

# UNDERSPEED OR PULSE CONTINUITY "WATCHDOG" RELAY

## TYPES: YWRVL4 (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
- 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:-

$$T = \frac{60}{n \cdot V} \quad \begin{array}{l} V = \text{Speed in RPM} \\ n = \text{Number of teeth} \end{array}$$

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:-

$$n \cdot \max = \frac{18000}{V \cdot \max}$$

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.

### ORDERING INFORMATION

TYPE	TIME RANGE (specify S, M or L)			COIL VOLTAGE
YWRVL4 (Din rail SPCO)	S (0.06 to 160 secs)	M (0.5 sec to 21 mins)	L (15 sec to 640 mins)	440VAC
	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
				48VDC
				24VDC

\* 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 versions the proximity sensor (NAMUR and PNP) is not isolated from the coil voltage.



### SPECIFICATIONS

#### Supply & Measuring

Nominal supply tolerance:	±15%
Max Power Consumption:	11VA
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 12 hour & 24 hour units also available

#### Special:

#### Relay output

Output contacts:	SPCO 10Amps/250V AC1
Mechanical life:	30 Million ops
Electrical life:	200K ops at max rated load

#### General

Operating temperature:	-10°C to +60°C
Storage temperature:	-10°C to +60°C
CE marked	Yes
In accordance with:	EN61000-6-1: 2007, EN61000-6-3: 2007 EN61010-1: 2002
Housing material	Thermo plastic ABS (DIN7728), auto extinguishable according to UL94V0

### CONNECTIONS & FUNCTION

