

vibro-meter
certified by


TQ 402/412 EA 402

Proximity Transducer Type TQ 402/412

CHARACTERISTICS

- Non-contacting measurement
- Eddy current principle
- Conforms to API 670 recommendations
- Certified to CENELEC standards
- 5 m and 10 m systems
- Pressure proof 1 bar (tip: 10 bar)

FEATURES

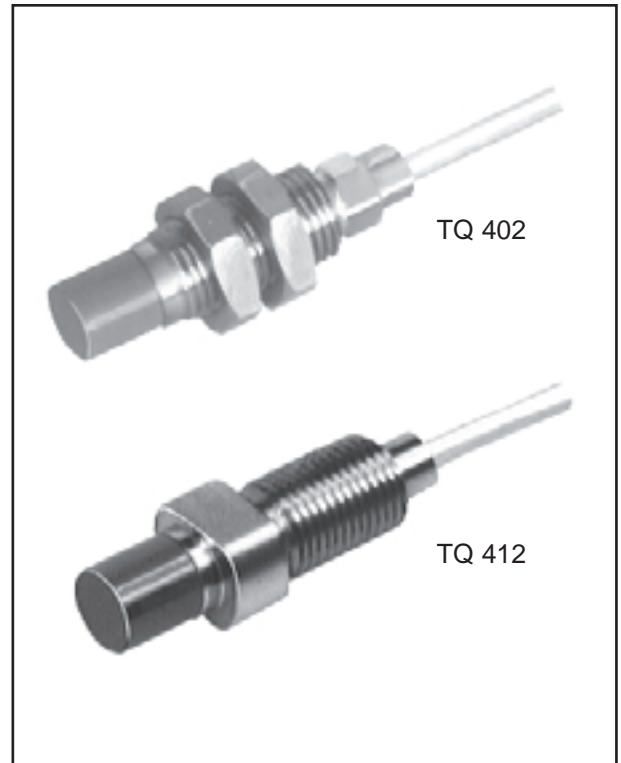
- **Measuring range:**
2 mm or 4 mm
- **Temperature range:**
-40°C to +180°C
- **Sensitivity:**
4 mV/μm or 8 mV/μm
- **Frequency response:**
DC to 20 kHz (-3 dB)

DESCRIPTION

These transducers are used for the contactless measurement of the relative displacement of moving machine elements. They are particularly adapted for measuring the relative vibration and axial position of rotating machine shafts such as those found in steam turbines, gas turbines, hydraulic turbines, alternators, turbo-compressors, pumps, etc.

The TQ 402/412 non-contacting transducer and the matching IQS 452 signal conditioner combine to form a calibrated proximity system in which each component is interchangeable. The system outputs a voltage proportional to the distance between the transducer tip and the target (e.g. machine shaft).

The active part of the proximity probe is a coil of wire that is moulded inside the tip of the transducer, which is 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 English thread. The TQ 412 body is intended for reverse-mount applications. The TQ 402/412 has an integral coaxial cable, terminated with an AMP-type connector. Various cable lengths (integral and extension) may be ordered.

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

The TQ 402/412 proximity transducer can be matched with the EA 402 extension cable. Optional junction boxes and housings offer mechanical protection of the integral and extension cable connectors.

GENERAL

Transducer input requirements:

High-frequency power source via matching conditioner type IQS 452.

OPERATION

(At 23°C ±5% in target material VCL 140, 1.7225)

	IQS 452 M0XX IQS 452 M1XX	IQS 452 M2XX IQS 452 M3XX
Measuring Range	4 mm	2 mm
Linear Meas. Range	0.4 to 4.4 mm	0.2 to 2.2 mm
Sensitivity	4 mV / μm	8 mV / μm

Linearity:

See system performance curves.

Interchangeability of elements:

≤5%

ENVIRONMENTAL

Temperature ranges

Transducer:

- -40°C to +180°C with drift <5%
- -180°C to +220°C with drift >5%

Cable:

-100°C to +200°C

Connector:

-65°C to +85°C

Heat shrinkable sleeve (Polyolefin):

-55°C to +135°C

Protection class:

IP 68 according to IEC 529 and DIN 40050

Explosive atmosphere:

CENELEC certificate LCIE SYST 93.C6081X EEx ib IIC T6

Probe construction:

Wire coil Ø 8.2 mm, Torlon tip, encapsulated in MAZ (1.4305) stainless steel body with high-temperature epoxy glue

Integral cable:

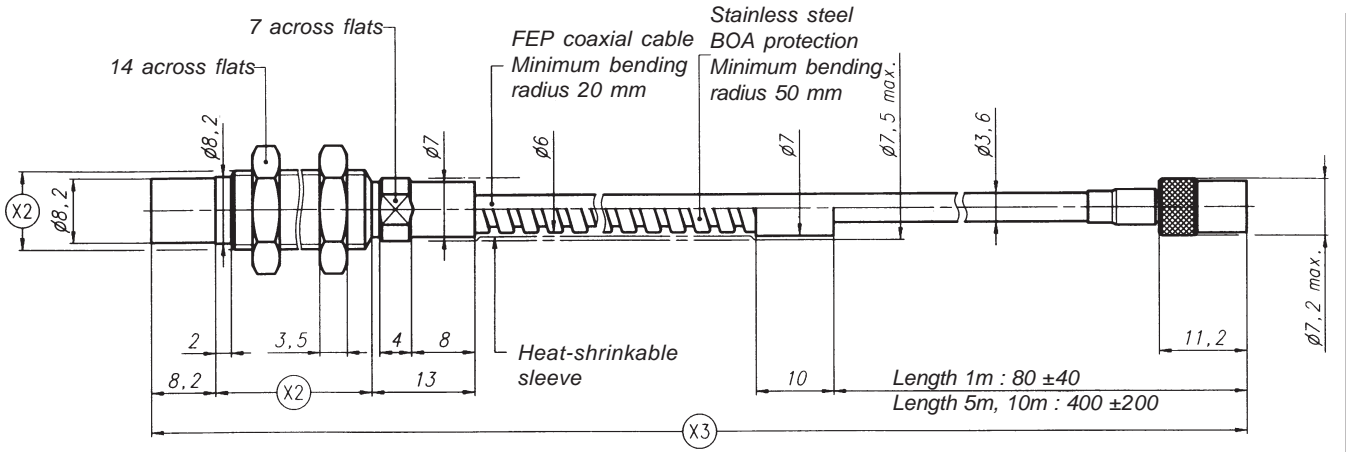
FEP covered 70 Ω coaxial cable, Ø 3.6 mm

Option : BOA stainless steel armour sheathing and heat shrinkable insulating sleeve

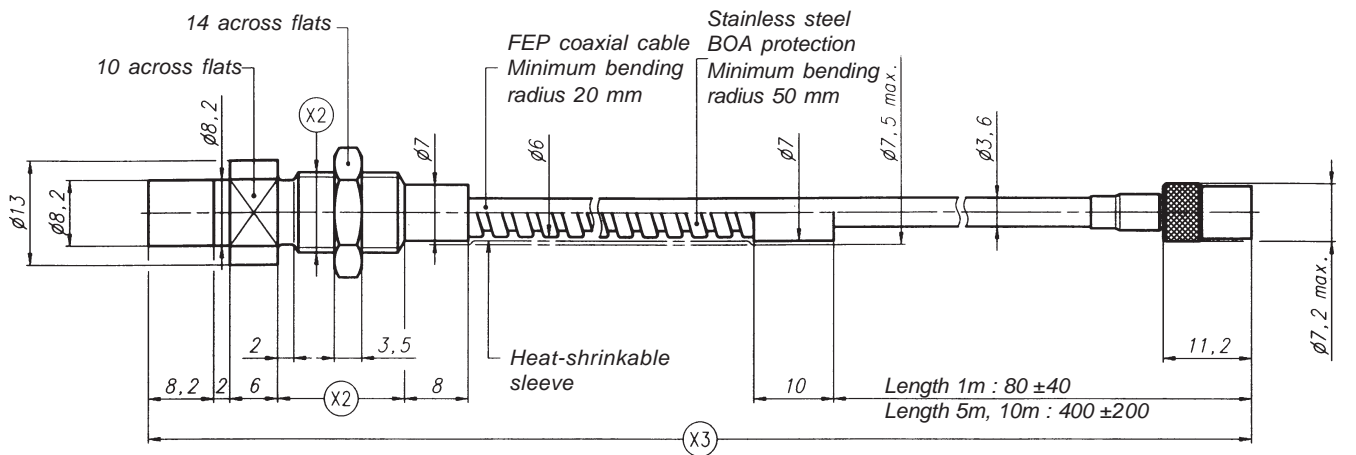
Connector:

Miniature coaxial male connector type AMP 1-330 723-0

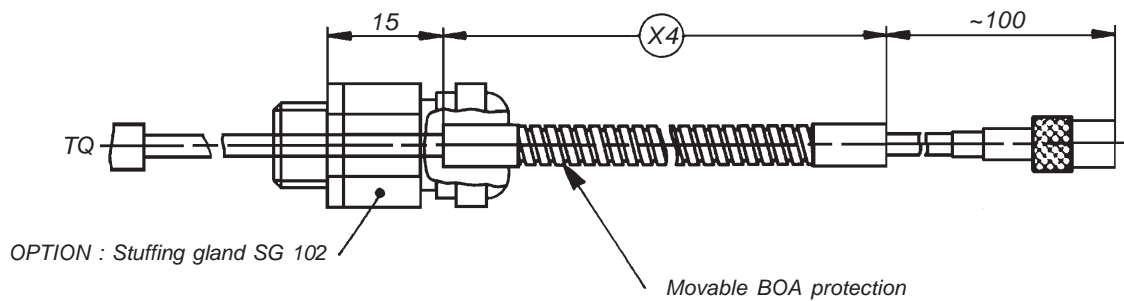
TQ 402 :



TQ 412 :



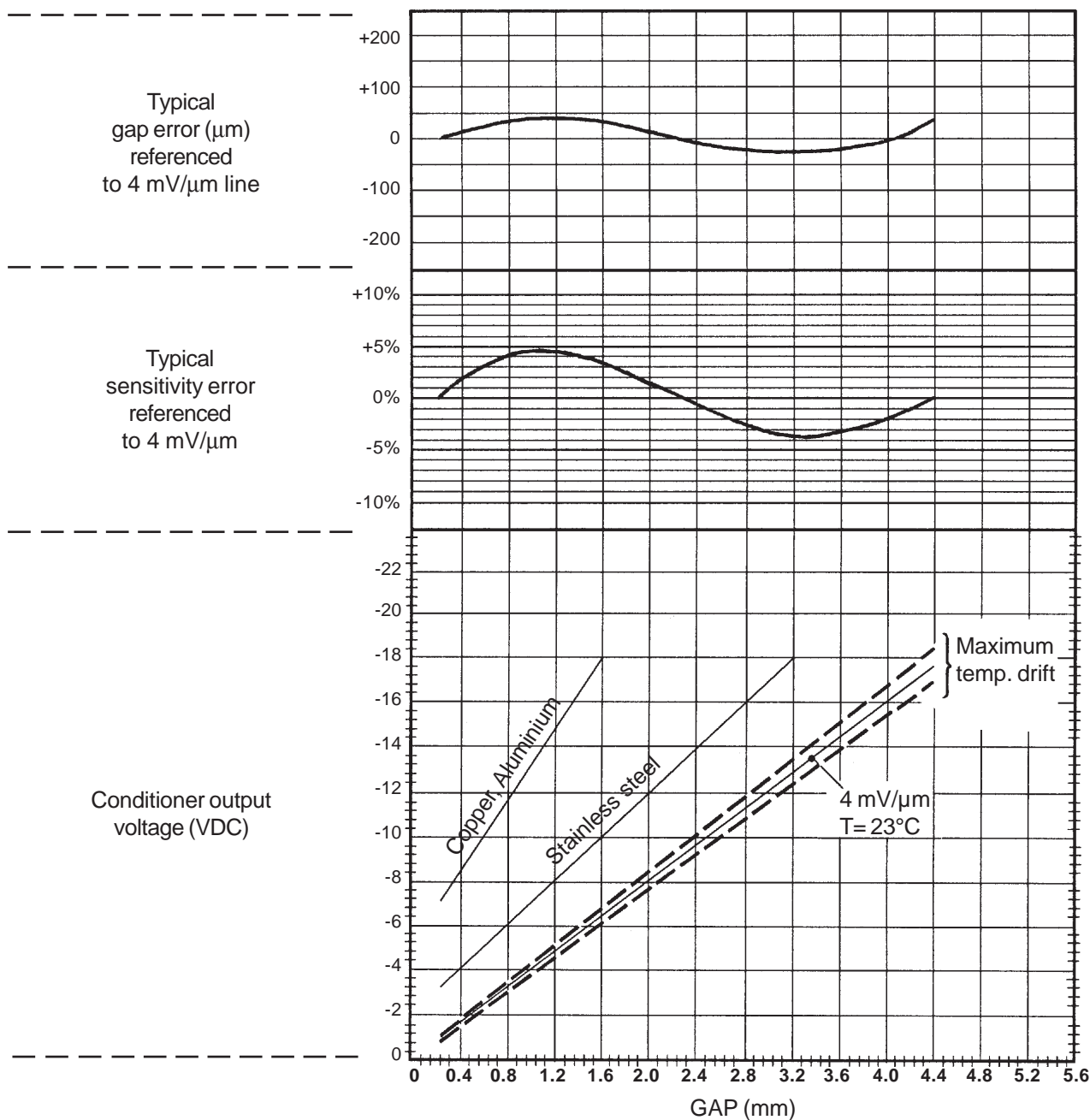
Movable BOA for TQ 402/412 :



Note :

Dimensions in mm if not otherwise specified

Curves for TQ 402/412 probe with IQS 452 M0XX or IQS 452 M1XX conditioner

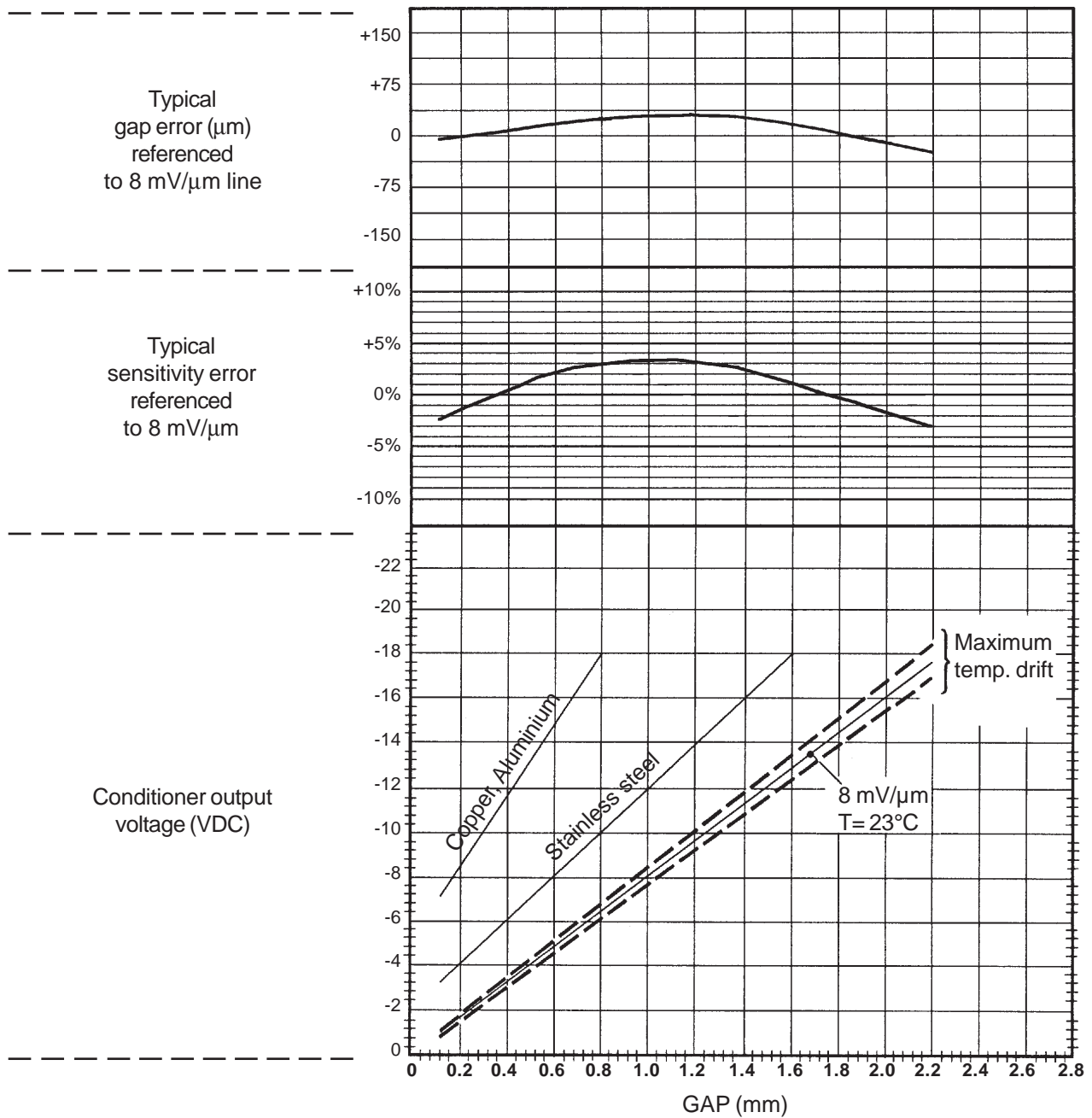


Probe : TQ 402/412 5 m
 Conditioner : IQS 452 M0XX or IQS 452 M1XX
 Target : VCL 140 (1.7225)
 Equivalent materials : A 37.11 (1.0065), AFNOR 40 CD4, AISI 4137

System calibration

The TQ + IQS system is designed for use with VCL 140 steel as a target. If special calibration is required, please define the alloy precisely or supply a sample of alloy (min. Ø 50 mm / 1 cm thick).

Curves for TQ 402/412 probe with IQS 452 M2XX or IQS 452 M3XX conditioner

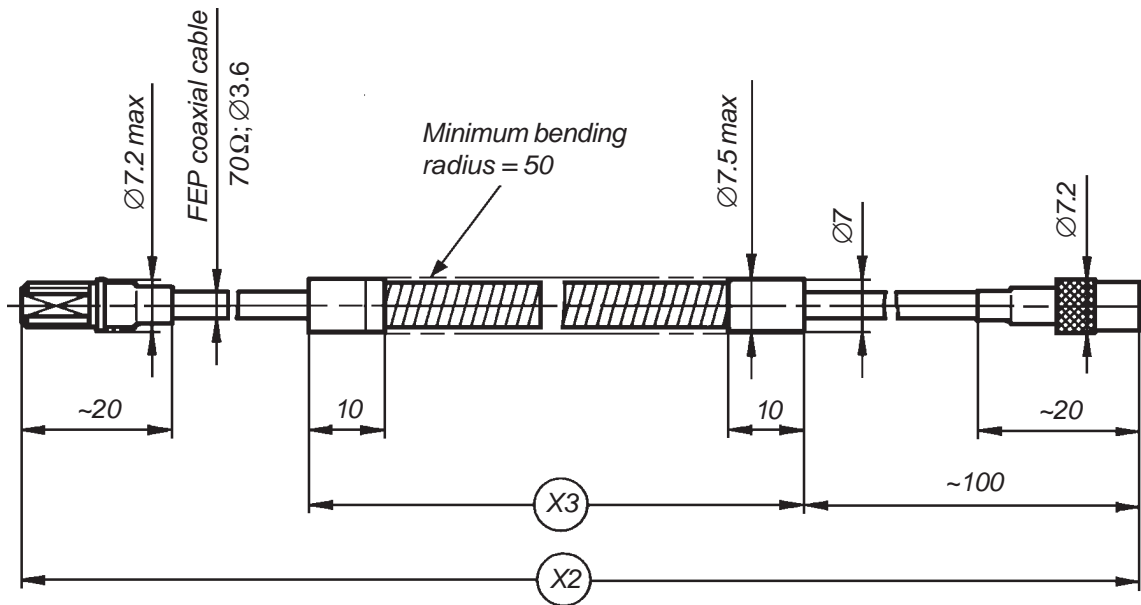


Probe : TQ 402/412 5 m
 Conditioner : IQS 452 M2XX or IQS 452 M3XX
 Target : VCL 140 (1.7225)
 Equivalent materials : A 37.11 (1.0065), AFNOR 40 CD4, AISI 4137

System calibration

The TQ + IQS system is designed for use with VCL 140 steel as a target. If special calibration is required, please define the alloy precisely or supply a sample of alloy (min. Ø 50 mm / 1 cm thick).

Dimensions :



Ordering Information :

- Designation : EA 402 Extension cable
- Ordering number : 913-402-000-01 / X1 / X2 / X3

X1	Environment
01	Standard (1)
02	Explosive (2)

X2	Cable length
03	4 m
05	9 m

X3	BOA protection
01	None
02	3.8 m BOA
04	8.8 m BOA
05	3.8 m BOA + Sleeve
06	8.8 m BOA + Sleeve



Accessories :

EA 402	Extension cable
JB 118	Junction box
SG 102	Cable feedthrough
IQS 452	Signal conditioner
PA 103, PA 113	Probe adaptor

Ordering Information for TQ 402/412 Proximity Probe :

- Designation : TQ 402/412 proximity probe
- Ordering number : **111-402-000-01 / X1 / X2 / X3 / X4 / X5**
111-412-000-01

X1	Environment
01	Standard (1)
02	Explosive (2)

X2	Body thread TQ 402
05	M10x1 x 20 mm
07	M10x1 x 42 mm (1)
09	M10x1 x 72 mm
11	M10x1 x 92 mm
06	3/8" - 24UNF x 20 mm
08	3/8" - 24UNF x 42 mm
10	3/8" - 24UNF x 72 mm
12	3/8" - 24UNF x 92 mm
X2	Body thread TQ 412
15	M10x1 x 16 mm
16	3/8" - 24UNF X 16 mm

X3	Integral cable
03	1 m length (1)
04	5 m
05	10 m
12	1 m + BOA
13	5 m + BOA
14	10 m+ BOA
23	1 m + BOA + Sleeve (4)
24	5 m + BOA + Sleeve (4)
25	10 m + BOA + Sleeve (4)

X5	Total length (3)
01	5 m (1)
02	10 m

X4	Movable BOA
01	None
02	1 m length
03	2 m
04	3 m
05	4 m
06	5 m
07	6 m
08	7 m
09	8 m
10	9 m

Notes :

- 1) Standard, available from stock. For special requests, replace the option code XX with 99 and specify the exact requirements.
- 2) The Exi version is marked blue.
- 3) Length of 1 m integral cable plus extension cable to IQS.
- 4) The BOA armoured cable protection is not leaktight. The heat shrinkable sleeve is splashproof only.



Due to the continual development of our products we reserve the right to modify the specifications without forewarning.



vibro-meter

Head Office

Vibro-Meter SA, Rte de Moncor 4,
P.O. Box 1071, CH-1701 Fribourg, Switzerland
Phone : +41 26-407 11 11
Fax Industrial & Marine : +41 26-407 13 01
Fax Aerospace : +41 26-402 36 62
Fax Instrumentation : +41 26-407 13 75
E-mail : vmsa@vibro-meter.ch
Internet : www.vibro-meter.com
www.meggitt.com

Sales Offices in :

- ◆ Germany ◆ France
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