

## TM016 Velocity/ Acceleration Vibration Transmitter

### Introduction

The TM016 is a solid state loop powered transmitter which provides a 4-20mA output proportional to the machine case vibration level. The 4-20mA output interfaces directly to any PLC or DCS for shutdown, alarm or trending. The TM016 is easy to install on the machine case.

Applications :

- ✓ **Motors**
- ✓ **Pumps**
- ✓ **Fans**
- ✓ **Blowers**
- ✓ **Engines**
- ✓ **Compressors**
- ✓ **Centrifuges**
- ✓ **Generators**
- ✓ **Turbochargers**
- ✓ **Gear Boxes**



### Features

- ✓ Loop powered 4-20mA velocity or acceleration (peak or RMS) output
- ✓ Wide operating temperature range -50°C to +120°C (-58°F to +248°F)
- ✓ Stainless steel housing
- ✓ NEMA4X, IP65 or IP67 environmental rating
- ✓ Multiple hazardous area approvals
- ✓ Frequency filter options
- ✓ Wide selection of mounting studs



## Electrical

### Overall vibration output:

4-20mA, load (loop powered)

Accuracy: 5%

### Frequency response ( $\pm 3$ db):

Acceleration: 2~3,000 Hz

Velocity: 2~3,000 Hz

### Transverse sensitivity:

< 5%

### Power supply:

12VDC - 30VDC

### Maximum load resistance:

At least 500 ohms @ 24VDC power supply

### Isolation:

500Vrms, circuit to case

### Case material:

316L stainless steel

### Output connection:

#### Flying leads:

2 cables for 4-20mA

2 cables for buffered output

#### Mil connector:

2 pins for 4-20mA

### Buffered output:

100mV/g nominal

Maximum cable length 3m (10ft)

### Filter option:

12dB/oct for hi-pass filter

12dB/oct for low-pass filter

### Intrinsically Safe:

ATEX:II 1G Ex ia IIC T4 Ga@Ta=-50°C to+100°C

(Ui=30V,Li=110mA,Pi=825mW,Ci=11nF,Li=84uH)

KEMA06ATEX0228

EN60079-0:2012,EN60079-11:2012,EN60079-26:200

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IECEX:EX ia IIC T4 Ga

IECEX DEK13.0021

IEC60079-0:2011,Ed.6,IEC60079-11:2011,Ed.6.

IEC60079-26:2006,Ed.2

PCEC:Ex ia IIC T4

\*\*TR CU: 0Ex ia IIC T4 X

№ TC RU C-US.ГБ05.B.00477

ГОСТ 30852.0-2002 (МЭК 60079-0:1998) (кроме п. 27)

ГОСТ 30852.10-2002 (МЭК 60079-11:1999)

ГОСТ 30852.1-2002 (МЭК 60079-1:1998)

ГОСТ Р МЭК 60079-0-2011 (п.п. 29.1-29.3, 29.11)

### Ex d Standards:

ATEX: II 2G Ex db IIC T4 Gb@Ta=-50°C to+120°C

KEMA06ATEX0275

ATEX: EN60079-0:2012+A11:2013, EN60079-1:2014

IECEX: Ex db IIC T4 Gb

IECEX DEK13.0073

IECEX: IEC60079-0: 2011, IEC 60079-1:2014

## Physical

### Temperature:

#### Operation:

Normal (G=0): -50°C ~ + 100°C (-58°F ~ +212°F)

High (G=1): -50°C ~ + 120°C (-58°F ~ +248°F)

Storage: -50°C ~ + 125°C (-58°F ~ +257°F)

### Dimensions:

Diameter: 38mm (1.5")

Height: Flying leads: 87mm (3.4");

Mil connectors: 87mm (3.4")

### Weight:

420g (0.875lb)

### Output Connections:

2-pin MIL-C-5015

Flying leads: 2 or 4 wires (Default lead length is 5m.

When working with TM016-11 or TM016-02, the lead length is 20cm)

1 NPT

### Environmental:

Flying leads: NEMA 4X, IP65

2-pin connector: IP67



**Order Information**

\* Factory default

**TM016-AAA-BCD-EF-G**

**AAA: Full Scale**

- AAA=000: 20mm/s (0.8ips), pk
- AAA=001: 20mm/s (0.8ips), rms
- AAA=121: 25mm/s (1.0ips), pk
- AAA=122: 12.5mm/s (0.5ips), pk
- AAA=123: 50mm/s (2.0ips), pk
- AAA=124: 125mm/s (5.0ips), pk
- AAA=132: 75mm/s (3.0ips), pk
- AAA=151: 25mm/s (1.0ips), rms
- AAA=152: 12.5mm/s (0.5ips), rms
- AAA=153: 50mm/s (2.0ips), rms
- AAA=154: 125mm/s (5.0ips), rms
- AAA=162: 75mm/s (3.0ips), rms
- AAA=200: 5.0g, pk
- AAA=201: 10g, pk
- AAA=202: 20g, pk

**B: Mounting Adaptor**

- B=0: 1/4" NPT
- B=1: 1/2" NPT
- B=2: 3/8-24UNF X 1/2"
- B=3: 1/2-20UNF X 1/2"
- B=4: M8x1-12
- B=5: M10x1.25-12

**C: Hazardous Area and Approvals**

- C=1: CE
- C=2\*: CE
  - CSA: Class I, Div. 1, Groups A, B, C & D
  - Class II, Div. 1, Groups E, F, G & T4@Ta=-50°C to+120°C
- ATEX: II 2G Ex db IIC T4 Gb@Ta=-50°C to+120°C  
KEMA06ATEX0275
- ATEX: II 1G Ex ia IIC T4 Ga @Ta=-50°C to+100°C  
KEMA06ATEX0228
- IECEX:Ex ia IIC T4 Ga  
IECEX DEK13.0021
- IECEX: Ex db IIC T4 Gb  
I E C E x D E K 1 3 . 0 0 7 3
- \*\* TR CU: 0Ex ia IIC T4 X  
№ TC RU C-US.ГБ05.B.00477
- \*\* TR CU: 1Ex d IIC T4 X  
№ TC RU C-US.ГБ05.B.00477
- PCEC: Ex ia IIC T4  
Ex d IIC T4

C=3: CE

- ATEX: II 1G Ex ia IIC T4 Ga@Ta=-50°C to+100°C  
KEMA06ATEX0228
- IECEX:Ex ia IIC T4 Ga  
IECEX DEK13.0021
- CSA:I.S.Class I,Div.2,Groups A,B,C,D
- \*\*TR CU: 0Ex ia IIC T4 X
- PCEC: Ex ia IIC T4

- C=4: CE  
Non-Incendive  
CSA:Class I,Div.2,Groups A,B,C,D

**D: Connection**

- D=0: 4-20mA, flying leads (C1 or C2)
- D=1: 4-20mA, flying leads with buffered output (C1 or C2)
- D=4: 4-20mA, 2-PIN MIL connector (C1 or C3)

**E: High-pass Filter**

- E=0: None
- E=1: 5Hz
- E=2: 10Hz
- E=3: 20Hz
- E=4: 50Hz
- E=5: 100Hz
- E=6: 200Hz

**F: Low-pass Filter**

- F=0: none
- F=1: 500Hz
- F=2: 1000Hz
- F=3: 2000Hz

**G: Temperature**

- G=0: Normal temperature (-50°C to + 100°C)
- G=1: High temperature (-50°C to + 120°C)

Note: \*\*TR CU certificate is pending

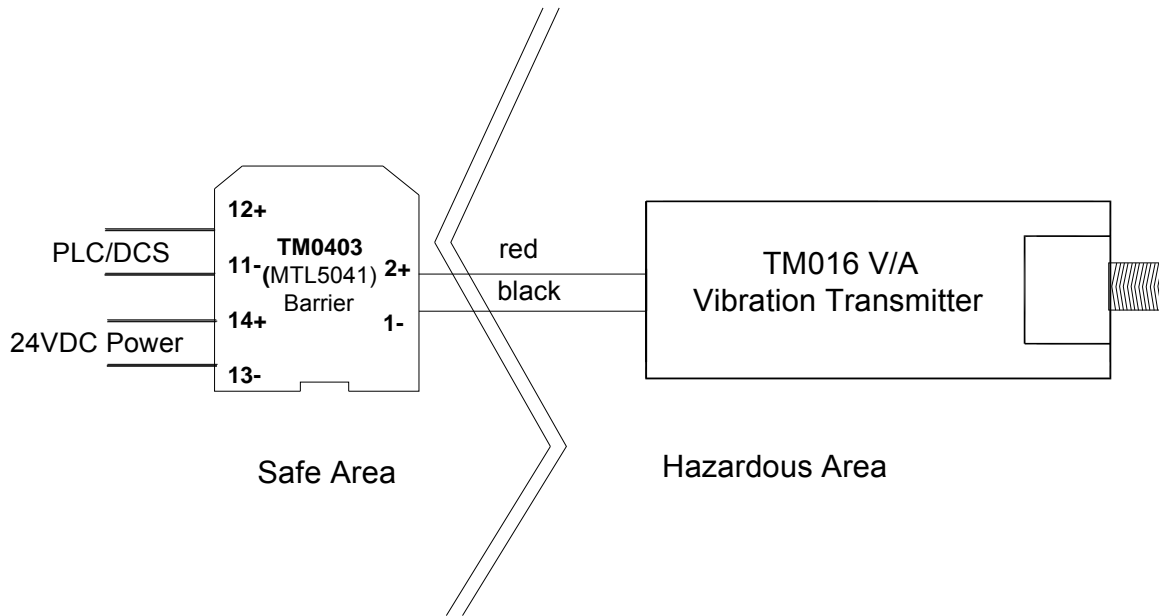
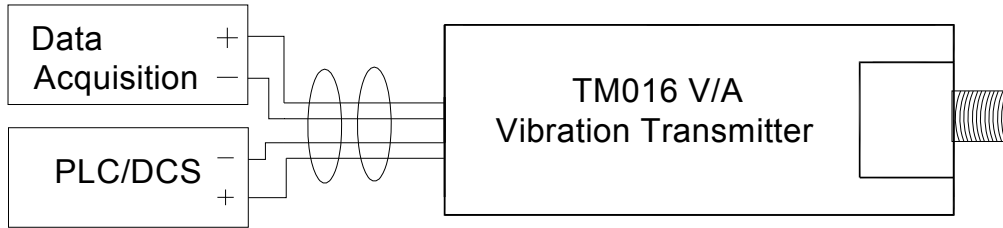
**TM016-K1**

Vibration transmitter kit includes:

- TM016-D0 or -D1 with TM016-02
- CE mark
- CSA: Class I, Div. 1, Groups A, B, C & D  
Class II, Div. 1, Groups E, F, G & T4
- ATEX: II 2G, Ex dIICT4 @Ta=-50°C to+120°C  
KEMA06ATEX0275



**Field-Wiring Diagram**



Note:

Other Barriers:

TM0406: (STAHL 9160/13-11-10s)

TM0407: (STAHL 9160/13-11-11s)

## Accessories

(Standard cable length is 5 meters. XX = 05)



**TM0702-XX:** Aluminum MIL connector with XX meters cable, 6.35mm diameter.  
Operating temperature range goes up to 120°C (250°F)



**TM0703-XX:** Sealed tight boot connector with XX meters cable, 6.35mm diameter.  
Operating temperature range goes up to 120°C (250°F)



**TM0704-XX:** Stainless steel MIL connector with Armored XX meters cable, 4.83mm diameter. Operating temperature range goes up to 150°C (300°F), Maximum Length is 10 meters.



**TM0705-XX:** Cornered MIL connector with XX meters cable, 4.83mm diameter.  
Operating temperature range goes up to 120°C (250°F)



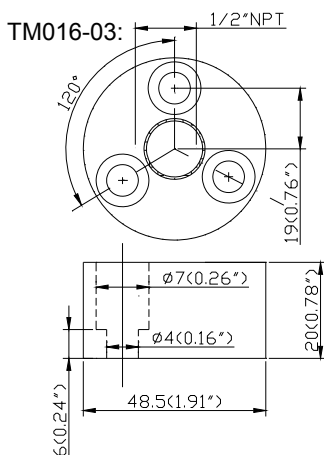
**TM016-01:** Aluminum conduit elbow & reducer. 1" to 3/4" NPT

**TM016-11:** Aluminum conduit elbow & reducer with terminal block. 1" to 3/4" NPT  
Class I, Div. 1, Groups B, C & D; Class II, Div. 1, Groups E, F & G and NEMA 4X, IP65



**TM016-02:** Stainless steel conduit elbow with terminal block. 1" to 3/4" NPT  
Class I, Div. 1, Groups A, B, C, D & T4; Class II, Div. 1, Groups E, F & G and NEMA 4X, IP65 (works with TM016)

**TM016-03:** Stainless steel flange mounting adaptor with 1/2" NPT mount; 3 holes of 7mm on the circle of 38mm (1.5") in diameter



**TM900A:** Power converter

**TM0200:** 3-1/2 digit display unit