8mm, 5mm Proximity Probe TM0180 and TM0105 Systems

Introduction to proximity probe transducers

Proximity probe transducers are used to measure the static and dynamic distance between the target and the probe. PVTVM's TM series proximity probes measure the following:

- ✓ Radial vibration used for indicating bearing condition and measuring machine malfunctions such as rotor imbalance, misalignment, and shaft crack.
- ✓ Axial thrust position used for determining thrust bearing wear or potential bearing failure.
- ✓ Shaft radial position used for determining shaft position relative to rotor attitude angle, an indicator of rotor stability and shaft alignment.
- ✓ Vibration amplitude and phase angle used for diagnostic information in Polar and Bode formats or for vector monitoring.
- ✓ Eccentricity used to measure the shaft bow during startup of large turbine machinery.
- ✓ Phase reference used for measuring shaft rotation speed and phase angle of shaft vibration for monitoring and diagnostic purposes.

The TM series proximity probe systems are designed to meet API 670 standards. Each system consists of a probe, extension cable, and a driver. PVTVM's transmitters (DTM and TR series) can directly interface with the probe and extension cable; therefore, eliminating the need of a probe driver. This smart design allows for easier field installation and greater economical benefits.

Components of proximity probe transducers

Probe

The TM0180 (8mm) and the TM0105 (5mm) probes are designed for long life cycles and are suitable for harsh environments. PVTVM realizes one of the most significant problems in proximity probe installations are ground loops and loss of isolation due to damaged cable jackets. PVTVM's custom rugged cable jacket prevents the probe cable from breaking and tearing and is highly resistive to corrosive environments.

The TM0180 probe and extension cable are equipped with a standard protective rubber boot, which covers the connectors and prevents oil and dirt penetration.



The TM0180 and TM0105 series probes come in 0.5m and 1.0m cable lengths, as well as, special lengths of 5.0m and 9.0m with an integrated probe and extension cable design.

The probe may be selected in English or metric units, as well as, reverse mounting options. Reverse mount probes are used with TM0393 probe housings for hazardous areas.

Extension Cable

PVTVM's extension cable design results in better system performance and a longer life cycle.

One may select various extension cable lengths based on the probe cable length. The total length of the probe and the extension cable need to be 5m or 9m in total length.

The connector on the extension cable is also an API 670 standard, allowing compatibility with other manufacturers' proximity probe systems.

Driver

The TM0182 driver is used for the TM0180 and TM0105 proximity probe systems. The circuit isolation from ground is a standard feature for all PVTVM's drivers. The total length of cable between the probe and the driver should be 5m or 9m. The distance between the driver and the vibration monitor can be up to 300m (1,000 ft). The three conductor shielded cables from the probe driver should be used to connect to a vibration monitor, such as, PVTVM's PT2060 monitor.

Note: Probe Driver is not required with some models of DTM or TR Transmitters.

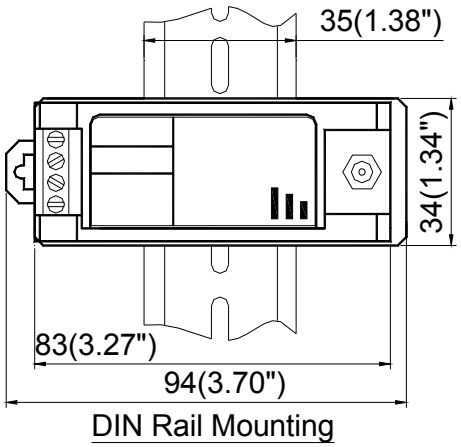
Hazardous Area

The TM0180 and TM0105 proximity probe transducers have hazardous area approvals.

ATEX: II 1 G,Ex ia IIC T4 Ga@Ta=-55 ℃ to +115℃
II 2 G,Ex ia IIC T2 Gb@Ta=-55 ℃ to +232℃
KEMA07ATEX0110X
EN60079-0:2012,EN60079-11:2012,EN60079-26:2007
IECEx:Ex ia IIC T4 Ga
IECEx DEK 13.0037 X
IEC 60079-0:2011,Ed.6
IEC 60079-11:2011,Ed.6
IEC 60079-26:2006,Ed.2
TR CU: 0Ex ia IIC T4 Ga X
№ TC RU C-US. AA87.B.01245
NANIO CCVE

ГОСТ 31610.0-2014 (IEC 60079-0:2011)

ГОСТ 31610.11-2014 (IEC 60079-11:2011)



DIN Rail Mounting

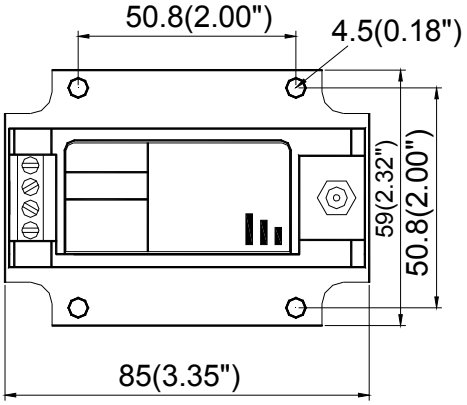


Plate Mounting

System Specifications

Electrical

Power Supply:
Voltage: -23 to -30VDC
Current: < 12mA

Linear Range:
2.0mm (80mil) begins at 0.25mm (10mil) from probe face (AISI4140)
Range is 0.25 - 2.25mm (10 - 90mil)

Sensitivity:
7.87 mV/um (200mV/mil)

Temperature Sensitivity (Normal):
Probe and 5 meters cable, from -35°C to 120°C, tolerance is within ±0.3%/℃ in the middle of the linear range. At 2.25mm (90mil), nominal ±0.5%/ ℃

Linearity (deviation from straight line):
Within±0.0254mm (±1.0mil) of a straight line, when calibrated as a system. ±0.038mm (±1.5mil) typical including interchangeability errors

Frequency Response (±3db):
0 - 10.0 KHz

Minimum Target Size:
15mm (0.6 inch) in diameter



Environmental

Probe Driver Temperature:
Operation: -40°C to +80°C
Storage: -50°C to +100°C
Probe Temperature:
Operation/Storage: -40°C to +120°C
Extension Cable Temperature:
Operation/Storage: -40°C to +120°C
Humidity:
100% non-condensing
Approval:

ATEX: II 1 G, Ex ia IIC T4 Ga @Ta=-40 ℃ to +80°C
KEMA06ATEX0217X

IECEx: Ex ia IIC T4 Ga @Ta=-40℃ ~ +80℃

IECEx DEK 13.0020 X

CSA: Intrinsically safe.
Class I, Div. 1, Groups A, B, C and D，T4
Class I, Zone 0, Ex ia IIC T4
Non-incendive
Class 1, Div. 2, Groups A, B, C and D
PCEC: Ex ia IIC T4
TR CU: 0Ex ia IIC T4 Ga X
№ TC RU C-US. AA87.B.01245
NANIO CCVE

Probe and Cable Approval:

ATEX: II 1 G, Ex ia IIC T4 Ga@Ta=-55 ℃to +115 ℃,

II 2 G, Ex ia IIC T2 Gb@Ta=-55 ℃ to +232℃

KEMA07ATEX0110X

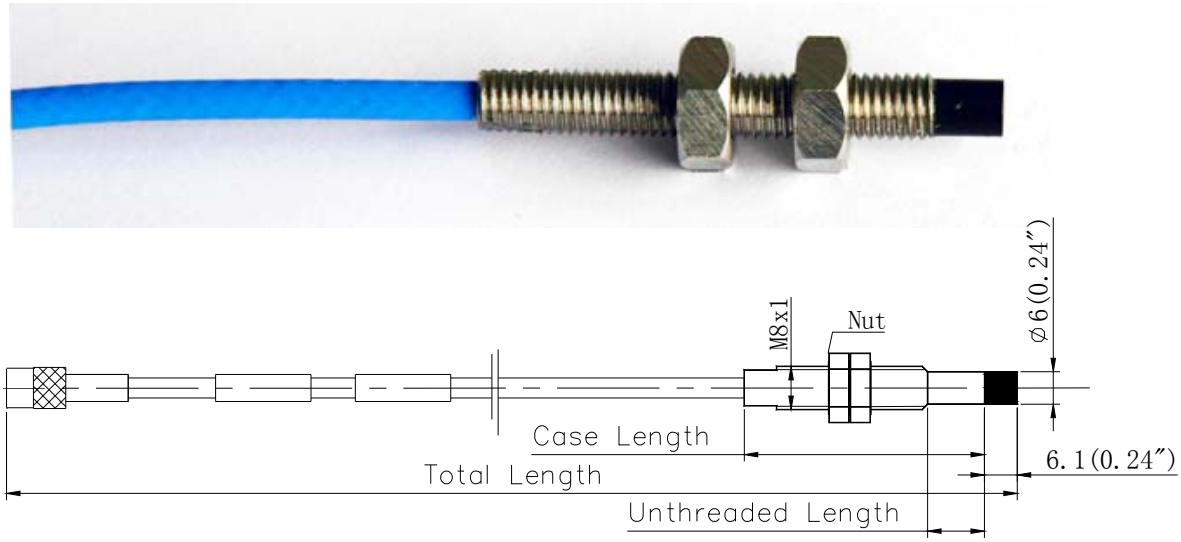
IECEx:Ex ia IIC T4 Ga or Ex ia IIC T2 Gb

IECEx DEK 13.0037X

CSA: Class I, Div 1, Grps ABCD, Ex ia IIC T4

Physical

Driver Height: 75mm (2.95”)
Driver Mounting: 35mm DIN rail mount or Plate mount



TM0105 Probe 5mm

Standard 5mm TM0105 Probes

(Works with TM0181 cables and TM0182 drivers)

TM0105	-XX	-XX	-XX	-XX	-XX
Standard 5mm Probe	**Probe Type**	**Unthreaded Length**	**Case Length**	**Total Length**	**Connector Type**
1/4"-28UNF; without armor	-01	Standard: 00 (0.0 in) Increment: 05 (0.5 in) Maximum: Case length - 1.0 in	Standard: 20 (2.0 in) Increment: 05 (0.5 in) Minimum: 10 (1.0 in) Maximum: 95 (9.5 in)	05 (0.5m) 10 (1.0m) 20 (2.0m) 50 (5.0m) 90 (9.0m)	00 (none) 02 (yes)
1/4"-28UNF; with armor	-02				
1/4"-28UNF; armor with FEP jacket	-023				
M8×1; without armor	-07	Standard: 00 (0 mm) Increment: 01 (10 mm) Maximum: Case length – 20 mm	Standard: 05 (50 mm) Increment: 01 (10 mm) Minimum: 02 (20 mm) Maximum: 25 (250 mm)		
M8×1; with armor	-08				
M8×1; armor with FEP jacket	-083				

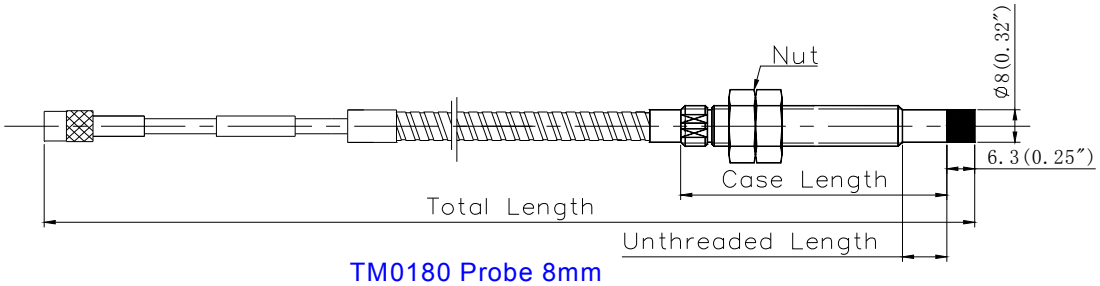
7200 Series 5mm TM0105 Probes

(Works with TM0181-21747 cables and TM0182-18745 drivers)

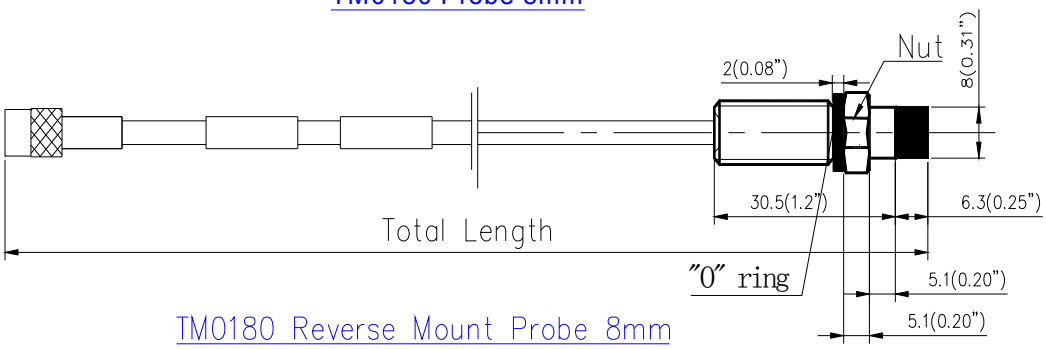
TM0105	-XXXXX	-XX	-XX	-XX	-XX
7200 5mm Probe	**Probe Type**	**Unthreaded Length**	**Case Length**	**Total Length**	**Connector Type**
1/4"-28UNF; without armor	-21500	Standard: 00 (0.0 in) Increment: 05 (0.5 in) Maximum: Case length - 1.0 in	Standard: 20 (2.0 in) Increment: 05 (0.5 in) Minimum: 10 (1.0 in) Maximum: 95 (9.5 in)	05 (0.5m) 10 (1.0m) 50 (5.0m) 90 (9.0m)	00 (none) 02 (yes)
1/4"-28UNF; with armor	-21501				
M8×1; without armor	-22813	Standard: 00 (0 mm) Increment: 01 (10 mm) Maximum: Case length – 20 mm	Standard: 05 (50 mm) Increment: 01 (10 mm) Minimum: 02 (20 mm) Maximum: 25 (250 mm)		
M8×1; with armor	-22812				

Standard 8mm TM0180





TM0180 Probe 8mm



TM0180 Reverse Mount Probe 8mm

(Works with TM0181 cables and TM0182 drivers)

TM0180	-XX	-XX	-XX	-XX	-XX	-X
Standard 8mm Probe	**Probe Type**	**Unthreaded Length**	**Case Length**	**Total Length**	**Connect or Type**	**Driver option**
3/8"-24UNF; without armor	-01	Standard: 00 (0.0 in) Increment: 05 (0.5 in) Maximum: Case length-1.0 in	Standard: 20 (2.0 in) Increment: 05 (0.5 in) Minimum: 10 (1.0 in) Maximum: 95 (9.5 in)	05 (0.5m) 10 (1.0m) 15 (1.5m) 20 (2.0m) 30 (3.0m) 50 (5.0m) 90 (9.0m)	00 (none) 02 (yes)	A or None
3/8"-24UNF; with armor	-02					
3/8"-24UNF; armor with FEP jacket	-023					
M10×1; without armor	-07	Standard: 00 (0 mm) Increment: 01 (10 mm) Maximum: Case length-20 mm	Standard: 05 (50 mm) Increment: 01 (10 mm) Minimum: 02 (20 mm) Maximum: 25 (250 mm)	05 (0.5m) 10 (1.0m) 15 (1.5m) 20 (2.0m) 50 (5.0m) 90 (9.0m)		
M10×1; with armor	-08					
M10×1; armor with FEP jacket	-083					

Reverse mount 3/8"-24UNF; without armor	-06	02 (0.2 in)	12 (1.2 in)	05 (0.5m) 10 (1.0m) 15 (1.5m) 20 (2.0m) 50 (5.0m) 90 (9.0m)	00 (none) 02 (yes)	A or None
Reverse mount M10×1; without armor	-05	05 (5 mm)	03 (30 mm)			

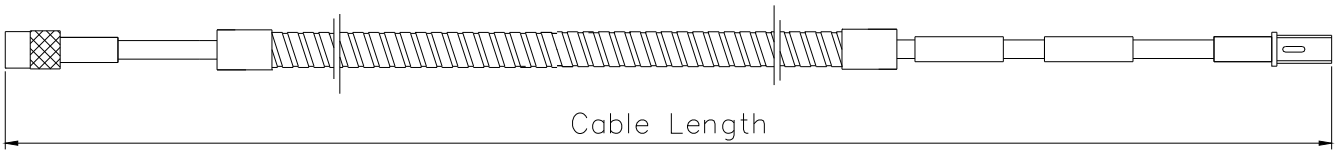
Note：**-A Driver option** is chosen only when the probe TM0180 works with TM0182 driver. When the probe works with other transmitters or monitors, no need to add **–A** option

7200 Series 8mm TM0180 Probes

(Works with TM0181-21747 cables and TM0182-18745 drivers)

TM0180	-XXXXX	-XX	-XX	-XX	-XX
7200 8mm Probe	**Probe Type**	**Unthreaded Length**	**Case Length**	**Total Length**	**Connector Type**
3/8"-24UNF; without armor	-21504	Standard: 00 (0.0 in) Increment: 05 (0.5 in) Maximum: Case length - 1.0 in	Standard: 20 (2.0 in) Increment: 05 (0.5 in) Minimum: 10 (1.0 in) Maximum: 95 (9.5 in)	05 (0.5m) 10 (1.0m) 50 (5.0m) 90 (9.0m)	00 (none) 02 (yes)
3/8"-24UNF; with armor	-21505				
M10×1; without armor	-22811	Standard: 00 (0 mm) Increment: 01 (10 mm) Maximum: Case length - 20 mm	Standard: 05 (50 mm) Increment:01 (10 mm) Minimum: 02 (20 mm) Maximum:25(250mm)		
M10×1; with armor	-22810				
Reverse mount 3/8"-24UNF; without armor	-21508	02 (0.2 in)	12 (1.2 in)	05 (0.5m) 10 (1.0m)	02 (yes)

Extension Cable



Extension Cable

Extension Cable for 5mm and 8mm Probes

(Works with TM0180 probes and TM0182 drivers)

TM0181	-XXXXX	-XXX	-XX
Probe Type	**Model**	**Cable Length**	**Armor**
Standard 5mm and 8mm probe		-030 (3.0 m) -035 (3.5 m) -040 (4.0 m) -045 (4.5 m) -060 (6.0 m) -070 (7.0 m) -075 (7.5 m) -080 (8.0 m) -085 (8.5 m)	-00 (No) -01 (Yes) -03(FEP jacket)
7200 series 5mm and 8mm probe	-21747	-040 (4.0 m) -045 (4.5 m) -080 (8.0 m) -085 (8.5 m)	-00 (No) -01 (Yes)



Proximity Probe Driver for 5mm and 8mm Probes

(Works with TM0180 probes and TM0181 cables)

TM0182	-AXX	-BXX	-CXX
Probe Type	**Cable Length**	**Hazardous Area Certification**	**Mounting**
Standard 8mm probe	-A50 (standard 8mm probe, 5m) -A90 (standard 8mm probe, 9m)	-B00 (no) -B01 (multiple)	-C00 (DIN rail) -C01 (plate mount)
Standard 5mm probe	-A55 (standard 5mm probe, 5m) -A95 (standard 5mm probe, 9m)		
7200 8mm/5mm probe	-A57 (7200 8mm / 5mm probe, 5m, 18745) -A97 (7200 8mm / 5mm probe, 9m, 18745)		

Note: The total length of the probe and cable should be either 5.0 meters or 9.0 meters.