

AC/DC DYNAMICS

OVER/UNDER SPEED RELAY (TACHO RELAY)

TM1 & TM4

OVERVIEW

Congratulations! You have purchased a quality product manufactured by AC/DC Dynamics. This tachometer relay is microprocessor controlled rotational speed monitor giving you high repeat accuracy and is intended for use in conjunction with proximity sensor. Namur, PNP or NPN N.O., where the sensor provides a pulse every time a target enters the sensing area (eg. a nut or bolt on a rotating shaft or the teeth of a gear wheel). The unit monitors the frequency of the pulses to provide either over or under speed detection, as well as a proportional output for driving an external display.

INSTALLATION

The TM1 & TM4 should be installed by a competent electrician in accordance with the relevant diagram. Please read these instructions carefully to ensure that the correct functions, link and range has been selected and that the control voltage is correct before switching on.

FUNCTIONS

OVERSPEED: No link 5 & 11

The relay energises if input exceeds the set limit and de-energises when speed falls to 3% below the set limit.

UNDERSPEED: Link 5 & 11

When power is applied the relay energises with no input. This allows the machine to get up to speed after which time the underspeed monitoring commences. Having exceeded the speed set point by 3%, the moment that the speed falls to below the set point, the output relay de-energises and will on re-energise when the speed exceeds the hysteresis level, which is setpoint plus 3%.

RANGE

One of ten ranges can be selected on front panel.

POS NO.	R.P.M SELECT	POS NO.	R.P.M SELECT
1	2-20 RPM	6	100-1000 RPM
2	5-50 RPM	7	200-2000 RPM
3	10-100 RPM	8	500-5000 RPM
4	20-200 RPM	9	1000-10000 RPM
5	50-500 RPM	10	2000-20000 RPM

The maximum measurable speed is 20000 RPM, or 333.33 input pulses per second. The reaction time is 1.5 times the time between two pulses. The maximum reaction time is when the relay is set for 2 RPM and is 45 seconds. At 1000 RPM the reaction time is 0.09 seconds. Hysteresis is fixed at 3% of set speed.

These ranges are based on one pulse per rpm. If there is more than one sensor target/pulse per revolution, the range must be changed accordingly. At low speeds, multiple pulses per revolution will proportionately increase the reaction time. Example: 8rpm with 10 sensor targets/pulse per revolution - set range for 8x10 rpm max - position 3 10-100rpm.

SELECTION OF SENSOR TYPE AND OUTPUT

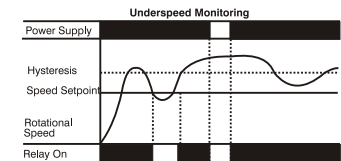
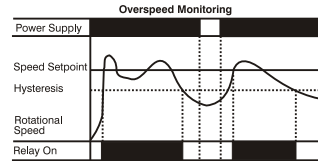
The relay interfaces directly with a 2 wire namur or 3 wire N.O. proximity switch or with a limit switch. Select the type of sensor with the DIP witch 1. DIP switch 2 is used to select 4-20mA or 0-20mA output (for TM4)

Proxy Type	DIP switch 1
NPN	on
PNP	off

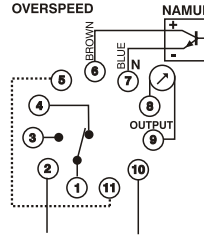
DIP switch 2	Output TM4	TM1
on	4-20mA	N/A
off	0-20mA	N/A

TM1: Output 0-1mA TM4: SW2 on: 4-20mA
 SW2 off: 0-20mA

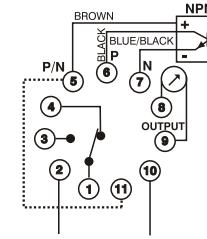
OPERATIONAL DIAGRAMS



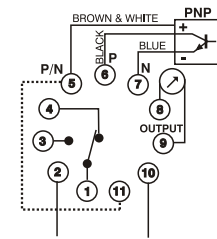
LINK 5+11 UNDERSPEED NO LINK OVERSPEED



SUPPLY VOLTAGE
NAMUR SENSOR



SUPPLY VOLTAGE
PROXIMITY SENSOR NPN



SUPPLY VOLTAGE
PROXIMITY SENSOR PNP

SPECIFICATIONS

Range accuracy: ±2%
 Repeatability: 0.1%
 Scale accuracy: ±5%
 Hysteresis: 3%
 Operating temperature: -20 - 70°C
 Power consumption: AC: 1.5VA
 DC: 100mA
 10A 250VAC

Available voltages:

AC: Galvanic isolation with internal transformer
 12, 24, 48, 110, 230, 400 or 525VAC
 ±15% (Test volts 2KV)
DC:
 12, 24, 48VDC

AC/DC Dynamics

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