

SKF Loop-powered Vibration Transmitter Series

CMSS 420VT, CMSS 420VTT

User Manual Part No. 32190700
Revision A

User Manual

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5271 Viewridge Court., San Diego, CA 92123-1841 USA
Telephone: (858) 496-3400, Fax: (858) 496-3531
Customer Service: 1-800-523-7514



SKF Reliability Systems

For additional information on SKF Reliability Systems products, contact:

SKF Reliability Systems

5271 Viewridge Court • San Diego, California 92123 USA

Telephone: +1 858-496-3400 • FAX: +1 858-496-3531

Web Site: www.skf.com/cm

For technical support, contact:

TSG-Americas@skf.com (North America, South America, and Asia)

or

TSG-EMEA@skf.com for customers in EMEA region (Europe, Middle East, and Africa)

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(Revision P, 12-07)

SKF Reliability Systems
5271 Viewridge Court • San Diego, California
92123 USA
Telephone: +1 858-496-3400 • FAX: +1 858-496-3531 • Web: www.skf.com/reliability

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SKF Vibration Transmitter CMSS 420

Overview of Vibration Transmitter CMSS 420

The CMSS 420 Series are solid state, loop-powered vibration transmitters. They provide a 4-20 mA output that is proportional to overall vibration in terms of velocity. The series of CMSS 420 continuously monitor machinery health and transmit directly into a PLC or DCS for trending, alarm and machine shutdown.

In addition, the CMSS 420VT provides access to the dynamic transducer output. The buffered output is available for temporary connection of portable analyzers for detailed machine fault analysis.

On the other hand, the CMSS 420VTT provides in addition a second 4-20 mA output related to Temperature.



Figure 1. The SKF Vibration Transmitter (CMSS 420VT) with LED Display Retrofit (CMSS 420LED).

As shown, this product is composed of two parts: a vibration transmitter that detects vibration and an LED Display Retrofit that connects the vibration transmitter to the LED, which displays a vibration measurement.

Detailed Features

Solid State Reliability

The parts within the vibration transmitter are solid state and have a greater resistance to shock, vibration and mechanical wear, and are more reliable than if the transmitter was composed of moving parts.

Specifications

SKF Vibration Transmitter CMSS 420

Integral Sensor

The integral sensor allows the transmitter to function as an independent unit and eliminates the need for an external sensor to detect vibration.

4-20 mA Output

The primary output of the transmitter is the 4-20 mA current output, which is scaled proportional to the full-scale range of the unit. The velocity transmitter is connected to the control system (PLC, DCS).

Buffered Output

The CMSS 420VT provides access to the buffered transducer signal when wired at Terminal D (+) with respect to Terminal D (-) or when using a BNC connector on a screw terminal at the side of the unit (if using the BNC Adapter Retrofit [CMSS 420BNC]). These buffered outputs have the same sensitivities, units, and bias voltages as the transducer itself. The buffered output is unfiltered.

The buffered output sensitivity is scaled to 100 mV/g.

Specifications

CMSS 420VT Specifications

Environmental

Operating Temperature: -20 to +80 °C (-4 to +176 °F)

Sealed: Epoxy encapsulated

Enclosure: Stainless Steel, NEMA 4, 4X, 12

Mounting: Stud Mounted

Weight: (without display) 227 g (8 oz)

DYNAMIC

Output: 4-20 mA proportional to full-scale Velocity

- -1 1" / sec rms (25.4 mm/sec rms)
- -2 2" / sec rms (50.8 mm/sec rms)

Frequency Response: 2-2,000 Hz

Buffered Output: Acceleration, 100 mV/g

Accuracy: ± 5% of full-scale

ELECTRICAL

Power (Two-wire loop power): +22 Vdc to +36 Vdc

Loop Connections: Velocity 4-20 mA Loop (**V**)

- Loop (+) Terminal V (+)
- Loop (-) Terminal V (-)

Buffered Acceleration Signal Connections:

Dynamic Signal **(D)** (nominal 100 mV/g)

- Buffered acceleration output Terminal D (+)
 - Buffered acceleration output Terminal D (-)
- The buffered output is for temporary connection of portable analysis instruments only. Instruments connected to this output must have a minimum input impedance of 1 mega-Ohm.

CMSS 420VTT Velocity and Temperature Specifications

ENVIRONMENTAL

Operating Temperature: -20 to +80 °C (-4 to +176 °F)

DYNAMIC

Output 1: 4-20 mA proportional to full-scale Velocity

- -1 1" / sec rms (25.4 mm/sec rms)
- -2 2" / sec rms (50.8 mm/sec rms)

Frequency Response: 2-2,000 Hz

Output 2: from 0 to +100 °C (from 32 to 212 °F)

(Although ambient operating temperature of the unit is rated +80 °C (+176 °F))

Accuracy: Velocity Loop: ± 5% of full-scale, Temperature Loop: +/-2.5 °C at 85 °C

ELECTRICAL

Power

Two-wire Velocity loop supply: +22 Vdc to +36 Vdc

Two-wire Temperature Loop supply: +18 Vdc to +36 Vdc.

Loop Connections:

Velocity 4-20 mA Loop **(V)**

- Loop (+) Terminal V (+)
- Loop (-) Terminal V (-)

Temperature 4-20 mA Loop **(T)**

- Loop (+) Terminal T (+)
 - Loop (-) Terminal T (-)
- The loops have to be powered completely separate from each other. They cannot share the same Ground (-).

Load:

The recommended Load Resistance (RL) for most installations is:

100 or 250 Ohms at Vs = 24 V DC, with or without LED/LCD display

Hazardous Area Ratings

SKF Vibration Transmitter CMSS 420

Maximum load resistance calculations: DC Supply Voltage range: 22 to 36 V DC

$$R_{Lmax} = (V_s - 14 - V_d) / 0.02$$

With R_L = Load resistance, V_s = DC supply voltage

V_d = Display voltage: 5.0 V DC for LED, 2.0 V DC for LCD, 0.0 V DC for no display

Hazardous Area Ratings

ELECTRICAL RATINGS

Power: +22 Vdc to +36 Vdc, 4 to 23 mA provided from an external DC source rated 36 VDC maximum, 23 mA maximum. The CMSS 420VT and CMSS 420VTT are suitable for use in Class 1, Division 2, Groups B, C, D. (USA and Canada)

Maximum load: Up to 500 Ohms resistive at 24 V DC and no display

(see – maximum load resistance calculations for specific requirements)

Grounding: Case isolated



Hazardous Location Safety

E112798

UL1604, CSA C22.2 No 213

Cl 1, Div 2, Grp B,C,D

24 VDC, 23 mA Max

Installation

To install the CMSS 420VT:

- Mount the CMSS 420VT into a tapped hole in the bearing housing or machine case.
- Connect two wires into a 4-20 mA loop.

You are now ready to interface with a PLC or DCS. Electrical conduit may be connected directly to the top 3/4" NPT fitting.

Transmitter differences

The CMSS 420VT vibration transmitter measures vibration in terms of velocity to monitor machine health and provide access to the dynamic transducer output.

The CMSS 420VTT vibration transmitter measures vibration in terms of velocity to monitor machine health and measures temperature.

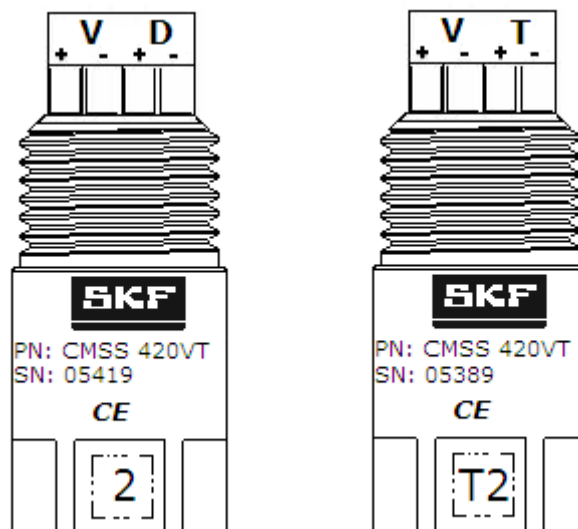


Figure 2. The CMSS 420VT-2 and CMSS 420VTT-2.

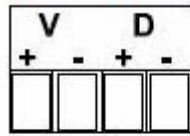
The Range Indicator is the range of the accelerometer measured from 0-1 in/sec rms velocity (Range Indicator: 1) or from 0-2 in/sec rms velocity (Range Indicator: 2).

Terminal V provides access to the velocity 4-20 mA loop. (CMSS 420VT and CMSS 420VTT)

Terminal D provides access to the buffered output. (CMSS 420VT only)

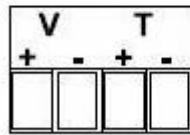
Terminal T provides access to the temperature 4-20 mA loop. (CMSS 420VTT only)

CMSS 420VT



**Velocity and Dynamic Signal
 -Buffered Acceleration Output**

CMSS 420VTT



Velocity and Temperature Output

Figure 3: CMSS 420VT and CMSS 420VTT Connectors

The BNC Adapter Retrofit is wired as shown:

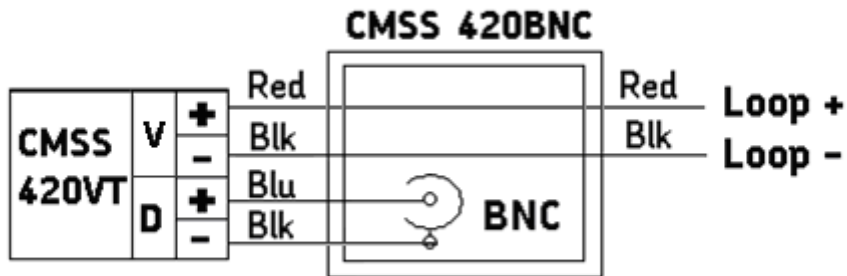


Figure 4. The CMSS 420BNC wiring diagram.

LED / LCD Display Retrofit

The LED/LCD displays the vibration in terms of velocity in in/sec (or mm/s respectively)

The LED/LCD Display Retrofit is wired as shown:

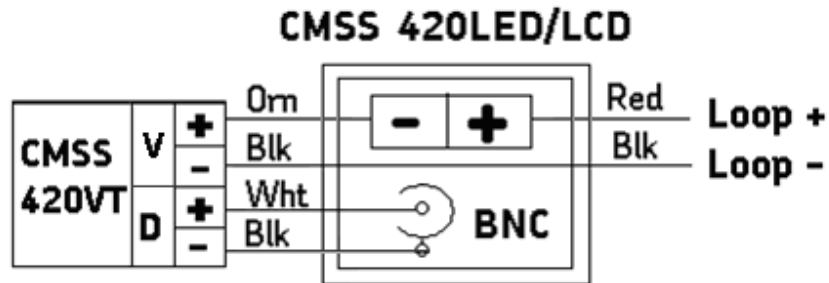


Figure 5. CMSS 420LED/LCD wiring diagram

Attaching the CMSS 420 LED / LCD to the transmitter

- Remove screws that connect the LED/LCD from the conduit elbow.
- With wires coming out of conduit elbow, connect to VT as shown in Figure 7 above.
- Tighten 420VT into conduit elbow (hang VT upside down and only twist conduit elbow).
- Re-attach LCD/LED.
- Mount 420VT to machine and connect wires to PLC/DCS.

Technical Drawing CMSS 420VT

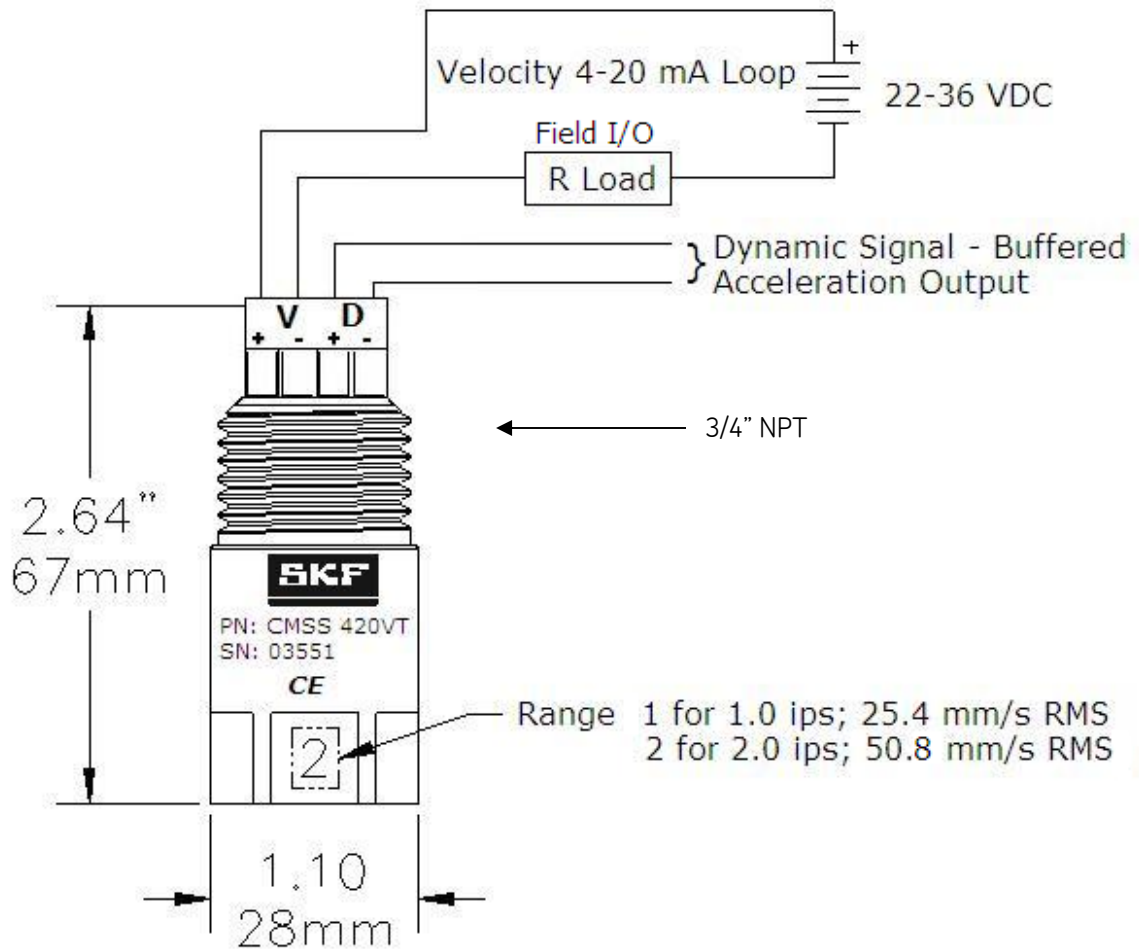


Figure 6. CMSS 420VT Dimensions and Connection Diagram.

Velocity and Dynamic Signal - Buffered Output

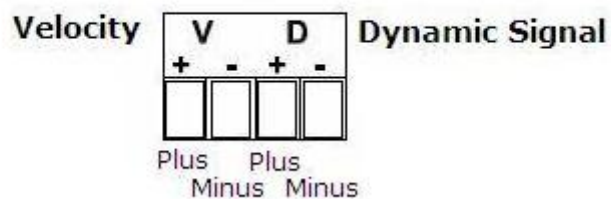


Figure 7. CMSS 420VT Pin Assignment.

Technical Drawing CMSS 420VTT

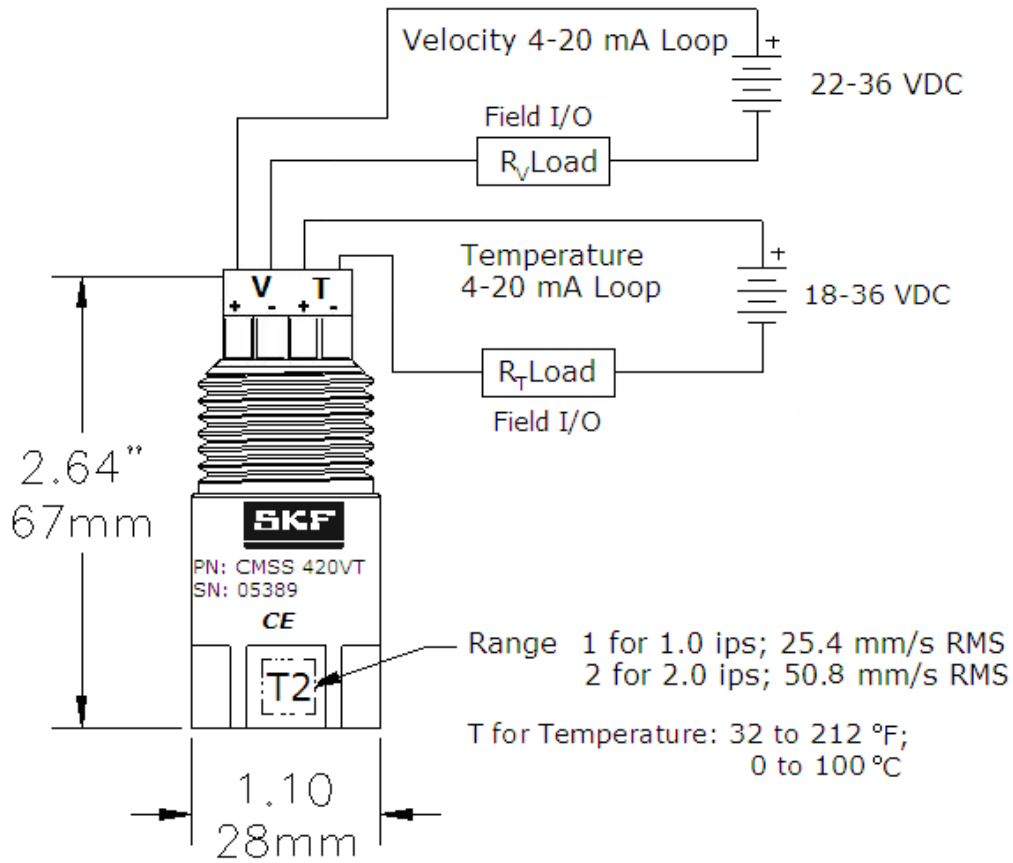


Figure 8: CMSS 420VTT Dimensions and Connection Diagram

Velocity and Temperature Outputs

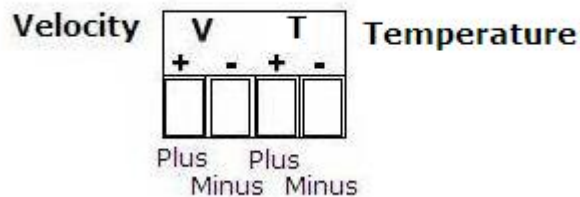


Figure 9: CMSS 420VTT Pin assignment

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