Wilcoxon Research®

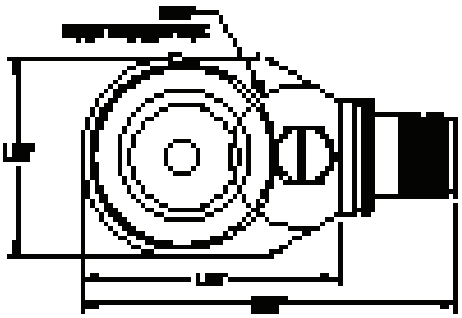
Side exit, 4-20 mA Loop Powered Sensors (LPS®)

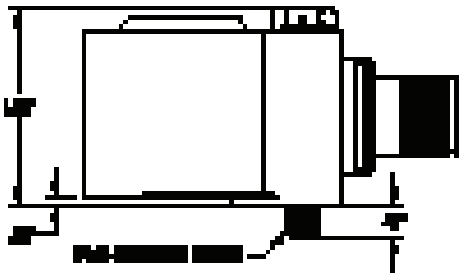
PC421 series

The 4-20 mA output of the PC421 series is proportional to vibration. The PC series provides continuous trending of overall machine vibration and can help guide maintenance. Dynamic signal output allows spectral vibration measurements using a single sensor. An output of 4 mA indicates a level of 0 ips or no vibration present for velocity output models and 0 g for acceleration output models. A full-scale reading of 20 mA indicates that the maximum range (RMS, equivalent peak or true peak) of the chosen unit, acceleration of velocity, is present.

The dynamic signal output is an optional addition. Any of the base sensor models can also have dynamic signal output. Adding -DA to a model specifies a dynamic acceleration signal output (100 mV/g). Adding -DV to a model specifies a dynamic velocity signal output (100 mV/ips). Choice of output: RMS, equivalent peak, and true peak permits you to choose the sensor that best fits your industrial requirements.

Connections		
Function	Connector pin	
	PC421xx-yy	PC421xx-yy-Dz
ground	shell	shell
loop positive (+)	A	A
loop negative (-)	B	B
dynamic signal	NA	C





Key features

- True peak output available on standard versions
- Peak equivalent, true RMS or true peak output available on dynamic signal version
- Optional dynamic signal output
- Case isolated
- Hermetically sealed
- ESD-protected
- EMI/RFI shielded
- Reverse wiring protection
- Manufactured in an approved ISO 9001 and AS9100 facility

Certifications

CE

Meggitt Sensing Systems

Our energy product competencies and services
Machinery protection | Condition monitoring | Integrated performance monitoring | Partial discharge monitoring | Sensors for extreme environments
Ignition systems | Flame detection and analysis | Industrial monitoring solutions | Nuclear products

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Specifications

Output, 4-20 mA			
Full scale, 20 mA, ±5%		see table 1	
Frequency response	**± 10%**	10 Hz - 1.0 kHz	
	± 3 dB	4.0 Hz - 2.0 kHz	
Repeatability		±2%	
Transverse sensitivity, max		5%	
Output, dynamic		PC421xx-yy-DA	PC421xx-yy-DV
Sensitivity, ±10%		100 mV/g	100 mV/ips
Full scale		20 g, peak	1.5 ips at 1 kHz
Frequency response, ±3 dB		2.5 Hz - 10 kHz	2.5 Hz - 2.5 kHz
Amplitude nonlinearity, max		1%	1%
Resonant frequency, mounted, nominal		21 kHz	21 kHz
Transverse sensitivity, max		5%	5%
Power requirements, 2 wire loop power			
Voltage, between pins A and B		10 - 30 VDC	
Loop resistance[1] at 24 VDC, max		700 Ω	
Turn-on time, 4-20 mA loop		30 seconds	
Grounding		case isolated, internally shielded	
Temperature range		-40 to +85° C	
Vibration limit		250 g peak	
Shock limit		2,500 g peak	
Sealing		hermetic	
Sensing element design		PZT, shear	
Weight		320 grams	
Case material		316L stainless steel	
Mounting		1/4-28 captive bolt	
		PC421xx-yy-DA	PC421xx-yy-DV
Output connector		2 pin, MIL-5015 style	3 pin, MIL-5015 style
Mating connector		R6 type	R6G type
Recommended cabling		J9T2A	J9T3A

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

$$\text{RL (max. resistance)} = \frac{V_{DC\ power} - 10\ V}{20\ mA}$$

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

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

DC supply voltage	RL (max resistance)[2]	RL (min watt 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	1k Ω	1/2 Watt

Note: Due to continuous process improvement, specifications are subject to change without notice.

This document is cleared for public release.

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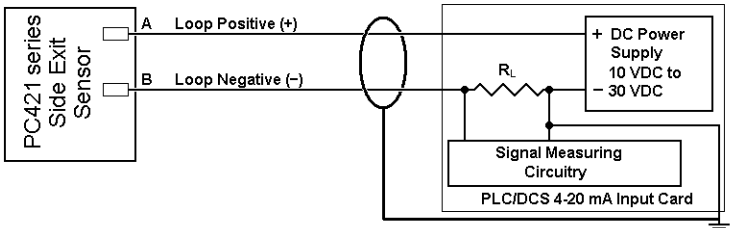
Table 1: PC421xx-yy-Dz model selection guide

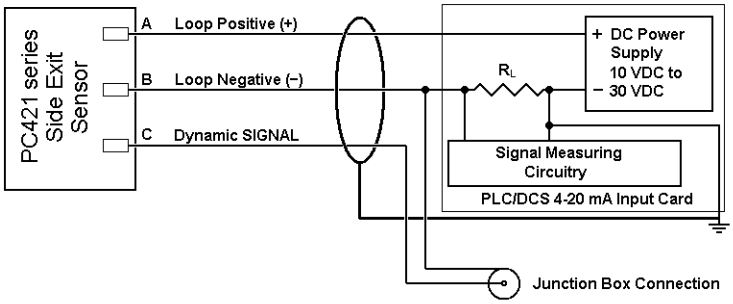
xx (4-20 mA output type)	-yy (full scale)	-Dz (dynamic output)[A]	
AR = acceleration, RMS[B] AP = acceleration, equivalent peak[B,C] ATP = acceleration, true peak[D]	-05 = 5 g (49 m/sec²) -10 = 10 g (98 m/sec²) -20 = 20 g (196 m/sec²)	-DA = dynamic acceleration -DV = dynamic velocity	100 mV/g (10.2 mV/m/sec²) 100 mV/ips (3.94 mV/mm/sec)
VR = velocity, RMS[B] VP = velocity, equivalent peak[B,C]	-05 = 0.5 ips (12.8 mm/sec) -10 = 1.0 ips (25.4 mm/sec) -20 = 2.0 ips (50.8 mm/sec) -30 = 3.0 ips (76.2 mm/sec) -50 = 5.0 ips (127 mm/sec)	-DA = dynamic acceleration -DV = dynamic velocity	100 mV/g (10.2 mV/m/sec²) 100 mV/ips (3.94 mV/mm/sec)

Notes: [A] Dynamic output is an option on all models. If dynamic output option is not desired, do not add -DA or -DV to the model number.
[B] RMS and equivalent peak version are available only with dynamic output options. The PCC421 series includes standard RMS and equivalent peak versions with a 105° C maximum operating temperature.
[C] Equivalent peak output is developed based on the true RMS value of vibration. For a pure sine wave, the equivalent peak output is 1.414 times the RMS value.
[D] True peak output is based on the actual measured peak value using the time waveform and is not based on the RMS calculation.

PC421xx-yy wiring diagram



PC421xx-yy-Dz wiring diagram



All wire and cable used for installation of PC421 series sensors should be shielded. Generally accepted instrumentation wiring practice considers the best way to ground the shield is to connect it at the measurement end of the cable. The shield should not be wired to ground at the sensor end of the cable. Wilcoxon R6W, R6GQAI, R6GQI and R6QI type connectors all leave the shield unconnected at the sensor end of the cable.

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