Introduction

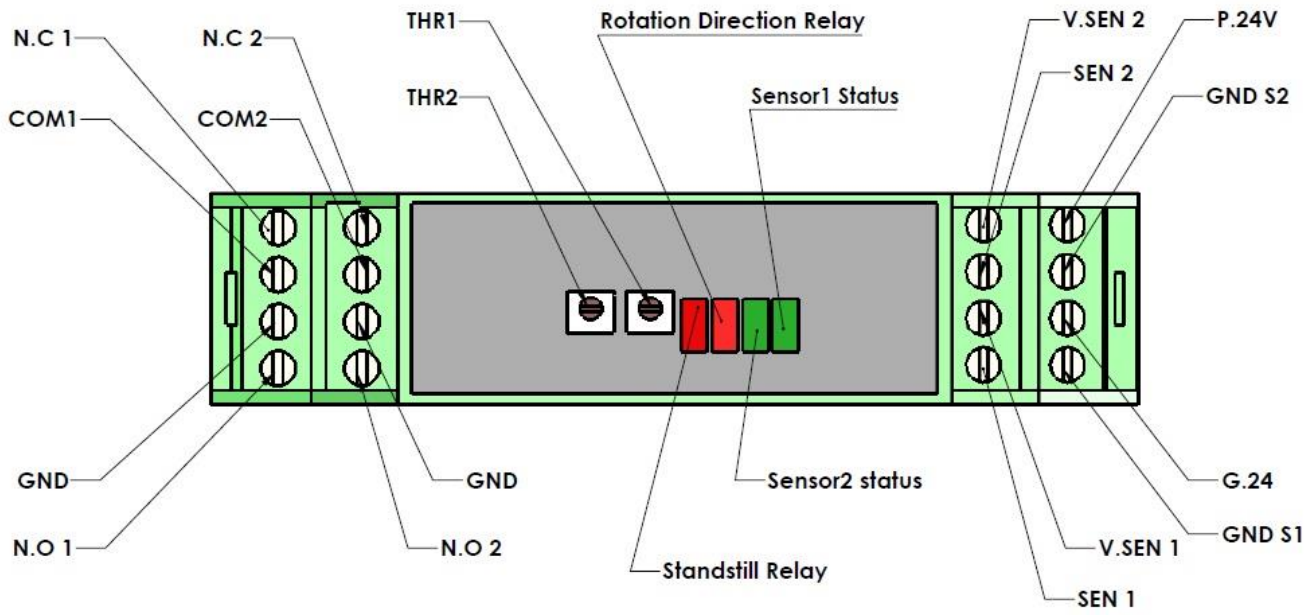
The VibroRail100-Reverse Rotation Monitor provides an early indication of a reverse rotation event. It is particularly useful on machines such as pumps, hydraulic turbines, and compressors that can rotate in the wrong direction during process upset conditions and thereby damage the machine.

Function

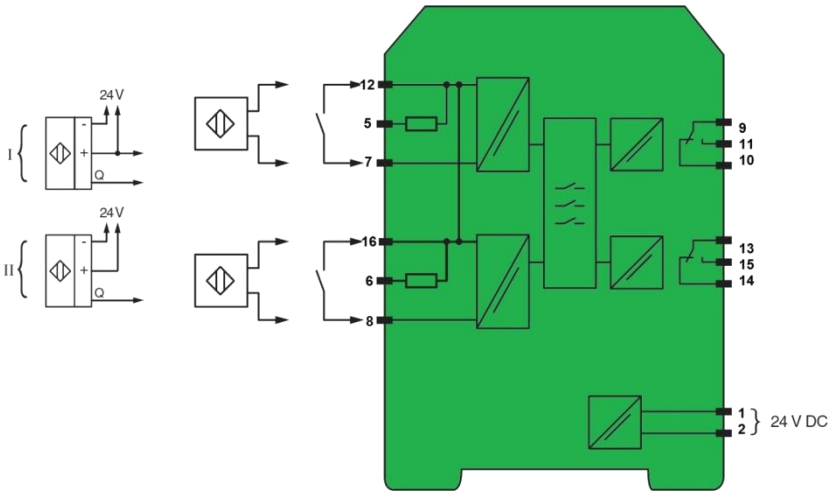
This signal conditioner is a zero speed/standstill monitor that accepts input frequency pulses and triggers an output when the frequency drops below a selected value.
Two startup override values are available. This unit can also be used to determine rotation direction. The available diagnostic LEDs show rotation detection, limit trip indicator, power on and hardware error indication.
The unit is easily programmed via switches mounted on the front of the unit. For additional information, refer to www.ABPVibro.com

Feature

- **2-channel signal conditioner**
- **24 Vdc supply**
- **PNP/push-pull, dry contacts or eddy current signal inputs**
- **Selectable frequency trip value**
- **2 relay contact outputs**
- **Start-up override**
- **Reverse detection**



Connection



General specifications

Signal type: Digital input, Analog signal

Supply

Connection: Terminals 1, 2

Rated voltage: U_n 18~30 Vdc

Power consumption: ≤1.5w

Indicators/operating means

LED Red: Standstill

LED Green: Status of sensor 1

LED Green: Status of sensor 2

LED Red: Rotation Direction Relay

Input

Connection: Input I: terminals 7, 12, 5
Input II: terminals 8, 16, 6

Line fault detection: Available for eddy current sensor

Pulse duration: > 200µs for standstill monitoring,
> 250µs for rotation direction detection

Output

Connection: Output I: terminals 9, 10, 11
Output II: terminals 13, 14, 15

Relay: 2 changeover contacts

Minimum switch current: 2mA/ 24Vdc

Energized/De-energized relay: approx.20ms/ approx.20ms

Contact loading: 1 SPDT, 1A Form C 24Vdc

Trip value: f_{max} for standstill monitoring: 0.1 Hz, 0.5 Hz, 2 Hz, 10Hz adjustable via jumper switch (JP4)

Frequency range: ≤2 KHz

Rotation direction detection: 90° phase difference between pulse input signal 1 and 2, overlapping ≥125µs

Ambient conditions

Ambient temperature: -20~60°c (-4~140°F)

Mechanical specifications

Degree of protection: IP20

Mass: approx.150g

Dimension: 11.5*9.5*2.2 cm

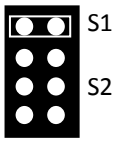
Mounting: on 35 mm DIN mounting rail acc. To EN 60715:2001

Operating principle

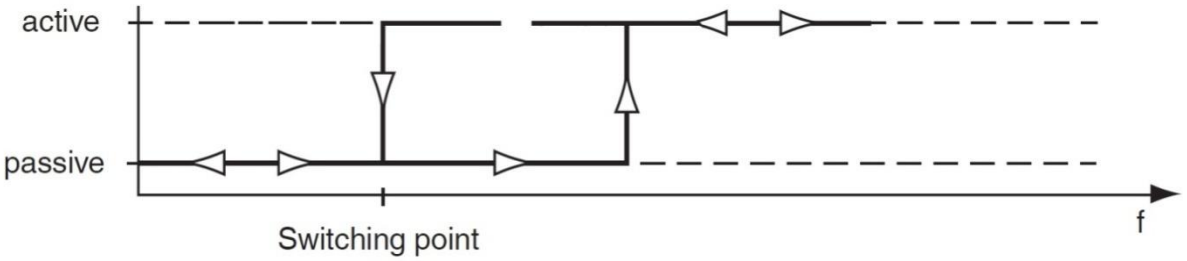
	I
Function	Standstill monitor with rotation direction monitoring
Input I:	Pulse input 1: Contacts (bounce-free)
Input II:	Pulse input2: Contacts (bounce-free)
Output I:	Passive
Output II:	Direction of rotation/error

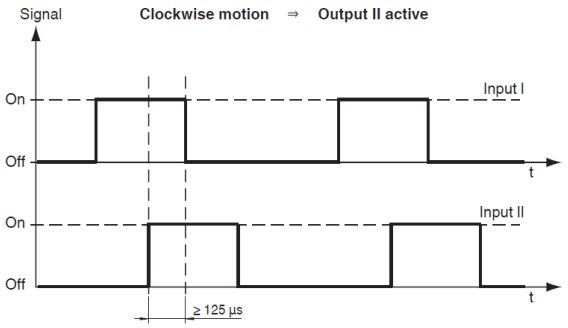
Standstill monitor setting

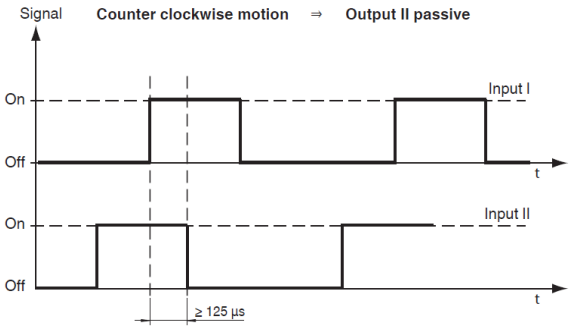
Trip value	Hysteresis	JP4
0.1 Hz	0.02 Hz	S1
0.5 Hz	0.1 Hz	S2
2 Hz	0.4 Hz	S3
10 Hz	2 Hz	S4

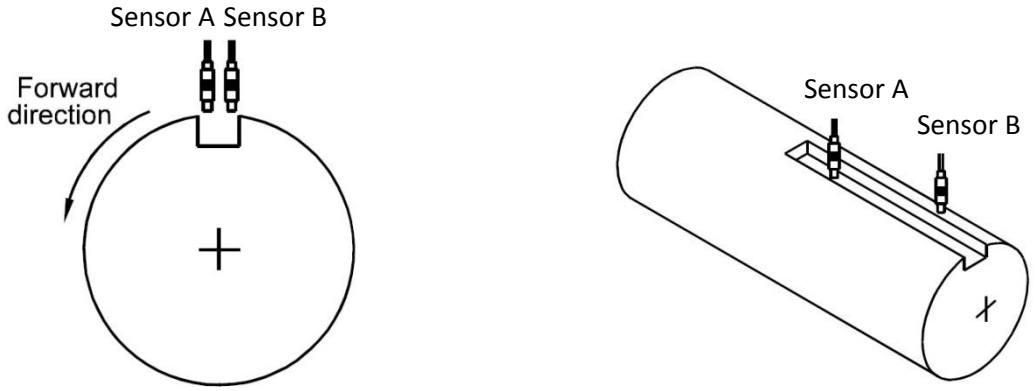


Standstill monitor with rotation direction







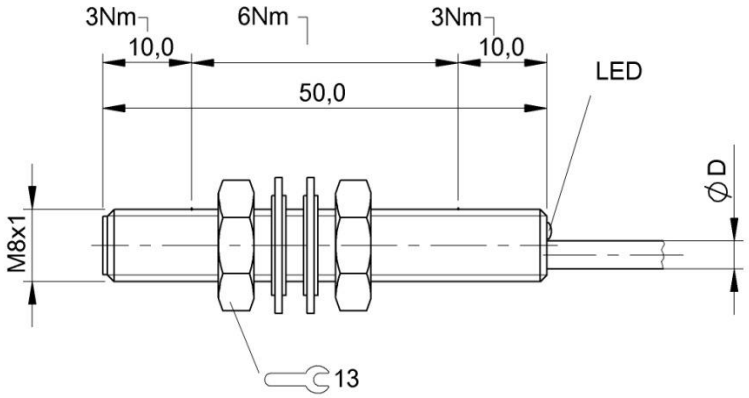


- When rotation is in the forward direction, the notch is detected first by sensor A and then by sensor B. The notch must remain in view of sensor B.

Accessories:

- **Power Supply 24 Vdc** for VibroRail100-RD
- **Power Supply -24 Vdc** for eddy current sensor which supply with -24 Vdc
- **Sensors:**

Model	Manufacturer	Country
3300 XL 8mm proximity transducer	Bently Nevada	USA
BES M08MI-PSC 20B-BV03	BALLUFF	German
ES500	ABPVibro	Eastern Europe



Characteristic Data

Eff. switching distance Sr	2 mm
Tolerance Sr	±10 %
Assured operating distance Sa	1,6 mm
Hysteresis H max. (in % of Sr)	15 %
Repeat accur. R max. (% of Sr)	5 %
Ambient temperature	-25...70 °C
Temp. drift max. (% of Sr)	10%
Switching freq. f max.	700 Hz
Ready delay tv max	30ms
Utilization category	DC 13
Function indicator	Yes
Power-on indicator	NO
Short-circuit protected	Yes
Degree of protection as per IEC 60529	IP67
Protected against polarity reversal	Yes
Protected against reverse connection	Yes

Characteristic Data

Housing material	CuZn
Surface protection	Nickel-plated
Sensing surface material	PA 12
Tightening torque max.	3 Nm / 6 Nm
Mounting length	50 mm
Connection type	Cable
Cable jacket material	PVC
Cable diameter D max.	3 mm
Cable short designation	LiY-Y-O
Cable length	3 m
Number of conductors	3
Conductor cross-section	0.14 mm²
Shock rating	Shock, half-sinus, 30 gn, 11ms
Vibration rating	55 Hz, 1 mm ampl., 3x30 min
Degree of contamination	3

Electrical Data

Operating voltage	
Rated operating voltage Ue DC	24 V
Ripple max. (% of Ue)	15 %
Voltage drop static max.	2,5 V
Rated insulation voltage Ui	75 DC V
Effective operating current Ie	200 mA
No-load current Io damped	10 mA
No-load current Io undamped	5 mA
Off-state current Ir max.	20 µA
Minimum operating current Im	0 mA
Rated short circuit current	100 A
Output resistance Ra	33.0k + D
Load capacitance max. (at Ue)	1 µF
Principle of operation	Inductive

Basic data

Basic standard	IEC 60947-5-2

Remarks

The sensor is functional again after the overload has been eliminated.
Embeddable: See installation notes for inductive sensors with extended switching distance 825357.

Subject to change