TM1 & TM4 OVER|UNDER SPEED RELAY

ACDC DYNAMICS
www.acdc.co.za



OVERVIEW

The TM1 & TM4 are quality timers manufactured by ACDC Dynamics. This tacho relay is microprocessor controlled rotational speed monitor giving you high repeat accuracy and is inteded for use in conjunction with a proximity sensor. Namur, PNP or NPN N.O., where the sensor provides a pulse every time a target enters the sensing area (e.g. 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

This module should be installed by a competent electrician in accordance with the relevant diagram. Read these instructions carefully to ensure that the correct functions / settings / control voltage are correct prior to switch on. These modules are supplied for use with a standard 11 Pin Base.

FUNCTION

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 re-energise when the speed exceeds the hysteresis level, which is setpoint plus 3%.

First 10 seconds after 'Switch On' monitoring function disabled to allow motor to achive normal run condition.

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 measursable speed is 20000 RPM, or 333.33 input pulses per second. The reaction time is 1.5 times the time between two pulses. The longest 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: 7 RPM with 10 sensor targets/pulse per revoltion - set range for 8 x 10 RPM max - position 3 10-100 RPM.

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 switch 1. DIP switch 2 is used to select 4-20mA or 0-20mA output (for TM4).

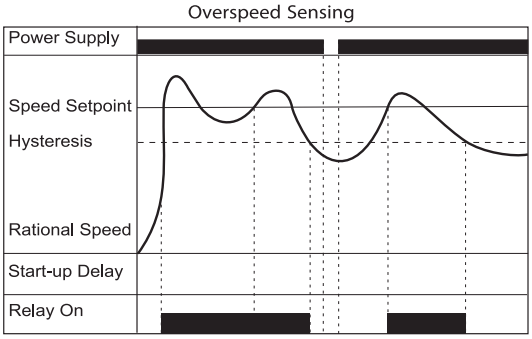
Proxy Type	DIP Switch 1	DIP Switch 2	Output TM4	TM1
NPN	On	On	4-20mA	N/A
PNP	Off	Off	0-20mA	N/A

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

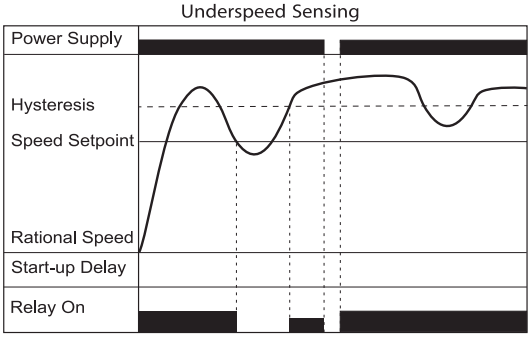
Specifications	
Range Accuracy	±2%
Repeatability	0.1%
Scale Accuracy	±5%
Hysteresis	3%
Operating Temperature	-20˚C to 70˚C
Power Consumption	AC: 1.5VA, DC:100mA
Contact Rating	10A 250VAC

OPERATIONAL DIAGRAMS

Overspeed Sensing

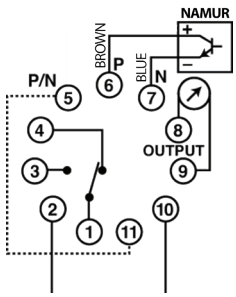


Underspeed Sensing

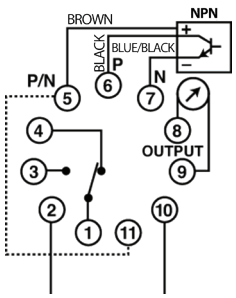


Available Voltages:
AC: Galvanic isolation with internal transformer 12, 24, 48, 110, 230, 400 or 525VAC ± 15% (Test Volts 2kV)
DC: 12, 24, 48VDC

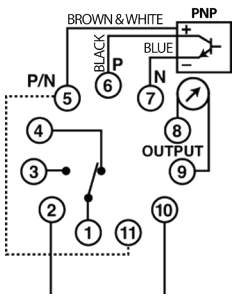
LINK 5 + 11 - UNDERSPEED
NO LINK - OVERSPEED



Supply Voltage
NAMUR Sensor



Supply Voltage
Proximity Sensor NPN



Supply Voltage
Proximity Sensor PNP

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