



PA 150

Probe mounting adaptor with proximity measuring system

FEATURES

- » From the Vibro-Meter® product line
- » Non-contact measurement system based on eddy current principle
- » Certified for use in potentially explosive atmospheres
- » Voltage or current output with protection against short circuits
- » Removable housing, with a U-shaped retainer, that allows easier probe installation and gap adjustment
- » Sealed die-cast aluminium housing, with choice of orientation, containing an IQS signal conditioner
- » Stainless steel rod available in lengths from 50 to 800 mm, with mounting position adjustable to ± 10 mm
- » Range of adaptor threads and lengths
- » Choice of cable fitting options



CHARACTERISTICS

- » Frequency response:
DC to 20 kHz (–3 dB)
- » Measuring range:
2 or 4 mm
- » Temperature ranges:
–40 to +180 °C for the transducer
–35 to +85 °C for the signal conditioner



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DESCRIPTION

The PA 150 is a complete self-contained measuring chain, that includes a TQ 412 proximity transducer with a 1 m cable and a standard IQS 452 signal conditioner. All of these system components are contained in a probe adaptor housing, thereby eliminating the need for an external extension cable.

The probe adaptor permits the external mounting of the reverse-mount proximity transducer without machine disassembly. The removable housing makes it easier to adjust the gap, even while the machine is running.

Designed for harsh industrial environments, the adjustable stainless steel rod and aluminium housing assembly protect the transducer and the signal conditioner.

By selecting the appropriate ordering options described below, the system configuration and sensitivity can be matched to the requirements of a particular application.

SPECIFICATIONS

Overall proximity system

Operation (ordering option G)

Sensitivity

- *Ordering option G1* : 8 mV/μm (200 mV/mil)
- *Ordering option G2* : 2.5 μA/μm (62.5 μA/mil)
- *Ordering option G3* : 4 mV/μm (100 mV/mil)
- *Ordering option G4* : 1.25 μA/μm (31.2 μA/mil)

Linear measuring range (typical)

- *Ordering option G1* : 0.15 to 2.15 mm, corresponding to a –1.6 to –17.6 V output
- *Ordering option G2* : 0.15 to 2.15 mm, corresponding to a –15.5 to –20.5 mA output
- *Ordering option G3* : 0.3 to 4.3 mm, corresponding to a –1.6 to –17.6 V output
- *Ordering option G4* : 0.3 to 4.3 mm, corresponding to a –15.5 to –20.5 mA output

Linearity

: See Performance curves on pages 4 and 5

Frequency response

: DC to 20 kHz (–3 dB)

Interchangeability of elements

: All components in system are interchangeable

Environmental – explosive atmospheres (ordering option A)

Available in Ex approved versions for use in hazardous locations

Type of protection Ex i: intrinsic safety		
Europe	Voluntary type examination certificate	LCIE 11 ATEX 3091 X II 1G (Zones 0, 1, 2) Ex ia IIC T6 to T3 Ga
International	IECEx certificate of conformity	IECEx LCI 11.0061X Ex ia IIC T6 to T3 Ga
North America	cCSAus certificate of compliance	1514309 Class I, Divisions 1 and 2, Groups A, B, C, D Ex ia

SPECIFICATIONS *(continued)*

Type of protection Ex nA: non-sparking apparatus		
Europe	Voluntary type examination certificate	LCIE 11 ATEX 1010 X II 3G (Zone 2) Ex nA II T6 to T3 Gc
International	IECEX certificate of conformity	IECEX LCI 11.0063X Ex nA II T6 to T3 Gc
North America	cCSAus certificate of compliance	1514309 Class I, Division 2, Groups A, B, C, D



For specific parameters of the mode of protection concerned and special conditions for safe use, please refer to the certificates that are available from Meggitt SA on demand.

Electrical grounding : The proximity system ground is isolated from the machine ground

System calibration

Calibration temperature : +23°C ± 5°C

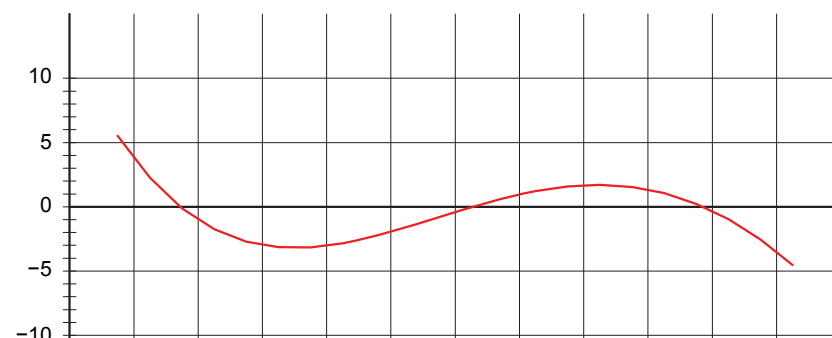
Target material : VCL 140 steel (1.7225)

Note: If special calibration is required, please define the alloy precisely or supply a sample of alloy (min. Ø50 mm / 1 cm thick) according to Meggitt Sensing Systems' drawing number PZ 7009/1.

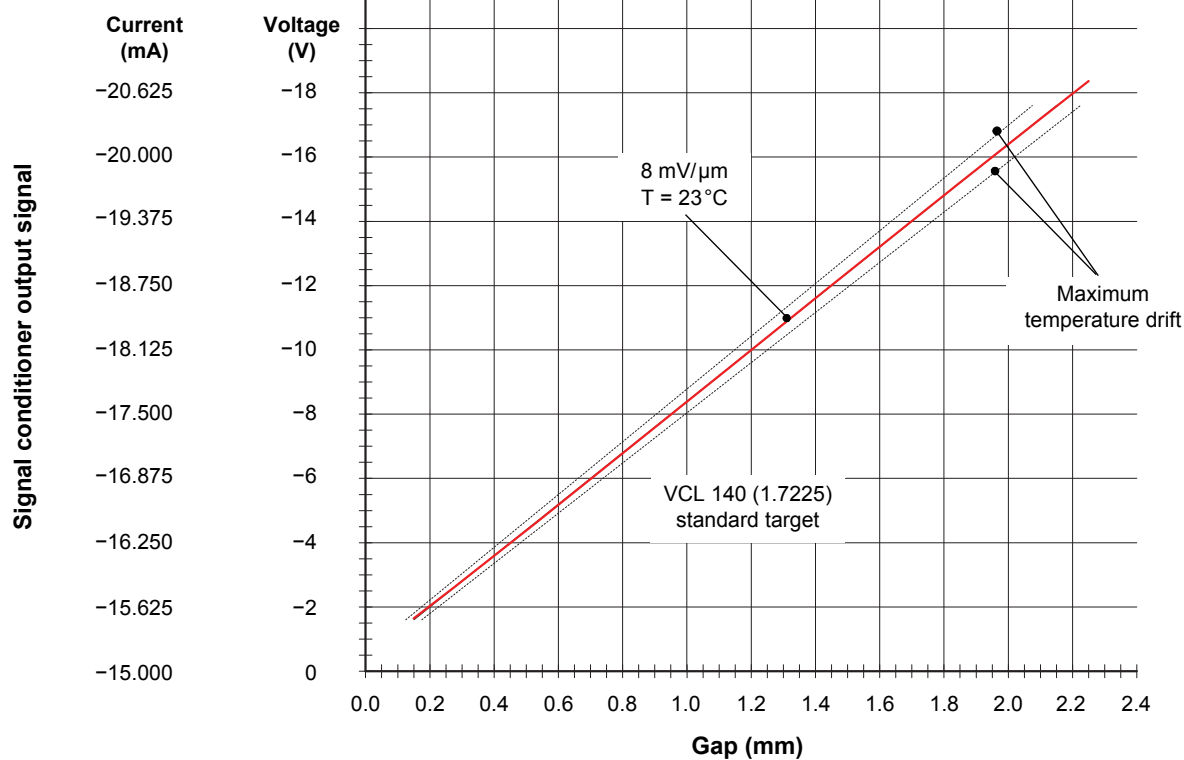
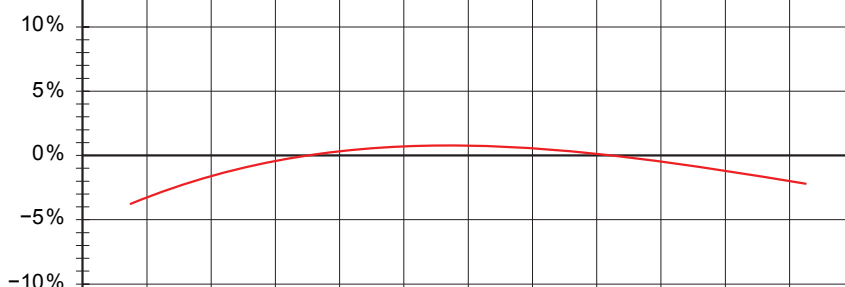
SPECIFICATIONS (continued)

Performance curves for TQ 412 with IQS 452 (ordering options G1 and G2)

Typical gap error (μm)
(Referenced to 8 mV/ μm
(2.5 $\mu\text{A}/\mu\text{m}$) line)



Typical sensitivity error
(Referenced to 8 mV/ μm
(2.5 $\mu\text{A}/\mu\text{m}$))



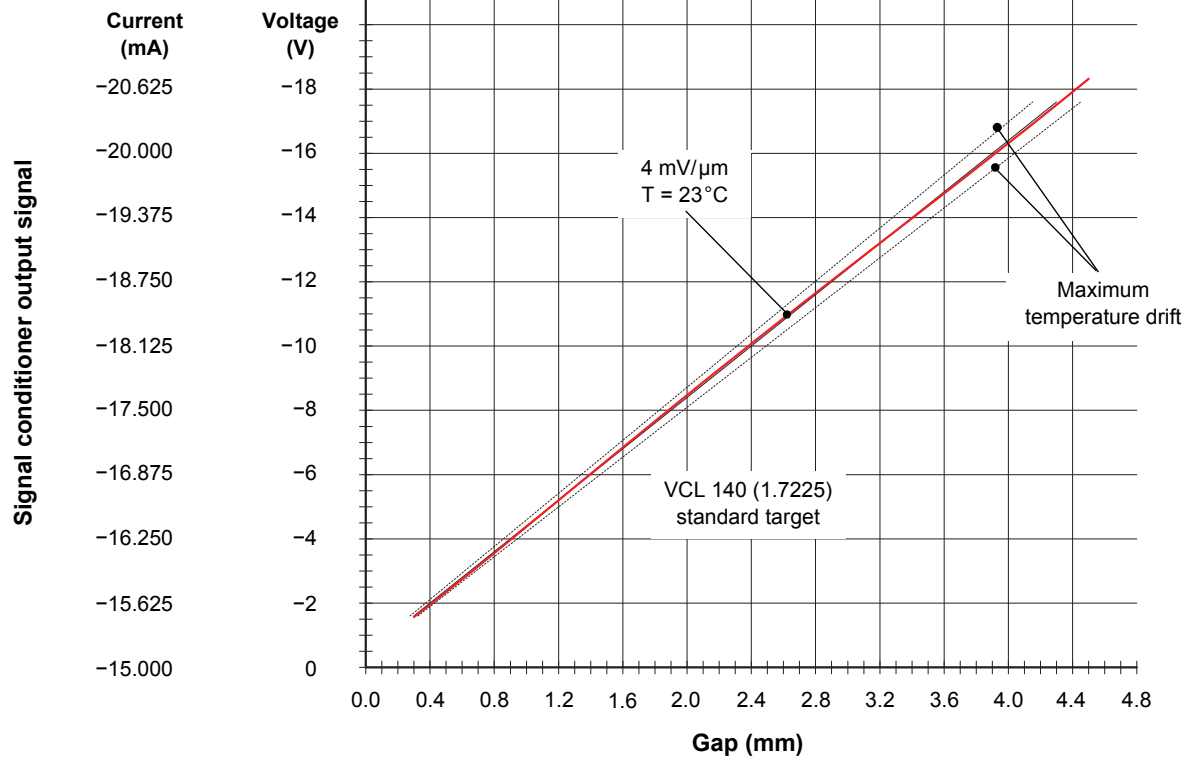
Proximity transducer: TQ 412
Signal conditioner: IQS 452 (ordering options G1 and G2)
Standard target material: VCL 140 (1.7225)
Equivalent materials: A 37.11 (1.0065), AFNOR 40 CD4, AISI 4140

SPECIFICATIONS (continued)

Performance curves for TQ 412 with IQS 452 (ordering options G3 and G4)

Typical gap error (μm)
(Referenced to 4 mV/ μm
(1.25 $\mu\text{A}/\mu\text{m}$) line)

Typical sensitivity error
(Referenced to 4 mV/ μm
(1.25 $\mu\text{A}/\mu\text{m}$))



Proximity transducer: TQ 412
Signal conditioner: IQS 452 (ordering options G3 and G4)
Standard target material: VCL 140 (1.7225)
Equivalent materials: A 37.11 (1.0065), AFNOR 40 CD4, AISI 4140

SPECIFICATIONS *(continued)*

TQ 412 proximity transducer

General

Transducer input requirements : High-frequency power source from an IQS 452 signal conditioner

Environmental

Temperature ranges

- *Transducer* : -40 to +180 °C with drift < 5% (operation).
+180 to +220 °C with drift > 5% (short-term survival).

- *Transducer and cable* : **-40 to +195 °C if used in an Ex zone**

- *Cable and connector* : -40 to +200 °C

- *Heat shrinkable sleeve
(modified Polyolefin)* : -40 to +135 °C

Protection rating : The entire transducer assembly is rated IP68 (transducer tip, integral cable and self-locking miniature coaxial connector, including all joins)
(according to IEC 60529)

Vibration : 5 g peak between 10 and 500 Hz
(according to IEC 60068-2-26)

Shock acceleration : 15 g peak (half sine-wave, 11 ms duration)
(according to IEC 60068-2-27)

Physical characteristics

Transducer construction : Wire coil Ø8 mm, Torlon (polyamide-imide) tip, encapsulated in stainless steel body (AISI 316L) with high-temperature epoxy glue

Integral cable : FEP covered 70 Ω coaxial cable, Ø3.6 mm

Connector : Self-locking miniature coaxial connector (male).
Note: When connecting, this should be hand-tightened, until locked.

SPECIFICATIONS *(continued)*

IQS 452 signal conditioner**Output**

Voltage output, 3-wire configuration

- *Voltage at min. gap* : -1.6 V
- *Voltage at max. gap* : -17.6 V
- *Dynamic range* : 16 V
- *Output impedance* : 500 Ω
- *Short-circuit current* : 45 mA

Current output, 2-wire configuration

- *Current at min. gap* : -15.5 mA
- *Current at max. gap* : -20.5 mA
- *Dynamic range* : 5 mA

Output capacitance

: 1 nF

Output inductance

: 100 μ H**Supply**

Voltage output, 3-wire configuration

- *Voltage* : -20 V to -32 V
- *Current* : -13 \pm 1 mA (-25 mA max.)

Current output, 2-wire configuration

- *Voltage* : -20 V to -32 V
- *Current* : -15.5 to -20.5 mA

Supply input capacitance

: 1 nF

Supply input inductance

: 100 μ H**Environmental**

Temperature ranges

- *Operation* : -35 to +85°C.
0 to +70°C if used in an Ex zone.
- *Storage* : -40 to +85°C

Humidity

: Max. 95% non condensing.
100% condensing (not submerged).

Protection rating

: IP40

(according to IEC 60529)

Vibration

: 2 g peak between 10 and 55 Hz

(according to IEC 60068-2-26)

Shock acceleration

: 15 g peak (half sine-wave, 11 ms duration)

(according to IEC 60068-2-27)

Physical characteristics

Construction material

: Injection moulded aluminium

Electrical connections

Input

: Self-locking miniature coaxial connector (female).
Note: When connecting, this should be hand-tightened, until locked.

Output and power

: Screw terminal strip

SPECIFICATIONS *(continued)*

Probe adaptor

Environmental – explosive atmospheres (ordering option A)

Available in Ex approved versions for use in hazardous locations

Rod (ordering option C)

Material	Stainless steel 1.4301
Length	See Ordering information on page 10
Probe mounting thread	M10x1

Adaptor assembly (ordering options D and E)

Material	: Stainless steel 1.4305
Adaptor length and mounting thread	: See Ordering information on page 10
O-ring seal	: Viton® (FPM), Ø13 x 1.5 mm

Cable fittings (ordering option F)

Stuffing gland	See Ordering information on page 10
Material (ordering option F1)	: Nickel-plated brass

Available in Ex approved versions for use in hazardous locations

Type of protection Ex e: increased safety		
Europe	EC type examination certificate	II 2 G/D (Zones 1, 2) EEx e II



For specific parameters of the mode of protection concerned and special conditions for safe use, please refer to the certificates that are available from Meggitt SA on demand.

Operation (ordering option G)

System sensitivity	: See Ordering information on page 10
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Housing (ordering option H)

Material	: Aluminium alloy
Orientation	
• Ordering option H1	: Longitudinal
• Ordering option H2	: Perpendicular
Cover	: Sealed with a NBR gasket
Colour	: Grey (RAL 7001)
Protection rating (according to IEC 60529)	: IP65
Temperature range	: See the Temperature ranges of individual components on pages 6 and 7
Impact resistance (according to EN 50014)	: >7 joules

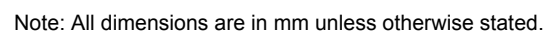
Available in Ex approved versions for use in hazardous locations

Type of protection Ex e: increased safety		
Europe	EC type examination certificate	II 2 G (Zones 1, 2) EEx e II



For specific parameters of the mode of protection concerned and special conditions for safe use, please refer to the certificates that are available from Meggitt SA on demand.

PA 150 probe mounting adaptor with proximity measuring system



ORDERING INFORMATION

To order please specify

Type : PA 150
Designation : Probe mounting adaptor with proximity measuring system
Ordering number : See below

Ordering number:

800 - 150 - 000 - 012



Environment (A)	
Standard	1
Explosive Ex i	2
Explosive Ex nA	3

Rod length (C)*	
Each 2 mm, from 50 to 800 mm	
50 mm min.	050
800 mm max.	800

Adaptor thread (D)	
M24	1
7/8" - 14UNF	2
3/4" NPT	3
G 3/4"	4
1" NPT	5

Adaptor length (E)*	
15 mm	015
105 mm	105
195 mm	195

Housing orientation (H)	
Longitudinal	1
Perpendicular	2

System sensitivity (G)	
1	8 mV/ μ m (2 mm measuring range)
2	2.5 μ A/ μ m (2 mm measuring range)
3	4 mV/ μ m (4 mm measuring range)
4	1.25 μ A/ μ m (4 mm measuring range)

Cable fitting (F)	
0	No cable fitting
1	M12x1.5 cable gland for \varnothing 4 to \varnothing 8 mm cable
2	M16x1.5 / PG9 adaptor with plug (for use with KS 107 flexible protection tube)
4	M16x1.5 / M20x1.5 adaptors with plug for \varnothing 12 mm (max.) cable
5	3/4" NPT

Note: Ordering option F1 allows a connector up to 7.2 mm to be fed through.



*For ordering options C and E, see the notes for NPT thread version in the Mechanical drawings on page 9.

REPLACEMENT PART ORDERING INFORMATION

TQ proximity transducer

Proximity probe	Version	Ordering number
TQ 412 (with 1 m integral cable)	Standard	111-412-000-113
	Ex i	111-412-000-123
	Ex nA	111-412-000-133

IQS signal conditioner

Signal conditioner	Sensitivity	Version	Ordering number
IQS 452 (1 m cable version)	8 mV/ μ m	Standard	204-452-000-252
		Ex i	204-452-000-272
		Ex nA	204-452-000-292
	2.5 μ A/ μ m	Standard	204-452-000-352
		Ex i	204-452-000-372
		Ex nA	204-452-000-392
	4 mV/ μ m	Standard	204-452-000-052
		Ex i	204-452-000-072
		Ex nA	204-452-000-092
	1.25 μ A/ μ m	Standard	204-452-000-152
		Ex i	204-452-000-172
		Ex nA	204-452-000-192

Note: For full product ordering options for the PA 150, see Ordering information on page 10.

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Meggitt Sensing Systems is the operating division of Meggitt specializing in sensing and monitoring systems, which has operated through its antecedents since 1927 under the names of ECET, Endevco, Ferroperm Piezoceramics, Lodge Ignition, Sensorex, Vibro-Meter and Wilcoxon Research. Today, these operations are integrated under one strategic business unit called Meggitt Sensing Systems, headquartered in Switzerland and providing complete systems, using these renowned brands, from a single supply base.

The Meggitt Sensing Systems facility in Fribourg, Switzerland was formerly known as Vibro-Meter SA, but is now Meggitt SA. This site produces a wide range of vibration and dynamic pressure sensors capable of operation in extreme environments, leading-edge microwave sensors, electronics monitoring systems and innovative software for aerospace and land-based turbo-machinery.



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