MEGGITT

DATA SHEET

vibro-meter®

TQ422/TQ432, EA402 and IQS900 proximity measurement system

KEY FEATURES AND BENEFITS

- From the vibro-meter® product line
- Non-contact measurement system based on eddy-current principle
- Ex certified versions for use in hazardous areas (potentially explosive atmospheres)
- TQ422 and TQ432 withstand up to 100 bar
- 1, 5 and 10 m systems
- Temperature-compensated design
- Voltage or current output with protection against short circuits
- Frequency response:
  DC to 20 kHz (−3 dB)
- Measurement range:
  2 or 4 mm
- Temperature range:
  −25 to +140 °C

APPLICATIONS

- Shaft relative vibration and gap/position measurement chains for machinery protection and/or condition monitoring
- Ideal for use with VM600^{Mk2}/VM600 and VibroSmart® machinery monitoring systems
- High-pressure applications

DESCRIPTION

The TQ422/TQ432, EA402 and IQS900 form a proximity measurement system from Meggitt's vibro-meter® product line. This proximity measurement system allows contactless measurement of the relative displacement of moving machine elements.

TQ4xx-based proximity measurement systems are particularly suitable for measuring the relative vibration and axial position of rotating machine shafts, such as those found in steam, gas and hydraulic turbines, as well as in alternators, turbo-compressors and pumps.

Meggitt SA, Route de Moncor 4, Case postale, 1701 Fribourg, Switzerland

Tel: +41 26 407 11 11
Fax: +41 26 407 13 01
energy@ch.meggitt.com
www.meggittsensing.com/energy
www.meggitt.com

DESCRIPTION *(continued)*

The system is based around a TQ422 or TQ432 non-contact sensor and an IQS900 signal conditioner. Together, these form a calibrated proximity measurement system in which each component is interchangeable. The system outputs a voltage or a current proportional to the distance between the transducer tip and the target, such as a machine shaft.

The TQ422 and the TQ432 are specially designed for high-pressure applications, with the transducer tip withstanding pressures of up to 100 bar. This makes them particularly suitable for measuring relative displacement or vibration on submerged pumps and various types of hydraulic turbines (for example, Kaplan and Francis). This transducer is also suitable for use when the region of the output of the transducer is cluttered.

The active part of the transducer is a coil of wire that is moulded inside the tip of the device, made of PEEK (polyetheretherketone). The transducer body is made of stainless steel. The target material must, in all cases, be metallic.

The transducer body is available only with metric thread. The TQ432 version is intended for reverse-mount applications. Both the TQ422 and the TQ432 have an integral coaxial cable, terminated with a self-locking miniature coaxial connector. Various cable lengths (integral and extension) can be ordered.

The IQS900 signal conditioner contains a high-frequency modulator/demodulator that supplies a driving signal to the transducer. This generates the necessary electro-magnetic field used to measure the gap. The conditioner circuitry is made of high-quality components and is mounted in a painted aluminium housing.

Note: The IQS900 signal conditioner matches or betters the outstanding measurement performance and specifications of the IQS450 signal conditioner, which it replaces. Accordingly, the IQS900 is compatible with all TQ9xx and TQ4xx proximity sensors / measurement chains.

In addition, the IQS900 signal conditioner includes improvements such as: SIL 2 “by design”, improved frame-voltage immunity, improved electromagnetic immunity and emissions, smaller output impedance (voltage output), optional diagnostic circuitry (that is, built-in self-test (BIST)), raw output pin, test input pin, new DIN-rail mounting adaptor and removable screw-terminal connectors for easier installation.

The TQ422 and the TQ432 transducers can be matched with a single EA402 extension cable to effectively lengthen the front-end. Optional housings, junction boxes and interconnection protectors are available for the mechanical and environmental protection of the connection between the integral and extension cables.

TQ4xx-based proximity measurement systems can be powered by associated machinery monitoring systems such as VM600^{Mk2}/VM600 modules (cards) or VibroSmart® modules, or by another power supply.

For specific applications, contact your local Meggitt representative.

SPECIFICATIONS

Overall proximity measurement system

Operation

Sensitivity

• Ordering option B21	: 8 mV/µm (200 mV/mil)
• Ordering option B22	: 2,5 µA/µm (62,5 µA/mil)
• Ordering option B23	: 4 mV/µm (100 mV/mil)
• Ordering option B24	: 1.25 µA/µm (31.2 µA/mil)

Linear measurement range (typical)

• Ordering option B21	: 0 to 2.0 mm, corresponding to a −2.4 to −18.4 V output
• Ordering option B22	: 0 to 2.0 mm, corresponding to a −15.5 to −20.5 mA output
• Ordering option B23	: 0 to 4.0 mm, corresponding to a −2.4 to −18.4 V output
• Ordering option B24	: 0 to 4.0 mm, corresponding to a −15.5 to −20.5 mA output
Linearity	: See **Performance curves on page 9**
Frequency response	: DC to 20 kHz (−3 dB)
Interchangeability of elements	: All components in system are interchangeable

SPECIFICATIONS *(continued)*

Environmental

Potentially explosive atmospheres

Available in Ex approved versions for use in hazardous locations – TQ422/TQ432 and EA402

Type of protection Ex i: intrinsic safety (**ordering option A2**)		
Europe	EC type examination certificate	Ⓔx II 1G (Zones 0, 1, 2) LCIE 11 ATEX 3091 X Ex ia IIC T6…T3 Ga
International	IECEx certificate of conformity	IECEx LCI 11.0061X Ex ia IIC T6…T3 Ga
North America	cCSAus certificate of compliance	cCSAus 1514309 Class I, Divisions 1 and 2, Groups A, B, C, D Ex ia
South Korea	KGS certificate of conformity	KGS 15-GA4BO-0664X Ex ia IIC T6 to T3
Russian Federation	EAЭC RU certificate of conformity	EAЭC RU C-CH.AД07.B.03003/21 0Ex ia IIC T6…T3 Ga X

Type of protection Ex nA: non-sparking (**ordering option A3**)		
Europe	Voluntary type examination certificate	Ⓔx II 3G (Zone 2) LCIE 11 ATEX 1010 X Ex nA II T6…T3 Gc
International	IECEx certificate of conformity	IECEx LCI 11.0063X Ex nA II T6…T3 Gc
North America	cCSAus certificate of compliance	cCSAus 1514309 Class I, Division 2, Groups A, B, C, D
Russian Federation	EAЭC RU certificate of conformity*	EAЭC RU C-CH.AД07.B.03003/21 2Ex nA II T6…T3 Gc X

*Not engraved/marked on the products.

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

⚠ **For the most recent information on the Ex certifications that are applicable to this product, refer to the *Ex product register (PL-1511) document* that is available from Meggitt SA.**

SPECIFICATIONS *(continued)*

Available in Ex approved versions for use in hazardous areas – IQS9xx (**ordering option code A5**)

Protection mode	IQS9xx
Europe	
ec (Gas)	Ⓔx II 3 G (Zone 2) Ex ec IIC T6 or T5 Gc LCIE 21 ATEX 1004 X T6: For −40°C ≤ T_{amb} ≤ +70°C T5: For −40°C ≤ T_{amb} ≤ +85°C
ia (Gas)	Ⓔx II 1 G (Zones 0, 1, 2) Ex ia IIC T6 or T5 Ga LCIE 21 ATEX 3002 X T6: For −40°C ≤ T_{amb} ≤ +70°C T5: For −40°C ≤ T_{amb} ≤ +85°C
ia (Dust)	Ⓔx II 1 D (Zones 20, 21, 22) Ex ia IIIC T_{200} 80°C…T_{200} 115°C Da LCIE 21 ATEX 3002 X T_{200} 80°C: For −40°C ≤ T_{amb} ≤ +50°C T_{200} 95°C: For −40°C ≤ T_{amb} ≤ +65°C T_{200} 115°C: For −40°C ≤ T_{amb} ≤ +85°C
International	
ec (Gas)	Ex ec IIC T6 or T5 Gc IECEx LCIE 21.0005X T6: For −40°C ≤ T_{amb} ≤ +70°C T5: For −40°C ≤ T_{amb} ≤ +85°C
ia (Gas)	Ex ia IIC T6 or T5 Ga IECEx LCIE 21.0006X T6: For −40°C ≤ T_{amb} ≤ +70°C T5: For −40°C ≤ T_{amb} ≤ +85°C
ia (Dust)	Ex ia IIIC T_{200} 80°C…T_{200} 115°C Da IECEx LCIE 21.0006X T_{200} 80°C: For −40°C ≤ T_{amb} ≤ +50°C T_{200} 95°C: For −40°C ≤ T_{amb} ≤ +65°C T_{200} 115°C: For −40°C ≤ T_{amb} ≤ +85°C

SPECIFICATIONS *(continued)*

Protection mode	IQS9xx
North America	
ec (Gas)	Class I, Division 2, Groups A, B, C, D T6…T5 Ex ec IIC T6…T5 Gc Class I, Zone 2, AEx ec IIC T6…T5 Gc cCSAus 80084516
ia (Gas)	IS Class I, Division 1, Groups A, B, C, D T6 or T5 Ex ia IIC T6 or T5 Ga Class I, Zone 0, AEx ia IIC T6 or T5 Ga cCSAus 80084516
ia (Dust)	Class II, Division 1, Groups E, F, G T80°C…T115°C Ex ia IIIC T80°C…T115°C Da Zone 20, AEx ia IIIC T80°C…T115°C Da cCSAus 80084516
South Korea	
ec (Gas)	Ex ec IIC T6…T5 Gc KGS 21-GA4BO-0355X T6: For −40°C ≤ T_{amb} ≤ +70°C T5: For −40°C ≤ T_{amb} ≤ +85°C
ia (Gas)	Ex ia IIC T6 or T5 Ga KGS 21-GA4BO-0353X T6: For −40°C ≤ T_{amb} ≤ +70°C T5: For −40°C ≤ T_{amb} ≤ +85°C
ia (Dust)	Ex ia IIIC T_{200} 80°C…T_{200} 115°C Da KGS 21-GA4BO-0352X T_{200} 80°C: For −40°C ≤ T_{amb} ≤ +50°C T_{200} 95°C: For −40°C ≤ T_{amb} ≤ +65°C T_{200} 115°C: For −40°C ≤ T_{amb} ≤ +85°C
United Kingdom**	
ec (Gas)	Ⓔx II 3 G (Zone 2) Ex ec IIC T6 or T5 Gc CML 21 UKEX 4549 X T6: For −40°C ≤ T_{amb} ≤ +70°C T5: For −40°C ≤ T_{amb} ≤ +85°C
ia (Gas)	Ⓔx II 1 G (Zones 0, 1, 2) Ex ia IIC T6 or T5 Ga CML 21 UKEX 2548 X T6: For −40°C ≤ T_{amb} ≤ +70°C T5: For −40°C ≤ T_{amb} ≤ +85°C
ia (Dust)	Ⓔx II 1 D (Zones 20, 21, 22) Ex ia IIIC T_{200} 80°C…T_{200} 115°C Da CML 21 UKEX 2548 X T_{200} 80°C: For −40°C ≤ T_{amb} ≤ +50°C T_{200} 95°C: For −40°C ≤ T_{amb} ≤ +65°C T_{200} 115°C: For −40°C ≤ T_{amb} ≤ +85°C
**Not engraved/marked on the products.	

SPECIFICATIONS *(continued)*

Protection mode	IQS9xx

Russian Federation	
ec (Gas)	2Ex e IIC T6…T5 Gc X EAЭC RU C-CH.AД07.B.03744/21 T6: For −40°C ≤ T_{amb} ≤ +70°C T5: For −40°C ≤ T_{amb} ≤ +85°C
ia (Gas)	0Ex ia IIC T6…T5 Ga X EAЭC RU C-CH.AД07.B.03744/21 T6: For −40°C ≤ T_{amb} ≤ +70°C T5: For −40°C ≤ T_{amb} ≤ +85°C
ia (Dust)	Ex ia IIIC T_{200} 80°C…T_{200} 115°C Da X EAЭC RU C-CH.AД07.B.03744/21 T_{200} 80°C: For −40°C ≤ T_{amb} ≤ +50°C T_{200} 95°C: For −40°C ≤ T_{amb} ≤ +65°C T_{200} 115°C: For −40°C ≤ T_{amb} ≤ +85°C

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

⚠ **For an IQS9xx signal conditioner with protection mode "Ex ec" located in an Ex Zone 2, the user must ensure that the IQS9xx is installed in an industrial housing or enclosure that ensures a protection rating of at least IP54 (or equivalent).**

⚠ **For the most recent information on the Ex certifications that are applicable to this product, refer to the *Ex product register (PL-1511) document* that is available from Meggitt SA.**

Approvals

Conformity	: European Union (EU) declaration of conformity (CE marking). EAC marking, Eurasian Customs Union (EACU) certificate/ declaration of conformity.
Electromagnetic compatibility	
• TQ422/TQ432 and EA402	: EN 61000-6-2:2005. EN 61000-6-4:2007 + A1:2011. TR CU 020/2011.
• IQS900	: EN 61000-6-2:2005. EN 61000-6-4:2007 + A1:2011. EN 61326-1:2013. EN 61326-3-2:2008 (SIL).
Electrical safety	: EN 61010-1:2010
Environmental management	: RoHS compliant (2011/65/EU)
Hazardous areas	: Ex approved versions (see **Potentially explosive atmospheres starting on page 4**)
Russian federal agency for technical regulation and metrology (Rosstandart)	: Pattern approval certificate No 60859-15

SPECIFICATIONS

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 (minimum: Ø50 mm / 1 cm thick) according to Meggitt SA drawing number PZ 7009/1.

Total system length

The total system length (TSL) is the sum of the length of the TQ4xx transducer's integral cable and the length of the EA40x extension cable. The supported TSLs can be obtained from different combinations of cables.

Total system lengths

- 1 m : 1.0 m integral cable with no extension cable
- 5 m : 1.0 m integral cable + 4.0 m extension cable.
  5.0 m integral cable with no extension cable.
- 10 m : 1.0 m integral cable + 9.0 m extension cable.
  5.0 m integral cable + 5.0 m extension cable.
  10.0 m integral cable with no extension cable.

Note: The combination of cables selected for a particular total system length depends on the application. For example, to obtain the optimum location for the separation between the integral and extension cables or to eliminate the requirement for an extension cable.

Total system length trimming

Due to the characteristics of the coaxial cable, an "electrical trimming" of the nominal length of extension cables is necessary to optimize the system performance and the transducer interchangeability.

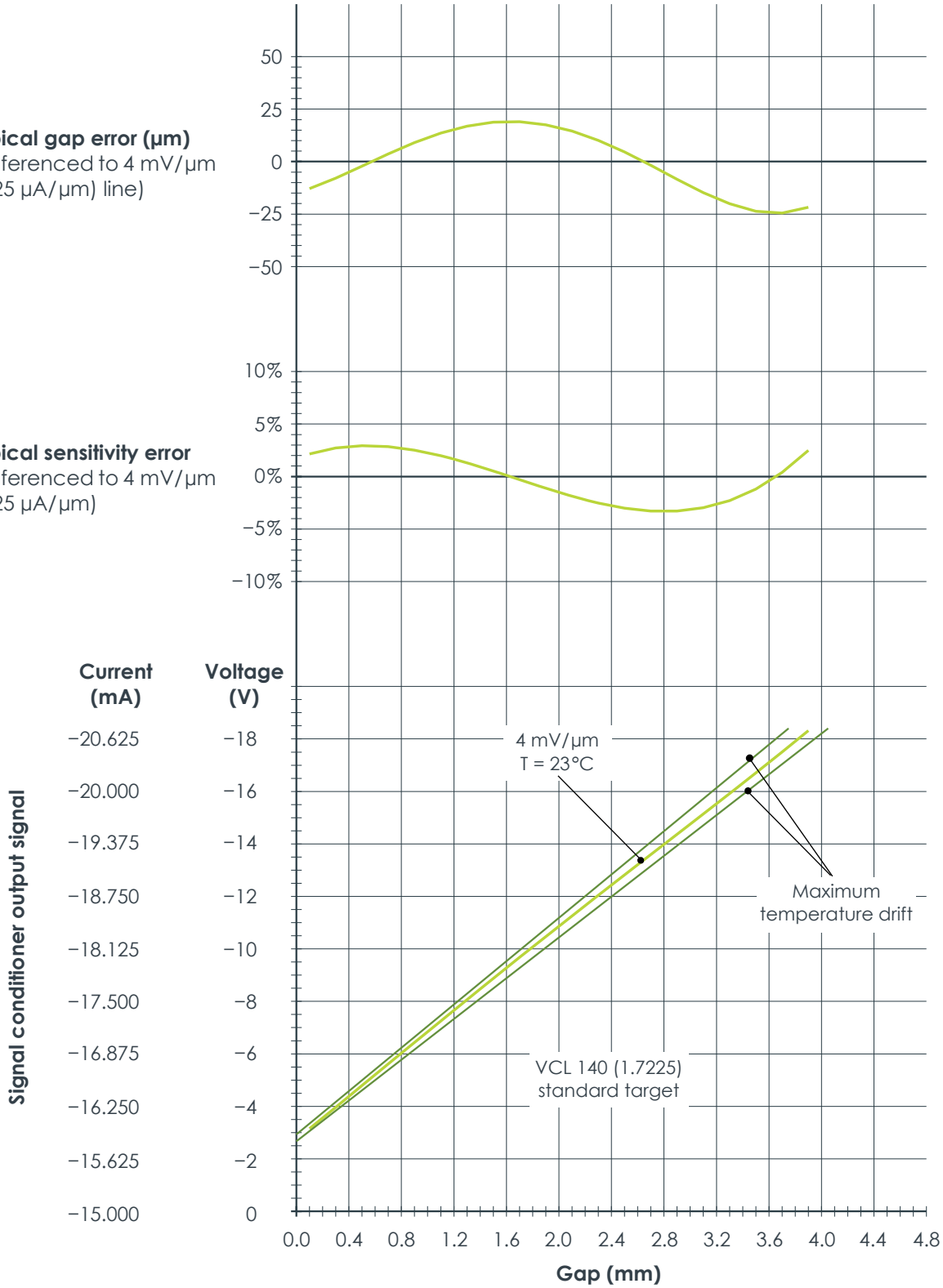
TSL for a 1 m measurement chain	: 0.9 m minimum
TSL for a 5 m measurement chain	: 4.4 m minimum
TSL for a 10 m measurement chain	: 8.8 m minimum

SPECIFICATIONS *(continued)*

Performance curves for TQ422 or TQ432 with IQS900

Typical gap error (µm)
(Referenced to 4 mV/µm (1.25 µA/µm) line)

Typical sensitivity error
(Referenced to 4 mV/µm (1.25 µA/µm)



Proximity transducer: TQ422 or TQ432
Signal conditioner: IQS900
Standard target material: VCL 140 (1.7225)
Equivalent materials: A 37.11 (1.0065), AFNOR 40 CD4, AISI 4140

SPECIFICATIONS *(continued)*

TQ422 and TQ432 proximity transducers and EA402 extension cable

General

Transducer input requirements	: High-frequency power source from an IQS900 signal conditioner

Environmental

Temperature ranges	
• Transducer	: −25 to +140°C with drift <5%
• Transducer and cable	: **−40 to +195°C if used in an Ex Zone**
• Cable and connector	: −40 to +200°C
Maximum pressures	
• Transducer tip	: 100 bar (TQ422 and TQ432)
• Transducer/cable assembly	: 10 bar (with flexible hose option). 1 bar (without flexible hose option).
Protection rating (according to IEC 60529)	: The head of the proximity transducer (transducer tip and integral cable) is rated IP68
Vibration (according to IEC 60068-2-26)	: 5 g peak between 10 and 500 Hz
Shock acceleration (according to IEC 60068-2-27)	: 15 g peak (half sine-wave, 11 ms duration)

Physical characteristics

Transducer construction	: Wire coil Ø8 mm, PEEK (polyetheretherketone) tip, encapsulated in stainless steel body (1.4435) with high-temperature epoxy glue
Integral and extension cables	: FEP covered 70 Ω coaxial cable, Ø3.6 mm
Connectors	: Self-locking miniature coaxial connectors. Note: When connecting, these should be hand-tightened until locked.
Optional protection	
• Flexible stainless steel hose (protection tube)	: The stainless steel hose of the TQ422 and TQ432 provides additional mechanical protection and is leak-tight. The stainless steel hose of the EA402 provides additional mechanical protection but is not leak-tight.
• FEP sheath (extruded fluorinated ethylene propylene)	: The FEP sheath of the EA402 provides resistance to almost all chemicals and low permeability to liquids, gases and moisture. It is also flexible, low friction and mechanically tough.

SPECIFICATIONS *(continued)*

IQS900 signal conditioner

Current output (2-wire signal transmission)

Current at min. / max. gap	: −15.5 mA / −20.5 mA
Measurement range	: 5 mA (corresponding to 2 mm)
Output sensitivity	: See **Operation on page 3** and **IQS900 signal conditioner on page 17**
Nominal output signal	
• Without diagnostics	: −15.5 to −20.5 mA
• With diagnostics	: −15.5 to −20.5 mA indicates normal operation. Other current values (>−15.5 or <−20.5 mA) indicate a problem with the measurement chain (sensor, cabling and/or signal conditioner).
Output impedance	: >60 kΩ. Note: Recommended monitoring system input impedance: ≤350 Ω.

Voltage output (3-wire signal transmission)

Voltage at min. / max. gap	: −1.6 V / −17.6 V
Measurement range	: 16 V (corresponding to 2 mm)
Output sensitivity	: See **Operation on page 3** and **IQS900 signal conditioner on page 17**
Nominal output signal	
• Without diagnostics	: −1.6 t o −17.6 V
• With diagnostics	: −1.6 t o −17.6 V indicates normal operation. Other current values (>−1.6 or <−17.6 V) indicate a problem with the measurement chain (sensor, cabling and/or signal conditioner).
Output impedance (small signal)	: <100 Ω at DC. <300 Ω at 20 kHz. Note: Recommended monitoring system input impedance: ≥50 kΩ. The low output impedance enables operation with a wider range of galvanic separation units / safety barriers, without loss of performance. For example, an IQS900 (output impedance 100 Ω) connected to a third-party galvanic isolator (input impedance 10 kΩ) will see 1% max. signal loss due to impedance matching.
Protection	: Short-circuit (35 mA), overvoltage (−33 V_{DC} typical)
Output voltage swing	: −0.05 to −22.5 V with a 50 kΩ load and a −24 V_{DC} power supply. −0.05 to −21.5 V with a 10 kΩ load and a −24 V_{DC} power supply.

Raw output (RAW/COM)

Output voltage range	: −0.8 to −8.8 V (nominal)
Output impedance	: <15 kΩ up to 20 kHz. <10 kΩ for DC measurement. Note: Recommended test equipment input impedance: >1 MΩ.
Protection	: Short-circuit, overvoltage (−33 V_{DC} typical)

Test input (TEST/COM)

Input voltage range	: ±0.1 to 4.0 V_{PK-PK} (nominal), depending on the measured gap (DC)
Input impedance	: 500 kΩ. Note: Recommended test equipment output impedance: >5 kΩ.
Protection	: Overvoltage (−33 V_{DC} typical)

SPECIFICATIONS *(continued)*

Power supply (to IQS900)

Input voltage range

- With a current output signal (2-wire signal transmission) : −18 to −30 V_{DC} (nominal)
- With a voltage output signal (3-wire signal transmission) : −19 to −30 V_{DC} (nominal)

Current consumption (with nominal 24 V_{DC} supply) : 25 mA max.

Overvoltage protection (diode) : −33 V_{DC} typical

Note: The IQS900 should be powered (energised) using a limited-power, low-voltage power supply such as a sensor power supply output provided a VM600^{Mk2}/VM600 or VibroSmart® monitoring and/or protection system, a GSI127 galvanic separation unit or other suitable power supply.
In safety-related applications, an IQS900 must be powered using a limited-power, low-voltage power supply with a safe limitation of −30 V_{DC} (nominal), even in the event of a single fault with the power supply.

Environmental

Temperature

- Operating and storage : −40 to 85°C (−40 to 185°F)

Humidity : 0 to 95%, non-condensing

Protection rating (according to IEC 60529) : IP20.
Note: The IQS900 is suitable for indoor use only unless it is installed in an industrial housing or enclosure that ensures a higher level of environmental protection.

Flammability : UL94 V-0

Vibration (according to IEC 60068-2-6) : 5 g peak between 10 and 500 Hz

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

Connectors

Self-locking miniature coaxial connector (bidirectional) : 1 contact for sensor-side signal:
sensor (connects to TQ9xx sensor or EA902 cable)

Screw-terminal connector (input) : 4 contacts for test signals:
raw output (RAW/COM) and
test input (TEST/COM)

Screw-terminal connector (output) : 4 contacts for monitor-side signals:
measurement output (O/P/COM) and
power supply input (−24V/COM)

Screw-terminal connectors

- Clamping range (min. to max.) : 0.2 to 1.5 mm^2 (24 to 16 AWG)
- Tightening torque (min. to max.) : 0.2 to 0.25 N•m (0.15 to 0.18 lb-ft)

Note: The IQS900 features removal screw-terminal connectors that can unplugged from the main body of its housing to simplify installation and mounting.

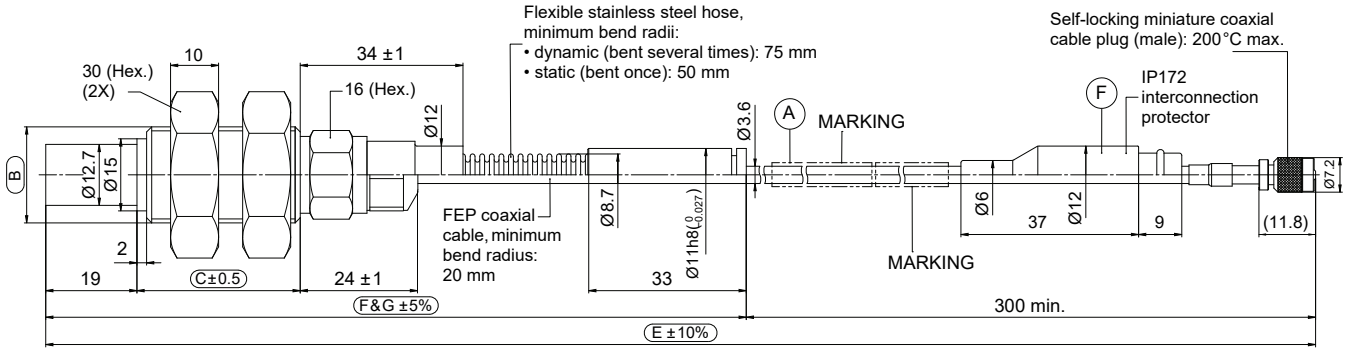
SPECIFICATIONS *(continued)*

Physical characteristics

Electrical connections	: Self-locking miniature coaxial connector and removable screw-terminal connectors (see **Connectors on page 12**)
Housing material	: Injection-moulded aluminium, painted
Dimensions	: See **Mechanical drawings and ordering information on page 14**
Weight	: 200 g (0.44 lb) approx.
Mounting	
• Without DIN-rail mounting adaptor	: Two M4 screws
• With DIN-rail mounting adaptor (ordering option code G2)	: MA130 DIN-rail mounting adaptor for IPC707 and IQS900 signal conditioners. Suitable for TH 35 DIN rails (according to EN 50022 / IEC 60715). For example, TH 35-7.5 or TH 35-15. See **Accessories on page 18**.

MECHANICAL DRAWINGS AND ORDERING INFORMATION

TQ422 proximity transducer



Ordering number:

111 - 422 - 000 - 013 - A B 1 C E F G H

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

Body thread (B)	
M20 x 1.5	1

Body length (C)	
42 mm	042
72 mm	072
92 mm	092
120 mm	120
150 mm	150
180 mm	180

Integral cable length (E)	
1 m	010
5 m	050
10 m	100

	Optional protection (F)	
	Cable	**Connector**
0	None	None
1	Flexible hose	None
5	None	IP172
6	Flexible hose	IP172

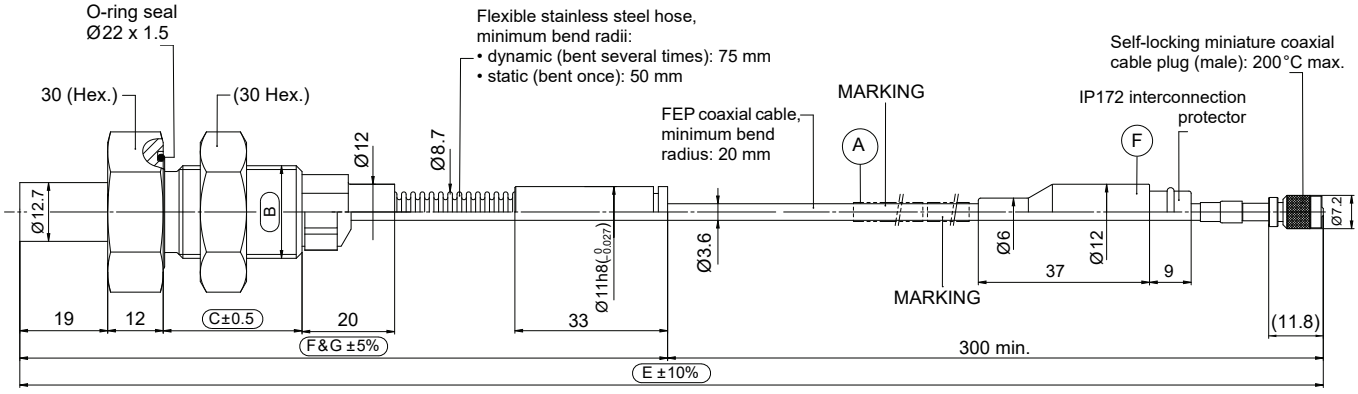
Flexible hose length (G)	
000	None
010	1 m nominal
050	5 m nominal
100	10 m nominal

Total system length (H) See note 1	
01	1 m
05	5 m
10	10 m

Notes
All dimensions are in mm unless otherwise stated.
1. The Total system length (H) = TQ422 integral cable length (E) + EA402 extension cable length.
For information on combining integral and extension cables to obtain a particular total system length, see **Total system length on page 8**. For information on cable length tolerances, see **Total system length trimming on page 8**.

MECHANICAL DRAWINGS AND ORDERING INFORMATION *(continued)*

TQ432 proximity transducer



Ordering number:

111 - 432 - 000 - 013 **A** **B** **1** **C** **E** **F** **G** **H**

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

Body thread (B)	
M20 x 1.5	1

Body length (C)	
42 mm	042

Integral cable length (E)	
1 m	010
5 m	050
10 m	100

Total system length (H) See note 1	
01	1 m
05	5 m
10	10 m

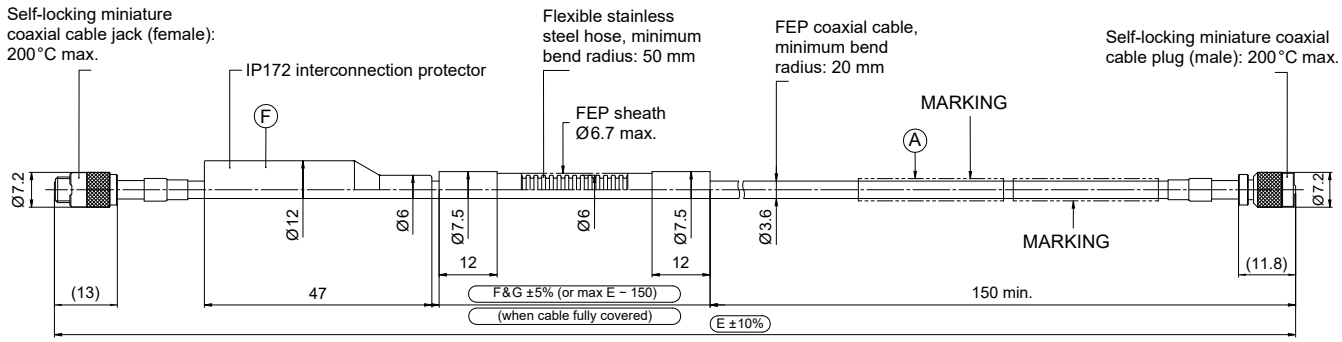
Flexible hose length (G)	
000	None
010	1 m nominal
050	5 m nominal
100	10 m nominal

Optional protection (F)		
	Cable	Connector
0	None	None
1	Flexible hose	None
5	None	IP172
6	Flexible hose	IP172

Notes
All dimensions are in mm unless otherwise stated.
1. The Total system length (H) = TQ432 integral cable length (E) + EA402 extension cable length.
For information on combining integral and extension cables to obtain a particular total system length, see **Total system length on page 8**. For information on cable length tolerances, see **Total system length trimming on page 8**.

MECHANICAL DRAWINGS AND ORDERING INFORMATION *(continued)*

EA402 extension cable



Ordering number: 913 - 402 - 000 - 013 A E F G

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

Extension cable length (E) See note 1	
4.0 m ±400 mm	040
5.0 m ±500 mm	050
9.0 m ±900 mm	090

Optional protection (F) See note 2		
Cable	**Connector**	
None	None	0
Flexible hose	None	1
Flexible hose with FEP sheath	None	2
None	IP172	5
Flexible hose	IP172	6
Flexible hose with FEP sheath	IP172	7

Flexible hose length (G) Each 0.1 m, from 0 to 8.8 m	
000	None
001	0.1 m min.
088	8.8 m max.

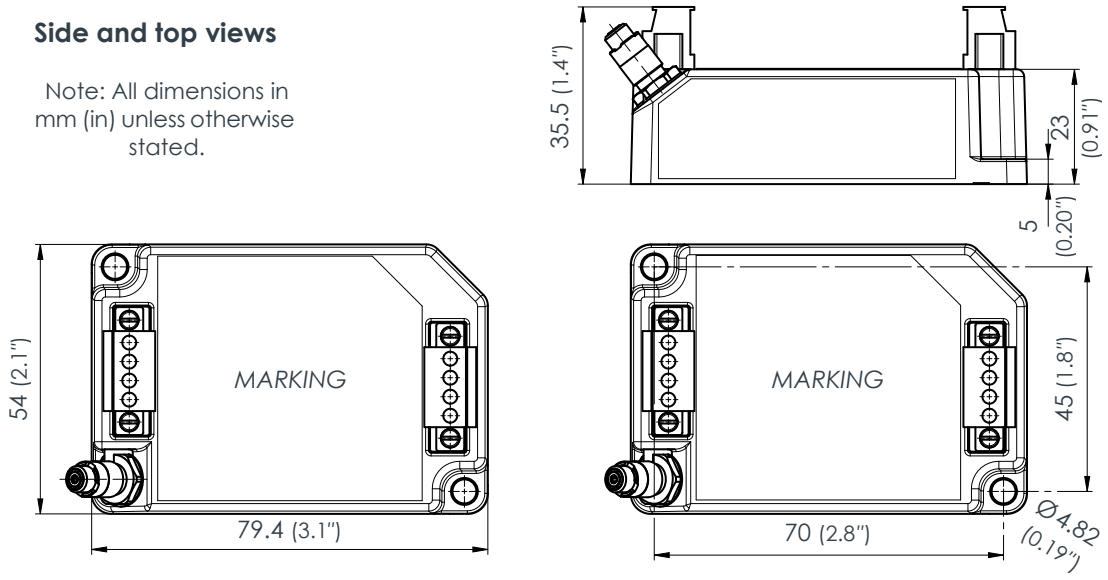
Notes
All dimensions are in mm unless otherwise stated.
1. The total system length = TQ422 or TQ432 integral cable length + EA402 extension cable length (E).
   For information on combining integral and extension cables to obtain a particular total system length, see **Total system length on page 8**. For information on cable length tolerances, see **Total system length trimming on page 8**.
2. When optional protection such as a flexible stainless steel hose with or without an FEP sheath is ordered:
   Flexible hose length (G) max. = EA402 extension cable length (E) − 150 mm, for an extension cable that is protected to the maximum extent possible ("cable fully covered").

MECHANICAL DRAWINGS AND ORDERING INFORMATION *(continued)*

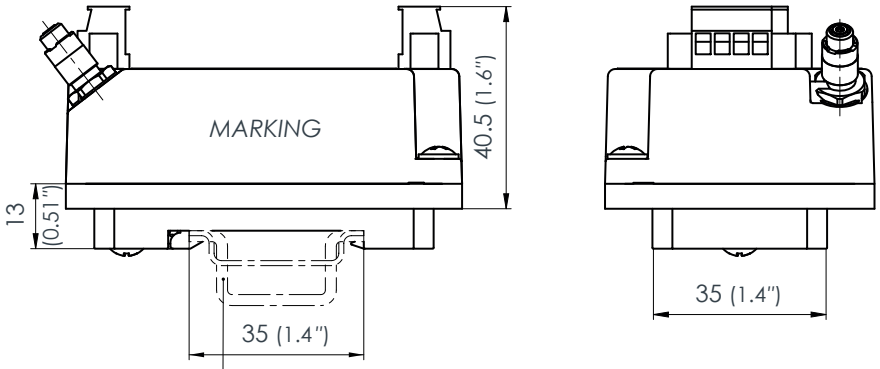
IQS900 signal conditioner

Side and top views

Note: All dimensions in mm (in) unless otherwise stated.



Side and end views with DIN-rail mounting adaptor (ordering option code G2)



IQS900 mounted on MA130 DIN-rail adaptor

Ordering number: 204 - 900 - 000 - 011 - A B C H I

Environment (A) [1]	
Standard	1
Explosive (Ex)	5

Measurement range	Sensitivity (B)	
2 mm	8 mV/µm	11
	2.5 µA/µm	12

Diagnostics (C) [2]	
Without diagnostics	1
With diagnostics (SIL)	2

Total system length (H)	
5 m	05
10 m	10

Installation (I)	
Without DIN-rail adaptor	0
With DIN-rail adaptor (MA130)	1

Notes
See following page.

MECHANICAL DRAWINGS AND ORDERING INFORMATION *(continued)*

IQS900 signal conditioner *(continued)*

Notes

1. Ordering option code **A5** ("Ex") specifies an IQS900 signal conditioner suitable for use for use in hazardous areas.
• For an IQS900 signal conditioner with protection mode "Ex" located in an Ex Zone 2, the user must ensure that the IQS900 is installed in an industrial housing or enclosure that ensures a protection rating of at least IP54 (or equivalent).

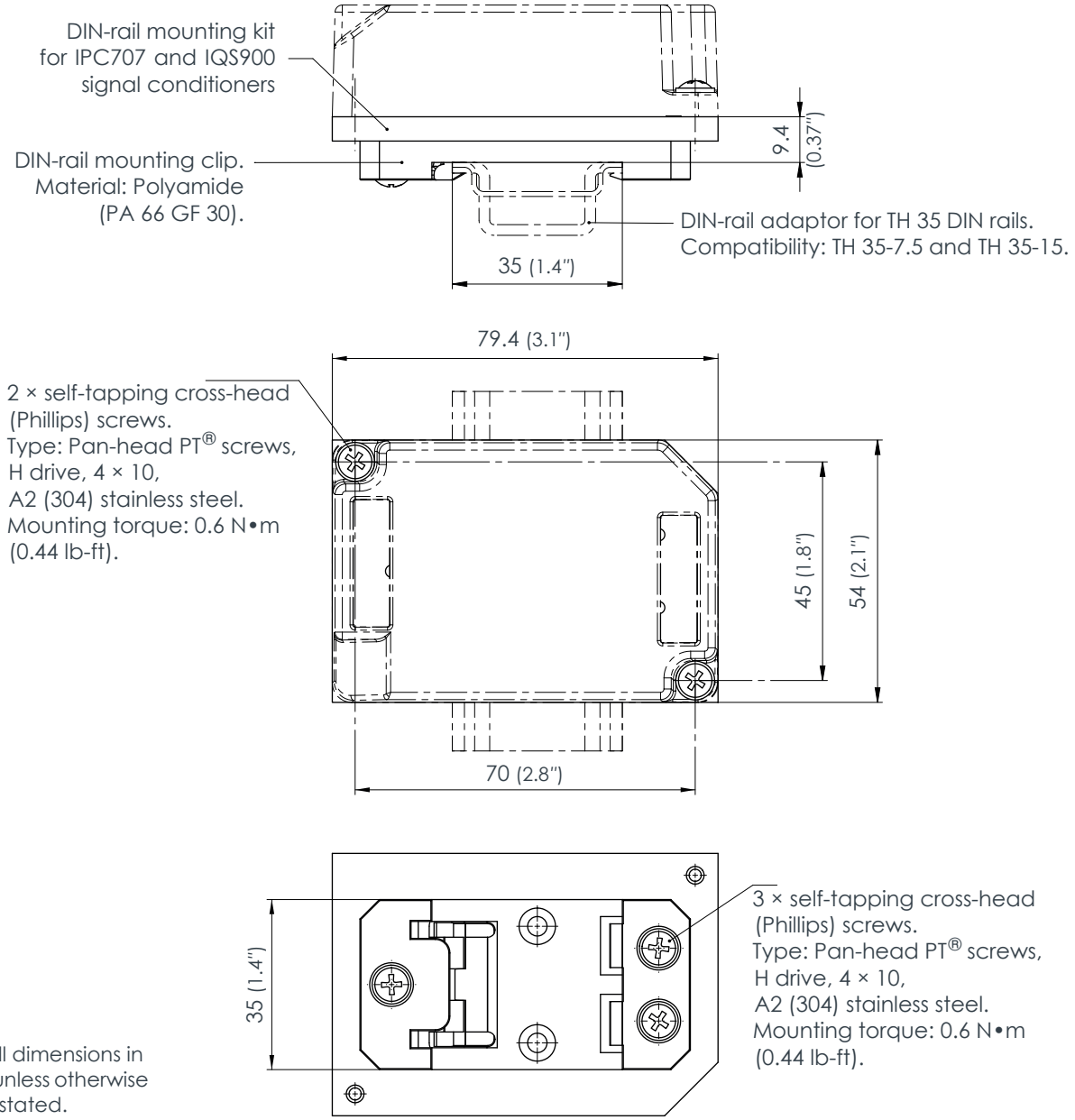
2. Ordering option code **C** specifies an IQS900 signal conditioner either without diagnostics (**C1**) or with diagnostics (**C2**):
• An IQS900 signal conditioner without diagnostics (**C1**) is similar to the IQS45x, which it replaces. The IQS900 is a form, fit and functionally equivalent replacement that matches or betters the measurement specifications of the IQS45x.
• An IQS900 signal conditioner with diagnostics (**C2**) includes optional diagnostic circuitry that automatically detects and remotely indicates problems with the measurement chain (sensor, cabling and/or the IQS900 itself). An IQS900 with diagnostics is certified SIL 2 (IEC 61508) and PL c Cat 1 (ISO 13849) "by design" to more easily meet the requirements of safety-related applications.
Contact Meggitt SA for further information.

ACCESSORIES

ABA17x	Industrial housings	: Refer to corresponding data sheets
IP172	Interconnection protection	: Refer to corresponding data sheet
JB118	Junction box	: Refer to corresponding data sheet
KS107	Flexible conduit	: Refer to corresponding data sheet
MA130	Mounting adaptor	: See below
SG1xx	Cable feedthroughs	: Refer to corresponding data sheets

ACCESSORIES *(continued)*

MA130 DIN-rail mounting adaptor



Note: All dimensions in mm (in) unless otherwise stated.

Ordering number (PNR): 809-130-000-021

RELATED PRODUCTS

TQ401, EA401 and IQS900	Proximity measurement system (2 mm measurement range)	: Refer to corresponding data sheet
TQ403, EA403 and IQS900	Proximity measurement system (12 mm measurement range)	: Refer to corresponding data sheet
TQ423, EA403 and IQS900	Proximity measurement system (12 mm measurement range, high-pressure applications)	: Refer to corresponding data sheet
TQ442, EA402 and IQS900	Proximity measurement system (2 or 4 mm measurement range, right-angle (90°) mount)	: Refer to corresponding data sheet
TQ902/TQ912, EA902 and IQS900	Proximity measurement chains (2 or 4 mm measurement range)	: Refer to corresponding data sheet
TQ922/TQ932, EA902 and IQS900	Proximity measurement chains (2 or 4 mm measurement range, high-pressure applications)	: Refer to corresponding data sheet
TQ942, EA902 and IQS900	Proximity measurement chain (2 or 4 mm measurement range, right-angle (90°) mount sensor)	: Refer to corresponding data sheet

Meggitt (Meggitt PLC) is a leading international engineering company, headquartered in England, that designs and delivers high-performance components and subsystems for aerospace, defence and selected energy markets. Meggitt comprises four customer-aligned divisions: Airframe Systems, Engine Systems, Energy & Equipment and Services & Support.

The Energy & Equipment division includes the Energy Sensing and Controls product group that specialises in sensing and monitoring solutions for a broad range of energy infrastructure, and control valves for industrial gas turbines, primarily for the Power Generation, Oil & Gas and Services markets. Energy & Equipment is headquartered in Switzerland (Meggitt SA) and incorporates the vibro-meter® product line, which has over 65 years of sensor and systems expertise and is trusted by original equipment manufacturers (OEMs) globally.

Sales offices

Meggitt has offices in more than 30 countries. For a complete list, please visit our website.

Local representative

Head office

Meggitt SA
Route de Moncor 4
Case postale
1701 Fribourg
Switzerland

Tel: +41 26 407 11 11
Fax: +41 26 407 13 01
energy@ch.meggitt.com
www.meggittsensing.com/energy
www.meggitt.com