

Acceleration loop powered sensors with dynamic vibration output

PC420A-DA dual output series

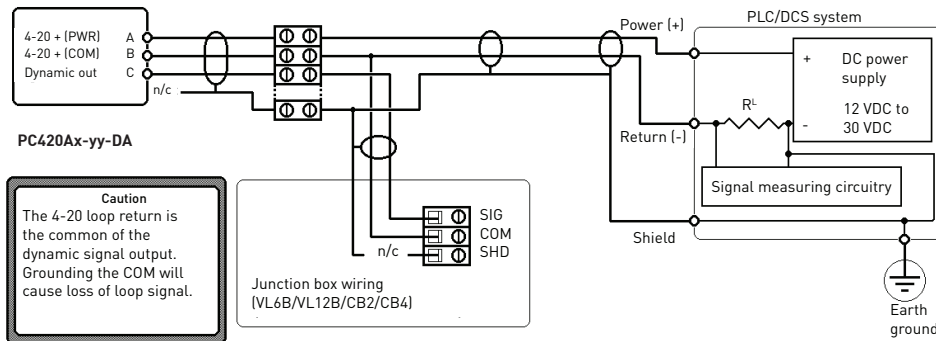
Wilcoxon's 4-20 mA vibration sensors integrate easily with an existing PLC, DCS or SCADA system. The PC420A-DA series dual output sensors provide 24/7 monitoring of overall machine vibration for continuous trending, alerting users to changing machine conditions and helping to guide maintenance in prioritizing the need for service. The choice of true RMS, true peak or peak output allows you to choose the sensor that best fits your industrial requirements. The sensor's 4-20 mA output is proportional to acceleration vibration. The dynamic output signal is derived from an internal buffered amplifier and requires that the 4-20 mA loop be powered.



Table 1: PC420Ax-yy-DA dual output model selection guide

| x (4-20 mA output type) | yy (4-20 mA full scale) | DA (dynamic output) |
|----------------------------|-------------------------------------|-----------------------------|
| R = RMS output | 05 = 5 g (49 m/sec ²) | DA = acceleration, 100 mV/g |
| P = calculated peak output | 10 = 10 g (98 m/sec ²) | |
| TP = true peak output | 20 = 20 g (196 m/sec ²) | |

Wiring diagram



Note: Dynamic output must be galvanically isolated when connected to an on time system.

Key features

- Choice of peak equivalent, true RMS or true peak output
- Dynamic signal output allows for in-depth analysis
- Easily integrated into existing process control systems
- Manufactured in an approved ISO 9001 facility

Certifications



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

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SPECIFICATIONS

Output, 4-20 mA:

| | | |
|------------------------------|---------------------------------------|-------------------------------------|
| Full scale, 20 mA, $\pm 5\%$ | see Table 1 on page 1 | |
| Frequency response: | $\pm 10\%$ ± 3 dB | 10 Hz - 1.0 kHz 4.0 Hz - 2.0 kHz |
| Repeatability | $\pm 2\%$ | |
| Transverse sensitivity, max | 5% | |

Dynamic output:

| | | |
|--------------------------------------|-----------------|--|
| Sensitivity, $\pm 10\%$ | 100 mV/g | |
| Full scale | 20 g | |
| Frequency response, ± 3 dB | 2.5 Hz - 10 kHz | |
| Amplitude nonlinearity, max | 1% | |
| Resonant frequency, mounted, nominal | 25 kHz | |
| Transverse sensitivity, max | 5% | |

Power requirements (2-wire loop power):

| | | |
|---|-------------------------------|--|
| Voltage at sensor terminals | 12 - 30 VDC | |
| Loop resistance ¹ at 24 VDC, max | 700 Ω | |
| Turn on time, 4-20 mA loop | < 30 sec | |
| Dynamic output, bias output voltage | +3.3 VDC, re: connector pin B | |

| | | |
|---------------------------------|------|--|
| Dynamic output noise, equiv. g: | | |
| 2.5 Hz - 10 kHz | 2 mg | |

| | | |
|-----------|------------------------------------|--|
| 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 ceramic / shear | |
|------------------------|---------------------|--|

| | | |
|--------|-----------|--|
| Weight | 162 grams | |
|--------|-----------|--|

| | | |
|---------------|----------------------|--|
| Case material | 316L stainless steel | |
|---------------|----------------------|--|

| | | |
|----------|--------------------|--|
| Mounting | 1/4-28 tapped hole | |
|----------|--------------------|--|

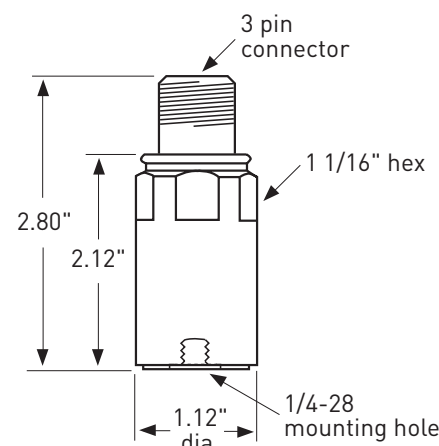
| | | |
|------------------|-------------------------|--|
| Output connector | 3 pin, MIL-C-5015 style | |
|------------------|-------------------------|--|

| | | |
|------------------|----------|--|
| Mating connector | R6G type | |
|------------------|----------|--|

| | | |
|---------------------|--|--|
| Recommended cabling | J9T3A (3-conductor shielded, yellow Teflon jacket) | |
|---------------------|--|--|

Accessories supplied: SF6 mounting stud; calibration data (level 2)

| Connections | |
|-----------------------------------|---------------|
| Function | Connector pin |
| loop positive (+) | A |
| loop negative (-), dynamic common | B |
| dynamic output | C |
| ground | shell |



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

$$R_L = \frac{V_{DC \text{ power}} - 10 \text{ V}}{20 \text{ mA}}$$

| 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 |

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

³ Minimum R_L wattage determined by: $(0.0004 \times R_L)$.

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