



PC420 series installation guide  
4-20mA series transducers  
Loop Powered Sensors (LPS®)

Caution: This guide should be read carefully before installation



## Safety section

PC420-series vibration transducers can be safely installed when the instructions in this manual are carefully followed. This section summarizes the safety considerations. Reminders in the form described below, will appear in the detailed instructions to assure operator awareness of these safety considerations. Qualified personnel should install the PC420-series vibration transducers only after becoming thoroughly familiar with this manual.



**WARNING:** This symbol is used in the instruction manual where the safety of the operator must be considered. The instruction manual should be consulted and read carefully.



**CAUTION:** This symbol is used when caution is needed to prevent damage to equipment. It is used where careful attention to certain procedures described in the instruction manual is needed. This symbol is also used to emphasize procedures other than normal operating procedures.

### Safety summary

1. The PC420-series vibration transducers covered by this installation guide do not require any special precautions, protective devices or equipment.
2. Because the PC420-series vibration transducers are designed to be mounted on rotating industrial equipment, personnel involved with the installation of PC420-series vibration transducers should be familiar with all plant safety requirements before beginning installation.
3. The PC420-series vibration transducers are hermetically sealed.
4. There are no user serviceable parts within the PC420-series vibration transducers.
5. Use common sense and avoid haste during the installation of the PC420-series vibration transducers!



## Contents

<b>1.0 Introduction.....</b>	<b>4</b>
<b>2.0 Applicable models.....</b>	<b>4</b>
<b>3.0 Mounting.....</b>	<b>5</b>
3.1 Threaded stud.....	5
3.2 Cementing pad.....	5
<b>4.0 Cabling.....</b>	<b>6</b>
<b>5.0 Technical assistance.....</b>	<b>8</b>
5.1 Technical assistance.....	8
5.2 Customer service.....	8



## 1.0 Introduction

This guide is designed to assist the user in the physical installation and wiring of the Wilcoxon Sensing Technologies PC420 series of vibration transducers. It is presumed that the user has already selected the mounting location and model of PC420-series transducer to be used. Assistance for the selection, location, and use of these transducers is contained in the “Application Guide for PC420-series LPS® Transducers” available from Wilcoxon Sensing Technologies.

## 2.0 Applicable models

This installation guide is intended for use with the PC420-series units with either velocity output (PC420Vx-yy) or acceleration output (PC420Ax-yy) as well as those with dynamic output (PC420xx-yy-DA or PC420xx-yy-DV).

### *PC420Vx-yy and PC420Ax-yy*

The velocity or acceleration units are two-wire devices. The model number designations have a root, PC420V or PC420A, designating the basic 4-20mA output as either velocity or acceleration. The PC420V-series are velocity 4-20mA output. The PC420A-series are acceleration 4-20mA output. The x-yy portion of the model number designates the type of signal processing and the full-scale range. The signal types are VR or AR for “root-mean square (rms)” signal output and VP or AP for “peak” signal output. The table below summarizes the models and full-scale ranges available.

Table 1 – PC420 model numbers for 2 wire output

PC420VR-yy	4-20mA velocity, rms
PC420VP-yy	4-20mA velocity, peak
PC420AR-yy	4-20mA acceleration, rms
PC420AP-yy	4-20mA acceleration, peak

-yy full scale	Velocity	Acceleration
-05	0.5 ips	5 g
-10	1.0 ips	10 g
-20	2.0 ips	20 g
-30	3.0 ips	N/A
-50	5.0 ips	N/A

### *PC420Vx-yy-Dz and PC420Ax-yy-Dz*

The dual output units are available with both the acceleration and velocity 4-20mA signal outputs as listed above and a dynamic signal output. The dynamic signal can be either velocity or acceleration, -DV or -DA. This allows the user to select both the type of 4-20mA loop output signal and the type of dynamic signal desired. The acceleration dynamic output (100 mV/g) and the velocity dynamic signal is 100 mV/ips.

Table 2 – PC420 model numbers for dynamic signal output

PC420xx-yy-DA	Dynamic acceleration output, 100 mV/g
PC420xx-yy-DV	Dynamic velocity output, 100 mV/ips



### 3.0 Mounting

When using vibration transducers to measure vibration, the transducer must have direct contact with the machine surface. The transducer should be mounted in a location that minimizes the vibration transmission route through the machine. Avoid mounting the transducer on thin sections or vibration free areas (antinodes).



SF6 stud

Direct stud mounting, epoxy and cementing pads are used for permanent installations. The transducer can be directly mounted by tapping a hole into the structure and attaching the transducer with a threaded stud. Cementing pads can be epoxied in place of the tapped hole; the transducer is then mounted to the pad. In some cases, the transducer can be mounted directly to the machine using epoxy.

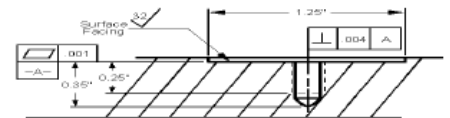
Cementing pads approach the capabilities of stud mounts when used properly. The following are recommended permanent mounting procedures. Alternative procedures should be evaluated with respect to frequency response, grounding, and installation requirements. Adhesive selection is critical for long-term reliability; please consult Wilcoxon Sensing Technologies before other procedures and materials are used.



SF8 cementing pad

#### 3.1 Threaded Stud

Stud mounting requires a tapped hole drilled directly into the structure. A threaded stud provides electrical and mechanical connection between the transducer and machine. The transducer requires a flat spot-faced surface with a perpendicular tapped hole. The spot face must be 1.1 times larger than the diameter of the transducer housing to ensure flush mounting. Burrs between the transducer and the machine must be eliminated. The centerline of the tapped hole should be perpendicular within 1° of the mounting surface to ensure no gaps are present between the base of the transducer and the structure. The tap drill and spot face can be machined in one step using the Wilcoxon ST101 Spot-Face tool. The ST101 will face the surface and drill the tap hole perpendicular to the face in one operation. The drill supplied with the ST101 is sized for a 1/4-28 tap. Additional guidance on mounting procedures and techniques can be obtained from Wilcoxon Sensing Technologies Technical note 21, Mounting considerations. It is available for download from the Wilcoxon web site at [www.wilcoxon.com](http://www.wilcoxon.com).



Surface preparation

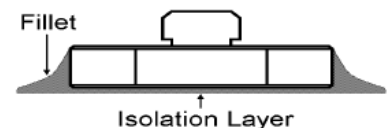


ST 101

The PC420-series transducers should be torqued to a value between 26 - 30 inch-pounds.

#### 3.2 Cementing pad

Cementing pads eliminate tapping into the structure, but provide high frequency capability approaching stud mounts. The PC420-series transducers should be mounted using a Wilcoxon SF8 cementing pad. The flat side is bonded to the machine with an appropriate adhesive. The opposite side contains a 1/4-28 stud for mounting the transmitter. Additional guidance on cementing pad mounting procedures can be obtained from Wilcoxon's Technical note 21, Mounting Considerations. It is available for download from the Wilcoxon Sensing Technologies web site at [www.wilcoxon.com](http://www.wilcoxon.com).



The PC420-series transducers should be torqued to 26 - 30 inch-pounds.



## 4.0 Cabling

Wilcoxon Sensing Technologies has cabling available with connectors already installed for use with the PC420-series vibration transducers. These cables are two-conductor, shielded, twisted pair wire for the 4-20 mA loop output and three-conductor, shielded, twisted wire for the dual output transducers. Isolated connectors are recommended for use with PC420-series transducers to eliminate the possibility of ground loops when wiring to 4-20 mA loop inputs. The cables listed below all use isolated connections for the shield at the transducer end of the cable so that the shield will not be grounded at the transducer.



J9F cable



J9T2A cable

Stock cable model numbers for use with the PC420-series transducers are:

Table 3: Standard cable lengths for stock cables

Length	Cable	Use with	Feature
5 m / 16 ft	R6W-0-J9T2A-16	2-wire PC420	IP67 connector, Teflon, braided shield
	R6W-0-J9T2A-16	2-wire PC420	IP67 connector, Teflon, braided shield
	R6W-0-J9F-16	2-wire PC420	IP67 connector, Teflon, braided shield
	R6W-0-J9F-16	2-wire PC420	IP67 connector, Teflon, braided shield
	R6GQI-0-J9T3A-16	Dual output PC420	IP68 connector, Teflon, braided shield

Length	Cable	Use with	Feature
10 m / 32 ft	R6QI-0-J9T2A-32	2-wire PC420	IP68 connector, Teflon, braided shield
	R6W-0-J9F-32	2-wire PC420	IP67 connector, Teflon, foil shield
	R6QI-0-J9F-32	2-wire PC420	IP68 connector, Teflon, foil shield
	R6GQI-0-J9T3A-32	Dual output PC420	IP68 connector, Teflon, foil shield

Cables can be manufactured in other lengths for an additional charge.

### Connection

The PC420 Series Transducers are loop powered devices. There is no additional signal conditioning equipment required for the transducers to function. The tables below show the cable conductor wire colors for the J9T2A, J9T3A and J9F cable assemblies listed in the previous section. The shield of the cable does not make electrical contact with the case of the PC420 series transducer. For other cable configurations, contact your Customer sales representative at 1800WILCOXON.



R6Q connector



R6W connector

Table 4: Output pin and cable conductor color designations for two wire PC420 series transducers

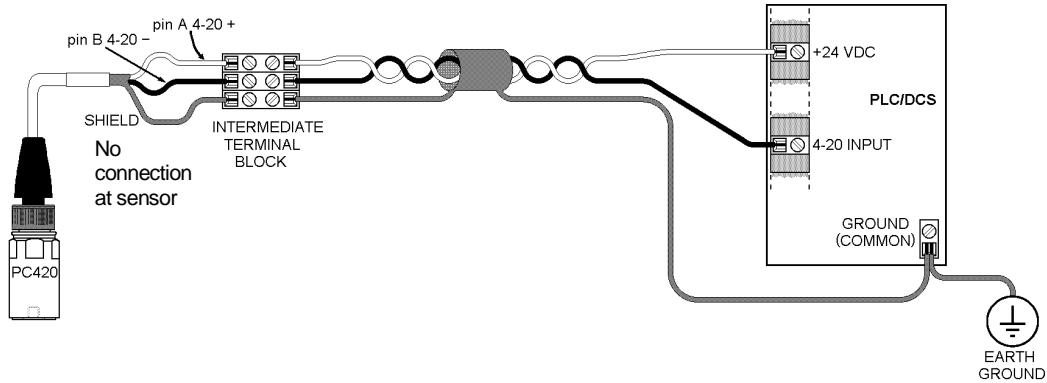
PC420xx-yy pin	Function	J9T2A	J9F
A	Loop power +	White	Red
B	Loop return -	Black	Black

Table 5: Output pin and cable conductor color designations for dual output PC420 series transducers

PC420xx-yy-Dz pin	Function	J9T3A
A	Loop power +	Red
B	Loop return/dynamic common -	Black
C	Dynamic signal output	White

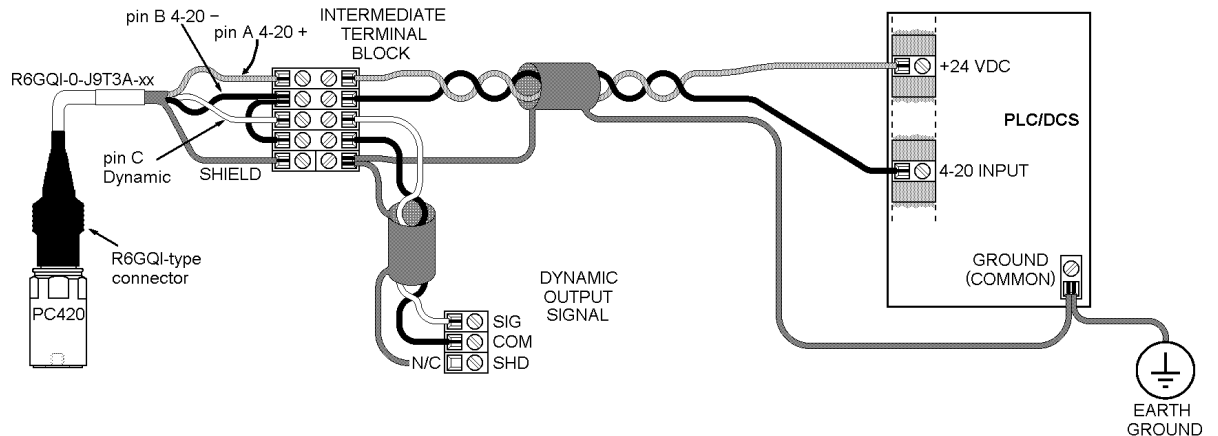


Figure 1: Typical two wire installation wiring



**CAUTION:** The common for the dynamic output is also the return signal for the 4-20mA loop wiring. Connecting this pin to 'ground' will usually short out the 4-20mA loop return resulting in a loss of the 4-20mA signal. The dynamic output is designed to be used by portable data collectors where no direct connection to ground exists. It can also be used by on-line systems when their signal input is galvanically isolated from ground.

Figure 1: Typical dual output installation wiring



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## **5.0 Technical assistance**

### 5.1 Technical assistance

For technical assistance, please contact Wilcoxon Sensing Technologies at 301-330-8811 or email [info@wilcoxon.com](mailto:info@wilcoxon.com).

### 5.2 Customer service

For all customer service inquiries, please call 301-330-8811 or email [info@wilcoxon.com](mailto:info@wilcoxon.com).