

UNDERSPEED OR PULSE CONTINUITY "WATCHDOG" RELAY

TYPE: YWRVL (spco)

FEATURES

- Din rail mounted
- 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
- 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 100mSec 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 stationary 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 S2 between terminals Z1 & Z2 **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, 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:-

$$T = \frac{60}{n \cdot V}$$

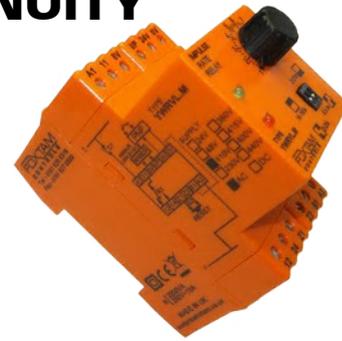
V = Speed in RPM
n = Number of teeth

ORDERING INFORMATION

TYPE	TIME RANGE (specify S, M or L)			COIL VOLTAGE	AUTO RESET
YWRVL (Din rail SPCO)	S (0.06 to 160 secs)	M (0.5 sec to 21 mins)	L (15 sec to 640 mins)	440VAC	M1**
	0.06 to 0.6 sec	0.5 to 5 sec	15 to 150 sec	415VAC	
	0.25 to 2.5 sec	2 to 20 sec	1 to 10 mins	400VAC	
	2 to 20 sec	16 to 160 sec	8 to 80 mins	380VAC	
	16 to 160 sec	2 to 21 mins	64 to 640 mins	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.



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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 (300Hz). Therefore, the maximum number of impulses per revolution is:-

$$n_{max} = \frac{18000}{V_{max}}$$

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:	± 15%
Max Power Consumption:	4VA
Repeat accuracy:	± 0.5% at constant ambient ± 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 20mA) Normally open contact (8VDC, 8mA)
Max operating speed:	300Hz (18,000 RPM)
Min impulse:	1mSec
Min time between impulses:	1mSec
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
Mechanical life:	30 Million ops
Electrical life:	200K ops at max rated load

General

Operating temperature:	-20°C to +65°C
Storage temperature:	-20°C to +65°C
Max cable size:	4mm
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

CONNECTIONS & FUNCTION

