Vibro Meter IQS450 204-450-000-001 A2-B23-H10-I0

Proximity Signal Conditioner



Vibro Meter IQS450 204-450-000-001 A2-B23-H10-I0 is a conditioner for a non-contact eddy-current proximity measurement chain, used to monitor shaft-relative movement and position. The IQS450 family drives a compatible probe and converts the probe-target gap into a proportional electrical output. The actual unit is marked for TQ4X2 probes, 4 mV/µm voltage sensitivity, 10 m cable length and VCL 140 target material. Its legacy 001 AMP-type coaxial interface is a key replacement distinction from the newer 002 self-locking connector.

Technical Specifications

Product Identity	
Complete legacy configuration	IQS450 204-450-000-001 A2-B23-H10-I0
Functional Configuration	
Photographed sensitivity	4 mV/µm; voltage-output calibration
Photographed chain length	10 m; total calibrated measurement chain
Photographed target material	VCL 140
Input connector	001: AMP-type miniature coaxial connector
Reference data scope	IQS450 002 / B23 parameters, 265-062 Version 7
Linear range - newer B23 reference	0.3-4.3 mm typical
Output - newer B23 reference	-1.6 to -17.6 V
Mounting configuration	I0; photographed without MA130 DIN-rail adaptor
Performance & Power	
Supply - newer reference	-20 to -32 V; thermal derating applies
Environment	
Temperature - newer reference	-35 to +85 °C for conditioner, with supply derating

Selected original manufacturer material follows on pages 3–7.

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Compatibility & Selection Guide

System compatibility. Match the probe, extension cable, total calibrated chain length, target material and voltage-input monitor as a complete system. The I0 unit is photographed without a DIN-rail adaptor. Preserve the legacy connector type and check the applicable A2 certificate conditions for the actual installation; newer-family certification and component interchangeability must not be assumed for an unmatched chain.

Wiring & Installation Reference

Installation precautions

Keep the probe, cable length and target-material calibration matched.

Apply only the hazardous-area certificate and measurement-chain conditions covering the actual legacy configuration.

View connection reference (PDF) — page 7 · View thermal reference (PDF) — page 6

DESCRIPTION *(continued)*

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

The transducer body is available with metric or imperial thread. The TQ 412 version is intended for reverse-mount applications. The TQ 402/412 has an integral coaxial cable, terminated with a self-locking miniature coaxial connector. Various cable lengths (integral and extension) can be ordered.

The IQS 450 signal conditioner contains a high-frequency modulator/demodulator that supplies a driving signal to the transducer. This generates the necessary electromagnetic field used to measure the gap. The conditioner circuitry is made of high-quality components and is mounted in an aluminium extrusion.

The TQ 402 and TQ 412 transducers can be matched with a single EA 402 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.

The proximity system can be powered by associated signal processing modules (for example, VM600 cards) or a rack power supply.

SPECIFICATIONS

Overall proximity 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 measuring range (typical)

- *Ordering option B21* : 0.15 to 2.15 mm, corresponding to a −1.6 to −17.6 V output
- *Ordering option B22* : 0.15 to 2.15 mm, corresponding to a −15.5 to −20.5 mA output
- *Ordering option B23* : 0.3 to 4.3 mm, corresponding to a −1.6 to −17.6 V output
- *Ordering option B24* : 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

Available in Ex approved versions for use in hazardous locations

Type of protection Ex i: intrinsic safety (**ordering option A2**)		
Europe	EC type examination certificate	LCIE 11 ATEX 3091 X II 1G (Zones 0, 1, 2) 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	1514309 Class I, Divisions 1 and 2, Groups A, B, C and D Ex ia

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

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SPECIFICATIONS *(continued)*

Type of protection Ex nA: non-sparking (**ordering option A3**)		
Europe	Voluntary type examination certificate	LCIE 11 ATEX 1010 X II 3G (Zone 2) 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	1514309 Class I, Division 2, Groups A, B, C, D

⚠ **When using protection mode 'nA' (non-sparking), the user shall ensure that the signal conditioner is installed in an enclosure that ensures a protection rating of at least IP54 (or equivalent).**

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

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.

Total system length

The total system length (TSL) is the sum of the length of the TQ 4xx transducer's integral cable and the length of the EA 40x 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 : 0.5 m integral cable + 4.5 m extension cable
  1.0 m integral cable + 4.0 m extension cable
  1.5 m integral cable + 3.5 m extension cable
  2.0 m integral cable + 3.0 m extension cable
  5.0 m integral cable with no extension cable
- 10 m : 0.5 m integral cable + 9.5 m extension cable
  1.0 m integral cable + 9.0 m extension cable
  1.5 m integral cable + 8.5 m extension cable
  2.0 m integral cable + 8.0 m extension cable
  5.0 m integral cable + 5.0 m extension cable
  10.0 m integral cable with no extension cable

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 measuring chain : 0.9 m minimum

TSL for a 5 m measuring chain : 4.4 m minimum

TSL for a 10 m measuring chain : 8.8 m minimum

SPECIFICATIONS *(continued)*

IQS 450 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 µH

Supply

Voltage output, 3-wire configuration

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

Current output, 2-wire configuration

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

Supply input capacitance : 1 nF

Supply input inductance : 100 µH

Environmental

Temperature ranges

- *Operating* : −35 to +85 °C*
- *Storage* : −40 to +85 °C

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

Protection rating (according to IEC 60529) : IP40

Vibration (according to IEC 60068-2-26) : 2 g peak between 10 and 55 Hz

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

Physical characteristics

Construction material : Injection moulded aluminium

Mounting : Two or four M4 screws

Dimensions : See Mechanical drawings and ordering information on page 12

*See Thermal considerations on page 8.

SPECIFICATIONS *(continued)*

Electrical connections

Input	:	Self-locking miniature coaxial connector (female). Note: When connecting, this should be hand-tightened, until locked.
Output and power	:	Three screw terminals – wire section 2.5 mm^2 (max.)

Weight

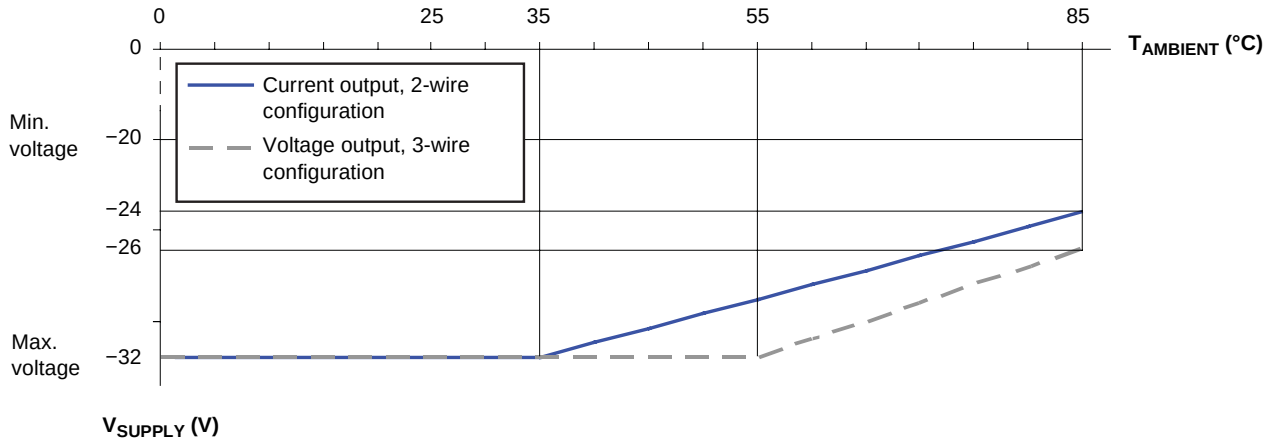
Standard version	:	140 g (approx.)
Ex version	:	220 g (approx.)

Signal conditioner with MA 130 mounting adaptor (ordering option I1)

Universal DIN rail holder type	:	TSH 35
DIN rail type (according to EN 50022 / IEC 60715)	:	TH 35-7.5 or TH 35-15

Thermal considerations

The IQS 450 signal conditioner will operate at ambient temperatures as high as 85 °C, but to do so, it requires derating of the maximum input voltage. The IQS 450 must operate between the minimum supply voltage and the maximum supply voltage, as shown on the following graph.

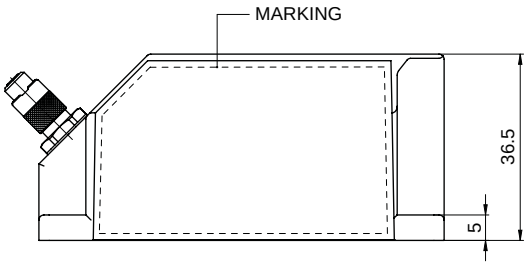


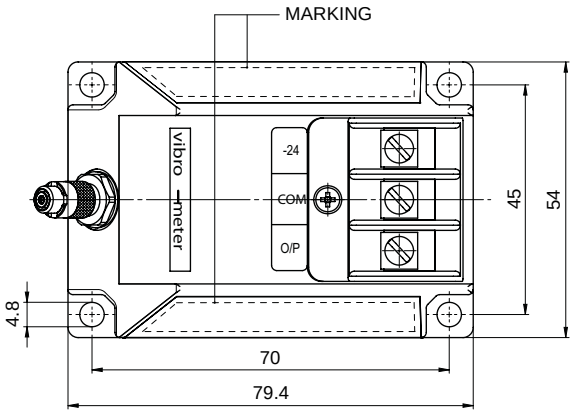
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MECHANICAL DRAWINGS AND ORDERING INFORMATION *(continued)*

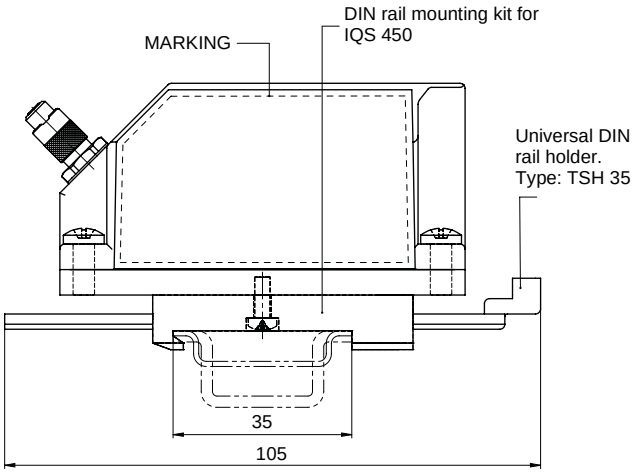
IQS 450 signal conditioner

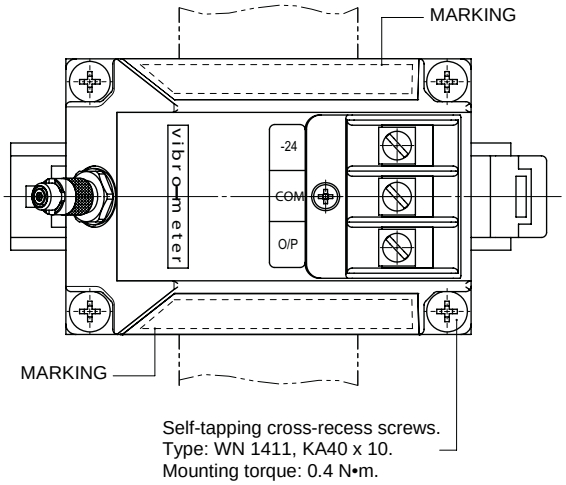
Signal conditioner only (ordering option I0)





Signal conditioner with MA 130 mounting adaptor (ordering option I1)





Note: All dimensions are in mm unless otherwise stated.

Ordering number: 204 - 450 - 000 - 002 **A** **B** **H** **I**

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

Installation (I)	
0	Signal conditioner only
1	Signal conditioner assembled on MA 130 mounting adaptor

Measuring range	Sensitivity (B)	
2 mm	8 mV/µm	21
	2.5 µA/µm	22
4 mm	4 mV/µm	23
	1.25 µA/µm	24

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

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