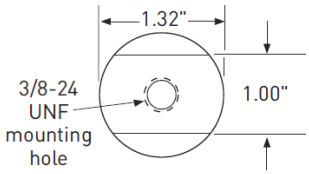
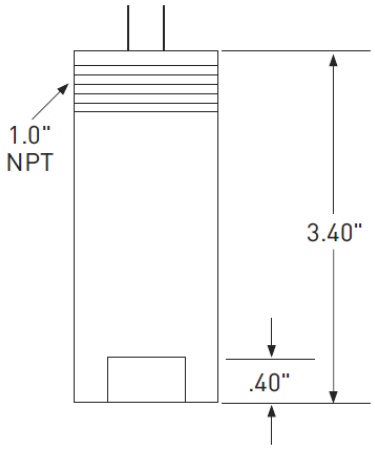
Explosion-proof, velocity loop powered sensor (LPS)

PC420V-EX series

Wilcoxon's 4-20 mA vibration sensors incorporate a velocity transducer, data acquisition circuitry, and vibration transmitter in a rugged industrial housing. The explosion-proof sensor provides a 4-20 mA output signal proportional to the overall velocity level. The 4-20 mA output is commonly accepted by process control systems including PLC, DCS or SCADA for cost-effective continuous vibration monitoring. Simplified condition based maintenance can be performed on machinery without the investment and learning curve associated with traditional vibration monitoring systems.

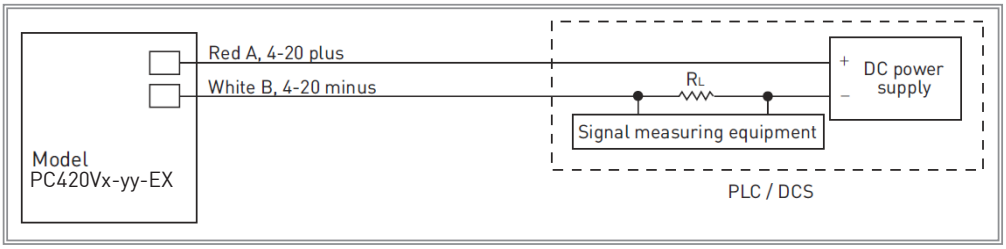
The velocity-output sensor is most suitable for rotating machinery which runs in the 600-3600 RPM (10-60 Hz) range due to its increased sensitivity to low frequency vibration. 4-20 mA sensors are specified by their full scale values, where a "-10" sensor is designed with a full scale range of 1.0 ips (inch per second) equivalent to 20 mA. By trending overall velocity, changes can be monitored and when a predetermined increase is reached, an informed decision to shut down machinery can be made.





Function	Cable
loop positive (+)	red
loop negative (–)	white

Typical circuit



Note: Due to continuous process improvement, specifications are subject to change without notice.
This document is cleared for public release.

Key features

- RMS, peak equivalent detection
- Explosion proof certified
- Corrosion resistant
- Provides continuous trending of overall machine vibration
- Hermetically sealed
- Reverse wiring protection
- Manufactured in an approved ISO 9001 facility

Certifications

Class I, Div 1, 2
Groups A, B, C, D
Class II, Div 1, 2
Groups E, F, G
Class III
T3C Ta = 85° C max

II 2 G
Ex d IIC T3
II 3 G
Ex nA IIC T3
-40° C ≤ Ta ≤ 85° C

For hazardous area locations, sensor must be installed in accordance with installation instructions or local code requirements.
Special conditions for safe use:
– Conduit seal must be installed within 18 inches (450 mm) of the enclosure.
– Use supply wires with spreading suitable for at least 70° C.

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SPECIFICATIONS

		English	Metric
Full scale, 20 mA, ±5%		see table 1	see table 1
Frequency response:	**± 10%** **± 3 dB**	600 CPM - 60 kCPM 240 CPM - 120 kCPM	10 Hz - 1.0 kHz 4.0 Hz - 2.0 kHz
Repeatability		±2%	±2%
Transverse sensitivity, max		5%	5%
Power requirements, 2-wire loop power:			
Voltage at sensor terminals		14 - 30 VDC	14 - 30 VDC
Loop resistance[1] at 24 VDC, max		700 Ω	700 Ω
Turn on time, 4-20 mA loop		<10 seconds	<10 seconds
Grounding		case isolated, internally shielded	
Temperature range		–40 to 185° F	–40 to +85° C
Vibration limit		250 g peak	2,450 m/sec^2 peak
Shock limit		2,500 g peak	24,525 m/sec^2 peak
Sealing		epoxy sealed	epoxy sealed
Sensing element design		PZT, shear	PZT, shear
Weight		13.4 oz	380 grams
Case material		303 stainless steel	303 stainless steel
Mounting		3/8-24 x 3/8 depth tapped hole	
Output leads, 18 AWG		13 ft	4 m

Notes: [1] Maximum loop resistance (R_L) can be calculated by:

$$R_L = \frac{V_{DC\ power} - 12\ V}{20\ mA}$$

[2] Lower resistance is allowed, greater than 10 Ω is recommended.

[3] Minimum R_L wattage determined by: (0.0004 x R_L).

DC supply voltage	R_L (max resistance)[2]	R_L (minimum wattage capability)[3]
12 VDC	100 Ω	1/8 watt
20 VDC	500 Ω	1/4 watt
24 VDC	700 Ω	1/2 watt
26 VDC	800 Ω	1/2 watt
30 VDC	1,000 Ω	1/2 watt

Table 1: PC420Vx-yy-EX model selection guide

x (4-20 mA output type)	yy (4-20 mA full scale)
R = RMS output, velocity P = equivalent peak output, velocity	05 = 0.5 ips 10 = 1.0 ips 20 = 2.0 ips 30 = 3.0 ips 50 = 5.0 ips

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Accessories supplied:

- SF20-2 mounting stud (international customers specify mounting requirements)
- Calibration data (level 2)

Optional accessories:

SF20-1 mounting stud (1/4-28 to 3/8-24)