal supply tolerance: $\pm 15 \%$

| Isolation AC versions: | Via transformer |
| :--- | :--- |
| Isolation DC versions: | None |
| Operating level: | $3.3 \mathrm{KOhms} \pm 5 \%$ |
| R | $1.8 \mathrm{KOhm} \pm 10 \%$ |

Reset level:
Max cold resistance of detection circuit: Max No. of PTC sensors: Sensor voltage: Short circuit detection: Operation delay on thermistor operation:
Relay output Output contacts:

Mechanical life: Electrical life:

General
Operating temperature:
Storage temperature:
Max cable size:
CE marked
In accordance with:

Housing material
3.3 KOhms $\pm 5 \%$
1.8 KOhms $\pm 10 \%$

1500 Ohms
6
2.5V DC max

30 Ohms $\pm 20 \%$
0.5 sec

SPCO 10Amps/250V AC1
DPCO 8Amps/250V AC1
30 Million ops
200K ops at max rated load
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
4mm
Yes
EN61000-6-1: 2007
EN61000-6-3: 2007
EN61010-1: 2002

Polycarbonate, Auto extinguishable to UL 94 V-0

**12VDC

# THERMISTOR MONITORING RELAY WITH BUILT IN "NO VOLT SAFE LATCH" PLUS MANUAL \& 

 REMOTE RESET
## TYPE: YWR2TC7 (dpco)

- FEATURES
- Din rail mounted
- DPCO output
- Manual reset
- Remains latched on loss of supply after fault
- Option Klixon version
- Dual LED indication
- Isolation via transformer

■ DESCRIPTION \& MODE OF OPERATION
Thermistor monitoring relay, din rail mounted and DPCO output. The relay will monitor a series circuit of up to 6 thermistors having a total "healthy" resistance not exceeding 1500 Ohms, the output relay will be energised indicated also by a red LED. Should overheating occur the individual resistance of a thermistor will rapidly rise above 3.3 KOhms at which point the normally energised relay will de-energise, accompanied by the red LED extinguishing, at which point the relay will be "latched off". In this latched condition the YWR2TC7 will not reset when the thermistor cools down and will not be reset by removing and re-applying the auxiliary supply. In order to reset the YWR2TC7 the auxiliary supply must be on, the thermistors cold, then the front reset button can be operated or the remote reset input activated to reenergise the relay. In normal "no fault" operation the relay will energise on the connection of the auxiliary supply. Newly installed units may need to be initially reset on commissioning, transit shock can cause the relay to latch over.

Also available is a Klixon switch input option, short circuit protection is omitted on versions for use with Klixon switches


## ORDERING INFORMATION

| TYPE | KLIXON | COIL VOLTAGE |  |  |
| :---: | :---: | :---: | :---: | :---: |
| YWR2TC7 | *T | 440VAC | 230VAC | **48VDC |
|  |  | 415VAC | 110VAC | **24VDC |
|  |  | 400VAC | 48VAC | **12VDC |
|  |  | 380VAC | 24VAC |  |

[^5]
# THERMISTOR MONITORING RELAYS <br> (Economical Version) 

TYPES: YRTC (spno) 8RTC, 11 RTC (spco)

## ■ FEATURES

- Din rail or 11 pin plug in
- Single pole output
- Optional Klixon versions
- Dual LED indication
- Economical version no latch or test


## ■ DESCRIPTION \& MODE OF OPERATION

Thermistor monitoring relays, available in either a din rail or 8 \& 11 pin plug in housing SPCO ( $\mathrm{N} / \mathrm{O}$ in the din rail housing). The relays will monitor a series circuit of up to 6 thermistors having a total "healthy" resistance not exceeding 1500 Ohms, the output relay will be energised indicated also by a red LED. Should overheating occur the individual resistance of a thermistor will rapidly rise above 3.3 KOhms at which point the normally energised relay will de-energise, accompanied by the red LED extinguishing. In the event of a short circuit or auxiliary supply loss the unit will de-energise.
As an option the units can be specified with a Klixon switch input option. However, short circuit protection is omitted on versions for use with Klixon switches.

## SPECIFICATIONS

Supply \& Measuring
Nominal supply tolerance: $\pm 15 \%$

## Isolation:

Operating level:
Reset level:
Max cold resistance of detection circuit: Max No. of PTC sensors:
Sensor voltage:
Short circuit detection:
Operation delay on thermistor operation:
Relay output
Output contacts:
Mechanical life:
Electrical life:
Via relay
3.3 KOhms $\pm 5 \%$
$1.8 \mathrm{KOhms} \pm 10 \%$
1500 Ohms
6
2.5VDC max

30 Ohms $\pm 20 \%$
0.5 sec

SPCO 10Amps/250V AC1
(Din rail version SPNO)
30 Million ops
200K ops at max rated load
General
Operating temperature:
Storage temperature:
Max cable size:
CE marked In accordance with:

Housing material
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
4 mm
Yes
EN61000-6-1: 2007
EN61000-6-3: 2007
EN61010-1: 2002
Polycarbonate, Auto extinguishable to UL 94 V-0

PRODUCT GROUP


## FUNCTION



## ORDERING INFORMATION

| TYPE | KLIXON | COIL VOLTAGE |
| :---: | :---: | :---: |
| YRTC (Din rail SPNO) | *T | 230VAC |
| 8RTC (8 pin SPCO) |  | 110VAC |
| 11RTC (11 pin SPCO) |  | 48VAC/DC |
|  |  | 24VAC/DC |

[^6]
# PT100 TEMPERATURE RELAY WITH BUILT IN "NO VOLT SAFE LATCH" PLUS MANUAL \& REMOTE 

 RESET
## TYPE: YWR2TR7 (dpco)

- FEATURES
- Din rail mounted
- DPCO output
- Adjustable range $0^{\circ} \mathrm{C}$ to $200^{\circ} \mathrm{C}$
- Manual reset
- Remains latched on loss of supply after fault
- Dual LED indication
- Isolation via transformer


## ■ DESCRIPTION \& MODE OF OPERATION

PT100 temperature relay, din rail mounted and DPCO output. The adjustable temperature sensing relay YWR2TR7 will monitor a PT100 sensing probe (preferably 3 wire, but 2 wire possible if terminals P2 \& PC are linked together). The adjustable range is $0^{\circ} \mathrm{C}$ to $200^{\circ} \mathrm{C}$ the output relay will be energised when below the set level, indicated also by a red LED. When the sensed temperature exceeds the set level the relay will be de-energised accompanied by the red LED extinguishing, at which point the relay will be "latched off". In this latched condition the YWR2TR7 will not reset on a failing temperature and will not be reset by removing and re-applying the auxiliary supply. In order to reset the YWR2TR7 the auxiliary supply must be on, the PT100 cold, then the front reset button can be operated or the remote reset input activated to re-energise the relay. In normal "no fault" operation the relay will energise on the connection of the auxiliary supply. Newly installed units may need to be initially reset on commissioning, transit shock can cause the relay to latch over.

## SPECIFICATIONS

Supply \& Measuring
Nominal supply tolerance: $\pm 15 \%$ Isolation AC versions: Isolation DC versions: PT100 sensor:

Operating level: Operation delay on Thermistor operation:

## Relay output

 Output contacts: Mechanical life: Electrical life:
## General

Operating temperature:
Storage temperature:
Max cable size:
CE marked:
In accordance with:
None
0.5 sec

4 mm
Yes

Via transformer

3 wire preferred
If 2 wire terminals P2 \& PC must be linked
$0^{\circ} \mathrm{C}$ to $200^{\circ} \mathrm{C}$ adjustable

DPCO 8Amps/250V AC1
30 Million ops
200K ops at max rated load
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$

EN61000-6-1: 2007
EN61000-6-3: 2007
EN61010-1: 2002



Polycarbonate, Auto extinguishable
to UL $94 \mathrm{~V}-0$
Housing material:

## ORDERING INFORMATION

## TYPE

COILVOLTAGE
YWR2TR7

| 440VAC | 230VAC | ${ }^{*} 48 \mathrm{VDC}$ |
| :--- | :--- | :--- |
| 415VAC | 110VAC | ${ }^{*} 24 \mathrm{VDC}$ |
| 400VAC | 48VAC | ${ }^{*} 12 \mathrm{VDC}$ |

[^7]
# PUMP SEAL LEAK MONITOR RELAY / WATER LEAK DETECTION RELAY \& THERMISTOR / KLIXON MONITORING RELAY <br> PRODUCT 

TYPES: 11WRSTC (PTC, 2xSPCO), 11WRSTCT (KLIXON, 2xSPCO)

## - FEATURES

- 11 Pin plug in
- Thermistor \& Klixon versions available
- Detection of water contamination of oil
- Detection of water leaks from pipes in buildings
- Isolated probe supply
- LED indication

■ DESCRIPTION \& MODE OF OPERATION
11 pin plug relay for the monitoring and alarming in applications such as water contamination of the oil within submersible pumps. Working on the conductive probe principle. In a situation healthy condition the output relay is energised, when the presence of water is detected, i.e. in the case of a pump, the seal fails and the oil becomes contaminated the resistance drops. If the resistance falls below the set level output relay will de-energise and the red LED will extinguish. A green LED indicates the connection of the auxiliary supply. Such pumps often have embedded thermistors within the motor winding this relay will also monitor a series circuit of up to 6 thermistors having a total "healthy" resistance not exceeding 1500 Ohms, the output relay will be energised indicated also by a red LED. Should overheating occur the individual resistance of a thermistor will rapidly rise above 3.3 KOhms at which point the normally energised relay/s will de-energise, accompanied by the red LED extinguishing. The relay will re-energise when the circuit resistance drops below 1.8 KOhms. in the event of a short circuit or auxiliary supply loss the unit will de-energise.



## SPECIFICATIONS

Supply \& Measuring
Nominal supply tolerance: $\pm 15 \%$
Isolation:
Probe supply:
Max probe current: Power consumption: Sensitivity fixed: Response time:
Operating level:
Reset level:
Max cold resistance of detection circuit:
Max No. of PTC sensors:
Sensor voltage:
Relay output
Output contacts:
Mechanical life:
Electrical life:
General
Operating temperature:
Merature: $\quad-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
cable size:
In accordance with:

Housing material
4 mm
Yes
EN61000-6-1: 2007
EN61000-6-3: 2007
EN61010-1: 2002
Polycarbonate, Auto extinguishable
to UL 94 V-0

## ORDERING INFORMATION

## TYPE

11WRSTC (PTC, 2x SPCO)
11WRSTC T (KLIXON, 2x SPCO)

| NOMINAL VOLTAGE |  |
| :--- | :--- |
| 440VAC | 230VAC |
| 415VAC | 110VAC |
| 400VAC | 48 VAC |
| 380VAC | 24 VAC |



# COMBINED PHASE FAILURE, SEQUENCE \& THERMISTOR RELAY 

TYPE: YWRPTC4 (spco + 1no)

- FEATURES
- Din rail mounted
- Monitors loss of phase
- Monitors phase sequence
- Monitors up to 6 thermistors
- Klixon version available
- Separate outputs for phase \& thermistor circuits
- Separate LED indication
- Available 3 or 4 wire
- Transformer technology
- Ideal lift industry product


## - DESCRIPTION \& MODE OF OPERATION

Din rail mounted combined phase failure, sequence thermistor relay (Klixon version also available). Available in either 3 or 4 wire and self powered, with separate output contacts and LED indication for phase faults and thermistor faults.
Both contacts energise when all is healthy, the phase relay R2 will de-energise when a phase sequence error is detected or a phase is lost (and in a 4 wire version also the Neutral). The thermistor circuit relay R1 will de-energise on detection of either a short circuit or overheat (resistance below 30 Ohms or above 3.3 KOhms ). Both relays are slightly delayed (delay fixed) to avoid nuisance tripping. The LED indicators will diagnose the circuit problems, a healthy situation results in all the LEDs being illuminated.


## ORDERING INFORMATION

| YPE | KLIXON | VOltage | SYSTEM |
| :---: | :---: | :---: | :---: |
| YWRPTC4 | ${ }^{*}$ T | $3 \times 110 \mathrm{~V}$ | 3W (3 wire) |
|  |  | $3 \times 220 \mathrm{~V}$ | 4W (4 wire) |
|  |  | $3 \times 380 \mathrm{~V}$ |  |
|  |  | $3 \times 400 \mathrm{~V}$ |  |
|  |  | $3 \times 415 \mathrm{~V}$ |  |
| * Insert TifKlixon version is required <br> ** Only available as 3 wire |  | $3 \times 440{ }^{* *}$ |  |
|  |  |  |  |

## SPECIFICATIONS

Supply \& Measuring
Nominal supply:

Permanent tolerance:
System:
Frequency:
Nominal Umin (fixed):
Thermistor operating:
Thermistor reset:
Max cold resistance:
Short circuit detection:
Max No. Of PTC sensors:
Sensor voltage:
Isolation:
Max power consumption: Insulation:

## Relay outputs:

Output contacts:
Delay phase sequence:
Delay phase loss:
Delay thermistor fault:
Mechanical life:
Electrical life:
General:
Operating temperature:
Storage temperature:
Max cable size:
CE marked:
In accordance with:

Housing material:
$3 \times 110 \mathrm{~V}$ AC, $3 \times 220 \mathrm{~V}$ AC $3 \times 380 \mathrm{VAC}, 3 \times 400 \mathrm{VAC}$ $3 \times 415 \mathrm{VAC}, 3 \times 440 \mathrm{VAC}$
$\pm 15 \%$
3 or 4 wire option
50/60Hz
$80 \%$ on all 3 phases
$60 \%$ on 1 phase drop
3.3 KOhm $\pm 5 \%$
$1.8 \mathrm{KOhm} \pm 10 \%$
15000 hms
30 Ohms $\pm 20 \%$
6
2.5V DC max

Via transformer \& opto isolator
$<6 \mathrm{VA}$
2.5KV 50Hzimpulse

SPCO + 1NO 8 Amps/250V AC1
0.5 sec (fixed)

50 mSec (fixed)
0.5 sec (fixed)

30 Million ops
200K ops at max rated load
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
4 mm
Yes
EN61000-6-1: 2007
EN61000-6-3: 2007
EN61010-1: 2002
Polycarbonate, Auto extinguishable
to UL 94 V-0

## OPTION

On 3 wire variants as a not cost option a separate AC auxiliary supply can be specified. This gives the possibility of additional"control circuit" voltage monitoring. If this is lost or is not present, the unit will de-energise or not energise as applicable.
24VAC, 48VAC, 110VAC

# COMBINED PHASE FAILURE, SEQUENCE \& THERMISTOR RELAY 

TYPE: MOD-PTC (2 x no)

- FEATURES
- Din rail mounted
- Modern modular design
- Monitors loss of phase \& phase sequence
- Monitors up to 6 thermistors
- Klixon version available
- Separate outputs for phase \& thermistor circuits
- Separate LED indication
- Available 3 or 4 wire
- Self powered
- Transformer technology
- Ideal lift industry product
- DESCRIPTION \& MODE OF OPERATION

Din rail mounted combined phase failure, sequence and thermistor relay (Klixon version also available). Available in either 3 or 4 wire and self powered, with separate normally open contacts and LED indication for phase faults and thermistor faults.
Both contacts energise when all is healthy, the phase relay R2 will de-energise when a phase sequence error is detected or a phase is lost (and in a 4 wire version also the Neutral). The thermistor circuit relay R1 will de-energise on detection of either a short circuit or overheat (resistance below 30 Ohms or above 3.3 KOhms ). Both relays are slightly delayed (delay fixed) to avoid nuisance tripping. The LED indicators will diagnose the circuit problems, a healthy situation results in all the LEDs being illuminated.

## SPECIFICATIONS

| Supply \& Measuring |  |
| :---: | :---: |
| Nominal supply: | $3 \times 110 \mathrm{VAC}, 3 \times 220 \mathrm{VAC}$ |
|  | $3 \times 380 \mathrm{VAC}, 3 \times 400 \mathrm{VAC}$ |
| Permanent tolerance: | $\pm 15 \%$ |
| System: | 3 or 4 wire option |
| Frequency: | 50/60Hz |
| Nominal Umin (fixed): | 80\% on all 3 phases |
|  | 60\% on 1 phase drop |
| Thermistor operating: | $3.3 \mathrm{KOhm} \pm 5 \%$ |
| Thermistor reset: | 1.8 KOhm $\pm 10 \%$ |
| Max cold resistance: | 1500 Ohms |
| Short circuit detection: | $30 \mathrm{hmss} \pm 20 \%$ |
| Max No. Of PTC sensors: | 6 |
| Sensor voltage: | 2.5 V DC max |
| Isolation: | Via transformer \& opto isolator |
| Max power consumption: | $<6 \mathrm{VA}$ |
| Insulation: | 2.5KV 50Hz impulse |
| Relay outputs: |  |
| Output contacts: | $2 \times \mathrm{NO} 5 \mathrm{Amps} / 250 \mathrm{~V}$ AC1 |
| Delay phase sequence: | 0.5 sec (fixed) |
| Delay phase loss: | 50 mSec (fixed) |
| Delay thermistor fault: | $0.5 \mathrm{sec}($ fixed) |
| Mechanical life: | 30 Million ops |
| Electrical life: | 100K ops at max rated load |
| General: |  |
| Operating temperature: | $-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$ |
| Storage temperature: | $-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$ |
| Max cable size: | 2.5 mm |
| CE marked: | Yes |
| In accordance with: | EN61000-6-1: 2007 |
|  | EN61000-6-3: 2007 |
|  | EN61010-1: 2002 |
| Housing material: | Polycarbonate, Auto extinguishable to UL 94 V-0 |




## LIFT ROOM TEMPERATURE RELAY

## TYPE: YRTCA

## FEATURES

■ Din rail mounted

- Dual LED indication
- Supplied complete with panel mounted sensor
- Ideal lift industry product
- Meets regulation EN81-1 traction lifts
- Meets regulation EN81-2 hydraulic lifts


## DESCRIPTION \& MODE OF OPERATION

A din rail mounted temperature sensing relay supplied complete with a panel mounted temperature sensor. The unit is designed to facilitate compliance with The Lift Directive regulations EN81-1 Traction Lifts and EN81-2 Hydraulic Lifts. These regulations require that the lift room temperature is monitored between $+5^{\circ} \mathrm{C}$ to $+40^{\circ} \mathrm{C}$ and an alarm be triggered if the temperature rises or falls outside these limits.

A permanent auxiliary supply is required on to terminals A1 and A2. The 22.5 mm panel mounted sensor needs to be connected to terminals P1 and P2. When the room temperature is between the two fixed set points, the output contact will be made between terminals 11 and 14 after a fixed time delay of 10 seconds. On deviation from these fixed set points, the output contact will open. Also the contact will open on loss of the auxiliary supply, thus making the unit fail safe. A green LED indicates that the auxiliary supply is present, a red LED indicates that the output contact is closed and thus the temperature is within specification.

## SPECIFICATIONS

\author{
Supply \& Measuring <br> Supply voltage tolerance: <br> Temperature range fixed: Accuracy: <br> Time delay fixed: Output contact: Max power rating: <br> Max current: <br> Mechanical life: <br> Electrical life: <br> Max duty: <br> General: <br> Operating temperature: <br> Storage temperature: <br> Sensor: <br> CE marked: <br> In accordance with: <br> [^8] <br> $+/-15 \%$ <br> +5 C to $+40^{\circ} \mathrm{C}$ <br> $+/-1^{\circ} \mathrm{C}$ <br> 10 Sec <br> 1 NO <br> 2200VA/30W <br> 10A AC/1ADC <br> $>30$ million ops <br> 200000 ops @ 2200VA resistive <br> 600 ops / hour <br> $-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$ <br> $-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$ <br> 22.5 mm front panel mounted <br> Yes <br> EN61000-6-1: 2007 <br> EN61000-6-3: 2007 <br> EN61010-1: 2002 <br> Polycarbonate, Auto extinguishable <br> to UL 94 V-0
}


## FUNCTION



# - ORDERING INFORMATION 

[^9] office for further assistance.

## "CT STYLE" CURRENT PROVING SWITCH

## TYPE: FOX.CS-200

## - FEATURES

- Din rail mounted
- Foot mounted option available on request
- Compact

■ Sensing range 2-200 Amps adjustable

- Self powered from flowing current
- No separate auxiliary supply required
- Dual LED indication
- Normally open output switch
- CE marked
- RoHS compliant


## DESCRIPTION \& MODE OF OPERATION

A compact Din rail or foot mounted "CT" style AC current proving switch, the sensing range (set point) being adjustable 2-200 Amps. On current flowing of at least 1 Amp the power LED will be illuminated, on current flowing in excess of the adjustable set point the status LED will be illuminated denoting the Normally Open output is closed. On current falling below the set point less a nominal 2\% hysteresis the output will open and the status LED will extinguish and the power LED will illuminate, if the current has fallen to zero both the power and status LED's will extinguish.
The FOX.CS-200 current switch is self powered yet benefits from a volt free output Normally Open switch. The maximum switching capability is $30 \mathrm{VAC} / \mathrm{DC} 0.5$ Amps.
It is also possible for low current sensing, to pass the conductor to be measured multiple times through the CT (referred to as turns). For example; 2 turns will give a sensing range of 1-100 Amps, 4 turns a sensing range of 0.5-50 Amps.


PRODUCT GROUP F


IDEAL FOR HVAC MARKET FOR SMALL FAN \& PUMP FAILURE MONITORING!

## SPECIFICATIONS

## Measuring

Sensing range:
Hysteresis:
Power LED:

Output
Max switching voltage:
Max switching current:
Output type:
Status LED:

## General

Rated system voltage: Insulation:
Frequency range:
Ambient temperature range: CE marked:
Compliance:

RoHS compliant:

2-200 Amps
$<2 \%$ fixed
Yes, 1 Amp \& above

30V AC/DC
0.5 Amps

Bi-directional solid state $\mathrm{N} / \mathrm{O}$
Yes, current above set point

Max 720V continuous
Max 3 KV for 1 min
$50-60 \mathrm{~Hz}$
$-30^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
Yes
IEC185, BS7626, BSED 60044-1
IEC 60044-1
Yes


## TYPE: YRI-41

## SPECIFICATIONS

| Supply \& Measuring: |  |
| :---: | :---: |
| Measurement ranges: | $1 \mathrm{~mA}-100 \mathrm{~mA}, 10 \mathrm{~mA}-1 \mathrm{~A}, 30 \mathrm{~mA}-3 \mathrm{~A}$, $50 \mathrm{~mA}-5 \mathrm{~A}, 100 \mathrm{~mA}-10 \mathrm{~A}$ |
| Max over current: | 100 mA version/ 250 mA for 1 sec |
|  | 1 A version/2A for 1 sec |
|  | 3 A version/5A for 1 sec |
|  | 5A version/8A for 1 sec |
|  | 10A version/ 15A for 1 sec |
| Hysteresis: | Nominal 1\% fixed |
| Repeat accuracy: | $< \pm 1 \%$ |
| Power consumption: | 5VA |
| Relay outputs: |  |
| Output: | Relay SPCO |
| Rated: | 8A/250VAC AC1 |
| Mechanical life: | 30 Million ops |
| Electrical life: | 200K at 8A/250VAC |
| General: |  |
| Operating temperature: | $-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$ |
| Storage temperature: | $-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$ |
| Max cable size: | 4 mm |
| CE marked | Yes |
| In accordance with: |  |
| Housing material: | Polycarbonate, Auto extinguishable to UL 94 V-0 |

## - FEATURES

- Din rail mounted 22.5 mm wide
- Powered from own monitored voltage
- No separate auxiliary supply required
- SPCO relay output rated 8 Amps
- 5 adjustable versions from 1 mA to 10 Amps
- 4mm terminals
- Dual LED indication
- CE marked


## - DESCRIPTION \& MODE OF OPERATION

The YRI-41 is a direct connected current proving switch available in five different adjustable ranges, $1 \mathrm{~mA}-100 \mathrm{~mA}$, $10 \mathrm{~mA}-1 \mathrm{~A}, 30 \mathrm{~mA}-3 \mathrm{~A}, 50 \mathrm{~mA}-5 \mathrm{~A}, 100 \mathrm{~mA}-10 \mathrm{~A}$. External current transformers cannot be used with the YRI-41. The current is monitored on its own supply hence a separate auxiliary supply is not required.
Note, the monitored load and the supply voltage must be from the same source and of the same voltage potential, please note carefully the circuit diagram.

On connection of the supply/load the green LED illuminates, should the load exceed the adjustable set point the SPCO relay output will energise and the red LED will illuminate. Should the load then fall below the set level, less than a nominal $1 \%$ hysteresis the output relay will de-energise and the red LED will be extinguished.


[^10]As standard units are supplied for a 230VAC potential. On request other potentials are available.
On request other current ranges also available for OEM applications.
On request 8 \& 11 pin plug in versions available

## IN LINE CURRENT PROVING SWITCH

## TYPE: MOD-I (spco)

## - FEATURES

- Din rail mounted
- Modern modular design
- Width 27 mm ( 1.5 modules)
- SPCO output
- Adjustable delay to energise time delay 1-10 secs
- No separate auxiliary supply required
- Four selectable ranges 0.1-1A, 0.3-3A, 0.5-5A, 1-10A
- LED indication
- CE marked


## DESCRIPTION \& MODE OF OPERATION

"With delay to energise on a rising current". The output relay delays to energise for up to 10 secs when the monitored current rises above the set level as selected by the front potentiometer. It will de-energise when the current falls below the set level less a fixed hysteresis of $1 \%$ against the set level. De-energisation will also occur if the auxiliary supply is lost.
The MOD-I can be used to monitor a 3 phase motor by passing one phase into terminal A1 and out on the relevant l.. terminal to the load. The panel Neutral needs to be connected to terminal A2 even if the load does not have a Neutral connection. All terminal details and information along with the CE mark is clearly marked on the sides of the housing.
Single range versions of the above product are available product type YRI-41 see page 66.


PRODUCT GROUP


## SPECIFICATIONS

## Supply\& Measuring

Supply voltage: $\quad 220-240 \mathrm{VAC}$
Max power consumption: 5VA
Insulation:
2.5 Kv 50 Hz impulse
0.1-1A (terminal 1)
0.3-3A (terminal 2)
$0.5-5 \mathrm{~A}$ (terminal 3 )
1-10A (terminal 4)
Max over current: $\quad 1$ A version/2A for 1 sec
3A version/5A for 1 sec
5A version/8A for 1sec
10A version/ 15A for 1sec
Nominal $1 \%$ fixed
$< \pm 1 \%$
1-10 secs

SPCO 16Amps/250V AC1
4000VA
30 Million ops
200Kat 16A/250VAC
$\begin{array}{ll}\text { Operating temperature: } & -20^{\circ} \mathrm{C} \text { to }+65^{\circ} \mathrm{C} \\ \text { Storage temperature: } & -20^{\circ} \mathrm{C} \text { to }+65^{\circ} \mathrm{C}\end{array}$
Max cable size:
CE marked
In accordance with:

Housing material:

# CURRENT CONTROL RELAYS WITH INITIAL START UP DELAY \& DELAY ON TRIPPING TIMERS 

# TYPES: YWRI, YWRI/I (spco) YWRI.CT5, YWRI/I.CT5 (spco) 

## FEATURES

- Din rail mounted
- SPCO output
- Three selectable input ranges 5 mA to 10 Amps
- Dedicated 5 Amp "CT" input version
- Selectable for both AC or DC current
- Selectable manual or auto reset
- Initial start up adjustable time delay $0.1-10$ secs
- Adjustable delay on rising current $0.1-10$ secs
- Adjustable delay on falling current $0.1-10$ secs
- Dual LED indication
- SUMMARY OF UNITS

YWRI - Din rail current sensing relay, selectable via a wired link for either AC or DC current.
YWRI/I - Din rail "inverse" acting current sensing relay, selectable via a wired link for either AC or DC current.


## MODE OF OPERATION

## YWRI

"Auto Reset" without latching mode. This mode is determined by terminals Y1 \& Y2 left open. The output relay is energised when the monitored current rises above the selected set level, set via the front potentiometer. The output relay will de-energise when the current falls back below the level selected less the set hysteresis adjustable 5 to $50 \%$, set via a second potentiometer. For example set level at 4Amps, hysteresis at $30 \%$ will result in energisation at 4Amps and de-energisation at 2.8 Amps. If the auxiliary supply is lost at any time the relay will also de-energise.
"Manual Reset" without latching mode. This mode is determined by a wired link between terminals Y1 \& Y2. The output energises when the monitored current rises above the level selected via the front potentiometer. Once energised the relay will remain latched even if the monitored current falls below the set level less any selected hysteresis. Resetting is achieved by opening the link between terminals Y1 \& Y2 or by removing the auxiliary supply. If whilst resetting the monitored current is still above the set level a reset will not be achieved. It is normally preferable in the latching mode to have the adjustable hysteresis set at minimum.

## YWRI/I

"Auto Reset" without latching. This version is only available as an "auto reset" device and the output relay acts in an "inverse" way, i.e. the output relay is normally energised and de-energises when the monitored current rises above the level selected via the front potentiometer. It will re-energise when the monitored current falls below the set level less the set hysteresis adjustable 5 to $50 \%$, set via a second potentiometer. It should be noted that on first connection of the auxiliary supply the relay will energise for 0.1 secs (i.e. current below the set level), whilst the scanning circuit is determining the level of current being measured. This time can be extended up to 10 secs via the adjustable "start up delay" thus allowing a longer stabilisation period.

## Adjustable Time Delays

The YWRI and YWRI/I current relays have 3 independently adjustable $0.1-10$ secs time delays. Initial start up delay timer, activated by the connection of the auxiliary supply, therefore if a control circuit is going to be permanently live this time delay will only ever be active once, a delay on rising current when the monitored current rises above the set level as selected by the front potentiometer and a delay on falling current, when the monitored current falls below the set level plus the hysteresis.

## OTHER APPLICATION NOTES

## Selection of AC or DC Current

Din rail mounted units can be selected for either AC or DC current monitoring via a wired link between terminals B1 \& IK. B1 \& IK linked = DC current. B1 \& IK open = AC current.

## Use of Current Transformers

The three current ranges are determined by wiring to different terminals. For monitoring currents above 10Amps AC a current transformer is required. On applications requiring a current transformer with a 5 Amp secondary use the YWRI.CT5 or YWRI/I.CT5 dedicated current transformer input units. A range of 1 Amp secondary CT's are available from our CT section page 156 to 164.

## DC Auxiliary Supply Versions

DC auxiliary supply versions are as standard non isolated. For these versions the supply and the measured current must be isolated from each other and must not exceed 50V DC. On request at extra cost isolated versions can be manufactured utilising internally a DC to DC converter.

## SPECIFICATIONS

Supply \& Measuring

Nominal supply tolerance: Isolation AC versions: Isolation DC versions

Power consumption: Hysteresis:
Repeataccuracy:
Response time:
Input ranges selectable:

Input impedances:

## Relay output

Output contacts:
Mechanical life:
Electrical life:

## General

Operating temperature:
Storage temperature:
Max cable size:
CE marked:
In accordance with:

Housing material:
$\pm 15 \%$
Via transformer
No as standard or:-
Yes via optional internal DC to DC converter 3VA max
Ajustable 5 to 50\% of le
$\pm 2 \%$ at constant ambient $\pm 5 \%$ across temperature range 100 mSec on make 200 mSec on break
$5-100 \mathrm{~mA}$ (max overload 5 A for less than 1 sec ) $50 \mathrm{~mA}-1 \mathrm{~A}$ (max overload 17A for less than 1 sec ) $0.5-10 \mathrm{~A}$ (max overload 55A for less than 1 sec )
100 mA range 10 hm
1 A range 0.10 hm
10A range 0.010 hm
SPCO 10Amps/250V AC1
30 Million ops
200K ops at max rated load
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
4 mm
Yes
EN61000-6-1: 2007
EN61000-6-3: 2007
EN61010-1: 2002
Polycarbonate, Auto extinguishable to UL 94 V-0

ORDERING INFORMATION

TYPE
YWRI (Din rail AC or DC current) YWRI/I (Din rail "inverse" AC or DC current)

COIL VOLTAGE
440VAC 110VAC
415VAC 48VAC 400VAC 24VAC 380VAC *48VDC 230VAC *24VDC

* No isolation on DC versions as standard, on request at extra cost isolated versions are available.



## FUNCTION

YWRI


T1 - Start up Delay
T2 - Delay on Rising Current
T3 - Delay on Falling Current



## TYPES: YWRI.CT5, YWRI/I.CT5 (spco)

As an option the YWRI current control relay is available with a dedicated 5 Amp input designed to work in conjunction with any C.T. with a 5 Amp secondary. The YWRI.CT5 has the same mode of operation as the standard versions.

## SPECIFICATIONS

Supply \& Measuring
Input range: $\quad 0.25-5 \mathrm{~A}$ (max overload 25 A for less than 1 sec ) Input impedances: 0.022 Ohm.

All other specification is the same as the standard YWRI.

## CONNECTIONS



* No isolation on DC versions as standard, on request at extra cost isolated versions are available.

COIL VOLTAGE

|  |  |  |
| :---: | :---: | :---: |
| YWRI.CT5 (Din rail AC current) | 440VAC | 110VAC |
| YWRI/I.CT5 (Din rail "inverse" AC current) | 415VAC | 48VAC |
|  | 400VAC | 24VAC |
|  | 380VAC | *48VDC |
|  | 230VAC | *24VDC |

# CURRENT CONTROL RELAYS WITH OUTPUT RELAY INITIALLY ENERGISED START UP PULSE \& DELAY ON TRIPPING <br> PRODUCT 

## TYPES: YWRI.H (spco) YWRI.H.CT5 (spco)



- Adjustable delay on rising current $0.1-10$ secs
- Adjustable delay on falling current $\mathbf{0 . 1 - 1 0}$ secs
- Dual LED indication

SUMMARY OF UNITS
YWRI.H - Din rail current sensing relay, selectable via a wired link for either AC or DC current.

## MODE OF OPERATION

## YWRI.H

"Auto Reset" without latching mode. This mode is determined by terminals Y1 \& Y2 left open. The output relay is energised when the monitored current rises above the selected set level, set via the front potentiometer. The output relay will de-energise when the current falls back below the level selected less the set hysteresis adjustable 5 to $50 \%$, set via a second potentiometer. For example set level at 4Amps, hysteresis at $30 \%$ will result in energisation at 4Amps and de-energisation at 2.8 Amps . If the auxiliary supply is lost at any time the relay will also de-energise.
"Manual Reset" without latching mode. This mode is determined by a wired link between terminals Y1 \& Y2. The output energises when the monitored current rises above the level selected via the front potentiometer. Once energised the relay will remain latched even if the monitored current falls below the set level less any selected hysteresis. Resetting is achieved by opening the link between terminals Y1 \& Y2 or by removing the auxiliary supply. If whilst resetting the monitored current is still above the set level a reset will not be achieved. It is normally preferable in the latching mode to have the adjustable hysteresis set at minimum.

## Adjustable Time Delays

The YWRI.H current relays have 3 independently adjustable $0.1-10$ Secs time delays. Initial start up adjustable pulse timer, activated by the connection of the auxiliary supply, if the current is below the set level after the time has elapsed the relay will de-energise, if it is above the the set level the relay will stay energised. If a control circuit is going to be permanently live this time delay will only ever be active once, a delay on rising current when the monitored current rises above the set level as selected by the front potentiometer and a delay on falling current, when the monitored current falls below the set level plus the hysteresis.

## OTHER APPLICATION NOTES

## Selection of AC or DC Current

Din rail mounted units can be selected for either AC or DC current monitoring via a wired link between terminals B1 \& IK. B1 \& IK linked = DC current. B1 \& IK open = AC current.

## Use of Current Transformers

The three current ranges are determined by wiring to different terminals. For monitoring currents above 10Amps AC a current transformer is required. On applications requiring a current transformer with a 5Amp secondary use the YWRI.H.CT5 dedicated current transformer input units. A range of 1 Amp secondary CT's are available from our CT section page 156 to 164.

## DC Auxiliary Supply Versions

DC auxiliary supply versions are as standard non isolated. For these versions the supply and the measured current must be isolated from each other and must not exceed 50V DC. On request at extra cost isolated versions can be manufactured utilising internally a DC to DC converter.

## SPECIFICATIONS

Supply \& Measuring

Nominal supply tolerance: Isolation AC versions: Isolation DC versions:

Power consumption:
Hysteresis:
Repeat accuracy:
Response time:
Input ranges selectable:

Input impedances:

## Relay output

Output contacts:
Mechanical life:
Electrical life:

## General

Operating temperature: Storage temperature:
Max cable size:
CE marked:
In accordance with:
$\pm 15 \%$
Via transformer
No as standard or:-
Yes via optional internal DC to DC converter
3VAmax
Adjustable 5 to $50 \%$ of le
$\pm 2 \%$ at constant ambient
$\pm 5 \%$ across temperature range
100 mSec on make
200 mSec on break
$5-100 \mathrm{~mA}$ (max overload 5 A for less than 1 sec ) $50 \mathrm{~mA}-1 \mathrm{~A}$ (max overload 17A for less than 1 sec ) 0.5-10A (max overload 55A for less than 1 sec )

100 mA range 10 hm
1 A range 0.10 hm
10A range 0.010 hm
SPCO 10Amps/250V AC1
30 Million ops
200K ops at max rated load
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
4 mm
Yes
EN61000-6-1: 2007
EN61000-6-3: 2007
EN61010-1: 2002
Polycarbonate, Auto extinguishable to UL 94 V-0

## ORDERING INFORMATION

## TYPE

YWRI . H (Din rail AC or DC current)

COILVOLTAGE
440VAC 110VAC 415VAC 48VAC 400VAC 24VAC 380VAC *48VDC 230VAC *24VDC

* No isolation on DC versions as standard, on request at extra cost isolated versions are available.




## TYPES: YWRI.H.CT5, YWRI/I.H.CT5 (spco)

ORDERING INFORMATION
As an option the YWRI.H current control relay is available with a dedicated 5 Amp input designed to work in conjunction with any C.T. with a 5 Amp secondary. The YWRI.H.CT5 has the same mode of operation as the standard versions.

## SPECIFICATIONS

## Supply \& Measuring

Input range: $\quad 0.25-5 \mathrm{~A}$ (max overload 25 A for less than 1 sec )
Input impedances: 0.022 Ohm.
All other specification is the same as the standard YWRI.H.

# 11 PIN PLUG IN CURRENT CONTROL RELAYS WITH INITIAL START UP DELAY <br> <br> TYPES: 11WRIA, 11WRID 11WRIA/I, 11WRID/I,(spco) 

 <br> <br> TYPES: 11WRIA, 11WRID 11WRIA/I, 11WRID/I,(spco)}

FEATURES<br>- 11 pin plug in<br>- SPCO output<br>- Three selectable input ranges 5 mA to 10 Amps<br>- Available for both AC or DC current<br>- Selectable manual or auto reset<br>- Initial start up adjustable time delay $0.1-10$ secs

## - SUMMARY OF UNITS



- Dual LED indication11WRIA - 11 pin plug in current sensing relay AC current only.
- 11WRID - 11 pin plug in current sensing relay DC current only.
- 11WRIA/I - Din rail "inverse" acting current sensing relay AC current only.
- 11WRID/I - Din rail "inverse" acting current sensing relay DC current only.


## MODE OF OPERATION

## 11WRIA, 11WRID

"Auto Reset" without latching mode. This mode is determined by terminals pins 9 \& 11 left open. The output relay is energised when the monitored current rises above the selected set level, set via the front potentiometer. The output relay will de-energise when the current falls back below the level selected less the set hysteresis adjustable 5 to $50 \%$, set via a second potentiometer. For example set level at 4 Amps, hysteresis at $30 \%$ will result in energisation at 4 Amps and de-energisation at 2.8 Amps . If the auxiliary supply is lost at any time the relay will also de-energise.
"Manual Reset" without latching mode. This mode is determined by a wired link between terminals pins 9 \& 11. The output energises when the monitored current rises above the level selected via the front potentiometer. Once energised the relay will remain latched even if the monitored current falls below the set level less any selected hysteresis. Resetting is achieved by opening the link between terminals pins 9 \& 11 or by removing the auxiliary supply. If whilst resetting the monitored current is still above the set level a reset will not be achieved. It is normally preferable in the latching mode to have the adjustable hysteresis set at minimum.

## 11WRIA/I, 11WRID/I

"Auto Reset" without latching. This version is only possible as an "auto reset" device and the output relay acts in an "inverse" way, i.e. the output relay is normally energised and de-energises when the monitored current rises above the level selected via the front potentiometer. It will re-energise when the monitored current falls below the set level less the set hysteresis adjustable 5 to $50 \%$, set via a second potentiometer. It should be noted that on first connection of the auxiliary supply the relay will energise for 0.1 secs (i.e. current below the set level), whilst the scanning circuit is determining the level of current being measured. This time can be extended up to 10 secs via the adjustable "start up delay" thus allowing a longer stablization period.

## OTHER APPLICATION NOTES

## Use of Current Transformers

The three current ranges are determined by wiring to different terminals. For monitoring currents above 10Amps AC a current transformer is required. It is recommended that preferably a 1 Amp secondary current transformer is used and connected to the 50 mA to 1 Amp input range, thus giving $100 \%$ resolution. A range of 1 Amp secondary CT's are available from our CT section page 156 to 164.

## Adjustable Initial Start Up Time Delay

The current relays have an adjustable $0.1-10 \mathrm{sec}$ initial start up delay timer, activated by the connection of the auxiliary supply, therefore if a control circuit is going to be permanently live the time delay will only ever be active once. In this scenario it may be preferable to use the versions 11WRIx5x on pages 74 \& 75 , these versions have a time delay that activates every time a monitored current exceeds or falls below the set levels.

## DC Auxiliary Supply Versions

DC auxiliary supply versions are as standard non isolated. For these versions the supply and the measured current must be isolated from each other and must not exceed 50V DC. On request at extra cost isolated versions can be manufactured utilising internally a $D C$ to $D C$ converter.

## SPECIFICATIONS

Supply \& Measuring
Nominal supply tolerance: $\pm 15 \%$
Isolation AC versions:
Isolation DC versions:
Power consumption:
Hysteresis:
Repeat accuracy:
Response time:
Input ranges selectable:

Input impedances:

Relay output
Output contacts:
Mechanical life:
Electrical life:

## General

Operating temperature:
Storage temperature:
CE marked:
In accordance with:

Housing material:

## ORDERING INFORMATION

TYPE
11WRIA (11 pin AC current)
11WRID (11 pin DC current)
11WRIA/I (11 pin AC current inverse output)
11WRID/I (11 pin DC current inverse output)
COIL VOLTAGE

| 440VAC | 110VAC |
| :--- | :--- |
| 415VAC | 480VAC |
| 400VAC | 24VAC |
| 380VAC | *48VDC |
| 230VAC | *24VDC |

* No isolation on DC versions as standard, on request at extra cost isolated versions are available

Via transformer
No as standard or:-
Yes via optional internal DC to DC converter
3VA max
Adjustable 5 to 50\% of le
$\pm 2 \%$ at constant ambient
$\pm 5 \%$ across temperature range
100 mSec on make
200 mSec on break
$5-100 \mathrm{~mA}$ (max overload 5A for less than 1 sec ) $50 \mathrm{~mA}-1 \mathrm{~A}$ (max overload 17A for less than 1 sec ) $0.5-10 \mathrm{~A}$ (max overload 55A for less than 1 sec )
100 mA range 10 hm
1 A range 0.10 hm
10A range 0.010 hm
SPCO 10Amps/250V AC1
30 Million ops
200K ops at max rated load
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
Yes
EN61000-6-1: 2007
EN61000-6-3: 2007
EN61010-1: 2002
Polycarbonate, Auto extinguishable to UL 94 V-0

FUNCTION


## CONNECTIONS



11WRIx

# 11 PIN PLUG IN CURRENT CONTROL RELAYS WITH TRIPPING TIME DELAYS 

# TYPES: 11 WRIA5A, 11WRID5A (over current relays) 11WRIA5C, 11WRID5C (under current relays) 

## - FEATURES

\author{

- 11 pin plug in <br> - SPCO output <br> - Three selectable input ranges 5 mA to 10 Amps <br> - Available for both AC or DC current <br> - Selectable manual or auto reset <br> - Adjustable time delay on tripping $0.1-10$ secs <br> - Dual LED indication
}

- SUMMARY OF UNITS

11WRIA5-11 pin plug in current sensing relay $A C$ current only. 11WRID5-11 pin plug in current sensing relay DC current only.
Suffix A - With delay to energise on a rising current.
Suffix C - With delay to de-energise on a falling current.

## MODE OF OPERATION

## 11WRIA5A, 11WRID5A

"With delay to energise on a rising current". The output relay delays to energise for up to 10 secs when the monitored current rises above the set level as selected by the front potentiometer. It will de-energise when the current falls below the set level less any hysteresis adjustable 5 to $50 \%$ against the set level. De-energisation will also occur if the auxiliary supply is lost. The units can be set to be either "manual" or "auto" reset (latched or non latched), achieved by a link or no link between terminals or pins 9 \& 11. For "manual" reset (latched) a link is required, when reaching the set level plus the set time delay the relay will latch and the link will need to be opened or the auxiliary supply removed to achieve a reset. Reset it only possible if the monitored current has fallen below the set level minus the set hysteresis.

## 11WRIA5C, 11WRID5C

"With delay to de-energise on a falling current". The output relay will energise when the monitored current reaches the set level as set via the potentiometer. The output relay will de-energise up to 10 secs after the monitored current has fallen and remains below the set hysteresis, adjustable 5 to $50 \%$ of the set current level. Should the auxiliary supply be lost the output relay will also de-energise. Whilst the latch circuit is fitted to the units on the 5C versions it cannot be utilised and therefore link pin 9 \& 11 should be left open.

## OTHER APPLICATION NOTES

## Use of Current Transformers

The three current ranges are determined by wiring to different terminals. For monitoring currents above 10Amps AC a current transformer is required. It is recommended that preferably a 1 Amp secondary current transformer is used and connected to the 50 mA to 1 Amp input range, thus giving $100 \%$ resolution. A range of 1 Amp secondary CT's are available from our CT section pages 156 to 164.

## Adjustable Time Delay on Tripping

The current relays have an adjustable $0.1-10$ sec delay on tripping timer which activates every time the set level is exceeded, or falls below the set level, as the case may be. This feature is extremely useful on applications where the control circuit is always live.

## DC Auxiliary Supply Versions

DC auxiliary supply versions are as standard non isolated. For these versions the supply and the measured current must be isolated from each other and must not exceed 50V DC. On request at extra cost isolated versions can be manufactured utilising internally a DC to DC converter.

## SPECIFICATIONS

## Supply \& Measuring

Nominal supply toler
Isolation AC versions
Isolation DC versions
$\pm 15 \%$
Via transformer
Isolation DC versions: No as standard or:-
Power consumption:
Hysteresis:
Repeat accuracy:
Response time:

Input ranges selectable:
Yes via optional internal DC to DC converter
3VA max
Ajustable 5 to $50 \%$ of le
$\pm 2 \%$ at constant ambient
$\pm 5 \%$ across temperature range
5 A version adjustable 0.1-10secs on make
5 A version 200 mSec on break
5 C version 100 mSec on make
5 C version $0.1-10$ secs on break
$5-100 \mathrm{~mA}$ (max overload 5A for less than 1 sec ) $50 \mathrm{~mA}-1 \mathrm{~A}$ (max overload 17A for less than 1 sec ) $0.5-10 \mathrm{~A}$ (max overload 55A for less than 1 sec )

Input impedances:

Relay output
Output contacts: Mechanical life:
Electrical life:
100 mA range 10 hm
1 A range 0.10 hm
10A range 0.010 hm
SPCO 10Amps/250V AC1
30 Million ops
200K ops at max rated load

## General

Operating temperature: $\quad-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
Storage temperature: $\quad-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
Max cable size:
4 mm

CEmarked
In accordance with:

Housing material
Yes
EN61000-6-1: 2007
EN61000-6-3: 2007
EN61010-1: 2002
Polycarbonate, Auto extinguishable
to UL 94 V-0

## ORDERING INFORMATION

TYPE
11WRIA5A (11 pin AC rising current)
11WRID5A (11 pin DC rising current)
11WRIA5C (11 pin AC falling current)
11WRID5C (11 pin DC falling current)
COIL VOLTAGE

| 440VAC | 110VAC |
| :--- | :--- | :--- |
| 415VAC | 48VAC |
| 400VAC | 24VAC |
| 380VAC | ${ }^{*}$ 48VDC |
| 230VAC | ${ }^{*}$ 24VDC |

${ }^{*}$ No isolation on DC versions as standard, on request at extra cost isolated versions are available.


## FUNCTION

## CONNECTIONS

5A


# IJjmidiand jay AC CURRENT LEVEL MONITORING RELAYS 

TYPES: CLA 1xxx, CLA 2xxx, CLA 3xxx, CLA 4xxx (spco)

## - FEATURES

- Din rail mounted Modular housing
- Under current monitoring
- Over current monitoring
- Over \& under current monitoring
- Choice of 1 Amp, 2 Amps, 5 Amps monitoring ranges
- Calibrated current control scales on settings
- Three LED's for indication


A range of Din rail mounted Modular housing AC current level monitoring relays, available either as under current monitoring, over current monitoring or combined under and over current monitoring. Available in four mode of operation configurations as follows:-

CLA 1 - Under current monitoring, setpoint adjustable between $10-100 \%$ of nominal In, with an adjustable delay on tripping timer 1-10 secs. Providing the monitored current level is above the set under current trip level the output relay will energise and the green "Healthy" LED will illuminate. If the current falls below the set trip level the unit will start timing, this will be indicated by the yellow "Timing" LED. If the monitored current does not recover before the set time period has elapsed the output relay will de-energise and the red "Fault" LED will illuminate. The unit will reset automatically when the current level returns to normal.

CLA 2 - Under and over current monitoring, both setpoints individually adjustable between 10-100\% of nominal In, without an adjustable delay on tripping timer. Providing the monitored current level is above the set under current trip level and below the set over current trip level the output relay will energise and the green "Healthy" LED will illuminate. If the current level deviates outside these limits the output relay will de-energise and the corresponding " $\mathrm{U} / \mathrm{C}$ " or " $\mathrm{O} / \mathrm{C}$ " red "Fault" LED will illuminate. The unit will reset automatically when the current level returns to normal.

CLA 3 - Over current monitoring, setpoint adjustable between $10-100 \%$ of nominal In , with an adjustable delay on tripping timer 1-10 secs. Providing the monitored current level is below the set over current trip level the output relay will be deenergise and the green "Healthy" LED will be illuminated. If the current rises above the set trip level the unit will start timing, this will be indicated by the yellow "Timing" LED. If the monitored current remains above the trip level for the full set time period then the output relay will energise and the red "Fault" LED will illuminate. The unit will reset automatically when the current level returns to normal.

CLA 4 - Over current monitoring, setpoint adjustable between 10-100\% of nominal In, with an adjustable 1-10 secs "Initial Start Up Delay Timer". The "Initial Start Up Delay Timer" prevents the unit from tripping for a timed period from application of the coil voltage, indicated by the yellow "Timing" LED. After the timed period has elapsed and providing the current has by then fallen to less than the set over current trip level the green "Healthy" LED will illuminate. If the monitored current subsequently rises above the set over current trip level the output relay will energise immediately ( $\leq 100 \mathrm{mSec}$ ) and the red "Fault" LED will illuminate. The unit will reset automatically when the current level returns to normal.

All four configurations are available with a choice of three current input ranges 0.1-1 Amps, 0.2-2 Amps and 0.5-5 Amps, above 5 amps an external current transformer is required with either a 1 Amp or 5 Amp secondary matched to a 1 Amp or 5 Amp relay as appropriate. A range of 1 Amp \& 5 Amp secondary CT's can be found from our CT section pages 156 to 164 .

The setpoint(s) potentiometers are current calibrated to allow accurate setting of the trip level/s. Isolation of the monitored current is provided by an internal current transformer.

## SPECIFICATIONS

## Current monitoring

Ranges:
Overload ratings:

U/C trip level:
0/C trip level:
Hysteresis:
General
Isolation:

LED indication:

CE marked:

1 Amp, 2 Amps, 5 Amps $100 \%$ of In continuous $150 \%$ of In for 30 seconds 250\% of In for 5 seconds Adjustable 10-100\% of In Adjustable 10-100\% of In Fixed $+4 \%$ of trip level

Via internal CT 2KV for 1 min Green "Healthy" Yellow "Timing" Red "Fault" Yes

## Timing

Delay timer: $\quad 1-10$ secs (not CLA 2 versions)
Response time:
Coil voltages
Coil voltages:
$<100 \mathrm{mSec}$
24VDC +/-15\%
24VAC, 110VAC, 230VAC +/-15\%
Power consumption: 8VA
Contact output
Type:
Rating:
Mechanical life:

PRODUCT

## ORDERING INFORMATION

## type configuration

CLA 1 Under Current with timer
2 Under \& Over Current without timer
3 Over Current with timer
4 Over Current with timer *

## CURRENT RANGE COIL SUPPLY

1 0.1-1 Amp 37 24VDC
$20.2-2$ Amps 07 24VAC
5 0.5-5 Amps 01 110VAC
50 230VAC
*The timer on the CLA 4 acts as an initial start up delay timer and only prevents tripping on the initial application of the coil supply, thereafter the trip is within 100 mSec .


## EARTH FAULT RELAY

## TYPE: YWRI/EF

## - FEATURES

■ 3 earth fault primary ranges $5-100 \mathrm{~mA}, 50 \mathrm{~mA}-1 \mathrm{~A}, 0.5-10 \mathrm{~A}$

- Fixed hysteresis at 5\% (other values on request)
- Latching facility (manual or auto reset)
- Test input
- Adjustable time delay on tripping 0.1-10sec
- LED for output relay status \& supply healthy
- SPCO output rated 10Amps
- DESCRIPTION \& MODE OF OPERATION

Din rail mounted current sensing relay dedicated for earth fault monitoring in conjunction with a core balance CT. The YWRI/EF has three adjustable earth fault input ranges selectable via terminal tapings $5-100 \mathrm{~mA}, 0.05-1 \mathrm{~A}, 0.5-$ 10A. On connection of the auxiliary supply the green LED illuminates. Exceeding the set earth fault level and after the adjustable tripping time has elapsed, the output relay energises and the red LED illuminates. The YWRI/EF has a fixed hysteresis of $5 \%$ of the set value, should the earth fault level fall below the set value less $5 \%$, the output relay will de-energise and the red LED will extinguish (auto reset). However, should the optional latch facility be utilised between terminals Y1 and Y2 via a remote NC contact, the NC contact has to be opened or the auxiliary supply removed to reset the unit (manual reset). The YWIR/EF via terminals Y2 and B1 also has a remote test input operated by a NO contact.

## SPECIFICATIONS

Auxiliary supply:

Isolation:
Power consumption:
Earth fault ranges: Input impedance:

Hysteresis:
Tripping delay: Repeat accuracy: Operating temperature:
Response time:
Output relay:
Mechanical life:
Electrical life:
Max cable size:
CE marked
In accordance with:

400VAC, 230VAC, $110 \mathrm{VAC}, 48 \mathrm{VAC}, 24 \mathrm{VAC}$
48VDC, 24VDC
$+/-15 \%(50 / 60 \mathrm{~Hz})$
Via transformer
Max 3VA
$5-100 \mathrm{~mA}, 50 \mathrm{~mA}-1 \mathrm{~A}, 0.5-10 \mathrm{~A}$
100mA range 1 KOhm
1 A range 1000 hms
10A range 10 Ohms
Fixed at $5 \%$ of set value (other values on request)
Adjustable 0.1-10secs (-0\% + 30\%)
$\pm 2 \%$ at constant ambient, to VDEO435 $\pm 5 \%$
$-10^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
100 mSec on make, 200 mSec on break
Max power 2200VA, 30WDC
250VACDC @ 10A AC, 1ADC
30 Million ops / max $600 \mathrm{ops} / \mathrm{hr}$
200000 at 2200VA (resistive)
4 mm
Yes
EN61000-6-1: 2007
EN61000-6-3: 2007
EN61010-1: 2002
Housing material:
Polycarbonate, Auto extinguishable
to UL 94 V-0

## NOTE

The YWRI/EF and its associated CT's are designed to monitor insulation break down.
IT MUST NOT BE USED AS THE MAIN SAFEGUARD FOR LIFE PROTECTION

ORDERING INFORMATION
TYPE AUXILIARY SUPPLY OPTIONS
YWRI/EF
400VAC, 230VAC, 110VAC, 48VAC, 24VAC, 48VDC, 24VDC
A core balance CT from the four options listed on the right of this page must be used with this product, do not use any other type of CT or manufacturer of CT's Tel: 01616265316 / 0127625858

## EARTH FAULT RELAY

## TYPE: YWRI/EF 30 AMPS

## - FEATURES

## - Earth fault range 1.5 to 30Amps

- Fixed hysteresis at 5\% (other values on request)
- Latching facility (manual or auto reset)
- Test input
- Adjustable time delay on tripping 0.1-10sec
- LED for output relay status \& supply healthy
- SPCO output rated 10Amps


## ■ DESCRIPTION \& MODE OF OPERATION

Din rail mounted current sensing relay dedicated for earth fault monitoring in conjunction with a core balance CT. The YWRI/EF 30Amps has an adjustable earth fault range of 1.5 -30Amps.
On connection of the auxiliary supply the green LED illuminates. Exceeding the set earth fault level and after the adjustable tripping time has elapsed, the output relay energises and the red LED illuminates. The YWRI/EF has a fixed hysteresis of $5 \%$ of the set value, should the earth fault level fall below the set value less 5\%, the output relay will de-energise and the red LED will extinguish (auto reset). However, should the optional latch facility be utilised between terminals Y1 and Y2 via a remote NC contact, the NC contact has to be opened or the auxiliary supply removed to reset the unit (manual reset). The YWIR/EF 30Amps via terminals Y2 and B1 also has a remote test input operated by a NO contact.

## SPECIFICATIONS

Auxiliary supply:

Supply tolerance: Isolation:
Power consumption:
Earth fault range: Input impedance: Hysteresis:
Tripping delay: Repeat accuracy: Operating temperature:
Response time:
Output relay:
Mechanical life:
Electrical life:
Max cable size:
CE marked
In accordance with:

Housing material:

400VAC, 230VAC, 110VAC, 48VAC, 24VAC 48VDC, 24VDC
$+/-15 \%$
Via transformer
Max 3VA
$1.5-30 \mathrm{~A}$
30 Ohms
Fixed at $5 \%$ of set value (other values on request) Adjustable 0.1-10secs
$\pm 2 \%$ at constant ambient, to VDEO435 $\pm 5 \%$
$-10^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
100 mSec on make, 200 mSec on break
Max power 2200VA, 30WDC
250VACDC @ 10A AC, 1ADC
30 Million ops/max 600 ops/hr
200000 at 2200 VA (resistive)
4mm
Yes
EN61000-6-1: 2007
EN61000-6-3: 2007
EN61010-1:2002
Polycarbonate, Auto extinguishable to UL 94 V-0

NOTE
The YWRI/EF 30Amps and its associated CT is designed to monitor insulation break down.

## IT MUST NOT BE USED AS THE MAIN SAFEGUARD FOR LIFE PROTECTION

TYPE
YWRI/EF 30 Amps


## CORE BALANCE CURRENT TRANSFORMER

The K1021 (with an ID of $290 \times 70 \mathrm{~mm}$ ) core balance current transformer must be used with the earth fault relay type YWRI/EF 30 Amps. One core balance current transformer is required per YWRI/EF, all conductors must pass through the CT. Core balance CTs are not sensitive to polarity either on the primary or secondary. However, the primary conductors must all pass in the same direction together.

## SPECIFICATIONS



The above core balance CT, type K1021 must be used with the YWRIEF/30 Amps, do not use any other CT or manufacturer of CT's.

# DC EARTH FAULT RELAY COMPLETE WITH DC EARTH FAULT CT 

## TYPE: YWRI.DEF

- FEATURES
- Range switchable between 1-20mA \& 10-200mA
- Auxiliary supply voltages between 9VDC \& 1200VDC / 24VAC \& 480VAC
- Fixed hysteresis at 2\% (other values on request)
- Latching facility (manual or auto reset)
- Test input
- Time delay 'On' \& 'Off' individually adjustable
- LED indication for output relay status \& supply healthy
- LED indication for fault direction (ie, positive or negative leg)
- SPCO output rated 10Amps


## ■ DESCRIPTION \& MODE OF OPERATION



A Din rail mounted current sensing relay dedicated for DC earth fault monitoring, such as insulation deterioration on a DC system. The unit is supplied complete with a dedicated DC Earth Fault CT type FOX21.CTD, this allows the relay to have two switchable earth fault ranges of $1-20 \mathrm{~mA}$ and $10-200 \mathrm{~mA}$. The unit is fitted with four LED's to aid status diagnosis:-

Green LED = Auxiliary supply voltage healthy
Red LED = Output relay energised
Top Amber LED = Positive leg earth fault
Bottom Amber LED = Negative leg earth fault
Both Amber LED's = Open circuit or short circuit between CT \& relay (also if Test function is used)
The amber earth fault LED's will start to illuminate at either 1 mA or 10 mA (depending on which range has been set), but the output relay will not de-energise until the setpoint has been reached, plus any delay "ON" time set, which is adjustable $0.1-10$ secs. The output relay is fail safe, ie energised when healthy, de-energises on earth fault.

After tripping on an earth fault and the fault level starts to fall below the setpoint it has to fall for a further 2\% (hysteresis) plus any delay "OFF" time set before the output relay energises again. This is "AUTO RESET". However, should the optional latch facility be utilised via a NC link between terminals Y1 \& Y2 the NC link will need to be opened or the auxiliary supply removed to facilitate a reset, providing the fault is below the setpoint level plus hysteresis, "MANUAL RESET".

The relay is also fitted with a relay Test input between terminals Y3 \& Y4 via a NO input.
For correct operation when using the FOX.21CTD both the positive and negative conductors need to pass through the CT from P1 to P2 (load on P2 side), to ensure accurate amber LED indication. It is also possible to position the CT on just the earth leg in which case P2 is the Earth side, when used in this configuration on an earth fault, only the positive fault amber LED will illuminate. In both the above scenarios correct connection between the CT and relay with respect to terminals S1 \& S2 is also important to ensure accurate indication.

DIMENSIONS


FOX. 21 CTD


YWRI.DEF

## SPECIFICATIONS

Auxiliary supply:

Power consumption:
Earth Fault ranges:
Hysteresis:
Tripping delay "ON":
Tripping delay "OFF":
Repeat accuracy:
FOX.21CTD internal dia:
Max distance between
CT and relay:
Recommended cable:
Operating temperature:
Output relay:
Mechanical Life:
Electrical life:
Max cable size:
CE marked:
RoHS compliant:
In accordance with:

Housing Material:
4mm
Yes
Yes

9-36VDC, 18-75VDC, 85-370VDC / 85-265VAC, 210-1200VDC (via separate DC to DC converter type YW1000D24D)
24VAC, 110VAC, 230VAC, 415VAC, 440VAC, 480VAC
Max 3W
$1-20 \mathrm{~mA}$ / $10-200 \mathrm{~mA}$ switchable
Fixed at $2 \%$ of set value (other values
on request)
Adjustable 0.1-10sec
Adjustable 0.1-10sec
$\pm 2 \%$ at constant ambient
21 mm

100 metres ( 200 metre loop in total)
1.5 mm tri rated
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
Max power 2200VA, 30W DC
250VACDC @ 10 Amps AC1, 1 Amp DC1
30 Million ops
200 K at 2200 VA (resistive)

EN61000-6-1: 2007
EN61000-6-3: 2007
EN61010-1: 2002
Polycarbonate, Auto extinguishable to UL 94 V-0

ORDERING INFORMATION

P/No YWRI.DEF

AUXILIARY SUPPLY OPTIONS
9-36VDC
18-75VDC
85-370VDC/85-265VAC
210-1200VDC (Via separate DC-DC
converter type YW1000D24D), page 134
24VAC
110VAC
230VAC
415VAC
440VAC
480VAC

FOX.21CTD

PRODUCT
GROUP

## NOTE

The YWRI.DEF and its associated CT are designed to monitor insulation breakdown. It must not be used as a safeguard for life protection.

## GROUNDING INFORMATION



If the battery is not grounded at the centre point grounding resistors are required. Use either solution $R_{1}$ if possible or the solution with $2 \times \mathrm{R}_{2}$.

## Calculations for grounding resistors

## $\mathrm{Ri}^{*}=\operatorname{MAX} \frac{\mathrm{U}}{4 \times \mathrm{I}_{\text {set }}} \mathrm{Ohm}$

Size of resistor $W^{* *}=\operatorname{Min} 0.4 \frac{U^{2}}{R_{1}}$ Watt

## $R_{2}{ }^{*}=$ MAX $\frac{U}{2 \times I}$ Ohm

Size of resistor $W^{* *}=\operatorname{Min} 1.6 \frac{U^{2}}{R_{2}}$ Watt

* The calculation of the resistor is based on a safety factor of 2 corresponding to a detection of a short circuit form one pole to ground to half battery voltage. A resistor selected according to the maximum resistor value as calculated above will limit the leak current to 2 times $I_{\text {set }}$ in the case of a direct short to ground.
If it is a branched circuit with distributed "acceptable" leaks, it is recommended to use a lower value resistor.
** The calculation of the resistor size is based on a safety factor of 1.6, corresponding to an acceptable increase of battery voltage of $26 \%$.

DC SYSTEMS WITH A SINGLE EARTH


CONNECTIONS


FUNCTION


# ADJUSTABLE 4-20mA OUTPUT SIGNAL GENERATOR 

TYPES: Y24D4-20i, Y24A4-20i, Y110A4-20i, Y230A4-20i



- Din Rail Mounted
- Separate Input \& Output LED Indication
- Input Voltage 24VDC, 24VAC, 110VAC, 230VAC
- Output 4-20mA Adjustable
- CE Marked
- RoHS Compliant


## DESCRIPTION

A conveniently packaged Din rail mounted AC or DC voltage input to an adjustable $4-20 \mathrm{~mA}$ output module. Designed for process control systems with "HAND / OFF / AUTO" applications. For example, when in "HAND" a signal anywhere between 4 mA and 20 mA needs to be forced into instrumentation equipment rather than a default 20 mA signal. The product is also useful for system testing and commissioning applications.

The product can be specified with either a 24VDC, $24 \mathrm{VAC}, 110 \mathrm{VAC}$ or 230 VAC supply voltage. In the case of 24 VDC isolation between the supply voltage and the output is via an internal DC to DC converter. With an AC supply voltage isolation is via an internal transformer.

The output signal is an adjustable $4-20 \mathrm{~mA}$ via a front mounted potentiometer. A healthy supply voltage is indicated via an illuminated green LED and a healthy output via an illuminated red LED.

## SPECIFICATIONS



## ORDERING INFORMATION

| TYPE | InPUT VOLTAGE | ADJUSTABLE OUTPUT |
| :---: | :---: | :---: |
| Y24D4-20i | 24VDC | $4-20 \mathrm{~mA}$ |
| Y24A4-20i | 24 VAC | $4-20 \mathrm{~mA}$ |
| Y110A4-20i | 110 VAC | $4-20 \mathrm{~mA}$ |
| Y230A4-20i | 230VAC | 4-20mA |

## 4-20mA OUT OF RANGE TRIP AMP RELAY

## TYPES: YRTP (spno) 8RTP,11RTP (spco)

## FEATURES

- Din rail \& plug in version
- Single pole output
- Transformer isolation
- Adjustable time delay 0.1-60sec
- Supply on LED
- Relay Status LED
- CE marked


## DESCRIPTION \& MODE OF OPERATION

A monitoring relay designed to monitor the integrity of a $4-20 \mathrm{~mA}$ signal rather than control a process, applications include safeguarding a system against potentially faulty transmitters or transducers where the output could on fault rise above 20 mA or fall below 4 mA but not reaching zero. Available in either a din rail or 8 \& 11 pin plug in housing with a SPCO output (SPNO in the din rail version). The output relay will be energized when the monitored signal is between $4 \& 20 \mathrm{~mA}$. The output relay will de-energise after an adjustable time delay up to 60 seconds if the monitored signal should fall below 3.5 mA or rise above 20.5 mA . There is a fixed hysteresis of 0.5 mA therefore if the monitored signal falls back within the $4-20 \mathrm{~mA}$ band the output relay will re-energise. If the auxiliary supply to the relay is lost at any time the output relay if energised will de-energise immediately.

## SPECIFICATIONS

## Supply \& Measuring

Supply voltage:
Supply tolerance: Isolation AC versions: Power consumption: Hysteresis:
Repeat accuracy:
Response time:
Input range:
Max over current: Input impedance:
Relay output
Output contacts:
Max breaking capacity:
Mechanical life:
Electrical life:
General
Operating temperature:
Storage temperature:
Max cable size:
CE marked:
In accordance with:
Housing material:

Dedicated voltage units 24VAC, 110VAC, 230VAC
$\pm 15 \%$
Via transformer
3VA max
Fixed 0.5 mA
$\pm 2 \%$ at constant ambient $\pm 5 \%$ across temperature range 10 mSec on make Adjustable up to 60 Sec on break 4-20mA adjustable
x10Continuous
1 ohm
SPCO 8Amps/250V AC1
(Din rail SPNO, Plug in SPCO) 2000VA 30 Million ops 200Kops at max rated load
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
4 mm
Yes
EN61000-6-1: 2007 EN61000-6-3: 2007
EN61010-1: 2002
Polycarbonate, Auto extinguishable to UL 94 V-0

## CONNECTIONS



## ORDERING INFORMATION

TYPE
COIL VOLTAGE
230VAC, 110VAC, 24VAC


PRODUCT GROUP

## 1(4)-20mA DC ADJUSTABLE TRIP AMPS

## TYPES: YWRIT, 11WRIT (spco) YWRI2T (2 x spco)

FEATURES

- Din rail or 11 pin plug in
- Single setpoint or dual setpoint values
- Selectable manual or auto reset
- Low input impedance
- Dual LED indication

SUMMARY OF UNITS
YWRIT - Din rail 1-20mA adjustable single setpoint trip amp.
 11WRIT - 11 pin plug in 1-20mA adjustable single setpoint trip amp. YWRI2T - Din rail 1-20mA two adjustable setpoint trip amp $2 \times$ SPCO outputs "Low" \& "High".

## MODE OF OPERATION

 YWRIT, 11WRIT"Auto Reset" without latching mode. This mode is determined by terminals Y 1 \& Y 2 or pins 9 \& 11 left open. The output relay is energised when the monitored circuit rises above the level selected via the front potentiometer. The output relay will de-energise when the current falls back below the level selected less the set hysteresis adjustable 5 to $50 \%$, set via a second potentiometer. If the auxiliary supply is lost at any time the relay will also deenergise.
"Manual Reset" latching mode. This mode is determined by a wired link between terminals Y1 \& Y2 or pins 9 \& 11. The output energises when the monitored circuit rises above the level selected by the front potentiometer. Once energised the relay will remain latched even if the monitored current falls below the set level less any selected hysteresis. Resetting is achieved by opening the link between terminals Y 1 \& Y 2 or pins 9 \& 11 or by removing the auxiliary supply. If whilst resetting the monitored current is still above the set level a reset will not be achieved. It is normally preferable in the latching mode to have the adjustable hysteresis set at minimum.

## YWRI2T

Two setpoint trip amp. Providing two separately controllable trip levels. With R1 selected as the "High" level and R2 as the "Low" level. When the monitored signal current rises above R2 set level R2 relay will energise. If the current continues to rise above R1 set level, relay R1 will energise. Conversely as the monitored current falls R1 will de-energise, if the fall continues R2 will de-energise. The unit has a built in fixed hysteresis of 2\% at each setpoint to avoid relay "chatter". The YWRI2T does not have a latched option and is therefore "auto" reset on both relays.

## OTHER APPLICATION NOTES

## Adjustable Time Delays

The trip amps YWRIT \& 11WRIT have 3 separately adjustable 0.1-10 sec delays, A startup delay activated by the connection of the auxiliary supply, therefore if a control circuit is going to be permanently live the time delay will only ever be active once, A delay on rising current and a delay on falling. The YWRI2T does not have any time delays.

## DC Auxiliary Supply Versions

DC auxiliary supply versions are as standard non isolated. For these versions the supply and the measured current must be isolated from each other and must not exceed 50 V DC. On request at extra cost isolated versions can be manufactured utilising internally a DC to DC converter.

## SPECIFICATIONS

Supply \& Measuring

| Nominal supply tolerance: Isolation AC versions: Isolation DC versions: | $\pm 15 \%$ |
| :---: | :---: |
|  | Via transformer |
|  | No as standard or:- |
|  | Yes via optional internal DC to DC converter |
| Power consumption: | 3VA max |
| Hysteresis: | Ajustable 5 to 50\% of le |
|  | YWRI2T fixed at 2\% |
| Repeat accuracy: | $\pm 2 \%$ at constant ambient |
|  | $\pm 5 \%$ across temperature range |
| Response time: | 100 mSec on make |
|  | 200 mSec on break |
| Input range: | 1-20mA adjustable |
| Max over current: | 1 Amp (max 1 sec) |
| Input impedance: | 100 hms |
| Time delays: | 0.1-10 secs separately adjustable |
|  | YWRI2T no delay |
| Relay output |  |
| Output contacts: | SPCO 10Amps/250V AC1 |
| Mechanical life: | 30 Million ops |
| Electrical life: | 200K ops at max rated load |
| General |  |
| Operating temperature: | $-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$ |
| Storage temperature: | $-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$ |
| Max cable size: | 4 mm |
| CEmarked | Yes |
| In accordance with: | EN61000-6-1: 2007 EN61000-6-3: 2007 |
|  | EN61010-1: 2002 |
| Housing material | Polycarbonate, Auto extinguishable |

## ORDERING INFORMATION

TYPE

| YWRIT (din rail SPCO) | 440VAC |  |  | 230VAC |
| :--- | :--- | :--- | :--- | :--- |

* $N o$ isolation on DC versions as standard, on request at extra cost isolated versions are available



## 0.1-10V DC ADJUSTABLE DUAL SETPOINT RELAY

## TYPE: YWRU2T/10VDC (2 x spco)

- FEATURES
- Din rail mounted
- Dual setpoint (two stage)
- Ideal HVAC \& BMS prduct
- Dual LED indication


## MODE OF OPERATION

Dual setpoint 0.1-10V DC relay. Providing two separately controllable trip levels. With R1 selected as the "High" level and R2 as the "Low" level. When the monitored signal voltage rises above R2 set level R2 relay will energise. If the voltage continues to rise above R1 set level, relay R1 will energise. Conversely as the monitored voltage falls R1 will de-energise, if the fall continues R2 will de-energise. The unit has a built in fixed hysteresis of 2\% at each setpoint to avoid relay "chatter". The YWRU2T does not have a latched option and is therefore "auto" reset on both relays.

## OTHER APPLICATION NOTES

DC Auxiliary Supply Versions
DC auxiliary supply versions are as standard non isolated. For these versions the supply and the measured current must be isolated from each other and must not exceed 50 V DC. On request at extra cost isolated versions can be manufactured utilising internally a DC to DC converter.

## SPECIFICATIONS

## Supply \& Measuring

Nominal supply tolerance: $\pm 15 \%$
Isolation AC versions: Isolation DC versions:

Power consumption:
Hysteresis:
Repeat accuracy:
Response time:
Input range:
Max over voltage:
Input impedance:
Relay output
Output contacts: Mechanical life:
Electrical life:
$\pm 15 \%$
Via transformer
No as standard or:-
Yes via optional internal DC to DC converter
3VA max
Fixed at 2\%
$\pm 2 \%$ at constant ambient
$\pm 5 \%$ across temperature range
100 mSec on make
200 mSec on break
0.1-10V DC adjustable

15V DC permanently
10 KOhms
SPCO 10Amps/250V AC1
30 Million ops
200 K ops at max rated load

## General

Operating temperature:
Storage temperature:
Max cable size:
CE marked In accordance with:

Housing material
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
4 mm
Yes
EN61000-6-1: 2007 EN61000-6-3: 2007
EN61010-1: 2002
Polycarbonate, Auto extinguishable


## ORDERING INFORMATION

to UL 94 V-0

## 

TYPE
coilvoltage

| YWRU2T/10VDC (Din rail $2 \times$ SPCO) | 440VAC | 230VAC | ${ }^{*} 48 \mathrm{VDC}$ |
| :--- | :--- | :--- | :--- |
|  | 415VAC | 110VAC | ${ }^{*} 24 \mathrm{VDC}$ |
|  | 400VAC | 48VAC |  |
|  | 380 VAC | 24VAC |  |

* No isolation on DC versions as standard, on request at extra cost isolated versions are available


# AC TO ADJUSTABLE 0-10VDC OUTPUT BMS POWER SUPPLY <br> TYPES: Y24A0-10D, Y110A0-10D, Y230A0-10D 

- Din Rail Mounted
- Separate Input \& Output LED Indication
- Input Voltage 24VAC, 110VAC, 230VAC
- Output 0-10VDC Adjustable
- CE Marked
- RoHS Compliant


## DESCRIPTION

A conveniently packaged Din rail mounted AC voltage to an adjustable 0-10VDC output module. Designed specifically for "HAND / OFF / AUTO" applications for BMS controller inputs, when in "HAND" a DC voltage needs to be forced into BMS input cards, but not necessarily a full 10VDC signal is required. This product can be specified with either a $24 \mathrm{VAC}, 110 \mathrm{VAC}$ or 230VAC primary voltage, the output voltage is an adjustable 0-10VDC via a front mounted potentiometer. A healthy $A C$ input voltage is signalled by an illuminated green LED, and the output voltage is indicated by an increasing in intensity illuminated red LED starting at 1VDC (below 1VDC the output will be present, but without LED indication). Note this product is not designed to power "control circuits", it is only for driving into BMS input cards, max 10mA @ 10VDC.

## SPECIFICATIONS

| Input Supply |  |
| :--- | :--- |
| Nominal Input: | 24VAC, 110VAC, 230VAC |
| Output Voltage Range: | $0-10 \mathrm{VDC}$ |
| Min Impedance: | 1 K Ohm |
| Max Impedance: | Infinity Ohms |
| Max Output Load: | 10 mA |
| AC Supply Healthy: | Via Green LED |
| DC Output Healthy: | Via Red LED |
|  | Variable Intensity 1-10VDC |
| Output Voltage Regulation: | $\leq 0.5 \%$ |
|  |  |
| General |  |
| Operating Temperature: | $-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$ |
| Storage Temperature: | $-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$ |
| Humidity: | $95 \%$ Rel H max |
| Isolation Voltage I/P-0/P: | 1500 VDC for 1 Min |
| CE Marked: | Yes |
| Standards Applied: | EN60950-1 |
|  | EN6100-6-3 |
| Material Housing: | EN61010-1 |
| RoHS Compliant: | Polycarbonate |
|  | Auto extinguishable to UL 94V-0 |
|  | Yes |

0-10VDC
1K Ohm
Infinity Ohms

Via Green LED
Via Red LED
Variable Intensity 1-10VDC
$\leq 0.5 \%$

[^11]

## ORDERING INFORMATION

TYPE
Y24AO-10D
Y110A0-10D
Y230A0-10D

INPUT VOLTAGE
24VAC
110VAC
230VAC

OUTPUT VOLTAGE
0-10VDC
0-10VDC
0-10VDC

# VOLTAGE CONTROL RELAYS, WITH SEPARATE AUXILIARY SUPPLY 

## TYPE: YWRU, 11WRU (spco)

- FEATURES
- Din rail or 11 pin plug in
- Suitable for both AC \& DC voltage control
- Selectable auto or maual reset
- Three selectable control ranges from:


## 0.1 to 400VDC

0.1 to 283VAC

- Special high voltage versions 700VDC, 1000VDC, 1500VDC
- Dual LED indication



## ■ DESCRIPTION \& MODE OF OPERATION

Voltage control relays suitable for both AC and DC voltage control, available in both din rail and 11 pin plug in. The standard units have three selectable via terminal taps voltage ranges from 0.1 to 400 VDC ( 0.1 to 283VAC). Also available only in the din rail housing are dedicated range "high voltage" control units which are most suitable for "railway traction voltage" monitoring.
"Auto Reset" without latching mode. This mode is determined by EC \& B1 or pin 9 \& 11 left open. The output relay is energised when the monitored voltage rises above the level selected via the front potentiometer. The output relay will de-energise when the voltage falls back below the level selected less the set hysteresis adjustable 5 to $50 \%$ set via a second potentiometer. If the separate auxiliary supply is lost at any time the relay will also de-energise.
"Manual Reset" latching mode. This mode is determined by a wired link between terminals EC \& B1 or pins 9 \& 11. The output relay energises when the monitored voltage rises above the level selected via the front potentiometer. Once energised the output relay will remain latched even if the monitored voltage falls below the set level less any selected hysteresis. Resetting is achieved by opening the link between terminals EC \& B1 or pins 9 \& 11 or by removing the auxiliary supply. If whilst resetting the monitored voltage is still above the set level a reset will not be achieved. It is normally preferable in the latching mode to have the adjustable hysteresis set at minimum.

## OTHER APPLICATION NOTES

## DC Auxiliary Supply Versions

DC auxiliary supply versions are as standard non isolated. For these versions the supply and the measured current must be isolated from each other and must not exceed 50 V DC. On request at extra cost isolated versions can be manufactured utilising internally a DC to DC converter.


## SPECIFICATIONS

Supply \& Measuring
Nominal supply tolerance: $\pm 15 \%$ Isolation AC versions: Via transformer Isolation DC versions: No as standard or:Yes via optional internal DC to DC converter 3VA max
Power consumption:

Hysteresis:
Repeat accuracy:
Response time:

## Relay output

Output contacts: Mechanical life: Electrical life: General
Operating temperature: $\quad-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
Storage temperature: $\quad-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
Max cable size: $\quad 4 \mathrm{~mm}$
CE marked
In accordance with: EN61000-6-3: 2007
EN61010-1: 2002
Housing material Polycarbonate, Auto extinguishable to UL 94 V-0

| Control range Ue |  | Input | Permanent | Peak |
| :---: | :---: | :---: | :---: | :---: |
| DC Volts | AC Volts | Resistance | Over Volts | Volts (10mSec) |
| 0.1 to 10V | 0.1 to 7.07 V | 10 KOhms | 15VDC | 20VDC |
| 0.4 to 40V | 0.3 to 28.3 V | 40 KOhms | 150VDC | 250VDC |
| 4 to 400 V | 2.9 to 283V | 400 KOhms | 500 VDC | 1500 VDC |
| 7-700V | 5 to 495V | 710 KOhms | 1000VDC | 2100VDC |
| $10-1000 \mathrm{~V}$ | 7 to 707V | 1.01 MOhms | 1750VDC | 3500 VDC |
| 15-1500V | 11 to 1060V | 1.51 MOhms | 1750VDC | 3500 VDC |


| ORDERING INFORMATION |  |  |  |
| :--- | :--- | :--- | :--- |
| TYPE | COILVOLTAGE |  |  |
| YWRU (Din rail) | 440VAC | 230VAC | ${ }^{*} 48 \mathrm{VDC}$ |
| 11WRU (11 pin plug in) | 415 VAC | 110VAC | ${ }^{*} 24 \mathrm{VDC}$ |
| YWRU/700V (Din rail) | 400VAC | 48VAC |  |
| YWRU/1000V (Din rail) | 380 VAC | 24VAC |  |

Adjustable 5-50\% of Ue
$\pm 2 \%$ at constant ambient
$\pm 5 \%$ across temperature range
100 mSec on make
200 mSec on break
SPCO 10Amps/250V AC1
30 Million ops
200K ops at max rated load

Yes

Input
Over Volts Volts (10mSec 20VDC 250VDC 2100VDC 3500VDC

TYPE YWRU (Din rail) YWRU/700V (Din rail) YWRU/1500V (Din rail)

* No isolation on DC versions as standard, on request at extra cost isolated versions are available



# VOLTAGE CONTROL RELAYS, WITH SEPARATE AUXILIARY SUPPLY, WITH DELAY ON TRIPPING 

## TYPE: YWRU.T10 (spco)

## - FEATURES

- Din rail mounted
- Suitable for both AC \& DC voltage control
- Separately adjusted delay on energise \& de-energise
- Selectable auto or manual reset
- Three selectable control ranges from:


## 0.1 to 400 VDC

0.1 to 283VAC

- Special high voltage versions 700VDC, 1000VDC, 1500VDC
- Dual LED indication


## - DESCRIPTION \& MODE OF OPERATION

Voltage control relays suitable for both AC and DC voltage control, available for din rail mounting. The standard units have three selectable via terminal taps voltage ranges from 0.1 to 400VDC ( 0.1 to 283VAC). Also available are dedicated range "high voltage" control units which are most suitable for "railway traction voltage" monitoring. "Auto Reset" without latching mode. This mode is determined by EC \& B1 left open. The output relay is energised when the monitored voltage rises above the level selected via the front potentiometer. The output relay will de-energise when the voltage falls back below the level selected less the set hysteresis adjustable 5 to $50 \%$ set via a second potentiometer. If the separate auxiliary supply is lost at any time the relay will also de-energise.
"Manual Reset" latching mode. This mode is determined by a wired link between terminals EC \& B1. The output relay energises when the monitored voltage rises above the level selected via the front potentiometer. Once energised the output relay will remain latched even if the monitored voltage falls below the set level less any selected hysteresis. Resetting is achieved by opening the link between terminals EC \& B1 or by removing the auxiliary supply. If whilst resetting the monitored voltage is still above the set level a reset will not be achieved. It is normally preferable in the latching mode to have the adjustable hysteresis and time set at minimum.
Adjustable Time Delays - The YWRU.T10 voltage relays have 2 independently adjustable 0.1-10 secs time delays. There is a delay on rising voltage when the monitored voltage rises above the set level as selected by the front potentiometer and a delay on falling voltage, when the monitored voltage falls below the set level plus the hysteresis.

## OTHER APPLICATION NOTES

DC Auxiliary Supply Versions - DC auxiliary supply versions are as standard non isolated. For these versions the supply and the measured current must be isolated from each other and must not exceed 50V DC. On request at extra cost isolated versions can be manufactured utilising internally a DC to DC converter.

## SPECIFICATIONS

## Supply \& Measuring

Nominal supply tolerance: $\pm 15 \%$
Isolation AC versions: Isolation DC versions:

Power consumption:
Hysteresis:
Repeat accuracy:
Response time:
Relay output
Output contacts: Mechanical life: Electrical life: General Operating temperature: Storage temperature: Max cable size: CE marked In accordance with:

Housing material:
Via transforme
No as standard or:3VA max

30 Million ops
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
4 mm
Yes

Yes via optional internal DC to DC converter
Adjustable 5-50\% of Ue
$\pm 2 \%$ at constant ambient
$\pm 5 \%$ across temperature range
0.1-10 Sec on make
0.1-10 Sec on break

SPCO 10Amps/250V AC1
200 K ops at max rated load

EN61000-6-1: 2007, EN61000-6-3: 2007
EN61010-1: 2002
Polycarbonate, Auto extinguishable
to UL 94 V-0

| Control range Ue |  | Input | Permanent | Peak |
| :---: | :---: | :---: | :---: | :---: |
| DC Volts | AC Volts | Resistance | Over Volts | Volts (10mSec) |
| 0.1 to 10V | 0.1 to 7.07V | 10 KOhms | 15VDC | 20VDC |
| 0.4 to 40V | 0.3 to 28.3 V | 40 KOhms | 150VDC | 250VDC |
| 4 to 400V | 2.9 to 283V | 400 KOhms | 500 VDC | 1500VDC |
| 7-700V | 5 to 495V | 710 KOhms | 1000VDC | 2100VDC |
| $10-1000 \mathrm{~V}$ | 7 to 707V | 1.01 MOhms | 1750VDC | 3500VDC |
| $15-1500 \mathrm{~V}$ | 11 to 1060V | 1.51 MOhms | 1750VDC | 3500VDC |

## ORDERING INFORMATION

TYPE
YWRU.T10 (Din rail)
YWRU.T10/700V (Din rail) YWRU.T10/1000V (Din rail) YWRU.T10/1500V (Din rail)

COIL VOLTAGE

| COIL VOLTAGE |  |  |
| :--- | :--- | :--- |
| 440VAC | 230 VAC | ${ }^{*} 48 \mathrm{VDC}$ |
| 415VAC | 110 VAC | ${ }^{*} 24 \mathrm{VDC}$ |
| 400VAC | 48 VAC |  |
| 380VAC | 24 VAC |  |

* No isolation on DC versions as standard, on request at extra cost isolated versions are available



# SELF POWERED AC VOLTAGE OVER \& UNDER CONTROL RELAYS 

## TYPES: YWROUV (spco), YWR2OUV (dpco) YWROUV2 (1 x spco over \& $1 \times$ spco under)

- FEATURES
- Din rail mounted
- Self powered no separate auxiliary supply required
- AC over \& under voltage control
- Optional adjustable time delay
- Nominal voltages 24VAC to 440VAC
- Multi LED indication


## ■ DESCRIPTION \& MODE OF OPERATION

Din rail mounted AC self powered voltage control relays (no separate auxiliary supply required) for the combined monitoring of both over and under voltage levels. Available only in a din rail package with nominal voltages from 24VAC to 440VAC, an option adjustable time delay 0.1 to 10 secs " $T$ " can be specified as a delay on tripping timer, (not possible on the YWROUV2).
YWROUV \& YWR2OUV - SPCO and DPCO output devices respectively, with separate over and under voltage control levels set via potentiometers $+20 \%$ and $-30 \%$ against the nominal voltage. The output relay will be energised when the voltage is within the set points. Deviation above or below the setpoints will cause the output relay to deenergise, plus any optional time delay set. Total loss of supply will cause an immediate de-energisation. On the voltage returning to with the set levels $+2 \%$ fixed hysteresis the output relay will re-energise. A green LED illuminated indicates a supply is present and a red LED illuminated indicates the output relay is in an energised state.
YWROUV2 - As above but with a separate relay output for over voltage and a separate relay output for under voltage, in a healthy state both relays are energised. R1 is designated as the over voltage relay and will de-energise if an over voltage level is reached. R2 is designated as the under voltage relay and will de-energise if an under voltage level is reached. The unit featured three LED indicators, green for a supply voltage present and individual red LED's for R1 and R2, a de-energisation will cause the respective LED to extinguish.


## SPECIFICATIONS

Supply \& Measuring
Nominal supply tolerance: $-35 \%$ \& $+25 \%$ (for 1 hour max)
Independent adjustable set levels:
Isolation:
Power consumption: Hysteresis:
Repeat accuracy:
Delay on tripping:
Relay output
Output contacts:
Mechanical life:
Electrical life:
General
Operating temperature:
Storage temperature:
Max cable size:
CEmarked
In accordance with:
Housing material
$-30 \%$ \& $+20 \%$
Via transformer
3VA max
Fixed 2\%
$\pm 2 \%$ at constant ambient
$\pm 5 \%$ across temperature range
100 mSec on make
0.1-10sec adjustable optional (not YWROUV2)

SPCO \& $2 \times$ SPCO 10Amps/250V AC1
DPCO 8Amps/250V AC1
30 Million ops
200K ops at max rated load
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
4 mm
Yes
EN61000-6-1: 2007, EN61000-6-3: 2007
EN61010-1: 2002
Polycarbonate, Auto extinguishable to UL 94 V-0

ORDERING INFORMATION

TYPE
YWROUV (Din rail SPCO)
YWR2OUV (Din rail DPCO)
YWROUV2 (Din rail $2 \times S P C O$ )

| TIME DELAY |  | NOMINAL VOLTAGE |  |
| :---: | :--- | :--- | :--- |
|  |  |  | 440VAC |
|  |  | 410VAC |  |
|  |  | 400VAC | 48VAC |
|  |  | 230VAC |  |

* Insert T if an adjustable 0.1-10sec time delay is required (not available on type YWROUV2).



## SELF POWERED DC VOLTAGE CONTROL RELAYS

## TYPES: YWRTU, 8WRTU, 11 WRTU (spco) YWR2TU, 8WR2TU, 11WR2TU (dpco)

- FEATURES
- Din rail or plug in
- Available SPCO or DPCO output
- Self powered
- Nominal voltages 12VDC to 48VDC
- Ideal battery level monitoring relay
- LED indication


## ■ DESCRIPTION \& MODE OF OPERATION

Din rail mounted or $8 / 11$ pin plug in DC self powered voltage control relays (no separate auxiliary supply required), available both SPCO and DPCO output. The output relay energises when the voltage rises above the set level controlled via a potentiometer adjustable - $20 \%$ to $+30 \%$ of the nominal voltage. The output relay will then de-energise when the voltage falls below the set level less a hysteresis adjustable via a second potentiometer 5 to $25 \%$ of the set level. If the total supply is lost deenergisation will also occur. A green LED indicates a voltage is present and a red LED indicates that the output relay is energised.

## SPECIFICATIONS

## Supply \& Measuring

Nominal supply tolerance: $\quad-20 \%$ \& $+35 \%$ (for 1 hour max)
Adjustable set level: $\quad-20 \%$ to $+30 \%$ of supply
Power consumption:
12VDC/2 Watts
24VDC/2 Watts 48VDC/4 Watts
Hysteresis:
Repeat accuracy:
Delay on tripping:
Relay output
Output contacts:
Mechanical life:
Electrical life:
Adjustable 5-25\%
$\pm 2 \%$ at constant ambient
$\pm 5 \%$ across temperature range
100 mSec on make \& break
SPCO 10Amps/250V AC1
DPCO 8Amps/250V AC1
30 Million ops
200K ops at max rated load
General
Operating temperature: $\quad-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
Storage temperature: $\quad-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
Max cable size: $\quad 4 \mathrm{~mm}$
CE marked
In accordance with:

Housing material
Yes
EN61000-6-1: 2007, EN61000-6-3: 2007
EN61010-1: 2002
Polycarbonate, Auto extinguishable to UL 94 V-0

## ORDERING INFORMATION

## TYPE

YWRTU (Din rail SPCO)
8WRTU (8 pin SPCO)
nOMINAL VOLTAGE
12VDC
24VDC
11WRTU (11 pinSPCO)
YWR2TU (Din rail DPCO)
8WR2TU (8 pin DPCO)
11WR2TU (11 pin DPCO)


# CONDUCTIVE PROBE LEVEL CONTROL RELAYS 

## TYPES: YWRW, 11WRW, 8WRW, 8WRWO (spco) YWR2W, 11WR2W (dpco)

## - FEATURES

- Din rail or plug in
- Available SPCO or DPCO output
- Control \& automatic regulation of liquid levels
- Selectable "pump up" or "pump down"
- Adjustable sensitivity
- Isolated AC probe supply
- LED indication
- Special Japanese standard pin out version


## - DESCRIPTION \& MODE OF OPERATION

Din rail mounted or $8 / 11$ pin plug in conductive probe level control relays for the control of maximum and/or minimum levels of conductive liquids.
Regulation of two levels "pump down" mode -The relay is energised when the high level probe is reached and deenergises when the level falls below the low level probe.
Regulation of two levels "pump up" mode -The relay is de-energised when the high level probe is reached and energises when the level falls below the low level probe.
Regulation of one level "pump down" mode selected Connect the maximum and common terminals together. In this case a single probe only is used and the relay energises when the probe is immersed. Or in "pump up" mode the relay operation is reversed.
Prove relay test feature/override (Din rail versions only)With probes connected the front selector switches can be used to control the relay providing a permanent "ON" or permanent "OFF".

## OTHER APPLICATION NOTES

1. On conductive vessels and tanks the chassis can be used as the "Common" electrode. If the vessel is non conductive a third probe is required as the "Common".
2. Probe cables up to a maximum of 100 m need not be screened, above 100 m screened cable is recommended. However, in any event it is not advisable to run the probe cables with power cables. When screened cable is used, the screen and the common should be connected together.
3. DC auxiliary supply units are available but not recommended as the probe supply is DC non isolated. DC on the probes runs a consequential risk of a possible electrolysis reaction, especially in solutions with a high mineral or contaminant contact. Whilst AC probes have a self cleaning effect.

## SPECIFICATIONS

Supply \& Measuring
Nominal supply toleranc
Isolation AC versions: Isolation level:
Isolation DC versions:
Probe supply:
Max probe current:
Power consumption:
Sensitivity range:
Response time:
$\pm 15 \%$
Via transformer 2KV AC between contacts, probes \& supply No
20V AC (AC supply versions)
12VDC (DC supply versions)
2 mA
3VA
Adjustable 4.7 to 100 KOhms
100 mSec on make


Relay output Output contacts: Mechanical life: Electrical life:

General
Operating temperature:
Storage temperature:
Max cable size:
CEmarked In accordance with:

Housing material

SPCO 10Amps/250V AC1
30 Million ops
200K ops at max rated load
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
4 mm
Yes
EN61000-6-1: 2007, EN61000-6-3: 2007
EN61010-1: 2002
Polycarbonate, Auto extinguishable to UL 94 V-0

| ORDERING INFORMATION |  |  |  |  |  |
| :--- | :--- | :--- | :--- | :---: | :---: |
| TYPE | COILVOLTAGE |  |  |  |  |
| YWRW (Din rail SPCO) | 440VAC | 230VAC | ${ }^{*} 12 \mathrm{VDC}$ |  |  |
| 11WRW (11 pin SPCO) | 415 VAC | 110 VAC | ${ }^{*} 24 \mathrm{VDC}$ |  |  |
| 8WRW (8 pin SPCO) | 400VAC | 48VAC | ${ }^{*} 48 \mathrm{VDC}$ |  |  |
| 8WRW0 (8 pin SPCO) | 380 VAC | 24VAC |  |  |  |

## CONDUCTIVE PROBE LEVEL CONTROL RELAY

## TYPES: MOD-W-1 (spco)

FEATURES

- Din rail mounted
- Modern modular design
- Width 27 mm ( 1.5 modules)
- SPCO output
- Transformer technology
- Adjustable sensitivity 2-100 KOhms
- Adjustable time delay 1-10sec
- Selectable pump up or pump down
- Relay proving feature
- LED indication
- CE marked


## DESCRIPTION \& MODE OF OPERATION

An attractive modern designed conductive probe type level control relay in a din rail mounted modular style housing of 1.5 modules width ( 27 mm ). The MOD-W-1 is a transformer based conductive probe level control relay and is hence available in dedicated AC voltages only. The sensitivity is potentiometer adjustable 2-100 Kohms, also a potentiometer is fitted to adjust a delay on tripping timer 0.1-10 secs, useful to delay threshold tripping due to fluid movement in tanks. An eight way function switch is provided (designated A to H ) to switch between "pump up" and "pump down" modes along with a relay proving function "permanent on" or "permanent off", the switch will also determine how the adjustable time delay will function. The function positions are as follows:-
A: Pump up, delay on energisation \& de-energisation
B: Pump down, delay on energisation \& de-energisation
C: Pump up, delay on energisation
D: Pump down, delay on energisation
E: Pump up, delay on de-energisation
F: Pump down, delay on de-energisation
G: Relay proving, permanent on
H: Relay proving, permanent off
Regulation of two levels - pump down mode: The relay energises when the high level probe is reached and deenergises when the level falls below the low level probe.
Regulation of two levels - pump up mode: The relay deenergises when the high level probe is reached and energises when the level falls below the low level probe.

## Regulation of one level - pump down mode selected:

 Connect the maximum and the common terminals together. In this case a single probe only is used and the relay operates when the probe is immersed.Note: Selection of pump up mode reverses the relay.
Relay proving feature: The front selector switch can be used to "prove" the relay either permanently ON or permanently OFF.
Common probe: A common reference is always required, if the vessel or tank is conductive the chassis of the tank or vessel will suffice. If the tank or vessel is not conductive a third probe is required to act as the common reference.

## ORDERING INFORMATION

| TYPE | COILVOLTAGE |
| :--- | :--- | :--- |
| MOD-W1(Din rail SPCO) | 230VAC 110VAC 24VAC |

* DC auxiliary supply units are possible but the probe supply is an unisolated 5VDC with a consequential risk of a possible electrolysis reaction, especially in solutions with a high mineral or contaminant content.



## SPECIFICATIONS

Supply \& Measuring
Supply voltage:
Dedicated voltage units 24VAC, 110VAC, 230VAC 24VDC (unisolated) ( $\pm 15 \%$ )
Max power consumption: 3VA
Insulation:
Sensitivity range:
Delay on tripping:
Probe supply:
Max probe current:
Relay output Output contacts: Max breaking capacity: Mechanical life: Electrical life:

## General

Operating temperature: Storage temperature
Max cable size:
CE marked
In accordance with:

Housing material
2.5 KV 50 Hz impulse

Adjustable 2-100 KOhms
Adjustable 1-10secs
20VAC *5VDC on DC Version
2 mA
SPCO 8Amps/250V AC1
2000VA
30 Million ops
200K ops at max rated load
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
2.5 mm

Yes
EN61000-6-1: 2007
EN61000-6-3: 2007
EN61010-1: 2002
Polycarbonate, Auto extinguishable
to UL 94 V-0


## DETECTION RELAY <br> TYPES: YWRWS (spco) YWR2WS (dpco)

PUMP SEAL LEAK MONITOR RELAY / WATER LEAK

## - FEATURES

- Din rail mounted
- Available SPCO or DPCO output
- Detection of water contamination of oil
- Detection of water leaks from pipes in buildings
- Adjustable sensitivity
- Isolated probe supply
- LED indication


## ■ DESCRIPTION \& MODE OF OPERATION

Din rail mounted units for the monitoring and alarming in applications where the presence of water is a problem. Such applications include water contamination of the oil within submersible pumps or water leak detection from pipes within buildings. Working on the conductive probe principle and with an adjustable sensitivity. In a situation healthy condition the output relay is energised, when the presence of water is detected, i.e. in the case of a pump, the seal fails and the oil becomes contaminated the resistance drops. If the resistance falls below the set level as set via the front potentiometer the output relay will deenergise and the red LED will extinguish. A green LED indicates the connection of the auxiliary supply.

## SPECIFICATIONS

## Supply \& Measuring

| Nominal supply tolerance: | $\pm 15 \%$ <br> Via transformer |
| :--- | :--- |
| Isolation: | 12VDC |
| Probe supply: | 2mA |
| Max probe current: | 3VA |
| Power consumption: | Adjustable 4.7 to 100 KOhms |
| Sensitivity range: | 100 mSec on make |
| Response time: <br> Relay output |  |
| Output contacts: | SPCO 10Amps/250V AC1 |
|  | DPCO 8Amps/250V AC1 |
| Mechanical life: | 30 Million ops |
| Electrical life: | 200K ops at max rated load |

General

| Operating temperature: | $-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$ |
| :--- | :--- |
| Storage temperature: | $-20^{\circ}$ to $+65^{\circ} \mathrm{C}$ |
| Max cable size: | 4 mm |
| CE marked: | Yes |
| In accordance with: | EN61000-6-1: 2007 |
|  | EN61000-6-3: 2007 |
|  | EN61010-1: 2002 |
| Housing material: | Polycarbonate, Auto extinguishable <br>  <br>  <br> to UL 94 V-0 |

## ORDERING INFORMATION

| TYPE | COIL VOLTAGE |  |
| :--- | :--- | :--- |
| YWRWS (Din rail SPCO) | 440VAC | 230VAC |
| YWR2WS (Din rail DPCO) | 415VAC | 110VAC |
|  | 400VAC | $48 V A C$ |
|  | $380 V A C$ | $24 V A C$ |



## DIN RAIL MODULAR PNP SIGNAL AMPLIFIER

TYPES: MOD-SAP-1 (spco)

## FEATURES

- Din rail mounted
- Modern modular design

■ Width 27 mm ( 1.5 module)

- SPCO output
- Multi voltage $24 \mathrm{VAC} / \mathrm{DC}, 110 \mathrm{VAC}, 230 \mathrm{VAC}$
- Dual LED indication
- RoHS Compliant
- CE marked


## DESCRIPTION \& MODE OF OPERATION

An attractive modern design in a din rail mounted modular style housing of 1.5 module width ( 27 mm ). The relay features large double deck terminals suitable for up to $2.5 \mathrm{~mm}^{2}$ cable. A green supply on LED is featured along with a red LED to indicate relay output status. The relay has a 24VDC output to supply the PNP senor. When a high output from sensor is connected to the input the relay will energise and the red LED is illuminated. As soon as the input is removed the relay will de-energise and the red LED will extinguish.



## SPECIFICATIONS

Relay outputs:
Output contacts:
Max breaking capacity:
Mechanical life: Electrical life:

Supply voltage:
Supply voltage:
Supply tolerance:
Max power consumption:
Sensor Input:
Sensor type:
Sensor Supply: Max input time: Min On time: Min Off time:

General:
Operating temperature: Storage temperature: Max cable size:
CE marked:
In accordance with:

Housing Material:

8Amps/250V AC1
2000VA
10 Million ops
500K ops at max rated load
$24 \mathrm{~V} \mathrm{AC} / \mathrm{DC}, 110 \mathrm{VAC}$ or 230 VAC
$-15 \%$ to $+10 \%$
40 mA

PNP
24VDC
Continuous
300 mS
300 mS
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
$2.5 \mathrm{~mm}^{2}$
Yes
EN61000-3-2, EN61000-4-2, EN61000-4-3
EN61000-4-4, EN61000-4-5, EN61000-4-11
CISPR 14.1
Polycarbonate, Auto extinguishable
to UL 94 V-0


# UNDERSPEED OR PULSE CONTINUITY "WATCHDOG" RELAY 

## TYPES: 11RVL, 8RVL (spco) 11RVLMP (spco)

## - FEATURES

- $8 \& 11$ pin plug in - SPCO output
- Detects machine underspeed, stopping, jamming
- Suitable as a watchdog relay with PLC's
- Choice of NAMUR, PNP or clean contact inputs
- Available auto or manual reset
- LED indication


## ■ DESCRIPTION \& MODE OF OPERATION

Simple 8 \& 11 pin plug in underspeed relays suitable for all kinds of machinery to detect loss of speed and pulse continuity. These units are useful where an output contact is required to alarm on jamming, loss of speed due to blunt cutting tools or as a "stationary" contact to allow the release of machine guards. Applications also include being used as "watchdog" relays.
The units are normally energised and are "time based" a pulse resets the time delay, if a pulse is not seen within the time range set on the front of the unit the output relay deenergises and latches out. The input circuit on the underspeed relay is looking for a change in state of input. To reset the unit the coil voltage needs to be removed for approximately 100 mSec then reconnected (as an option suffix M1 can be added to the order code giving an auto reset device).
On initial connection and reconnection of the coil voltage the unit will energise for approximately 8 seconds irrespective of the rate of pulses inputting the device, this is in order to allow a stationery machine/system to run up to normal speed. Note, if M1 auto reset option is specified the 8 second run up time is not applicable, care is therefore cautioned in the choice of application that this option is specified to avoid relay chatter.
The relay will de-energise in the event of a coil supply voltage failure, failure of the sensor, breakage of the cable between sensor and the unit, hence the underspeed monitor is fail safe.
11RVL, 8RVL - The input is achieved from either a NAMUR proximity switch or from a clean contact.
11RVLMP - The input is achieved from either a NAMUR proximity switch, PNP sensor or from a clean contact. The 11RVLMP also benefits from a reset input by momentarily closing link S2 between pins 2 \& 8. Note that the 8 second run up time will not be applicable and is only achieved by the connection and reconnection of the coil voltage.

## OTHER APPLICATION NOTES

The choice of sensor depends on the speed of the equipment and the time between impulses. To determine the controlling time it is necessary to calculate the time between two impulses at normal speed. This time will be:-

$$
\begin{array}{rl}
T=\underline{60} & V=\text { Speed in RPM } \\
n . V & n=\text { Number of teeth }
\end{array}
$$

- ORDERING INFORMATION


For higher speeds one impulse per revolution would be sufficient, but for very low speeds it may be necessary to have a higher number of impulses per revolution in order to achieve a reasonable operating time. It should also be noted that at maximum speed the number of impulses received must be less than 18000 per minute ( 300 Hz ). Therefore, the maximum number of impulses per revolution is:-
n. $\max =\underline{18000}$
V.max

The proximity sensor (NAMUR and PNP) is not isolated from the coil voltage.

## SPECIFICATIONS

## Supply \& Measuring

Nominal supply tolerance: $\pm 15 \%$
Max Power Consumption: 4VA
Repeat accuracy: $\quad \pm 0.5 \%$ at constant ambient $\pm 3 \%$ across temperature range
Reset time: $\quad 100 \mathrm{mSec}$ on make
Inhibit time on switch on: Input signal:

Max operating speed:
Min impulse:
7 to 8 seconds
NAMUR proximity switch, PNP sensor (max 20mA)
Normally open contact (8VDC, 8 mA )
1 mSec
Min time between impulses: 1 mSec
Timing:
Special:
Relay output
Output contacts: Mechanical life:
Electrical life:
General
Operating temperature: $\quad-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
Storage temperature: $\quad-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
CEmarked:
In accordance with:
Housing material:
EN61000-6-1: 2007, EN61000-6-3: 2007 EN61010-1: 2002

Polycarbonate, Auto extinguishable
to UL 94 V-0


COIL VOLTAGE
230VAC
AUTO RESET

L ( 15 sec to 640 mins) 15 to 150 sec 1 to 10 mins 8 to 80 mins 64 to 640 mins

## 110VAC

 48 V AC/DC $24 \mathrm{VAC} / \mathrm{DC}$ 12VDC[^12]${ }^{* *}$ Insert M1 if auto reset is required, standard unit once switched requires the removal and reconnection of the coil voltage to achieve a reset.

## UNDERSPEED OR PULSE CONTINUITY "WATCHDOG" RELAY

## TYPE: YWRVL (spco)

- FEATURES



## - Choice of NAMUR, PNP or clean contact inputs

Suitable as a watchdog relay with PLC's

- Transformer isolation from sensor input circuit
- Available auto or manual reset
- LED indication


## DESCRIPTION \& MODE OF OPERATION

Din rail mounted underspeed relays suitable for all kinds of machinery to detect loss of speed and pulse continuity. These units are useful when an output contact is required to alarm on jamming, loss of speed due to blunt cutting tools or as a "stationary" contact to allow the release of machine guards. Applications also include being used as "watchdog" relays.
The units are normally energised and are "time based" a pulse resets the time delay, if a pulse is not seen within the time range set on the front of the unit the output relay de-energises and latches out. The input circuit on the underspeed relay is looking for a change in state of input. To reset the unit the coil voltage needs to be removed for approximately 100 mSec then reconnected (as an option suffix M1 can be added to the order code giving an auto reset device).
On initial connection and reconnection of the coil voltage the unit will energise for approximately 8 seconds irrespective of the rate of pulses inputting the device, this is in order to allow a stationery machine/system to run up to normal speed. Note, if M1 auto reset option is specified the 8 second run up time is not applicable, care is therefore cautioned in the choice of application that this option is specified to avoid relay chatter.
The input is achieved from either a NAMUR proximity switch, PNP sensor or from a clean contact. The YWRVL also benefits from a reset input by momentarily closing link S 2 between terminals Z 1 \& Z 2 note that the $\mathbf{8}$ second run up time will not be applicable and is only achieved by the connection and reconnection of the coil voltage, again care is therefore cautioned in the choice of application of this feature to avoid relay chatter. The relay will de-energise in the event of a coil voltage failure, failure of the sensor, breakage of the cable between sensor and the unit, hence the underspeed monitor is fail safe.

## OTHER APPLICATION NOTES

The choice of sensor depends on the speed of the equipment and the time between impulses. To determine the controlling time it is necessary to calculate the time between two impulses at normal speed. This time will be:-

$$
\begin{array}{rl}
\mathrm{T}=\underline{60} & \mathrm{~V}=\text { Speed in RPM } \\
\mathrm{n} \cdot \mathrm{~V} & \mathrm{n}=\text { Number of teeth }
\end{array}
$$

## ORDERING INFORMATION

| TYPE | TIME RANGE (specify S, M orl) |  |
| :---: | :---: | :---: |
| YWRVL (Din rail SPCO) | $\mathbf{S}(0.06$ to 160 secs) | M ( 0.5 sec to 21 mins ) |
|  | 0.06 to 0.6 sec | 0.5 to 5 sec |
|  | 0.25 to 2.5 sec | 2 to 20 sec |
|  | 2 to 20 sec | 16 to 160 sec |
|  | 16 to 160 sec | 2 to 21 mins |

For higher speeds one impulse per revolution would be sufficient, but for very low speeds it may be necessary to have a higher number of impulses per revolution in order to achieve a reasonable operating time. It should also be noted that at maximum speed the number of impulses received must be less than 18000 per minute ( 300 Hz ). Therefore, the maximum number of impulses per revolution is:-
n. $\max =\underline{18000}$
V.max

The proximity sensor (NAMUR and PNP) is isolated from the coil voltage by means of a transformer. On DC coil voltage versions there is no isolation.

## SPECIFICATIONS

## Supply \& Measuring

| Nominal supply tolerance: | $\pm 15 \%$ |
| :---: | :---: |
| Max Power Consumption: | 4VA |
| Repeat accuracy: | $\pm 0.5 \%$ at constant ambient |
|  | $\pm 3 \%$ across temperature range |
| Reset time: | 100 mSec on make |
| Inhibit time on switch on: | 7 to 8 seconds |
| Input signal: | NAMUR proximity switch, PNP sensor (max 20 mA ) Normally open contact (8VDC, 8mA) |
| Max operating speed: | 300 Hz ( $18,000 \mathrm{RPM}$ ) |
| Min impulse: | 1 mSec |
| Min time between impulses | 1 mSec |
| Timing: | Selected by 4 sub time ranges |
|  | Specify range S, M or L |
| Special: | 12 hour \& 24 hour units also available |
| Relay output |  |
| Output contacts: | SPCO 10Amps/250V AC1 |
| Mechanicallife: | 30 Million ops |
| Electrical life: | 200K ops at max rated load |
| General |  |
| Operating temperature: | $-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$ |
| Storage temperature: | $-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$ |
| Max cable size: | 4 mm |
| CE marked: | Yes |
| In accordance with: | EN61000-6-1: 2007, EN61000-6-3: 2007 |
|  | EN61010-1: 2002 |
| Housing material: | Polycarbonate, Auto extinguishable |

to UL 94 V-0


COIL VOLTAGE AUTO RESET
L( 15 sec to 640 mins $)$
440VAC
AUTO RESET
15 to 150 sec
1 to 10 mins
8 to 80 mins
415VAC
400VAC
380VAC
230VAC
110VAC
48VAC
24VAC
24VDC

* Also available are dedicated 12 hour and 24 hour versions, as supplied to detect jamming and loss of flow on rotating arm sewage beds.
** Insert M1 if auto reset is required, standard unit once switched requires the removal and reconnection of the coil voltage to achieve a reset.


# UNDERSPEED OR PULSE CONTINUITY "WATCHDOG" RELAY 

## TYPES: YWRVL4 (spco)

\author{

- FEATURES <br> - Din rail mounted <br> - SPCO output
}
- Detection of machine underspeed, stopping, jamming
- Suitable as a watchdog relay with PLC's
- Choice of NAMUR, PNP or clean contact inputs
- Transformer isolation from sensor input circuit
- Auto reset

■ Without start up time delay

- DESCRIPTION \& MODE OF OPERATION

Din rail mounted underspeed relays suitable for all kinds of machinery to detect loss of speed and pulse continuity. These units are useful when an output contact is required to alarm on jamming, loss of speed due to blunt cutting tools or as a "stationary" contact to allow the release of machine guards. Applications also include being used as "watchdog" relays.
The input is achieved from either a NAMUR proximity switch, PNP sensor or from a clean contact. Unlike the unit type YWRVL the YWRVL4 does not energise for approximately 8 seconds on the initial connection of the coil voltage, but will energise when the first leading edge of an input is seen. Thereon the operation is "time based" an input will reset the time delay, if an input is not seen within the set time the output relay will de-energise but not latch. Therefore the unit will re-energise if a new leading edge of an input is seen. Removal of the coil voltage, failure of the sensor, or a breakage in the cable between the unit and the PLC or sensor will also cause the output relay to de-energise if in an energised state. Hence the underspeed monitor is fail safe.

## OTHER APPLICATION NOTES

The choice of sensor depends on the speed of the equipment and the time between impulses. To determine the controlling time it is necessary to calculate the time between two impulses at normal speed. This time will be:-
$\mathrm{T}=\underline{60}$
$\mathrm{V}=$ Speed in RPM
n.V
$\mathrm{n}=$ Number of teeth

For higher speeds one impulse per revolution would be sufficient, but for very low speeds it may be necessary to have a higher number of impulses per revolution in order to achieve a reasonable operating time. It should also be noted that at maximum speed the number of impulses received must be less than 18000 per minute $(300 \mathrm{~Hz})$. Therefore, the maximum number of impulses per revolution is:-
n. $\max =\underline{18000}$

The proximity sensor (NAMUR and PNP) is isolated from the coil voltage by means of a transformer. On DC coil voltage versions there is no isolation.

## SPECIFICATIONS

## Supply \& Measuring

Nominal supply tolerance: $\pm 15 \%$
Max Power Consumption: 11VA
Repeat accuracy:
Reset time:
Input signal:
Max operating speed:
Min impulse:
Min time between impulses: 1 mSec
Timing:
Special:
Relay output Output contacts: Mechanical life: Electrical life: General Operating temperature: Storage temperature: CE marked: In accordance with:

Housing material:

## ORDERING INFORMATION

| TYPE | TIME RANGE (specify S, M or L) |  |  |
| :---: | :---: | :---: | :---: |
| YWRVL4 (Din rail SPCO) | S (0.06 to 160 secs) | M ( 0.5 sec to 21 mins ) | L (15 sec to 640 mins |
|  | 0.06 to 0.6 sec | 0.5 to 5 sec | 15 to 150 sec |
|  | 0.25 to 2.5 sec | 2 to 20 sec | 1 to 10 mins |
|  | 2 to 20 sec | 16 to 160 sec | 8 to 80 mins |
|  | 16 to 160 sec | 2 to 21 mins | 64 to 640 mins |
| * Also available are dedicated 12 hour and 24 hour versions, as supplied to detect jamming and loss of flow on rotating sewage beds |  |  |  |
| ** On DC auxiliary supply | proximity sensor (NA | nd PNP) is not isolated fr | he coil voltage. |



# PLUG IN RELAYS \& SOCKETS, MODULAR POWER <br> RELAYS \& LATCHING RELAYS, FLEETING CONTACT RELAYS 

| PAGES | P/No. | DESCRIPTION |
| :--- | :--- | :--- |
| 100 | FRP3145 | Foxtam 14 pin 4PCO relays |
| 101 | FRP3125 | Foxtam 8 pin DPCO relays (14 pin style) |
| 102 | TRP3145 \& TRP3140 | Iskra 14 pin 4PCO relays |
| 103 | TRP3125 \& TRP3120 | Iskra 8 pin DPCO relays (14 pin style) |
| 104 | TRP6825 \& TRP6820 | Iskra 8 pin DPCO relays (octal style) |
| 104 | TRP6935 \& TRP6930 | Iskra 11 pin 3PCO relays |
| 105 |  | 14 pin, 8 pin, 11 pin relay sockets |
| 106 | 41F-1Z-C2 | Terminal style 6mm wide SPCO interface relay modules |
| 107 | HF115FH | SPCO low coil consumption SPCO, BMS interface relays \& socket |
| 108 | HF115F1 \& HF115F2 | SPCO \& DPCO miniature interface relays \& sockets |
| 109 | HF115FP | DPCO miniature interface relay with test, flag \& LED, plus sockets |
| 110 | UNI-1R \& UNI-3R | Modular Din rail SPCO \& 3PCO, 16 Amp power relays |
| 111 | UNI-1LR \& UNI-2LR | Modular Din rail SPCO \& DPCO latching relays |
| 112 | UNI-4LRS | Modular Din rail 4 x SPNO latching, sequence \& memory relay |
| 113 | 8/11/YRX | 8, 11 pin \& Din rail SPCO \& DPCO fleeting contact relay |



## FOXTAM 14 PIN 4PCO, 5 AMP RATED RELAYS

## TYPE: FRP3145/VOLTS

\author{

- FEATURES <br> - LED indication <br> - Flag indication <br> - Test button <br> - Locking facility <br> - DC coils with integral diode protection <br> - CE marked
}


## ■ DESCRIPTION \& MODE OF OPERATION

A high quality range of CE marked standard pin out 4PCO 14 pin plug in relays, nominally rated at 5Amps/250VAC AC1. The relays benefit from every customer required option as standard, namely both mechanical and electrical indication via a mechanical flag and a high intensity LED. DC coil relays also have included within the relay a protection diode fitted across the coil as standard.
The relays can be manually tested by a momentary action push button, a lever can then be twisted to give a locking facility. Contact material is silver. To differentiate between AC and DC coils in the same installation the push button is coloured red for AC coils and blue for DC coils. Available coil voltages are 24VDC, 24VAC, 110VAC and 230VAC. Clearly marked on the relay case are the connection details and the CE mark.

## IMPORTANT NOTE

With regards coil connection on DC coil relays which have both a protection diode and LED fitted as standard, coil polarity matters (+A1, 13) (-A2, 14).

## - COIL DATA

| Coil rated <br> voltage | Coil resistance at <br> $20^{\circ} \mathrm{C}$ |  |
| :---: | :---: | :---: |
|  | DC |  |
| Un(V)DC/AC | $\operatorname{Rn}(\Omega) \pm 10 \%$ |  |
| 24 | 650 | 160 |
| 110 |  | 3400 |
| 230 |  | 13600 |

Drop out voltage DC $10 \%$ min Pull in voltage DC $80 \%$ max Drop out voltage AC 30\% min Pull in voltage AC 80\% max

## CONTACT DATA

Contact form:
Contact material:
Rated current:
Max. operating voltage:
Max. Switching power:
Max. operating duty:
Mechanical life:
Electrical life:

FRP3145 (4PCO)
$\mathrm{AgSnO}_{2}$
5A 250VAC AC1 / 30VDC
250VAC, 110 VDC
600VA, 150W
360 operat./h at max rated load
18000 operat./h at min. load
$10^{7}$ operations (no load operation)
$10^{5}$ operat. at max rated resistive load

## ORDERING INFORMATION

## TYPE

 COIL VOLTAGEFRP3145 24VDC, 24VAC, 110VAC, 23OVAC
Sockets see page $\mathbf{1 0 5}$ for full details.


## GENERAL DATA

Rated Power Pull In Max: DC1.1W; AC 2VA
Max Coil Temperature: $\quad 155^{\circ} \mathrm{C}$
Test voltage(1min.) contact-coil:
Contact-contact:
Between-contact 4CO:
Operate time at Un:
Release time:
Insulation resistance (500VDC):
Vibration resistance (10-55Hz):
Shock endurance:
Ambient temperature for operating:
Mounting position:
$\geq 2 \mathrm{kV}_{\text {ms }} 50 \mathrm{~Hz}$
$\geq 1 \mathrm{kV}$ 畀 50 Hz
$\geq 1 \mathrm{kV}_{\text {ms }} 50 \mathrm{~Hz}$
$\leq 25 \mathrm{~ms}$
$\leq 25 \mathrm{~ms}$
$100 \mathrm{M} \Omega$
Amplitude width 1.5 mm
$1000 \mathrm{~m} / \mathrm{S}^{2} \mathrm{Min}$
$-25^{\circ} \mathrm{C}$ to $+55^{\circ} \mathrm{C}$
As desired
35 g


## FOXTAM 8 PIN DPCO, 10 AMP RATED RELAYS

## TYPE: FRP3125/VOLTS

- FEATURES
- LED indication
- Flag indication
- Test button
- Locking facility
- DC coils with integral diode protection
- CE marked


## - DESCRIPTION \& MODE OF OPERATION

A high quality range of CE marked standard pin out DPCO 8 pin plug in relays, in the " 14 pin style", nominally rated at 10Amps/250VAC AC1. The relays benefit from every customer required option as standard, namely both mechanical and electrical indication via a mechanical flag and a high intensity LED. DC coil relays also have included within the relay a protection diode fitted across the coil as standard.

The relays can be manually tested by a momentary action push button, a lever can then be twisted to give a locking facility. Contact material is silver. To differentiate between AC and DC coils in the same installation the push button is coloured red for AC coils and blue for DC coils. Available coil voltages are 24VDC, 24VAC, 110VAC and 230VAC. Clearly marked on the relay case are the connection details and the CE mark.

## IMPORTANT NOTE

With regards coil connection on DC coil relays which have both a protection diode and LED fitted as standard, coil polarity matters (+A1, 13) (-A2, 14).

## COIL DATA

| Coil rated <br> voltage | Coil resistance at <br> $20^{\circ} \mathrm{C}$ |  |
| :---: | :---: | :---: |
|  | DC | AC |
| Un(V)DC/AC | $\operatorname{Rn}(\Omega) \pm 10 \%$ |  |

Drop out voltage DC $10 \%$ min Pull in voltage DC $80 \%$ max Drop out voltage AC 30\% min Pull in voltage AC 80\% max

## CONTACT DATA

Contact form:
Contact material:
Rated current:
Max. allowable voltage:
Max. switching power:
Max. operating duty:
Mechanical life:
Electrical life:

FRP3125 (DPC0)
$\mathrm{AgSnO}_{2}$
10A 250VAC AC1 / 30VDC
250VAC, 110 VDC
1200VA, 300W
360 operat./h at max rated load 18000 operat./h at min. load $10^{7}$ operations (no load operation)
$10^{5}$ operat. at max rated resistive load

## ORDERING INFORMATION

TYPE COILVOLTAGE
FRP3125 24VDC, 24VAC, 110VAC, 230VAC
PYF-08AE Socket for FRP3125 Relay
Sockets see page $\mathbf{1 0 5}$ for full details.


## ISKRA14 PIN 4PCO, 5 AMP RATED RELAYS

 a protection diode and LED fitted as standard, coil polarity matters (+A1, 13) (-A2, 14).
## COIL DATA

| Coil rated <br> voltage | coil resistance at <br> $20^{\circ} \mathrm{C}$ |  | Operative voltage range <br> at $20^{\circ} \mathrm{C}$ |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Un(V)DC/AC | $\operatorname{Rn}(\Omega) \pm 10 \%$ |  | Operate <br> Uop $\geq(V)$ |  |  |
|  | Umax DC <br> $\geq(V)$ | Umax AC <br> $\geq$ |  |  |  |
|  | 40 | 12 | 4.8 | 9.6 | 8.3 |
| 12 | 160 | 49 | 9.6 | 19.2 | 16.7 |
| 24 | 650 | 192 | 19.2 | 38.7 | 33.5 |
| 48 | 2600 | 785 | 38.4 | 77.5 | 66.9 |
| 60 | 4000 | 1240 | 48 | 96 | 83 |
| 110 | 13500 | 3880 | 88 | 176 | 153 |
| 220 | 53000 | 17400 | 176 | 350 | 306 |
| 230 | 58000 | 18200 | 184 | 366 | 320 |

## GENERAL DATA

Rated Power Pull In:
Rated Power in Operation:
Max Coil Temperature:
Test voltage (1 min.) contact-coil:
Contact-contact:
Between-contact 4CO:
Operate time at Un:
Release time:
Bounce time:
Insulation resistance (500VDC):
Vibration resistance ( $10-50 \mathrm{~Hz}$ ):
Shock resistance ( 11 ms ) functional:
Shock resistance ( 11 ms ) destructive:
Ambient temperature for operating:
Ambient temperature for storage:
Protection degree:
Mounting position:
Relay weight:

DC1W; AC 1.2VA
DC 0.6W; AC 0.7VA
$155^{\circ} \mathrm{C}$
$\geq 2 \mathrm{kV}$ rms' 50 Hz
$\geq 1 \mathrm{kV}_{\text {rms }} 50 \mathrm{~Hz}$
$\geq 1 \mathrm{kV} \mathrm{rms}^{5} 50 \mathrm{~Hz}$
$\leq 15 \mathrm{~ms}$
$\leq 14 \mathrm{~ms}$
$\leq 5 \mathrm{~ms}$
$>10 \mathrm{M} \Omega$
3 gn
20 gn
100 gn
$-25^{\circ} \mathrm{C}$ to $+60^{\circ} \mathrm{C}$
$-40^{\circ} \mathrm{C}$ to $+85^{\circ} \mathrm{C}$
IP 50, IEC 529
As desired
35 g

## ISKRA 8 PIN DPCO, 10 AMP RATED RELAYS

TYPES: TRP3125/AC VOLTS, TRP3120/DC VOLTS

- FEATURES
- LED indication
- Flag indication
- Test button
- Locking facility
- DC coils with integral diode protection - Optional gold flashed contacts
- CE marked
- VDE approved
- UL \& CSA approved


## - DESCRIPTION \& MODE OF OPERATION

A high quality range of CE marked DPCO 8 pin plug in relays in the " 14 pin style", nominally rated at $10 \mathrm{Amps} / 250 \mathrm{VAC}$. The relays benefit from every customer required option as standard, namely both mechanical and electrical indication via a mechanical flag and a high intensity LED. DC coil relays also have included within the relay a protection diode fitted across the coil as standard. The relays can be manually tested by a momentary action push button, the same push button can be pulled outwards to give a locking facility. Standard contact material is silver but on request the relays are available with gold flashed contacts for long term assurance of low level signal switching (suffix part number GF). To differentiate between AC and DC coils in the same installation the push button is coloured red for AC coils and blue for DC coils. Coil voltages available are from 6VDC to 220VDC and 6VAC to 230VAC. Clearly marked on the relay case are the connection details, approvals and the CE mark.

## IMPORTANT NOTE

With regards coil connection on DC coil relays which have both a protection diode and LED fitted as standard, coil polarity matters (+A1, 13) (-A2, 14).

## COIL DATA

| Coil rated voltage | coil resistance at $20^{\circ} \mathrm{C}$ |  | Operative voltage range at $20^{\circ} \mathrm{C}$ |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Un(V)DC/AC | $\operatorname{Rn}(\Omega) \pm 10 \%$ |  | Operate $\mathrm{Uop} \geq(\mathrm{V})$ | $U \max$ DC $\geq(V)$ | Umax AC $\geq \text { (V) }$ |
| 6 | 40 | 12 | 4.8 | 9.6 | 8.3 |
| 12 | 160 | 49 | 9.6 | 19.2 | 16.7 |
| 24 | 650 | 192 | 19.2 | 38.7 | 33.5 |
| 48 | 2600 | 785 | 38.4 | 77.5 | 66.9 |
| 60 | 4000 | 1240 | 48 | 96 | 83 |
| 110 | 13500 | 3880 | 88 | 176 | 153 |
| 220 | 53000 | 17400 | 176 | 350 | 306 |
| 230 | 58000 | 18200 | 184 | 366 | 320 |

## GENERAL DATA

Rated Power Pull In:
Rated Power in Operation:
Max Coil Temperature:
Test voltage ( 1 min .) contact-coil:
Contact-contact:
Between-contact DPCO:
Operate time at Un:
Release time:
Bounce time:
Insulation resistance (500VDC):
Vibration resistance ( $10-50 \mathrm{~Hz}$ ):
Shock resistance ( 11 ms ) functional: Shock resistance ( 11 ms ) destructive:
Ambient temperature for operating:
Ambient temperature for storage:
Protection degree:
Mounting position:
Relay weight:

DC1W; AC 1.2VA
DC0.6W; AC 0.7VA
$155^{\circ} \mathrm{C}$
$\geq 2 \mathrm{kV}_{\text {rms }} 50 \mathrm{~Hz}$
$\geq 1 \mathrm{kV}_{\text {rms' }} 50 \mathrm{~Hz}$
$\geq 1 \mathrm{kV}_{\text {rms }} 50 \mathrm{~Hz}$
$\leq 15 \mathrm{~ms}$
$\leq 14 \mathrm{~ms}$
$\leq 5 \mathrm{~ms}$
$>10^{3} \mathrm{M} \Omega$
3 gn
20 gn
100 gn
$-25^{\circ} \mathrm{C}$ to $+60^{\circ} \mathrm{C}$
$-40^{\circ} \mathrm{C}$ to $+85^{\circ} \mathrm{C}$
IP 50, IEC 529
As desired
35 g


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TYPES: TRP6825/AC VOLTS, TRP6820/DC VOLTS (dpco) TRP6935/AC VOLTS, TRP6930/DC VOLTS (3pco)

COIL DATA

| Coil rated <br> voltage | coil resistance at <br> $20^{\circ} \mathrm{C}$ |  | Operative voltage range <br> at $20^{\circ} \mathrm{C}$ |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | DC | AC | Operate <br> Uop $<(\mathrm{V})$ |  | Umax DC <br> $<(V)$ |
| Un(V)DC/AC | $\operatorname{Rn}(\Omega)+/-10 \%$ |  | Umax AC <br> $<(V)$ |  |  |
|  | 28 | 5.7 | 4.8 | 9.0 | 9.5 |
| 6 | 110 | 25 | 9.6 | 18 | 19 |
| 12 | 440 | 100 | 19.2 | 36 | 38 |
| 24 | 1740 | 400 | 38.4 | 73 | 76 |
| 48 | 2750 | 630 | 48 | 91 | 95 |
| 60 | 9000 | 2000 | 88 | 168 | 174 |
| 110 | 39000 | 8800 | 184 | 351 | 365 |
| 220 |  |  |  |  |  |

## CONTACT DATA

Contact material:
Rated current:
Max make current:
Max operating voltage:
Max switching power:
Min switching load:
Contact resistance:
Max operating frequency:
AgCd010
10A
20A
250VAC/DC
2500VA 400W
6 V 100 mA
$<100 \mathrm{mOhm}$
ops/hr at rated
load, $36000 \mathrm{ops} / \mathrm{hr}$ at min load
Mechanical life:
$>100$ Million ops

## ORDERING INFORMATION

## TYPE

COIL VOLTAGE
8 PINDPCO
TRP6825 6VAC, 12VAC, 24VAC, 48VAC, 60VAC, $110 \mathrm{VAC}, 230 \mathrm{VAC}$
TRP6820 6VDC, $12 \mathrm{VDC}, 24 \mathrm{VDC}, 48 \mathrm{VDC}, 60 \mathrm{VDC}, 110 \mathrm{VDC}, 220 \mathrm{VDC}$
11 PIN 3PCO
TRP6935 6VAC, $12 \mathrm{VAC}, 24 \mathrm{VAC}, 48 \mathrm{VAC}, 60 \mathrm{VAC}, 110 \mathrm{VAC}, 230 \mathrm{VAC}$
TRP6930 6VDC, $12 \mathrm{VDC}, 24 \mathrm{VDC}, 48 \mathrm{VDC}, 60 \mathrm{VDC}, 110 \mathrm{VDC}, 220 \mathrm{VDC}$
ADD SUFFIX "GF" AFTER PART NUMBER FOR GOLD FLASHED
CONTACTS
Socket see page 105 for full details.


PERFORMANCE GRAPHS


Electrical life, resistive DC load


Max. switching capacity, resistive DC load


## GENERAL DATA

Rated Power Pull In:
Rated Power in Operation:
Operate voltage:
Release voltage:
Max coil temperature:
Test voltage (1 min ) contact coil:
Contact contact:
Between contact sets:
Operate time:
Release time:
Bounce time:
Vibration resistance ( $10-55 \mathrm{~Hz}$ ):
Shock resistance (11ms) functional:
Shock resistance ( 11 ms ) destructive:
Ambient temperature for operating:
Ambient temperature for storage:
Protection degree:
Mounting position:
Relay weight:

DC1W; AC 2VA
DC 0.8W; AC 1.2VA
Uop $<80 \%$ Un
Ure $>10 \%$ Un (DC),
Ure $>15 \%$ Un (AC)
$155^{\circ} \mathrm{C}$
$>2 \mathrm{KVrms} 50 \mathrm{~Hz}$
$>1 \mathrm{KVrms} 50 \mathrm{~Hz}$
$>2 \mathrm{KVrms} 50 \mathrm{~Hz}$
$<15 \mathrm{~ms}$
$<15 \mathrm{~ms}$
$<5 \mathrm{~ms}$
3 gn
10gn
100 gn
$-25^{\circ} \mathrm{C}$ to $+40^{\circ} \mathrm{C}$
$-40^{\circ} \mathrm{C}$ to $+80^{\circ} \mathrm{C}$
IP50, IEC529
As desired
85 g

## RELAY SOCKETS FOR 14 PIN FRP3145 \& TRP314x 4PCO RELAYS

## TYPES: PYF-14AEW, PYF-14BE, PYF-14BE/3

## PYF-14AEW

Our most popular 14 pin socket, complete with a fixed marker tab and a screwdriver release tab. An optional wire retaining clip is also available, part number MHO.

PYF-14BE \& PYF-14BE/3
"High sided" 14 pin sockets with tunnel clamps. A triple deck version, the PYF-14BE/3 allows segregation of voltages, coil terminals being on one side with two A2 terminals. All changeover terminals on the opposite side. Both socket types have a removable marker tab and screwdriver release tab. Retaining clips are also available for both versions,


PYF-14AEW


PYF-14BE

## RELAY SOCKETS FOR 8 PIN FRP3125 \& TRP312x DPCO RELAYS

## TYPE: PYF-08AE

■ DESCRIPTION
The FRP3125 \& TRP312x relays can be utilised with the 14 pin socket, the two outer sets of terminals are used and of course the coil terminals. However, a dedicated 8 pin relay socket is available type PYF-08AE, this socket also has a higher current rating and is thus more desirable when switching the higher currents that the FRP3125 \& TRP312x relays can switch. Retaining clips are supplied with each socket.


## DIN RAIL MOUNTED SOCKETS FOR 8 \& 11 PIN RELAYS

TYPES: CS083N (8 PIN) \& CS113N (11 PIN)
■ DESCRIPTION
Compact square black sockets, with protected terminals types CS083N \& CS113N. The sockets have a screwdriver release tab and have captive clamps for ease of cable insertion. Up to $2 \times 2.5 \mathrm{~mm}$ cables can be accepted. The sockets are suitable for fork, ferule and ring terminal ends.


## - DESCRIPTION

Fully protected sockets with coil and common terminals at one end and the change overs pairs at the other end side by side, thus enabling very easy wiring changes and corrections. The terminals are rising style tunnel clamps, up to $2 \times 2.5 \mathrm{~mm}$ cables can be accepted. The sockets also have a white marking area. An optional wire retaining clip is also available, part number MR28800

## DIMENSIONS




# SPCO WAFER STYLE 6mm WIDE INTERFACE RELAY MODULES <br> <br> TYPE: 41F-1Z-C2-xxx 

 <br> <br> TYPE: 41F-1Z-C2-xxx}

## - FEATURES

- Supplied as a complete made up package of relay \& socket
- One part number for simplicity in ordering


## - Only 6 mm wide

- With built in LED indication as standard
- Built in relay removal ejector clip
- SPCO contact rated 6 Amps / 250VAC AC1
- AC \& DC coil voltages
- Low coil consumption


## RELAY DESCRIPTION



A genuine SPCO mechanical relay package the width of a terminal at only $\mathbf{6 m m}$ wide is the ultimate solution when space is limited and a high packing density is required, in fact in certain applications use the product as a combined terminal and relay saving on even more space. The product is supplied as a complete package of socket and relay combined, the base features an integral LED indicator and a relay retaining clip that also acts as the relay ejector if the need to remove the relay arises. Whilst being the ultimate in space saving the relay has a switching capability of 6 Amps / 250VAC AC1 and also benefits from a low coil consumption.
A dedicated 9VDC relay module is available for use in the BMS sector where $0-10 \mathrm{VDC}$ signals are used and a digital output is required. With a pull in voltage of 7.5 VDC and a release voltage of 4VDC, along with a low power consumption of circa 160 mW (including the LED), this makes these modules an attractive alternative as a "BMS SRMV" relay.
The socket element is more than a socket, it is an electronic device dropping a voltage over a range and also providing a LED indicator. The socket is an equal component in the assembly as the relay. For example, a 240VAC supply does not utilise a 240VAC coil relay, a 60VDC relay is used. This is why this product is only sold as a complete made up assembly.

An optional 20 way jumper bar comb is available to common up negatives or 0 V 's, also available as an accessory is a strip of 16 marker tags.

Also of note, is that $12 \mathrm{~V}, 24 \mathrm{~V}$ and 48 V coils can be either AC or DC , same relay.

## SPECIFICATIONS

| Contact type: | SPCO |
| :--- | :--- |
| Contact rating: | $6 \mathrm{Amps} / 250 \mathrm{VAC} \mathrm{AC1}$ |
| Contact material: | AgNi |
| Operate time: | 8 mSec max |
| Release time: | 4 mSec max |
| Electrical life: | 30000 ops (at full load) |
| Mechanical life: | 10000000 ops |
| Insulation resistance: | 1000 MOhms |
| Insulation:- |  |
| Coil to contacts: | 4 KVAC 1 min |
| Open contacts: | 1 KVAC 1 min |
| Ambient temperature: <br> CE marked: | $-40^{\circ} \mathrm{C}$ to $+55^{\circ} \mathrm{C}$ |
| VDE approved \& marked: | Yes |
| UL approved \& marked: | Yes |
|  | Yes |

ORDERING INFORMATION \& COIL DATA

| P/No. | COIL <br> CONSUMPTION * |
| :--- | :---: |
| 41F-1Z-C2-9VDC | 17.8 mA |$|$| 41F-1Z-C2-12VACDC |  |
| :--- | :---: |
| 41F-1Z-C2-24VACDC |  |
| 41F-1Z-C2-48VACDC |  |
| 41F-1Z-C2-125VAC |  |
| 41F-1Z-C2-240VAC |  |
| 41F-20 |  |
| 41F-TAG |  |
| 20 way jumper comb |  |
| Strip of marker tags |  |

## SPCO MINIATURE LOW COIL CONSUMPTION BMS

 INTERFACE RELAY
## TYPE: HF115FH (spco 10Amp)

## FEATURES

- Miniature SPCO BMS interface relay
- Low coil consumption
- 12VDC version compatible with 10VDC BMS signals
- Fully sealed
- Strong pins for socket insertion
- UL \& VDE approval
- DC coil voltages only


## RELAY DESCRIPTION



Miniature interface relays available as SPCO and only with DC coils. The HF115FH is a special sensitive coil version of the HF115F1, the HF115FH has a much higher coil resistance and hence a lower coil consumption of 250 mW . This makes the HF115FH relay ideally suited for converting BMS and PLC, $0-10 \mathrm{VDC}$ analogue signals to digital inputs when there is only limited power behind the signal. In particular the HF115FH is fully compatible with the 0-10VDC output from "Trend Building Management Systems", the 12VDC coil relay will pull in at 9VDC.
Other applications include using the 24VDC coil version for converting transistor outputs to digital (often only limited power is available). Or when utilising a power supply and overall power consumption has to be kept within limits.


| COIL <br> VOLTAGE | PULL IN <br> VOLTAGE | RELEASE <br> VOLTAGE | COIL <br> CONSUMPTION* | COIL <br> OHMS* |
| :---: | :---: | :---: | :---: | :---: |
| 12VDC | 9VDC | 1.2VDC | 20.8 mA | 576 |
| 24VDC | 18VDC | 2.4 VDC | 10.4 mA | 2304 |
|  |  |  | ${ }^{*}+/-10 \%$ | $*+/-10 \%$ |

## ORDERING INFORMATION

P/No.
HF115FH / 12VDC
HF115FH / 24VDC
Other DC coil voltages available on request

## DIN RAIL MOUNTED SOCKET FOR HF115FH RELAY

Fully finger protected miniature interface relay base with rising tunnel style clamps. The PI-35BE is the SPCO socket for the HF115FH relay. An optional marker tab (one supplied with each base) maybe fitted in up to four different positions. Available as an option is an ejector style retaining clip.

## P/No.

| PI-35BE | Standard SPCO 5 pin base |
| :--- | :--- |
| TR | Spare marker tab |
| MS16 | Ejector clip |



## SPCO \& DPCO MINIATURE INTERFACE RELAYS



Miniature interface relays available either as SPCO or DPCO suitable for PCB mounting or for plugging into standard 15 mm wide Din rail mounted interface relay bases. The relays are compact in construction being of low profile and fully sealed. The PCB pins are strong and are therefore hard to bend when inserted into a socket. Small in size but the switching capacity is large, the SPCO is rated at 12 Amps / 250VAC AC1 and the DPCO version is rated at 8 Amps / 250VAC AC1. For ease of identifying AC circuits against DC circuits in a control panel, AC coil relays are white and DC coil relays are black.

## SPECIFICATIONS

| Contact type: | SPCO \& DPCO |
| :---: | :---: |
| Contact rating: | 12A/250VAC AC1 \& 8A/250VAC AC1 |
| Max switching voltage: | 440VAC / 125VDC |
| Max switching power: | 3000VA \& 2000VA |
| Contact material: | $\mathrm{AgSnO}^{2}$ |
| Operate time: | 15 mSec max |
| Release time: | 8 mSec max |
| Mechanical life AC: | 1000000 ops |
| Mechanical life DC: | 10000000 ops |
| Electrical life AC: | 50000 ops (full load) |
| Electrical life DC: | 100000 ops (full load) |
| Insulation resistance: | 1000MOhms |
| Insulation:- |  |
| Coil to contacts: | 5KVAC 1 min |
| Open contacts: | 1KVAC 1 min |
| Between contact sets: | 2.5 kVAC 1 min |
| Ambient temperature: | $-40^{\circ} \mathrm{C}$ to $+70^{\circ} \mathrm{C}\left(\mathrm{DC}+85^{\circ} \mathrm{C}\right)$ |
| VDE approved: | Yes |
| UL approved \& marked: | Yes |

COIL DATA

| COIL <br> VOLTAGE | PULL IN <br> VOLTAGE | RELEASE <br> VOLTAGE | COIL <br> CONSUMPTION* | COIL <br> OHMS* |
| :---: | :---: | :---: | :---: | :---: |
| 5VDC | 3.5 VDC | 0.5 VDC | 80.6 mA | 62 |
| 6VDC | 4.2 | 0.6 VDC | 66.6 mA | 90 |
| 12VDC | 8.4 VDC | 1.2 VDC | 33.3 mA | 360 |
| 24VDC | 16.8 VDC | 2.4 VDC | 16.6 mA | 1440 |
| 48VDC | 33.6 VDC | 4.8 VDC | 8.3 mA | 5760 |
| 60VDC | 42VDC | 6.3 VDC | 8 mA | 7500 |
| 110VDC | 77VDC | 11 VDC | 4.4 mA | 25200 |
| 24VAC | 18VAC | 3.6 VAC | 31.6 mA | 350 |
| 110VAC | 86.3VAC | 17.3 VAC | 6.6 mA | 8100 |
| 230VAC | 172.5 VAC | 34.5 VAC | 3.2 mA | 3250 |
|  |  |  | $*+/-10 \%$ | $*+/-10 \%$ |



- ORDERING INFORMATION

P/No.
HF115F1 / Volts SPCO 12 Amps
HF115F2 / Volts DPCO 8 Amps
PI-35BE Standard SPCO 5 pin base
PI-50BE PI-50BE/3 TR MS16 Standard DPCO 8 pin base Triple deck DPCO 8 pin base Spare marker tab Ejector clip

Width of Bases 15.7 mm


PI-35BE


PI-50BE


PI-50BE/3

## DIN RAIL MOUNTED SOCKETS FOR HF115F1 \& HF115F2 RELAYS

Fully finger protected miniature interface relay bases with rising tunnel style clamps. The PI-35BE is the SPCO socket for the HF115F1 relay. Whilst both the PI-50BE and PI-50BE/3 are DPCO sockets for the HF115F2 relay, the PI-50BE/3 is a "triple deck" base with the coil connections on one side of the base and all the changeover contacts on the other side, thus achieving voltage segregation. An optional marker tab (one supplied with each base) maybe fitted in up to four different positions. Available as an option is an ejector style retaining clip.

## DPCO MINIATURE INTERFACE RELAY WITH BUILT IN TEST BUTTON, FLAG INDICATOR \& LED INDICATION

## TYPE: HF115FP (dpco 8 Amp)

## FEATURES

- Miniature DPCO plug in interface relay
- With built in test \& locking button
- With built in flag indicator
- With built in LED indicator
- DPCO contacts rated 8 Amps / 250VAC AC1
- AC \& DC coil voltages


Miniature interface relays suitable for PCB mounting or for plugging into standard 15 mm wide Din rail mounted interface relay bases. Whilst being miniature in size they also as standard benefit from user friendly features such as an integral test and locking facility, built in mechanical flag indication and a LED indicator, these features are usually associated with larger relays. Current switching capability is 8 Amps / 250VAC AC1

## SPECIFICATIONS

Contact type:
Contact rating:
Max switching voltage:
Max switching power: Contact material:
Coil power pull in:
Operate time: Release time: Mechanical life: Insulation resistance: Insulation:-
Coil to contacts: Open contacts: Between contact sets: Ambient temperature: VDE approved:
UL approved \& marked:

DPCO
8 Amps / 250VAC AC1
440VAC
2000VA
AgNi
DC 0.4 W AC 0.75 VA
(excludes LED)
15 mSec max
8 mSec max
5000000 ops 1000MOhms

5KVAC 1 min
1KVAC 1 min
2.5kVAC 1 min $-40^{\circ} \mathrm{C}$ to $+70^{\circ} \mathrm{C}$
Yes
Yes

## ORDERING INFORMATION \& COIL DATA



| P/No | COIL <br> VOLTAGE | PULL IN <br> VOLTAGE | RELEASE <br> VOLTAGE | COIL <br> CONSUMPTION* | COIL <br> OHMS* |
| :--- | :---: | :---: | :---: | :---: | :---: |
| HF115FP/12VDC | 12VDC | 8.4 VDC | 1.2 VDC | 33.3 mA | 360 |
| HF115FP/24VDC | 24VDC | 16.8 VDC | 2.4 VDC | 16.6 mA | 1440 |
| HF115FP/24VAC | 24VAC | 18VAC | 3.6 VAC | 31.6 mA | 350 |
| HF115FP/110VAC | 110 VAC | 86.3VAC | 17.3 VAC | 6.6 mA | 8100 |
| HF115FP/230VAC | 230VAC | 172.5VAC | 34.5 VAC | 3.2 mA | 3250 |
|  |  |  |  | ${ }^{*}+/-10 \%$ | ${ }^{*}+/-10 \%$ |

## DIN RAIL MOUNTED SOCKETS FOR HF115FP RELAY

Fully finger protected 8 pin miniature interface relay bases. Both the PI-50BE and PI-50BE/3 have rising tunnel style clamps. The PI-50BE/3 is a "triple deck" base with the coil connections on one side of the base and all the changeover contacts on the other side, thus achieving voltage segregation. An optional marker tab (one supplied with each base) maybe fitted in up to four different positions. Also available as an option is an ejector style retaining clip.

P/No.

PI-50BE PI-50BE/3
TR
MS25

Standard DPCO 8 pin base Triple deck DPCO 8 pin base Spare marker tab Ejector clip


PI-50BE


PI-50BE/3

Width of Bases 15.7 mm

## MODULAR POWER RELAYS

## SPECIFICATIONS

| Supply Voltage |  |
| :---: | :---: |
| Coil Voltage: | A1 to A2 (230VAC) |
|  | A1 to A3 (110VAC) |
|  | A1 to A4 (24VAC) |
|  | A1-to $44+(24 \mathrm{VDC})$ |
| Max power consumption: | 5VA/2.8W |
| Insulation: | 2.5 KV 50 Hz impulse |
| Relay outputs: |  |
| Output contacts: | 16Amps/250V AC1 |
| Max breaking capacity: | 4000VA |
| Energisation time: | $<50 \mathrm{mSec}$ |
| Reset time: | $<50 \mathrm{mSec}$ |
| Mechanical life: | 30 Million ops |
| Electrical life: | 200K ops at max rated load |
| General: |  |
| Operating temperature: | $-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$ |
| Storage temperature: | $-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$ |
| Max cable size: | 2.5 mm |
| CEmarked | Yes |
| In accordance with: | EN61000-6-1: 2007 |
|  | EN61000-6-3: 2007 |
|  | EN61010-1: 2002 |
| Housing material: | Polycarbonate, Auto extinguishable to UL 94 V-0 |



## ELECTRONIC LATCHING RELAYS

TYPES: UNI-1LR (spco) \& UNI-2LR (dpco)

- FEATURES
- Din rail mounted
- Modern modular design
- Width 27 mm ( 1.5 modules)
- SPCO \& DPCO versions
- 16 Amp AC1 rated
- Multi voltage 12-250VACDC
- Dual LED indication
- CE marked


## - DESCRIPTION \& MODE OF OPERATION

An attractive modern designed 16 Amp AC1 latching relay in a din rail mounted modular style housing of 1.5 modules width $(27 \mathrm{~mm})$. The relay features the facility of double deck terminals thus enabling the timer to be available also in both SPCO and DPCO versions. The latching function is commanded via three different trigger inputs (see operation description below). A green supply on LED is featured along with a red LED to indicate relay output status. All terminal details and information along with the CE mark is clearly marked on the sides of the housing.

## FUNCTION

A permanent supply is required at all times on terminals A1 \& A2, however this is not the controlling factor. The controlling factor is a trigger command from terminal A1 onto terminals Y1, Y2 or Y3. On an input being made from A 1 to Y 1 the relay contacts will immediately energise, on a new trigger input from A1 to Y1 the contacts will immediately de-energise. Alternatively a trigger input can be made from A1 to Y2 this just being an energisation command (ON), or A1 to Y3 a deenergisation command (OFF).

## SPECIFICATIONS

| Supply Voltage |  |
| :---: | :---: |
| Coil Voltage: | 12-250VACDC |
| Max power consumption: | 5VA/2.8W |
| Insulation: | 2.5KV 50Hzimpulse |
| Trigger inputs (Y1, Y2 \& Y 3 ): |  |
| Max consumption: | 5 mA |
| Min input time: | 25 mSec |
| Max time input: | Continuous |
| A1 to Y1: | On/ Off (toggle action) |
| A1 to Y2: | On |
| A1 to Y3: | Off |
| Relay outputs: |  |
| Output contacts: | 16Amps/250V AC1 |
| Max breaking capacity: | 4000VA |
| Reset time: | Max 100mSec |
| Mechanical life: | 30 Million ops |
| Electrical life: | 200K ops at max rated load |
| General: |  |
| Operating temperature: | $-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$ |
| Storage temperature: | $-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$ |
| Max cable size: | 2.5 mm |
| Approvals | VDE0110 (Group C) \& VDE0435 |
| CEmarked | Yes |
| In accordance with: | EN61000-6-1: 2007 |
|  | EN61000-6-3: 2007 |
|  | EN61010-1:2002 |
| Housing material | Polycarbonate, Auto extinguishable to UL 94 V-0 |



NOTE: A 4PCO 8 Amp latching relay is also possible utilising function I on our multi function unit UNI-4M. This unit is only with the ON/Off toggle input. And if you require a plug in unit see page 8.


The command contacts should be isolated from other circuits and must only be connected to the same supply as the coil voltage to the relays.

- Din rail modular design
- Tri voltage $24 \mathrm{VAC} / \mathrm{DC}, 110 \mathrm{VAC}$, 230VAC
- 4 programmable relay outputs
- Programmable for 6 sequencing/latching functions
- Selectable memory function
- Dual LED indication
- DESCRIPTION \& MODE OF OPERATION

A din rail mounted tri voltage modular latching / sequence relay with a selectable memory option. Outputs are four individual single pole normally open contacts. The unit is programmed via three front selector switches. Switch 1 determines the number of relays in play, switch 2 the function of the latching / sequencing of the relays, switch 3 selects if the memory function is required.
The unit requires a permanent supply to the coil and operation is then achieved by using up to three volt free trigger commands from A1 onto terminals FWD, BCK or RESET. The unit reacts to the leading edge of a trigger input only. If required the trigger input can then be held continuously, if then a leading edge is then seen on any of the other inputs the unit will operate accordingly. A trigger to FWD will cause the unit to switch the relays in a forward manner, whilst a trigger to BCK will cause the unit to step back a position. A RESET trigger will cause the unit to reset back to the first (start) position.
Two LED's indicate the units operation, a green LED to indicate the connection of a supply voltage. The red LED will predominantly be not illuminated however, every 2 seconds it will blink quickly the number of relays energised.

## SWITCH 1 - RELAYS

Determines the number of relays to be in operation
A: 0,1 One relay, minimum relays on $=0$
B: 0,1,2 Two relays, minimum relays on $=0$
C: 1,2 Two relays, minimum relays on $=1$
D: $0,1,2,3 \quad$ Three relays, minimum relays on $=0$
E: 1,2,3 Three relays, minimum relays on $=1$
F: 0,1,2,3,4 Four relays, minimum relays on $=0$
G: 1, 2, 3, $4 \quad$ Four relays, minimum relays on $=1$
H: All relays permanently off

## SWITCH 2 - FUNCTION

Selects the relay operation pattern
1: Repeat sequential i.e. 1-2-3-4-1-2-3-4-.....
2: Cycle sequential i.e.1-2-3-4-3-2-1-2-.....
3: Limit sequential i.e.1-2-3-4-4-4-4-4-.....
4: Repeat add i.e. 1-1\&2-1\&2\&3-1\&2\&3\&4-1-1\&2-1\&2\&3-.....
5: Cycle add i.e. 1-1\&2-1\&2\&3-1\&2\&3\&4-1\&2\&3-1\&2-.....
6: Limit add i.e. 1-1\&2-1\&2\&3-1\&2\&3\&4-1\&2\&3\&4-1\&2\&3\&4-.....

* If relay position A, B, D or F is selected then " 0 " (no relay energised), also is applicable to any of the above functions settings, i.e. the first (start) position is " 0 ".
* The above functions depict a forward stepping only, if a BCK input is made the unit will move back a position.


## SWITCH 3 - MEMORY (circa 1 month)

ON: On power up the unit will return to the last output state before power was lost
OFF: Will power up on minimum relays set at the beginning of the set pattern, i.e. relay switch set to " $E$ " relay 1 will only energise, set to " $A$ " no relays will be energised.


## TYPES: YRX, 11RX, 8RX (spco) 11R2X, 8R2X (dpco)

## - FEATURES

- Din rail or 11 pin plug in
- SPCO \& DPCO versions
- Pulses on "supply on" and/or "supply off"
- Fixed 0.5sec timing
- LED indication
- CE marked


## DESCRIPTION \& MODE OF OPERATION

Simple din rail mounted or 8 \& 11 pin plug in fleeting contact relays, available SPCO and with a DPCO option on the 8 \& 11 pin plug in units. The units have four selectable modes of operation changed via a dip switch on the top of the relay, the time of the fleeting contact is always fixed at 0.5 secs. The four modes of operation are:

1. Pulse on connection of coil supply
2. Pulse on removal of coil supply
3. Pulse on both connection and removal of coil supply
4. Unit disabled

Ideal applications for fleeting contact relays include the resetting of circuits and systems on initial "power up" or "power down".

## SPECIFICATIONS

| Supply \& measuring |  |
| :---: | :---: |
| Supply voltage tolerance: | $\pm 15 \%$ |
| Frequency: | 50/60Hz |
| Max power consumption: | 3VA |
| Timing: |  |
| Timing: | Fixed at $0.5 \mathrm{sec} \pm 20 \%$ |
| Min supply on time: | 1 sec |
| Reset time: | 2 secs |
| Relay outputs: |  |
| Output contacts: | SPCO units 10Amps/250V AC1 DPCO units 8Amps/250VAC1 |
| Mechanical life: | 30 Million ops |
| Electrical life: | 200K ops at max rated load |
| General: |  |
| Operating temperature: | $-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$ |
| Storage temperature: | $-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$ |
| Max cable size: | 4 mm |
| CE marked: | Yes |
| In accordance with: | EN61000-6-1: 2007 |
|  | EN61000-6-3: 2007 |
|  | EN61010-1: 2002 |
| Housing material: | Polycarbonate, Auto extinguishable to UL 94 V-0 |

ORDERING INFORMATION

TYPE
YRX(Din rail SPCO)
8RX (18 pin SPCO)
11RX(11 pin SPCO)
8R2X(8 pin DPCO)
11R2X(11 pin DPCO)

COILVOLTAGE
230V AC
110 V AC
48V AC/DC
24V AC/DC
230 V AC \& 24 V AC/DC*
110 V AC \& 24 V AC/DC*
48V AC/DC \& 24 V AC/DC*

## PANEL LAMP TEST MODULES ALARM INTEGRATORS PANEL, MOUNTED AUDIBLES

| PAGES | P/No. | DESCRIPTION |
| :--- | :--- | :--- |
| 115 | YWAD | Din rail 11 way filament \& neon lamp test module |
| 116 | YWACD | Din rail 8 way LED lamp test module |
| 117 | YWRICD, YWA9 | 11 pin \& Din rail alarm integrators, 8 ways to 15 ways |
|  | YWA15, 11WA8 |  |
| 118 | YWA5 | Din rail 5 way repeating alarm integrator |
| 119 | YWA10 | Din rail 10 way, twin output mutable and repeatable alarm relay |
| 120 | SC01, SX01, SY01 | Panel mounted audibles |
| 121 | SC03, SP03 |  |




## FILAMENT \& NEON LAMP TEST MODULE

TYPES: YWAD

- FEATURES
- Din rail mounted
- 11 ways, expandable
- High performance
- Cost effective


## DESCRIPTION \& MODE OF OPERATION

The limited service life of filament signal lamps often necessitates regular testing, as the indication of a defective lamp may not be immediately recognised.
The YWAD lamp test module is a din rail mounted 11 way lamp test module, the extra input terminal " C " is the lamp test input. For more than 11 ways a number of units can be linked together via the " C " input terminal.

The lamp test module uses very high voltage tolerant components, such as avalanche diodes. Avalanche diodes are especially suitable for withstanding high voltages.

## IMPORTANT NOTES

The YWAD is essentially a diode based device and can be used in both AC and DC applications. However, when used in AC applications the YWAD when activated will pass only a half cycle. This will result with the lamps being approx. $60 \%$ bright when the lamps are tested. Whilst this is satisfactory for filament lamps it is usually not sufficient for LED type lamps. For LED lamps use product type YWACD on page 116.

## SPECIFICATIONS

Max permitted voltage: 1000V
Max advised working voltage: 600V
Max current per way: 1Amp
Max instantaneous current: 20Amps for 10 mSec
Max inverse current:
Operating temperature: In accordance with:

50uA
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
EN61000-6-1: 2007
EN61000-6-3: 2007
EN61010-1: 2002
Housing material:
Polycarbonate, Auto extinguishable to UL 94 V-0

## CONNECTION DETAILS

$\begin{array}{ll}\text { Terminals 1-11: } & \text { Test Outputs } \\ \text { Terminal C: } & \text { Test Input }\end{array}$
■ ORDERING INFORMATION
YWAD



## LED LAMP TEST MODULE

## TYPES: YWACD

## FEATURES

- Din rail mounted 48 mm wide
- Dedicated voltage (full potential passed to LEDs)
- 8 ways
- Each way fully isolated

■ No back feeds

- Saves time on panel wiring
- CE marked


## DESCRIPTION \& MODE OF OPERATION

The YWACD is an 8 way lamp test module designed for use with modern LED based indicator lamps. Filament lamp test modules utilise diodes and only allow a half cycle to pass which invariably is not sufficient to strike a LED. The new YWACD is constructed in a manner that allows the full potential to pass, gives full isolation per lamp circuit and at the same time gives full back feed protection. The YWACD is designed to save on wiring time where "lamp test" is called for in specifications and cable congestion on crowded doors.

## SPECIFICATIONS

No. of ways:
Voltages:
Voltage tolerance: Power consumption: Max current per way: Max cable size: Operating temp: CE marked: In accordance with:

Housing material:

8
$12 \mathrm{~V}, 24 \mathrm{~V}, 110 \mathrm{~V}, 230 \mathrm{~V}$ (specify AC or DC)
$\pm 20 \%$
2VA / 2W
1Amp
2.5 mm
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
Yes
EN61000-6-1: 2007
EN61000-6-3: 2007
Polycarbonate, Auto extinguishable to UL 94 V- 0


## ORDERING INFORMATION

| TYPE | $\underline{\text { vOLTAGE }}$ |
| :--- | :--- |
| YWACD | 12VDC, 24VDC, 110VDC, 220VDC |
|  | 12VAC, 24VAC, 110VAC, 230VAC |
|  | OTHER VOLTAGES ON REOUEST |

## ALARM INTEGRATORS

TYPES: YWRICD 8 INPUTS, YWA9 9 INPUTS, YWA15 15 INPUTS $11 W A 88$ INPUTS (11 pin plug in)

- FEATURES
- Din rail mounted \& 11 pin plug in versions
- Choice of input ways
- High performance
- DESCRIPTION \& MODE OF OPERATION

Often in the design of a control system the requirement to provide a "common" alarm signal to say drive an audible alarm or signal a BMS system is required.
Alarm integrators are single modules available in a number of input ways. The integral electronics ensures that each input is electrically isolated from each other, thus preventing feedback from occurring between inputs. This construction enables a single unit to effectively monitor many different circuits and/or sensors and provide a common alarm output. Indicator lamps may also be connected to each input to show and display the alarm source. To increase the number of alarm ways units can be linked together to facilitate this, the alarm output contacts will require to be wired out in parallel from each unit.
The alarm output is a volt free relay output. The YWRICD is a 1C/O output, whilst the YWA9, YWA15 11WA8 are 1N/O output.
The alarm integrators are available in various input voltages. However, a mix of input voltages on one unit is not possible and in all cases the input signals must be derived from the same source, with AC versions also derived from the same phase.
The alarm integrators use very high voltage tolerant components, such as avalanche diodes. Avalanche diodes are especially suitable for withstanding high voltages.

## SPECIFICATIONS

Voltage tolerance: Operating temperature: Outward contact YWRICD \& 11WA8: YWA9 \& YWA15:
Housing material:
$\pm 15 \%$
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$

10Amps/250VAC 1Amp/50VDC
5Amps/250VAC
Polycarbonate, Auto extinguishable to UL 94 V-0

## CONNECTION DETAILS

YWA9 \& YWA15:
Terminals (1-9), (1-15):

Terminal N:
Terminals AA:

## YWRICD:

Terminals 1-8:

## Terminal A2:

Terminal 11:
Terminal 12:
Terminal 14:

## 11WA8:

Pins 1-8:

## Pin 10:

Pins 9 \& 11:

Alarm signal inputs (for $\mathrm{DC}+\mathrm{V}$ signals required) Common Neutral or with DC OV Normally open alarm contact

## Alarm signal inputs

(for $\mathrm{DC}+\mathrm{V}$ signals required)
Common Neutral or with DC OV
Common of $\mathrm{C} / 0$ relay output
Closed of $\mathrm{C} / \mathrm{O}$ relay output
Open of $\mathrm{C} / 0$ relay output

Alarm signal inputs
(for $\mathrm{DC}+\mathrm{V}$ signals required)
Common neutral or with DC OV
Normally open alarm contact



## ORDERING INFORMATION

TYPE
YWRICD/Volts:
YWA9/Volts: YWA15/Volts: 11WA8/Volts: Voltages:

## DESCRIPTION

8 inputs 1 C/O output
9 inputs 1 N/O output
15 inputs 1 N/O output
8 inputs 1 N/O output
12VACDC, 24VACDC,
48VACDC, $110 \mathrm{VAC}, 230 \mathrm{VAC}$

## REPEATING ALARM INTEGRATORS

TYPES: YWA5

- FEATURES
- Din rail mounted
- 5 input ways
- Mutable
- High performance
- An economical solution

DESCRIPTION \& MODE OF OPERATION
Often in the design of a control system the requirement to provide a "common" alarm signal to say drive an audible alarm or signal a BMS system is required. However, it is sometimes required that after an alarm input signal is received the output relay is cancelled, thus say silencing an audible even if the alarm input is still present. The YWA5 achieves this function.
The YWA5 is available in various input voltages. However, a mix of input voltages on one unit is not possible and in all cases the input signals must be derived from the same source, with AC versions also derived from the same phase.
The integral electronics ensures that each input is electrically isolated from each other, thus preventing feedback from occurring between inputs. The YWA5 use very high voltage tolerant components, such as avalanche diodes. Avalanche diodes are especially suitable for withstanding high voltages.

## MODE OF OPERATION IN BRIEF

YWA5, any input in the output relay energises. The output relay can then be reset via a pulse to the cancel terminal " C ", even if the original input(s) is still present. Another input in and the relay will energise again - and so on. Removal of all inputs before reset via cancel will cause the relay to reset. The cancel signal on terminal " C " must be the same voltage as the input signals. Do not maintain the cancel signal for any longer than is necessary or new alarms may not become apparent, in no event should a "maintained contact" input be used.

## SPECIFICATIONS

Voltage tolerance:
Operating temperature:
Outward contact:
Housing material:
$\pm 15 \%$
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
5Amps/250VAC
Polycarbonate, Auto extinguishable to UL 94 V-0

## CONNECTION DETAILS

Terminal N:
Terminal C:

Terminals AA:

Common Neutral or with DC OV
Cancel input (for $\mathrm{DC}+\mathrm{V}$ signal required) Normally open alarm contact, closes on alarm, opens on reset

## ORDERING INFORMATION

## 10 INPUT, TWIN OUTPUT, MUTABLE \& REPEATABLE ALARM MODULE

TYPES: YWA10

- FEATURES
- Din rail mounted
- 10 input ways
- Twin outputs
- Mutable \& repeatable
- High performance
- Compact size
- DESCRIPTION \& MODE OF OPERATION

Often in the design of a control system the requirement to provide a "common" alarm signal to say drive an audible alarm or signal a BMS system is required. However, it is sometimes required that after an alarm input signal is received the output relay is cancelled, thus say silencing an audible even if the alarm input is still present, but also with an alarm contact still to remain to give silent indication. The YWA10 achieves this function.
The YWA10 is only available in 24VACDC input voltage. In all cases the input signals must be derived from the same source, with AC versions also derived from the same phase.
The integral electronics ensures that each input is electrically isolated from each other, thus preventing feedback from occurring between inputs.

## MODE OF OPERATION IN BRIEF

YWA10, any input in then two separate output relays energise. One output relay (AA) can then be reset via a pulse to the cancel terminal " C ", even if the original input(s) is still present, the second relay (BB) will always remain energised so long as an alarm input is present. Another input in and the cancelled relay will energise again - and so on.

## SPECIFICATIONS

| Voltage tolerance: | $\pm 15 \%$ |
| :--- | :--- |
| Operating temperature: | $-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$ |
| Outward contact: | $5 \mathrm{Amps} / 250 \mathrm{VAC}$ |
| Housing material: | Polycarbonate, Auto extinguishable <br>  |
| to UL 94 V-0 |  |

## CONNECTION DETAILS

Terminal N:
Terminal C:
Terminals AA:
Terminals BB: Terminals 1-10:

Common Neutral or with DC OV Cancel input (for $\mathrm{DC}+\mathrm{V}$ signal required) Normally open alarm contact, closes on alarm, opens on reset Normally open alarm contact, closes on alarm Alarm signal inputs (for $\mathrm{DC}+\mathrm{V}$ signals required)

## ORDERING INFORMATION




## FOXTAM PANEL MOUNTED AUDIBLES

## TYPES: SC01-428, SX01-428, SY01-115 SC03-115, SC03-250, SP03-250

- Solid state
- No moving parts
- No RF noise or electrical interference
- Ideal for hostile environments


## DESCRIPTION

Sonartones are panel mounted audible alarms, inexpensive and rugged that cannot be ignored. They produce a penetrating sound, with a volume of between $80-95 \mathrm{~dB}$ this can be varied by adjusting the supply voltage. Both continuous and pulsating tone units are available in a wide range of AC and DC supply voltages. Connections are via a pair of $0.8 \times 6.3 \mathrm{~mm}$ male push on terminals, also tapped with fitted screws. Note: dedicated DC voltage audible's are polarity sensitive and will not operate if the DC voltage is applied in reverse direction, damage is also likely to occur.

## SPECIFICATIONS

| Operating temperature: | $-30^{\circ} \mathrm{C}$ to $+60^{\circ} \mathrm{C}$ |
| :--- | :--- |
| Humidity: | $95 \% \mathrm{RH} / 40^{\circ} \mathrm{C} \mathrm{max}$ (for 100 hours) |
| Voltage tolerance: | $+15 \%$ Max |
| Life test continuous: | 300 hours |
| Life test intermittent: | 1 min on, 5 min off duty cycle 1000 times |
| Intensity: | $80-95 \mathrm{~dB}$ at 1 meter |
| Housing material: | Self-extinguishing nylon |

## MOUNTING

Mounting is via the rear of the panel with a maximum panel thickness of 6.3 mm a clearance hole size of 29 mm diameter is required.

## ORDERING INFORMATION

| $\underline{\text { P/No }}$ | $\underline{\text { Voltage }}$ | $\underline{\text { Tone }}$ | $\underline{\text { Case size }}$ |
| :--- | :--- | :--- | :--- |
| SC01-428 | 4-28VDC | Continuous | 01 |
| SX01-428 | 4-28VAC/DC | Continuous | 01 |
| SY01-428 | 4-28VAC/DC | Pulsating | 01 |
| SC03-115 | 30-120VAC/DC | Continuous | 03 |
| SC03-250 | 50-250VAC | Continuous | 03 |
| SP03-250 | 50-250VAC | Pulsating | 01 |

## INDICATOR \& ALARM ANNUNCIATOR PANELS

- 10 way indicator panel
- Choice of LED colours
- With built in lamp test button
- 24VAC/DC supply voltage

- 10 way alarm / indicator panel
- Single selectable relay output
- Each input selectable to R1 or just indicate
- Adjustable time delay
- Choice of LED colours
- With built in lamp test button
- 24VAC/DC supply voltage

- FC-DK10
- 10 way alarm / indicator panel
- Dual selectable relay output
- Each input selectable to R1, R2 or just indicate
- Adjustable time delay

■ Choice of LED colours

- With built in lamp test button
- 24VAC/DC supply voltage

- FC-LKM10 \& FC-LKS10
- 10 way fully mutable \& repeatable alarm annunciator panel
- 10 way expandable panels (FC-LKS10)
- Each input selectable to R1, R2, R3 or just indicate
- Adjustable time delay
- Each output selectable to be "NO" or "NC"
- Each input selectable to be latched or non latched

■ Choice of LED colours


- With built in lamp test \& reset button
- 24VAC/DC supply voltage

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## DC POWER SUPPLIES DC TO DC CONVERTERS VOLTAGE TRANSFORMERS

| PAGES | P/No. | DESCRIPTION |
| :--- | :--- | :--- |
| 124 \& 125 | FOX.PSU-1 | Din rail Modular 12VDC \& 24VDC power supplies |
| 126 | YxxA0-10D | Din rail adjustable 0-10VDC output BMS power supply |
| 127 to 132 | FOX.PSU-2 | Din rail 10VDC, 12VDC \& 24VDC power supplies |
| 133 \& 134 | YxxDxxD | Din rail DC to DC converters |
| 135 | FOX.TXM | Din rail Modular 230VAC/24VAC secondary voltage transformers |
| $136 \& 137$ | FOX.TX | Open metal frame voltage transformers |



# FOXTAM DIN RAIL MOUNTED MODULAR SWITCH MODE POWER SUPPLIES 

PRODUCT GROUP

## TYPE: FOX.PSU-1 xxx/xx

- Din rail mounted modular construction
- Switch mode technology \& regulated class 2
- 12VDC output from 1 amp to 5 Amps
- 24VDC output from 0.5 amps to 2.5 Amps
- 100-240VAC universal voltage primary
- Short circuit protection
- Electronic overload protection
- CE marked


## TECHNICAL SPECIFICATIONS

## INPUT

Primary voltage:
Frequency: OUTPUT Indication: Adjustment: Regulation: Temp range:

Continuous use: STANDARDS
Safety standards: EMC standards: Insulation:
CE marked:

100-240VAC +/-10\% $47-63 \mathrm{~Hz}$

Via green LED (not 1 module units)
12-14VDC \& 24-28VDC (not 1 module units)
$+/-3 \%$ across $0-100 \%$ of load
$0-50^{\circ} \mathrm{C}$ full load possible
$60^{\circ} \mathrm{C}$ possible but at $-30 \%$ reduced load
Yes

EN60950-2006/95/ECC 89/336
EN55022/B - EN55024
Class II
Yes

## CASE DIMENSIONS



Example illustrated is 3 modules width, the profile is the same for all case sizes but the widths vary as follows:
1 Module width: $\quad A=17.5 \mathrm{~mm}$
2 Modules width: $A=35.0 \mathrm{~mm}$
3 Modules width: $A=52.5 \mathrm{~mm}$
4 Modules width: $A=70.0 \mathrm{~mm}$

## FOX.PSU-1 012/12VDC FOX.PSU-1 012/24VDC

## FEATURES

$\square$ Output 12VDC / 1 Amp
Output 24VDC / 0.5 Amp

- Only 1 module width (17.5mm)
- Primary voltage 100-240VAC universal

PRODUCT GROUP

## FOX.PSU-1 024/12VDC FOX.PSU-1 024/24VDC

## FEATURES

- Output 12VDC adjustable 12-14VDC / 2 Amps Output 24VDC adjustable 24-28VDC / 1 Amps
- 2 modules width ( 35 mm )
- Primary voltage 100-240VAC universal

- LED indication for output healthy


## FOX.PSU-1 030/24VDC

## - FEATURES

- Output 24VDC adjustable 24-28VDC / 1.25 Amps
- 3 modules width ( 53.5 mm )
- Primary voltage $\mathbf{1 0 0} \mathbf{- 2 4 0 V A C}$ universal
- LED indication for output healthy



## FOX.PSU-1 060/12VDC FOX.PSU-1 060/24VDC

[^13]

## AC TO ADJUSTABLE 0-10VDC OUTPUT BMS POWER

 SUPPLY
## PRODUCT

 GROUPTYPES: Y24A0-10D, Y110A0-10D, Y230A0-10D - FEATURES

- Din Rail Mounted
- Separate Input \& Output LED Indication
- Input Voltage 24VAC, 110VAC, 230VAC
- Output 0-10VDC Adjustable
- CE Marked
- RoHS Compliant


## DESCRIPTION



A conveniently packaged Din rail mounted AC voltage to an adjustable 0-10VDC output module. Designed specifically for "HAND / OFF / AUTO" applications for BMS controller inputs, when in "HAND" a DC voltage needs to be forced into BMS input cards, but not necessarily a full 10VDC signal is required. This product can be specified with either a $24 \mathrm{VAC}, 110 \mathrm{VAC}$ or 230 VAC primary voltage, the output voltage is an adjustable $0-10 \mathrm{VDC}$ via a front mounted potentiometer. A healthy AC input voltage is signalled by an illuminated green LED, and the output voltage is indicated by an increasing in intensity illuminated red LED starting at 1VDC (below 1VDC the output will be present, but without LED indication). Note this product is not designed to power "control circuits", it is only for driving into BMS input cards, max 10mA @ 10VDC.

## SPECIFICATIONS

## Input Supply

Nominal Input:
Output Voltage Range:
Min Impedance:
Max Impedance:
Max Output Load:
AC Supply Healthy:
DC Output Healthy:
Output Voltage Regulation:

## General

Operating Temperature:
Storage Temperature: Humidity: Isolation Voltage I/P-0/P: CE Marked:
Standards Applied:

Material Housing:
RoHS Compliant:

24VAC, 110VAC, 230VAC
0-10VDC
1 K 0 hm
Infinity Ohms
10 mA
Via Green LED
Via Red LED
Variable Intensity 1-10VDC
$\leq 0.5 \%$
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
95\% Rel H max
1500VDC for 1 Min
Yes
EN60950-1
EN6100-6-3
EN61010-1
Polycarbonate
Auto extinguishable to UL 94V-0 Yes

## ORDERING INFORMATION

| Type | Input Voltage | Output Voltage |
| :---: | :---: | :---: |
| Y24A0-10D | 24VAC | 0-10VDC |
| Y110A0-10D | 110VAC | $0-10 \mathrm{VDC}$ |
| Y230A0-10D | 230VAC | 0-10VDC |

## CONNECTIONS



## FOXTAM SWITCH MODE POWER SUPPLIES

TYPE: FOX.PSU-2 xxx/xxx

## FEATURES

- DIN RAIL MOUNTED
- VERY COMPACT
- HIGH QUALITY
- 26-34 YEARS MTBF
- 10VDC, 12VDC \& 24VDC OUTPUTS

■ OUTPUTS FROM 1.04 AMPS TO 20.8 AMPS

- DUAL PRIMARY VOLTAGE 110 / 240VAC
- ADJUSTABLE OUTPUTS +/- 10\%
- BUILT IN SHORT CIRCUIT PROTECTION WITH AUTO RESET


## DESCRIPTION

A range of din rail mounted switch mode power supplies in either 10VDC, 12VDC or 24VDC output voltage, that is also adjustable by $+/-10 \%$. The FOX.PSU- 2 range of power supplies are of very high quality with a MTBF figure (Mean Time Between Failure) of between 26 and 34 years. The power supplies feature built in short circuit and overload protection with auto reset. The smaller output power supplies have a universal primary voltage of between 100-240VAC, whilst the larger output units are selectable via a switch 115 V or 240 VAC .

## TECHNICAL SPECIFICATIONS

## Input

Primary voltage:

Frequency:
Tolerance:

## Output

Indication:
Voltage adjustment:
Voltage tolerance: Voltage linearity: Load influence: Start up time: Off time: Short circuit protect: Ripple 10VDC, 12VDC: Ripple 24VDC:

## General

Operating temperature: Storage temperature: Humidity: Dielectric strength: Terminals: CE Marked: Continual use:

100-240VAC universal (25W \& 50W) 100-120VAC \& 200-240VAC switchable (100W, 150W, 300W \& 500W versions) 47-63Hz
$-15 \%$ to $+10 \%$

Via green LED
Via potentiometer +/-10\%
$+/-1 \%$ max with $0-100 \%$ load
$+/-1 \%$ max with 0-100\% load
$+/-1 \&$ max with $0-100 \%$ load
Max 3 secs
Max 13 mSec
Yes, with auto reset
$25 \mathrm{~W} / 120 \mathrm{mV}, 50 \mathrm{~W} / 100 \mathrm{mV}, 150 \mathrm{~W} / 120 \mathrm{mV}$
$25 \mathrm{~W} / 150 \mathrm{mV}$, all others 240 mV
$-15^{\circ} \mathrm{C}$ to $+50^{\circ} \mathrm{C}$
$-20^{\circ} \mathrm{C}$ to $+80^{\circ} \mathrm{C}$
5-95\% RH
2 KV for 1 min, between input, output $\&$ housing
Screw terminals max $2 \times 2.5 \mathrm{~mm}$ cable
Yes
Yes


## FOX.PSU-2 025/10VDC

FOX.PSU-2 025/10VDC DIMENSIONS

## FOX.PSU-2 025/12VDC

## FEATURES

- Output 12VDC / 2.08 Amps
- Primary voltage 100-240VAC universal
- Adjustable output +/-10\%
- LED Indication

FOX.PSU-2 025/12VDC DIMENSIONS



PRODUCT

- Primary voltage 100-240VAC universal
- Adjustable output +/-10\%
- LED indication



FOX.PSU-2 025/12VDC CONNECTIONS


## FOX.PSU-2 050/12VDC

- FEATURES
- Output 12VDC / 4.2 Amps
- Primary voltage 100-240VAC universal
- Adjustable output +/-10\%
- Protected terminals
- LED indication


PRODUCT

FOX.PSU-2 050/12VDC CONNECTIONS


## FOX.PSU-2 150/12VDC

- FEATURES
- Output 12VDC / 12.5 Amps
- Primary voltage 100-120VAC \& 200-240VAC switchable
- Adjustable output +/-10\%
- LED indication


FOX.PSU-2 150/12VDC DIMENSIONS


FOX.PSU-2 150/12VDC CONNECTIONS


## FOX.PSU-2 025/24VDC



■ Primary voltage 100-240VAC universal

- Adjustable output +/-10\%
- LED indication



## FOX.PSU-2 050/24VDC

- FEATURES
- Output 24VDC / 2.1 Amps
- Primary voltage 100-240VDC universal
- Adjustable output +/-10\%
- Protected terminals
- LED indication

FOX.PSU-2 050/24VDC DIMENSIONS


FOX.PSU-2 025/24VDC CONNECTIONS



FOX.PSU-2 050/24VDC CONNECTIONS


## FOX.PSU-2 100/24VDC

## FEATURES

■ Output 24VDC / 4.2 Amps

- Primary voltage 100-120VAC \& 200-240VAC switchable
- Adjustable output +/-10\%
- Protected terminals
- LED indication


FOX.PSU-2 100/24VDC DIMENSIONS


## FOX.PSU-2 150/24VDC

## - FEATURES

- Output 24VDC / 6.25 Amps
- Primary voltage $\mathbf{1 0 0} \mathbf{- 1 2 0 V A C}$ \& 200-240VAC switchable
- Adjustable output +/-10\%
- LED indication

FOX.PSU-2 150/24VDC DIMENSIONS


FOX.PSU-2 150/24VDC CONNECTIONS


## FOX.PSU-2 300/24VDC



## FOX.PSU-2 500/24VDC

## FEATURES

- Output 24VDC / 20.8 Amps
- Primary voltage $\mathbf{1 0 0}$-120VAC \& 200-240VAC switchable
- Adjustable output
- Built in cooling fan
- Protected terminals
- LED indication



## FOX.PSU-2 500/24VDC DIMENSIONS



FOX.PSU-2 500/24VDC CONNECTIONS


## DIN RAIL, DC TO DC CONVERTERS

TYPES: Y24D5D, Y24D12D, Y24D24D, Y48D5D, Y48D12D, Y48D24D.

- FEATURES
- Din rail mounted
- Input supply healthy LED indication
- Output supply healthy LED indication
- Indefinite short-circuit protection
- I/O Isolation 1500VDC
- Wide input voltage range 9-36VDC \& 18-75 VDC
- Outputs 5VDC, 12VDC, 24VDC
- 6 Watt outputs

DESCRIPTION
Din rial mounted DC/DC converters with a wide ranging input supply. High efficiency operation and low output noise. These DC/DC converters feature separate LED indication for healthy input \& output supplies. All terminal details along with CE mark is clearly marked on the side of the housing.

## CONNECTIONS



IMPORTANT NOTE: Polarity matters, incorrect connection will cause non operation.


[^14]
## - FEATURES

- Primary current 0-50 Amps
- Voltage up to 800VAC or 1000VDC
- Voltage up to 80VAC or 100VDC (LV version)
- Universal AC $\mathbf{1 - 4 0 0 H z}$ or DC measurement
- Output RS485 MODBUS RTU
- Measures Volts, Current, Watts, VAr, VA, Voltage Peak Current Peak, Hz, COS, KWh import, KWh export, THD
- Class 0.5 accuracy (voltage, current, active power)
- TRMS measurement
- Screw mounting or Din rail mounting
- Fast response time



## - DESCRIPTION

The Ol-POWER-485 and Ol-POWER-485-LV are moulded case high accuracy "CT" style universal DC or AC multi parameter energy meters and are galvanically isolated from the measuring circuit. The "CT's" have a primary current range of $0-50 \mathrm{Amps}$ AC/DC and for voltage up to 800VAC or 1000VDC (LV version 80VAC or 100VDC).
The "CT's" are equipped with RS485 MODBUS RTU communications. Measuring parameters include Volts, Peak Volts, Current, Peak Current, Watts, VAr, VA, Hz, COS, KWh import, KWh export \& THD.
Via the RS485 the "CT's" are fully configurable with the aid of free software supplied, for example response / filtering times can be configured, along with minimum current and power thresholds (below these values the device cuts off and the measured value is zero. The Baudrate is selected via dip-switches.
The "CT's" require a supply voltage of 9 to 30 VDC and has an internal aperture size of 15 mm Dia.
The principle of putting in primary turns on CT's to reduce the primary current range also applies to these current transformers.

## SPECIFICATIONS

Supply voltage:
Power consumption:
Accuracy:

Resolution:
Temp coefficient:
Operating temp:
Humidity:
Output:
Baudrate:
Sampling rate:
Input impedance:
Mounting:
Dip switch:
Max measurement range:

AC frequency range: Measuring parameters:

Isolation:

Indication:

Terminals:

9 to 30VDC
$<1.3$ W
@ $25^{\circ} \mathrm{C}$ up to 200 Hz
Class 0.5 (I, V, W)
Frequency $+/-0.1 \mathrm{~Hz}$
12 bit
$<200 \mathrm{ppm} /{ }^{\circ} \mathrm{C}$
-15 to $+65^{\circ} \mathrm{C}$
$10-90 \% R H t$
RS485 MODBUS RTU
1200.... 115200 Baud

11 K samples per second
1M Ohm +/-1\%
Screw or Din rail
2 way
50 Amps AC/DC 800VAC or 1000 VDC 80VAC or 100VDC (LV version) $1-400 \mathrm{~Hz}$
Volts, Peak Volts, Current, Peak Current, Watts, VAr, VA, Hz, COS, KWh import \& export, THD min \& max each reading 3 KV current measurement 4 KV voltage measurement On an uninsulated conductor Via yellow LED Supply voltage present - steady Data communicating - flashing 4 way \& 2 way removable plug


## DIP SWITCH TABLE

| Dip switch settings | $\mathbf{1}$ | $\mathbf{2}$ |
| :---: | :---: | :---: |
| All setting from EEPROM | 0 | 0 |
| Set Address 1 -Baud 9600 | 1 | 0 |
| Set Address 1 -Baud 38400 | 1 | 1 |

## ORDERING INFORMATION

P/No. Ol-POWER-485
QI-POWER-485-LV (Low Voltage version)

# 300 Amps/800VAC or 400 Amps/1000VDC 300 Amps/80VAC or 400 Amps/100VDC 

## FEATURES

- Primary current 0-300 Amps AC or 400 Amps DC
- Voltage up to 800 VAC or 1000 VDC

■ Voltage up to 80VAC or 100VDC (LV version)

- Universal AC $1-400 \mathrm{~Hz}$ or DC measurement
- Output RS485 MODBUS RTU with over 200 registers
- Measures Volts, Current, Watts, VAr, VA, Voltage Peak Current Peak, Hz, COS, KWh import, KWh export, THD
- Class 0.5 accuracy (voltage, current, active power)
- TRMS measurement
- Screw mounting or Din rail mounting
- Fast response time



## - DESCRIPTION

The OI-POWER-485-300 and OI-POWER-485-300-LV are moulded case high accuracy "CT" style universal DC or AC multi parameter energy meters and are galvanically isolated from the measuring circuit. The "CT's" have a primary current range of $0-300$ Amps AC or $0-400$ Amps DC and for voltage up to 800VAC or 1000VDC (LV version 80VAC or 100VDC).
The "CT's" are equipped with RS485 MODBUS RTU communications. Measuring parameters include Volts, Peak Volts, Current, Peak Current, Watts, VAr, VA, Hz, COS, KWh import, KWh export \& THD.
Via the RS485 the "CT's" are fully configurable with the aid of free software supplied, for example response / filtering times can be configured, along with minimum current and power thresholds (below these values the device cuts off and the measured value is zero. The Baudrate is selected via dip-switches.
The "CT's" require a supply voltage of 9 to 30VDC and has an internal aperture size of 33 mm Dia.
The principle of putting in primary turns on CT's to reduce the primary current range also applies to these current transformers.

## SPECIFICATIONS

| Supply voltage: <br> Power consumption: <br> Accuracy: | 9 to 30VDC |
| :---: | :---: |
|  | <1.3 W |
|  | @ $25^{\circ} \mathrm{C}$ up to 200 Hz |
|  | Class 0.5 (I, V, W) |
|  | Frequency $+/-0.1 \mathrm{~Hz}$ |
| Resolution: | 12 bit |
| Temp coefficient: | <200 ppm/ ${ }^{\circ} \mathrm{C}$ |
| Operating temp: | -15 to $+65^{\circ} \mathrm{C}$ |
| Humidity: | 10-90 \% RHt |
| Output: | RS485 MODBUS RTU |
| Baudrate: | 1200.... 115200 Baud |
| Sampling rate: | 11 K samples per second |
| Input impedance: | 1M Ohm +/-1\% |
| Mounting: | Screw or Din rail |
| Dip switch: | 2 way |
| Max measurement range: | 300Amps AC or 400 Amps DC 800VAC or 1000VDC |
|  | 80 VAC or 100VDC (LV version) |
| AC frequency range: Measuring parameters: | $1-400 \mathrm{~Hz}$ |
|  | Volts, Peak Volts, Current, Peak Current, Watts, VAr, VA, $\mathrm{Hz}, \mathrm{COS}, \mathrm{KWh}$ import \& export, THD min \& max each reading |
| Isolation: | 3 KV current measurement |
|  | 4 KV voltage measurement |
|  | On an uninsulated conductor |
| Indication: | Via yellow LED |
|  | Supply voltage present - steady |
|  | Data communicating - flashing |
| Terminals: | 4 way \& 2 way removable plug |



## DIP SWITCH TABLE

| Dip switch settings | $\mathbf{1}$ | $\mathbf{2}$ |
| :---: | :---: | :---: |
| All setting from EEPROM | 0 | 0 |
| Set Address 1 -Baud 9600 | 1 | 0 |
| Set Address 1 -Baud 38400 | 1 | 1 |

## ORDERING INFORMATION

P/No. OI-POWER-485-300
OI-POWER-485-300-LV (Low Voltage version)

| REGISTER NAME | COMMENT | REGISTER TYPE | $\begin{aligned} & \text { R/ } \\ & \mathbf{W} \end{aligned}$ | DEFAULT VALUE | RANGE | MODBUS ADDRESS |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Machine_ID | ID machine | Unsigned 16 bits | R | 16 |  | 40001 |
| FW_VERSION | Firmware Release | Unsigned 16 bits | R |  |  | 40002 |
| addr | MODBUS ADDRESS | Unsigned 16 bits | R/W | 1 | $1 . . .250$ | 40003 |
| Delay | Answer Delay | Unsigned 16 bits | R/W | 1 | $1 . . .1000$ | 40004 |
| Baudrate | $\begin{gathered} \text { Baudrate } \\ 0=1200 / 1=2400 \\ 2=48000 / 3=9600 \\ 4=19200 / 5=38400 \\ 6=57600 / 7=115200 \end{gathered}$ | Unsigned 16 bits | R/W | 1 | 1 ... 7 | 40005 |
| parity | $\begin{gathered} \text { Type of parity } \\ 0=8, N, 1 \\ 1=8,0,1(\mathrm{ODD}) \\ 2=8, \mathrm{E}, 1 \text { (EVEN) } \end{gathered}$ | Unsigned 16 bits | R/W | 0 | $0 \ldots 2$ | 40006 |
| In_start | Start Input | Floating 32 bits | R/W | 0 |  | $\begin{aligned} & 40007 \text { (LO) } \\ & 40008 \text { (HI) } \end{aligned}$ |
| In-Stop | Stop Input | Floating 32 bits | R/W | $\begin{gathered} 300 \\ \text { AC/DC } \end{gathered}$ |  | $\begin{aligned} & 40009 \text { (LO) } \\ & 40010 \text { (HI) } \end{aligned}$ |
| Out_start_V | Start Output (mV) | Unsigned 16 bits | R/W | 0 | $\begin{gathered} 1 \\ \ldots \\ \ldots \end{gathered}$ | 40011 |
| Out_stop_V | Stop Output (mV) | Unsigned 16 bits | R/W | 10000 | $\begin{gathered} 0 \\ \ldots 10000 \end{gathered}$ | 40012 |
| flit1 | no of samples for mobile average ( $1=100 \mathrm{~ms}$ ) | Unsigned 16 bits | R/W | 1 | 1 ... 32 | 40013 |
| flit | Second level filter for ripple problems on AC measurement | Unsigned 16 bits | R/W | 4096 | $\begin{aligned} & 1000 \ldots \\ & 20000 \end{aligned}$ | 40014 |
| Cutoff | Cutoff value (A) | Unsigned 16 bits | R/W | 1500 |  | 40029 |
| RMS_A | RMS Current Value | Floating 32 bits | R |  |  | $\begin{aligned} & 40037 \text { (LO) } \\ & 40038 \text { (HI) } \end{aligned}$ |
| status | Status Register <br> bit $0=1$ : Error flash setting <br> bit 1=1: Errorflashcalibration <br> bit 2=1: Over Range <br> bit 3=1: Under Range | Unsigned 16 bits | R |  |  | 40048 |
| RMS_100 | RMS Value of Current $(A \times 100)$ | Signed 16 bits | R |  |  | 40050 |
| RMS_sw | RMS Current Value @ swapped | Floating 32 bits | R |  |  | $\begin{aligned} & 40051 \text { (HI) } \\ & 40052 \text { (LO) } \end{aligned}$ |
| Ah | Ah counting (resettable) | Floating 32 bits | R/W |  |  | $\begin{aligned} & 40053 \text { (LO) } \\ & 40054 \text { (HI) } \end{aligned}$ |
| A_MAX | Max current value/100 (resettable) | Signed 16 bits | R/W |  |  | 40055 |
| A_min | min current value/100 (resettable) | Signed 16 bits | R/W |  |  | 40056 |
| Data High | Calibration Data (yy,mm) | Unsigned 16 bits | R |  |  | 40057 |
| Data Medium | Calibration Data (day, hour) | Unsigned 16 bits | R |  |  | 40058 |
| Data Low | Calibration Data (min, sec) | Unsigned 16 bits | R |  |  | 40059 |


| DISCRIPTION | $\mathbf{1}$ | $\mathbf{2}$ | $\mathbf{3}$ | $\mathbf{4}$ | $\mathbf{5}$ | $\mathbf{6}$ | $\mathbf{7}$ | $\mathbf{8}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| All setting from EEPROM | 0 | 0 | 0 | 0 |  |  |  |  |
| ADD $=\mathbf{1}$ | 0 | 0 | 0 | 1 |  |  |  |  |
| ADD $=\mathbf{2}$ | 0 | 0 | 1 | 0 |  |  |  |  |
| ADD $=15$ | 1 | 1 | 1 | 1 |  |  |  |  |
| 2400 BAUDRATE |  |  |  |  | 0 | 0 |  |  |
| 9600 BAUDRATE |  |  |  |  | 0 | 1 |  |  |
| 38400 BAUDRATE |  |  |  |  | 1 | 0 |  |  |
| 57800 BAUDRATE |  |  |  |  | 1 | 1 |  |  |
| MONOPOLAR (TRMS) |  |  |  |  |  |  | 0 |  |
| BIPOLAR (MEAN VALUE) |  |  |  |  |  |  | 1 |  |
| 300 A AC/DC |  |  |  |  |  |  |  | 0 |
| 150 A AC/DC |  |  |  |  |  |  |  | 1 |

## CONNECTION DIAGRAM FOR OI-POWER-xxx



## SOFTWARE DOWNLOADS

To enable programming, setup and configuration the following two free software downloads are available from www.qeed.it (section products/download software). Java required.

## Product Type

FACILE-QI-50-V-485
FACILE-QI-POWER-485

For Ol-50-V-485 \& Ol-300-V-485
For all Ol-POWER-xxx variants

## STANDARDS

EN61000-6-4/2006 + A1 2011;
EN64000-6-2/2005 ; EN61010-1/2010
EN55022: 2010-12; EN55024: 2010-11;
EN61000-6-4/2006 + A1 2011;
EN64000-6-2/2005 ; EN61010-1/2010
CE Marked and UL pending on (some types)

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## ANALOGUE METERS, DIGITAL METERS,KWh \& MULTI DISPLAY METERS

| PAGES | P/No. | DESCRIPTION |
| :---: | :---: | :---: |
| 192 | AU318E | Ammeter selector switch |
|  | V308E | Voltmeter selector switch |
| 193 to 195 |  | Din 48/72/96mm analogue meters |
| 196 \& 197 | CS3S | Din $48 \times 24 \mathrm{~mm}, 4$ digit, display only digital panel meters |
| 198 \& 199 | CS3 | Din $48 \times 24 \mathrm{~mm}, 5$ digit, digital panel meters with output options |
| 200 \& 201 | CM2 | Din $96 \times 48 \mathrm{~mm}, 4$ digit, display only digital panel meters |
| 202 \& 203 | CSS-40/41/50 | Din $96 \times 48 \mathrm{~mm}, 4,41 / 2,5$ digit digital panel meters with thumbwheel selectable relay output setpoints |
| 204 to 207 | CS1/CS2 | Din $96 \times 48 \mathrm{~mm}, 5$ digit, digital panel meters with output options |
| 208 | CST-321M | Din $96 \times 48 \mathrm{~mm}, 31 / 2$ digit, six channel temperature meter |
| 209 | CS2-TM | Din $96 \times 48 \mathrm{~mm}$, DC Ampere hour meter with output options |
| 210 \& 211 | VAW | Din $96 \times 48 \mathrm{~mm}$, DC multi display energy meter with output options |
| 212 \& 213 | MW-5 | Din $96 \times 48 \mathrm{~mm}, 4112$ digit, Wattmeter with output options |
|  | MQ-5 | Din $96 \times 48 \mathrm{~mm}, 4112$ digit, VAr meter with output options |
|  | MPF-5 | Din $96 \times 48 \mathrm{~mm}, 4112$ digit, Power Factor meter with output options |
| 215 | CUBE 300 | Din 96 mm , KW \& KWh meter |
| 216 \& 217 | CUBE 350 | Din 96 mm , single line display multi display energy meter |
| 218 \& 219 | CUBE 400 | Din 96 mm , three line display multi display energy meter |
| 220 \& 221 | MULTICUBE 950 | Din 96 mm , three line display, multi channel input, multi display energy meter |
| 222 \& 223 | RAIL 350 | Din rail mounted, multi display energy meters |



## AMMETER AND VOLTMETER SELECTOR SWITCHES

## DESCRIPTION

Two rotary selector switches for switching of ammeters (4 positions) and voltmeters (7 positions)

## APPLICATION

Suitable for panel builders requiring a panel mounted switch for switching meters between phase currents or line \& phase voltages.

## DIMENSIONS




SPECIFICATIONS

Rated current: Rated voltage: IP rating: Max cable size: Temperature range: CE Marked:

BS EN 60947-3 10 A (AC22) BS EN 60947-3 500 V AC Front - IP 40, Back - IP 2X $4 \mathrm{~mm}^{2}$ $20^{\circ} \mathrm{C}$ to $+40^{\circ} \mathrm{C}$ Yes

## TYPE: AU318E AMMETER SELECTOR SWITCH



## TYPE: V308E VOLTMETER SELECTOR SWITCH



## FOXTAM DIN 48, 72, 96mm ANALOGUE METERS

## GENERAL INTRODUCTION

The Foxtam Controls range of Din standard analogue meters are available as $48 \mathrm{~mm}, 72 \mathrm{~mm}$ and 96 mm . The moving iron ammeters are fitted with the British standard $x 6$ overload scale. However

PRODUCT GROUP CC $x 5, \times 2$ and no overload options are also readily available. The range, as standard, are supplied with $90^{\circ}$ movements, $240^{\circ}$ movements are also available to order. Please contact the sales office for assistance.
The majority of meters are supplied with terminal covers as standard.

## TECHNICAL SPECIFICATIONS

## Standards:

Sizes:
Types:
Protection: Insulation:
Temperature:
Construction:

DIN43700, IEC51 and BS89 Din $48 \mathrm{~mm}, 72 \mathrm{~mm}$ and 96 mm AC Moving Iron \& DC Moving Coil IP52 (IP65 on request) 2kV for 1min
Operating $-25^{\circ} \mathrm{C}$ to $+40^{\circ} \mathrm{C}$ Pivot and jewel movement


## MOVING IRON AC AMMETERS

Types:
Accuracy: Burden:

Ranges:

Overscales:

D48SD, D72SD, D96SD
Class 1.5
$1 \mathrm{~A} \& 5 \mathrm{~A}$ movements $0.7 \mathrm{VA}, 6 \mathrm{~A}$ to $30 \mathrm{~A} 1.2 \mathrm{VA}, 40 \mathrm{~A}$ and above 2.4VA
0.5/1/1.5/2/2.5/4/5/6/10/15/20/25/30/40/50/60/80/100Amps (D48SD only up to 40A) 1A \& 5A movements also used as CT input i.e. D72SD/CT5 Scaled: 0-100A x6 British standard $\times 6$. On request $\times 2, x 5$ or no overscale


## MOVING IRON AC VOLTMETERS

Types:
Accuracy:
Burden:
Ranges:

D48SD, D72SD, D96SD
Class 1.5
Max 6VA
$150 / 300 / 500 \mathrm{VAC}$ (others on request)


FREQUENCY METERS

Types:
Accuracy:
Burden: Ranges:

D48HZ, D72HZ, D96HZ
Class 1
6 mA
$45-55 \mathrm{~Hz}, 45-65 \mathrm{~Hz}, 55-65 \mathrm{~Hz}, 360-440 \mathrm{~Hz}$
( $45-65 \mathrm{~Hz}$ standard range) Supply voltage
must be specified 110/240/380/400/415/440V


MOVING COIL DC AMMETERS

Types:
Accuracy:
Burden:
Ranges:

## Scales:

D48MC, D72MC, D96MC
Class 1.5
80 mV to 150 mV volt drop depending on input current Any input between 50 to 800 uA and 1 to 800 mA Also 1/1.5/2/2.5/4/5/6/10/15/20/25/30/40/50A (D48MC only up to 30A) Dedicated $4-20 \mathrm{~mA}$ version Special scales made as requested


## MOVING COIL DC VOLTMETERS

Types:
Accuracy:
Burden:
Ranges:

Scales:

D48MC, D72MC, D96MC
Class 1.5
Approx 1 mA
50 mV to 1000 V specify range required
**D48MC up to 800V
Shunt input ranges available as standard i.e. 60 mV
Special scales made as required

## POWER FACTOR METER

Types:
Accuracy: Burden: Inputs:

System:
Ranges:

D96PF (Self contained)
Class 1.5
Current inputs 0.5 VA , voltage inputs 2VA
Current via 1Amp or 5Amp CT input
Voltage direct 63VAC to 500VAC
3P3W Balanced
CAP 0.5 to 1 to IND 0.5


## WATT METERS

## Types:

Accuracy:
Burden:
Inputs:
Systems:

D96WA
Class 1.5
Current inputs 0.5 VA , voltage inputs 2VA
Current via 1Amp or 5Amp CT input Voltage direct 63VAC to 500VAC
Single phase, 3P3W Balanced, 3P4W Balanced 3P3W Unbalanced, 3P4W Unbalanced


## ANALOGUE METER OPTIONS

- Extra adjustable red pointer
- Coloured segments on scale
- Polycarbonate fronts - Heavily damped movements
- External potentiometer adjustment (DC only)
- AC rectified movements
- Rubber terminal boots
- Red line on scale
- Tropical finish and sealed to IP65
- Centre zero movements (DC only)
- Terminal covers
- Special scales


## PANEL CUT OUTS

Din 48mm: $45 \times 45 \mathrm{~mm}$ Din 72mm: $68 \times 68 \mathrm{~mm}$ Din $96 \mathrm{~mm}: 92 \times 92 \mathrm{~mm}$

## PHASE SEQUENCE INDICATORS

Foxtam Controls Phase Sequence Indicators (P.S.I) are suitable for a range of applications to indicate both the presence of all three phases and the correct sequence of those phases.
Incorrect phase connection will often cause serious damage to the motors of compressors, pumps, gen-sets, heating and ventilation equipment. Mobile generators, remote installations and shore to ship supplies are most vulnerable to such hazards and are, therefore, ideal applications for the Foxtam range.

The absence of a phase is indicated by a neon to identify the missing phase. The presence of all three phases in the correct sequence is indicated by the white neon. Incorrect phase sequence is indicated by a red neon.

## MODELS

FE48PSI 48mm square FE72PSI 72mm square FE96PSI 96mm square

## TECHNICAL DATA

## Ratings:

Burden:

Voltage 180-500V Frequency 50/60Hz
3VA maximum


## - FEATURES

- 72mm Ammeters \& Voltmeters
- 96mm Ammeters \& Voltmeters
- Fully front IP65 sealed
- Supplied with IP65 panel gasket
- Supplied with terminal cover
- Ammeters with ARP (Adjustable Red Pointer)
- Adjusters sealed with O-Rings
- Everything supplied as a kit


## - DESCRIPTION



Din $72 \mathrm{~mm} \& 96 \mathrm{~mm}$ analogue meters that are genuinely IP65 sealed, both from the front and also sealed to the panel via a gasket. The front seal is achieved by sealing the glass into the plastic bezel, whilst the adjusters for the adjustable red pointer, along with the zero adjuster are fitted into the glass with o-ring seals.
Ammeters are stocked in Din 72mm (Din 96 mm on request) direct connected 2 Amps, 3 Amps, 4 Amps, 5 Amps, 6 Amps, 8 Amps, 10 Amps, 15 Amps, 20 Amps and 25 Amps. Also stocked are 5 Amps movement meters driven from a 5 Amp secondary current transformer (1 Amp secondary on request) and a corresponding scale will be fitted to match the current transformers primary. All ammeters have $x 6$ overload movements and are fitted with the adjustable red pointer as standard. (On Request these can be supplied without)

Voltmeters are stocked in both Din 72 mm and $96 \mathrm{~mm} 0-500 \mathrm{VAC}$. As standard they are not supplied with the adjustable red pointer option. (ARP available on request if required).
All meters are supplied as a kit which includes the IP65 panel gasket and a terminal cover.

## ORDERING INFORMATION

| TYPE | InPUT | RANGES |  |  | RED POINTER |
| :---: | :---: | :---: | :---: | :---: | :---: |
| D72/IP65 | *CT1A | 0.5A | 4A | 15A | ** ARP |
| D96/P65 | *CT5A | 1A | 5A | 20A |  |
|  | DR | 1.5A | 6 A | 25A |  |
|  | 0-500V | 2A | 8A | 30A |  |
|  |  | 3A | 10A | 40A |  |
| * Specify current input range |  |  |  |  |  |



DIN 72mm \& 96mm GLASS CASED HOUR COUNTERS

$$
\begin{array}{ll}
\text { TYPES: } & \text { R572/AC VOLTS \& R5 77/DC VOLTS (DIN 72mm) } \\
& \text { R596/AC VOLTS \& R5 97/DC VOLTS (DIN 96mm) }
\end{array}
$$

# DIN 48x24mm 4 DIGIT, DIGITAL PANEL METER, DISPLAY ONLY 

## TYPE: CS3S

## FEATURES

## - Measuring DCA, DCV, ACA, ACV \& PT100 inputs

- Optional TRMS versions
- Analogue signal inputs
- High accuracy, stability \& resolution
- Wide range of AC \& DC auxiliary supplies
- Special scaling
- CE marked


Programming \& set up buttons can be specified with "Visible Buttons" on the front panel or "Discrete Buttons" behind the front screen. If not specified, meter will be supplied with "Discrete Buttons"

## DESCRIPTION \& MODE OF OPERATION

Din $48 \times 24 \mathrm{~mm} 4$ digit microprocessor based digital panel meters, available with a wide choice of both AC and DC voltage or current inputs including standard and non standard analogue signal inputs. PT100 temperature inputs can also be specified. The meters are can be programmed by four tactile switches that can be specified to be accessed directly on the front panel or specified as discrete, where the buttons are hidden behind the front screen. These meters are display only meters and have no outputs, for meters Din 48x24mm with outputs please see meter type CS3 on pages 198 \&199

## SPECIFICATIONS

Measuring accuracy (VAD): $\leq \pm 0.1 \% \mathrm{FS} \pm 1$ digit
Measuring accuracy (VAA): $\leq \pm 0.2 \%$ FS $\pm 1$ digit
Measuring accuracy (VAAT): $\leq \pm 0.2 \%$ FS $\pm 1$ digit
Measuring accuracy (TR): $\leq \pm 0.1 \%$ FS $\pm 1$ digit
Temperature effect:
Sampling rate:
Response time:
Display:
Display range:
Decimal point:
Maximum over range:
Aux. Supply:

Power consumption: Operating temperature: Operating humidity: Dielectric strength: Insulation resistance:
EMC:
Low voltage directive: Dimensions mm:
Panel cut out mm: Case material: Terminals:

## FEATURES

The following functions can be set up at the time of ordering, or programmed if required at a later date:

AvG to increase or decrease the response time, factory default 100 mSec
dF iLT to increase filtering on noisy supplies possibly to be utilised in conjunction with AvG.

LoCUt to ignore induced readings at zero from leaky circuits or noise pick up, but not at the detriment of a real reading. For example if LoCUt value of 5 set, any reading of 5 or below is ignored, but when reading is genuinely say 100 the meter reads 100 and not 95

AoLS low scale point when scaling say to other engineering values, can be set from -1999 to +9999 the meter has the facility to also fine adjust
AoHS high scale point when scaling say to other engineering values, can be set from -1999 to +9999 the meter has the facility to also fine adjust

Further details and assistance on the above set up features are available from our sales office.

## MEASUREMENT

| Voltage |  | CURRENT |  | TEMPERATURE |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| INPUT RANGE | INPUT RESISTANCE | INPUT RANGE | INPUT RESISTANCE | INPUT RANGE | INPUT RESISTANCE |
| 0-199.9mV | $\geq 5 \mathrm{M}$ Ohms | 0-1.999uA | $\leq 1 \mathrm{~K}$ Ohms | PT100 | $\geq 1 \mathrm{M}$ Ohms |
| 0-1.999V | $\geq 1 \mathrm{M} \mathrm{Ohms}$ | $0-1.999 \mathrm{~mA}$ | $\leq 100$ Ohms | PT1000 | $\geq 1 \mathrm{M} \mathrm{Ohms}$ |
| 0-19.99V | $\geq 1 \mathrm{M} \mathrm{Ohms}$ | $0-19.99 \mathrm{~mA}$ | $\leq 10$ Ohms |  |  |
| 0-199.9V | $\geq 1 \mathrm{M} \mathrm{Ohms}$ | $0-199.9 \mathrm{~mA}$ | $\leq 10 \mathrm{hm}$ |  |  |
| 0-300V | $\geq 2 \mathrm{M} \mathrm{Ohms}$ | 0-1.999A | $\leq 0.05$ Ohms |  |  |
| $0-50 \mathrm{mV}$ | $\geq 5 \mathrm{M} \mathrm{Ohms}$ | 0-1A | $\leq 0.1$ Ohms |  |  |
| $0-60 \mathrm{mV}$ | $\geq 5 \mathrm{M} \mathrm{Ohms}$ | $0-1 \mathrm{~mA}$ | $\leq 100$ Ohms |  |  |
| $0-100 \mathrm{mV}$ | $\geq 5 \mathrm{M} \mathrm{Ohms}$ | $0-10 \mathrm{~mA}$ | $\leq 250$ Ohms |  |  |
| 0-1V | $\geq 1 \mathrm{M} \mathrm{Ohms}$ | $0-20 \mathrm{~mA}$ | $\leq 250$ Ohms |  |  |
| $0-5 \mathrm{~V}$ | $\geq 1 \mathrm{M} \mathrm{Ohms}$ | 4-20mA | $\leq 250$ Ohms |  |  |
| 0-10V | $\geq 1 \mathrm{M} \mathrm{Ohms}$ |  |  |  |  |

ORDERING INFORMATION (The meter will be scaled exactly to your requirements, please specify any special scaling required and any scaling to other engineering units)

|  | INPUT TYPE | INPUT RANGE V | INPUT RANGE A | PT100/PT1000 INPUT RANGE | AUX. SUPPLY | PRODUCT |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| CS3S- | VAD (VDC or ADC) <br> VAA (VAC or AAC) <br> VAT (TRMS) <br> TR1 (PT100) <br> TR2 (PT1000) | $\begin{aligned} & 0-199.9 \mathrm{mV} \\ & 0-1.999 \mathrm{~V} \\ & 0-19.99 \mathrm{~V} \\ & 0-199.9 \mathrm{~V} \\ & 0-300 \mathrm{~V} \\ & 0-50 \mathrm{mV} \\ & 0-60 \mathrm{mV} \\ & 0-100 \mathrm{mV} \\ & 0-1 \mathrm{~V} \\ & 0-5 \mathrm{~V} \\ & 0-10 \mathrm{~V} \\ & 1-5 \mathrm{~V} \\ & 2-10 \mathrm{~V} \\ & \text { Special specify } \end{aligned}$ | $\begin{aligned} & 0-1.999 \mathrm{uA} \\ & 0-1.999 \mathrm{~mA} \\ & 0-19.99 \mathrm{~mA} \\ & 0-199.9 \mathrm{~mA} \\ & 0-1.999 \mathrm{~A} \\ & 0-1 \mathrm{~A} \\ & 0-1 \mathrm{~mA} \\ & 0-10 \mathrm{~mA} \\ & 0-20 \mathrm{~mA} \\ & 4-20 \mathrm{~mA} \\ & \text { Special specify } \end{aligned}$ | $\begin{aligned} & -199.9-800.0^{\circ} \mathrm{C}^{*} \\ & -199.9-600.0^{\circ} \mathrm{C}^{* *} \end{aligned}$ <br> Special specify <br> *TR1 <br> **TR2 | 5VDC (4.5-9VDC) 12VDC $(9-18 \mathrm{VDC})$ 24VDC $(18-36 \mathrm{VDC})$ 48VDC $(36-72 \mathrm{VDC})$ ADH $85-264 \mathrm{VAC}$ $100-300 \mathrm{VDC}$ | DD |

Please also specify if front programming / set up buttons are to be "Visible" or "Discrete"


# DIN 48x24mm DIGITAL MICROPROCESSOR METER WITH RELAY OUTPUTS, ANALOGUE SIGNAL OUTPUT, RS485 

GROUP

## TYPE: CS3

## - FEATURES

- DCA \& DCV analogue signal inputs
- Potentiometer \& resistance inputs
- High accuracy, stability \& resolution
- Choice of relay, analogue signal or RS485 outputs
- Digital inputs for hold \& de-latch functions
- Excitation supply available
- CE marked


Programming \& set up buttons can be specified with "Visible Buttons" on the front panel or "Discrete Buttons" behind the front screen. If not specified, meter will be supplied with "Discrete Buttons"

## - DESCRIPTION

Miniature Din $48 \times 24 \mathrm{~mm} 5$ digit panel meters, available with a wide choice of DC analogue voltage and current signal inputs, along with potentiometer and resistance inputs. These meters can be specified with one or two relay outputs, plus if required an analogue output or RS485 MODBUS RTU. An excitation supply of 24 VDC max 30 mA is featured as standard on the CS3-PR version. These meters utilise the latest microprocessor technology in both the setting and operation of the meter.

## SPECIFICATIONS

## General

Measuring accu
Sampling rate:
Response time:
Display:
Display range:
Decimal point:
Over range indication:
Under range indication:
Power supply:
Power consumption:
Excitation supply: Operating temperature: Operating relative humidity: Temperature coefficient: Storage temperature: Dielectric strength:

Protection:
$\leq \pm 0.04 \% \mathrm{FS} \pm 1$ digit
15 cycles/Sec
$\leq 100 \mathrm{mSec}$
10 mm high LED's
-19999 to +29999
At any point or not at all
"ovFL" displayed when input is over
$120 \%$ of input range
"-ovFL" displayed when input is under
$-20 \%$ of input range
20-90V AC/DC
85-264V AC/DC
4.5VA

24VDC / 30mA max (CS3-PR only)
$0-60^{\circ} \mathrm{C}$
20-95\% RH
$\leq 100$ PPM $/{ }^{\circ} \mathrm{C}$
-10 to $+70^{\circ} \mathrm{C}$
AC 1.5 KV for 1 min between input, output/s, power \& case
IP54

OPTIONAL RELAY OUTPUT

Relay programmable:
Latching:
Number of setpoints:
Energisation functions:
Time delay programmable:
Hysteresis programmable:
Relay contacts:

Low/Low-Low/High/High-High/Low-High Optional please specify
1 or 2
Start delay/Energisation \& De-energisation delay/Energisation latching/Hysteresis
$0-9$ mins 59.9 secs
0-5000 counts
$2 x$ NO: 1A/230VAC, 3A/115VAC

## OPTIONAL ANALOGUE OUTPUT

## Accuracy:

Ripple:
Response time:
Output capability:
$\leq \pm \%$ of FS
$\leq \pm \%$ of FS
$\leq 100 \mathrm{mSec}$ (10-90\% of input)
Voltage 1000 Ohm
Current into 600 Ohm max

## OPTIONAL RS485 COMMUNICATIONS

## Protocol:

Baud rate programmable: Data bits:
Parity programmable:
Address programmable:
Distance:
Terminal resistor:

MODBUSRTU
1200/2400/4800/9600/19200/38400
8 bit programmable
Even, odd or none (with 1 or 2 stop bit)
1-255 programmable
1200 Metres
150 Ohm at last unit

ORDERING INFORMATION (The meter will be scaled and set exactly to your requirements)

| INPUT TYPE |  |  | INPUT RANGE |  | OUTPUT 1 | OUTPUT 2 | AUX. POWER |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| CS3 | PR (Analogue signal) PM (Potentiometer) RS (Resistance) |  | Insert input range from lists below any custom signal is also generally possible. |  | None <br> 1 Relay* <br> 2 Relays* | None <br> 0-5VDC <br> 1-5VDC <br> $0-10 \mathrm{VDC}$ <br> $0-10 \mathrm{~mA}$ <br> $0-20 \mathrm{~mA}$ <br> 4-20mA <br> Specify <br> RS485 | $\begin{aligned} & \text { 20-90V AC/DC } \\ & \text { 85-264V AC/DC } \end{aligned}$ |
| * Sp |  |  |  |  |  | Specify relay/s configuration/s and any delay times or hysteresis |  |
| INPUT RANGES |  |  |  |  |  |  |  |
| ANALOGUE SIGNALS |  | POTENTIOMETER |  | RESISTANCE |  |  |  |
| 0-5VDC |  | $0-50$ to 2 <br> $0-2 \mathrm{~K}$ to 1 <br> $0-20 \mathrm{~K}$ Oh <br> Specify | Ohm (3 wire) | 0-200 Ohm (2 wire) $0-2 \mathrm{~K}$ Ohm (2 wire) 0-200K Ohm (2wire) Specify |  |  |  |
| 1-5VDC |  |  | K Ohm (3 wire) |  |  |  |  |
| 0-10VDC |  |  | (2 wire) |  |  |  |  |
| $0-10 \mathrm{~mA}$ |  |  |  |  |  |  |  |
| $0-20 \mathrm{~mA}$ |  |  |  |  |  |  |  |
| 4-20mA |  |  |  |  |  |  |  |
| Specify |  |  |  |  |  |  |  |

## MEASUREMENT

| MEASURING RANGE |  | INPUTIMPEDANCE |
| :---: | :---: | :---: |
| DCV | 0-5V | $\leq 1 \mathrm{M} \mathrm{Ohm}$ |
|  | 1-5V | $\leq 1 \mathrm{M}$ Ohm |
|  | 0-10V | $\leq 1 \mathrm{M}$ Ohm |
| DCA | 0-10mA | 250 Ohm |
|  | 0-20mA | 250 Ohm |
|  | $4-20 \mathrm{~mA}$ | 250 Ohm |
| All Potentiometer Inputs |  | $\leq 1 \mathrm{M} \mathrm{Ohm}$ |
| All Resistance Inputs |  | $\leq 1 \mathrm{M} \mathrm{Ohm}$ |

FRONT PANEL

RELAY STATUS
INDICATION
COMM. STATUS
EXTERNAL
CONTROL INPUT


DISPLAY SCREEN OPERATION KEY ENGINEER UNIT

DIMENSIONS


CONNECTION DIAGRAM CS3-PR


Power Supply


FILTER OR TRANSFORMER $\underset{=}{\boldsymbol{=}}$

2 WIRE TRANSMITTER CONNECTION 4~20MA SOURCE CONNECTION


CONNECTION DIAGRAM CS3-RS
PRODUCT


CONNECTION DIAGRAM CS3-PM


POWER SUPPLY


RS485 COMMUNICATION PORT


POWER SUPPLY


# DIN 96x48mm 4 DIGIT DISPLAY ONLY MICROPROCESSOR METER AC \& DC VOLTAGE \& CURRENT, DC ANALOGUE SIGNALS, THERMOCOUPLE, PT100 \& PT1000 INPUTS 

TYPE: CM2

## FEATURES

- Measuring DCA, DCV, ACA, ACV
- Optional TRMS versions
- Measuring DC analogue signals inputs
- Measuring thermocouple inputs
- Measuring PT100 \& PT1000 inputs
- High accuracy, stability \& resolution
- Optional excitation supply available
- Wide range of auxiliary supplies
- Special scaling
- CE marked



## - DESCRIPTION \& MODE OF OPERATION

Din $96 x 48 \mathrm{~mm} 4$ digit panel meters, available with a wide choice of AC \& DC voltage and current inputs, including DC analogue signal inputs, thermocouple inputs and PT100, PT1000 inputs. The meters are can be programmed by four tactile switches that can be specified to be accessed directly on the front panel or specified as discrete, where the buttons are hidden behind the front screen. These meters are display only meters and have no outputs, for meters with outputs please see meter range CS1.
All meters, in particular analogue input meters can be scaled to other engineering values, including negative to positive scaling and offset zero.

## FEATURES

The following functions can be set up at the time of ordering, or programmed if required at a later date: AvG to increase or decrease the response time, factory default 100 mSec
dF iLT to increase filtering on noisy supplies possibly to be utilised in conjunction with AvG.
LoCUt to ignore induced readings at zero from leaky circuits or noise pick up, but not at the detriment of a real reading. For example if LoCUt value of 5 set, any reading of 5 or below is ignored, but when reading is genuinely say 100 the meter reads 100 and not 95 .
AoLS low scale point when scaling say to other engineering values, can be set from -1999 to +9999 the meter has the facility to also fine adjust.
AoHS high scale point when scaling say to other engineering values, can be set from -1999 to +9999 the meter has the facility to also fine adjust

Further details and assistance on the above set up features are available from our sales office.

## MEASUREMENT

## SPECIFICATIONS

| Measuring accuracy (PR): | $\leq \pm 0.1 \% \mathrm{FS} \pm 1$ digit |
| :---: | :---: |
| Measuring accuracy (TC): | $\leq \pm 0.2 \% \mathrm{FS} \pm 1$ digit |
| Measuring accuracy (TR): | $\leq \pm 0.2 \% \mathrm{FS} \pm 1$ digit |
| Temperature effect: | $\leq 100 \mathrm{PPM} /{ }^{\circ} \mathrm{C}$ |
| Sampling rate: | 15 cycles / sec |
| Response time: | $\leq 100 \mathrm{mSec}$ (standard) |
|  | Can be altered in set up |
| Display: | $4 \times 20 \mathrm{~mm}$ high red LED's |
| Display range: | -1999 to +9999 |
| Decimal point: | At any point or not at all |
| Over range indication: | "ouFL" when input is $>110 \%$ of input range |
| Under range indication: | "-ouFL" when input is < LoSC value |
| Aux. Supply | ADH: 85-264VAC \& 100-300VDC <br> ADL: 20-56VAC/DC |
| Power consumption: | $\mathrm{AC}: \leq 8 \mathrm{VA} \quad \mathrm{DC}: \leq 4 \mathrm{~W}$ |
| Back up memory: | EPROM |
| Operating temperature: | $0-60^{\circ} \mathrm{C}$ |
| Operating humidity: | 20-95\% RH |
| Dielectric strength: | 2KV for 1 min, between input \& aux. |
| Insulation resistance: | $\geq 100 \mathrm{MOhms}$ @ 500VDC between input \& aux |
| EMC: | EN55011:2002 \& EN 61326:2003 |
| Low voltage directive: | EN61010-1:2010 |
| Dimensions mm: | $96(\mathrm{~W}) \times 48(\mathrm{H}) \times 80$ (D) |
| Panel cut out mm: | 92(W) $\times 45(\mathrm{H}$ |
| Case material: | ABS (UL 94V-0) ${ }^{2}$ |
| Terminals: | Screw max 2mm ${ }^{2}$ |


| VOLTAGE INPUT RANGE | INPUT RESISTANCE | VOLTAGE INPUT RANGE | INPUT RESISTANCE | CURRENT INPUT RANGE | INPUT RESISTANCE |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 0-199.9mV | > 5M Ohms | 0-1V | > 1M Ohms | 0-1mA | 250 Ohms |
| 0-1.999V | > 1M Ohms | 0-5V | $>1 \mathrm{M}$ Ohms | 0-10mA | 250 Ohms |
| 0-19.99V | > 1M Ohms | 1-5V | $>1 \mathrm{M} \mathrm{Ohms}$ | 0-20mA | 250 Ohms |
| 0-199.9V | > 1M Ohms | 0-10V* | $>1 \mathrm{M} \mathrm{Ohms*}$ | 4-20mA | 250 Ohms |
| 0-300V | > 2M Ohms | 0-10V | > 100K Ohms | 0-1.999mA | 100 Ohms |
| 0-600V | > 3M Ohms | 2-10V | > 100K Ohms | 0-19.99mA | 10 Ohms |
| $0-50 \mathrm{mV}$ | > 5M Ohms |  | *Special | 0-199.9mA | 1 Ohm |
| $0-60 \mathrm{mV}$ | > 5M Ohms |  | request | 0-1.999A | 0.05 Ohms |
| $0-100 \mathrm{mV}$ | > 5M Ohms |  |  | 0-1A | 0.1 Ohms |
|  |  |  |  | 0-5A | 0.02 Ohms |
|  |  |  |  | 0-10A | 0.01 Ohms |

## ORDERING INFORMATION

(The meter will be scaled exactly to your requirements)

|  | INPUT TYPE | VOLTAGE INPUT | CURRENT INPUT | PR INPUT RANGE | TC INPUT RANGE** | TR \& TRK INPUT RANGE** | AUX SUPPLY |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| CM2- | VAD (VDC or ADC) <br> VAA (VAC or AAC) <br> VAT (TRMS) <br> PR (DC analogue signals) <br> TC (Thermocouple) <br> TR (PT100) <br> TRK (PT1000) | 0-199.9mV <br> $0-1.999 \mathrm{~V}$ <br> $0-19.99 \mathrm{~V}$ <br> 0-199.9V <br> $0-300 \mathrm{~V}$ <br> $0-600 \mathrm{~V}^{*}$ <br> $0-50 \mathrm{mV}$ <br> $0-60 \mathrm{mV}$ <br> $0-100 \mathrm{mV}$ <br> Special <br> specify | $\begin{aligned} & 0-1.999 \mathrm{~mA} \\ & 0-19.99 \mathrm{~mA} \\ & 0-199.9 \mathrm{~mA} \\ & 0-1.999 \mathrm{~A} \\ & 0-1 \mathrm{~A} \\ & 0-5 \mathrm{~A} \\ & 0-10 \mathrm{~A} \\ & \text { Special } \\ & \text { specify } \end{aligned}$ | $0-1 \mathrm{~V}$ <br> $0-5 \mathrm{~V}$ <br> $1-5 \mathrm{~V}$ <br> 0-10V <br> 2-10V <br> $0-1 \mathrm{~mA}$ <br> $0-10 \mathrm{~mA}$ <br> $0-20 \mathrm{~mA}$ <br> 4-20mA*** <br> Special <br> specify | $K\left(-270^{\circ} \mathrm{C}\right.$ to $\left.+1372^{\circ} \mathrm{C}\right)$ <br> K1 ( $-128.8^{\circ} \mathrm{C}$ to $+537.7^{\circ} \mathrm{C}$ ) <br> $\mathrm{J}\left(-210^{\circ} \mathrm{C}\right.$ to $\left.+1200^{\circ} \mathrm{C}\right)$ <br> $\mathrm{J} 1\left(-128.8^{\circ} \mathrm{C}\right.$ to $\left.+537.7^{\circ} \mathrm{C}\right)$ <br> $\mathrm{E}\left(-270^{\circ} \mathrm{C}\right.$ to $\left.+1000^{\circ} \mathrm{C}\right)$ <br> $\mathrm{E} 1\left(0^{\circ} \mathrm{C}\right.$ to $\left.+537.7^{\circ} \mathrm{C}\right)$ <br> $\mathrm{T}\left(-270^{\circ} \mathrm{C}\right.$ to $\left.+400^{\circ} \mathrm{C}\right)$ <br> T1 $\left(-128.8^{\circ} \mathrm{C}\right.$ to $\left.+400^{\circ} \mathrm{C}\right)$ <br> R $\left(-50^{\circ} \mathrm{C}\right.$ to $\left.+1768^{\circ} \mathrm{C}\right)$ <br> $\mathrm{S}\left(-50^{\circ} \mathrm{C}\right.$ to $\left.+1768^{\circ} \mathrm{C}\right)$ <br> $\mathrm{B}\left(+250^{\circ} \mathrm{C}\right.$ to $\left.+1820^{\circ} \mathrm{C}\right)$ <br> N $\left(-200^{\circ} \mathrm{C}\right.$ to $\left.+1300^{\circ} \mathrm{C}\right)$ | $\begin{aligned} & \text { PT100 }\left(-199.9^{\circ} \mathrm{C} \text { to }+800^{\circ} \mathrm{C}\right) \\ & \text { PT1000 }\left(-199.9^{\circ} \mathrm{C} \text { to }+800^{\circ} \mathrm{C}\right) \end{aligned}$ | $\left\{\begin{array}{c} \text { ADH 85-264VAC } \\ 100-300 \mathrm{VDC} \\ \text { ADL 20-56VAC/DC } \end{array}\right.$ |

*For voltage inputs in excess of 600V, please use meter type CS1, see pages 204 to 207
** On TC, TR \& TRK input meters, scaling can also be on request in ' $F$ '
***An optional (extra cost) 24VDC built in excitation voltage output can be specified, max 30mA
Please also specify if front programming / set up buttons are to be "Visible" or "Discrete"


# DIN 96x48mm RELAY OUTPUT TRIP METERS 

TYPES: CSS-40
4 DIGIT TYPE (9999) CSS-41 4½ DIGIT TYPE (19999) CSS-50 5 DIGIT TYPE (99999)

FEATURES<br>- Measuring DCA, DCV, ACA, ACV, Hz<br>- Process signal inputs<br>- High accuracy, stability and resolution<br>- Easily programmable via thumbwheel switches<br>- Three relay output possibilities<br>- Optional excitation supply available<br>- CE marked<br>\section*{- DESCRIPTION}



A Din $96 x 48 \mathrm{~mm}$ digital panel meter available in a 4 digit, $41 / 2$ digit and 5 digit option with either one or two relay setpoint outputs. If one output is ordered this can be designated as a Low or High output in the ordering and in the case of two relay outputs Low/Low, High/High, High/Low. Also an extra output is provided as a "GO" output. This meter combines the traditional but popular user friendly front panel thumbwheel type push button switches to set the setpoints with the latest microprocessor technology.

## SPECIFICATIONS

Measuring accuracy (AC):
Measuring accuracy (other):
Sampling rate:
Display:
Over-range indication: Under-range indication:
Relays output:
Optional excitation supply:
Power supply:
Power consumption:
Operating temperature:
Operating relative humidity:
Temperature coefficient:
Storage temperature:
Dielectric strength:
Protection:

4 digit: $\pm 0.1 \% \mathrm{FS} \pm 1$ digit $41 / 2$ digit \& 5 digit : $\pm 0.04 \% \mathrm{FS} \pm 1$ digit 4 digit: $\pm 0.04 \% \mathrm{FS} \pm 1$ digit $41 / 2$ digit \& 5 digit $: \pm 0.02 \% \mathrm{FS} \pm 1$ digit Approx every 100 mSec
14.2 mm high red LEDs
"OFL" displayed
"-OFL" displayed SPDT: 115V/3A, 230V/2A AC1 DC: $10 \mathrm{~V} / 35 \mathrm{~mA}, 24 \mathrm{~V} / 25 \mathrm{~mA}$ $115 / 230$ VAC $\pm 15 \%, 50 / 60 \mathrm{~Hz}$ 12VDC, 24VDC, 48VDC 4.5VA
$0-55^{\circ} \mathrm{C}$
$20-90 \%$ RH
$\leq 100 \mathrm{PM} /^{\circ} \mathrm{C}\left(0-50^{\circ} \mathrm{C}\right)$
$\leq 50 \mathrm{PM} /{ }^{\circ} \mathrm{C}\left(23 \pm 3^{\circ} \mathrm{C}\right)$
$-10^{\circ} \mathrm{C}$ to $+70^{\circ} \mathrm{C}$
AC 2.0 KV for 1 min between input, output/s, power \& case IP54

Measurement

|  | MEASURING RANGE | INPUT IMPEDANCE |
| :--- | :--- | :--- |
|  | $999.9 / 999.99 \mathrm{uA}$ | 1 K Ohm |
|  | $9.999 / 9.9999 \mathrm{~mA}$ | 100 Ohm |
| CURRENT | $9.99 / 99.999 \mathrm{~mA}$ | 10 Ohm |
| AC / DC | $1.000 / 1.0000 \mathrm{~A}$ | 1 Ohm |
|  | $5.000 / 5.0000 \mathrm{~A}$ | 0.02 Ohm |
|  | $10.00 / 10.000 \mathrm{~A}$ | 0.01 Ohm |
|  | $99.99 / 99.999 \mathrm{mV}$ | $\leq 5 \mathrm{M} \mathrm{Ohm}$ |
|  | $999.9 / 999.99 \mathrm{mV}$ | $\leq 1 \mathrm{M}$ Ohm |
|  | $9.999 / 9.9999 \mathrm{~V}$ | $\leq 1 \mathrm{M} \mathrm{Ohm}$ |
| VOLTAGE | $99.99 / 99.999 \mathrm{~V}$ | $\leq 1 \mathrm{M}$ Ohm |
| AC / DC | $150.0 / 150.00 \mathrm{~V}$ | $\leq 1 \mathrm{M}$ Ohm |
|  | $300.0 / 300.00 \mathrm{~V}$ | $\leq 1 \mathrm{M}$ Ohm |
|  | $600.0 / 600.00 \mathrm{~V}$ | $\leq 1 \mathrm{M}$ Ohm |
|  | $1000 / 1000.0 \mathrm{~V}$ | $\leq 1 \mathrm{M}$ Ohm |
| All Frequency Inputs | $\leq 1 \mathrm{M}$ Ohm |  |
| All Potentionmeter Inputs | $\leq 1 \mathrm{M}$ Ohm |  |
| All Resistance Inputs | $\leq 1 \mathrm{M}$ Ohm |  |
| All PT100 Inputs | $\leq 1 \mathrm{M}$ Ohm |  |



| DISPLAY | INPUT TYPE |  | INPUT RANGE |  | RELAY OUTPUT | OPTIONAL EXCITATION | AUX. SUPPLY |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{aligned} & \text { CSS-40 (4 digit) } \\ & \text { CSS-41 (4 } 1 / 2 \text { digit) } \\ & \text { CSS-50 (5 digit) } \end{aligned}$ | D (VDC or ADC) <br> A (VAC or AAC) <br> TR (TRMS) <br> F (Frequency) <br> T (Temperature) <br> $\mathbf{P}$ (Potentionmeter) <br> R (Resistance 2 wire) |  | Insert input range from lists below, any custom signal is also generally possible. |  | L (Low) <br> H (High) <br> LL (Low / Low) HH (High / High) HL (High / Low) | 10VDC Exc 12VDC Exc 24VDC Exc Specify | $\begin{gathered} \text { 115/230VAC } \\ 24 V A C \\ \text { 12VDC } \\ 24 V D C \\ \text { 48VDC } \end{gathered}$ <br> Specify AC Specify DC |
|  |  |  | 7 | $\downarrow$ |  |  |  |
| INPUT RANGES |  |  |  |  |  |  |  |
| CURRENT | VOLTAGE | STRAIN |  | FREQU | TYPE/LEVEL | POTENTIOMETER | PT100 |
| $\begin{aligned} & 0-100 \mathrm{uA} \\ & 0-1 \mathrm{~mA} \\ & 0-10 \mathrm{~mA} \\ & 0-20 \mathrm{~mA} \\ & 4-20 \mathrm{~mA} \\ & 0-100 \mathrm{~mA} \\ & 0-1 \mathrm{~A} \\ & 0-5 \mathrm{~A} \\ & 0-10 \mathrm{~A} \\ & \text { Specify } \end{aligned}$ | $0-50 \mathrm{mV}$ $0-60 \mathrm{mV}$ $0-100 \mathrm{mV}$ $0-1 \mathrm{~V}$ $0-5 \mathrm{~V}$ $1-5 \mathrm{~V}$ $0-10 \mathrm{~V}$ $2-10 \mathrm{~V}$ $0-100 \mathrm{~V}$ $0-150 \mathrm{~V}$ $0-300 \mathrm{~V}$ $0-600 \mathrm{~V}$ $0-1000 \mathrm{~V}$ -10 to +10 VDC Specify | $1.0 \mathrm{mV} / \mathrm{V}$ <br> $1.25 \mathrm{mV} / \mathrm{V}$ <br> $1.5 \mathrm{mV} / \mathrm{V}$ <br> $2.0 \mathrm{mV} / \mathrm{V}$ <br> $3.0 \mathrm{mV} / \mathrm{V}$ <br> $4.0 \mathrm{mV} / \mathrm{V}$ <br> $5.0 \mathrm{mV} / \mathrm{V}$ <br> $10.0 \mathrm{mV} / \mathrm{V}$ <br> $20.0 \mathrm{mV} / \mathrm{V}$ <br> Specify |  | $0-10 \mathrm{~Hz}$ $0-20 \mathrm{~Hz}$ $0-50 \mathrm{~Hz}$ $0-100 \mathrm{~Hz}$ $0-200 \mathrm{~Hz}$ $0-500 \mathrm{~Hz}$ $0-1 \mathrm{KHz}$ $0-2 \mathrm{KHz}$ $0-5 \mathrm{KHz}$ $0-10 \mathrm{KHz}$ $0-30 \mathrm{KHz}$ Specify | Open collect <br> Volt free contact <br> 5 V pulse <br> 12 V pulse <br> 24 V pulse <br> 100-300VAC <br> 300-600VAC <br> Specify | 50-10K Ohm <br> 10K-100K Ohm <br> Specify <br> Resistor (2 wire) <br> 0-100 Ohm <br> $0-1 \mathrm{~K} 0 \mathrm{hm}$ <br> 0-10K Ohm <br> Specify | $\begin{aligned} & -50 \text { to } 0^{\circ} \mathrm{C} \\ & -50 \text { to }+50^{\circ} \mathrm{C} \\ & -50 \text { to }+100^{\circ} \mathrm{C} \\ & -50 \text { to }+200^{\circ} \mathrm{C} \\ & 0 \text { to } 50^{\circ} \mathrm{C} \\ & 0 \text { to } 100^{\circ} \mathrm{C} \\ & 0 \text { to } 200^{\circ} \mathrm{C} \\ & 0 \text { to } 400^{\circ} \mathrm{C} \\ & 0 \text { to } 600^{\circ} \mathrm{C} \\ & 0 \text { to } 800^{\circ} \mathrm{C} \\ & -100 \text { to }+100^{\circ} \mathrm{C} \end{aligned}$ |

# DIN 96x48mm 5 DIGIT MICROPROCESSOR METER WITH RELAY OUTPUTS, ANALOGUE SIGNAL 

 OUTPUT, RS485
## TYPES: CS1, CS2

- FEATURES
- Measuring DCA, DCV, ACA, ACV, Hz
- Analogue signal inputs
- Hz \& pulse rate inputs
- Thermocouple \& PT100 inputs
- Strain gauge inputs
- Potentiometer \& resistance inputs
- High accuracy, stability \& resolution
- Choice of relay, analogue signal or RS485 outputs
- Optional excitation supply available
- Special scaling
- CE marked


## DESCRIPTION

Din $96 \times 48 \mathrm{~mm} 5$ digit digital panel meters, available with a wide choice of both DC and AC inputs, along with many process inputs. The meter can be specified with a choice of one of three outputs, one relay (non adjustable from the front) can be specified as latched or non latched, an isolated analogue output or RS485 MODBUS RTU. The meter utilises the latest microprocessor technology in both the setting and operation of the meter.

## SPECIFICATIONS

## GENERAL

Measuring accuracy (VAA):
Measuring accuracy (VAT):
Measuring accuracy (VAD):
Measuring accuracy (F):
Measuring accuracy (SG):
Measuring accuracy (PM):
Measuring accuracy (RS):
Measuring accuracy ( $\mathbf{T}$ ):
Measuring accuracy(RL):
Sampling rate:
Response time:
Display:
Display range:
Decimal point:
Over-range indication:
Under-range indication:
Power supply:

Power consumption:
Excitation max current: Operating temperature: Operating relative humidity: Temperature coefficient: Storage temperature: Dielectric strength:

Protection:
$\leq \pm 0.1 \%$ FS $\pm 1$ digit $\leq \pm 0.1 \% \mathrm{FS} \pm 1$ digit $\leq \pm 0.04 \%$ FS $\pm 1$ digit $\leq \pm 0.005 \% \mathrm{FS} \pm 1$ digit $\leq \pm 0.04 \% \mathrm{FS} \pm 1$ digit $\leq \pm 0.04 \%$ FS $\pm$ 1digit $\leq \pm 0.04 \% \mathrm{FS} \pm 1$ digit
PT100: $\leq \pm 0.1 \% \mathrm{FS} \pm 1$ digit Thermocouple: $\leq \pm 0.2 \%$ FS $\pm 1$ digit $\leq \pm 0.005 \%$ FS $\pm 1$ digit
15 cycles / sec
$\leq 100 \mathrm{mSec}$
20 mm high red LEDs
-19999 to 29999 (CS1-RL 0.0000 to 99999)
At any point or not at all
"ovFL" displayed when input is over $120 \%$ of input range
"-ovFL" displayed when input is under - $-20 \%$ of input range
$115 / 230$ VAC $\pm 15 \%, 50 / 60 \mathrm{~Hz}$
20-90V AC/DC
85-264V AC/DC
4.5-5VA

30 mA
$0-60^{\circ} \mathrm{C}$
20-95\% RH
$\leq 100 \mathrm{PPM} /{ }^{\circ} \mathrm{C}$
$-10^{\circ} \mathrm{C}$ to $+70^{\circ} \mathrm{C}$
AC 2.0 KV for 1 min between input, output/s power and case IP54


Programming \& set up buttons can be specified with "Visible Buttons" on the front panel or "Discrete Buttons" behind the front screen. If not specified, meter will be supplied with "Discrete Buttons"

OPTIONAL RELAY OUTPUT
Relay programmable: Number of setpoints: Energisation functions:

Time delay adjustable: Relay contact:

Low, High, Low (latched), High (latched) 1
Start delay/Energisation \& de-energisation delay/Energisation latching/Hysteresis $0-9$ mins 59.9 secs
SPDT 5A/230VAC, 10A/115VAC
OPTIONAL ANALOGUE OUTPUT

| Accuracy: | $\leq \pm 0.1 \%$ of FS |
| :--- | :--- |
| Ripple: | $\leq \pm 0.1 \%$ of FS |
| Response time: | $\leq 100 \mathrm{mSec}(10-90 \%$ of input) |
| Output capability: | $\geq$ Voltage 1000 Ohm |
|  | Current into 600 Ohm max |

OPTIONAL RS485 COMMUNICATIONS:
Protocol: MODBUSRTU

Baud rate programmable:
Data bits:
Parity programmable:
Address programmable:
Distance:
Terminal resistor:
MODBUSRTU
1200/2400/4800/9600/19200/38400 8 bits
Even, odd or none (with 1 or 2 stop bit)
1-255
1200 Metres
150 Ohm at lastunit

## MEASUREMENT

|  | MEASURING RANGE | INPUT IMPEDANCE |
| :---: | :---: | :---: |
| CURRENT AC/DC | 0-199.99uA | 1 K Ohm |
|  | 0-1.9999mA | 100 Ohm |
|  | 0-19.999mA | 10 Ohm |
|  | 0-199.99mA | 1 Ohm |
|  | 0-1.9999A | 0.05 Ohm |
|  | 0-5A | 0.02 Ohm |
|  | 0-10A | 0.01 Ohm |
|  | $0-10 \mathrm{~mA}$ | 250 Ohm |
|  | $0-20 \mathrm{~mA}$ | 250 Ohm |
|  | 4-20mA | 250 Ohm |
| VOLTAGE AC/DC | $0-50$ to 100 mV | $\geq 5 \mathrm{M}$ Ohm |
|  | 0-199.99mV | $\geq 5 \mathrm{M}$ Ohm |
|  | 0-1.9999V | $\geq 1 \mathrm{M}$ Ohm |
|  | 0-19.999V | $\geq 1 \mathrm{M}$ Ohm |
|  | 0-199.99V | $\geq 1 \mathrm{M}$ Ohm |
|  | 0-300V | $\geq 2 \mathrm{M} \mathrm{Ohm}$ |
|  | 0-600V | $\geq 2 \mathrm{M} \mathrm{Ohm}$ |
|  | 0-1000V | $\geq 2 \mathrm{M} \mathrm{Ohm}$ |
| All Strain Gauge Inputs All Resistance Inputs All Potentiometer Inputs All Temperature Inputs |  | $\geq 1 \mathrm{M}$ Ohm |
|  |  | $\geq 1 \mathrm{M} \mathrm{Ohm}$ |
|  |  | $\geq 1 \mathrm{M} 0 \mathrm{hm}$ |
|  |  | $\geq 1 \mathrm{M}$ Ohm |

## ORDERING INFORMATION (The meter will be scaled exactly to your requirements)




## HIGH VOLTAGE MODULE

For input voltages of between $1000 \mathrm{~V} \& 4000 \mathrm{~V}$ either AC or DC an external "High Voltage Module" PCB must be used. The module has two voltage taps of $0-2000 \mathrm{~V} \& 0-4000 \mathrm{~V}$


A1 A2 A3


High Voltage Input (Use for 0-1000V)

AC or DC


Please check the voltage of power supplied first, and then connect to the specified terminals. It is recommended that power supplied to the meter be protected by a fuse or circuit breaker.


## CS1-F CONNECTION DIAGRAM



Please check the voltage of power supplied first, and then connect to the specified terminals. It is recommended that power supplied to the meter be protected by a fuse or circuit breaker.

## Power Supply



RS485 Communication Port



Please check the voltage of power supplied first, and then connect to the specified terminals. It is recommended that power supplied to the meter be protected by a fuse or circuit breaker.

Power Supply


Input connection
RS485 Communication Port


## CS1-SG CONNECTION DIAGRAM



Please check the voltage of power supplied first, and then connect to the specified terminals. It is recommended that power supplied to the meter be protected by a fuse or circuit breaker.

Power Supply


## CS1-PM CONNECTION DIAGRAM



Please check the voltage of power supplied first, and then connect to the specified terminals. It is recommended that power supplied to the meter be protected by a fuse or circuit breaker.

## Power Supply



Sensor input connection


CS1-RS CONNECTION DIAGRAM


Please check the voltage of power supplied first, and then connect to the specified terminals. It is recommended that power supplied to the meter be protected by a fuse or circuit breaker.

## Power Supply



RS485 Port


Please check the voltage of power supplied first, and then connect to the specified terminals. It is recommended that power supplied to the meter be protected by a fuse or circuit breaker.

Power Supply


RS485 Communication Port


CS1-T CONNECTION DIAGRAM


Please check the voltage of power supplied first, and then connect to the specified terminals. It is recommended that power supplied to the meter be protected by a fuse or circuit breaker.

Power Supply


RS485 Communication Port


RS485 Port

## DIN 96x48mm 3½ DIGIT SIX CHANNEL TEMPERATURE METER

TYPE: CST-321M

## - FEATURES

■ Measuring T/C: K,J,T,E,R RTD: PT100

- Accuracy T/C: $\pm 0.25 \%$, RTD: $\pm 0.1 \%$
- $31 / 2$ Digit display : 1999
- Easy to wire, screw type terminal
- DIN standard ( $96 \times 48 \mathrm{~mm}$ )
- High stability \& low cost
- MEASUREMENT

| MEASURING RANGE |  | RESOLUTION | INPUT <br> IMPEDANCE |  |
| :--- | :---: | :--- | :--- | :--- |
|  | K | $0-1200^{\circ} \mathrm{C}$ | $1^{\circ} \mathrm{C}$ | $\geq 1 \mathrm{M}$ Ohm |
| Thermo- | J | $0-750^{\circ} \mathrm{C}$ | $1^{\circ} \mathrm{C}$ | $\geq 1 \mathrm{M}$ Ohm |
| Couple | T | $0-400^{\circ} \mathrm{C}$ | $1^{\circ} \mathrm{C}$ | $\geq 1 \mathrm{M} 0 \mathrm{hm}$ |
|  | E | $0-1000^{\circ} \mathrm{C}$ | $1^{\circ} \mathrm{C}$ | $\geq 1 \mathrm{M} 0 \mathrm{hm}$ |
|  | R | $400-1600^{\circ} \mathrm{C}$ | $1^{\circ} \mathrm{C}$ | $\geq 1 \mathrm{M} 0 \mathrm{hm}$ |
| R.T.D. | PT100 | $-199.9-199.9^{\circ} \mathrm{C}$ | $0.1^{\circ} \mathrm{C}$ | $\geq 1 \mathrm{M} 0 \mathrm{hm}$ |
|  | PT100 | $0-800^{\circ} \mathrm{C}$ | $1^{\circ} \mathrm{C}$ | $\geq 1 \mathrm{M} 0 \mathrm{hm}$ |

## SPECIFICATIONS

Measuring:

Span adjustment:
Zero adjustment:
Sampling time:
Scan mode:
Polarity display: Over-range indication: Operating temperature: Operating relative humidity Temperature coefficient:

T/C: $\pm 0.25 \% \mathrm{FS} \pm 1$ digit RTD: $\pm 0.1 \%$ FS $\pm 1$ digit $\leq 10 \%$ of FS
$\leq 2 \%$ of FS
About 3 cycles/sec
Auto/Manual settable by front key Auto scan time is adjustable 5-60 Secs.
When input is negative "-"
"1" display
$0-60^{\circ} \mathrm{C}$
20-95\% R.H.
$\leq 100 \mathrm{PPM} /{ }^{\circ} \mathrm{C}$
$\leq 50 \mathrm{PPM} /{ }^{\circ} \mathrm{C}\left(23 \pm 5^{\circ} \mathrm{C}\right)$
Cold junction compensation: $25 \pm 10^{\circ} \mathrm{C}$, error $<0.5^{\circ} \mathrm{C}$
Storage temperature:
Power supply:
Power consumption: Dielectric strength:
-10 to $+70^{\circ} \mathrm{C}$
AC $115 / 230 \mathrm{~V} \pm 10 \%, 50 / 60 \mathrm{~Hz}$
DC 12/24/48 $\pm 10 \%$
DC 3W, AC 4.5VA
AC 2.0KV for 1 min. (Between power/input) AC 3.0KV for 1 min . (Between terminal/case)


## CONNECTION DIAGRAM

ADJUSTMENT

## THERMOCOUPLE INPUT:



## ORDERING INFORMATION

CST-321M

| INPUT TYPE - IN |  | - AUX. POW |  | Aux. Power |
| :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |
| $\nabla$ |  | TThermocouple $\quad$ PT100 |  |  |
| CODE | INPUT TYPE | INPUT RANGE | INPUT RANGE | AUX. POWER |
| K | K type | $0-100^{\circ} \mathrm{C}$ | $0-199.9{ }^{\circ} \mathrm{C}$ | AC 115/230V |
| J | J type | $0-200^{\circ} \mathrm{C}$ | $-50 \sim+50^{\circ} \mathrm{C}$ | Specify |
| T | T type | $0-400^{\circ} \mathrm{C}$ | -99.9~+199.9 ${ }^{\circ} \mathrm{C}$ |  |
| E | Etype | $0-600^{\circ} \mathrm{C}$ | $0-300^{\circ} \mathrm{C}$ |  |
| R | R type | $0-1000^{\circ} \mathrm{C}$ | $0-600^{\circ} \mathrm{C}$ |  |
| P | PT100 | $0-1200^{\circ} \mathrm{C}$ | $0-800^{\circ} \mathrm{C}$ |  |
| 0 | Other | $\underset{\text { Specify }}{400-1600^{\circ} \mathrm{C}}$ | $\underset{\text { Specify }}{ }$ |  |

# DIN 96x48mm DC AMPERE HOUR METER WITH RELAY OUTPUTS, ANALOGUE OUTPUT, RS485 <br> TYPE: CS2-TM <br> <br> - Features <br> <br> - Features <br> - Separate totalising display <br> - Separate batch count display <br> - 3 volt free control inputs <br> - Up to 4 relay outputs <br> - CE marked <br> - Ideal product for electroplating applications <br>  <br> PRODUCT GROUP 

## - DESCRIPTION

A Din $96 x 48 \mathrm{~mm}$ DC Ampere Hour meter, taking a current reference from a DC shunt and integrating this reference against time to achieve an Ampere Hour or Ampere Minute reading. There are two display screens, the main ten digit screen is the totaliser display, the other screen is a "Batch" programmable setting. The meter can be specified with up to four relay outputs ( $2 \mathrm{C} / \mathrm{O}$ and $2 \mathrm{~N} / \mathrm{O}$ ) which can be assigned at the time of ordering for many functions to control say an electroplating system. As an option RS485 MODBUS is also available. Three volt free control inputs are featured as standard for functions such as reset. Please discuss your exact requirements with our technical sales department.


## SPECIFICATIONS

GENERAL
Accuracy: DC current input: Sampling rate: Response time: Display:

Status LED's: Over-range indication:

Under-range indication:
Power consumption: Operating temperature: Operating relative humidity: Temperature coefficient: Storage temperature: Dielectric strength:

Protection:
OPTIONAL RELAY OUTPUT Latching:
Number of setpoints: Energisation functions:

Time delay programmable: Relay contacts:
$\leq \pm 0.4 \%$ of FS
Via a $50 \mathrm{mV}, 60 \mathrm{mV}$ or 100 mV shunt
15 cycles/Sec
$\leq 100 \mathrm{mSec}$
7.1 mm high LED's

Top row 10 red digits
Bottom row 6 red digits
4 square LED's to indicate outputs "ovFL" displayed when input is over $120 \%$ of input range
"-ovFL" displayed when input is under
-20\% of input range
5VA / 5W
$0-60^{\circ} \mathrm{C}$
20-95\% RH
$\leq 50$ PPM/ C
$-10^{\circ} \mathrm{C}$ to $+70^{\circ} \mathrm{C}$
AC 2.0KV for 1 min between input,
output/s, power \& case
IP54
Optional please specify
Up to 4
Start delay/Energisation
\& de-energisation delay/Energisation latching/Hysteresis
$0-9$ mins 59.9 secs
Relays 1 \& 4: 2xNO 1A/230VAC,
3A/115VAC
Relays 2 \& $3: 2 x C O 1 A / 230 V A C$,
3A/115VAC
OPTIONAL RS485 COMIMUNICATIONS:

Protocol:
Baud rate programmable:
Data bits:
Parity programmable:
Address programmable:
Distance:
Terminal resistor:

MODBUSRTU
1200/2400/4800/9600/19200/ 38400
7 or 8 bit programmable
Even, odd or none (with 1 or 2 stop bit)
1-255 programmable
1200 Metres
150 Ohm at last unit

# DIN 96x48mm DC MILTI DISPLAY POWER METER WITH RELAY OUTPUTS, ANALOGUE SIGNAL OUTPUTS, RS485 

## TYPE: VAW

## FEATURES

- Multi display DC energy meter
- Displays DCV, DCA, KW, KWh, Hours Run
- High accuracy, stability \& resolution
- Choice of multi relay, pulse, analogue signal or RS485 outputs
- Digital inputs for hold \& de-latch functions
- Ideal for solar \& wind energy systems
- CE marked


## - DESCRIPTION

A Din $96 x 48 \mathrm{~mm}$ multi display DC power meter. Measuring, displaying and communicating DC voltage, current, instantaneous power (Watts/KW), import and export Wh/KWh along with hours run. The voltage, current and power parameters also have max and min value recording during power on. The meter has the possibility for specifying up to 4 relay outputs including pulse outputs. The relays can be determined as set points for any of the parameters either low or high. In addition an analogue output also can be requested which can be assigned to any of the instantaneous measured parameters.
Lastly, along with all the above mentioned outputs, RS485 MODBUS RTU communications can also be specified. The VAW meter is particularly suitable for solar energy and wind energy systems, along with electroplating, battery and transport applications. A particular feature of this meter which is especially relevant in "green energy" applications, is that after a certain time of no operator interaction with the meter, the meter enters a "switch down" mode and reduces the power to the LED's, thus saving money.

## SPECIFICATIONS

## GENERAL

Samplingrate:
Response time:
Display:

Status LED's:
Display pages:

Over-range indication:
Under-range indication:
Max voltage withstand:
Max current withstand:
Power consumption:
Operating temperature: Operating relative humidity: Temperature coefficient: Storage temperature: Dielectric strength:

Protection:

15 cycles/Sec $\leq 100 \mathrm{mSec}$
7.1 mm high LED's

Top row 10 red digits
Bottom row 6 green digits
10 square LED's to indicate inputs and outputs
Page 1: Voltage (4 digits), Current ( 5 digits), Power Page 2: Voltage (5 digits), Current (4 digits), Power Page 3: Power and Import Energy Page 4: Power and Export Energy Page 5: Power and Hours Run "ovFL" displayed when input is over 120\% of input range
"-ovFL" displayed when input is under $-20 \%$ of input range
x2 continuous
$\times 4$ for 2 seconds
x3 continuous
$\times 10$ for 10 seconds
$5 \mathrm{VA} / 5 \mathrm{~W}$ and in switch down mode 2VA / 2W
$0-60^{\circ} \mathrm{C}$
20-95\% RH
$\leq 50 \mathrm{PM} /{ }^{\circ} \mathrm{C}$
$-10^{\circ} \mathrm{C}$ to $+70^{\circ} \mathrm{C}$
AC 2.0 KV for 1 min between input, output/s, power \& case
IP54


OPTIONAL RELAY OUTPUT

Relay programmable:
Latching:
Number of setpoints:
Energisation functions:
Time delay programmable: Hysteresis programmable: Relay contacts:

## Low or High

Optional please specify
Up to 4
Start delay/Energisation \& de-energisation
delay/Energisation latching/Hysteresis
$0-9$ mins 59.9 secs
$0-5000$ counts
Relays 1 \& 4: 2xNO 1A/230VAC,
A/115VAC
Relays 2 \& $3: 2 x C O 1 A / 230 V A C, 3 A / 115 V A C$
OPTIONAL ANALOGUE OUTPUT
Accuracy:
$\leq \pm 0.1 \%$ of FS
Ripple:
Response time:
Output capability:
$\leq \pm 0.1 \%$ of FS
100 mSec ( $10-90 \%$ of input)
Voltage 1000 Ohm
Current into 600 Ohm max

## OPTIONAL RS485 COMMUNICATIONS:

## Protocol:

Baud rate programmable:
Data bits:
Parity programmable:
Address programmable:
Distance:
Terminal resistor:

MODBUS RTU
1200/2400/4800/9600/19200/38400
7 or 8 bit programmable
Even, odd or none (with 1 or 2 stop bit)
1-255 programmable
1200 Metres
150 Ohm at last unit


ACCURACY \& RESOLUTION

| Parameter | Accuracy | Display Range | Resolution | Decimal Point |
| :---: | :---: | :---: | :---: | :---: |
| Voltage: <br> Current: <br> Power: <br> Import Energy: <br> Export Energy: <br> Hours Run: | $\begin{aligned} & 0.04 \% \pm 1 \text { digit } \\ & 0.04 \% \pm 1 \text { digit } \\ & 0.1 \% \pm 1 \text { digit } \\ & 0.1 \% \pm 1 \text { digit } \\ & 0.1 \% \pm 1 \text { digit } \\ & 0.04 \% \pm 1 \text { digit } \end{aligned}$ | $\begin{aligned} & -19999 \text { to }+99999 \\ & -19999 \text { to }+99999 \\ & 0 \text { to } \pm 99999 \\ & 0 \text { to } 9999999999 \\ & -1999999999 \text { to } 0 \\ & 0 \text { to } 999999999 \end{aligned}$ | 0.01 mV to 1 V <br> 0.01 uA to 1 A <br> Auto ranges KW <br> 0.0001 KWh <br> 0.0001 KWh <br> 1 Hour | With regard to current \& voltage a decimal point can be requested at any point or not at all. Regarding power (KW) this is auto ranging only, depending on the multiplication between current and voltage. |
| INPUT SIGNAL |  |  |  |  |
| Voltage Input <br> $0-50 \mathrm{mV}$ <br> $0-60 \mathrm{mV}$ <br> $0-100 \mathrm{mV}$ <br> $0-199.99 \mathrm{mV}$ <br> 0-1.9999V <br> 0-19.999V <br> 0-199.99V <br> shunt required | Impedance <br> $\geq 5 \mathrm{M} \mathrm{Ohm}$ <br> $\geq 5 \mathrm{MOhm}$ <br> $\geq 5 \mathrm{M} \mathrm{Ohm}$ <br> $\geq 1 \mathrm{MOhm}$ <br> $\geq 1 \mathrm{MOhm}$ <br> $\geq 1 \mathrm{MOhm}$ <br> $\geq 1 \mathrm{MOhm}$ | Current Input <br> 0-199.99uA <br> 0-1.9999mA <br> 0-19.999mA <br> $0-199.99 \mathrm{~mA}$ <br> 0-1A <br> 0-5A <br> Above 5 Amps | Impedance <br> 1 KOhm <br> 100 Ohm <br> 10 hm <br> 1 Ohm <br> 0.250 hm <br> 0.2 hmm |  |

## ORDERING INFORMATION (The meter will be scaled and set exactly to your requirements)

|  | CURRENT INPUT | VOLTAGE INPUT | OUTPUT 1 | OUTPUT 2 | OUTPUT 3 | AUX. POWER |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| VAW | 0-199.99uA <br> $0-1.9999 \mathrm{~mA}$ <br> $0-19.99 \mathrm{~mA}$ <br> $0-199.99 \mathrm{~mA}$ <br> 0-1.9999A <br> 0-5A <br> $\mathrm{xxx} / 50 \mathrm{mV}$ shunt <br> $\mathrm{xxx} / 60 \mathrm{mV}$ shunt <br> $\mathrm{xxx} / 100 \mathrm{mV}$ shunt <br> Input from transducer <br> (Specify) | $\begin{aligned} & 0-199.9 \mathrm{mV} \\ & 0-1.999 \mathrm{~V} \\ & 0-19.99 \mathrm{~V} \\ & 0-199.9 \mathrm{~V} \\ & \text { Specify } \end{aligned}$ | None <br> 2 Relays* <br> 4 Relays* <br> 3 Relays + 1 Pulse* | None <br> $0-5 \mathrm{VDC}$ ** <br> 1-5VDC** <br> 0-10VDC** <br> $0-10 \mathrm{~mA}$ ** <br> $0-20 \mathrm{~mA}{ }^{* *}$ <br> 4-20mA** <br> Specify** | None RS485 | 115/230V AC 4.5-15V DC 20-56V AC/DC 85-264V AC/DC |

* Regarding the relays, specify the parameters they refer to, along with is it a "Low" or "High" trip, latched or non latched, any delay times or hysteresis required per relay. If a pulse output is requested specify pulse length required ( 100 mSec typical) and pulse rate to the counts.
** Specify to which measured parameter the analogue output is to be assigned to.

FRONT PANEL


Page 1 for Voltage(4 digits), Current(5 digits) and Power(kW)


Page 4 for Run Hour and Power(kW)


## CONNECTION DIAGRAM

Please check the voltage of power supplied first, and then connect to the specified terminals. It is recommended that power supplied to the meter be protected by a fuse or circuit breaker.

## Power Supply

Input connection


# DIN 96x48mm 4½ DIGIT POWER METER WITH RELAY OUTPUTS, ANALOGUE SIGNAL OUTPUT, RS485 

## TYPES: MW-5 (WATT) MQ-5 (VAR) MPF-5 (COS)

## - FEATURES

## - Single phase

- Three phase $\mathbf{3}$ wire \& 4 wire balanced \& unbalanced
- TRMS measurement
- High accuracy, stability \& resolution
- Choice of relay, analogue signal or RS485 outputs
- Digital inputs for hold \& de-latch functions
- CE marked


## - DESCRIPTION

Din $96 \times 48 \mathrm{~mm}$ digital single parameter power meters either as Watts, VAR or Power Factor. The meters can be specified for both single and three phase systems, 3 or 4 wire and are suitable for both balanced and unbalanced loads. The meters can be specified as a "display only" meter, or with a choice of one or two outputs. One relay or two relays that can be specified as latched or non latched, or an isolated analogue output with or without one relay output. Or with, or without RS485 MODBUS RTU which can also be with or without one relay output. The meter utilises the latest microprocessor technology in both the setting and operation of the meter.

## SPECIFICATIONS

## GENERAL

Measuring accuracy:

## Waveform effect:

Sampling rate:
Response time:
System connection:

Display:
Voltage input:

## Hz:

Current input:

Input burden voltage: Input burden current: Over volts withstand: Over current withstand:

Power supply:

Power consumption:
Operating temperature: Operating relative humidity: Temperature coefficient:
Storage temperature:
Dielectric strength:
Protection:
$\leq \pm 0.5 \% \mathrm{FS} \pm 1$ digit
$\leq 0.2 \%$ FS at $30 \%$ distortion
15 cycles / sec
100 mSec
1P2W ( 1 CT required)
3P3W (2 CT's required), suitable for balanced or unbalanced loads 3P4W (3 CT's required), suitable for balanced or unbalanced loads
20 mm high red LEDs
Max 500VAC L-L or L-N VT inputs specify between: 50V-1000KV primary / $50-500 \mathrm{~V}$ secondary
$50 / 60 \mathrm{~Hz} \pm 3 \%$ or $400 \mathrm{~Hz} \pm 3 \%$
1 Amp or 5 Amp direct CT inputs specify CT ratio:1-10000 Amps primary / 1 Amp or 5 Amp secondary $\leq 0.5 \mathrm{VA}$ per phase $\leq 0.1$ VA per phase x2 continuously, $x 4$ for 2 Secs $\times 3$ continuously, x10 for 10 Secs, ( $\times 50$ for 1 Sec 5 Amp version)
$115 / 230 \mathrm{VAC} \pm 15 \%, 50 / 60 \mathrm{~Hz}$
20-90V AC/DC
85-264V AC/DC
5VA
$0-60^{\circ} \mathrm{C}$
$20-95 \%$ RH
$\leq 100 \mathrm{PPM} /{ }^{\circ} \mathrm{C}$
$-10^{\circ} \mathrm{C}$ to $+70^{\circ} \mathrm{C}$
AC 2.0KV for 1 min between input, output/s power and case
IP54

OPTIONAL RELAY OUTPUT
Relay programmable: Latching:
Number of setpoints:
Energisation functions:
Time delay programmable: Hysteresis programmable: Relay contact:

Low/Low-Low/High/High-High/Low-High Optional please specify
1 or 2
Start delay/Energisation \& de-energisation delay/Energisation latching/Hysteresis
$0-9$ mins 59.9 secs
$0-5000$ counts
$2 \times \mathrm{NO}: 1 \mathrm{~A} / 230 \mathrm{VAC}, 3 \mathrm{~A} / 115 \mathrm{VAC}$
OPTIONAL ANALOGUE OUTPUT

| Accuracy: | $\leq \pm 0.1 \%$ of FS |
| :--- | :--- |
| Ripple: | $\leq \pm 0.1 \%$ of FS |
| Response time: | $\leq 100 \mathrm{mSec}(10-90 \%$ of input) |
| Output capability: | $\leq$ Voltage 10000 hm |
|  | Current into 6000 hm max |

## OPTIONAL RS485 COMMUNICATIONS:

| Protocol: | MODBUS RTU |
| :--- | :--- |
| Baud rate programmable: | $1200 / 2400 / 4800 / 9600 / 19200 / 38400$ |
| Data bits: | 8 bit programmable |
| Parity programmable: | Even, odd or none (with 1 or 2 stop bit) |
| Address programmable: | $1-255$ programmable |
| Distance: | 1200 Metres |
| Terminal resistor: | 150 ohm at last unit |

## ORDERING INFORMATION

| METER | CONNECTION | VOLTAGE INPUT | $\begin{gathered} \text { VOLTAGE } \\ \mathrm{Hz} \end{gathered}$ | CURRENT INPUT | OUTPUT 1 | OUTPUT 2 | OUTPUT 3 | AUX. POWER |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| MW-5 (WATTS) <br> MO-5 (VAR) <br> MPF-5 (COS) | $\begin{aligned} & -12(1 \mathrm{P} 2 \mathrm{~W}) \\ & -33(3 \mathrm{P} 3 \mathrm{~W}) \\ & -34(3 \mathrm{P} 4 \mathrm{~W}) \end{aligned}$ | 50-500V <br> VT ratio | $\begin{aligned} & 50 \mathrm{~Hz} \\ & 60 \mathrm{~Hz} \\ & 400 \mathrm{~Hz} * * \\ & \text { Speficy } \end{aligned}$ | 0-1 Amp 0-5 Amp CT ratio | None Relay | None $\begin{aligned} & 4-20 \mathrm{~mA} \\ & 0-10 \mathrm{~V} \end{aligned}$ | None RS485 | $\begin{gathered} \text { 115/230VAC } \\ \text { 85-264VACDC } \\ \text { 20-90VACDC } \end{gathered}$ |

## * Specify relay configuration, delay times if required and any hysteresis

## DIMENSIONS



INSTALLATION

Please install meter within working temperature \& humidity environment


## CONNECTION DIAGRAM

Single phase


3 phase 3 wire


3 phase 4 wire


Output signal connection
Due to terminal quantitative restrictions, the left side of the terminal can be used for analog output; the right terminal can be used for RS485 output RS485 output


## DIN 96mm KW \& KWh METER

## TYPE: CUBE 300

## - FEATURES

## - Panel mounting

- Suitable for 3 phase loads 3 wire or 4 wire
- Suitable for single phase loads
- Isolated pulse output as standard
- Class 1 accuracy
- IP54 standard



# DIN 96mm SINGLE LINE DISPLAY, MULTI DISPLAY ENERGY METER <br> <br> TYPE: CUBE 350 

 <br> <br> TYPE: CUBE 350}

FEATURES

- Panel mounting
- Suitable for 3 phase loads 3 wire or 4 wire
- Suitable for single phase loads
- TRMS measurement to 30th Harmonic
- Isolated dual pulse outputs as standard
- Optional MODBUS RS485 output
- Current input via CT's 5 Amp, 1 Amp or 333mV
- Class 1 accuracy
- IP54 standard



## - DESCRIPTION \& MODE OF OPERATION

A Din 96mm single line display, multi display energy meter with dual isolated volt free pulse outputs as standard for KWh \& KVArh for interfacing to external equipment such as BMS systems. The CUBE 350 can also be specified optionally with MODBUS RS485 whilst still retaining the pulse outputs, plus an additional harmonics option via MODBUS is also available. The CUBE 350 is suitable for both three phase and single phase loads and if three phase both 3 wire or 4 wire balanced or unbalanced loads, inductive or resistive. The CUBE 350 is fully programmable to set up CT ratios, the CT secondary can be specified at ordering as either conventional 5 Amp or 1 Amp, or as 333 mVAC which are used in application scenarios where the CT's are sited a distance away from the meter and VA burden within the secondary cabling is an issue. The CUBE 350 auto scales to $\mathrm{Wh}, \mathrm{KWh}, \mathrm{MWh}$ etc, depending on the CT ratio programmed. The CUBE 350 is able to accept a very wide voltage input span of $80-480 \mathrm{~V}$ L-L or $46-277 \mathrm{~V}$ L-N, thus enabling the CUBE 350 to be used on VT circuits such as $11 \mathrm{KV} / 110 \mathrm{~V}$, therefore a VT ratio can also be programmed if required. Optionally an additional Voltage Expander module can be ordered for system voltages from 480-690V L-L / 277-399 L-N +10\%

## SPECIFICATIONS

## Inputs

System:

Voltage:
Voltage expander: Current:

Frequency: Harmonics:

Voltage burden: Current burden: Voltage overload: Current overload: Auxiliary supply Standard:

Load:
General
Temperature:
Humidity:
Material:
Terminals:
Dimensions:

1 phase
3 phase, 3 wire or 4 wire Balanced or unbalanced 80-480V L-L / 46-277V L-N $\pm 0 \%$
Optional 480-690V L-L / 277-399V L-N +10\%
Via external CT's
5 Amp, 1 Amp, 333mV
Measuring range $0.2 \%$ to $120 \%$
$5-65 \mathrm{~Hz}$
HD to $30^{\text {th }}$ (with Harmonics option)
Individual to $15^{\text {th }}$ (with Harmonics option)
0.1VA per phase
0.1 VA per phase
$x 4$ for 1 hour
$x 40$ for 0.5 Sec max
230VAC $50 / 60 \mathrm{~Hz} \pm 15 \%$
On request 24VDC, 110VAC
VA / 5W max
Operating $-10^{\circ} \mathrm{C}$ to $+55^{\circ} \mathrm{C}$
$75 \%$ non condensing
Mablex to UL94-V-0, self ext.
4 mm rising cage
$96 \times 96 \times 83.5 \mathrm{~mm}$
( 72 mm behind panel)


## ACCURACY

KWh:
kVArh:
KW \& KVA:
KVAr:
Amps \& Volts:
Power Factor:
Neutral current:
Pulse output
Function: $\quad 1$ pulse for KWh
1 pulse for KVArh
Scaling: $\quad$ Programmable between 1 \& 100 counts of registers
Pulse periods: Programmable between $0.1-20 \mathrm{Sec}$
Type:
Rating:
Isolation:
Class 1 per EN 62053-21 Class 0.5 per ANSI C12.20
Class 2 per EN 62053-23
Class 0.25 IEC 60688
Class 0.5 IEC 60688
Class 0.1 IEC 60688
$\pm 0.2^{\circ}$
Class 0.5 IEC 60688
$2 \times \mathrm{NO}$ volt free, optically isolated 100mA @ 70VDC/33VAC max
3.5KV for 1 min

DISPLAY PARAMETERS

|  | Per Phase | Sum |
| :---: | :---: | :---: |
| Volts, L-L \& L-N | * |  |
| Amps | * |  |
| Power Factor | * | * |
| Import KWh |  | * |
| Import KVArh |  | * |
| KW | * | * |
| Hours Run (on load) |  | * |

## ORDERING INFORMATION

| TYPE | CURRE <br> INPUT |
| :--- | ---: |
| CUBE 350 | 5 Amp |
| CUBE 350 / MODBUS | 1 Amp |
| CUBE 350 / MODBUS / HARMONICS | 333 mV |
| Dual pulse outputs on all meters as standard |  |
|  |  |
| *Specify |  |
| **Please see page $\mathbf{1 7 9}$ for $\mathbf{3 3 3 m V}$ secondary CT's |  |

## VOLTAGE EXPANDER

An optional Voltage Expander is available for the CUBE 350 range for high L-L system voltages between 480V - 690V


# DIN 96mm THREE LINE DISPLAY, MULTI DISPLAY ENERGY METER <br> TYPE: CUBE 400 <br> PRODUCT GROUP 

## - FEATURES

- Panel mounting
- Suitable for 3 phase loads 3 wire or 4 wire
- Suitable for single phase loads
- TRMS measurement to 30th Harmonic
- Isolated dual pulse outputs as standard
- Optional MODBUS RS485 output
- Optional IP Ethernet enabled, with built in Web pages
- Current input via CT's 5 Amp, 1 Amp or 333mV
- Class 1 accuracy
- IP54 standard


## DESCRIPTION \& MODE OF OPERATION


#### Abstract

The CUBE 400 is a Din 96 mm three line display, multi display energy meter suitable for both three phase and single phase loads and if three phase both 3 wire or 4 wire balanced or unbalanced loads, inductive or resistive. The CUBE 400 is fully programmable to set up CT ratios, the CT secondary can be specified at ordering as either conventional 5 Amp or 1 Amp, or as 333 mVAC which are used in application scenarios where the CT's are sited a distance away from the meter and VA burden within the secondary cabling is an issue. The CUBE 400 auto scales to $\mathrm{Wh}, \mathrm{KWh}, \mathrm{MWh}$ etc, depending on the CT ratio programmed. The CUBE 400 is able to accept a very wide voltage input span of $80-480 \mathrm{~V}$ L-L or $46-277 \mathrm{~V}$ L-N, thus enabling the CUBE 400 to be used on VT circuits such as $11 \mathrm{KV} / 110 \mathrm{~V}$, therefore a VT ratio can also be programmed if required. Optionally an additional Voltage Expander module can be ordered for system voltages from 480-690V L-L / 277-399 L-N +10\%.


## COMMUNICATIONS

Pulse Outputs - All CUBE 400's have dual isolated volt free pulse outputs as standard for KWh \& KVArh or KVAh selectable for interfacing to external equipment such as BMS systems.
MODBUS Communications - The CUBE 400 can also be specified optionally with MODBUS RS485 whilst still retaining the pulse outputs. Plus an additional Harmonics option, individual to the 15 th and THD to the 30th via MODBUS is also available. IP Ethernet Option - With built in Web pages showing parameters of; Energy, Power, Volts, Amps, Power Factor and digital input/s and output/s set-up, with total logging of up to 60 parameters. Set up logging for FTP / HTTP / TFTP / SNMP for directly interfacing with energy management software and building control solutions. Additionally CUBE 400's with the IP Ethernet option comes with three scalable digital pulse inputs from say other utility meters, such as gas and water etc, which can also be read via the Web pages. Two digital alarm outputs are also provided along with the standard pulse outputs that all CUBE 400's have. Harmonics, individual to the $15^{\text {th }}$ and THD to the $30^{\text {th }}$ is a standard on IP Ethernet meters.

## DISPLAY PARAMETERS

|  | Per Phase | Sum |
| :--- | :---: | :---: |
| Volts, L-L \& L-N | $*$ |  |
| Amps | $*$ |  |
| Power Factor | $*$ | $*$ |
| Import KWh |  | $*$ |
| Import KVAh |  | $*$ |
| Import KVArh |  | $*$ |
| Export KWh |  | $*$ |
| Export KVArh |  | $*$ |
| Hz |  | $*$ |
| KW |  | $*$ |
| Hours Run (on load) |  | $*$ |
| Export KWh |  |  |
| Export KVArh |  | $*$ |
| Peak Volts L-N |  | $*$ |
| Peak Amps |  | $*$ |
| Neutral Amps |  | $*$ |
| KW, KVA, KVAr |  | $*$ |
| KW, KVA, KVAr Demand |  | $*$ |
| Peak KW, KVA, KVAr Demand |  | $*$ |
| Avarage Volts \& Peak | $*$ |  |
| Amp Demand \& Peak | $*$ |  |
| ADDITIONAL PARAMETERS VIA MODBUS |  |  |
| Ind \& Cap KVArh |  | $*$ |
| And if Harmonics option specified:- |  |  |
| \% THD Volts \& Amps |  |  |
| Individual Harm. 2nd to 15th | $*$ |  |

## DIMENSIONS



## SPECIFICATIONS

| Inputs |  |
| :---: | :---: |
| System: | 1 phase |
|  | 3 phase, 3 wire or 4 wire |
|  | Balanced or unbalanced |
| Voltage: | 80-480V L-L / 46-277V L-N +0\% |
| Voltage expander: | Optional 480-690V L-L/ 277-399V L-N +10\% |
| Current: | Via external CT's |
|  | 5 Amp, 1 Amp, 333mV |
|  | Measuring range $0.2 \%$ to $120 \%$ |
| Frequency: | $45-65 \mathrm{~Hz}$ |
| Harmonics: | THD to 30th (with Harmonics option) |
|  | Individual to $15^{\text {th }}$ (with Harmonics option) |
| Voltage burden: | < 0.1VA per phase |
| Current burden: | < 0.1VA per phase |
| Voltage overload: | x 4 for 1 hour |
| Current overload: | x40 for 0.5 Sec max |
| Auxiliary supply |  |
| Standard: | 230VAC 50/60Hz $\pm 15 \%$ |
|  | On request 24VDC, 110VAC |
| Load: | 5VA / 5W max |
| General |  |
| Temperature: | Operating $-10^{\circ} \mathrm{C}$ to $+55^{\circ} \mathrm{C}$ |
| Humidity: | $<75 \%$ non condensing |
| Material: | Mablex to UL94-V-0, self ext. |
| Terminals: | 4 mm rising cage |
| Dimensions: | $96 \times 96 \times 83.5 \mathrm{~mm}$ <br> (72mm behind panel) |


| Accuracy |  |  |
| :--- | :--- | :---: |
| KWh: | Class 1 per EN 62053-21 | PRODUCT |
|  | Class 0.5 per ANSI C12.20 | GROUP |
| KVArh: | Class 2 per EN $62053-23$ |  |
| KW \& KVA: | Class 0.25 IEC 60688 |  |

Class 0.25 IEC 60688
Amps \& Volts: Class 0.1 IEC 60688
Power Factor: $\quad \pm 0.2^{\circ}$
Neutral current: Class 0.5 IEC 60688
Pulse outputs
Function: 1 pulse for KWh
1 pulse for KVArh or KVAh
Scaling: Programmable between 1 \& 100 counts of registers
Pulse periods: Programmable between 0.1-20Sec
Type: $2 \times$ NO volt free, optically isolated
Rating: $\quad 100 \mathrm{~mA} @ 70 \mathrm{VDC} / 33 \mathrm{VAC}$ max
Isolation: $\quad 3.5 \mathrm{KV}$ for 1 min

## IP ethernet option

Digital inputs: 3
Digital outputs: 2

## ORDERING INFORMATION

| TYPE | CURRENT <br> INPUT TYPE* |
| :--- | :--- |
| CUBE 400 | 5 Amp |
| CUBE 400 / MODBUS | 1 Amp |
| CUBE 400 / MODBUS / HARMONICS | $333 \mathrm{mV} * *$ |
| CUBE 400 / IP |  |

OPTIONS*
230VAC aux supply (standard)
110VAC aux supply
24VDC aux supply
Voltage Expander
${ }^{*}$ Specify
**Please see page 179 for 333 mV secondary CT's

## VOLTAGE EXPANDER

An optional Voltage Expander is available for the CUBE 400 range for high L-L system voltages between 480V-690V


# DIN 96mm THREE LINE DISPLAY, 3 METERS IN 1, MULTI DISPLAY ENERGY METER 

## TYPE: MULTICUBE 950

ceATURES

## - Panel mounting

- Suitable for 1ph or 3ph loads, 3 wire or 4 wire
- Meters $3 \times 3$ ph loads or $9 \times 1$ ph loads, or in any combination
- TRMS measurement to 80th Harmonic
- $4 x$ isolated configurable pulse or alarm outputs
- Optional MODBUS RTU output
- Optional MBus output
- Current input via CT's 333mV (option for 5 Amp \& 1 Amp CT's)
- Class 0.5 accuracy


## ■ DESCRIPTION \& MODE OF OPERATION

The MULTICUBE 950 is a Din 96 mm three line display, powerful and extremely cost effective " 3 in 1 " metering solution, monitoring $3 \times 3$ phase loads ( 3 wire or 4 wire) or, $9 \times 1$ phase loads or a combination of them, for example $2 \times 3$ phase loads and $3 \times 1$ phase loads.

Cost effectiveness per meter point is further enhanced by just one voltage and comms connection per MULTICUBE 950. Further time savings come from the "Plug \& Play" RJ12 to RJ12 CT adaptors, included as part of the kit. Each three 333mV secondary CT kits are supplied with their secondary tails already terminated into the adaptor and the RJ12 cables do the rest. In the case of single phase loads three loads go to one adaptor.

Whilst the MULTICUBE 950 is built around our range of 333 mVAC secondary split core current transformers, it is also possible to use the MULTICUBE 950 with 5 Amp and 1 Amp secondary CT's, either totally or in part. Should 5 Amp or 1 Amp secondary CT's be utilised a separate Din rail mounted adaptor needs to be purchased and the secondary of these CT's physically terminated and then the RJ12 connections are made.

The MULTICUBE 950 also features innovative "Auto CT Recognition", this avoids errors from programming the CT primaries incorrectly by automatically recognising the CT primaries for you. Additionally, "Auto CT Rotation" compensates for CT's installed the wrong way round. Plus "Auto CT Accuracy Compensation" guarantees the accuracy of your data, the meter will compensate for any phase angle errors in your CT's, giving peace of mind that data will not contain any hidden inaccuracies.

Further safeguards against error are provided by the RJ12 plugs that cannot be installed the wrong way round. This just leaves the possibility of installing the CT's on the wrong phases (CT's not in phase). Should this occur a warning on the meter's large backlit display comes up informing there is an error.

The very powerful MULTICUBE 950 also packs in demands and alarms as standard and fast communication options allow up to 20 reads every second. The fast MODBUS RTU option also provides aggregated " 3 in 1 " data and optional 100 mSec reading updates. Also included is a MODBUS test facility to test the integrity of the MODBUS wiring.

The MULICUBE 950 auto scales to Wh, KWh, MWh etc, depending on the CT ratio programmed. The MULTICUBE 950 is able to accept a very wide voltage input span of $80-480 \mathrm{~V}$ L-L or $46-277 \mathrm{~V}$ L-N, thus enabling the CUBE 400 to be used on VT circuits such as $11 \mathrm{KV} / 110 \mathrm{~V}$, therefore a VT ratio can also be programmed if required.


## DISPLAY PARAMETERS

|  | Per Phase | Sum |
| :--- | ---: | :--- |
| Volts, L-L \& L-N | $1-3$ |  |
| Amps | $1-9$ |  |
| Power Factor | $1-9$ | $*$ |
| Import KWh | $1-9$ | $*$ |
| Import KVAh | $1-9$ | $*$ |
| Import KVArh | $1-9$ | $*$ |
| Export KWh | $1-9$ | $*$ |
| Export KVArh | $1-9$ | $*$ |
| Hz | $1-9$ | $*$ |
| Export KWh | $1-9$ | $*$ |
| Export KVArh | $1-3$ |  |
| Peak Volts L-N | $1-9$ |  |
| Peak Amps |  |  |
| Neutral Amps | $1-9$ | $*$ |
| KW, KVA, KVAr | $1-9$ | $*$ |
| KW, KVA, KVAr Demand | $1-9$ | $*$ |
| Peak KW, KVA, KVAr Demand | $1-3$ |  |
| Avarage Volts \& Peak | $1-9$ |  |
| Amp Demand \& Peak | $1-9$ |  |

## ADDITIONAL PARAMETERS VIA MODBUS

And if Harmonics option specified:-
\% THD Volts \& Amps
Individual Harm. $2^{\text {nd }}$ to 63 rd

## SPECIFICATIONS

| Inputs |  |
| :---: | :---: |
| System: | 1 phase |
|  | 3 phase, 3 wire or 4 wire |
|  | Balanced or unbalanced |
| Voltage: | 80-480V L-L / 46-277V L-N +20\% |
| Current: | Via external 333mv CT's |
|  | Option via adaptor for 5 Amp, 1 Amp |
|  | Measuring range $0.2 \%$ to 120\% |
| Frequency: | $45-65 \mathrm{~Hz}$ |
| Harmonics: | Input to 80th Harmonic |
|  | Individual measured to 63rd (option) |
| Voltage burden: | < 0.1VA per phase |
| Current burden: | < 0.1VA per phase |
| Voltage overload: $x 4$ for 1 hour |  |
| Current overload: x 40 for 0.5 Sec max |  |
| Auxiliary supply |  |
| Standard: | 100-240VAC ( $45-65 \mathrm{~Hz}$ ) |
| Load: | 4VA max |
| General |  |
| Temperature: | Operating $-10^{\circ} \mathrm{C}$ to $+55^{\circ} \mathrm{C}$ |
| Humidity: | $<75 \%$ non condensing |
| Material: | Mablex to UL94-V-0, self ext. |
| Terminals: | 4 mm rising cage |
| Dimensions: | $96 \times 96 \times 83.5 \mathrm{~mm}$ |
|  | ( 72 mm behind panel) |


| Accuracy |  |
| :---: | :---: |
| KWh: | Class 0.5 per EN 62053-22 |
|  | Class 0.5 per ANSI C12.20 |
| KVArh: | Class 1 per EN 62053-23 |
| KW \& KVA: | Class 0.25 IEC 60688 |
| KVAr: | Class 0.5 IEC 60688 |
| Amps \& Volts: | Class 0.1 IEC 60688 |
| Power Factor: | $\pm 0.2^{\circ}$ |
| Neutral current: | Class 0.5 IEC 60688 |
| Pulse outputs |  |
| Function: | 1 pulse for KWh, or programmable |
| Scaling: | Programmable between 1 \& 100 counts of registers |
| Pulse periods: | Programmable between 0.1-20Sec |
| Type: | $4 \times$ NO volt free, optically isolated |
| Rating: | 100mA @ 70VDC/33VAC max |
| Isolation: | 3.5 KV for 1 min |
| Comminications modbus RTU |  |
| Baud: | 4800-38400 |
| Parity: | Selectable NONE/ODD/EVEN |
| ID's: | Joint master \& individual meters |
| Speed: | Up to 20 reads per second |
| Instantaneous: | Readings updated every second |
| Isolation: | 3.5 KV |
| Communications MBus |  |
| Baud: | 1200-9600 |
| ID's: | Joint master \& individual meters |
| Tables: | Short / Long configurable |
| Isolation: |  |

## ORDERING INFORMATION

*Specify
**Please see page 179 for 333 mV secondary CT's
TYPE
MULTICUBE 950
MULTICUBE 950 / MODBUS
MULTICUBE 950 / HARMONICS / MODBUS
MULTICUBE 950 / Mbus
MULTICUBE 950 / HARMONICS / Mbus

MULTICUBE 950 / HARMONICS / Mbus

OPTIONS*
230VAC aux supply (standard) 110VAC aux supply
24VDC aux supply
5 Amp adaptor
1 Amp adaptor

DIMENSIONS


## DIN RAIL MOUNTED MULTI DISPLAY ENERGY METER

## TYPE: RAIL 350

## - FEATURES

- Din rail mounted (6 modules width)
- Suitable for 3 phase loads 3 wire or 4 wire
- Suitable for single phase loads
- TRMS measurement to 30th Harmonic
- Isolated dual pulse outputs as standard
- Optional MODBUS RS485 output
- Optional IP Ethernet enabled, with built in Web pages
- Current input via CT's 5 Amp, 1 Amp or 333mV
- Class 1 accuracy



## DESCRIPTION \& MODE OF OPERATION

The RAIL 350 is a Din rail mounted ( 6 module width) multi display energy meter suitable for both three phase and single phase loads and if three phase both 3 wire or 4 wire balanced or unbalanced loads, inductive or resistive. The RAIL 350 is fully programmable to set up CT ratios, the CT secondary can be specified at ordering as either conventional 5 Amp or 1 Amp, or as 333 mVAC which are used in application scenarios where the CT's are sited a distance away from the meter and VA burden within the secondary cabling is an issue. The RAIL 350 auto scales to Wh, KWh, MWh etc, depending on the CT ratio programmed. The RAIL 350 is able to accept a very wide voltage input span of $80-480 \mathrm{~V}$ L-L or $46-277 \mathrm{~V}$ L-N, thus enabling the RAIL 350 to be used on VT circuits such as $11 \mathrm{KV} / 110 \mathrm{~V}$, therefore a VT ratio can also be programmed if required. Please note, the optional Voltage Expander module as detailed for the CUBE 350 and CUBE 400 cannot be used with the RAIL 350

## COMMUNICATIONS

Pulse Outputs - All RAIL 350's have dual isolated volt free pulse outputs as standard for KWh \& KVArh for interfacing to external equipment such as BMS systems.
MODBUS Communications - The RAIL 350 can also be specified optionally with MODBUS RS485 whilst still retaining the pulse outputs. Via the MODBUS communications comes Harmonics information, individual to the 15th and THD to the 30 th.
IP Ethernet Option - With built in Web pages showing parameters of; Energy, Power, Volts, Amps, Power Factor and digital input/s and output/s set-up, with total logging of up to 60 parameters. Set up logging for TCP//P protocols FTP/ HTTP / TFTP / SNMP for directly interfacing with energy management software and building control solutions. Additionally RAIL 350's with the IP Ethernet option comes with three scalable digital pulse inputs from say other utility meters, such as gas and water etc, which can also be read via the Web pages. Two digital alarm outputs are also provided along with the standard pulse outputs that all RAIL 350 's have. Harmonics, individual to the $15^{\text {th }}$ and THD to the $30^{\text {th }}$ is a standard on IP Ethernet meters

## DISPLAY PARAMETERS



## Specifications

| Inputs |  | Accuracy |  |  |
| :---: | :---: | :---: | :---: | :---: |
| System: | 1 phase | KWh: | Class 1 per EN 62053-21 | PRODUCT |
|  | 3 phase, 3 wire or 4 wire |  | Class 0.5 per ANSI C12.20 | GROUP |
|  | Balanced or unbalanced | KVArh: | Class 2 per EN 62053-23 | E |
| Voltage: | 80-480V L-L / 46-277V L-N $\pm 0 \%$ | KW \& KVA: | Class 0.25 IEC 60688 |  |
|  |  | KVAr: | Class 0.5 IEC 60688 |  |
| Current: | Via external CT's | Amps \& Volts: | Class 0.1 IEC 60688 |  |
|  | 5 Amp, 1 Amp, 333mV | Power Factor: | $\pm 0.2^{\circ}$ |  |
|  | Measuring range $0.2 \%$ to $120 \%$ | Neutral current: | Class 0.5 IEC 60688 |  |
| Frequency: | $45-65 \mathrm{~Hz}$ | Pulse outputs |  |  |
| Harmonics: | THD to 30th (with Harmonics option) | Function: | 1 pulse for KWh |  |
|  | Individual to 15th (with Harmonics option) |  | 1 pulse for KVArh |  |
| Voltage burden: | $<0.1 \mathrm{VA}$ per phase | Scaling: | Programmable between 1 \& 100 |  |
| Current burden: | < 0.1VA per phase |  | counts of registers |  |
| Voltage overload: | x4 for 1 hour | Pulse periods: | Programmable between 0.1-20Sec |  |
| Current overload: | x40 for 0.5 Sec max | Type: | 2 x NO volt free, optically isolated |  |
| Auxiliary supply |  | Rating: | 100mA @ 70VDC/33VAC max |  |
| Standard: | 230VAC $50 / 60 \mathrm{~Hz} \pm 15 \%$ | Isolation: | 3.5 KV for 1 min |  |
|  | On request 24VDC, 110VAC | IP ethernet opti |  |  |
| Load: | 5VA / 5W max | Digital inputs: | 3 |  |
| General |  | Digital outputs: | 2 |  |
| Temperature: | Operating $-10^{\circ} \mathrm{C}$ to $+55^{\circ} \mathrm{C}$ |  |  |  |
| Humidity: | $<75 \%$ non condensing |  |  |  |
| Material: | Noryl to UL94-V-0, self ext. |  |  |  |
| Terminals: | 4 mm rising cage |  |  |  |
| Dimensions: | $106 \times 90 \times 58 \mathrm{~mm}$ <br> (Din rail modular, 6 modules width) |  |  |  |

ORDERING INFORMATION

| TYPE | CURRENT <br> INPUT TYPE* |  |  |
| :--- | :--- | :--- | :--- |
| RAIL 350 | 5 Amp |  |  |
| OPTIONS* |  |  |  |

[^15]
## ELECTRICAL MEASUREMENT TRANSDUCERS

| PAGES | P/No. | DESCRIPTION |
| :--- | :--- | :--- |
| 225 | MOD-U | Self powered AC voltage transducer |
| 226 | YW4 | Four way AC current transducer kit |
| 228 | FOX.TR.AU | AC voltage transducers |
| 229 | FOX.TR.AI | AC current transducers |
| $230 \& 231$ | FOX.TR.W | Active power (Watts) transducers |
| $232 \& 233$ | FOX.TR.VAR | Reactive power (VAr) transducers |
| $234 \& 235$ | FOX.TR.W.VAR | Combined active \& reactive power transducers |
| 236 | FOX.TR.COS | Power factor transducers |
| 237 | FOX.TR.HZ | Frequency transducers |
| 238 | FOX.TR.DI | DC current transducers |
| 239 | FOX.TR.DU | DC voltage transducers |



## SELF POWERED AC VOLTAGE TRANSDUCER 0-300VAC INPUT, 0-10VDC OUTPUT

TYPE: MOD-U

- FEATURES
- Din Rail Mounted
- Self powered
- Isolated output
- Screw terminals
- CE Marked


An attractive modern design AC voltage transducer in a din rail mounted modular style housing of 1.5 modules width ( 27 mm ). The MOD-U voltage transducer is designed to measure AC voltage in a single phase system. It will convert the AC signal to a DC voltage output that is directly proportional to the input signal. The MOD-U is a self powered device (i.e. no auxiliary required). The output from the MOD-U is an isolated 0-10VDC. It is required that at least $10 \%$ of Un ie 30VAC is present to obtain a reliable output.

## SPECIFIC SPECIFICATIONS

| Supply \& Measuring |  |
| :--- | :--- |
| Supply: | $0-300 \mathrm{VAC}$ |
| Supply minimum: | $10 \% \mathrm{Un}$ |
| Supply maximum: | $120 \% \mathrm{Un}$ |
| Frequency: | $50-60 \mathrm{~Hz}$ |
| Max power consumption: | 3 VA |
| Isolation |  |
| Supply to output: | Via transformer 2.5 KV 50 Hz |
|  | Impulse |
| Output |  |
| Output Voltage; | $0-10 \mathrm{VDC}$ |
| Max output Power: | 0.1 VA |
| Short circuit duration: | Indefinite |
| Accuracy: | $0.5 \%$ |
| General |  |
| Storage temperature: | $-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$ |
| Operating temperature: | $-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$ |
| Max cable size: | $2.5 m m$ Terminal |
| max torque: | 0.4 Nm |
| CE marked: | Yes |
| Standards applied: | EN61000-6-1: 2007 |
|  | EN61000-6-3: 2007 |
| Housing Material: | EN61010-1: 2002 |
| IP rating: | Polycarbonate, Auto |
|  | extinguishable to UL $94 \mathrm{~V}-0$ |
|  | IP50 |



## ORDERING INFORMATION

| TYPE | INPUT RANGE | OUTPUT |
| :--- | :--- | :--- |
| MOD-U | 0-300VAC | $0-10 \mathrm{VDC}$ |

INPUT RANGE 0-10VDC

MOD-U
0-300VAC

# FOUR WAY AC CURRENT TRANSDUCER <br> $4 \times 0.1-50$ AMPS INPUTS TO $4 \times 0$ x 5 VDC OR 0-10VDC OUTPUTS 

## TYPES: YW4 / 0-5VDC YW4 / 0-10VDC

## - FEATURES

- Din rail mounted
- Supplied complete with four split core CT's
- Primary current range $0.1-50 \mathrm{Amps}$
- Choice of $4 \times 0-5 V D C$ or $0-10$ VDC outputs
- Ideal retrofit solution for monitoring output ways on PDU's


## - DESCRIPTION \& MODE OF OPERATION

A din rail mounted four way AC current transducer. Accepting up to four inputs from the miniature split core current transformers supplied as a "kit" with the unit and giving four isolated analogue voltage signal outputs, either $0-5 \mathrm{~V}$ DC or $0-10 \mathrm{~V}$ DC. The maximum primary current possible is 50 Amps which is compatible with the 10 mm ID of the split core CT.
The YW4 has individual pairs of terminals for the CT inputs, whilst the output channels share a common 0 V rail. The YW4 requires a separate AC or DC supply voltage with isolation offered via an internal transformer or DC to DC converter.

## SPECIFICATIONS

## Supply \& Measuring

| Nominal supply tolerance: | $\pm 15 \%$ |
| :--- | :--- |
| Frequency: | $50 / 60 \mathrm{~Hz}$ |
| Max power consumption: | 3 VA |
| Input x 4: | $0.1-50 \mathrm{Amps}$ via split core CT |
| Input impedance per channel: | 10 Ohms |
| Output x 4: | $0-5 \mathrm{VDC}$ or $0-10 \mathrm{VDC}$ |
| Output impedance: | $>1 \mathrm{KOhms}$ |
| Gain error: | $<0.1 \%$ of full scale |
| Zero offset: | $<0.1 \%$ of full scale |
| Isolation |  |
| Supply to input \& output: | Via internal transformer or DC to DC converter |
| Input to output: | Via external CT |
| Output channel to channel: | Common 0 V rail |

General
Operating temperature: $\quad-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
Storage temperature: $\quad-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
Max cable size: $\quad 2.5 \mathrm{~mm}$
CE marked
In accordance with:

Housing material Yes EN61000-6-1: 2007, EN61000-6-3: 2007, EN61010-1: 2002 Polycarbonate, Auto extinguishable to UL 94 V-0

CTSpecifications
Primary currentrange:
Secondary current: Accuracy class: Max input current: Max circuit voltage: Frequency: Internal diameter: External dimensions (mm): $26 \mathrm{~W} \times 23 \mathrm{D} \times 48 \mathrm{H}$

## ORDERING INFORMATION

| TYPE | SUPPLY VOLTAGE |  |  |
| :--- | :--- | :--- | :--- |
| YW4/0-5VDC | 440VAC | 230VAC | 48VDC |
| YW4/0-10VDC | 415VAC | 110VAC | 24VDC |
|  | 400VAC | 48VAC | $12 V D C$ |

Spare CT's available separately, P/No. F-50A versions are available

CONNECTIONS


To maintain Class 1 accuracy the total CT secondary cable input loop impedance per CT must not be greater than 0.1 Ohms. Therefore, care should be made to ensure the total loop distance is as short as possible, and/or the loop cable size diameter is as great as reasonably possible.

## FOXTAM ELECTRICAL MEASUREMENT TRANSDUCERS

## GENERAL SPECIFICATIONS \& DIMENSIONS

OUTPUT

Response time: Warm up time: Output ripple:
Long term drift:
Maximum load:

Adjustment:
$<400 \mathrm{mSec}$
$<15 \mathrm{mins}$
1\% peak full scale
+/- 0.25\% per year non cumulative
0-1mA 10 KOhm max
$0-2.5 \mathrm{~mA} \quad 6 \mathrm{KOhm} \max$
$0-5 \mathrm{~mA} 3 \mathrm{KOhm}$ max
$0-10 \mathrm{~mA}$ 1.5 KOhm max
$0-20 \mathrm{~mA}$ \& $4-20 \mathrm{~mA} 750$ Ohm max
Self powered voltage \& current transducers have an adjustable span only All other transducers have an adjustable zero \& span

## AUXILIARY SUPPLY

AC:
24/110/230/415V others on request
DC:
Tolerance:
Consumption:

24 / 48 / 110V
+/- 20\%
4VA / W (combined Watt / VAr transducers 7VA / W)

## EMC COMPLIANCE

Directive 89/36/EEC: Electrostatic discharge IEC801.2 (8KV)
Electromagnetic fields IEC801.3 level 3
Fast transient bursts IEC801.4 level 4
Surge withstand IEC255-5

## ENCLOSURE

Material:
Isolation:
Mounting:
CE Marked:

Grey ABS plastic with finger proof terminal covers
4 KV rms 50 Hz for 1 min (to IEC414) between input / output / case / auxiliary supply 1KV DC / 600VAC between outputs on combined Watt / VAr transducers 35 mm Din rail (DIN-EN 50022)
Yes


See individual transducer data sheets for unit specific specification details

## TYPE: FOX.TR.AU

## DESCRIPTION



Foxtam AC voltage transducers can measure voltage either directly (max 600VAC) or via the secondary of a voltage transformer. The transducer converts the AC input voltage to an isolated analogue DC mA or DC voltage analogue signal output, directly proportional to the input. The 4 KV isolated output signals can be utilised for many applications and can be fed into analogue meters, digital meters, PLC's or BMS systems.

Transducer types include:-
Self powered - The lower cost option where no auxiliary supply is required but at least $10 \%$ of the input range is required to start generating an accurate output. Self powered units can only give a zero based output, hence a $4-20 \mathrm{~mA}$ output is not possible. Self powered units also have an enhanced burden on the input (circa 3VA).
Powered - An auxiliary supply is required, these transducers can be used accurately down to $0 \%$ of the input range. A wide choice of outputs are possible including $4-20 \mathrm{~mA}$.

Powered TRMS - As per the standard powered transducer but with enhanced measuring technology, typically used for the accurate measurement of distorted waveforms. TRMS versions are also suited for use on high frequency circuits between 40 to 500 Hz .

## SPECIFIC SPECIFICATIONS

Accuracy:
Input voltage:

Overload:

Working range:

Frequency:
Input burdens:

Class 0.25
$0-50 \mathrm{~V} . . .600 \mathrm{VAC}$ direct
VT ratio specify
1.2 x Un continuous 1.5 x Un for 1 sec
$0-120 \%$ Un (powered units) 10-120\% Un (self powered units) 50 Hz or $6 \mathrm{Hzz} 40-500 \mathrm{~Hz}$ (TRMS units)
$<0.2 \mathrm{VA}$ (powered units)
$<3$ VA (self powered units)
Case size:


## ORDERING INFORMATION

TYPE<br>FOX.TR.AU / Self powered<br>FOX.TR.AU / Powered<br>FOX.TR.AU / Powered TRMS

INPUT RANGE
0-50....600VAC direct*
VT ratio
Expandable input*** Suppressed zero input***

| OUTPUT | AUX SUPPLY |
| :--- | :--- |
| $0-1 \mathrm{~mA}$ | 24 VAC |
| $0-2.5 \mathrm{~mA}$ | 63 VAC |
| $0-5 \mathrm{~mA}$ | 110 VAC |
| $0-10 \mathrm{~mA}$ | 230 VAC |
| $0-20 \mathrm{~mA}$ | 415 VAC |
| $4-20 \mathrm{~mA} * *$ | 24 VDC |
| $0-1 \mathrm{VDC}$ | 48 VDC |
| $0-5 \mathrm{VDC}$ | 110 VDC |
| $0-10 \mathrm{VDC}$ |  |

*Specify exact direct input range required, recommended standard ranges $\mathbf{0 - 1 5 0 \mathrm { V } , 0 - 3 0 0 \mathrm { V } , 0 - 5 0 0 \mathrm { V }}$
**Not possible on self powered units
***Suppressed zero and expandable input versions are possible on powered units ie, a +/- \% deviation around a nominal point $\mathbf{1 8 4 - 2 3 0 - 2 7 6 V}$ giving for example say $\mathbf{0} \mathbf{- 5}-10 \mathrm{VDC}$ or $\mathbf{4} \mathbf{- 1 2 - 2 0 m A}$ output. Consult office for advice

## AC CURRENT TRANSDUCERS

## TYPE: FOX.TR.AI

## - DESCRIPTION



Foxtam AC current transducers can measure current either directly (max 7.5 Amps) or via the secondary of a current transformer, either 0-1 Amp or 0-5 Amp. The transducer converts the AC input current to an isolated analogue DC mA or DC voltage analogue signal output, directly proportional to the input. The 4 KV isolated output signals can be utilised for many applications and can be fed into analogue meters, digital meters, PLC's or BMS systems.

Transducer types include:-
Self powered - The lower cost option where no auxiliary supply is required but at least $10 \%$ of the input range is required to start generating an accurate output. Self powered units can only give a zero based output, hence a 4-20mA output is not possible. Self powered units also have an enhanced burden on the input (circa 3VA).

Powered - An auxiliary supply is required, these transducers can be used accurately down to $0 \%$ of the input range. A wide choice of outputs are possible including $4-20 \mathrm{~mA}$.

Powered TRMS - As per the standard powered transducer but with enhanced measuring technology, typically used for the accurate measurement of distorted waveforms. TRMS versions are also suited for use on high frequency circuits between 40 to 500 Hz .

Powered Bi-polar - For use in bi-directional current flow applications such as import / export scenarios. The analogue output signal can be either mA (but not $4-20 \mathrm{~mA}$ ) or voltage and is also bi-polar for example -10VDC to 0 to +10 VDC .

## SPECIFIC SPECIFICATIONS

| Accuracy: | Class 0.25 |
| :--- | :--- |
| Input current: | $0-0.7 \mathrm{~A} \ldots .7 .5 \mathrm{~A}$ direct |
|  | $0-1 \mathrm{~A}$ or $0-5 \mathrm{~A}$ CT input |
| Overload: | $2 \times \ln$ continuous |
|  | $30 \times \ln$ for 1 sec |
| Working range: | $0-120 \%$ In (powered units) |
|  | $10-120 \%$ In (self powered units) |
| Frequency: | 50 Hz or $60 \mathrm{~Hz}, 40-500 \mathrm{~Hz}$ (TRMS units) |
| Input burdens: | $<0.3 \mathrm{VA}$ (powered units) |
|  | $<3 \mathrm{VA}$ (self powered units) |
| Case size: | 1 (Bi-polar units 2 ) |

## ORDERING INFORMATION

TYPE
FOX.TR.AI / Self powered
FOX.TR.AI / Powered
FOX.TR.AI / Powered TRMS
FOX.TR.AI / Powered Bi-polar

INPUT RANGE
0-0.7....7.5A direct*
$0-1 \mathrm{~A}$ CT
0-5A CT


| OUTPUT |  |
| :--- | :--- |
| $0-1 \mathrm{~mA}$ | AUX SUPPLY |
| $0-2.5 \mathrm{~mA}$ | 24VAC |
| $0-5 \mathrm{~mA}$ | 63 VAC |
| $0-10 \mathrm{~mA}$ | 110 VAC |
| $0-20 \mathrm{~mA}$ | 230 VAC |
| $4-20 \mathrm{~mA}^{* *}$ | 415 VAC |
| $0-1 \mathrm{VDC}$ | 24 VDC |
| $0-5 \mathrm{VDC}$ | 48 VDC |
| $0-10 \mathrm{VDC}$ | 110 VDC |
| Bi-polar*** |  |

[^16]
## ACTIVE POWER (WATTS) TRANSDUCERS

TYPE: FOX.TR.W

## DESCRIPTION

Foxtam active power (Watts) transducers can measure directly or via inputs from current transformers and/or voltage transformers. All active power transducers require a separate auxiliary supply. At the time of ordering the input details especially CT and VT input ratio details must be specified. Any specific scale range can also be determined, otherwise a sensible scale range from the input details supplied will be calculated. The 4 KV isolated output signals are suitable for many applications, such as inputs to analogue and digital meters, PLC's or BMS

Transducer types include:-
FOX.TR.W. 12 - Single phase, requiring a single current and voltage input.
FOX.TR.W.33B - Three phase, three wire balanced load, requiring current inputs from L1 \& L3 and voltage inputs from L1 \& L3. On request the unit can be configured current input L1 only and voltage inputs L1, L2 \& L3 (the housing width will increase to case size 3 ).

FOX.TR.W.33U - Three phase, three wire unbalanced load, requiring current inputs from L1 \& L2 and voltage inputs from L1, L2 \& L3. On request the current input can be from L1 \& L3.

FOX.TR.W.34B - Three phase, four wire balanced load, requiring a single current input from L1 and a voltage input from L1 along with the Neutral.

FOX.TR.W.34U - Three phase, four wire unbalanced load, requiring current and voltage inputs from L1, L2 \& L3 plus the connection of the Neutral.

Any of the above active power transducers can be supplied as bi-directional (import / export) with a + /- analogue output or a $4-12-20 \mathrm{~mA}$ output.

## SPECIFIC SPECIFICATIONS

Class 0.25
0-50V...600VAC direct
VT ratio specify 0-0.7A...7.5A direct CT ratio specify 1 A or 5 A
1.2 x Un \& 2 x In continuous
$1.5 x$ Un \& $30 x$ In for 1 sec
0-120\%
50 Hz or 60 Hz
$<0.2 \mathrm{VA}$ voltage input
$<0.3$ VA current input

## CASE SIZES

FOX.TR.W.12-Single phase: 2
FOX.TR.W.33B-3P3W Balanced: 2
(special configuration as detailed above): 3
FOX.TR.W.33U-3P3W Unbalanced: 3
FOX.TR.W.34B-3P4W Balanced: 2
FOX.TR.W.34U-3P4W Unbalanced: 3

## ORDERING INFORMATION

TYPE<br>FOX.TR.W. 12 / Single phase<br>FOX.TR.W.33B / 3P3W balanced<br>FOX.TR.W.33U / 3P3W unbalanced<br>FOX.TR.W.34B / 3P4W balanced<br>FOX.TR.W.34U / 3P4W unbalanced

INPUT RANGE
$0-50 \ldots . .600 \mathrm{VAC}$ direct*
VT ratio*
Plus:-
0.7A....7.5A direct*
CT ratio*

| OUTPUT | AUX SUPPLY |
| :--- | :--- |
| $0-1 \mathrm{~mA}$ | 24 VAC |
| $0-2.5 \mathrm{~mA}$ | 63 VAC |
| $0-5 \mathrm{~mA}$ | 110 VAC |
| $0-10 \mathrm{~mA}$ | 230 VAC |
| $0-20 \mathrm{~mA}$ | 415 VAC |
| $4-20 \mathrm{~mA}$ | 24 VDC |
| $4-12-20 \mathrm{~mA}^{* *}$ | 48 VDC |
| $0-1 \mathrm{VDC}$ | 110 VDC |
| $0-5 \mathrm{VDC}$ |  |
| $0-10 \mathrm{VDC}$ |  |

*Specify exact direct input ranges required and/or CT \& VT ratios
**For bi-directional active power transducers (import / export versions), also +/- output signals can be specified for example -10VDC to 0 to +10VDC

## ACTIVE POWER (WATTS) TRANSDUCERS




## REACTIVE POWER (VAr) TRANSDUCERS

TYPE: FOX.TR.VAR

DESCRIPTION
Foxtam reactive power (VAr) transducers can measure directly or via inputs from current transformers and/or voltage transformers. All reactive power transducers require a separate auxiliary supply. At the time of ordering the input details especially CT and VT input ratio details must be specified. Any specific scale range can also be determined, otherwise a sensible scale range from the input details supplied will be calculated. The 4 KV isolated output signals are suitable for many applications, such as inputs to analogue and digital meters, PLC's or BMS

Transducer types include:-
FOX.TR.VAR. 12 - Single phase, requiring a single current and voltage input.
FOX.TR.VAR.33B - Three phase, three wire balanced load, requiring current inputs from L1 \& L3 and voltage inputs from L1 \& L3. On request the unit can be configured current input L1 only and voltage inputs L1, L2 \& L3 (the housing width will increase to case size 3).

FOX.TR.VAR.33U - Three phase, three wire unbalanced load, requiring current inputs from L1 \& L2 and voltage inputs from L1, L2 \& L3. On request the current input can be from L1 \& L3.

FOX.TR.VAR.34B - Three phase, four wire balanced load, requiring a single current input from L1 and a voltage input from L1 along with the Neutral.

FOX.TR.VAR.34U - Three phase, four wire unbalanced load, requiring current and voltage inputs from L1, L2 \& L3 plus the connection of the Neutral.

Any of the above active power transducers can be supplied as bi-directional (import / export) with a +/- analogue output or a $4-12-20 \mathrm{~mA}$ output.

## SPECIFIC SPECIFICATIONS

Accuracy:
Input voltage:

Current input:

Overload:

Working range:
Frequency:
Input burdens:

Class 0.25
0-50V...600VAC direct VT ratio specify
0-0.7A...7.5A direct
CT ratio specify 1 A or 5 A
1.2 x Un \& 2 x In continuous
1.5 x Un \& $30 \mathrm{x} \ln$ for 1 sec

0-120\%
50 Hz or 60 Hz
$<0.2 \mathrm{VA}$ voltage input
$<0.3 \mathrm{VA}$ current input

## CASE SIZES

FOX.TR.VAR.12-Single phase: 2
FOX.TR.VAR.33B-3P3W Balanced: 2
(special configuration as detailed above): 3
FOX.TR.VAR.33U-3P3W Unbalanced: 3
FOX.TR.VAR.34B-3P4W Balanced: 2
FOX.TR.VAR.34U-3P4W Unbalanced: 3

## ORDERING INFORMATION

## TYPE

FOX.TR.VAR. 12 / Single phase
FOX.TR.VAR.33B / 3P3W balanced
FOX.TR.VAR.33U / 3P3W unbalanced
FOX.TR.VAR.34B / 3P4W balanced
FOX.TR.VAR.34U / 3P4W unbalanced

INPUT RANGE
$0-50 \ldots . .600 \mathrm{VAC}$ direct*
VT ratio*
Plus:-
0.7A....7.5A direct*

CT ratio*

| OUTPUT | AUX SUPPLY |
| :--- | :--- |
| $0-1 \mathrm{~mA}$ | 24 VAC |
| $0-2.5 \mathrm{~mA}$ | 63 VAC |
| $0-5 \mathrm{~mA}$ | 110 VAC |
| $0-10 \mathrm{~mA}$ | 230 VAC |
| $0-20 \mathrm{~mA}$ | 415 VAC |
| $4-20 \mathrm{~mA}$ | 24 VDC |
| $4-12-20 \mathrm{~mA}^{* *}$ | 48 VDC |
| $0-1 \mathrm{VDC}$ | 110 VDC |
| $0-5 \mathrm{VDC}$ |  |
| $0-10 \mathrm{VDC}$ |  |

*Specify exact direct input ranges required and/or CT \& VT ratios
**For bi-directional reactive power transducers (import / export versions), also +/- output signals can be specified for example -10VDC to 0 to +10VDC



# COMBINED ACTIVE \& REACTIVE POWER (WATTS \& VAr) TRANSDUCERS 

## TYPE: FOX.TR.W.VAR

 GROUPFoxtam combined active and reactive power (Watts \& VAr) transducers can measure directly or via inputs from current transformers and/or voltage transformers. All combined active and reactive power transducers require a separate auxiliary supply. At the time of ordering the input details especially CT and VT input ratio details must be specified. Any specific scale range can also be determined, otherwise sensible scale ranges from the input details supplied will be calculated. The 4 KV isolated output signals are suitable for many applications, such as inputs to analogue and digital meters, PLC's or BMS systems.

Transducer types include:-
FOX.TR.W.VAR. 12 - Single phase, requiring a single current and voltage input.
FOX.TR.W.VAR.33B - Three phase, three wire balanced load, requiring current inputs from L1 \& L3 and voltage inputs from L1 \& L3. On request the unit can be configured current input L1 only and voltage inputs L1, L2 \& L3.
FOX.TR.W.VAR. 33 U - Three phase, three wire unbalanced load, requiring current inputs from L1 \& L2 and voltage inputs from L1, L2 \& L3. On request the current input can be from L1 \& L3.

FOX.TR.W.VAR.34B - Three phase, four wire balanced load, requiring a single current input from L1 and a voltage input from L1 along with the Neutral.

Any of the above transducers can be supplied as bi-directional (import / export) with a $+/-$ analogue output or a 4-12-20mA output.

## SPECIFIC SPECIFICATIONS

Accuracy:
Input voltage:

Current input:

Overload:

Working range:
Frequency:
Input burdens:

Class 0.25
0-50V...600VAC direct
VT ratio specify
0-0.7A...7.5A direct
or CT ratio specify 1 A or 5 A
1.2 x Un \& 2 x In continuous
1.5 x Un \& $30 \mathrm{x} \ln$ for 1 sec

0-120\%
50 Hz or 60 Hz
$<0.2$ VA voltage input
$<0.3$ VA current input

## CASE SIZES

FOX.TR.W.VAR.12-Single phase: 3
FOX.TR.W.VAR.33B-3P3W Balanced: 3
(special configuration as detailed above): 3
FOX.TR.W.VAR.33U-3P3W Unbalanced: 3
FOX.TR.W.VAR.34B-3P4W Balanced: 3

## - ORDERING INFORMATION

TYPE
FOX.TR.W.VAR. 12 / Single phase
FOX.TR.W.VAR.33B / 3P3W balanced
FOX.TR.W.VAR.33U / 3P3W unbalanced
FOX.TR.W.VAR.34B / 3P4W balanced

| INPUT RANGE | OUTPUT | AUX SUPPLY |
| :---: | :---: | :---: |
| 0-50....600VAC direct* | 0-1mA | 24VAC |
| VT ratio* | $0-2.5 \mathrm{~mA}$ | 63VAC |
| Plus:- | $0-5 \mathrm{~mA}$ | 110VAC |
| 0.7A....7.5A direct* | $0-10 \mathrm{~mA}$ | 230VAC |
| CT ratio* | $0-20 \mathrm{~mA}$ | 415VAC |
|  | 4-20mA | 24VDC |
|  | 4-12-20mA** | 48VDC |
|  | 0-1VDC | 110VDC |
|  | 0-5VDC |  |
|  | 0-10VDC |  |

[^17]


ON REQUEST THE UNIT CAN BE CONFIGURED L1


On combined Watt \& VAr transducers the full scale VAr input can be specified between $50 \%$ and $200 \%$ of the full scale Watt input.
e.g. If full scale Watt input is 200Watts, the VAr input can be specified anywhere between 100 and 400VArs.

## POWER FACTOR (COS) TRANSDUCERS

## TYPE: FOX.TR.COS

## DESCRIPTION



Foxtam power factor transducers measure the Cosine of the phase angle between the current and the voltage. All power factor transducers require a separate auxiliary supply. At the time of ordering the input voltage and current details especially any CT and VT input ratio details must be specified. Any specific power factor scale range can also be determined. The 4 KV isolated output signals are suitable for many applications, such as inputs to analogue and digital meters, PLC's or BMS systems and in particular power factor correction systems.
Transducer types include:-
FOX.TR.COS. 12 - Single phase, requiring a single current and voltage input.
FOX.TR.COS.33B - Three phase, three wire balanced load, requiring a current input from L1 and voltage inputs from L2 \& L3.

Any of the above power factor transducers can be supplied with a bi-polar output (+/-) or as an example 4-12-20mA output or 0-5-10VDC.

## SPECIFIC SPECIFICATIONS

| Accuracy: | Class 0.5 (down to 10\% of FS) |
| :---: | :---: |
| Input voltage: | 0-50V...600VAC direct |
|  | VT ratio specify |
| Current input: | 0-0.7A...7.5A direct |
|  | CT ratio specify 1 A or 5 A |
| Overload: | 1.2 x Un \& 2 x In continuous |
|  | 1.5 x Un \& 30 x In for 1 sec |
| Working range: | 20-120\% Un |
|  | 5-120\% In |
| Frequency: | 50 Hz or 60 Hz |
| Input burdens: | $<0.2 \mathrm{VA}$ voltage input |
|  | <0.3VA current input |
| Case size: | 2 |



## - ORDERING INFORMATION

TYPE<br>FOX.TR.COS. 12 / Single phase FOX.TR.COS.33B / 3P3W balanced<br>INPUTS<br>0-50....600VAC direct*<br>VT ratio*<br>Plus:-<br>0.7A....7.5A direct*<br>CT ratio*

| OUTPUT |  |
| :--- | :--- |
| OUX SUPPLY  <br> +/-1mA $24 V A C$ <br> +/-2.5mA 63 VAC <br> +/-5mA 110 VAC <br> +/-10mA 230 VAC <br> +/-20mA 415 VAC <br> 4-12-20mA** 24 VDC <br> +/-1VDC 48 VDC <br> +/-5VDC 110 VDC <br> +/-10VDC  |  |

[^18]FREQUENCY (Hz) TRANSDUCERS
TYPE: FOX.TR.HZ

## DESCRIPTION



PRODUCT
GROUP GG

Foxtam frequency transducers measures "mains" frequency either directly or via a voltage transformer. The transducer converts the input signal to either a DC mA or DC voltage analogue signal output, directly proportional to the input. All frequency transducers are self powered and do not require a separate auxiliary supply. The 4 KV isolated output signals can be utilised for many applications and can be fed into analogue meters, digital meters, PLC's or BMS systems.

Transducer types include:-
FOX.TR.HZ.U - Uni-polar output for example 4-20mA or 0-10VDC
FOX.TR.HZ.B - Bi-polar output for example $4-12-20 \mathrm{~mA}$ or -10 VDC to 0 to +10 VDC

## SPECIFIC SPECIFICATIONS

Accuracy:
Input voltage:
Overload:

Working range:
Burden:
Case size:
$+/-1 \%$ of centre frequency
50V...600VAC
1.2 x Un continuous
1.5 x Un for 1 sec

80-120\% Un
$<3$ VA
2


## ORDERING INFORMATION

| TYPE | INPUT VOLTS | Hz RANGE | OUTPUT UNI | OUTPUT BI |
| :---: | :---: | :---: | :---: | :---: |
| FOX.TR.HZ.U / Uni-polar | 110VAC | $45-65 \mathrm{~Hz}$ | 0-1mA | +/-1mA |
| FOX.TR.HZ.B / Bi-polar | 230VAC | $49-51 \mathrm{~Hz}$ | $0-2.5 \mathrm{~mA}$ | $+/-2.5 \mathrm{~mA}$ |
|  | 415VAC | $48-52 \mathrm{~Hz}$ | 0-5mA | $+/-5 \mathrm{~mA}$ |
|  | 50...600VAC* | $47-53 \mathrm{~Hz}$ | $0-10 \mathrm{~mA}$ | +/-10mA |
|  |  | $45-55 \mathrm{~Hz}$ | $0-20 \mathrm{~mA}$ | $+/-20 \mathrm{~mA}$ |
|  |  | $59-61 \mathrm{~Hz}$ | $4-20 \mathrm{~mA}$ | 4-12-20mA** |
|  |  | $58-62 \mathrm{~Hz}$ | 0-1VDC | +/-1VDC |
|  |  | $57-63 \mathrm{~Hz}$ | 0-5VDC | +/-5VDC |
|  |  | $55-65 \mathrm{~Hz}$ | 0-10VDC | +/-10VDC |
|  |  | $390-410 \mathrm{~Hz}$ |  |  |
|  |  | $380-420 \mathrm{~Hz}$ |  |  |
|  |  | $370-430 \mathrm{~Hz}$ |  |  |
|  |  | $360-440 \mathrm{~Hz}$ |  |  |

[^19]
## DC CURRENT TRANSDUCERS

## TYPE: FOX.TR.DI

## DESCRIPTION

 GROUP GG

Foxtam DC current transducers can measure DC current directly up to 10 Amps , above 10 Amps a shunt should be used in conjunction with a DC voltage transducer type FOX.TR.DU. The transducer converts the input signal to either a DC mA or DC voltage analogue signal output, directly proportional to the input. All DC current transducer require an auxiliary supply voltage. The 4 KV isolated output signals can be utilised for many applications and can be fed into analogue meters, digital meters, PLC's or BMS systems.

Transducer types include:-
FOX.TR.DI.U - Uni-polar output for example $4-20 \mathrm{~mA}$ or 0-10VDC.
FOX.TR.DI.B - Bi-polar transducers which are particularly applicable for renewable energy applications when charging and discharging batteries. Also for applications involving the control of DC motors when reversing polarity to control direction of motion, outputs for example can be $4-12-20 \mathrm{~mA}$ or -10 VDC to 0 to +10 VDC .

## SPECIFIC SPECIFICATIONS

| Accuracy: | Class 0.25 |
| :--- | :--- |
| Input current: | $0-1 \mathrm{~mA} . . .10 \mathrm{~A}$ direct |
| Overload: | $2 \times \ln$ continuous |
|  | $30 \times \ln$ for 1 sec |
| Working range: | $0-120 \%$ In |
| Input Burden: | $<0.3 \mathrm{VA}$ |
| Case size: | 1 |



## ORDERING INFORMATION

TYPE
FOX.TR.DI.U / Uni-polar
FOX.TR.DI.B / Bi-polar

INPUT RANGE
0-1mA....10A direct* FOX.TR.DI.B / Bi-polar
OUTPUT UNI
$0-1 \mathrm{~mA}$
$0-2.5 \mathrm{~mA}$
$0-5 \mathrm{~mA}$
$0-10 \mathrm{~mA}$
$0-20 \mathrm{~mA}$
$4-20 \mathrm{~mA}$
$0-1 \mathrm{VDC}$
$0-5 \mathrm{VDC}$
$0-10 \mathrm{VDC}$

| OUTPUT BI |  | AUX SUPPLY |
| :--- | :--- | :--- |
| +/-1mA |  | 24 VAC |
| +/-2.5mA |  | 63 VAC |
| +/-5mA |  | 110 VAC |
| +/-10mA |  | 230 VAC |
| +/-20mA | 415 VAC |  |
| 4-12-20mA** | 24 VDC |  |
| +/-1VDC | 48 VDC |  |
| +/-5VDC |  | 110 VDC |
| +/-10VDC |  |  |

[^20]
## DC VOLTAGE TRANSDUCERS

## TYPE: FOX.TR.DU

## DESCRIPTION



Foxtam DC voltage transducers can measure DC voltages directly up to 1000 VDC . Specific $0-50 \mathrm{mV}, 60 \mathrm{mV}, 75 \mathrm{mV}$ are available for use directly with DC current shunts. The transducer converts the input signal to either a DC mA or DC voltage analogue signal output, directly proportional to the input. All DC voltage transducer require an auxiliary supply voltage. The 4 KV isolated output signals can be utilised for many applications and can be fed into analogue meters, digital meters, PLC's or BMS systems.

Transducer types include:-
FOX.TR.DU.U - Uni-polar output for example 4-20mA or 0-10VDC.
FOX.TR.DU.B - Bi-polar transducers which are particularly applicable for applications involving the control of DC motors when reversing polarity to control direction of motion, outputs for example can be -10VDC to 0 to +10 VDC or 4-12-20mA.

## SPECIFIC SPECIFICATIONS

Accuracy:
Input voltage:
Overload:

Working range:
Input Burden:
Case size:

Class 0.25
$0-20 \mathrm{mV}$... 1000 V direct
$1.2 \times$ Un continuous
1.5 x Un for 1 sec
$0-120 \%$ In
$<0.2 \mathrm{VA}$
1


## ORDERING INFORMATION

TYPE
FOX.TR.DU.U / Uni-polar
FOX.TR.DU.B / Bi-polar

| INPUT RANGE |
| :--- |
| $0-50 \mathrm{mVDC}$ |
| $0-60 \mathrm{mVDC}$ |
| $0-75 \mathrm{mVDC}$ |
| $0-20 \mathrm{mV} . . .1000 \mathrm{VDC*}$ |


| OUTPUT UNI | OUTPUT BI | AUX SUPPLY |
| :---: | :---: | :---: |
| 0-1mA | +/-1mA | 24VAC |
| $0-2.5 \mathrm{~mA}$ | $+/-2.5 \mathrm{~mA}$ | 63VAC |
| 0-5mA | $+/-5 \mathrm{~mA}$ | 110VAC |
| 0-10mA | +/-10mA | 230VAC |
| 0-20mA | $+/-20 \mathrm{~mA}$ | 415VAC |
| 4-20mA | 4-12-20mA** | 24VDC |
| 0-1VDC | +/-1VDC | 48VDC |
| 0-5VDC | +/-5VDC | 110VDC |
| 0-10VDC | +/-10VDC |  |

[^21]|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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ISOLATING SIGNAL CONDITIONERS \& CONVERTERS, TRIP AMPS, ANALOGUE SIGNAL GENERATORS

| PAGES | P/No. | DESCRIPTION |
| :--- | :--- | :--- |
| 242 \& 243 | FOX.ISC | Single channel \& dual channel output isolating signal conditioners <br> and converters |
|  | MATHSCON | Dual input, single output, "Maths" function isolating signal <br> conditioners \& converters |
| 244 | YxxA0-10D | Adjustable 0-10VDC output signal generator |
| 245 | Yxxx4-20i | Adjustable 4-20mA output signal generator |
| 246 | 8/11/YRTP | $4-20 m A$ out of range trip Amp relay |
| 247 | 11/YWRIT | $1(4)-20 m A$ adjustable trip Amps relay |
| 248 | YWRU2T/10VDC | $0.1-10$ VDC adjustable dual setpoint relay |

## ISOLATING SIGNAL CONDITIONERS \& CONVERTERS

## TYPES: FOX.ISC-1-xxx FOX.ISC-2-xxx <br> Single input, single output Single input, dual output



A range of slim ( 17.5 mm wide) isolating signal conditioners and converters. The standard "in stock" product features selectable via dip switches, analogue input and analogue output signal ranges. Available is a single analogue input unit with a single analogue output, also available is a single analogue input unit with dual isolated analogue outputs (both outputs can be set to be different to each other). All units require a separate auxiliary supply, either a low voltage version $20-56 \mathrm{~V}$ AC/DC, or a high voltage version $85-265 \mathrm{VAC} / 100-300 \mathrm{VDC}$.

LED's indicate that the auxiliary supply is present, plus the input signal is present (approx $5 \%$ of full input range), a third LED signals that the output is present (approx $5 \%$ of full output range), dual output units will have two output LED's.

We are happy to offer these units set up and calibrated to your requirements at time of ordering. However, customers are able to change input and output ranges by dip switch selection, this is via removing a side cover, switch information is detailed below. Removing the front cover which hinges up gives access to Span and Zero adjustment potentiometers for fine tuning the output(s). Units will be supplied unless otherwise requested at factory default of input 4-20mA and output $4-20 \mathrm{~mA}$. Changing the output or input via the dip switches will cause the calibration to drift this can be rectified by using the Span and Zero potentiometers.

## SPECIFIC SPECIFICATIONS

Accuracy: Response time: Output ripple: Output span adjust: Output zero adjust: Input impedance:

Output impedance:
$\leq+/-0.2 \%$ FS ( $\leq+/-0.1 \%$ FS option)
$\leq 250 \mathrm{mSec}$ (thermocouple inputs $\leq 500 \mathrm{mSec}$ )
$\leq+/-0.1 \%$ FS
$+/-10 \%$ via potentiometer
+/-10\% via potentiometer
$0-20 \mathrm{~mA}, 4-20 \mathrm{~mA} 2500 \mathrm{hms}$ 0-5V, 0-10V, 1-5V, 2-10V 1 MOhms All other inputs 1 MOhms $0-20 \mathrm{~mA}, 4-20 \mathrm{~mA} 5200 \mathrm{hms}$ $0-5 V D C, 1-5 V D C \quad 5000 \mathrm{hms}$ 0-10VDC, 2-10VDC 1 KOhms
Power consumption: DC 4W, AC 6VA
Operating temp:
Operating humidity: Temp coefficient: Isolation:

Standards:
EMC
CE marked:
Rosh compliant:
$0-60^{\circ} \mathrm{C}$
20-95\% RH, non condensing
$\pm 100 \mathrm{PPM} /{ }^{\circ} \mathrm{C}$
2 KV AC for 1 min
Between; aux supply / output(s) / input / case
IEC 61010 (category 3)
EN55011:2002 EN61326:2003
Yes
Yes

DIP SWITCH SETTINGS

| INPUT DIP SWITCH (ZC) SETTING |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| INPUT | SW1 | SW2 | SW3 | SW4 |
| 0-5VDC | OFF | OFF | OFF | OFF |
| 0-10VDC | OFF | ON | OFF | OFF |
| 1-5VDC | OFF | OFF | ON | ON |
| $2-10 \mathrm{VDC}$ | OFF | ON | ON | ON |
| 0-20mA | ON | OFF | OFF | OFF |
| $4-20 \mathrm{~mA}$ | ON | OFF | ON | ON |


| OUTPUT DIP SWITCH (ZB \& ZA) SETTING |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| OUTPUT 1 (ZB) OUTPUT 2 (ZA) |  |  |  |  |  |  |
| OUTPUT | SW1 | SW2 | SW3 | SW4 | SW5 | SW6 |
| 0-5VDC | OFF | ON | ON | ON | OFF | ON |
| 0-10VDC | OFF | ON | OFF | ON | OFF | ON |
| 1-5VDC | ON | OFF | ON | ON | OFF | ON |
| $2-10 \mathrm{VDC}$ | ON | OFF | OFF | ON | OFF | ON |
| $0-20 \mathrm{~mA}$ | OFF | ON | OFF | OFF | ON | OFF |
| $4-20 \mathrm{~mA}$ | ON | OFF | OFF | OFF | ON | OFF |

## MATHSCON

Available also, are dual input, single output "Maths" units, for say summating two input signals together, or subtracting one from another. The inputs and output do not need to be the same. The product is called a MATHSCON, please contact sales office for assistance with your exact requirements, the MATHSCON's are manufactured to order

## DIMENSIONS \& CONNECTIONS



# ADJUSTABLE 0-10VDC OUTPUT SIGNAL GENERATOR 

TYPES: Y24A0-10D, Y110A0-10D, Y230A0-10D

## FEATURES

$\square$ Din Rail Mounted

- Separate Input \& Output LED Indication
$\square$ Input Voltage 24VAC, 110VAC, 230VAC
- Output 0-10VDC Adjustable
- CE Marked
- RoHS Compliant


## DESCRIPTION

A conveniently packaged Din rail mounted AC voltage to an adjustable 0-10VDC output module. Designed specifically for "HAND / OFF / AUTO" applications for BMS controller inputs, when in "HAND" a DC voltage needs to be forced into BMS input cards, but not necessarily a full 10VDC signal is required. This product can be specified with either a $24 \mathrm{VAC}, 110 \mathrm{VAC}$ or 230VAC primary voltage, the output voltage is an adjustable 0-10VDC via a front mounted potentiometer. A healthy AC input voltage is signalled by an illuminated green LED, and the output voltage is indicated by an increasing in intensity illuminated red LED starting at 1VDC (below 1VDC the output will be present, but without LED indication). Note this product is not designed to power "control circuits", it is only for driving into BMS input cards, max 10mA @ 10VDC.

## SPECIFICATIONS

## Input Supply

Nominal Input:
Output Voltage Range:
Min Impedance:
Max Impedance:
Max Output Load:
AC Supply Healthy: DC Output Healthy:

Output Voltage Regulation:

## General

Operating Temperature:
Storage Temperature:
Humidity:
Isolation Voltage I/P-O/P:
CE Marked:
Standards Applied:

Material Housing:
RoHS Compliant:

24VAC, 110VAC, 230VAC
0-10VDC
1K Ohm
Infinity Ohms
10 mA
Via Green LED
Via Red LED
Variable Intensity 1-10VDC
$\leq 0.5 \%$

[^22]

CONNECTIONS


## ORDERING INFORMATION

Type
Y24AO-10D
Y110AO-10D
Y230AO-10D

Input Voltage
Output Voltage
24VAC
0-10VDC
0-10VDC
0-10VDC
In due course the above unit will also be available as a "remote potentiometer" version. Please contact the sales office for further information.

## ADJUSTABLE 4-20mA OUTPUT SIGNAL GENERATOR

TYPES: Y24D4-20i, Y24A4-20i, Y110A4-20i, Y230A4-20i

- FEATURES
- Din Rail Mounted
- Separate Input \& Output LED Indication
- Input Voltage 24VDC, 24VAC, 110VAC, 230VAC
- Output 4-20mA Adjustable
- CE Marked
- RoHS Compliant


## DESCRIPTION

A conveniently packaged Din rail mounted AC or DC voltage input to an adjustable $4-20 \mathrm{~mA}$ output module. Designed for process control systems with "HAND / OFF / AUTO" applications. For example, when in "HAND" a signal anywhere between 4 mA and 20 mA needs to be forced into instrumentation equipment rather than a default 20 mA signal. The product is also useful for system testing and commissioning applications.

The product can be specified with either a 24 VDC , $24 \mathrm{VAC}, 110 \mathrm{VAC}$ or 230 VAC supply voltage. In the case of 24VDC isolation between the supply voltage and the output is via an internal DC to DC converter. With an AC supply voltage isolation is via an internal transformer.

The output signal is an adjustable $4-20 \mathrm{~mA}$ via a front mounted potentiometer. A healthy supply voltage is indicated via an illuminated green LED and a healthy output via an illuminated red LED.

## SPECIFICATIONS

Input Supply
Nominal Input:
Output:
Max Output Load:
Supply Healthy:
Output Healthy: Output Voltage Regulation:

## General

Operating Temperature:
Storage Temperature:
Humidity:
Isolation Voltage I/P-0/P:
CE Marked:
Standards Applied:

Material Housing:
RoHS Compliant:

24VDC, 24VAC, 110VAC, 230VAC
$4-20 \mathrm{~mA}$
750 Ohms
Via Green LED
Via Red LED
$<0.5 \%$
$-40^{\circ} \mathrm{C}$ to $65^{\circ} \mathrm{C}$
$-40^{\circ} \mathrm{C}$ to $65^{\circ} \mathrm{C}$
$95 \%$ Rel H max
1500V for 1 min
Yes
EN60950-1
EN6100-6-3
EN61010-1
Polycarbonate
Auto extinguishable to UL 94V-0
Yes

| Type | Input Voltage | Adjustable Output |
| :--- | :---: | :---: |
| Y24D4-20i | 24VDC | $4-20 \mathrm{~mA}$ |
| Y24A4-20i | 24VAC | $4-20 \mathrm{~mA}$ |
| Y110A4-20i | 110VAC | $4-20 \mathrm{~mA}$ |
| Y230A4-20i | 230 VAC | $4-20 \mathrm{~mA}$ |

## 4-20mA OUT OF RANGE TRIP AMP RELAY

## TYPES: YRTP (spno) 8RTP,11RTP (spco)

## FEATURES

- Din rail \& plug in version
- Single pole output
- Transformer isolation
- Adjustable time delay 0.1-60sec
- Supply on LED
- Relay Status LED
- CE marked


## DESCRIPTION \& MODE OF OPERATION

A monitoring relay designed to monitor the integrity of a $4-20 \mathrm{~mA}$ signal rather than control a process, applications include safeguarding a system against potentially faulty transmitters or transducers where the output could on fault rise above 20 mA or fall below 4 mA but not reaching zero. Available in either a din rail or 8 \& 11 pin plug in housing with a SPCO output (SPNO in the din rail version). The output relay will be energized when the monitored signal is between 4 \& 20 mA . The output relay will de-energise after an adjustable time delay up to 60 seconds if the monitored signal should fall below 3.5 mA or rise above 20.5 mA . There is a fixed hysteresis of 0.5 mA therefore if the monitored signal falls back within the $4-20 \mathrm{~mA}$ band the output relay will re-energise. If the auxiliary supply to the relay is lost at any time the output relay if energised will de-energise immediately.

## SPECIFICATIONS

## Supply \& Measuring

Supply voltage:
Dedicated voltage units 24VAC, 110VAC, 230VAC
$\pm 15 \%$
Supply tolerance:
Isolation AC versions:
Power consumption:
Hysteresis:
Repeat accuracy:
Via transformer
3VA max
Fixed 0.5 mA
$\pm 2 \%$ at constant ambient
$\pm 5 \%$ across temperature range
Response time:

Input range:
Max over current:
Input impedance:
Relay output
Output contacts:
Max breaking capacity:
Mechanical life:
Electrical life:
General
Operating temperature:
Storage temperature:
Max cable size:
CE marked:
In accordance with:
10 mSec on make
Adjustable up to 60 Sec on break
$4-20 \mathrm{~mA}$ adjustable
x10Continuous
1 ohm
SPCO 8Amps/250V AC1 (Din rail SPNO, Plug in SPCO) 2000VA 30 Million ops 200K ops at max rated load
$-20^{\circ} \mathrm{C}$ to $+60^{\circ} \mathrm{C}$
$-20^{\circ} \mathrm{C}$ to $+60^{\circ} \mathrm{C}$
4mm
Yes
EN61000-6-1: 2007, EN61000-6-3: 2007
EN61010-1: 2002
Housing material: Polycarbonate, Auto extinguishable to UL 94 V-0

## FUNCTION



## CONNECTIONS




## 1(4)-20mA DC ADJUSTABLE TRIP AMPS

TYPES: YWRIT, 11WRIT (spco) YWRI2T (2 x spco)

## FEATURES

- Din rail or 11 pin plug in
- Single setpoint or dual setpoint values
- Selectable manual or auto reset
- Low input impedance
- Dual LED indication
- SUMMARY OF UNITS

YWRIT - Din rail 1-20mA adjustable single setpoint trip amp. 11WRIT - 11 pin plug in 1-20mA adjustable single setpoint trip amp.
YWRI2T - Din rail 1-20mA two adjustable setpoint trip amp $2 \times$ SPCO outputs "Low" \& "High".

## MODE OF OPERATION

## YWRIT, 11WRIT

"Auto Reset" without latching mode. This mode is determined by terminals Y1 \& Y2 or pins 9 \& 11 left open. The output relay is energised when the monitored circuit rises above the level selected via the front potentiometer. The output relay will de-energise when the current falls back below the level selected less the set hysteresis adjustable 5 to $50 \%$, set via a second potentiometer. If the auxiliary supply is lost at any time the relay will also deenergise.
"Manual Reset" latching mode. This mode is determined by a wired link between terminals Y1 \& Y2 or pins 9 \& 11. The output energises when the monitored circuit rises above the level selected by the front potentiometer. Once energised the relay will remain latched even if the monitored current falls below the set level less any selected hysteresis. Resetting is achieved by opening the link between terminals Y1 \& Y2 or pins 9 \& 11 or by removing the auxiliary supply. If whilst resetting the monitored current is still above the set level a reset will not be achieved. It is normally preferable in the latching mode to have the adjustable hysteresis set at minimum.

## YWRI2T

Two setpoint trip amp. Providing two separately controllable trip levels. With R1 selected as the "High" level and R2 as the "Low" level. When the monitored signal current rises above R2 set level R2 relay will energise. If the current continues to rise above R1 set level, relay R1 will energise. Conversely as the monitored current falls R1 will de-energise, if the fall continues R2 will de-energise. The unit has a built in fixed hysteresis of 2\% at each setpoint to avoid relay "chatter". The YWRI2T does not have a latched option and is therefore "auto" reset on both relays.

## OTHER APPLICATION NOTES

## Adjustable Time Delays

The trip amps YWRIT \& 11WRIT have 3 separately adjustable $0.1-10 \mathrm{sec}$ delays. A startup delay activated by the connection of the auxiliary supply, therefore if a control circuit is going to be permanently live the time delay will only ever be active once. A delay on rising current and a delay on falling. The YWRI2T does not have any time delays.

## DC Auxiliary Supply Versions

DC auxiliary supply versions are as standard non isolated. For these versions the supply and the measured current must be isolated from each other and must not exceed 50 V DC. On request at extra cost isolated versions can be manufactured utilising internally a DC to DC converter.

## SPECIFICATIONS

## Supply \& Measuring

Nominal supply tolerance: $\pm 15$
Isolation AC versions:
Isolation DC versions:
Power consumption: Hysteresis:

Repeat accuracy:
Responsetime:
Inputrange:
Max over current: Input impedance: Time delays:

Relay output
Output contacts: Mechanical life: Electrical life: General Operating temperature: Storage temperature: Max cable size:
CEmarked
In accordance with:
Housing material
$\pm 15 \%$
Via transformer 3VA max

1 Amp (max 1 sec)
100 hms YWRI2T no delay

30 Million ops
$-20^{\circ} \mathrm{C}$ to $+60^{\circ} \mathrm{C}$
$-20^{\circ} \mathrm{C}$ to $+60^{\circ} \mathrm{C}$
4 mm
Yes
EN61010-1: 2002

No as standard or:-
Yes via optional internal DC to DC converter
Ajustable 5 to $50 \%$ ofle
YWRI2T fixed at $2 \%$
$\pm 2 \%$ at constant ambient
$\pm 5 \%$ across temperature range
100 mSec on make
200 mSec on break
1-20mA adjustable
$0.1-10$ secs separately adjustable

SPCO 10Amps/250V AC1
200K ops at max rated load

EN61000-6-1: 2007, EN61000-6-3: 2007
Polycarbonate, Auto extinguishable to UL 94 V-0

## ORDERING INFORMATION

TYPE
YWRIT (din rail SPCO)
11WRIT (11 pinSPCO)
YWRI2T (din rail $2 \times$ SPCO)

* No isolation on DC versions as standard, on request at extra cost isolated versions are available



## 0.1-10V DC ADJUSTABLE DUAL SETPOINT RELAY

## TYPE: YWRU2T/10VDC (2 x spco)

## FEATURES

Din rail mounted

- Dual setpoint (two stage)
- Ideal HVAC \& BMS prduct
- Dual LED indication


## MODE OF OPERATION

Dual setpoint 0.1-10V DC relay. Providing two separately controllable trip levels. With R1 selected as the "High" level and R2 as the "Low" level. When the monitored signal voltage rises above R2 set level R2 relay will energise. If the voltage continues to rise above R1 set level, relay R1 will energise. Conversely as the monitored voltage falls R1 will de-energise, if the fall continues R2 will de-energise. The unit has a built in fixed hysteresis of 2\% at each setpoint to avoid relay "chatter". The YWRU2T does not have a latched option and is therefore "auto" reset on both relays.

## OTHER APPLICATION NOTES

## DC Auxiliary Supply Versions

DC auxiliary supply versions are as standard non isolated. For these versions the supply and the measured current must be isolated from each other and must not exceed 50 V DC. On request at extra cost isolated versions can be manufactured utilising internally a DC to DC converter.

## SPECIFICATIONS

## Supply \& Measuring

[^23]
## $\pm 15 \%$

Power consumption:
Hysteresis:
Repeat accuracy:
Response time:
Input range:
Max over voltage:
Input impedance:
Relay output
Output contacts: Mechanical life: Electrical life:

Via transformer
No as standard or:-
Yes via optional internal DC to DC converter
3VA max
Fixed at 2\%
$\pm 2 \%$ at constant ambient
$\pm 5 \%$ across temperature range
100 mSec on make
200mSec on break
0.1-10V DC adjustable

15V DC permanently
10 KOhms
SPCO 10Amps/250V AC1
30 Million ops
200K ops at max rated load
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
Operating temperature:
$-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
Storage temperature:
4 mm
Max cable size:
CE marked
In accordance with:
Housing material
Yes
EN61000-6-1: 2007, EN61000-6-3: 2007
EN61010-1: 2002
Polycarbonate, Auto extinguishable
to UL 94 V-0

## ORDERING INFORMATION

| TYPE | COIL VOLTAGE |  |  |
| :--- | :--- | :--- | :--- |
|  |  |  |  |
| YWRU2T/10VDC (Din rail $2 \times$ SPCO) | 440VAC | 230VAC | ${ }^{* 48 V D C ~}$ |
|  | 415VAC | 110VAC | ${ }^{*} 24 \mathrm{VDC}$ |
|  | 400VAC | 48VAC |  |
|  | 380 VAC | 24VAC |  |

* No isolation on DC versions as standard, on request at extra cost isolated versions are available


PRODUCT GROUP


| PAGES | P/No. | DESCRIPTION |
| :--- | :--- | :--- |
| $250-251$ | PROBLOC BR | Combined lightning \& voltage surge arresters. Type 1 \& 2 |
| 252 | PROTEC C 40 | Voltage surge arresters. Type 2 |
|  | PROTEC CR 40 |  |
| 253 | SAFETEC BR | 1000VDC floating or Earthed system, combined lightning \& voltage surge |
|  | 12.5/1000VDC Y PV TCG | arresters. Type 1 \& 2 |
| 254 | PROTEC DMDR 20/xxx | Voltage surge arresters for floating or Earth ed systems |
| 255 | PSC-2/xxx | Voltage surge arresters for "Floating" low current systems |
| 256 | SPH-2/30DC | Lightning \& voltage surge arresters for "Floating" DC analogue signals |
|  | SPH-4/30VDC |  |



TYPES: PROBLOC BR 50 (2+0), PROBLOC BR 75 (3+0), PROBLOC BR 100 (4+0)

## FEATURES

- Type 1 \& 2 combined
- Protection level 8/20 100KA, 10/350 25KA per pole
- Available 2, 3 or 4 pole, wired in parallel
- With auxiliary contact
- Flag indication


## DESCRIPTION \& MODE OF OPERATION



Modular 2, 3 and 4 pole combined lightning 10/350 and voltage surge arrester $8 / 20$ conforming to the latest IEC standards Class I \& II (Type $1 \& 2$ ), to protect against the effects of direct lightning strikes and the resultant mains disturbance.
When selecting the nominal voltage required the voltage should be selected on the basis of L-N or L-Earth depending on the system. The standard version recommended for $\mathbf{3 8 0}-550 \mathrm{~V}$ L-L or $\mathbf{2 2 0 - 3 2 0} \mathrm{V}$ L-N systems is the $\mathbf{3 2 0 V}$ version. For $\mathbf{1 1 0 \mathrm { V }} \mathrm{L}-\mathrm{L}$ systems use the $\mathbf{1 5 0 V}$ version, according to IEC-61643-11.
The units are suitable for AC single phase or three phase systems and are purchased either as 2, 3 or 4 pole units, thus a TP\&N system requires a 4 pole unit (if a Neutral is present, it must be protected). Wiring is in parallel with discrimination fuses or a MCB fitted. For systems of $\geq 250$ Amps fuses 250 Amps gG are recommended. All units have a common Earth terminal that needs to be bonded down to Earth.
All units have a front mechanically driven flag indicator per pole, green for healthy and red for fault. All versions have a mechanically driven auxiliary C/O contact. In a healthy state the contact is made between terminals 11 \& 12. In the event of the MOV's failing due to an intense or multiple surges the contact will change state to 11 \& 14 (also indicated by the red flag). In this state protection has been lost, the unit will need replacing.

## SPECIFICATIONS

Complies with:
Category:
Protection mode:
Protection via:
Nominal discharge current 8/20:
Max discharge current $8 / 20$ :
Impulse current 10/350:
Total impulse current 10/350:

Specific energy:
Response time:
Thermal protection: Back up fuse if mains $>250$ Amps: Short circuit withstand current: Operating temperature range:
Terminal cross section:
Module size:
Auxiliary contact:
Contact rating:
PROBLOC BR $\mathbf{x x x} / \mathbf{x x x}$
Max AC continuous voltage L-N/L-E:
Protection level:

IEC 61643-11:2011 / EN61643-11:2012
Class I \& II / Type 1 \& 2
L/N - Earth
High energy MOV's (Metal Oxide Varistors)
25KA per pole
100KA per pole
25KA per pole
$(4+0) \mathrm{L} 1+\mathrm{L} 2+\mathrm{L} 3+\mathrm{N}-\mathrm{E}: \quad$ 100KA
$(3+0) \mathrm{L} 1+\mathrm{L} 2+\mathrm{L} 3-\mathrm{E}: \quad$ 75KA
$(2+0) \mathrm{L} 1+\mathrm{N}-\mathrm{E}: \quad 50 К \mathrm{~A}$
156 KJ / Ohm per pole
$<25$ n Sec
Yes
250 Amps gG
$25 \mathrm{KA} / 50 \mathrm{~Hz}$
$-40^{\circ} \mathrm{C}$ to $+70^{\circ} \mathrm{C}$
Max $35 \mathrm{~mm}^{2}$ solid cable / $25 \mathrm{~mm}^{2}$ stranded cable
2 pole ( 4 modules, 72 mm ), 3 pole ( 6 modules, 108 mm ), 4 pole ( 8 modules, 144 mm )
Yes
250VAC/0.5 Amps / 125VAC/3 Amps
150320
150 V 320 V
$<0.7 \mathrm{KV} \quad<1.4 \mathrm{KV}$

ORDERING INFORMATION

| 2 pole |  |  |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| PROBLOC BR 50/150 | 56.0573 | PROBLOC BR 75/150 | 56.0583 | PROBLOC BR 100/150 | 56.0593 |  |
| PROBLOC BR 50/320 | 56.0577 | PROBLOC BR 75/320 | 56.0587 | PROBLOC BR 100/320 | 56.0597 |  |

PROBLOC BR 50/150
PROBLOC BR 50/320

GROUP
HH
DIMENSIONS
INTERNAL CONFIGURATION

PROBLOC BR 75/150 PROBLOC BR 75/320

DIMENSIONS
INTERNAL CONFIGURATION


PROBLOC BR 100/150
PROBLOC BR 100/320

DIMENSIONS
INTERNAL CONFIGURATION


## VOLTAGE SURGE ARRESTERS TYPE 2: Imax 40KA 8/20

## TYPES: PROTEC C 40 PROTEC CR 40 (with auxiliary contact)

## FEATURES

- Type 2
- Purchased per pole, wired in parallel
- Protection level 8/20 40KA
- Removable \& replaceable MOV module
- Optional auxiliary contact
- Flag indication


## - DESCRIPTION \& MODE OF OPERATION

Modular voltage surge arresters $8 / 20$ conforming to the latest IEC standard Class II (Type 2), developed to protect against the effects of indirect lightning strikes and resultant induced voltages. Two choices of nominal voltage options are available.

When selecting the nominal voltage required the voltage should be selected on the basis of L-N or L-Earth depending on the system. The standard version recommended for $\mathbf{3 8 0 - 5 5 0 V}$ L-L or $\mathbf{2 2 0 - 3 2 0 V}$ L-N systems is the $\mathbf{3 2 0 V}$ version. For 110V L-L systems use the 150V version, according to IEC-61643-11.

The units are suitable for AC single phase or three phase and are "purchased per pole", thus a TP\&N system requires 4 units (if a Neutral is present, it must be protected). Wiring is in parallel with discrimination fuses or a MCB fitted. For systems of $\geq 125$ Amps fuses 125 Amps gG are recommended. The secondary side of each pole needs to be bonded down to Earth.

All units have a front mechanically driven flag indicator, green for healthy and red for fault. Additionally "CR" versions also have a mechanically driven auxiliary $\mathrm{C} / \mathrm{O}$ contact. In a healthy state the contact is made between terminals 11 \& 12 . In the event of the MOV's failing due to an intense or multiple surges the contact will change state to 11 \& 14 (also indicated by the red flag). In this state protection has been lost, the unit will need replacing. A feature of the PROTEC units is that the MOV module is plug in and can be replaced without disconnecting the unit or isolating the system.

## SPECIFICATIONS

Complies with:
Category:
Protection mode:
Protection via:
Nominal discharge current:
Max discharge current:
Response time:
Thermal protection:
Back up fuse if mains $>125$ Amps:
Short circuit withstand current:
Operating temperature range:
Terminal cross section:
Module size:
Optional auxiliary contact:
Contact rating:
PROTEC C(R) 40/xxx

IEC 61643-11:2011 / EN61643-11:2012
Class II / Type 2
L/N - Earth
High energy MOV's (Metal Oxide Varistors)
20KA
40KA
$<25 n$ Sec
Yes
125 Amps gG
$25 \mathrm{KA} / 50 \mathrm{~Hz}$
$-40^{\circ} \mathrm{C}$ to $+85^{\circ} \mathrm{C}$
Max $35 \mathrm{~mm}^{2}$ solid cable / $25 \mathrm{~mm}^{2}$ stranded cable
1 (18mm)
Yes, (CR version)
250VAC/0.5 Amps / 125VAC/3 Amps
150320
Max AC continuous voltage L-N/L-E: 150V 320V
Protection level: $<1.0 \mathrm{KV} \quad<1.5 \mathrm{KV}$

## ORDERING INFORMATION

TYPE (WITHOUT AUXILIARY CONTACT)
PROTEC C 40/150 50.A064
PROTEC C 40/320 50.A045

TYPE (WITH AUXILIARY CONTACT)
PROTEC CR 40/150 50.A069
PROTEC CR 40/320 50.A046

DIMENSIONS \& INTERNAL CONFIGURATION


| SPARE MOV MODULES |  |
| :--- | :--- |
| 150 V | $50 . \mathrm{A} 074$ |

150V 50.A074
320 V 50.A049

## TYPE: SAFETEC BR 12.5/1000VDC Y PV TCG

- Type 1 \& 2 combined

Raycap
$\square$ Protection level 8/20 40KA, 10/350 12.5KA per pole

- Wired in parallel
- Suitable for floating or Earthed DC systems
- Suitable for solar PV \& railway applications
- No leakage current
- No fusing required
- With auxiliary contact
- Flag indication


## - DESCRIPTION \& MODE OF OPERATION

Modular 2 pole combined lightning $10 / 350$ and voltage surge arrester $8 / 20$ conforming to the latest IEC / EN standards Class I \& II (Type 1 \& 2), to protect against the effects of lightning strikes and the resultant induced voltages.
The units are suitable for both DC floating or Earthed systems and are wired in parallel and the need of fusing is not required. Wiring of a floating system requires the Earth (PE terminals) to be bonded to Earth, for a negative Earthed system the negative terminal and PE terminals are both connected to the negative voltage rail, the opposite applies for a positively Earthed system.
The unit has a front mechanically driven flag indicator per pole, green for healthy and red for fault, plus a mechanically driven auxiliary C/O contact. In a healthy state the contact is made between terminals 11 \& 12. In the event of the MOV's failing due to an intense or multiple surges the contact will change state to 11 \& 14 (also indicated by the red flag). In this state protection has been lost, the unit will need replacing.

## SPECIFICATIONS

Complies with:
Category:
Protection via:
Nominal discharge current $8 / 20$ :
Max discharge current 8/20: Impulse current 10/350: Total impulse current 10/350:
Specific energy: Response time: Thermal protection: Short circuit withstand current: Operating temperature range: Terminal cross section:
Module size:

Auxiliary contact:
Contact rating:
Max DC continuous voltage:
Protection level:

EN50539-11:2013
Class I \& II / Type 1 \& 2
High energy MOV's (Metal Oxide Varistors)
\& GDT (Gas Discharge Tube)
12.5KA per pole

40KA
12.5KA per pole

25KA
39KJ / Ohm per pole
$<25 n \mathrm{Sec}$
Yes
1000 Amps
$-40^{\circ} \mathrm{C}$ to $+70^{\circ} \mathrm{C}$
Max $35 \mathrm{~mm}^{2}$ solid cable / $25 \mathrm{~mm}^{2}$ stranded cable
2 pole ( 4 modules, 72 mm ), 3 pole ( 6 modules, 108 mm ), 4 pole ( 8 modules, 144 mm )
Yes
250VAC/0.5 Amps / 125VAC/3 Amps
1000 V
<4.6KV

## ORDERING INFORMATION

## TYPE

SAFETEC BR 12.5/1000VDC Y PV TCG 54.0583

## DIMENSIONS \& INTERNAL CONFIGURATION



FLOATING SYSTEM


## VOLTAGE SURGE ARRESTERS FOR DC FLOATING OR EARTHED POWER SUPPLIES \& SYSTEMS <br> PRODUCT GROUP

## TYPE: PROTEC DMDR 20/xxx

- Type 3
- Wired in parallel
- Suitable for floating or Earthed DC systems
- Suitable for power supply and telecommunication applications
- No fusing required
- Flag indication
- Remote contact



## - DESCRIPTION \& MODE OF OPERATION

Modular voltage surge arrester $8 / 20$ conforming to the latest IEC / EN standards Class III (Type 3), to protect against the effects of indirect lightning strikes and the resultant induced voltages.

The units are suitable for both DC floating or Earthed systems and are wired in parallel and the need of fusing is not required. These units are particularly suitable for DC power supply protection and telecommunication applications.

The unit has a front mechanically driven flag indicator per pole, green for healthy and red for fault, plus a mechanically driven auxiliary N/C contact. In a healthy state the contact is made, In the event of the MOV's failing due to an intense or multiple surges the contact will change state to open (also indicated by the red flag). In this state protection has been lost, the unit will need replacing.

## SPECIFICATIONS

Complies with:
Category:
Protection via:
Response time floating system: Response time Earthed system:
Thermal protection:
Operating temperature range:
Terminal cross section:
Module size:
Remote contact:

| PROTEC DMDR 20/ | 24V | 48V | 60V | 120V |
| :--- | :--- | :--- | :--- | ---: |
| Maximum continuous DC voltage: | 34 V | 60 V | 75 V | 150 V |
| Nominal discharge current $8 / 20:$ | 1.2 KA | 2.5 KA | 2.5 KA | 4.0 KA |
| Max discharge current $8 / 20:$ | 4 KA | 6 KA | 6 KA | 10 KA |
| Protection level floating system: | $<180 \mathrm{~V}$ | $<370 \mathrm{~V}$ | $<400 \mathrm{~V}$ | $<600 \mathrm{~V}$ |
| Protection level Earthed system: | $<550 \mathrm{~V}$ | $<650 \mathrm{~V}$ | $<700 \mathrm{~V}$ | $<850 \mathrm{~V}$ |

## ORDERING INFORMATION

IEC61643-1:2005 / EN61643-11:2005
Class III / Type 3
High energy MOV's (Metal Oxide Varistors) \& GDT (Gas Discharge Tube)
$<25 n$ Sec
$<100 \mathrm{n}$ Sec
Yes
$-40^{\circ} \mathrm{C}$ to $+80^{\circ} \mathrm{C}$
$6 \mathrm{~mm}^{2}$ stranded cable
1 (18mm)
Yes

Spare Modules
24VDC 510784
48VDC 510836
6OVDC 510837
120VDC 510838

DIMENSIONS \& INTERNAL CONFIGURATION


Legend
GDT Gas Discharge Tube
MOV Metal Oxide Varistor
PE Ground
R Resistor
RC Remote Control (NC)

# VOLTAGE SURGE ARRESTERS FOR "FLOATING" LOW CURRENT DC POWER SUPPLIES \& SYSTEMS Imax 20KA 8/20 <br> PRODUCT 

## TYPE: PSC-2/xxx



- FEATURES
- Wired in series, maximum 4 Amps
- Suitable for floating DC systems
- Suitable for low power supply and telecommunication applications
- No fusing required
- Width only 12mm


## DESCRIPTION \& MODE OF OPERATION

These units are designed to protect small 12, 24 and 48VDC floating power supplies and systems and are wired in series, maximum system load 4 Amps. Protection is via MOV's, the plug in module facilitates the replacement of a failed MOV without the need to disconnect the system wiring and as it is in parallel across the system, failure or removal of the module does not interrupt the system voltage.

## SPECIFICATIONS

| Complies with: | IEC / EN61643-21 |
| :--- | :--- |
| Category: | C1 / C2 / C3 |

Maximum in series current rating: 4 Amps
C2 Nominal discharge current 8/20: 10KA
Maximum discharge current 8/20: 20KA
Protection via:
High energy MOV's (Metal Oxide Varistors)
Response time:
Thermal protection:
Operating temperature range: Terminal cross section:

| PSC-2/ | 12V | 24V | 48V |
| :--- | :--- | :--- | :--- |
| Maximum continuous DC voltage: | 15 V | 28 V | 52 V |

## ORDERING INFORMATION

## Type

PSC-2/12VDC 7086.83
PSC-2/24VDC 7086.84
PSC-2/48VDC 7086.85

Spare Modules
12VDC 7086.86
24VDC 7086.87
48VDC 7086.88

## DIMENSIONS \& INTERNAL CONFIGURATION



# LIGHTNING \& VOLTAGE SURGE ARRESTERS FOR 

 "FLOATING" DC ANALOGUE SIGNALS: Imax 20KA 8/20 \& limp 5KA 10/350
## TYPES: SPH-2/30VDC (single channel) SPH-4/30VDC (double channel)



- No fusing required
- Width only 12 mm


## - DESCRIPTION \& MODE OF OPERATION

These units are designed to protect all DC "floating" analogue signal lines both voltage and mA, including TTL levels and PT100 signals. The maximum potential of any signal line can be 30VDC, signal lines are wired in series, maximum current 1 Amp. Available as either single channel or double channel, in the case of a double channel each channel is isolated from each other. Protection is via Gas Discharge Tube technology and high speed silicon avalanche diodes. The plug in module facilitates the replacement of a failed GDT without the need to disconnect the system wiring and as it is in parallel across the system, failure or removal of the module does not interrupt the analogue signal lines.

## SPECIFICATIONS

## Complies with: <br> Category:

IEC / EN61643-21
D1 / C1 / C2 / C3
Maximum in series current rating: 1 Amp Nominal max system voltage: 30VDC Absolute max system voltage: 33VDC
C2 Nominal discharge current 8/20:10KA
Maximum discharge current 8/20: 20KA
D1 impulse current 10/350:
5KA
Response time Line - Line: $\quad<1 \mathrm{n} \mathrm{Sec}$ Response time Line - Ground: Serial impedance:
Operating temperature range:
Terminal cross section:

## ORDERING INFORMATION

| Type |  | Spare Modules |  |  |
| :--- | :--- | :--- | :--- | :--- |
| SPH-2/30VDC | (single channel) | 7082.84 | 30VDC | 7082.85 |
| SPH-4/30VDC | (double channel | 7082.82 | 30VDC | 7082.83 |




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MINI-1M
UNI-8-1M \& UNI-11-1M
TB48
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8/11/YSA
UNI-2X \& UNI-4X
8/11RAXF
8/11/YRH
8/11/YSH
UNI-1C \& UNI-4C
8/11/YRC
8/11/YRB
UNI-1K \& UNI-2K
8/11/YRK
UNI-2Q \& UNI-4Q
8/11/YR2Q
UNI-1B \& UNI-4B
8/11/YRDB
8/11/YSDB
UNI-1D \& UNI-4D
8/11/YRD
11R2ES
8/11/LYRAPTU
8/11/LYRAFTU
8/11/LYRHFTU
8/11/LYRQFTU
GBP
AH5N
AH4CN-RG
134 \& 136
ALPHA \& UNO
SC28 \& SC44
MOD-P \& MOD-PN
BXP
8/11/YWRP
8/11/YWRUP \& 8/11/YWRUPS
YWRKPTU(S)
YWR2AKPTU(S)
BAE, BAP, BBE, BBP
BCE, BDE, BDP, BMP
BPP, BQE, BQP, BRP
BWP
BFP
MOD-TC-2 \& YWRTC
YWR2TC7, 8/11/YRTC
YWR2TR7
11WRSTC, 11WRSTCT
YWRPTC4 \& MOD-PTC
YRTCA
FOX.CS-200
YRI-41 \& MOD-I
YWRI, YWRI.H, 11WRIA, 11WRID
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11/YWRIT \& YWR2IT
YWRU2T/10VDC
YxxA0-10D
11/YWRU \& YWRU.T10
YWROUV, YWR2OUV, YWROUV2
8/11/YWRTU
8/11/YWRW \& MOD-W-1
YWRWS
MOD-SAP-1
8/11RVL, YWRVL, YWRVL4
FRP3145
FRP3125
TRP3145 \& TRP3140
TRP3125 \& TRP3120
TRP6825 \& TRP6820
TRP6935 \& TRP6930
14 pin, 8 pin, 11 pin relay sockets
41F-1Z-C2
HF115FH
HF115F1 \& HF115F2
HF115FP
UNI-1R \& UNI-3R
UNI-1LR \& UNI-2LR
UNI-4LRS
8/11/YRX
YWAD
YWACD
YWRICD, YWA9, YWA15, 11WA8
YWA5
YWA10
SC01, SX01, SY01, SC03, SP03
FC-xxx
FOX.PSU-1
YxxA0-10D
FOX.PSU-2
YxxDxxD
FOX.TXM
FOX.TX
TSC \& TSD
KZS 2M
S1L, S3L, G1L, G3L
VLC10, VLC14, VLC2
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FOX.WP
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FOX40.1, FOX50.1
FOX60.15, FOX60.3
FOX80.1, FOX100.3
FOX100.55, FOX84.34
FOX105.38, FOX127.38
FOX127.54, FOX75
FOX105, FOX140
FOX.SUM
FOX.SC23, FOX.SC58
FOX.SC812, FOX.SC816
FOX.SC40, YW4
KBR18, KBR32, KBR44
CS-6 \& SC-6
WSK40, ASR22.3
ASK31.3, ASK318.3
ASK41.3, ASK412.4
ASK41.4, ASK61.4
ASK63.4, ASK105.6
ASK105.6N, ASK81.4
ASK101.4
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SCL, SCT ROPE
FOX.DCCT
CCT31.3, CCT41.4
UA-SHT \& NST
Ql-50V-485, Ql-300-V-485
QI-POWER-485, Ql-POWER-485-LV
QI-POWER-485-300, OI-POWER-485-300-LV
AU318E, V308E
Din 48/72/96mm analogue meters
CS3S
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P/No.<br>CM2<br>CSS-40/41/50<br>CS1/CS2<br>CST-321M<br>CS2-TM<br>VAW<br>MW-5, MQ-5, MPF-5<br>CUBE 300<br>CUBE 350<br>CUBE 400<br>MULTICUBE 950<br>RAIL 350<br>MOD-U<br>YW4<br>FOX.TR.AU<br>FOX.TR.AI<br>FOX.TR.W<br>FOX.TR.VAR<br>FOX.TR.W.VAR<br>FOX.TR.COS<br>FOX.TR.HZ<br>FOX.TR.DI<br>FOX.TR.DU<br>FOX.ISC, MATHSCON<br>YxxA0-10D<br>Yxxx4-20i<br>8/11/YRTP<br>11/YWRIT<br>YWRU2.T/10VDC<br>PROBLOC BR 50, PROBLOC BR 75<br>PROBLOC BR 100<br>PROTEC C 40, PROTEC CR 40<br>SAFETEC BR 12.5/1000VDC Y PV TCG<br>PROTEC DMDR 20/xxx<br>PSC-2/xxx<br>SPH-2/30VDC, SPH-4/30VDC

DESCRIPTION OF PRODUCT GROUPS

A Foxtam Classic range Electronic Timers
B Foxtam Modular range Electronic Timers
C ANLY Electronic and Din 48 mm Process Timers
D Foxtam Classic range Sensing and Control Relays
E Foxtam Modular range Sensing and Control Relays
F Foxtam BMS / HVAC Specific Products
G Foxtam Modular range Power Relays, Latching Relays and Sequence Relays
H Plug in Relays and Relay Sockets
I Electro Mechanical Time Switches
J Digital Time Switches
K Mechanical Extension Timers
L Foxtam Alarm Integrators
M Foxtam Lamp Test Modules
N Foxtam Panel Mounted Audible
0 ETI MCB's, RCBO's, Bus-bar and Din Rail Mounted Fuse Holders
P Foxtam Modular range Power Supplies
0 Foxtam Power Supplies
R Foxtam DC to DC Converters

S Foxtam Modular range Transformers
T Foxtam Control Panel Transformers
U Hour Counters and Operation Counters
V Foxtam Current Transformers
W MBS Current Transformers and Transducers
X CS / SC range of "CT" Style Current Transducers
Y Split Core 333mVAC Secondary Current Transformers
Z AC/DC MODBUS Output Current Transformers
AA DC Split Core Current Transformers / Transducers
BB DC Shunts
CC Din 48/72/96 Analogue Meters
DD Digital Panel Meters
EE KWh and Multi Display Energy Meters
FF Foxtam Signal Isolators and Converters, Analogue Signal Trip Amps
GG Foxtam Electrical Transducers
HH Lightning and Voltage Surge Arresters
JJ Midland Jay Electronic Timers and Monitoring Relays
KK Indicator and Alarm Annunciator Panels
s "'- NOTES

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Serving:-


Water Industry


Process Control


BMS


Transportation


HVAC


Energy

## FDXTAM OONTAOLS

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MANUFACTURING: Foxtam House, Watts Street, Chadderton, Oldham Lancs OL9 9LQ Tel: +44 (0161) 62605316 Fax: +44 (0161) 6270929
email: sales@foxtamcontrols.co.uk
www.foxtamcontrols.co.uk


Tel: 0127625858 \& 01616265316


[^0]:    * Phase imbalance + Neutral shift only available on three phase 4 wire units

[^1]:    * Insert S if sequence is required
    ** Insert Txxx for the required time delay

[^2]:    OPTION
    On 3 wire variants as a no cost option a separate AC auxiliary supply can be specified. This gives the possibility of additonal "control circuit" voltage monitoring. If this is lost or is not present, the unit will de-energise or not energise as applicable.
    24VAC, 48VAC, 110VAC

[^3]:    **Please see page 54 for enclosure dimensions

[^4]:    **Specify

[^5]:    * Insert T if Klixon version is required
    ** No isolation on DC versions

[^6]:    * Insert T if Klixon version is required

[^7]:    * No isolation on DC versions

[^8]:    Housing material:

[^9]:    TYPE
    VOLTAGE
    YRTCA $/ 5-40^{\circ} \mathrm{C}$
    230VAC, 110VAC, 48VACDC, 24VACDC
    Above units supplied complete with panel mounted sensor
    Spare sensors available/No. NTC3K
    It is possible for applications within the HVAC industry to manufacture bespoke temperature ranges of the above units, please contact our sales

[^10]:    ORDERING INFORMATION
    TYPE
    YRI-41/1mA-100mA
    YRI-41/10mA-1A
    YRI-41/30mA-3A
    YRI-41/50mA-5A
    YRI-41/100mA-10A

[^11]:    $-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
    to +65

    1500VDC for 1 Min

    EN60950-1
    EN6100-6-3
    EN61010-1
    Auto extinguishable to UL 94V-0
    Yes

[^12]:    * Also available are dedicated 12 hour and 24 hour versions, as supplied to detect jamming and loss of flow on rotating arm sewage beds.

[^13]:    FEATURES

    - Output 12VDC adjustable 12-14VDC / 5 Amps Output 24VDC adjustable 24-28VDC / 2.5 Amps
    ■ 4 modules width ( 70 mm )
    - Primary voltage 100-240VAC universal
    - LED indication for output healthy

[^14]:    ORDERING INFORMATION

    | Input Voltage | Output Voltag |
    | :---: | :---: |
    | 9-36VDC | 5VDC |
    | 9-36VDC | 12VDC |
    | $9-36 \mathrm{VDC}$ | 24VDC |
    | 18-75VDC | 5VDC |
    | 18-75VDC | 12VDC |
    | 18-75VDC | 24VDC |

    

    ## SPECIFICATIONS

    | Input Supply |  |
    | :---: | :---: |
    | Nominal Input: | 24VDC or 48VDC |
    | Input Voltage Range: | $9-36 \mathrm{VDC}$ or 18-75VDC |
    | Input Current at No Load: | 24 V Input, 20 mA Typ. |
    |  | 48 V Input, 10 mA Typ. |
    | Input Current at Full Load: | 24 V Input, $300 \mathrm{~mA} \mathrm{Typ}$. |
    |  | 48 V Input, 150mA Typ. |
    | Surge Voltage: | 24 V Input, 50V Max |
    |  | 48 V Input, 100V Max |
    | Reverse Voltage Protection: | 1A MAX |
    | Output Supply |  |
    | Output Voltage/Current: | 5VDC/1.2A |
    |  | $12 \mathrm{VDC} / 500 \mathrm{~mA}$ |
    |  | $24 \mathrm{VDC} / 250 \mathrm{~mA}$ |
    | Output Power: | 6 Watt |
    | Voltage Accuracy: | $\pm 2 \%$ |
    | Regulation: | Vin Min to Vin Max 0.5\% |
    |  | Load variation 0-100\% 1.2\% |
    | Ripple \% Noise | <60mV PK-PK Typ. |
    | Temperature Coefficient: | $\pm 0.02 \% / \mathrm{K}$ |
    | Output Current Limitation: | $>150 \%$ of lout, Constant Current |
    | Short Circuit Protection: | Continuous (Automatic Recovery) |
    | Max Capacitive Load: | 5V Output 470uF |
    |  | 12V Output 100uF |
    |  | 24V Output 47uF |
    | General |  |
    | Operating Temperature: | $-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$ |
    | Storage Temperature: | $-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$ |
    | Load De rating: | 5 V Output $2.5 \% / \mathrm{K}$ above $60^{\circ} \mathrm{C}$ |
    |  | 12V, 24 V Output $3.3 \% / \mathrm{K}$ above $70^{\circ} \mathrm{C}$ |
    | Humidity: | 95\% Rel H max |
    | Reliability, Calculated MTBF |  |
    | (MIL-HDBK-217F at $+25^{\circ} \mathrm{C}$ ): | $>800,000 \mathrm{~h}$ |
    | Isolation Voltage I/P-0/P (60sec): | 1500VDC |
    | Isolation capacitance: | 1,000pF Typ. |
    | Isolation Resistance: | >1,000M Ohm |
    | Switching Frequency: | 300kHz typ (Pulse Frequency Modulation) |
    | CE Marked: | Yes |
    | Standards Applied: | EN 55022 Class A |
    |  | IEC/EN60950-1 |
    |  | EN6100-6-3 |
    |  | EN61010-1 |
    | Material Housing: | Polycarbonate |
    |  | Auto extinguishable to UL 94V-0 |
    | Environmental Compliance: | RoHS 2011/65/EU |

    ## DIN RAIL, DC TO DC CONVERTERS

    ## TYPES: YW300D5D, YW300D12D, YW300D24D YW1000D5D, YW1000D12D, YW1000D24D

    - FEATURES
    - Din rail mounted
    - Output supply healthy LED indication
    - Indefinite short circuit protection
    - I/O isolation 4000VDC
    - Wide input voltage range $\mathbf{8 5}$-370VDC \& 210-1200VDC
    - Outputs 5VDC, 12VDC, 24VDC
    - 5 Watts or 15 Watts output
    - CE marked
    - RoHS compliant


    ## DESCRIPTION

    Conveniently packaged range of Din rail mounted DC/DC converters with wide ranging input supplies. High efficiency operation with low output noise. These DC/DC converters feature LED indication for healthy output supply. All terminal details along with CE mark is clearly marked on the side of the housing.

    ## CONNECTIONS

    

    IMPORTANT NOTE: Polarity matters, incorrect connection will not just cause non operation but also cause product failure.

    ## DIMENSIONS

    

    YW300DxxD
    

    YW1000DxxD

    ## FOXTAM DIN RAIL MOUNTED MODULAR TRANSFORMERS

    ## TYPE: FOX.TXM xxxx/xx

    ## FEATURES

    - Din rail mounted modular construction
    - 230VAC 50/60Hz primary
    - 24VAC secondary
    - 10VA to 75VA
    - Built in secondary PTC or fuse protection
    - TECHNICAL SPECIFICATIONS


    ## INPUT

    | Primary voltage: | 230VAC +/-10\% |
    | :---: | :---: |
    | Frequency: | $47-63 \mathrm{~Hz}$ |
    | OUTPUT |  |
    | Voltage: | 24VAC |
    | Temperature range: | $-10^{\circ} \mathrm{C}$ to $+40^{\circ} \mathrm{C}\left(10 \mathrm{VA}\right.$ unit up to $+50^{\circ} \mathrm{C}$ ) | Continuous use: Yes STANDARDS Safety standards: EMC standards: Insulation: CE marked:

    ```
    --10%
    24VAC
    ```

    Yes

    EN61558-2006/95/ECC 89/336
    EN55022/B - EN55024
    Class II
    Yes

    ## FOX.TXM 0010/24VAC

    ## FEATURES

    - 230VAC PRIMARY
    - 10VA / 24VAC SECONDARY
    - 2 MODULES WIDTH (35mm)

    CASE DIMENSIONS
    

    Example illustrated is 3 modules width, the profile is the same for all case sizes but the widths vary as follows:

    ```
    2 Modules width: A=35.0mm
    3 Modules width: A=52.5mm
    5 Modules width: A=87.5mm
    6 Modules width: A=105mm
    8 Modules width: A=140mm
    ```


    ## FOX-TXM 0020/24VAC

    ## - FEATURES

    - 230VAC PRIMARY
    - 20VA / 24VAC SECONDARY
    - 3 MODULES WIDTH (52.5mm)
    - BUILT IN SECONDARY PTC PROTECTION


    ## FOX-TXM 0035/24VAC

    ## - FEATURES

    - 230VAC PRIMARY
    - 35VA / 24VAC SECONDARY
    - 5 MODULES WIDTH ( 87.5 mm )
    - BUILT IN SECONDARY REMOVABLE FUSE PROTECTION


    ## Other Modular 24VAC Transformers


    
    -

    ## FOXTAM CONTROL PANEL TRANSFORMERS

    - Multi tap secondaries 0-12-24V / 0-55-110V / 0-115-230V
    - VA sizes from 30VA to 3200VA
    - Double wound isolating
    - With primary winding earth screen
    - Earth terminal
    - Non welded construction means cool operation
    - CE marked
    


    ## DESCRIPTION

    Quality double wound isolating transformers for general "Control Panel" applications, giving excellent on load and off load performance and stability. Benefiting from a multi tap primary 0-230/240-400-415-440V with no confusing terminal links required, likewise the secondary taps are also without requiring links. Available with a choice of secondary voltages $0-12-24 \mathrm{~V} / 0-55-110 \mathrm{~V}$ or $0-115-230 \mathrm{~V}$. The construction in of a non-welded style, which is preferable to ensure cool operation both on and off load. The transformers also benefit from a primary Earth screen as a safeguard in the event of a catastrophic short circuit in the primary, thus ensuring any potential is routed to Earth rather than to the secondary. An optional Din rail mounting adaptor is available for the 30VA, 50VA, 100VA and 160VA transformers sizes, (one adaptor fits all). It is important to note, when sizing a transformer that the lower secondary voltage tap will be at half the specified VA rating. Example, a 100VA / 24VAC transformer will give you 50VA at 12VAC.

    ## SPECIFICATIONS

    According to:
    CE Marked:
    Terminals:
    Copper:
    Lamination Loss:
    Thermic Class:
    Protection Class:

    EN61558-2-4/2-6
    Yes IP20
    Class F/H
    $1.5 \mathrm{~W} / \mathrm{Kg}$
    Class F
    Class 1

    Insulation:

    Tropicalised:
    Frequency:
    Continuously Rated:

    4KV between windings 2 KV between windings \& chassis Earth
    Yes
    50/60Hz
    Yes

    ## FOX.TX.D-CLIP

    Optional DIN Rail Mounting Clip suitable for 30VA, 50VA, 100VA \& 160VA secondary transformers.
    

    | Dimensions |  |  |  |  |  |  |  |
    | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
    | Type-1 (0-12-24V) | A | B | C | D | E | F | G |
    | FOX.TX 0030 | 77 | 77 | 75 | 37 | 53 | 4 | 6 |
    | FOX.TX 0050 | 77 | 76 | 80 | 42 | 53 |  | 6 |
    | FOX.TX 0100 | 86 | 84 | 80 | 37 | 70 | 4 | 10 |
    | FOX.TX 0160 | 86 | 84 | 89 | 47 | 70 | 4 | 10 |
    | FOX.TX 0200 | 97 | 92 | 98 | 48 | 80 | 4 | 12 |
    | FOX.TX 0320 | 123 | 110 | 95 | 59 | 99 | 12 | 14 |
    | FOX.TX 0400 | 122 | 113 | 98 | 64 | 99 | 12 | 14 |
    | FOX.TX 0500 | 122 | 111 | 108 | 74 | 100 | 12 | 14 |
    | FOX.TX 0630 | 154 | 149 | 120 | 77 | 125 | 8 | 17 |
    | FOX.TX 0800 | 150 | 154 | 158 | 116 | 125 | 8 | 18 |
    | FOX.TX 1000 | 150 | 149 | 138 | 113 | 124 | 8 | 24 |
    | FOX.TX 1600 | 198 | 224 | 180 | 108 | 169 | 13 | 12 |
    | FOX.TX 2000 | 198 | 258 | 211 | 127 | 169 | 19 | 12 |
    | FOX.TX 2500 | 198 | 260 | 245 | 145 | 169 | 19 | 12 |
    | FOX.TX 3200 | 242 | 278 | 240 | 112 | 210 | 16 | 22 |
    | Type-2 (0-115-230V) | A | B | C | D | E | F | G |
    | FOX.TX 0030 | 77 | 77 | 75 | 37 | 53 |  | 6 |
    | FOX.TX 0050 | 77 | 76 | 80 | 42 | 53 | 4 | 6 |
    | FOX.TX 0100 | 86 | 84 | 80 | 37 | 70 | 4 | 10 |
    | FOX.TX 0160 | 86 | 84 | 89 | 47 | 70 | 4 | 10 |
    | FOX.TX 0200 | 97 | 92 | 91 | 51 | 80 | 4 | 12 |
    | FOX.TX 0320 | 121 | 110 | 88 | 60 | 110 | 6 | 14 |
    | FOX.TX 0400 | 121 | 110 | 95 | 64 | 100 | 7 | 14 |
    | FOX.TX 0500 | 120 | 118 | 114 | 75 | 100 | 6 | 14 |
    | FOX.TX 0630 | 150 | 133 | 112 | 75 | 126 | 8 | 19 |
    | FOX.TX 0800 | 150 | 135 | 128 | 85 | 125 | 8 | 18 |
    | FOX.TX 1000 | 150 | 139 | 168 | 113 | 124 | 8 | 24 |
    | FOX.TX 1600 | 198 | 198 | 150 | 112 | 169 | 16 | 13 |
    | FOX.TX 2000 | 198 | 198 | 180 | 130 | 168 | 14 | 12 |
    | FOX.TX 2500 | 198 | 198 | 199 | 146 | 168 | 14 | 12 |
    | FOX.TX 3200 | 241 | 240 | 200 | 116 | 200 | 20 | 33 |
    | Type-3 (0-55-110V) | A | B | C | D | E | F | G |
    | FOX.TX 0030 | 77 | 77 | 75 | 37 | 53 | 4 | 6 |
    | FOX.TX 0050 | 77 | 76 | 80 | 42 | 53 | 4 | 6 |
    | FOX.TX 0100 | 86 | 84 | 80 | 37 | 70 | 4 | 10 |
    | FOX.TX 0160 | 86 | 84 | 89 | 47 | 70 | 4 | 10 |
    | FOX.TX 0200 | 97 | 92 | 91 | 51 | 80 | 4 | 12 |
    | FOX.TX 0320 | 120 | 111 | 94 | 58 | 100 | 7 | 14 |
    | FOX.TX 0400 | 120 | 118 | 108 | 64 | 100 | 6 | 14 |
    | FOX.TX 0500 | 120 | 130 | 118 | 74 | 100 | 7 | 14 |
    | FOX.TX 0630 | 150 | 138 | 128 | 74 | 125 | 8 | 24 |
    | FOX.TX 0800 | 150 | 154 | 158 | 116 | 135 | 8 | 19 |
    | FOX.TX 1000 | 150 | 139 | 168 | 113 | 124 | 8 | 24 |
    | FOX.TX 1600 | 198 | 198 | 155 | 112 | 169 | 14 | 12 |
    | FOX.TX 2000 | 198 | 198 | 180 | 130 | 168 | 14 | 12 |
    | FOX.TX 2500 | 198 | 200 | 197 | 145 | 169 | 19 | 22 |
    | FOX.TX 3200 | 240 | 240 | 200 | 112 | 200 | 20 | 33 |
    |  |  |  |  |  |  |  |  |

    ## MCB's, RCBO's \& FUSE HOLDERS

    | PAGES | P/No. | DESCRIPTION |
    | :--- | :--- | :--- |
    | 140 \& 141 | TSC \& TSD | Single, double \& triple pole type C \& D, 10KA MCB's |
    | 142 | KZS 2M | Two pole type C, RCBO's |
    | 142 | S1L, S3L, G1L, G3L | Single phase \& three phase MCB bus-bar |
    | 143 | VLC10, VLC14, | Din rail mounted fuse holders |
    |  | VLC22 |  |

    

    # MINIATURE CIRCUIT BREAKERS, MCB's ETIMAT 10KA 

    PRODUCT
    TYPES: TSC \& TSD

    ## DESCRIPTION

    ETIMAT 10 MCB's are produced according to the latest international standards EN60898 IEC60898 and IEC60947-2. These MCB's are for protection and control of circuits against overloads and short circuits in commercial and industrial applications.

    ## CHARACTERISTIC C

    Characteristic C is recommended for industrial applications where higher starting effects are expected e.g. transformers, motors and lighting installations. Thermal release at 1.13 to $1.45 \times \ln$. Magnetic breaking release at 5 to $10 \times \ln$.

    ## CHARACTERISTIC D

    Characteristic $D$ is recommended for heavy industrial applications where very high starting effects are expected, e.g. Motors starting under load. Thermal release 1.13 to $1.45 \times \mathrm{In}$. Magnetic breaking release 10 to 20 In .

    ## SPECIFICATIONS

    | Voltage Ue: | $230 / 400 \mathrm{~V}$ |
    | :--- | :--- |
    |  | 60 V DC per pole |
    | Frequency: | $50 / 60 \mathrm{~Hz}$ |
    | Poles: | 1,2 and 3 poles |
    | Breaking capacity: | 10 KA |
    | Electrical Life: | $>20000$ operations |
    | Mechanical Life: | $>1000000$ operations |
    | Terminal Sizes: | All $25 \mathrm{~mm}^{2}$ |

    ## FEATURES

    - Available as 1, 2 or 3 pole
    - Types 'C' and 'D'
    - CE Marked
    - RoHS compliant
    

    C - CHARACTERISTIC
    $\longleftarrow$ - ヨWIL ONIddIपІ
    

    D - CHARACTERISTIC
    

    | SINGLE-POLE MCB's |  |  | TWO-POLE MCB's |  |  | THREE-POLE MCB's |  |  |
    | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
    | Order Code | Current Rating | Breaking Capacity | Order Code | Current Rating | Breaking Capacity | Order Code |  | Breaking Capacity |
    | C - C | A R A C T | RISTIC | C - C | A R A C T | RISTIC | C - C H | C T | ISTIC |
    | TSC-101 | 1 | 10kA | TSC-201 | 1 | 10kA | TSC-301 |  | 10kA |
    | TSC-102 | 2 | 10kA | TSC-202 | 2 | 10kA | TSC-302 | 2 | 10kA |
    | TSC-104 | 4 | 10kA | TSC-204 | 4 | 10kA | TSC-304 | 4 | 10kA |
    | TSC-106 | 6 | 10kA | TSC-206 | 6 | 10kA | TSC-306 | 6 | 10kA |
    | TSC-110 | 10 | 10kA | TSC-210 | 10 | 10kA | TSC-310 |  | 10kA |
    | TSC-116 | 16 | 10kA | TSC-216 | 16 | 10kA | TSC-316 |  | 10 kA |
    | TSC-120 | 20 | 10kA | TSC-220 | 20 | 10kA | TSC-320 |  | 10kA |
    | TSC-125 | $25$ | 10kA | TSC-225 | $25$ | 10kA | TSC-325 |  | 10 kA |
    | TSC-132 | 32 | 10kA | TSC-232 | 32 | 10kA | TSC-332 | 32 | 10kA |
    | TSC-140 | 40 | 10kA | TSC-240 | 40 | 10kA | TSC-340 |  | 10kA |
    | TSC-150 | 50 | 10kA | TSC-250 | 50 | 10kA | TSC-350 |  | 10kA |
    | TSC-163 | 63 | 10kA | TSC-263 | 63 | 10kA | TSC-363 | 63 | 10kA |
    | D - C | ARACt | RIStic | D - C | ARAC T | RISTIC | D - C H | C | RISTIC |
    | TSD-101 | 1 | 10kA | TSD-201 | 1 | 10kA | TSD-301 |  | $10 \mathrm{kA}$ |
    | TSD-102 | 2 | 10kA | TSD-202 | 2 | 10kA | TSD-302 | 2 | 10kA |
    | TSD-104 | 4 | 10kA | TSD-204 | 4 | 10kA | TSD-304 | 4 | 10kA |
    | TSD-106 | 6 | 10kA | TSD-206 | 6 | 10kA | TSD-306 | 6 | 10kA |
    | TSD-110 | $10$ | 10kA | TSD-210 | 10 | 10kA | TSD-310 |  | 10kA |
    | TSD-116 | $16$ | $10 \mathrm{kA}$ | TSD-216 | $16$ | 10kA | TSD-316 |  | 10kA |
    | TSD-120 | 20 | 10kA | TSD-220 | 20 | 10kA | TSD-320 | 20 | 10kA |
    | TSD-125 | 25 | 10kA | TSD-225 | 25 | 10kA | TSD-325 | 25 | 10kA |
    | TSD-132 | 32 | 10kA | TSD-232 | 32 | 10kA | TSD-332 | 32 | 10kA |
    | TSD-140 | 40 | 10kA | TSD-240 | 40 | 10kA | TSD-340 | 40 | 10kA |

    

    ## ADD ON AUXILIARY CONTACT BLOCK FOR MCB's

    PS ETIMAT is an auxiliary switch used for remote signalling of the MCB to which it is fixed.

    ## SPECIFICATIONS

    | Contacts: | Max. 6 Amps at 230 V AC or |
    | :--- | :--- |
    |  | 1 Amp at 110 V DC |
    | Contacts: | 1 NO \& 1 NC |
    | Width: | $1 / 2$ module $(9 \mathrm{~mm})$ |

    ## ORDERING INFORMATION

    TYPE: PS ETIMAT

    # RCBO's COMBINED MCB/RCD TWO POLE $\mathcal{Z I}^{1}$ 

    TYPES: KZS 2M xxx

    ## DESCRIPTION

    Providing the combined advantage of protection against earth leakage faults with short-circuit protection.

    ## SPECIFICATIONS

    | Max voltage: | 230 V |
    | :--- | :--- |
    | Breaking capacity: | 10 KA |
    | Tripping curve: | C |
    | Sensitivity: | 30 mAmps. |
    | Ambient temperature: | $-25^{\circ} \mathrm{C}$ to $+40^{\circ} \mathrm{C}$ |
    | Width: | 36 mm |
    | Standard: | EN61009 |

    ## ORDERING INFORMATION

    | Type | Rated Current <br> Amps | Characteristics |
    | :---: | :---: | :---: |
    | KZS 2M 6C | 6 | C |
    | KZS 2M 10C | 10 | C |
    | KZS 2M 16C | 16 | C |
    | KZS 2M 20C | 20 | C |
    | KZS 2M 25C | 25 | C |
    | KZS 2M 32C | 32 | $C$ |

    KZS 2M... replaces old P/No. TCU...
    

    ## CONNECTING BUSBAR

    | TYPE | LENGTH mm | MODULES | AREA mm ${ }^{2}$ |
    | :---: | :---: | :---: | :---: |
    | SINGLE PHASE PIN TYPE |  |  |  |
    | S1L 1000/16 | 1000 | 56 | 16 |
    | THREEPHASE PIN TYPE |  |  |  |
    | S3L 1000/16 | 1000 | 56 | 16 |
    | SINGLEPHASEFORK TYPE |  |  |  |
    | G1L 1000/16 | 1000 | 56 | 16 |
    | THREE PHASE FORK TYPE |  |  |  |
    | G3L 1000/16 | 1000 | 56 | 16 |

    Maximum permanent current on above bus-bars $\mathbf{8 0}$ Amps

    END PROTECTOR FOR THREE-PHASE BAR
    GA-1 End protector

    ## Pin Type

    1, 2 \& 3 phase solid copper conductors with pin attachments for connection of NORM modular components e.g. MCB's and RCD's.
    

    ## Fork Type

    1, 2 \& 3 phase solid copper conductors with fork attachments for connection of NORM modular components e.g.MCB's and RCD's.

    ## DIN RAIL MOUNTED FUSE HOLDERS

    ## TYPES: VLC10 (10x38mm) max 32Amp VLC14 (14x51mm) max 50Amp VLC22 ( $22 \times 58 \mathrm{~mm}$ ) max 100Amp <br> VLC14 (14x51mm) max 50Amp

    ## DESCRIPTION

    1, 2 \& 3 PoleType: VLC10 for fuse links $10 \times 38 \mathrm{~mm}$, max operational current 32 Amps @ 690VAC Rated making \& breaking capacity: 75 Amps.

    Type: VLC14 for fuse links $14 \times 51 \mathrm{~mm}$, max operational current 50 Amps @ 690VAC Rated making \& breaking capacity: 150 Amps.

    Type: VLC22 for fuse links $22 \times 58 \mathrm{~mm}$, max operational current 100 Amps @ 690VAC Rated making \& breaking capacity: 150 Amps.

    ## STANDARDS

    - IEC 60947-1
    - IEC 60947-3
    - ADVANTAGES
    - Materials resistant to high temperatures
    - Silvered contact parts
    - Low own heating
    - Fixing to standard din rail of 35mm (EN50022)
    - 25 mm terminals VLC10
    - 35mm terminals VLC14
    - 50 mm terminals VLC22
    - VLC10 \& VLC14 UL, CSA approved
    - CE marked
    - Possibility of sealing in switched ON condition


    ## ORDERING INFORMATION

    | TYPE | DESCRIPTION | WIDTH $\times$ HEIGHT |
    | :--- | :---: | :---: |
    |  |  |  |
    | VLC10 1P | 1 pole | $17.5 \times 81 \mathrm{~mm}$ |
    | VLC10 2P | 2 pole | $35 \times 81 \mathrm{~mm}$ |
    | VLC10 3P | 3 pole | $52.5 \times 81 \mathrm{~mm}$ |
    |  |  |  |
    | VLC14 1P | 1 pole | $27 \times 94 \mathrm{~mm}$ |
    | VLC14 2P | 2 pole | $54 \times 94 \mathrm{~mm}$ |
    | VLC14 3P | 3 pole | $81 \times 94 \mathrm{~mm}$ |
    |  |  |  |
    | VLC22 1P | 1 pole | $35.5 \times 120 \mathrm{~mm}$ |
    | VLC22 2P | 2 pole | $71 \times 120 \mathrm{~mm}$ |
    | VLC22 3P | 3 pole | $107 \times 120 \mathrm{~mm}$ |

    

    | PAGES | P/No. | DESCRIPTION |
    | :---: | :---: | :---: |
    | 145 | 632.2 \& 630.2 | Din 48 mm hour run counter \& bezels |
    | 146 | 920 | Din 48 mm combined hour run counter \& operations counter |
    |  | 661.6 \& 666.6 | Din rail mounted hour run counters |
    | 147 | 250.2 \& 260.2 | $36 \times 24 \mathrm{~mm}$ hour run counter |
    |  | 252.2 \& 262.2 | $48 \times 24 \mathrm{~mm}$ hour run counter |
    |  | 604.2 \& 609.2 | $54 \times 29 \mathrm{~mm}$ hour run counter |
    | 148 | 610.11 \& 617.11 | $54 \times 29 \mathrm{~mm}$ resettable hour run counter |
    |  | 200.4 \& 208 | $24 \times 24 \mathrm{~mm}$ miniature hour run counter |
    | 149 | 656 | $32 \times 15 \mathrm{~mm}$ miniature hour run counter |
    |  | R572 \& R577 | Din 72 mm glass cased hour run counter |
    |  | R596 \& R597 | Din 96 mm glass cased hour run counter |
    | 150 | 587.10.2 \& 587.2 | 56 mm Dia. DC quartz automotive style hour run counters |
    | 151 | 170 \& 171 | $36 \times 24 \mathrm{~mm}$ operation counters, with \& without reset |
    |  | 180 \& 181 | $53 \times 28 \mathrm{~mm}$ operation counters, with \& without reset |
    |  | 663.6 \& 668.6 | Din rail mounted operations counter |
    | 152 | 670.6 \& 672.6 | Din rail mounted digital hour counter, operation counter \& combined hours \& operation counter |
    | 153 | $\begin{aligned} & 3800,3810 \\ & 3801,3811 \end{aligned}$ | $48 \times 24 \mathrm{~mm}$ digital hour counters \& operation counters, with \& without reset Din 48 mm digital hour counters \& operation counters, with \& without reset |

    

    ## ELECTROMECHANICAL HOUR RUN COUNTERS DIN 48mm HOUR COUNTER

    ## TYPES: 632.2/AC VOLTS \& 630.2/DC VOLTS

    ## - FEATURES

    - Standard IP65 front
    - Optional IP65 gasket
    - Optional 55 mm bezel
    - Optional 72mm bezel
    - Ratchet fixing clamp
    - IP20 screw terminals
    - Black front
    - Operation indication


    ## - DESCRIPTION

    Din standard 48 mm seven digit black faced hour run counter, front panel sealed as standard to IP65 with additional optional IP65 panel sealing gasket. Screw terminations to IP20, suitable for square or round hole fixing. Optional 55 mm and 72 mm bezels available.
    
    
    

    Counting range: AC Voltages: Frequency: DC Voltages: Current: Protection Class: Temp range: CE marked: Terminations:
    99999.99h
    $12,24,48,110,230,400 \mathrm{~V}( \pm 10 \%)$
    50 Hz or 60 Hz (specify)
    $2-20 \mathrm{~V}, 10-80 \mathrm{~V}, 80-220 \mathrm{~V}$
    AC $10 \mathrm{~mA}, \mathrm{DC} 0.5-27 \mathrm{~mA}$
    IP65 front, IP20 terminals
    $-20^{\circ} \mathrm{C}$ to $+70^{\circ} \mathrm{C}$
    Yes
    Protected screw

    - OPTIONS ON REQUEST
    (special P/No's \& prices may apply)
    - Grey faced
    - 52 mm square front
    - 58 mm diameter round front
    - $6.3 \times 0.8 \mathrm{~mm}$ push on terminations
    - IP00 terminations
    - Dual $50 / 60 \mathrm{~Hz}$ AC versions
    - Metal fixing clamp
    - Customer logos
    - UL, CSA, VDE approval and marked


    ## ORDERING INFORMATION

    632.2 / AC Volts: $12,24,48,110,230,400 \mathrm{VAC} 50 \mathrm{~Hz}$ or 60 Hz 630.2 / DC Volts: 2-20VDC, 10-80VDC, 80-220VDC

    55 mm bezel
    72 mm bezel
    IP65 48x48mm gasket

    # DIN 48mm COMBINED HOUR \& OPERATION COUNTER 

    ## TYPE: 920

    - FEATURES


    ## - IP65 front

    - Optional IP65 panel gasket
    - Optional 55 mm bezel
    - Combined hours \& operations
    - Optional 72mm bezel
    - Screw terminals
    - Ratchet fixing clamp
    - Black front
    - Operation indication
    - One set of input connections


    ## DESCRIPTION

    Din 48 mm seven digit combined hour run counter and operations counter. Front panel sealed as standard to IP65 with an additional optional IP65 panel sealing gasket. Suitable for square or round hole fixing, with optional 55 mm or 72 mm bezels. Connection is via one pair of terminals only, on connection and disconnection of the supply voltage the operation counter increments one count. On a continued supply voltage being present the hour counter continues to increment.

    ## ORDERING INFORMATION

    920/ AC Volts $110,230 \mathrm{VAC}$ (Specify 50 Hz or 60 Hz ) 920/DC Volts 24VDC
    55 mm bezel
    72 mm bezel
    IP65 48x48mm gasket
    

    ## DIN RAIL HOUR COUNTER

    ## TYPES: 661.6/AC VOLTS 666.6/DC VOLTS

    ## - FEATURES

    - Din rail mounted
    - Modular construction
    - Seven digits
    - Colour grey RAL7035


    ## DESCRIPTION

    Din rail mounted grey modular type hour counter, suitable for mounting within consumer units. Width 36 mm ( 2 modules), height 60 mm . These counters benefit from an excellent specification regarding shock and vibration resistance.

    ## ORDERING INFORMATION

    666.1 / AC Volts $12,24,48,110,230,400 \mathrm{VAC}$ (Specify $50 \mathrm{~Hz} / 60 \mathrm{~Hz}$ ) 666.6 / DC Volts 12-24VDC
    

    ## STANDARD SPECIFICATIONS

    Counting range:
    AC Voltages:
    Frequency:
    DC Voltages:
    Current:
    Protection class:
    Temp range:
    Vibration resist:
    Shock resit:
    99999.99h

    12, 24, 48, 110, 230, 400VAC
    50 Hz or 60 Hz (specify)
    12-24VDC ( $\pm 10 \%$ )
    AC $5-15 \mathrm{~mA}, \mathrm{DC} 5-15 \mathrm{~mA}$
    IP65
    $-10^{\circ} \mathrm{C}$ to $+70^{\circ} \mathrm{C}$
    $1 \mathrm{~g}(10-500 \mathrm{~Hz})$, to EN60068-2-34
    $30 \mathrm{~g}(18 \mathrm{mSec})$, to EN60068-2-27

    - FEATURES
    - Standard IP65 front
    - Optional IP65 gasket
    - Ratchet fixing clamp
    - Screw terminals
    - Black front
    - Seven digits
    - DESCRIPTION

    Rectangular seven digit hour counters either in front bezel sizes of $36 \times 24 \mathrm{~mm}, 48 \times 24 \mathrm{~mm}$ or $54 \times 29 \mathrm{~mm}$. Front sealed as standard to IP65 with additional optional IP65 panel sealing gasket. Supplied as standard with screw terminals but with the option of $6.3 \times 0.8 \mathrm{~mm}$ push on terminals.

    ## STANDARD SPECIFICATIONS

    Counting range:
    AC Voltages:

    ## Frequency:

    DC Voltages:
    Current:
    Protection Class:
    Temp range:
    CE marked:
    Terminations:

    ### 99999.99h

    $12,24,110,230,400 \mathrm{~V}( \pm 10 \%)$
    50 Hz or 60 Hz (specify)
    $12-24 \mathrm{VDC}, 10-50 \mathrm{VDC}, 50-120 \mathrm{VDC}$
    AC 8 mA , DC $5-15 \mathrm{~mA}$
    IP65 front, IP00 terminals
    $-30^{\circ} \mathrm{C}$ to $+70^{\circ} \mathrm{C}$,
    Yes
    Screw

    - OPTIONS ON REQUEST
    (special P/No's \& prices may apply)
    - Grey faced
    - $6.3 \times 0.8 \mathrm{~mm}$ push on terminations
    - Dual $50 / 60 \mathrm{~Hz}$ AC versions
    - 100 Hz versions
    - Customer logos
    - Type 604 \& 609 flying lead cable termination
    - UL, CSA, VDE marked


    ## - ORDERING INFORMATION

    250.2 / AC Volts $12,24,110,230 \mathrm{VAC}$ (Specify 50 Hz or 60 Hz ) 252.2 / AC Volts 12, 24, 110, 230VAC (Specify 50 Hz or 60 Hz ) 604.2 / AC Volts 12, 24, 110, 230, 400VAC (Specify 50Hz or 60Hz) 260.2 / DC Volts 12-24VDC
    262.2 / DC Volts 12-24VDC
    609.2 / DC Volts 10-50VDC, 50-120VDC

    IP65 36x24mm gasket
    IP65 48x24mm gasket
    IP65 54x29mm gasket
    
    

    ## TYPES: 610.11/AC VOLTS 617.11/DC VOLTS <br> - FEATURES

    - Black front
    - Metal fixing clamp
    - Pushbutton reset
    - Bezel size $54 \times 29 \mathrm{~mm}$
    - Flying lead termination
    - Six digits


    ## DESCRIPTION

    Resetable rectangular $54 \times 29 \mathrm{~mm}$ six digit black faced hour run counter. Reset is via manual front bezel pushbutton. Termination is via cable flying leads 500 mm in length. A robust metal fixing clamp is standard with this resetable hour run counter.

    ## STANDARD SPECIFICATIONS

    | Counting range: | 9999.99 h |
    | :--- | :--- |
    | AC Voltages: | $12,24,110,230 \mathrm{~V}( \pm 10 \%)$ |
    | Frequency: | 50 Hz or $60 \mathrm{~Hz}($ specify $)$ |
    | DC Voltages: | $12-24 \mathrm{VDC}, 36,80,110 \mathrm{~V}( \pm 15 \%)$ |
    | Current: | AC $2 \mathrm{VA}, \mathrm{DC} 7.5-30 \mathrm{~mA}$ |
    | Protection Class: | IP41 front |
    | Temp range: | $-20^{\circ} \mathrm{C}$ to $+70^{\circ} \mathrm{C}$ |
    | CE marked: | Yes |
    | Terminations: | Flying leads 500 mm |

    

    ## ORDERING INFORMATION

    610.11 / AC Volts 12, 24, 110, 230VAC<br>(specify 50 Hz or 60 Hz )

    617.11 / DC Volts 12-24, 36, 80, 110VDC

    ## MINIATURE 24mm HOUR COUNTER

    ## TYPES: 200.4/AC VOLTS 208/DC VOLTS

    ## FEATURES

    - Miniature size, only 24 mm square
    22.3 mm DIA. cutout

    Five digits
    Grey housing
    Push on terminations
    CE marked
    DESCRIPTION
    Miniature 24 mm square five digit hour counter available in both DC and AC voltages including 230VAC. Supplied in a grey housing with a metal spring retaining clip. Termination is via push on terminals $6.3 \times 0.8 \mathrm{~mm}$.

    ## STANDARD SPECIFICATIONS

    Counting range:
    AC Voltages:
    Frequency: DC Voltages: Current: Protection Class: Temp range: CE marked:
    Terminations:
    9999.9h

    12-24, 36-60, 60-140, 230VAC ( $\pm 10 \%$ )
    50 Hz or 60 Hz (specify)
    10-27VDC
    AC 8 mA, DC $7.5-39 \mathrm{~mA}$
    IP54 front
    $-30^{\circ} \mathrm{C}$ to $+80^{\circ} \mathrm{C}$
    Yes
    Push on $6.3 \times 0.8 \mathrm{~mm}$
    
    

    ORDERING INFORMATION

    | $\mathbf{2 0 0 . 4}$ / AC Volts | $12-24,36-30,60-140,240 \mathrm{VAC}$ <br> (specify 50 Hz or 60 Hz ) |
    | :--- | :--- |
    | $\mathbf{2 0 8}$ / DC Volts | $10-27 \mathrm{VDC}$ |

    ## DC MINIATURE HOUR RUN COUNTER

    ## TYPE: 656/DC VOLTS

    ■ FEATURES

    - Front bezel size $32 \times 15 \mathrm{~mm}$
    - Panel or PCB mounting
    - IP65 front
    - DC voltages only
    - Count interrupt input
    - Seven digit
    - DESCRIPTION

    Miniature seven digit hour run counter with a front bezel size of only $32 \times 15 \mathrm{~mm}$, only available in DC voltages. The 656 counter is suitable for front panel mounting or PCB mounting. A useful feature is a third input terminal which is designated as a count interrupt.

    ## - STANDARD SPECIFICATIONS

    Counting range: DC voltage:
    Current:
    Protection class:
    Temp range:
    Terminations:
    99999.99h
    4.5-35VDC

    2-4.4mA
    IP65 front
    $-10^{\circ} \mathrm{C}$ to $+60^{\circ} \mathrm{C}$
    Solder pins
    

    ## DIN 72mm \& 96mm GLASS CASED HOUR COUNTERS

    TYPES: R572/AC VOLTS \& R577/DC VOLTS (DIN 72mm) R596/AC VOLTS \& R597/DC VOLTS (DIN 96mm)

    ## - FEATURES

    ## - DIN 72 mm or DIN 96 mm

    - Instrument case style
    - Seven digits
    - Optional reset versions
    - Metal fixing clamp
    - With operation indication


    ## DESCRIPTION

    Glass cased Din 72 mm and $\operatorname{Din} 96 \mathrm{~mm}$ seven digit hour run counters. These hour counters compliment and match Din standard analogue meters. The counters are supplied complete with a metal fixing bracket and push on terminations $6.3 \times 0.8 \mathrm{~mm}$

    ## STANDARD SPECIFICATIONS

    Counting range: AC Voltages: Frequency: DC Voltages: Current: Protection class: Temp range: CE marked: Terminations:
    99999.99h
    $24,110,230,400 \mathrm{~V}( \pm 10 \%)$
    50 Hz or 60 Hz (specify) $10-50 \mathrm{~V}, 110 \mathrm{~V}( \pm 10 \%$ )
    AC $5-83 \mathrm{~mA}, \mathrm{DC} 7.5-30 \mathrm{~mA}$
    IP52 front, IPOO terminals $10^{\circ} \mathrm{C}$ to $+60^{\circ} \mathrm{C}$
    Yes
    Push on $6.3 \times 0.8 \mathrm{~mm}$
    

    ■ OPTIONS ON REQUEST
    (special P/No's \& prices may apply)

    - Resetable
    - UL approval
    - Non reflecting glass
    - ORDERING INFORMATION

    R572/AC Volts 24, 110, 230, 400VAC
    (Specify 50 Hz or 60 Hz )
    R577/DC Volts $10-50 \mathrm{VDC}, 110 \mathrm{VDC}$
    R596/AC Volts 24, 110, 230, 400VAC
    (Specify 50 Hz or 60 Hz )

    ## DC QUARTZ 56mm DIA. FRONT BEZEL HOUR COUNTERS

    ## TYPES: 587.10.2/DC VOLTS 587.2/DC VOLTS

    (Black plastic front bezel ring) (Black metal front bezel ring)

    ## FEATURES

    - IP65 front
    - 56 mm DIA. bezel size
    - Mounting hole DIA. 52mm
    - Seven digits
    - Push on terminations
    - 10-80VDC standard one unit
    - Operation indication
    - Damping rings available


    ## - DESCRIPTION

    DC quartz operated hour run counters, 56 mm diameter front bezel size. These hour counters are particularly suited to "automotive" applications, the front bezel and mounting dimensions complimenting other automotive style instrumentation such as temperature and oil pressure gauges. Versions suitable for 60 mm diameter hole mounting are available on request along with optional 72 mm diameter hole mounting versions complete with rubber damping rings for high vibration and impact applications such as heavy plant machinery and railway locomotives.

    ## STANDARD SPECIFICATIONS

    | Counting range: | 99999.99 h |
    | :--- | :--- |
    | DC Voltages: | $2-20 \mathrm{~V}, 10-80 \mathrm{~V}, 80-220 \mathrm{~V}$ |
    | Current: | $0.5-27 \mathrm{~mA}$ |
    | Protection class: | $\mathrm{IP65}$ front, IPOO terminals |
    | Temp range: | $-40^{\circ} \mathrm{C}$ to $+80^{\circ} \mathrm{C}$ |
    | CE marked: | Yes |
    | Terminations: | Push on $6.3 \times 0.8 \mathrm{~mm}$ |

    - OPTIONS ON REQUEST
    (special P/N0's \& prices may apply)
    - Sweep hand min. indication
    - 60 mm diameter hole mounting ( 64 mm front bezel size)
    - Rubber damping rings ( 72 mm diameter hole mounting)
    - Chromed metal front bezel rings
    - Screw terminal connection
    - Customer logos


    ## ■ ORDERING INFORMATION

    587.10.2 / DC Volts
    $2-20 \mathrm{~V}, 10-80 \mathrm{~V}^{*}, 80-220 \mathrm{VDC}$
    587.2 / DC Volts
    $2-20 \mathrm{~V}, 10-80 \mathrm{~V}$ *, $80-220 \mathrm{VDC}$

    * Standard unit
    


    ## RECTANGULAR OPERATION COUNTERS

    ## TYPES: 170 36x24mm \& 180 53x28mm (Without reset) 171 36x24mm \& 181 53x28mm (With reset)

    - Simple but durable
    - CE marked
    - With \& without reset
    - Economical
    - AC \& DC voltages


    ## ■ DESCRIPTION

    Simple electromechanical operation counters, available in a choice of two front bezel sizes $36 \times 4 \mathrm{~mm}$ or $53 \times 28 \mathrm{~mm}$. The counters are available with or without reset. On resetable versions the reset is via a front manual pushbutton.

    ## STANDARD SPECIFICATIONS

    Counting range

    AC Voltage:
    Frequency: DC Voltage:
    Current:
    Protection class:
    Max count speed:
    Min pulse length:
    Min pulse/break:
    Durability:
    Temp range:
    CE marked:
    Terminations:

    999999 ops
    99999 ops (type171)
    230V ( $\pm 10 \%$ )
    $50 / 60 \mathrm{~Hz}$ (same unit)
    24 V ( $\pm 10 \%$ )
    AC $6.5-3 \mathrm{~mA}, \mathrm{DC} 21 \mathrm{~mA}$
    IP50 (171 \& 181)
    IP52 (170 \& 180)
    10 pulses per Sec
    50 mSec .
    50/50mSec
    $>50000000$ ops
    $-10^{\circ} \mathrm{C}$ to $+50^{\circ} \mathrm{C}$
    Yes
    Flying leads 150 mm , (170 \& 171)
    1.6 mm push on's, with crimps supplied (180 \& 181)
    

    ## DIMENSIONS

    

    TYPES 170-171
    

    TYPES 180-181: FRONT BEZEL SIZE $53 \times 28 \mathrm{~mm}$, PANEL CUT OUT $\mathbf{2 5} \times 50 \mathrm{~mm}+\mathbf{+ 0}$, BODY LENGTH 62.5 mm PLUS 9.5 mm FOR TERMINALS

    - ORDERING INFORMATION

    | 170/AC Volts | 230VAC |  |
    | :---: | :---: | :---: |
    | 170/DC Volts | 24VDC | (Other DC voltages on request) |
    | 171/AC Volts | 230VAC |  |
    | 171/DC Volts | 24VDC | (Other DC voltages on request) |
    | 180/AC Volts | 230VAC |  |
    | 180/DC Volts | 24VDC | (Other DC voltages on request) |
    | 181/AC Volts | 230VAC |  |
    | 181/DC Volts | 24VDC | (Other DC voltages on request) |

    170/AC Volts 170/DC Volts 171/AC Volts 171/DC Volts 180/AC Volts 180/DC Volts 181/DC Volts

    230VAC
    24VDC (Other DC voltages on request) VAC 230VAC

    Other DC voltages on request

    24VDC (Other DC voltages on request)

    ## DIN RAIL MOUNTED OPERATIONS COUNTER

    TYPES: 663.6/AC VOLTS \& 668.6/DC VOLTS

    ## FEATURES

    - Din rail mounted
    - Modular construction
    - Seven digits


    ## ■ STANDARD SPECIFICATIONS

    Counting range: AC Voltages: Frequency: DC Voltages: Current: Protection class: Temp range: Vibration resist: shock resist:
    Max count speed:
    CE marked:

    9999999 ops
    $24,48,110,230,400 \mathrm{VAC}( \pm 10 \%)$ $50 / 60 \mathrm{~Hz}$
    12-24VDC (other voltages on request)
    AC $5-15 \mathrm{~mA}$, DC $5-15 \mathrm{~mA}$
    IP65
    $-10^{\circ} \mathrm{C}$ to $+70^{\circ} \mathrm{C}$
    $1 \mathrm{~g}(10-500 \mathrm{~Hz})$, to EN60068-2-34
    30 g ( 18 mSec ), to EN60068-2-27
    10 pulses per Sec.
    Yes

    ## ORDERING INFORMATION

    663.6/AC Volts $\quad 24,48,110,230,400 \mathrm{VAC}$
    668.6/DC Volts $12-24 \mathrm{VDC}$ (Other DC voltages on request)
    

    ## DESCRIPTION

    Din rail mounted modular construction grey operation counter, suitable for mounting within consumer units width 36 mm ( 2 modules) and height 60 mm . These operation counters benefit from an excellent shock and vibration resistance specification.

    # DIN RAIL MOUNTED DIGITAL HOUR \& PULSE COUNTERS 

    FEATURES- DIN rail mounted- Hour counters- Pulse counters- Combined hour counter \& pulse counter- IP65 sealed (without reset button)
    ■ Universal supply $\mathbf{1 2 - 1 5 0 V D C}$ \& 24-240VAC

    - Very low power consumption
    - High shock \& vibration resistance- Seven digits, 5 mm high
    - High visibility LCD display- IP20 screw terminals■ Data EEprom stored (25 years)
    - DESCRIPTION

    Din rail seven digit digital hour counters and pulse counters with the option of a combined hour and pulse counter. These counters benefit from the latest ASIC technology which affords ultra low power consumption. The counters have a universal supply voltage of $12-150 \mathrm{VDC}$ and $24-240 \mathrm{VAC}$. It is possible to specify the counters with or without reset, if a reset is required this can be either by a remote electrical input, or combined with a sunken manual pushbutton. The combined unit is only resetable via the manual sunken pushbutton, this can be specified on one or both of the registers.

    ## STANDARD SPECIFICATIONS

    | Counting range: | 999999.9 h <br> 9999999 ops |
    | :--- | :--- |
    | Supply volts: | $12-150 \mathrm{VDC} \& 24-240 \mathrm{VAC}$ (universal $\pm 10 \%$ ) |
    | Frequency: | $50 / 60 \mathrm{~Hz}$ |
    | Current: | 100 uA to 3 mA |
    | Count speed: | Max 10 Hz |
    | Pulse length: | Min $5 \mathrm{mSec}($ count \& reset) |
    | Vibration resist: | $1 \mathrm{~g} \mathrm{(10-500Hz)} ,\mathrm{to} \mathrm{EN60068-2-34}$ |
    | Shock resist: | $30 \mathrm{~g} \mathrm{(18mSec)} ,\mathrm{to} \mathrm{EN60068-2-27}$ |
    | Protection class: | $\mathrm{IP65}$ without reset, IP40 with reset |
    | Temp range: | $-10^{\circ} \mathrm{C}$ to $+70^{\circ} \mathrm{C}$ |
    | CE marked: | Yes |
    | Terminations: | $\mathrm{IP2O}$ protected screw |

    ## ORDERING INFORMATION

    670.6.*.1/12-150VDC \& 24-240VAC (Hour counter) 670.6.*.2/12-150VDC \& 24-240VAC (Pulse counter)

    * Insert " 1 " without reset. Insert " 2 " with electrical reset. Insert " 3 " with manual and electrical reset.


    ## 672.6.*.1.*. $\mathbf{~ / ~ 1 2 - 1 5 0 V D C ~ \& ~ 2 4 - 2 4 0 V A C ~ ( C o m b i n e d ~ c o u n t e r ) ~}$

    * Insert " 1 " without reset. Insert " 2 " with manual reset. (First insertion is for the hour counter. The second insertion is for the pulse counter. It is possible to have reset on just one counter or on both counters).
    


    ## DIGITAL HOUR \& PULSE COUNTERS TYPE 38XX

    ## TYPES: $\mathbf{3 8 0 0}$ (Hour counter $48 \times 24 \mathrm{~mm}$ ) 3801 (Hour counter 48x48mm) 3810 (Pulse counter 48x24mm)

    BAUSER
    PRODUCT

    ## - FEATURES

    - Choice of bezel size
    - IP65 sealed fronts (without front reset)
    - IP54 sealed fronts (with front reset)
    - Optional IP65 gaskets
    - Choice of reset options
    - Seven digits, 7mm high
    - High shock \& vibration resistance
    - High visibility LCD display
    - Screw terminal connection
    - Supplied with retaining clip


    ## - DESCRIPTION

    The 38XX series of seven digit counters are available in both hour or pulse counters and feature 7 mm high digits. A choice of $48 \times 24 \mathrm{~mm}$ or $48 \times 48 \mathrm{~mm}$ front bezel sizes are available. All types are available with or without reset, if reset is required a choice can be made between a front manual reset button combined with a remote electrical reset input, or with the remote electrical reset only.

    ## STANDARD SPECIFICATIONS

    

    7 digits, 7 mm high
    24VAC/DC, 110-240VAC ( $\pm 10 \%$ )
    $12-24 \mathrm{VDC}, 24-48 \mathrm{VDC}$ ( $\pm 25 \%$ )
    ,
    Max 10Hz, AC or AC/DC units
    Max 30Hz, DC units
    IP65 front, (without front reset) front, (with front reset) O

    1 g ( $10-500 \mathrm{~Hz}$ ), to EN60068-2-34
    55 g to SAEJ1378
    30 g ( 18 mSec ), to EN60068-2-27
    Screw
    

    ## ■ OPTIONS ON REOUEST

    (special P/No's \& prices apply)

    - Round glass cased units, front bezel size 56 mm diameter
    - Push on terminals $6.3 \times 0.8 \mathrm{~mm}$
    - Variation of decimal point, hour counters only
    - Prescaler and multiplier options on pulse counters
    - Higher Hz input speeds on pulse counters

    ■ ORDERING INFORMATION

    ## Hour Counter:-

    3800.*.1.0.1.2 / 12-24VDC, 24-48VDC, 24VAC/DC, 110-240VAC 3801.*.1.0.1.2 / 12-24VDC, 24-48VDC, 24VAC/DC, 110-240VAC Pulse Counter:-
    3810.*.1.**.0.2 / 12-24VDC, 24-48VDC, 24VAC/DC, 110-240VAC 3811.*.1.**.0.2 / 12-24VDC, 24-48VDC, 24VAC/DC, 110-240VAC

    * Insert "1" for without reset. Insert "2" for with electrical reset. Insert " 3 " for with electrical and manual reset.
    ** Insert "1" for DC voltages pulse counters. Insert "7" for AC/DC and AC voltages pulse counters

    IP65 48x24mm gasket
    IP65 48x48mm gasket

    # MOULDED CASE CURRENT TRANSFORMERS, SWITCH OUTPUT CT, SUMMATION CT's, SPLIT CORE CT'S, DC CURRENT CT's, CT's WITH ANALOGUE OUTPUTS \& CT's WITH MODBUS OUTPUTS 

    | PAGES | P/No. | DESCRIPTION |
    | :---: | :---: | :---: |
    | FOXTAM MOULDED CASE CURRENT TRANSFORMERS (PAGES 155 to 168) |  |  |
    | 155 | FOX.CS-200 | "CT" style current proving switch |
    | 156 | FOX.WP | Primary wound moulded case CT |
    | 157 | FOX21 | Width 45 mm , aperture 21 mm Dia. |
    |  | FOX30.1 | Width 50 mm , aperture $30 \times 10 \mathrm{~mm}$ or $20 \times 20 \mathrm{~mm}$, 24 mm Dia. |
    | 158 | FOX40.1 | Width 60 mm , aperture $40 \times 10 \mathrm{~mm}$ or $30 \times 20 \mathrm{~mm}$, 28 mm Dia. |
    |  | FOX50.1 | Width 70 mm , aperture $50 \times 10 \mathrm{~mm}$ or $40 \times 30 \mathrm{~mm}, 41 \mathrm{~mm}$ Dia. |
    | 159 | FOX60.15 | Width 85 mm , aperture $60 \times 15 \mathrm{~mm}$ or $50 \times 30 \mathrm{~mm}, 45 \mathrm{~mm}$ Dia. |
    |  | FOX60.3 | Width 90 mm , aperture $60 \times 30 \mathrm{~mm}$ |
    | 160 | FOX80.1 | Width 100 mm , aperture $80 \times 10 \mathrm{~mm}$ or $60 \times 30 \mathrm{~mm}, 60 \mathrm{~mm}$ Dia. |
    |  | FOX100.3 | Width 135 mm , aperture $100 \times 30 \mathrm{~mm}$ or $80 \times 50 \mathrm{~mm}, 85 \mathrm{~mm}$ Dia. |
    | 161 | FOX100.55 | Width 129 mm , aperture $100 \times 55 \mathrm{~mm}$ |
    |  | FOX84.34 | Frame size $132 \times 96 \mathrm{~mm}$, aperture $84 \times 34 \mathrm{~mm}$ |
    | 162 | FOX105.38 | Frame size $148 \times 98 \mathrm{~mm}$, aperture $105 \times 38 \mathrm{~mm}$ |
    |  | FOX127.38 | Frame size $178 \times 98 \mathrm{~mm}$, aperture $127 \times 38 \mathrm{~mm}$ |
    | 163 | FOX127.54 | Frame size $178 \times 125 \mathrm{~mm}$, aperture $127 \times 54 \mathrm{~mm}$ |
    |  | FOX75 | Three phase triple CT, width 75 mm , pitch centres 24 mm |
    | 164 | FOX105 | Three phase triple CT, width 105 mm , pitch centres 35 mm |
    |  | FOX140 | Three phase triple CT, width 140 mm , pitch centres 45 mm |
    | 165 | FOX.SUM | Din rail mounted 2 ways to 9 ways summation CT's |
    | 166 | FOX.SC23 \& | Split core CT's |
    |  | FOX.SC58 |  |
    | 167 | FOX.SC812 \& | Split core CT's |
    |  | FOX.SC816 |  |
    | 168 | $\begin{aligned} & \text { FOX.SC40 } \\ & \text { YW4 } \end{aligned}$ | Split core CT <br> Four way current transducer kit |
    | 169 | KBR18, KBR32, | MBS miniature split core CT's |
    |  | KBR44 |  |
    | 170 | CS-6 \& SC-6 | Solid core \& split core AC "CT" style current transducers |
    | MBS MOULDED CASE CURRENT TRANSFORMERS WITH PLUG IN TRANSDUCER MODULES (PAGES 171 to 178) |  |  |
    | 172 | WSK40 | Primary wound moulded case CT |
    |  | ASR22.3 | Width 60 mm , aperture 22.5 mm Dia. |
    | 173 | ASK31.3 | Width 60 mm , aperture $30 \times 10 \mathrm{~mm}, 26 \mathrm{~mm}$ Dia. |
    |  | ASK318.3 | Width 60 mm , aperture $31 \times 18 \mathrm{~mm}, 26 \mathrm{~mm}$ Dia. |
    | 174 | ASK41.3 | Width 60 mm , aperture $40 \times 12 \mathrm{~mm}$ or $32 \times 18 \mathrm{~mm}, 26 \mathrm{~mm}$ Dia. |
    |  | ASK412.4 | Width 70 mm , aperture $40 \times 12 \mathrm{~mm}$ or $30 \times 15 \mathrm{~mm}, 30.5 \mathrm{~mm}$ Dia. |
    | 175 | ASK41.4 | Width 70 mm , aperture $40 \times 10 \mathrm{~mm}$ or $2 \times 30 \times 5 \mathrm{~mm}, 32 \mathrm{~mm}$ Dia. |
    |  | ASK61.4 | Width 95 mm , aperture $63 \times 10 \mathrm{~mm}$ or $2 \times 50 \times 10 \mathrm{~mm}, 44 \mathrm{~mm}$ Dia. |
    | 176 | ASK63.4 | Width 95 mm , aperture $60 \times 30 \mathrm{~mm}$ or $50 \times 40 \mathrm{~mm}, 44 \mathrm{~mm}$ Dia. |
    |  | ASK105.6 | Width 129 mm , aperture $100 \times 55 \mathrm{~mm}$ |
    | 177 | ASK105.6N | Width 129 mm , aperture $100 \times 55 \mathrm{~mm}$ |
    |  | ASK81.4 | Width 120 mm , aperture $80 \times 10 \mathrm{~mm}$ or $60 \times 30 \mathrm{~mm}$ or $2 \times 60 \times 10 \mathrm{~mm}, 55 \mathrm{~mm}$ Dia. |
    | 178 | ASK101.4 | Width 130 mm , aperture $100 \times 10 \mathrm{~mm}$ or $2 \times 80 \times 10 \mathrm{~mm}, 70 \mathrm{~mm}$ Dia. |
    | 179 | SCL, SCT | Split core 333mVAC secondary CT's |
    |  | ROPE | Rogowski coil 333mVAC secondary CT's |
    | $\begin{aligned} & 180 \text { to } 183 \\ & 184 \end{aligned}$ | FOX.DCCT | DC Split core CT's |
    |  | CCT31.3 \& | MBS AC/DC "CT" style current transducer |
    |  | CCT41.4 | MBS AC/DC CT style current transducer |
    | 185 | UA-SHT, NST | DC Shunts |
    | 186 to 189 | Q | AC/DC MODBUS output CT's \& energy CT's |

    ## "CT STYLE" CURRENT PROVING SWITCH

    ## TYPE: FOX.CS-200

    - FEATURES
    - Din rail mounted
    - Foot mounted option available on request
    - Compact
    - Sensing range 2-200 Amps adjustable
    - Self powered from flowing current
    - No separate auxiliary supply required
    - Dual LED indication
    - Normally open output switch
    - CE marked
    - RoHS compliant


    ## DESCRIPTION \& MODE OF OPERATION

    A compact Din rail or foot mounted "CT" style AC current proving switch, the sensing range (set point) being adjustable 2-200 Amps. On current flowing of at least 1 Amp the power LED will be illuminated, on current flowing in excess of the adjustable set point the status LED will be illuminated denoting the Normally Open output is closed. On current falling below the set point less a nominal $2 \%$ hysteresis the output will open and the status LED will extinguish and the power LED will illuminate, if the current has fallen to zero both the power and status LED's will extinguish.
    The FOX.CS-200 current switch is self powered yet benefits from a volt free output Normally Open switch. The maximum switching capability is 30VAC/DC 0.5 Amps.
    It is also possible for low current sensing, to pass the conductor to be measured multiple times through the CT (referred to as turns). For example; 2 turns will give a sensing range of 1-100 Amps, 4 turns a sensing range of 0.5-50 Amps.
    

    IDEAL FOR HVAC MARKET FOR SMALL FAN \& PUMP FAILURE MONITORING!

    | Measuring |  |
    | :--- | :--- |
    | Sensing range: $2-200$ Amps <br> Hysteresis: $<2 \%$ fixed <br> Power LED: Yes, 1 Amp \& above <br>   <br> Output  <br> Max switching voltage: 30V AC/DC <br> Max switching current: 0.5 Amps <br> Output type: Bi-directional solid state N/0 <br> Status LED: Yes, current above set point. |  |

    ## General

    Rated system voltage: Insulation:
    Frequency range:
    Ambient temperature range:
    CE marked:
    Compliance:

    RoHS compliant:
    

    ## FOXTAM RANGE OF CURRENT TRANSFORMERS

    - FEATURES
    - Moulded case
    - Primary wound versions
    - Bus-bar versions
    - Din rail mounted versions
    - Summation CT's
    - Split coreCT's
    - Triple three phase CT's
    - Sliding sealable terminal covers
    - P1 \& P2 primary designation within moulding
    - S1 \& S2 secondary designation within moulding
    - 1 Amp \& 5 Amp secondaries
    - Class 1 as standard (Class 0.5 \& 0.2 on request)


    ## SPECIFICATIONS

    Compliance:
    CE marked:
    Rated system voltage:
    Insulation:
    Frequency range:
    Ambient temperature range:
    Continuos current:
    Material:

    IEC185, BS7626, BSED 60044-1, IEC 60044-1
    Yes
    Max 720V continuous
    Max 3KV for 1 min
    $50-60 \mathrm{~Hz}$ ( 400 Hz on requested)
    $-30^{\circ} \mathrm{C}$ to $85^{\circ} \mathrm{C}$ (Triple Three Phase \& Split Core CT's max $80^{\circ} \mathrm{C}$ )
    1.2 x rated current

    Polycarbonate UL94V-0
    

    ## FOX.WP

    Moulded case Primary Wound current transformers for primary currents from 1 Amp to 40 Amps. With built in terminal covers and M6 terminals for the primary current connection.

    ## FEATURES

    - Din rail or foot mounted
    - Built in hinged sealable terminal covers
    - Transformer width 60 mm
    - Primary ranges from 1 Amp to 40 Amps
    - 1 Amp or 5 Amp secondaries

    | P/No. | CLASS | VA |
    | :--- | :--- | :--- |
    | FOX.WP $1 / 1$ | 1 | 5 |
    | FOX.WP $1 / 5$ | 1 | 5 |
    | FOX.WP 5/5 | 1 | 5 |
    | FOX.WP $10 / 5$ | 1 | 5 |
    | FOX.WP $15 / 5$ | 1 | 5 |
    | FOX.WP 20/5 | 1 | 5 |
    | FOX.WP 25/5 | 1 | 5 |
    | FOX.WP 30/5 | 1 | 5 |
    | FOX.WP 40/5 | 1 | 5 |

    All of the above ratios are available as Class 0.5 to special order, please consult our sales office.
    

    ## FOX21

    Moulded case compact "our smallest current transformer", for primary currents from 50 Amps to 300 Amps. With built in sliding sealable terminal covers.

    - FEATURES
    - Din rail or foot mounted
    - Built in sliding sealable terminal covers
    - Transformer width 45 mm
    - Max conductor size 21 mm dia.
    - 1 Amp or 5 Amp secondaries

    | P/No. | CLASS | VA |
    | :--- | :--- | :--- |
    | FOX21 50/5 | 1 | 1 |
    | FOX21 60/5 | 1 | 1.5 |
    | FOX21 80/5 | 1 | 1.5 |
    | FOX21 100/5 | 1 | 2.5 |
    | FOX21 150/5 | 1 | 2.5 |
    | FOX21 200/5 | 1 | 2.5 |
    | FOX21 250/5 | 1 | 2.5 |
    | FOX21 300/5 | 1 | 2.5 |

    Some of the above ratios are available as Class 0.5 to special order, please consult our sales office.
    

    ## FOX30.1

    Moulded case compact current transformers, for primary currents from 100 Amps to 600 Amps. With built in sliding sealable terminal covers.

    ## FEATURES

    - Din rail, bus-bar or foot mounted
    - Built in sliding sealable terminal covers
    - Transformer width 50 mm
    - Max conductor size 24 mm dia.
    - Max bus-bar size $30 \times 10 \mathrm{~mm}$ or $20 \times 20 \mathrm{~mm}$
    - 1 Amp or 5 Amp secondaries
    
    


    ## F0X40.1

    Moulded case current transformers, for primary currents from 100 Amps to 800 Amps . With built in sliding sealable terminal covers.

    - FEATURES
    - Bus-bar or foot mounted
    - Built in sliding sealable terminal covers
    - Transformer width 60 mm
    - Max conductor size 28 mm dia.

    ■ Max bus-bar size $40 \times 10 \mathrm{~mm}$ or $30 \times 20 \mathrm{~mm}$

    - 1 Amp or 5 Amp secondaries

    | P/No. | CLASS | VA |
    | :--- | :--- | :--- |
    | FOX40.1 1100/5 | 1 | 2.5 |
    | FOX40.1 150/5 | 1 | 2.5 |
    | FOX40.1 200/5 | 1 | 2.5 |
    | FOX40.1 250/5 | 1 | 2.5 |
    | FOX40.1 300/5 | 1 | 2.5 |
    | FOX40.1 400/5 | 1 | 5 |
    | FOX40.1 500/5 | 1 | 5 |
    | FOX40.1 600/5 | 1 | 5 |
    | FOX40.1 800/5 | 1 | 10 |

    All of the above ratios are available as Class 0.5 to special order, please consult our sales office.
    

    ## FOX50.1

    Moulded case current transformers, for primary currents from 250 Amps to 1200 Amps. With built in sliding sealable terminal covers.

    ## ■ FEATURES

    ■ Bus-bar or foot mounted

    - Built in sliding sealable terminal covers
    - Transformer width 70 mm
    - Max conductor size 41 mm dia.
    - Max bus-bar size $50 \times 10 \mathrm{~mm}$ or $40 \times 30 \mathrm{~mm}$
    - 1 Amp or 5 Amp secondaries

    | P/No. | CLASS | VA |
    | :--- | :--- | :--- |
    | FOX50.1 250/5 | 1 | 2.5 |
    | FOX50.1 300/5 | 1 | 2.5 |
    | FOX50.1 400/5 | 1 | 5 |
    | FOX50.1 500/5 | 1 | 5 |
    | FOX50.1 600/5 | 1 | 5 |
    | FOX50.1 800/5 | 1 | 10 |
    | FOX50.1 1000/5 | 1 | 15 |
    | FOX50.1 1200/5 | 1 | 15 |

    All of the above ratios are available as Class 0.5 to special order, please consult our sales office.
    

    ## F0X60.15

    Moulded case current transformers, for primary currents from 400 Amps to 1600 Amps. With built in sliding sealable terminal covers.

    ## - FEATURES

    - Bus-bar or foot mounted
    - Built in sliding sealable terminal covers
    - Transformer width 85 mm
    - Max conductor size 46 mm dia.
    - Max bus-bar size $60 \times 15 \mathrm{~mm}$ or $50 \times 30 \mathrm{~mm}$
    - 1 Amp or 5 Amp secondaries

    | P/No. | CLASS | VA |
    | :--- | :--- | :--- |
    | FOX60.15 400/5 | 1 | 5 |
    | FOX60.15 500/5 | 1 | 5 |
    | FOX60.15 600/5 | 1 | 5 |
    | FOX60.15 800/5 | 1 | 10 |
    | FOX60.15 1000/5 | 1 | 15 |
    | FOX60.15 1200/5 | 1 | 15 |
    | FOX60.15 1500/5 | 1 | 15 |
    | FOX60.15 1600/5 | 1 | 15 |

    All of the above ratios are available as Class 0.5 and Class 0.2 to special order, please consult our sales office.
    

    ## FOX60.3

    Moulded case current transformers, for primary currents from 400 Amps to 2000 Amps. With built in sliding sealable terminal covers.

    - FEATURES
    - Bus-bar or foot mounted
    - Built in sliding sealable terminal covers
    - Transformer width 90 mm
    - Max bus-bar size $60 \times 30 \mathrm{~mm}$
    - 1 Amp or 5 Amp secondaries

    | P/No. | CLASS | VA |
    | :--- | :--- | :--- |
    | FOX60.3 400/5 | 1 | 5 |
    | FOX60.3 500/5 | 1 | 5 |
    | FOX60.3 600/5 | 1 | 5 |
    | FOX60.3 800/5 | 1 | 10 |
    | FOX60.3 1000/5 | 1 | 10 |
    | FOX60.3 1200/5 | 1 | 10 |
    | FOX60.3 1500/5 | 1 | 15 |
    | FOX60.3 1600/5 | 1 | 15 |
    | FOX60.3 2000/5 | 1 | 15 |

    All of the above ratios are available as Class 0.5 and Class 0.2 to special order, please consult our sales office.
    

    ## FOX80.1

    Moulded case current transformers, for primary currents from 400 Amps to 2000 Amps. With built in sliding sealable terminal covers.

    ## - FEATURES

    - Bus-bar or foot mounted
    - Built in sliding sealable terminal covers
    - Transformer width 100 mm
    - Max conductor size 61 mm dia.
    - Max bus-bar size $80 \times 10 \mathrm{~mm}$ or $60 \times 30 \mathrm{~mm}$
    - 1 Amp or 5 Amp secondaries

    | P/No. | CLASS | VA |
    | :--- | :--- | :--- |
    | FOX80.1 400/5 | 1 | 5 |
    | FOX80.1 500/5 | 1 | 5 |
    | FOX80.1 600/5 | 1 | 5 |
    | FOX80.1 800/5 | 1 | 10 |
    | FOX80.1 1000/5 | 1 | 10 |
    | FOX80.1 1200/5 | 1 | 10 |
    | FOX80.1 1500/5 | 1 | 15 |
    | FOX80.1 1600/5 | 1 | 15 |
    | FOX80.1 2000/5 | 1 | 15 |

    All of the above ratios are available as Class 0.5 and Class 0.2 to special order, please consult our sales office.
    

    ## FOX100.3

    Moulded case current transformers, for primary currents from 400 Amps to 4000 Amps. With built in sliding sealable terminal covers.

    - FEATURES
    - Bus-bar or foot mounted
    - Built in sliding sealable terminal covers
    - Transformer width 135 mm
    - Max conductor size 85 mm dia.
    - Max bus-bar size $100 \times 30 \mathrm{~mm}$ or $80 \times 50 \mathrm{~mm}$
    - 1 Amp or 5 Amp secondaries

    | P/No. | CLASS | VA |
    | :--- | :--- | :--- |
    | FOX100.3 400/5 | 1 | 2.5 |
    | FOX100.3 500/5 | 1 | 2.5 |
    | FOX100.3 600/5 | 1 | 5 |
    | FOX100.3 800/5 | 1 | 5 |
    | FOX100.3 1000/5 | 1 | 10 |
    | FOX100.3 1200/5 | 1 | 10 |
    | FOX100.3 1500/5 | 1 | 15 |
    | FOX100.3 1600/5 | 1 | 15 |
    | FOX100.3 2000/5 | 1 | 15 |
    | FOX100.3 2500/5 | 1 | 15 |
    | FOX100.3 3000/5 | 1 | 15 |
    | FOX100.3 4000/5 | 1 | 15 |

    All of the above ratios are available as Class 0.5 and Class 0.2 to special order, please consult our sales office.
    

    ## FOX100.55

    Moulded case current transformers, for primary currents from 600 Amps to 4000 Amps. With built in sliding sealable terminal covers.

    ## - FEATURES

    - Bus-bar or foot mounted
    - Built in sliding sealable terminal covers
    - Transformer width 129 mm
    - Max bus-bar size $100 \times 55 \mathrm{~mm}$
    - 1 Amp or 5 Amp secondaries

    | P/No. | CLASS | VA |
    | :--- | :--- | :--- |
    | FOX100.55 600/5 | 1 | 10 |
    | FOX100.55 800/5 | 1 | 15 |
    | FOX100.55 1000/5 | 1 | 15 |
    | FOX100.55 1200/5 | 1 | 15 |
    | FOX100.55 1500/5 | 1 | 15 |
    | FOX100.55 1600/5 | 1 | 15 |
    | FOX100.55 2000/5 | 1 | 15 |
    | FOX100.55 2500/5 | 1 | 15 |
    | FOX100.55 3000/5 | 1 | 15 |
    | FOX100.55 4000/5 | 1 | 15 |

    All of the above ratios are available as Class 0.5 and Class 0.2 to special order, please consult our sales office.
    
    

    ## F0X84.34

    Moulded case rectangular current transformers, for mounting on vertical bus-bars with primary currents from 400 Amps to 2500 Amps. With built in sliding sealable terminal covers.

    ## FEATURES

    - Bus-bar mounted
    - Built in sliding sealable terminal covers
    - Transformer size $135 \times 96 \mathrm{~mm}$
    - Max bus-bar size $84 \times 34 \mathrm{~mm}$
    - 1 Amp or 5 Amp secondaries

    | P/No. | CLASS | VA |
    | :--- | :--- | :--- |
    | FOX84.34 400/5 | 1 | 5 |
    | FOX84.34 500/5 | 1 | 5 |
    | FOX84.34 600/5 | 1 | 5 |
    | FOX84.34 800/5 | 1 | 10 |
    | FOX84.34 1000/5 | 1 | 10 |
    | FOX84.34 1200/5 | 1 | 10 |
    | FOX84.34 1500/5 | 1 | 10 |
    | FOX84.34 1600/5 | 1 | 10 |
    | FOX84.34 2000/5 | 1 | 10 |
    | FOX84.34 2500/5 | 1 | 10 |

    All of the above ratios are available as Class 0.5 and Class 0.2 to special order, please consult our sales office.
    

    ## FOX84.34 DIMENSIONS

    
    

    ## FOX105.38

    Moulded case rectangular current transformers, for mounting on vertical bus-bars with primary currents from 800 Amps to 4000 Amps. With built in sliding sealable terminal covers.

    ## - FEATURES

    - Bus-bar mounted
    - Built in sliding sealable terminal covers
    - Transformer size $156 \times 98 \mathrm{~mm}$
    - Max bus-bar size $105 \times 38 \mathrm{~mm}$
    - 1 Amp or 5 Amp secondaries

    | P/No. | CLASS | VA |
    | :--- | :--- | :--- |
    | FOX105.38 800/5 | 1 | 15 |
    | FOX105.38 1000/5 | 1 | 15 |
    | FOX105.38 1200/5 | 1 | 15 |
    | FOX105.38 1500/5 | 1 | 15 |
    | FOX105.38 1600/5 | 1 | 15 |
    | FOX105.38 2000/5 | 1 | 15 |
    | FOX105.38 2500/5 | 1 | 15 |
    | FOX105.38 3000/5 | 1 | 15 |
    | FOX105.38 4000/5 | 1 | 15 |

    All of the above ratios are available as Class 0.5 and Class 0.2 to special order, please consult our sales office.
    
    

    ## FOX127.38

    Moulded case rectangular current transformers, for mounting on vertical bus-bars with primary currents from 800 Amps to 5000 Amps. With built in sliding sealable terminal covers.

    ## ■ FEATURES

    - Bus-bar mounted
    - Built in sliding sealable terminal covers
    - Transformer size 178x98mm
    - Max bus-bar size $127 \times 38 \mathrm{~mm}$
    - 1 Amp or 5 Amp secondaries

    | P/No. | CLASS | VA |
    | :--- | :--- | :--- |
    | FOX127.38 800/5 | 1 | 15 |
    | FOX127.38 1000/5 | 1 | 15 |
    | FOX127.38 1200/5 | 1 | 15 |
    | FOX127.38 1500/5 | 1 | 15 |
    | FOX127.38 1600/5 | 1 | 15 |
    | FOX127.38 2000/5 | 1 | 15 |
    | FOX127.38 2500/5 | 1 | 15 |
    | FOX127.38 3000/5 | 1 | 15 |
    | FOX127.38 4000/5 | 1 | 15 |
    | FOX127.38 5000/5 | 1 | 15 |

    All of the above ratios are available as Class 0.5 and Class 0.2 to special order, please consult our sales office.
    

    ## FOX127.54

    Moulded case rectangular current transformers, for mounting on vertical bus-bars with primary currents from 3000 Amps to 6000 Amps. With built in sliding sealable terminal covers.

    - FEATURES
    - Bus-bar mounted
    - Built in sliding sealable terminal covers
    - Transformer size $178 \times 125 \mathrm{~mm}$
    - Max bus-bar size $127 \times 54 \mathrm{~mm}$
    - 1 Amp or 5 Amp secondaries

    | P/No. | CLASS | VA |
    | :--- | :--- | :--- |
    | FOX127.54 3000/5 | 1 | 15 |
    | FOX127.54 4000/5 | 1 | 15 |
    | FOX127.54 5000/5 | 1 | 15 |
    | FOX127.54 6000/5 | 1 | 15 |

    All of the above ratios are available as Class 0.5 and Class 0.2 to special order, please consult our sales office.
    

    ## F0X75

    Moulded case "triple" current transformer with apertures on 25 mm centres, giving an overall width of 75 mm allowing installation directly on top of moulded case circuit breakers.

    - FEATURES
    - Foot mounted
    - With terminal cover
    - Transformer width 75 mm
    - Max cable size 15 mm dia.
    - Max bus-bar size 15 mm width
    - 1 Amp or 5 Amp secondaries

    | P/No. | CLASS | VA |
    | :--- | :--- | :--- |
    | FOX75 60/5 | 1 | 1 |
    | FOX75 80/5 | 1 | 1.5 |
    | FOX75 100/5 | 1 | 1.5 |
    | FOX75 150/5 | 1 | 2.5 |

    

    ## FOX105

    Moulded case "triple" current transformer with apertures on 35 mm centres, giving an overall width of 105 mm allowing installation directly on top of moulded case circuit breakers.

    - FEATURES
    - Foot mounted
    - With terminal cover
    - Transformer width 105 mm
    - Max cable size 21 mm dia.
    - Max bus-bar size 21 mm width
    - 1 Amp or 5 Amp secondaries

    | P/No. | CLASS | VA |
    | :--- | :--- | :--- |
    | FOX105 100/5 | 1 | 1.5 |
    | FOX105 150/5 | 1 | 2.5 |
    | FOX105 200/5 | 1 | 2.5 |
    | FOX105 250/5 | 1 | 2.5 |

    

    ## FOX140

    Moulded case "triple" current transformers with apertures on 45 mm centres, giving an overall width of 140 mm allowing installation directly on top of moulded case circuit breakers.

    - FEATURES
    - Foot mounted
    - With terminal cover
    - Transformer width 140 mm
    - MAx cable size 31 mm dia.
    - Max bus-bar size 31 mm width
    - 1 Amp or 5 Amp secondaries

    | P/No. | CLASS | VA |
    | :--- | :--- | :--- |
    | FOX140 250/5 | 1 | 2.5 |
    | FOX140 300/5 | 1 | 2.5 |
    | FOX140 400/5 | 1 | 2.5 |
    | FOX140 500/5 | 1 | 2.5 |
    | FOX140 600/5 | 1 | 2.5 |

    

    ## SUMMATION CURRENT TRANSFORMERS

    ## FOX.SUM

    ## - FEATURES

    - Din rail mounted
    - Protected terminals
    - Up to 9 primary inputs
    - 1 Amp or 5 Amp secondaries


    ## DESCRIPTION

    Din rail mounted summation current transformers enable the summing of several independent loads on different supplies.

    An example: Three 3 phase supplies to be read by one KWh meter.

    | Supply 1: | 200 Amps |
    | :--- | :--- |
    | Supply 2: | 800 Amps |
    | Supply 3: | 1000 Amps |

    Required for each supply are three main CT's of the above primary currents, one for each phase L1/L2/L3. Also required will be three, 3 input summation CT's, each of the summation CT's must be designated to a phase. The secondaries from the L1 phase main CT's should be fed to the inputs of the L1 designated summation CT, likewise the same applies for L2 and L3 phases. The secondary output from the summation CT's will then equal the sum of the three primary currents:-
    $200 / 5+800 / 5+1000 / 5=2000 / 5$
    The meter being used must therefore be calibrated for 2000/5.
    The above example of summation CT's have unbalanced ratio inputs and therefore have to be manufactured to order. Balance ratio input summation CT's are usually ex-stock.

    Summation CT's can also be used for subtraction purposes by reversing the polarity of the inputs. It is also possible to summate a mixture of single phase and three phase supplies.

    Please consult our sales office for application assistance.

    | P/No. | CLASS | VA |
    | :--- | :--- | :--- |
    | FOX.SUM2 $1+1=1$ | 1 | 5 |
    | FOX.SUM2 $5+5=5$ | 1 | 5 |
    | FOX.SUM3 $1+1+1=1$ | 1 | 5 |
    | FOX.SUM3 $5+5+5=5$ | 1 | 5 |
    | FOX.SUM4 $1+1+1+1=1$ | 1 | 5 |
    | FOX.SUM4 $5+5+5+5=5$ | 1 | 5 |
    | FOX.SUM5 $1+1+1+1+1=1$ | 1 | 5 |
    | FOX.SUM5 $5+5+5+5+5=5$ | 1 | 5 |
    | FOX.SUM6 $1+1+1+1+1+1=1$ | 1 | 5 |
    | FOX.SUM6 $5+5+5+5+5+5=5$ | 1 | 5 |
    | FOX.SUM7 $1+1+1+1+1+1+1=1$ | 1 | 5 |
    | FOX.SUM7 $5+5+5+5+5+5+5=5$ | 1 | 5 |
    | FOX.SUM8 $1+1+1+1+1+1+1+1=1$ | 1 | 5 |
    | FOX.SUM8 $5+5+5+5+5+5+5+5=5$ | 1 | 5 |
    | FOX.SUM9 $1+1+1+1+1+1+1+1+1=1$ | 1 | 5 |
    | FOX.SUM9 $5+5+5+5+5+5+5+5+5=5$ | 1 | 5 |

    

    ## FOX.SC23

    FEATURES

    - Protected terminals
    - Integral cable / bus-bar pinch screws
    - Primaries from 100 Amps to 400 Amps
    - Max aperture size $23 \times 33 \mathrm{~mm}$
    - Max overall dimensions 93x103mm
    - Class 1 (class 0.5 on request, some ratios)
    - 1 Amp or 5 Amp secondaries

    | P/No. | CLASS | VA |
    | :--- | :--- | :--- |
    | FOX.SC23 100/5 | 1 | 1.5 |
    | FOX.SC23 150/5 | 1 | 1.75 |
    | FOX.SC23 200/5 | 1 | 2.5 |
    | FOX.SC23 250/5 | 1 | 3.75 |
    | FOX.SC23 300/5 | 1 | 5 |
    | FOX.SC23 400/5 | 1 | 6.25 |

    1 Amp secondaries available to special order, along with class 0.5 on some ratios, please consult our sales office.
    

    ## FOX.SC58

    ## - FEATURES

    - Protected terminals
    - Integral cable / bus-bar pinch screws
    - Primaries from 250 Amps to 1000 Amps
    - Max aperture size $82 \times 52 \mathrm{~mm}$
    - Max overall dimensions 125x158mm
    - Class 1 (class 0.5 on request)
    - 1 Amp or 5 Amp Secondaries

    | P/No. | CLASS | VA |
    | :--- | :--- | :--- |
    | FOX.SC58 250/5 | 1 | 2.5 |
    | FOX.SC58 300/5 | 1 | 3.75 |
    | FOX.SC58 400/5 | 1 | 3.75 |
    | FOX.SC58 500/5 | 1 | 5 |
    | FOX.SC58 600/5 | 1 | 7.5 |
    | FOX.SC58 800/5 | 1 | 10 |
    | FOX.SC58 1000/5 | 1 | 15 |

    1 Amp secondaries available to special order, along with class 0.5 on some ratios, please consult our sales office.
    

    ## F0X.SC812

    - FEATURES
    - Protected terminals
    - Integral cable / bus-bar pinch screws

    ■ Primaries from 250 Amps to 3000 Amps

    - Max aperture size $82 \times 122 \mathrm{~mm}$
    - Max overall dimensions 155x198mm
    - Class 1 (class 0.5 on request)
    - 1 Amp or 5 Amp secondaries

    | P/No. | CLASS | VA |
    | :--- | :--- | :--- |
    | FOX.SC812 250/5 | 1 | 2.5 |
    | FOX.SC812 300/5 | 1 | 3.75 |
    | FOX.SC812 400/5 | 1 | 3.75 |
    | FOX.SC812 500/5 | 1 | 5 |
    | FOX.SC812 600/5 | 1 | 7.5 |
    | FOX.SC812 800/5 | 1 | 10 |
    | FOX.SC812 1000/5 | 1 | 15 |
    | FOX.SC812 1200/5 | 1 | 30 |
    | FOX.SC812 1500/5 | 1 | 45 |
    | FOX.SC812 1600/5 | 1 | 45 |
    | FOX.SC812 2000/5 | 1 | 45 |
    | FOC.SC812 2500/5 | 1 | 45 |
    | FOX.SC812 3000/5 | 1 | 45 |

    

    1 Amp secondaries available to special order, along with class 0.5 on some ratios, please consult our sales office.

    ## F0X.SC816

    ## - FEATURES

    - Protected terminals
    - Integral cable / bus-bar pinch screws
    - Primaries from 1000 Amps to 5000 Amps
    - Max aperture size $82 \times 162 \mathrm{~mm}$
    - Max overall dimensions $195 \times 245 \mathrm{~mm}$
    - Class 1 (class 0.5 on request)
    - 1 Amp or 5 Amp secondaries

    | P/No. | CLASS | VA |
    | :--- | :--- | :--- |
    | FOX.SC816 1000/5 | 1 | 20 |
    | FOX.SC816 1200/5 | 1 | 20 |
    | FOX.SC816 1500/5 | 1 | 30 |
    | FOX.SC816 1600/5 | 1 | 30 |
    | FOX.SC816 2000/5 | 1 | 30 |
    | FOX.SC816 $2500 / 5$ | 1 | 30 |
    | FOX.SC816 3000/5 | 1 | 45 |
    | FOX.SC816 4000/5 | 1 | 45 |
    | FOX.SC816 5000/5 | 1 | 45 |

    

    1 Amp secondaries available to special order, along with class 0.5 on some ratios, please consult our sales office.

    ## FOX.SC40

    

    - Protected terminals
    - Max cable size 40 mm dia.
    - Primaries from 100 Amps to 800 Amps
    - Max overall dimensions 116x105mm
    - Class 1 (only)
    - 1 Amp or 5 Amp secondaries

    | P/No. | CLASS | VA |
    | :--- | :--- | :--- |
    | FOX.SC40 100/5 | DIMENSIONS |  |
    | FOX.SC40 150/5 | 1 | 1 |
    | FOX.SC40 200/5 | 1 | 1.5 |
    | FOX.SC40 250/5 | 1 | 2.5 |
    | FOX.SC40 300/5 | 1 | 2.5 |
    | FOX.SC40 400/5 | 1 | 2.5 |
    | FOX.SC40 500/5 | 1 | 5 |
    | FOX.SC40 600/5 | 1 | 5 |
    | FOX.SC40 800/5 | 1 | 5 |
    |  | 1 | 5 |
    |  |  |  |
    | Maximum Width 116mm |  |  |

    ## FOUR WAY AC CURRENT TRANSDUCER $4 \times 0.1-50$ AMPS INPUTS TO $4 \times 0$ 0-5VDC OR 0-10VDC OUTPUTS

    ## TYPES: YW4/0-5VDC, YW4/0-10VDC

    - FEATURES
    - Din rail mounted
    - Supplied complete with four split core CT's
    - Primary current range $0.1-50 \mathrm{Amps}$
    - Choice of $4 x 0-5 V D C$ or $0-10 \mathrm{VDC}$ outputs
    - Ideal retrofit solution for monitoring output ways on PDU's
    


    ## DESCRIPTION \& MODE OF OPERATION

    A din rail mounted four way AC current transducer. Accepting up to four inputs from the miniature split core current transformers supplied as a "kit" with the unit and giving four isolated analogue voltage signal outputs, either $0-5 \mathrm{~V}$ DC or $0-10 \mathrm{~V}$ DC. The maximum primary current possible is 50 Amps which is compatible with the 10 mm ID of the split core CT. The YW4 has individual pairs of terminals for the CT inputs, whilst the output channels share a common OV rail. The YW4 requires a separate AC or DC supply voltage with isolation offered via an internal transformer or DC to DC converter.

    ## SPECIFICATIONS

    Supply \& Measuring
    Nominal supply tolerance: $+15 \%$ Frequency
    Max power consumption: $50 / 60 \mathrm{~Hz}$

    Inputx 4 :
    3VA
    0.1-50Amps via split coreCT

    Input impedance per channel: 100 hms
    Outputx 4 :
    Output impedance:
    Gain error:
    $0-5 V D C$ or 0-10VDC
    $>1 \mathrm{KOhms}$
    Zero offset:
    Isolation
    Supply to input \& output:
    Input to output:
    Output channel to channel: General
    Operating temperature: Storage temperature:
    Max cable size:
    CE marked:
    In accordance with:
    Housing material:
    $<0.1 \%$ of full scale
    $<0.1 \%$ of full scale
    Via internal transformer or DC to DC converter
    Via external CT
    Common OV rail
    $-20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
    $20^{\circ} \mathrm{C}$ to $+65^{\circ} \mathrm{C}$
    2.5 mm

    Yes
    EN61000-6-3: 2007
    EN61010-1: 2002
    Polycarbonate, Auto extinguishable
    to UL $94 \mathrm{~V}-0$

    ## CONNECTIONS

    

    CT Specifications

    ## Primary current range:

    Secondary current: Accuracy class: Max input current: Max circuit voltage: Frequency:
    Internal diameter: External dimensions (mm): 26W x 23D x 48H

    ## ORDERING INFORMATION

    TYPE

    | YW4/0-5V DC | 440VAC | 230VAC | 48VDC |
    | :--- | :--- | :--- | :--- |
    | YW4/0-10V DC | 415VAC | 110VAC | 24VDC |
    |  | 400VAC | 48VAC | 12VDC |

    0.1 to 50Amps
    $0-16.6 \mathrm{~mA}$
    Class 1
    100Amps continuous 600 V AC (insulated cable) 10 Hz to 5 KHz
    10 mm

    ## SUPPLY VOLTAGE

    | 440VAC | 230VAC | 48VDC |
    | :--- | :--- | :--- |
    | 415VAC | 110VAC | 24VDC |
    | 400VAC | 48VAC | 12VDC |
    | 380VAC | 24VAC |  |

    Spare CT's available separately, P/N o. F-50A

    # 18, 32 \& 44mm ID SPLIT CORE CURRENT TRANSFORMERS \& TRANSDUCERS 

    ## TYPES: KBR18, KBR32 \& KBR44

    - FEATURES
    - 18mm, 32mm \& 44mm internal diameter
    - Integral ratchet style cable clamp

    ■ "Click shut" closing action
    ■ Primary currents 50 Amps to 1000 Amps

    - Accuracy Class 1
    - 5 Amp, 1 Amp, 4-20mA secondaries
    - Supplied with 2.5 m of flying leads
    


    ## - DESCRIPTION

    A very compact split core device available as a current transformer or a current sensor, ideal for retro fitting in tight for space, existing installations. Secondary outputs available are:-

    5 Amp (certain ratios)
    1 Amp (certain ratios).
    $4-20 \mathrm{~mA}$ loop powered 24VDC.
    These devices feature an integral ratchet style cable fixing clamps, an easy "click shut" closing action and are supplied with 2.5 m of 0.75 mm colour coded flying leads.

    ## SPECIFICATIONS

    | Continuous over current: | $1.2 \times \mathrm{In}$ |
    | :--- | :--- |
    | Max short time current: | $60 \times \mathrm{In} 1 \mathrm{sec}$ |
    | Max system voltage: | $720 \mathrm{~V} 50-60 \mathrm{~Hz}$ |
    | Isolation test voltage: | 3 KV 50 Hz 1 min |
    | Isolation class: | E |
    | Ambient temperature: | $-5^{\circ} \mathrm{C}$ to $+50^{\circ} \mathrm{C}$ |
    | Standards: | DIN EN60044/1 |
    |  | VDE $0414 / 1$ |
    | CE marked: | Yes |

    ## ORDERING INFORMATION

    | P/No. | INTERNAL DIAMETER | OUTPUT | VA |
    | :---: | :---: | :---: | :---: |
    | KBR18 200/1 <br> KBR18 250/1 | $\begin{aligned} & 18 \mathrm{~mm} \\ & 18 \mathrm{~mm} \end{aligned}$ | $\begin{aligned} & 1 \mathrm{Amp} \\ & 1 \mathrm{Amp} \end{aligned}$ | $\begin{aligned} & 1 \\ & 1.5 \end{aligned}$ |
    | KBR32 300/5 <br> KBR32 400/5 <br> KBR32 500/5 <br> KBR32 600/5 | $\begin{aligned} & 32 \mathrm{~mm} \\ & 32 \mathrm{~mm} \\ & 32 \mathrm{~mm} \\ & 32 \mathrm{~mm} \end{aligned}$ | 5 Amp 5 Amp 5 Amp 5 Amp | $\begin{aligned} & 2.5 \\ & 5 \\ & 5 \\ & 5 \end{aligned}$ |
    | $\begin{aligned} & \text { KBR32 300/1 } \\ & \text { KBR32 400/1 } \\ & \text { KBR32 500/1 } \\ & \text { KBR32 } 600 / 1 \end{aligned}$ | $\begin{aligned} & 32 \mathrm{~mm} \\ & 32 \mathrm{~mm} \\ & 32 \mathrm{~mm} \\ & 32 \mathrm{~mm} \end{aligned}$ | 1 Amp <br> 1 Amp <br> 1 Amp <br> 1 Amp | $\begin{aligned} & 5 \\ & 5 \\ & 5 \\ & 5 \end{aligned}$ |
    | KBR32 100/4-20mA <br> KBR32 150/4-20mA <br> KBR32 200/4-20mA <br> KBR32 250/4-20mA <br> KBR32 300/4-20mA <br> KBR32 400/4-20mA <br> KBR32 500/4-20mA <br> KBR32 600/4-20mA | $\begin{aligned} & 32 \mathrm{~mm} \\ & 32 \mathrm{~mm} \\ & 32 \mathrm{~mm} \\ & 32 \mathrm{~mm} \\ & 32 \mathrm{~mm} \\ & 32 \mathrm{~mm} \\ & 32 \mathrm{~mm} \\ & 32 \mathrm{~mm} \end{aligned}$ | $\begin{aligned} & 4-20 \mathrm{~mA} \\ & 4-20 \mathrm{~mA} \\ & 4-20 \mathrm{~mA} \\ & 4-20 \mathrm{~mA} \\ & 4-20 \mathrm{~mA} \\ & 4-20 \mathrm{~mA} \\ & 4-20 \mathrm{~mA} \\ & 4-20 \mathrm{~mA} \end{aligned}$ | N/A N/A N/A N/A N/A N/A N/A N/A |


    | P/No. | INTERNAL DIAMETER | OUTPUT | VA |
    | :---: | :---: | :---: | :---: |
    | KBR44 250/5 | 44 mm | 5 Amp | 1.5 |
    | KBR44 300/5 | 44 mm | 5 Amp | 2.5 |
    | KBR44 400/5 | 4 mm | 5 Amp | 5 |
    | KBR44 500/5 | 44 mm | 5 Amp | 5 |
    | KBR44 600/5 | 44 mm | 5 Amp | 5 |
    | KBR44 800/5 | 44 mm | 5 Amp | 5 |
    | KBR44 1000/5 | 44 mm | 5 Amp | 5 |
    | KBR44 250/1 | 44 mm | 1 Amp | 2.5 |
    | KBR44 300/1 | 44 mm | 1 Amp | 2.5 |
    | KBR44 400/1 | 44 mm | 1 Amp | 5 |
    | KBR44 500/1 | 44 mm | 1 Amp | 5 |
    | KBR44 600/1 | 44 mm | 1 Amp | 5 |
    | KBR44 800/1 | 44 mm | 1 Amp | 5 |
    | KBR44 1000/1 | 44 mm | 1 Amp | 5 |
    | KBR44 250/4-20mA | 44 mm | $4-20 \mathrm{~mA}$ | N/A |
    | KBR44 300/4-20mA | 44 mm | $4-20 \mathrm{~mA}$ | N/A |
    | KBR44 400/4-20mA | 44 mm | 4-20mA | N/A |
    | KBR44 500/4-20mA | 44 mm | $4-20 \mathrm{~mA}$ | N/A |
    | KBR44 600/4-20mA | 44 mm | 4-20mA | N/A |
    | KBR44 800/4-20mA | 44 mm | $4-20 \mathrm{~mA}$ | N/A |
    | KBR44 1000/4-20mA | 44 mm | 4-20mA | N/A |

    ## - FEATURES

    - CT style
    - Moulded case insulation to 600VAC
    - Solid core \& split core versions
    - Din rail mounted
    - Self powered 0-5VDC \& 0-10VDC outputs
    - Loop powered 4-20mA output


    ## - DESCRIPTION

    

    The CS-6xx \& SC-xx range of AC current transducers look like standard current transformers and are used as such. The range is available in standard ring type, or for retro fit projects in split core. Either way both types are Din rail mountable, moulded case and insulated up to 600VAC.
    Some of the transducers are dedicated primary ranges, whilst others have selectable primary ranges, selectable via a slider switch or jumpers, like traditional CT's primary turns can be made to reduce the ratio. Three output options are available, either a $0-5 \mathrm{VDC}$ or $0-10 \mathrm{VDC}$ output which is self powered. The $4-20 \mathrm{~mA}$ version is a loop powered output and therefore requires a nominal 24VDC external source to power the loop.
    The 675 types are designed to measure complex and distorted wave forms being a TRMS device, they are also ideal for current measurement on the output side of VFD's.

    ## SPECIFICATIONS

    | Response Time: | Types 650 \& $651(200 \mathrm{mSec})$ Types 652 ( 250 mSec ) | Temp Range: | $\begin{aligned} & -15^{\circ} \mathrm{C} \text { to }+60^{\circ} \mathrm{C} \\ & \text { Types } 675\left(-15^{\circ} \mathrm{C} \text { to }+50^{\circ} \mathrm{C}\right) \end{aligned}$ |
    | :---: | :---: | :---: | :---: |
    |  | Types 675 ( 500 mSec ) | Humidity: | 5-90\% RH |
    | Accuracy: | Class 2 (Class 1 on request) | CS Dimensions: | Aperture 20.3 mm Dia . |
    | 0-5VDC Output: | Self powered |  | Body $66 \mathrm{~W} \times 67 \mathrm{H} \times 25 \mathrm{mmD}$ |
    |  | Load 1 MOhm typical | SC Dimensions: | Aperture 20.3 mm Dia. |
    | 0-10VDC Output: | Self powered |  | Body $67 \mathrm{~W} \times 69 \mathrm{H} \times 24 \mathrm{mmD}$ |
    |  | Load 1MOhm typical | Enclosure: | ABS/PC, UL94V-0 |
    | 4-20mA Output: | 15-30VDC loop powered Max load 600 Ohms (@24VDC) | Approvals: CE Marked: | cULus listed Yes |

    ## - ORDERING INFORMATION

    | P/No. | Primary Range Amps | Max Cont. A | Hz Range | Output |
    | :---: | :---: | :---: | :---: | :---: |
    | CS-650-R1 \& SC-650-R1 | 0-10A / 0-20A / 0-50A* | 100 Amps | $45-65 \mathrm{~Hz}$ | 0-5VDC |
    | CS-650-R2 \& SC-650-R2 | 0-50A / 0-100A / 0-150A* | 150 Amps | $45-65 \mathrm{~Hz}$ | 0-5VDC |
    | CS-650-200 \& SC-650-200 | 0-200 A | 200 Amps | $45-65 \mathrm{~Hz}$ | 0-5VDC |
    | CS-651-R1 | 0-10A / 0-20A / 0-50A* | 100 Amps | $45-65 \mathrm{~Hz}$ | 0-10VDC |
    | SC-651-R1 | 0-20A / 0-40A /0-60A* | 100 Amps | $45-65 \mathrm{~Hz}$ | 0-10VDC |
    | SC-651-R2 | 0-50A / 0-100A / 0-150A* | 150 Amps | $45-65 \mathrm{~Hz}$ | 0-10VDC |
    | CS-651-100 | 0-100 A | 150 Amps | $45-65 \mathrm{~Hz}$ | 0-10VDC |
    | CS-651-200 \& SC-651-200 | 0-200 A | 225 Amps | $45-65 \mathrm{~Hz}$ | 0-10VDC |
    | CS-652-R1 | 0-10A / 0-20A / 0-50A* | 100 Amps | $45-65 \mathrm{~Hz}$ | 4-20mA |
    | SC-652-R1 | 0-20A / 0-40A / 0-60A* | 100 Amps | $45-65 \mathrm{~Hz}$ | 4-20mA |
    | CS-652-R2 \& SC-652-R2 | 0-50A 0-100A / 0-150A* | 150 Amps | $45-65 \mathrm{~Hz}$ | 4-20mA |
    | CS-652-200 \& SC-652-200 | 0-200 A | 250 Amps | $45-65 \mathrm{~Hz}$ | 4-20mA |
    | CS-675-2 \& SC-675-2 | 0-2A | 10 Amps | $20-400 \mathrm{~Hz}$ | 4-20mA |
    | CS-675-5 \& SC-675-5 | 0-5A | 15 Amps | $20-400 \mathrm{~Hz}$ | 4-20mA |
    | CS-675-R1 \& SC-675-R1 | 0-10A / 0-20A / 0-50A** | 100 Amps*** | $20-400 \mathrm{~Hz}$ | $4-20 \mathrm{~mA}$ |
    | CS-675-R2 \& SC-675-R2 | 0-50A / 0-100A / 0-150A** | 150 Amps**** | $20-400 \mathrm{~Hz}$ | $4-20 \mathrm{~mA}$ |
    | CS-675-200 \& SC-675-200 | 0-200A | 250 Amps***** | $20-400 \mathrm{~Hz}$ | $4-20 \mathrm{~mA}$ |

    CS = Solid Core SC = Split Core
    *Range switch selectable **Range jumper selectable
    ***On the split core variant the max continuous current is $x 3$ of the range selected
    ****On the split core variant the max continuous current is $x 2$ of the range selected
    ****On the split core variant the max continuous current is 300 Amps
    

    ## MBS RANGE OF CURRENT TRANSFORMERS

    - FEATURES
    - Moulded case
    - Primary wound versions
    - Bus-bar versions
    - Many types can be din rail mounted
    - All fixings \& if applicable din rail clip supplied
    - Snap shut hinged secondary terminal covers
    - Insulated ends to bus-bar clamping screws
    - P1>P2 (K>L) primary designation within moulding
    - S1 S2 ( I ) secondary designation within moulding
    - 1 Amp \& 5 Amp secondaries
    - Other class accuracies \& VA ratings on request


    ## SPECIFICATION

    Compliance: CE marked: Construction:

    Rated Hz:
    Insulation:
    Tropicalised versions:

    DIN VDE 0414/1, DIN 42600, IEC 185, VBG 4 Yes Self extinguishing to UL94VO black polycarbonate, casing ultrasonically welded
    $50-60 \mathrm{~Hz}$, other frequencies on request up to 400 Hz Class E, up to 720V
    On request

    GREAT IDEA !!
    PLUG IN TRANSDÜCERS MODULES
    

    ## NMC - UNIQUE PLUG IN TRANSDUCER OPTION

    ## - DESCRIPTION

    Do you ultimately need an analogue signal for your current measurement? The MBS range of CT's feature a plug in transducer module option.
    Just twist off the secondary terminal covers and remove the secondary terminal screws. Screw in the brass transformer to module connecting studs and plug in the NMC transducer module.
    Each NMC transducer block will give two different isolated analogue outputs. Also the secondary of the current transformer is repeated, if this repeat facility is not required the supplied shorting link must be left in situ. It is possible to generate $0-20 \mathrm{~mA}$ and $0-10 \mathrm{VDC}$ without any auxiliary supply (self powered module version). Please note that the self powered versions can only be used on current transformers with an output of at least 2.5 VA , if a $4-20 \mathrm{~mA}$ signal is required in all cases an auxiliary supply is required, $24 V D C, 110$ VAC or 230 VAC .

    ## NMC MODULE SPECIFICATIONS

    INPUT
    Current:
    Power consumption:
    Overload capacity:

    ## OUTPUT

    Signal I:
    Max external resistance: Current limit on overload: Signal V:
    External resistance:
    Voltage limit on overload:

    ## GENERAL

    DC auxiliary supply: AC auxiliary supply: Response time: General accuracy: Accuracy range: Isolation:

    1Amp or 5Amp
    $<1 \mathrm{VA}$, self powered versions $>2.5 \mathrm{VA}$
    $1.2 x$ In continuously, $8 x$ In $<40$ secs
    $0-20 \mathrm{~mA}$ or $4-20 \mathrm{~mA}$
    500 ohms
    $<34 m A$
    0-10VDC
    $>10$ Kohms
    18VDC
    $24 \mathrm{VDC} \pm 15 \%$
    $110 \mathrm{VAC}, 230 \mathrm{VAC} \pm 10 \%, 50-60 \mathrm{~Hz}$
    $<500 \mathrm{mSec}$
    Class 0.5
    1-120\% In powered, 15-120\% self powered 4KV

    ## GENERAL INSTALLATION NOTES

    1. Remove red CT secondary covers by twisting them, some gentle force is required.
    2. Remove the secondary screws on the P2 (L) side of the CT, pull out the brass studs from the rear of the transducer / relay module and screw into the holes left by the secondary screws.
    3. Clip transducer module on to the top of the CT.
    4. If the $1 \mathrm{Amp} / 5 \mathrm{Amp}$ CT output is not required the link for shorting should be left in situ across terminals 5 \& 6 .

    ## NMC NOTES

    1. On connection of the auxiliary supply the two green LED's should illuminate.
    2. Note, the self powered transducer version is only possible to use if the CT being used generates at least 2.5 VA . The self powered version current output is $0-20 \mathrm{~mA}$ instead of $4-20 \mathrm{~mA}$.

    ## Terminal No.

    1
    1
    2
    Positive 0-10VDC output
    Negative $0-20 \mathrm{~mA} / 4-20 \mathrm{~mA}$ output
    Positive $0-20 \mathrm{~mA} / 4-20 \mathrm{~mA}$ output *
    S1 (k) 1Amp /5Amp output *
    S2 (I) 1Amp / 5Amp output *

    + / L auxiliary supply *
    - / N auxiliary supply *
    * Depending on version ordered
    


    ## MOULDED CASE PRIMARY WOUND CT - WITH UNIQUE TRANSDUCER OPTION

    ## TYPE: WSK40

    

    - Snap fit terminal covers
    - Transformer width 70 mm
    - Primary ranges from 1 Amp to 30 Amps

    1 Amp or 5 Amp secondaries

    | PRIMARY <br> CURRENT | 1 | 5 | 10 | 15 | 20 | 25 | 30 |
    | :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
    | VA | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
    | CLASS | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

    ## - NMC PLUG IN TRANSDUCERS

    | P/No | $\begin{gathered} \text { CT } \\ \text { SECONDARY } \end{gathered}$ | $\begin{aligned} & \text { AUX } \\ & \text { SUPPLY } \end{aligned}$ | OUTPUT |
    | :---: | :---: | :---: | :---: |
    | NMC012-37213 | 1A | Self powered | 0-20mA \& 0-10VDC \& 1A |
    | NMCO22-37013 | 5A | Self powered | 0-20mA \& 0-10VDC \& 5A |
    | NMC212-39233 | 1A | 24VDC | $4-20 \mathrm{~mA}$ \& $0-10 \mathrm{VDC}$ \& 1 A |
    | NMC222-39033 | 5A | 24VDC | $4-20 \mathrm{~mA}$ \& 0-10VDC \& 5 A |
    | NMC312-36233 | 1A | 230VAC | 4-20mA \& 0-10VDC \& 1A |
    | NMC322-36033 | 5A | 230VAC | 4-20mA \& 0-10VDC \& 5 A |
    | NMC412-76233 | 1A | 110VAC | $4-20 \mathrm{~mA}$ \& 0-10VDC \& 1 A |
    | NMC422-76033 | 5A | 110VAC | $4-20 \mathrm{~mA}$ \& 0-10VDC \& 5 A |

    ## DIMENSIONS

    
    

    All WSK40 models available with 1 Amp or 5 Amp secondaries. Above ratios available as Class 0.5 to special order, please consult sales office for information.

    Spare Din rail mounting clips available P/No. 55012

    # MOULDED CASE CT - WITH UNIQUE TRANSDUCER OPTION 

    ## TYPE: ASR22.3

    ## FEATURES

    - Din rail mounted or foot mounted
    - Snap fit secondary terminal covers
    - Transformer width 60 mm
    - Max conductor size 22.5 mm dia.
    - Primary ranges from 40 Amps to 600 Amps
    - 1 Amp or 5 Amp secondaries

    | PRIMARY <br> CURRENT | 40 | 50 | 60 | 80 | 100 | 150 | 200 | 250 | 300 | 400 | 500 | 600 |
    | :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
    | VA | 1 | 1 | 1 | 2.5 | 3.75 | 5 | 5 | 10 | 10 | 10 | 10 | 10 |
    | CLASS | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

    ## NMC PLUG IN TRANSDUCERS

    | P/No | $\begin{gathered} \text { CT } \\ \text { SECONDARY } \end{gathered}$ | $\begin{gathered} \text { AUX } \\ \text { SUPPLY } \end{gathered}$ | OUTPUT |
    | :---: | :---: | :---: | :---: |
    | NMC011-37212 | 1A | Self powered | $0-20 \mathrm{~mA}$ \& 0-10VDC \& 1A |
    | NMC021-37012 | 5A | Self powered | $0-20 \mathrm{~mA}$ \& 0-10VDC \& 5A |
    | NMC211-39232 | 1A | 24VDC | $4-20 \mathrm{~mA}$ \& 0-10VDC \& 1A |
    | NMC221-39032 | 5A | 24VDC | $4-20 \mathrm{~mA}$ \& 0-10VDC \& 5A |
    | NMC311-36232 | 1A | 230VAC | $4-20 \mathrm{~mA}$ \& 0-10VDC \& 1A |
    | NMC321-36032 | 5A | 230VAC | $4-20 \mathrm{~mA}$ \& 0-10VDC \& 5A |
    | NMC411-76232 | 1A | 110VAC | $4-20 \mathrm{~mA}$ \& $0-10 \mathrm{VDC}$ \& 1 A |
    | NMC421-76032 | 5A | 110VAC | 4-20mA \& 0-10VDC \& 5A |

    ## DIMENSIONS

    

    All ASR22.3 models available with 1 Amp or 5 Amp secondaries. Above ratios available as Class 0.5 to special order, please consult sales office for information.

    Spare Din rail mounting clips available P/No. 55012

    ## MOULDED CASE CT - WITH UNIQUE TRANSDUCER OPTION

    ## TYPE: ASK31.3

    ## - FEATURES

    - Din rail, bus-bar or foot mounted
    - Snap fit secondary terminal covers
    - Insulated ends to bus-bar pinch screws
    - Transformer width 60 mm
    
    - Max conductor size 26 mm dia.
    - Max bus-bar size $\mathbf{3 0 \times 1 0 m m}$
    - Primary ranges from 50 Amps to $\mathbf{7 5 0}$ Amps
    - 1 Amp or 5 Amp secondaries


    ## - NMC PLUG IN TRANSDUCERS

    | P/No | $\begin{gathered} \text { CT } \\ \text { SECONDARY } \end{gathered}$ | AUX SUPPLY | OUTPUT |
    | :---: | :---: | :---: | :---: |
    | NMC011-37212 | 1A | Self powered | $0-20 \mathrm{~mA}$ \& 0-10VDC \& 1A |
    | NMC021-37012 | 5A | Self powered | $0-20 \mathrm{~mA}$ \& $0-10 \mathrm{VDC}$ \& 5A |
    | NMC211-39232 | 1A | 24VDC | $4-20 \mathrm{~mA}$ \& $0-10 \mathrm{VDC}$ \& 1A |
    | NMC221-39032 | 5A | 24VDC | $4-20 \mathrm{~mA}$ \& 0-10VDC \& 5A |
    | NMC311-36232 | 1A | 230VAC | $4-20 \mathrm{~mA}$ \& $0-10 \mathrm{VDC}$ \& 1 A |
    | NMC321-36032 | 5A | 230VAC | $4-20 \mathrm{~mA}$ \& 0-10VDC \& 5A |
    | NMC411-76232 | 1A | 110VAC | $4-20 \mathrm{~mA}$ \& 0-10VDC \& 1A |
    | NMC421-76032 | 5A | 110VAC | 4-20mA \& 0-10VDC \& 5A |

    

    All ASK31.3 models available with 1 Amp or 5 Amp secondaries. Some of the above ratios available as Class 0.5 \& Class 0.2 to special order, please consult sales office for information.
    Spare Din rail mounting clips available P/No. 53011

    ## MOULDED CASE CT - WITH UNIQUE TRANSDUCER OPTION

    ## TYPE: ASK318.3 <br> FEATURES

    - Din rail, bus-bar or foot mounted
    - Snap fit secondary terminal covers
    - Insulated ends to bus-bar pinch screws
    - Transformer width 60 mm
    - Max conductor size 26 mm dia.
    - Max bus-bar size 31x18mm
    - Primary ranges from 60 Amps to 600 Amps
    - 1 Amp or 5 Amp secondaries


    ## - NMC PLUG IN TRANSDUCERS

    | P/No | CT |
    | :---: | :---: | :---: | :---: |
    | SECONDARY |  |$\quad$| AUX |
    | :---: |
    | SUPPLY |$\quad$ OUTPUT

    

    All ASK318.3 models available with 1 Amp or 5 Amp secondaries. Some of the above ratios available as Class 0.5 to special order, please consult sales office for information.

    ## MOULDED CASE CT - WITH UNIQUE TRANSDUCER OPTION

    ## TYPE: ASK41.3

    ## - FEATURES

    - Din rail, bus-bar or foot mounted
    - Snap fit secondary terminal covers
    - Insulated ends to bus-bar pinch screws
    - Transformer width 60 mm
    - Max conductor size $\mathbf{2 6 m m}$ dia.
    - Max bus-bar size $40 \times 12 \mathrm{~mm}$ or $32 \times 18 \mathrm{~mm}$
    - Primary ranges from 100 Amps to 750 Amps
    - 1 Amp or 5 Amp secondaries

    NMC PLUG IN TRANSDUCERS

    | P/No | CT SECONDARY | $\begin{gathered} \text { AUX } \\ \text { SUPPLY } \end{gathered}$ | OUTPUT |
    | :---: | :---: | :---: | :---: |
    | NMC011-37212 | 1A | Self powered | $0-20 \mathrm{~mA}$ \& 0-10VDC \& 1A |
    | NMC021-37012 | 5A | Self powered | $0-20 \mathrm{~mA}$ \& 0-10VDC \& 5A |
    | NMC211-39232 | 1A | 24VDC | $4-20 \mathrm{~mA}$ \& $0-10 \mathrm{VDC}$ \& 1A |
    | NMC221-39032 | 5A | 24VDC | $4-20 \mathrm{~mA}$ \& 0-10VDC \& 5A |
    | NMC311-36232 | 1A | 230VAC | $4-20 \mathrm{~mA}$ \& 0-10VDC \& 1A |
    | NMC321-36032 | 5A | 230VAC | $4-20 \mathrm{~mA}$ \& 0-10VDC \& 5A |
    | NMC411-76232 | 1A | 110VAC | $4-20 \mathrm{~mA}$ \& 0-10VDC \& 1A |
    | NMC421-76032 | 5A | 110VAC | $4-20 \mathrm{~mA}$ \& 0-10VDC \& 5A |

    

    | PRIMARY <br> CURRENT | 100 | 150 | 200 | 250 | 300 | 400 | 500 | 600 | 750 |
    | :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
    | VA | 1.5 | 2.5 | 2.5 | 2.5 | 5 | 5 | 5 | 5 | 10 |
    | CLASS | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

    All ASK41.3 models available up to 300 Amps with 1 Amp or 5 Amp secondaries, above 300 Amps 5 Amp secondary only. Spare Din rail mounting clips available P/No. 53011

    ## MOULDED CASE CT - WITH UNIQUE TRANSDUCER OPTION

    ## TYPE: ASK412.4

    ## FEATURES

    - Din rail, bus-bar or foot mounted
    - Snap fit secondary terminal covers
    - Insulated ends to bus-bar pinch screws
    - Transformer width 70 mm
    
    - Max conductor size 30.5 mm dia.
    - Max bus-bar size $40 \times 12 \mathrm{~mm}$ or $30 \times 15 \mathrm{~mm}$
    - Primary ranges from 50 Amps to $\mathbf{8 0 0}$ Amps
    - 1 Amp or 5 Amp secondaries
    - NMC PLUG IN TRANSDUCERS

    | P/No | $\begin{gathered} \text { CT } \\ \text { SECONDARY } \end{gathered}$ | $\begin{gathered} \text { AUX } \\ \text { SUPPLY } \end{gathered}$ | OUTPUT |
    | :---: | :---: | :---: | :---: |
    | NMC013-37214 | 1A | Self powered | $0-20 \mathrm{~mA}$ \& 0-10VDC \& 1 A |
    | NMCO23-37014 | 5A | Self powered | $0-20 \mathrm{~mA}$ \& 0-10VDC \& 5A |
    | NMC213-39234 | 1A | 24VDC | $4-20 \mathrm{~mA}$ \& 0-10VDC \& 1A |
    | NMC223-39034 | 5A | 24VDC | $4-20 \mathrm{~mA}$ \& 0-10VDC \& 5A |
    | NMC313-36234 | 1A | 230VAC | $4-20 \mathrm{~mA}$ \& 0-10VDC \& 1A |
    | NMC323-36034 | 5A | 230VAC | $4-20 \mathrm{~mA}$ \& 0-10VDC \& 5A |
    | NMC413-76234 | 1A | 110VAC | $4-20 \mathrm{~mA}$ \& 0-10VDC \& 1 A |
    | NMC423-76034 | 5A | 110VAC | 4-20mA \& 0-10VDC \& 5A |

    

    All ASK412.4 models available with 1 Amp or 5 Amp secondaries. Some of the above ratios available as Class $\mathbf{0 . 5}$ to special order, please consult sales office for information.
    Spare Din rail mounting clips available P/No. 55012

    ## MOULDED CASE CT - WITH UNIQUE TRANSDUCER

    OPTION
    ## TYPE: ASK41.4

    - FEATURES
    - Din rail, bus-bar or foot mounted
    - Snap fit secondary terminal covers
    - Insulated ends to bus-bar pinch screws
    - Transformer width 70mm
    - Max conductor size 32 mm dia.
    - Max bus-bar size $40 \times 10 \mathrm{~mm}$ or $2 \times 30 \times 5 \mathrm{~mm}$
    $\square$ Primary ranges from $\mathbf{5 0}$ Amps to 1000 Amps
    - 1 Amp or 5 Amp secondaries


    ## - NMC PLUG IN TRANSDUCERS

    | P/No | $\begin{gathered} \text { CT } \\ \text { SECONDARY } \end{gathered}$ | $\begin{gathered} \text { AUX } \\ \text { SUPPLY } \end{gathered}$ | OUTPUT |
    | :---: | :---: | :---: | :---: |
    | NMC013-37214 | 1A | Self powered | $0-20 \mathrm{~mA}$ \& 0-10VDC \& 1A |
    | NMC023-37014 | 5A | Self powered | $0-20 \mathrm{~mA}$ \& 0-10VDC \& 5A |
    | NMC213-39234 | 1A | 24VDC | $4-20 \mathrm{~mA}$ \& 0-10VDC \& 1A |
    | NMC223-39034 | 5A | 24VDC | $4-20 \mathrm{~mA}$ \& 0-10VDC \& 5A |
    | NMC313-36234 | 1A | 230VAC | $4-20 \mathrm{~mA}$ \& 0-10VDC \& 1A |
    | NMC323-36034 | 5A | 230VAC | $4-20 \mathrm{~mA}$ \& 0-10VDC \& 5A |
    | NMC413-76234 | 1A | 110VAC | $4-20 \mathrm{~mA}$ \& 0-10VDC \& 1A |
    | NMC423-76034 | 5A | 110VAC | 4-20mA \& 0-10VDC \& 5A |

    

    All ASK41.4 models available with 1 Amp or 5 Amp secondaries. Some of the above ratios available as Class 0.5 \& Class 0.2 to special order, please consult sales office for information.
    Spare Din rail mounting clips available P/No. 55012

    ## MOULDED CASE CT - WITH UNIQUE TRANSDUCER OPTION

    ## TYPE: ASK61.4

    - FEATURES
    - Foot or bus-bar mounted
    - Snap fit secondary terminal covers
    - Insulated ends to bus-bar pinch screws
    - Transformer width 95 mm
    - Max conductor size 44 mm dia.
    - Max bus-bar size $\mathbf{6 3 x 1 0 m m}$ or $2 \times 50 \times 10 \mathrm{~mm}$
    - Primary ranges from $\mathbf{2 0 0}$ Amps to 1600 Amps
    - 1 Amp or 5 Amp secondaries
    - NMC PLUG IN TRANSDUCERS

    | P/No | $\begin{array}{\|c\|} \hline \text { CT } \\ \text { SECONDARY } \end{array}$ | $\begin{gathered} \text { AUX } \\ \text { SUPPLY } \end{gathered}$ | OUTPUT |
    | :---: | :---: | :---: | :---: |
    | NMC014-37215 | 1A | Self powered | 0-20mA \& 0-10VDC \& 1A |
    | NMC024-37015 | 5A | Self powered | 0-20mA \& 0-10VDC \& 5A |
    | NMC214-39235 | 1A | 24VDC | 4-20mA \& 0-10VDC \& 1A |
    | NMC224-39035 | 5A | 24VDC | $4-20 \mathrm{~mA}$ \& 0-10VDC \& 5A |
    | NMC314-36235 | 1A | 230VAC | $4-20 \mathrm{~mA}$ \& 0-10VDC \& 1A |
    | NMC324-36035 | 5A | 230VAC | $4-20 \mathrm{~mA}$ \& 0-10VDC \& 5 A |
    | NMC414-76235 | 1A | 110VAC | $4-20 \mathrm{~mA}$ \& 0-10VDC \& 1A |
    | NMC424-76035 | 5A | 110VAC | 4-20mA \& 0-10VDC \& 5A |

    

    All ASK61.4 models available with 1 Amp or 5 Amp secondaries. Above ratios available as Class 0.5 \& Class 0.2 to special order, please consult sales office for information.

    ## MOULDED CASE CT - WITH UNIQUE TRANSDUCER

    OPTION
    ## TYPE: ASK63.4

    - FEATURES
    - Foot or bus-bar mounted
    - Snap fit secondary terminal covers
    - Insulated ends to bus-bar pinch screws
    - Transformer width 95 mm
    - Max conductor size 44 mm dia.
    - Max bus-bar size $\mathbf{6 0 x} 30 \mathrm{~mm}$ or $50 \times 40 \mathrm{~mm}$
    - Primary ranges from $\mathbf{3 0 0}$ Amps to 1600 Amps
    - 1 Amp or 5 Amp secondaries
    - NMC PLUG IN TRANSDUCERS

    | P/No | $\begin{gathered} \text { CT } \\ \text { SECONDARY } \end{gathered}$ | $\begin{gathered} \text { AUX } \\ \text { SUPPLY } \end{gathered}$ | OUTPUT |
    | :---: | :---: | :---: | :---: |
    | NMC014-37215 | 1A | Self powered | $0-20 \mathrm{~mA}$ \& 0-10VDC \& 1A |
    | NMC024-37015 | 5A | Self powered | $0-20 \mathrm{~mA}$ \& 0-10VDC \& 5A |
    | NMC214-39235 | 1A | 24VDC | $4-20 \mathrm{~mA}$ \& 0-10VDC \& 1A |
    | NMC224-39035 | 5A | 24VDC | $4-20 \mathrm{~mA}$ \& 0-10VDC \& 5A |
    | NMC314-36235 | 1A | 230VAC | $4-20 \mathrm{~mA}$ \& $0-10 \mathrm{VDC}$ \& 1 A |
    | NMC324-36035 | 5A | 230VAC | $4-20 \mathrm{~mA}$ \& 0-10VDC \& 5A |
    | NMC414-76235 | 1A | 110VAC | $4-20 \mathrm{~mA}$ \& 0-10VDC \& 1A |
    | NMC424-76035 | 5A | 110VAC | 4-20mA \& 0-10VDC \& 5A |

    

    | PRIMARY <br> CURRENT | 300 | 400 | 500 | 600 | 800 | 1000 | 1200 | 1500 |
    | :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
    | VA | 2.5 | 5 | 10 | 15 | 15 | 15 | 15 | 15 |
    | CLASS | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

    All ASK63.4 models available with 1 Amp or 5 Amp secondaries. Above ratios available as Class 0.5 \& Class 0.2 to special order, please consult sales office for information.

    ## MOULDED CASE CT - WITH UNIQUE TRANSDUCER OPTION

    ## TYPE: ASK105.6

    ## - FEATURES

    - Foot or bus-bar mounted
    - Snap fit secondary terminal covers
    - Insulated ends to bus-bar pinch screws
    
    - Transformer width 129 mm
    - Max bus-bar size $100 \times 55 \mathrm{~mm}$
    - Primary ranges from 600 Amps to $\mathbf{3 0 0 0}$ Amps
    - 1 Amp or 5 Amp secondaries

    NMC PLUG IN TRANSDUCERS

    | P/No | $\begin{array}{\|c\|} \hline \text { CT } \\ \text { SECONDARY } \end{array}$ | $\begin{gathered} \text { AUX } \\ \text { SUPPLY } \end{gathered}$ | OUTPUT |
    | :---: | :---: | :---: | :---: |
    | NMC014-37215 | 1A | Self powered | $0-20 \mathrm{~mA}$ \& 0-10VDC \& 1A |
    | NMC024-37015 | 5A | Self powered | $0-20 \mathrm{~mA}$ \& 0-10VDC \& 5A |
    | NMC214-39235 | 1A | 24VDC | $4-20 \mathrm{~mA}$ \& 0-10VDC \& 1A |
    | NMC224-39035 | 5A | 24VDC | 4-20mA \& 0-10VDC \& 5A |
    | NMC314-36235 | 1A | 230VAC | $4-20 \mathrm{~mA}$ \& 0-10VDC \& 1A |
    | NMC324-36035 | 5A | 230VAC | $4-20 \mathrm{~mA}$ \& 0-10VDC \& 5A |
    | NMC414-76235 | 1A | 110VAC | $4-20 \mathrm{~mA}$ \& 0-10VDC \& 1A |
    | NMC424-76035 | 5A | 110VAC | 4-20mA \& 0-10VDC \& 5A |

    

    All ASK105. 6 models available with 1 Amp or 5 Amp secondaries. Above ratios available as Class 0.5 \& Class 0.2 to special order, please consult sales office for information.

    ## MOULDED CASE CT - WITH UNIQUE TRANSDUCER OPTION

    ## TYPES: ASK105.6N

    FEATURES

    - Foot or bus-bar mounted
    - Snap fit secondary terminal covers
    - Insulated ends to bus-bar pinch screws
    - Transformer width 129mm
    - Max bus-bar size $100 \times 55 \mathrm{~mm}$
    - Primary ranges from $\mathbf{2 5 0 0}$ Amps to $\mathbf{4 0 0 0}$ Amps
    - 1 Amp or 5 Amp secondaries
    - NMC PLUG IN TRANSDUCERS

    | P/No | $\begin{gathered} \text { CT } \\ \text { SECONDARY } \end{gathered}$ | $\begin{gathered} \text { AUX } \\ \text { SUPPLY } \end{gathered}$ | OUTPUT |
    | :---: | :---: | :---: | :---: |
    | NMC014-37215 | 1A | Self powered | $0-20 \mathrm{~mA}$ \& 0-10VDC \& 1A |
    | NMCO24-37015 | 5A | Self powered | $0-20 \mathrm{~mA}$ \& 0-10VDC \& 5A |
    | NMC214-39235 | 1A | 24VDC | $4-20 \mathrm{~mA}$ \& 0-10VDC \& 1A |
    | NMC224-39035 | 5A | 24VDC | $4-20 \mathrm{~mA}$ \& 0-10VDC \& 5A |
    | NMC314-36235 | 1A | 230VAC | $4-20 \mathrm{~mA}$ \& 0-10VDC \& 1A |
    | NMC324-36035 | 5A | 230VAC | $4-20 \mathrm{~mA}$ \& 0-10VDC \& 5A |
    | NMC414-76235 | 1A | 110VAC | $4-20 \mathrm{~mA}$ \& 0-10VDC \& 1A |
    | NMC424-76035 | 5A | 110VAC | 4-20mA \& 0-10VDC \& 5A |

    

    | PRIMARY <br> CURRENT | 2500 | 3000 | 4000 |
    | :--- | :---: | :---: | :---: |
    | VA | 30 | 30 | 30 |
    | CLASS | 1 | 1 | 1 |

    All ASK105.6N models available with 1 Amp or 5 Amp secondaries. Above ratios available as Class 0.5 to special order, please consult sales office for information.

    ## MOULDED CASE CT - WITH UNIQUE TRANSDUCER OPTION

    ## TYPES: ASK81.4

    ## FEATURES

    - Foot or bus-bar mounted
    - Snap fit secondary terminal covers
    - Insulated ends to bus-bar pinch screws
    - Transformer width 120 mm
    - Max conductor size 55 mm dia.
    - Max bus-bar size $\mathbf{8 0 \times 1 0 m m}$ or $\mathbf{6 0 x} 30$ or $2 \times 60 \times 10 \mathrm{~mm}$
    - Primary ranges from $\mathbf{4 0 0}$ Amps to 2000 Amps
    - 1 Amp or 5 Amp secondaries


    ## - NMC PLUG IN TRANSDUCERS

    | P/No | $\begin{gathered} \text { CT } \\ \text { SECONDARY } \end{gathered}$ | $\begin{gathered} \text { AUX } \\ \text { SUPPLY } \end{gathered}$ | OUTPUT |
    | :---: | :---: | :---: | :---: |
    | NMC014-37215 | 1A | Self powered | $0-20 \mathrm{~mA}$ \& 0-10VDC \& 1A |
    | NMC024-37015 | 5A | Self powered | $0-20 \mathrm{~mA}$ \& $0-10 \mathrm{VDC}$ \& 5A |
    | NMC214-39235 | 1A | 24VDC | $4-20 \mathrm{~mA}$ \& 0-10VDC \& 1A |
    | NMC224-39035 | 5A | 24VDC | $4-20 \mathrm{~mA}$ \& 0-10VDC \& 5A |
    | NMC314-36235 | 1A | 230VAC | $4-20 \mathrm{~mA}$ \& 0-10VDC \& 1A |
    | NMC324-36035 | 5A | 230VAC | $4-20 \mathrm{~mA}$ \& 0-10VDC \& 5A |
    | NMC414-76235 | 1A | 110VAC | $4-20 \mathrm{~mA}$ \& $0-10 \mathrm{VDC}$ \& 1A |
    | NMC424-76035 | 5A | 110VAC | $4-20 \mathrm{~mA}$ \& $0-10 \mathrm{VDC}$ \& 5A |

    

    All ASK81.4 models available with 1 Amp or 5 Amp secondaries. Above ratios available as Class 0.5 to special order, please consult sales office for information.

    ## MOULDED CASE CT - WITH UNIQUE TRANSDUCER OPTION

    ## TYPES: ASK101.4

    ## - FEATURES

    - Foot mounted or bus-bar mounted
    - Snap fit secondary terminal covers
    - Insulated ends to bus-bar pinch screws
    - Transformer width 130mm
    - Max conductor size 70 mm dia.

    ■ Max bus-bar size $100 \times 10 \mathrm{~mm}$ or $2 \times 80 \times 10 \mathrm{~mm}$

    - Primary ranges from 500 Amps to 2000 Amps
    - 1 Amp or 5 Amp secondaries


    ## ■ NMC PLUG IN TRANSDUCERS

    | P/No | CT <br> SECONDARY | AUX <br> SUPPLY | OUTPUT |
    | :---: | :---: | :---: | :---: |
    | NMC014-37215 | 1A | Self powered | $0-20 \mathrm{~mA} \& 0-10 \mathrm{VDC}$ \& 1A |
    | NMC024-37015 | 5A | Self powered | $0-20 \mathrm{~mA} \& 0-10 \mathrm{VDC}$ \& 5A |
    | NMC214-39235 | 1A | 24VDC | $4-20 \mathrm{~mA} \& 0-10 \mathrm{VDC} \& 1 \mathrm{~A}$ |
    | NMC224-39035 | 5A | 24VDC | $4-20 \mathrm{~mA} \& 0-10 \mathrm{VDC} \& 5 \mathrm{~A}$ |
    | NMC314-36235 | 1A | 230VAC | $4-20 \mathrm{~mA} \& 0-10 \mathrm{VDC} \& 1 \mathrm{~A}$ |
    | NMC324-36035 | 5A | 230VAC | $4-20 \mathrm{~mA} \& 0-10 \mathrm{VDC} \& 5 \mathrm{~A}$ |
    | NMC414-76235 | 1A | 110VAC | $4-20 \mathrm{~mA} \& 0-10 \mathrm{VDC} \& 1 \mathrm{~A}$ |
    | NMC424-76035 | 5A | 110VAC | $4-20 \mathrm{~mA} \& 0-10 \mathrm{VDC} \& 5 \mathrm{~A}$ |

    

    All ASK101.4 models available with 1 Amp or 5 Amp secondaries. Above ratios available as Class $\mathbf{0 . 5}$ to special order, please consult sales office for information.

    ## HOW FAR AWAY CAN A CT BE SITED FROM YOUR INSTRUMENTATION ?

    Firstly, you have to allow double the distance, the return cabling has to be allowed for, therefore 15 mtrs is in fact 30 mtrs .
    The formulae for calculating the VA required is $\mathbf{I}^{\mathbf{2}} \mathbf{R}=\mathrm{VA}$
    Where $I$ is the secondary current of the CT.
    Where $\mathbf{R}$ is the resistance, the resistance of the secondary of the CT cabling per metre, multiplied by the number of metres.
    Typical resistance of tri rated cable per metre is as follows at an ambient temperature of $20^{\circ} \mathrm{C}$. However, it is advised that the customer specifically checks with his own cable supplier as specifications will slightly vary.

    ## TYPICAL TRI RATED CABLE IMPEDANCE

    | 0.5 mm | $=0.039$ | Ohms $/ \mathrm{mtr}$ |
    | :--- | :--- | :--- |
    | 0.75 mm | $=0.026$ | Ohms $/ \mathrm{mtr}$ |
    | 1.0 mm | $=0.0195$ | Ohms $/ \mathrm{mtr}$ |
    | 1.5 mm | $=0.0133$ | Ohms $/ \mathrm{mtr}$ |
    | 2.5 mm | $=0.00798$ | Ohms $/ \mathrm{mtr}$ |
    | 4.0 mm | $=0.00495$ | Ohms $/ \mathrm{mtr}$ |
    | 6.0 mm | $=0.0033$ | Ohms $/ \mathrm{mtr}$ |
    | 10.0 mm | $=0.00191$ | Ohms $/ \mathrm{mtr}$ |

    The input burden of the instrumentation equipment that the secondary of the CT is feeding into must also be allowed for. Typically with modern digital display metering this is very low approx. 0.1 to 0.2 VA , whilst analogue meters can be as high as 1.5 VA

    An example calculation:-
    A meter sited 6 metres away from the CT with a 5 Amp secondary, utilising 1.5 mm secondary cabling. What VA output from the CT is required:-
    $5^{2} \times(12 \times 0.0133)+0.2 \mathrm{VA}($ the meter $)=4.19 \mathrm{VA}$ output required $\quad$ (Use a 5 VACT )
    The VA required can be reduced by utilising 1 Amp secondary CT's because $\mathbf{5}^{2}$ becomes $\mathbf{1}^{\mathbf{2}}$, therefore the VA required reduces by $\times 25$ or the distance achievable increases by $\times 25$ depending on how you view the application.
    Increasing the secondary cable size will also increase the distance achievable.

    ## SPLIT CORE 333mVAC SECONDARY CT's

    ## TYPES: SCL, SCT, ROPE

    ## - FEATURES

    - Split core

    ■ Rogowski "flexible rope" CT's

    - Ideal retro-fit solution
    - Compact sizes
    - Safe when open circuit
    
    - Ideal for when CT's are sited a distance from the meter (VA burden is not relevant)
    - Recommended for use with our CUBE \& RAIL 333 mV CT input energy meters


    ## ■ DESCRIPTION \& MODE OF OPERATION

    The SCT and SCL range of split core 333mVAC secondary current transformers are designed for fast and easy installation with no need to disconnect any loads. An internal precision resistor across the secondary winding of the CT provides a safe, low voltage output of 333 mVAC with minimal current. Unlike conventional 5 Amp and 1 Amp secondary CT's, where the VA burden in the secondary circuit, against the VA that is available from the CT, has to be taken into consideration. Meaning how far away the CT from the meter can be maximally sited needs to be calculated. With 333mVAC secondary CT's this is not relevant. The SCL range is supplied with 1 metre of flying lead cable and the SCT range with 2 metres.

    The ROPE range of "flexible" Rogowski Coil current transformers are supplied only in sets of 3 in either lengths of 461mm or 610 mm . The set of three are supplied with a 5VDC nominal power supply with a $100-240 \mathrm{VAC}$ primary to excite the CT's. These CT's also have a 333 mVAC secondary and are extremely flexible making them particularly suitable when CT's are required to be fitted retrospectively in awkward situations. They are supplied with 2 metres of captive cable.

    Please note, should the CT secondary cabling need to be extended 250V rated Belden Cable (or equivalent) needs to be utilised.

    ## SPECIFICATIONS

    | Secondary: | $0-333 \mathrm{mVAC}$ | Insulation: | SCL: 300 Vrms |
    | :--- | :--- | :--- | :--- |
    | Frequency range: | $50 \mathrm{~Hz}-60 \mathrm{~Hz}$ |  | SCT: 600 Vrms |
    | Accuracy: | $\pm 1 \%$ | Operating temp: $\mathrm{SCL}:-25^{\circ} \mathrm{C}$ to $+90^{\circ} \mathrm{C}$ |  |
    | In max: | $120 \%$ | SCT: $-15^{\circ} \mathrm{C}$ to $+60^{\circ} \mathrm{C}$ |  |
    | Phase error: | $<2^{\circ} @ 0.51 \mathrm{n}$ |  | ROPE: $-20^{\circ} \mathrm{C}$ to $+70^{\circ} \mathrm{C}$ |

    ## ORDERING INFORMATION \& TYPES

    | SCL \& SCT (supplied individually) |  |  |  |  |  |  |
    | :--- | :--- | :--- | :--- | :--- | :--- | :---: |
    |  | Dimensions mm |  |  |  |  |  |
    | P/No | A | B | C | D | E |  |
    | SCL8 5A | 43 | 37 | 32 | 8 | 13 |  |
    | SCT10 30A | 25 | 42 | 15 | 10 | 10 |  |
    | SCL16 50A | 51 | 45 | 37 | 16 | 16 |  |
    | SCT19 50A | 51 | 53 | 17 | 19 | 19 |  |
    | SCL16 100A | 51 | 45 | 37 | 16 | 16 |  |
    | SCT19 150A | 51 | 53 | 17 | 19 | 19 |  |
    | SCT32 400A | 82.5 | 85 | 27 | 32 | 32 |  |
    | SCT51 800A | 121 | 127 | 32 | 51 | 51 |  |


    | ROPE (supplied in sets of 3 with power supply) |  |
    | :--- | :--- |
    | P/No | Length |
    | ROPE 461 1000A | 461 mm |
    | ROPE 461 1500A | 461 mm |
    | ROPE 461 2000A | 461 mm |
    | ROPE 461 3000A | 461 mm |
    | ROPE 461 3500A | 461 mm |
    | ROPE 610 1000A | 610 mm |
    | ROPE 610 1500A | 610 mm |
    | ROPE 610 2000A | 610 mm |
    | ROPE 610 3000A | 610 mm |
    | ROPE 610 3500A | 610 mm |

    

    ## "CT STYLE" SPLIT CORE DC CURRENT TRANSDUCERS

    ## TYPES: FOX.DCCT

    

    ## DESCRIPTION

    A range of moulded case DC "CT" style split core transducers available in 15 housing sizes catering for DC currents from 50 Amps to 30000 Amps. The transducers are available with a choice of output options and require a DC auxiliary power supply, either single for uni-directional monitoring, or $\pm$ for bi-directional current flow (import / export).

    ## ORDERING INFORMATION

    | P/NO | HOUSING* | PRIMARY CURRENT | OUTPUT | AUX SUPPLY |
    | :---: | :---: | :---: | :---: | :---: |
    | FOX.DCCT | C1 to C16 | xxx Amp | 0-5 VDC | + 12VDC |
    |  |  |  | $0-20 \mathrm{~mA}$ | + 15VDC |
    |  |  |  | 4-20mA | + 24VDC |
    |  |  |  |  | $\pm 12 \mathrm{VDC**}$ |
    |  |  |  |  | $\pm 15 \mathrm{VDC**}$ |


    | Accuracy: |  |
    | :---: | :---: |
    | Temp drift: |  |
    | Linearity range: |  |
    | Overload capability: |  |
    | Response time: |  |
    | Current consumption: Isolation: |  |
    | Operation Temp: |  |
    | Fire retardancy: |  |
    | OUTPUT | AUX SUPPLY |
    | 0-5 VDC | + 12VDC |
    | $0-20 \mathrm{~mA}$ | + 15VDC |
    | 4-20mA | + 24VDC |
    |  | $\pm 12 \mathrm{VDC} * *$ |
    |  | $\pm 15 \mathrm{VDC**}$ |

    ** Aux supply option for bi directional current flow applications (not $4-20 \mathrm{~mA}$ output)
    It is often the case when utilising this range of products that they are being used on higher potential DC systems and that the only voltage available is the higher DC potential. We therefore have a range of Din rail mounted DC to DC converters to facilitate the DC auxiliary supply voltage required for the above CT's. Our DC to DC converters can be found on pages 133 \& 134
    

    HOUSING C1
    

    PRODUCT
    AA
    PRIMARY RANGES:
    0-100 Amps to 0-1000 Amps
    TERMINAL ARRANGEMENT:
    Connector

    HOUSING C2
    

    PRIMARY RANGES:
    0-200 Amps to 0-1800 Amps

    TERMINAL ARRANGEMENT:
    Connector

    PRIMARY RANGES:
    0-500 Amps to 0-2800 Amps
    TERMINAL ARRANGEMENT:
    Connector

    HOUSING C4
    

    PRIMARY RANGES:
    0-300 Amps to 0-6000 Amps
    TERMINAL ARRANGEMENT:
    Screw

    ## HOUSING C5

    

    PRIMARY RANGES:
    0-300 Amps to 0-6000 Amps
    TERMINAL ARRANGEMENT:
    Screw

    HOUSING C6
    

    PRIMARY RANGES:
    0-200 Amps to 0-5000 Amps

    TERMINAL ARRANGEMENT:
    Connector

    HOUSING C7
    
    

    PRIMARY RANGES:
    0-300 Amps to 0-1500 Amps
    TERMINAL ARRANGEMENT:
    Connector

    HOUSING C8
    
    

    PRIMARY RANGES:
    0-50 Amps to 0-1000 Amps
    TERMINAL ARRANGEMENT:
    Connector

    HOUSING C9
    
    

    PRIMARY RANGES:
    0-50 Amps to 0-1000 Amps
    TERMINAL ARRANGEMENT:
    Connector

    HOUSING C10
    

    Tel: 01616265316 / 0127625858
    

    PRIMARY RANGES:
    0-500 Amps to 0-5000 Amps
    TERMINAL ARRANGEMENT:
    Connector

    HOUSING C11
    
    

    PRIMARY RANGES:
    0-4000 Amps to 0-10000 Amps
    TERMINAL ARRANGEMENT: Screw

    PRIMARY RANGES:
    0-100 Amps to 0-1000 Amps
    TERMINAL ARRANGEMENT:
    Connector

    HOUSING C13
    

    ## HOUSING C12

    

    PRIMARY RANGES:
    0-500 Amps to 0-2500 Amps
    TERMINAL ARRANGEMENT:
    Connector

    ## HOUSING C14

    

    PRIMARY RANGES:
    0-10000 Amps to 0-30000 Amps
    TERMINAL ARRANGEMENT:
    Connector

    ## HOUSING C16

    

    Tel: 01616265316 / 0127625858
    

    PRIMARY RANGES:
    0-500 Amps to 0-2500 Amps
    TERMINAL ARRANGEMENT:
    Connector

    ## AC / DC "CT" STYLE CURRENT TRANSDUCERS

    TYPES: CCT31.3 RMS / xxx
    CCT41.4 RMS / xxx
    PRODUCT

    ## FEATURES

    - Primary currents from 0-50 Amps to 0-750 Amps
    - Universal AC 20 Hz to 6 KHz or DC measurement
    - Output 4-20mA
    - Class 1 accuracy
    - TRMS measurement
    - Foot mounted
    - Two frame sizes
    - Fast response time
    
    - DESCRIPTION

    A range of moulded case high accuracy universal DC or AC "CT" style current transducers, any AC current measured can be on a frequency range of between 20 Hz and 6 KHz . As would be expected of a product of this type and specification the measurement technology is TRMS. The output requires a 24 VDC auxiliary supply, generating a $4-20 \mathrm{~mA}$ output proportional and linear to the primary range of the transducer. Measurement ranges of between 0-50 Amps and 0-750 Amps are available in two frame sizes.

    These products are particularly relevant with the growing prevalence of DC systems such as in the telecommunications, railway, and renewable energy sectors. Likewise the wide frequency range enables these products to be very suitable for distorted wave form scenarios, 400 Hz systems and applications using VFD's.

    ## SPECIFICATIONS

    Measuring range:
    Frequency:
    Output:
    Auxiliary supply:
    Max output load:
    Accuracy:
    Response time: Insulation:
    Insulation test:
    Max primary current: Operating temp:
    Terminals:

    0-50 Amps to 0-750 Amps
    DC \& 20Hz to 6 KHz AC (universal)
    4-20mA
    24VDC +/-15\%
    $<500$ Ohms
    Class 1
    $<200 \mathrm{mSec}$
    720 V continuous
    6 KV 50 Hz for 1 min .
    1.2 x In continuous
    $-25^{\circ} \mathrm{C}$ to $+60^{\circ} \mathrm{C}$
    Quick release max 2.5 mm
    

    | P/No. | PRIMARY <br> CURRENT | OUTPUT |
    | :--- | :---: | :---: |
    | CCT41.4 RMS | 150 A | $4-20 \mathrm{~mA}$ |
    |  | 200 A | $4-20 \mathrm{~mA}$ |
    |  | 250 A | $4-20 \mathrm{~mA}$ |
    |  | 300 A | $4-20 \mathrm{~mA}$ |
    |  | 400 A | $4-20 \mathrm{~mA}$ |
    |  | 500 A | $4-20 \mathrm{~mA}$ |
    |  | 600 A | $4-20 \mathrm{~mA}$ |
    |  | 750 A | $4-20 \mathrm{~mA}$ |

    CCT41.4 RMS
    

    ## DC SHUNTS (*60mV SECONDARY AS STANDARD)

    ## TYPES: UA-SHT \& NST

    ## ■ TYPE A

    - Primary current 10 Amps to 200 Amps
    - Standard accuracy $\pm-1 \%$ ( $0.5 \%$ \& 0.25\% on request)
    - Specify with model the secondary: $50 \mathrm{mV}, 60 \mathrm{mV}$ *, 75 mV , 100 mV
    

    | MODEL | A | B | C | D | E | F | G | H | I | J | K | L | M |
    | :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
    | UA-SHT-A-10A/20A/30A/40A/ <br> 50A/60A/80A/100A/150A | 31 | 136 | 110 | 73 | 20 | 6 | 12 | 17 | 32 | 13 | 21 | 5 | 17 |
    | UA-SHT-A-200A | 31 | 136 | 110 | 67 | 20 | 6 | 12 | 17 | 29 | 15 | - | - | 17 |

    NST-30

    - Primary current 250 Amps to 600 Amps
    - Standard accuracy $\pm-1 \%$ ( $0.5 \%$ \& $0.25 \%$ on request)
    - Specify with model the secondary:
    $50 \mathrm{mV}, 60 \mathrm{mV}$ * 75 mV , 100 mV

    | MODEL | A | B | C | D | E |
    | :--- | :---: | :---: | :---: | :---: | :---: |
    | NST-30-250A | 41 | 88 | 115 | 10 | 12 |
    | NST-30-300A | 35 | 88 | 116 | 12.5 | 20 |
    | NST-30-400A | 44 | 86 | 116 | 12.5 | 20 |
    | NST-30-500A | 55 | 88 | 116 | 12.5 | 20 |
    | NST-30-600A | 60 | 90 | 125 | 12.5 | 21 |

    

    ## ■ NST-40

    - Primary current 800 Amps to 1500 Amps
    - Standard accuracy $\pm-1 \%$ ( $0.5 \%$ \& $0.25 \%$ on request)
    - Specify with model the secondary:

    50 mV , 60 mV *, 75 mV , 100 mV
    

    | MODEL | A | B | C | D | E |
    | :--- | :---: | :---: | :---: | :---: | :---: |
    | NST-40-800A | 70 | 125 | 90 | 12.5 | 20 |
    | NST-40-1000A | 70 | 160 | 120 | 12.5 | 20 |
    | NST-40-1200A | 85 | 160 | 120 | 12.5 | 20 |
    | NST-40-1500A | 100 | 160 | 120 | 12.5 | 20 |

    

    ## - NST-50

    - Primary current 2000 Amps to 5000 Amps
    - Standard accuracy $\pm-1 \%$ ( $0.5 \%$ \& $0.25 \%$ on request)
    - Specify with model the secondary:
    
    $50 \mathrm{mV}, 60 \mathrm{mV}$ *, 75 mV , 100mV

    | MODEL | A | B | C | D | E | F |
    | :--- | :---: | :---: | :---: | :---: | :---: | :---: |
    | NST-50-2000A | 103 | 230 | 205 | 55 | 12.5 | 50 |
    | NST-50-2500A | 103 | 191 | 167 | 56 | 13.5 | 38 |
    | NST-50-3000A | 103 | 280 | 238 | 65 | 15.0 | 64 |
    | NST-50-4000A | 110 | 292 | 253 | 65 | 17.0 | 82 |
    | NST-50-5000A | 128 | 315 | 271 | 65 | 17.0 | 106 |

    # AC / DC "CT" STYLE RS485 MODBUS SERIAL OUTPUT CURRENT TRANSMITTER 

    ## TYPES: Q1-50-V-485 Ol-300-V-485

    ## FEATURES

    - Primary current 0-50 Amps
    - Primary current 0-150 / 0-300 Amps switchable

    ■ Universal AC 20 Hz to 2 KHz or DC measurement

    - Output 0-10VDC \& RS485 MODBUS
    - Configurable for uni-polar or bi-polar operation (DC current only)
    - Class 0.5 accuracy
    - TRMS measurement
    - Screw mounting or Din rail mounting
    - Fast response time


    ## (150 / 300 Amps Switchable)

    ## ■ DESCRIPTION

    

    The Ol-50-V-485 and Ol-300-V-485 are moulded case high accuracy universal DC or AC current transducers / transformers galvanically isolated from the measuring circuit. The "CT's" are available as a 0-50 Amp fixed range unit, or a switchable, via dip-switch primary current range of either 0-150 Amps or 0-300 Amps and is equipped with both a 0-10VDC dampened output and RS485 MODBUS serial communications.
    Also via the dip-switches you can select the CT for uni-polar measurement, or on a DC system bi-polar measurement is also an option ( $0-5-10 \mathrm{VDC}$ output), rather than a -10 to 0 to +10 VDC output. The dip-switches also configure the Baudrate, the MODBUS address up to a maximum of 15 addresses.
    Via the serial port and free software the span, zero and the MODBUS registers are easily configurable. With respect to the span and zero this can be configured freely within the primary current range and output scale. For example you could configure a 95 Amp to 175 Amp primary range with a $2.5-7.0 \mathrm{VDC}$ output.

    The "CT" requires a supply voltage 12 to 30VDC and has an internal aperture size of 33mm Dia.
    The principle of putting in primary turns on CT's to further reduce the primary scale also applies to these current transformers.

    ## SPECIFICATIONS

    | Supply voltage: | 12 to 30VDC |
    | :--- | :--- |
    | Power consumption: | Max 20 mA |
    | Accuracy: | Class 0.5 |
    | Resolution: | 12 bit |
    | Temp coefficient: | $<200 \mathrm{ppm} /{ }^{\circ} \mathrm{C}$ |
    | Operating temp: | -15 to $+65^{\circ} \mathrm{C}$ |
    | Humidity: | $10-90$ \%RH non condensing |
    | Outputs: | $0-10 \mathrm{VDC}$ |
    |  | RS485 MODBUS serial |
    | Response time: | 1 Sec on 0-10VDC output |
    |  | 30 mSec on MODBUS output |
    | Measurement: | $0-50$ Amps AC/DC |
    |  | $0-300$ Amps AC TRMS 20-2000Hz (mono-polar) |
    |  | $0-300$ Amps DC (bi-polar) |
    |  | Isolation: |
    | Overload: | 3KV on an uninsulated conductor |
    | Indication: | 1KA continuous, 2KA pulse |
    |  | Via yellow LED |
    |  | Supply voltage connected - fixed illumination |
    | Dip switch: | Data communicating - flashing |
    | Terminals: | 8 way |
    | Mounting: | 5 way removable plug |
    |  | Screw or Din rail (via included clips) |

    ## DIMENSIONS

    

    P/No's. Ql-50-V-485
    QI-300-V-485

    ## CONNECTIONS

    |  | $\longrightarrow$ 5. POWER |
    | :--- | :--- |
    | INPUT | $\longleftrightarrow$ 4. B- |
    | 0..50/300 A | $\longleftrightarrow$ 3. A+ |
    | AC/DC | $\longrightarrow$ 2. V OUT |
    |  | $\longleftrightarrow$ 1. GND |

    ## TYPES: OI-POWER-485 Ql-POWER-485-LV <br> <br> 50 Amps AC/DC, 800VAC or 1000VDC <br> <br> 50 Amps AC/DC, 800VAC or 1000VDC 50 Amps AC/DC, 80VAC or 100VDC

    50 Amps AC/DC, 80VAC or 100VDC[^15]:    *Specify
    **Please see page 179 for 333 mV secondary CT's

[^16]:    *Specify exact direct input range required
    **Not possible on self powered units
    ***Bi-polar units will be +/- outputs (4-20mA not possible)

[^17]:    *Specify exact direct input ranges required and/or CT \& VT ratios
    **For bi-directional active and reactive power transducers (import / export versions), also +/- output signals can be specified for example -10VDC to 0 to +10VDC
    ***Subject to technical viability it is possible to have a different output for both active and reactive power

[^18]:    *Specify exact direct input ranges required and/or CT \& VT ratios and power factor scale range required
    ${ }^{* *}$ Also possible to have a signal output for example $0-5-10 \mathrm{VDC}$ output or similar, consult the sales office for technical viability.

[^19]:    *Specify exact voltage input +/-20\%
    **Also possible on bi-polar units to have as an example 0-5-10VDC output

[^20]:    *Specify exact current input
    **Also possible on bi-polar units to have as an example $0-5-10 \mathrm{VDC}$ output

[^21]:    *Specify exact voltage input, above 600VDC a price surcharge is applicable.
    **Also possible on bi-polar units to have as an example 0-5-10VDC output

[^22]:    $-40^{\circ} \mathrm{C}$ to $65^{\circ} \mathrm{C}$
    $-40^{\circ} \mathrm{C}$ to $65^{\circ} \mathrm{C}$
    95\% Rel H max
    1500VDC for 1 Min
    Yes
    EN60950-1
    EN6100-6-3
    EN61010-1
    Polycarbonate
    Auto extinguishable to UL 94V-0
    Yes

[^23]:    Nominal supply toleranc Isolation AC versions:
    Isolation DC versions:

