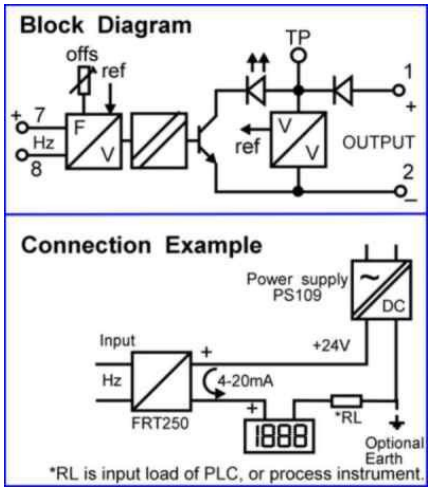
Frequency Transmitter v5 FRT250

Description

The FRT250 is a loop powered isolating transmitter that accepts a variety of frequency or pulse input signals. Typical inputs include signals from turbine flow meters, NAMUR proximity sensors, or any device producing a DC pulse or pulsing contact. Frequency range is 5Hz up to 5kHz with an amplitude range of 0.1Vp-p up to 50V pulses. NAMUR proximity sensors are directly connected. Standard output is 4 - 20mA with a minimum supply voltage of 6.3V. This enables the FRT250 to be used in 12V battery supply systems or in automotive applications. Other factory set output configurations are 10 - 50mA loop powered and 0 - 10mA, 0 - 20mA or voltage output in 3-wire connection up to 40Vdc. Higher voltages are permissible with the use of suitable series zener diodes. Double surge protection is standard with all Series 200 loop powered transmitters to prevent failure due to spikes induced by DC switched inductive loads. The input conditioning of the FRT250 consists of a charge-pump circuit, converting pulse signals produced by a front trigger circuit to an analogue signal. Final calibration is trimmed using the front accessible zero and span 15-turn trim adjustments. A front mounted L.E.D. and a test socket verify module function and assist in calibration checks without disconnection of output wires.

General Specifications

Size:	23.5W x 71.5H x 109D (mm).
Mounting:	Clip for 35mm DIN-Rail.
Housing material:	ABS.
Connection:	Screw terminals.
Weight:	0.090 kg.
Protection class:	IP40.
Calibration accuracy:	<0.2% of range.
Linearity:	<0.2% of range.
Operating temperature range:	-20...+70°C.
Temperature drift error:	< 0.5% within operating range.
Supply voltage:	6.3 - 40V continuous (50V 30 seconds).
Load for 4 -20mA output:	$RL_{max} = \frac{SupplyVoltage - 6.3\text{V}}{0.02\text{A}} \Omega$
Load change effect:	0.1% up to RL max.
Response time:	for 0.5% ripple at 10% of signal $T_{90} = \frac{20\,\text{sec}}{F_{max}}$
Internal offset adjustment:	±50% typical.
Front zero adjustment:	+20% / -10% typical.
Front span adjustment:	±25% typical.
Input range:	5Hz up to 5kHz.
Input level:	0.1Vpp sine up to 50Vdc pulse.
Excitation for NAMUR sensor:	5V/1mA (or contact).
Input/output isolation:	>2kV rms except for 3W proximity inputs.
Electromagnetic compatibility:	Complies with AS/NZS 4251.1 (EN 50081.1)



For input / output combinations refer to TYPE NO. DESIGNATION overleaf.

A.P.C.S.

FRT250 - X X X X

TYPE NO. DESIGNATION

Output:

1 = 4 - 20mA. } 2-wire
2 = 10 - 50mA }
*) 3 = 0 - 1mA. } 3 - wire, 0V Ref
*) 4 = 0 - 10m A. }
*) 5 = 0 - 20mA. }

*) 6 = 0 - 1V. } 3 - wire, OV Ref.
*) 7 = 0 - 5V min. supply 10.5Vdc. }
*) 8 = 0 - 10V min. supply 15.5Vdc. }
*) 9 = Other (Specify).

Input:

The input frequency range must be specified when ordering.

*) 1 = Sine, sawtooth or pulse, (use '2').
2 = Pulse 0.1 - 50Vdc external source.
*) 3 = 5V pulse; external source (use '2').
4 = NAMUR proximity or contact.
*) 5 = Pulsing contact, (use '4').
*)# 6 = 3-wire NPN proximity sensor (not-isolated).
*)# 7 = 3-wire PNP proximity sensor (not-isolated).
*) 9 = Other (Specify).

Action:

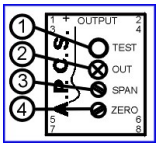
1 = Direct.
*) 2 = Reverse.

Options:

0 = None.
*) 1 = Output ramp.
*) 9 = Other (Specify).

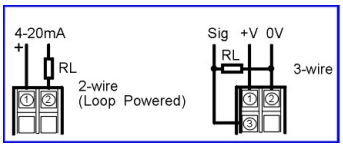
*) = Price Extra. # = Use with 3-wire output only

Front Control Explanation

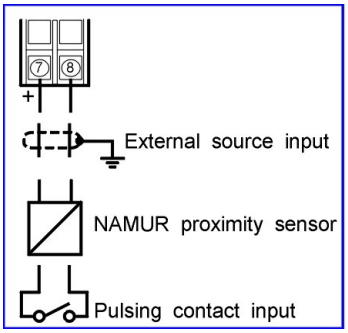


1) Test socket - output signal access with reference to terminal (1) loop integrity is maintained when digital multimeter Rin <30 Ω is used.
2) Loop indicator - dim at 4mA, bright at 20mA.
3) SPAN (full scale) adjust 15 turn.
4) ZERO (start scale) adjust 15 turn.

Output Connection

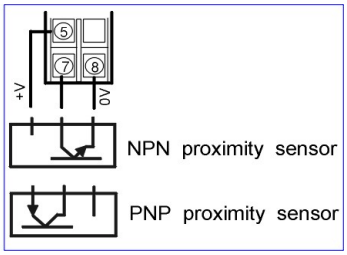


Inputs 1 to 5



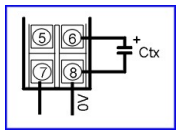
Inputs 6 & 7

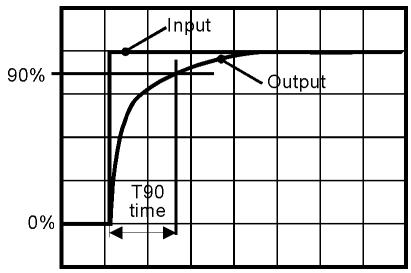
NPN and PNP proximity sensors are only available with 3-wire output and there is no input/output isolation due to current drain of proximity sensors.



Output Ramp Option

A external capacitor Ctx used to set the output response time T_{90} in seconds as shown on the chart below.





Ctx	2µ2	3µ3	4µ7	10µ	22µ	47µ
T_{90}	0.5	0.7	1	2	5	10

$$T_{90}=0.2\times C_{tx}(\mu F)$$