VT9285 Vibration Transmitter

Overview

The VT9285 is a digital vibration transmitter that combines digital circuit technique and piezoelectric principle perfectly. It adopts 24 bit ADC and DAC conversion circuit greatly improving the measurement accuracy and response time. Via software, acceleration signals is integral in domain, which increasing the linearity, linearizing the output curve and enhancing the anti-interference capability of the transmitter.

The VT9285 vibration transmitter is designed to measure vibration of revolving machine. It combines vibration sensor and signal processing circuit into a stainless steel casing, which provides an ideal solution to measure the level of the mechanical vibration. And it outputs a 4-20mA signal proportional to the vibration and transmits the signal directly to the programmable controller (PLC), distributed control system (DCS), monitor or other monitoring instrument with 4-20mA input signal. l.

VT9285 is a self-contained transmitter, without moving parts and can be mounted directly on the case of rotating machine or bearing housing. A variety of full scale range, process mounting stud styles and several of electrical interfaces is available and can be selected respectively.

VT9285 can overlay HART communication protocol. HART protocol adopts FSK frequency shift keying signal based on Bell202 standard, and carries out two-way digital communication by stacking 0.5mA audio digital signal on the low frequency 4-20mA analog signal, and the data transmission rate is 1.2 kbps. Since the average value of FSK signal is 0, it does not affect the size of analog signal transmitted to the control system, ensuring the compatibility with the existing analog system. In HART protocol communication, the main variables and control information are transmitted by 4-20mA. When necessary, additional measurement, process parameters, equipment configuration, calibration and diagnostic information are accessed through HART protocol. Support BURST MODE.

HART communication adopts the half-duplex communication mode, which is characterized by the realization of digital signal communication on the existing analog signal transmission line. It is a transitional product in the transition process from analog system to digital system, so it has strong market competitiveness in the current transition period and has been developed rapidly.

HART adopts the unified equipment description language DDL

HART version number 7

VT9285 Vibration Transmitter

HART COMMUNICATION PROTOCOL

Product description

D=0-3； H=1-4； G=0,1,2

Lower shell material：304SS/316L；

Upper shell material：alloy aluminum /316L

Hazardous Area Rating： Ex d IIC T6 Gb

Ex ia IIC T4 Ga（Upper shell material can only be selected 316L）

D=0-3： H=1,3； G=4,5

Lower shell material：304SS/316L；

Upper shell material：alloy aluminum

D=4； H=0； G=2,3

Integral shell material：304SS/316L

Hazardous Area Rating： Ex ia IIC T4 Ga

Wiring： MIL Connector

D=5,6； H=0； G=2,3

Integral shell material：304SS/316L

Hazardous Area Rating： Ex ia IIC T4 Ga

Wiring：Cable-integrated (or self-contained stainless steel cable protector)

D=7,8； H=0； G=2,3

Integral shell material：304SS/316L

Hazardous Area Rating： Ex ia IIC T4 Ga

Wiring： 1/2”NPT Interface cable-integrated(or self-contained stainless steel cable protector)

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VT9285 Vibration Transmitter

HART COMMUNICATION PROTOCOL

Do you need to display it on site?

The VT9299 can meet this requirement when the site requires local display.

The VT9299 is a vibration transmitter with a housing mounted on the display.

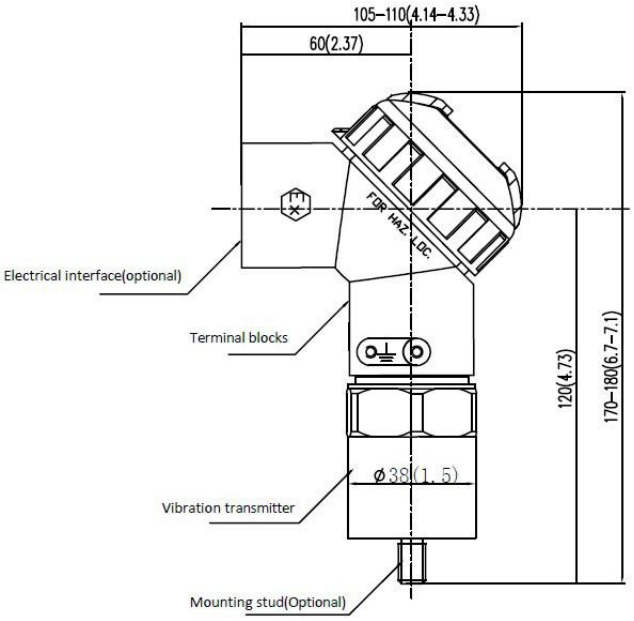
The transmitter uses a combination of digital processing and piezoelectric measurement.

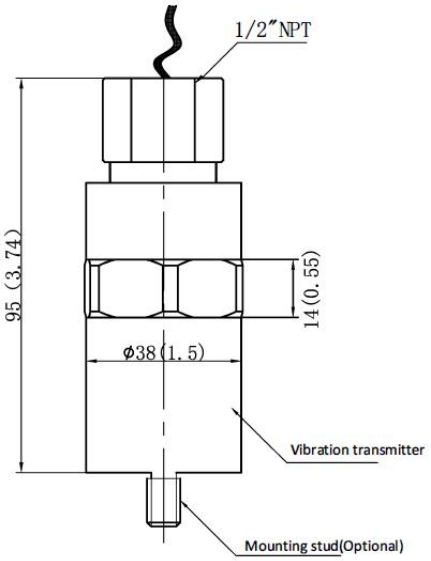
It is a wide temperature range vibration measuring instrument for real industrial applications.

The temperature range is -40℃～+70℃.

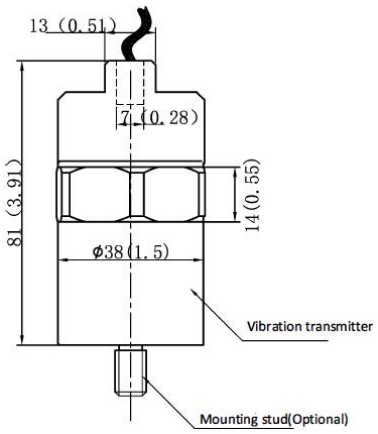
See VT9299 sample YSZK.06-2020 for details.

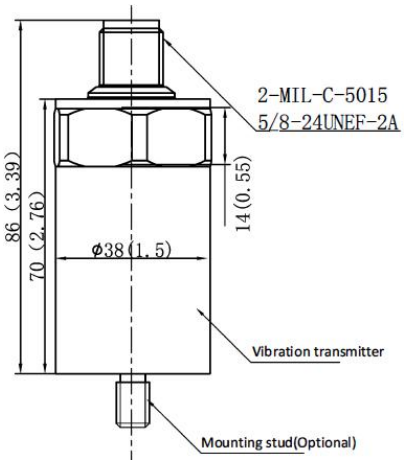
Dimension plan





Unit：mm（in）





VT9285 Vibration Transmitter

Product features

Output a 4-20mA signal proportional to the vibration

Optional HART communication protocol

Connect directly to the PLC, DCS or any other control system

Two-wire or three-wire connection

Wide power supply range of 12-30VDC

Multiple connection & mounting stud available

Optional measurement of acceleration, velocity or displacement

Digital circuits

Anti-electromagnetic and anti-RF interference

Built-in surge protection

High and low pass filter available

100mv/g dynamic signal output

“slope-restriction” technique

Applications

Blower Centrifuge

Compressor Engine

Motor Electrical generator Pump

Fan Turbocharger Turbine

Technical specifications

Measurement range: Refer to model selection guide AAA，output 4-20mA signal proportional to vibration level.

Accuracy： ±1%（repeatability）

Linearity： ±0.5%

Dynamic output sensitivity： 100mV/g（±5%）

Frequency response： 2-2000Hz（±3dB）

Sensitive Axis: along the sensor’s vertical axis

Power supply（Vs）： 12-30VDC, non-polarity connection

Electrical connection： Optional

Shell material： Standard: 304SS, optional: 316L

External magnetic： ≤400A/m

Enclosure Rating: IP66

Application in hazards area： Use isolated safety barrier

RMS Root mean square value measurement：

User can select RMS root mean square value of vibration

RMS value=PK×0.707

The maximum load resistance（R_L）： R_L =50×（Vs-12）Ω

Dynamic signal output resistance： 10 kΩ

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HART COMMUNICATION PROTOCOL

Explosion-proof grade:

ATEX:II 2G Ex db IIC T6 Gb, IP66

-55℃≤Ta≤+75℃

II 2G Ex ia IIC T4 Ga, IP66

-55℃≤Ta≤+80℃

Parameters / "D" in model definition	Ui(V)	Ii(A)	Pi(W)	Ci(nF)	Li(μH)
0 or 4	28	0.1	0.7	0	0
5 or 6 or 7 or 8	28	0.1	0.7	0.2	1

IECEx:Ex db IIC T6 Gb, IP66

-55℃≤Ta≤+75℃

Exia IIC T4 Ga, IP66

-55℃≤Ta≤+80℃

Parameters / "D" in model definition	Ui(V)	Ii(A)	Pi(W)	Ci(nF)	Li(μH)
0 or 4	28	0.1	0.7	0	0
5 or 6 or 7 or 8	28	0.1	0.7	0.2	1

EAC:1Ex d IIC T6 Gb X, IP66

-55℃≤Ta≤+75℃

0Ex ia IIC T4 Ga X, IP66

-55℃≤Ta≤+75℃

Maximum input voltage Ui(V)	Input current Li(mA)	Input power Pi(w)	Maximum internal equivalent parameter	
			Ci(nF)	Li(μH)
28	100	0.7	20	5

NEPSI: Ex db IIC T6 Gb, IP66

-55℃≤Ta≤+75℃

Ex ia IIC T4 Ga, IP66

-55℃≤Ta≤+80℃

Maximum input voltage Ui(V)	Input current Li(mA)	Input power Pi(w)	Maximum internal equivalent parameter	
			Ci(μF)	Li(mH)
28	100	0.7	0	0

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VT9285 Vibration Transmitter

Model selection guide

VT9285X-AAA-BCD-EF-GH

X： Transmitter function type

B 2-wire

C 3-wire

H 2-wire with Hart enabled

AAA： Measuring range

Vibration velocity peak value

121 25.4mm/s（1.0ips），pk

122 12.7mm/s（0.5ips），pk

123 50mm/s（2.0ips），pk

124 125mm/s（5.0ips），pk

125 10mm/s（0.4ips），pk

126 20mm/s（0.8ips），pk

127 16mm/s（0.65ips），pk

128 75mm/s（3.0ips），pk

Vibration velocity root mean square value

151 25.4mm/s（1.0ips），rms

152 12.7mm/s（0.5ips），rms

153 50mm/s（2.0ips），rms

154 125mm/s（5.0ips），rms

155 10mm/s（0.4ips），rms

156 20mm/s（0.8ips），rms

157 16mm/s（0.65ips），rms

158 75mm/s（3.0ips），rms

Vibration acceleration peak value

801 1g，pk

802 2g，pk

803 3g，pk

804 5g, pk

Vibration acceleration root mean square value

831 1g，rms

832 2g，rms

833 3g，rms

834 5g, rms

Vibration displacement

101 0-100μm，pk- pk

102 0-125μm，pk- pk

103 0-150μm，pk- pk

104 0-200μm，pk- pk

105 0-250μm，pk- pk

106 0-500μm，pk- pk

107 0-1000μm，pk- pk

B： Mounting stud

0 Integral 1/4”NPT

1 Integral 1/2”NPT

2 3/8”-24UNF×1/2”

3 M8×1-12

4 M10×1.25-12

5 1/4”-20UNC

6 1/4”-28UNF

7 M8×1.25-12

8 M10×1-12

9 M10×1.5-12

10 M12×1.75-12

11 M20×1.5-12

X Customize, contact factory

VT9285 Vibration Transmitter

Model selection guide

VT9285X-AAA-BCD-EF-GH

C：Hazardous Area Rating

1 Safety zone

2 IECEx, Ex ia IIC T4 Ga（D=0,4,5,6,7,8）

3 NEPSI/CMExC, Ex ia IIC T4 Ga

4 IECEx, Ex db IIC T6 Gb（D=0,1,2,3）

5 ATEX, Ex ia IIC T4 Ga（D=0,4,5,6,7,8）

6 NEPSI/CMExC, Ex d IIC T6 Gb（D=0,1,2,3）

7 ATEX, Ex d IIC T6 Gb（D=0,1,2,3）

8 EAC, Ex d IIC T6 Gb（D=0,1,2,3）

9 EAC, Ex ia IIC T4 Ga X

D：Wiring

0 4-20mA flying leads

1 4-20mA dynamic signal：flying leads

2 4-20mA terminal blocks

3 4-20mA dynamic signal：terminal blocks

4 4-20mA MIL connector

5 4-20mA cable-integrated,3m

6 4-20mA armored cable-integrated,3m

7 4-20mA with 1/2NPT interface cable-integrated,3m

8 4-20mA with 1/2NPT interface armored cable-integrated,3m

E：High-pass filter

0 unfiltered（2Hz）standard

1 5Hz

2 10Hz

3 20Hz

4 50Hz

5 100Hz

6 200Hz

F：Low-pass filter

0 unfiltered（1500Hz）standard

1 500Hz

2 1000Hz

3 2000Hz

G：Case material

0 Lower shell:304SS;Upper shell: alloy aluminum

1 Lower shell:316L;Upper shell: alloy aluminum

2 Integral 316L

3 Integral 304SS(D=4,5,6,7,8)

H：Electrical interface

0 No（D=4,5,6,7,8）

1 1/2”NPT

2 3/4”NPT

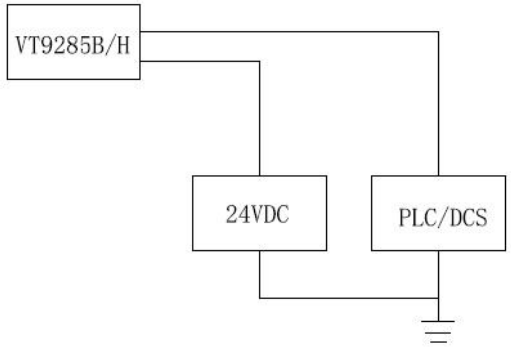
3 M20×1.5

4 1”NPT

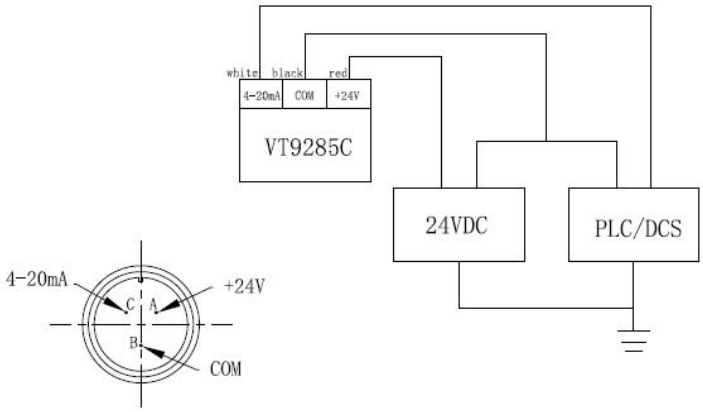
Vibration Transmitter

Wiring diagram

Safety zone and Flame-proof area



VT9285B/H schematic diagram



VT9285C schematic diagram

Intrinsically safe and explosion-proof area