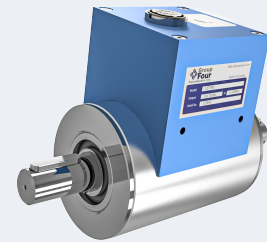


The LXT 980 is the most cost-effective, mid range entry into professional torque measurement technology. This sensor is mainly used in automotive testing, motor break testing, starting torque testing, gear box testing and break away torque testing.



FEATURES

- Best price-performance ratio
- Integrated electronic (Plug & Play)
- Contactless measurement system
- Including 5m cable and calibration certificate
- Suitable accessories (Readout unit, couplings)

TECHNICAL DATA

- Nominal torque: up to 2.000 Nm, bidirectional
- Rotational speed: ≤ 10.000 rpm
- Accuracy: ≤ ±0,2 %
- Temperature range: -40 °C to +85 °C
- Protection class: IP50
- Output signal options: 0-10 V/4-20 mA
- Cut-off frequency: 2.500 Hz

LXT 980

| LXT 980 round shaft | Unit | Nominal torque bidirectional (+/-) (Nm) | Limiting torque unidirectional (Nm) | Limiting torque bidirectional (+/-) (Nm) | Rotational speed (rpm) |
|---------------------|------|---|-------------------------------------|--|------------------------|
| Ø 15 mm | [Nm] | 50 | 65 | 65 | 10.000 |
| | | 100 | 130 | 130 | |
| Ø 25 mm | | 250 | 325 | 325 | 8.000 |
| | | 500 | 650 | 650 | |
| Ø 40 mm | | 1.000 | 1300 | 1300 | 5.000 |
| | | 2.000 | 2600 | 2600 | |

| LXT 980 square shaft | Unit | Nominal torque bidirectional (+/-) (Nm) | Limiting torque unidirectional (Nm) | Limiting torque bidirectional (+/-) (Nm) | Rotational speed (rpm) |
|----------------------|------|---|-------------------------------------|--|------------------------|
| 3/8 inch | [Nm] | 50 | 50 | 30 | 10.000 |
| | | 100 | 100 | 60 | |
| 1/2 inch | | 250 | 250 | 150 | 8.000 |
| | | 500 | 500 | 300 | |
| 1 inch | | 1.000 | 1.000 | 600 | 5.000 |

Note: In case of overload, the sensor leads to an offset in measurement. In such case, the sensor needs to be recalibrated at Group Four. The sensor should be operated only within the specified nominal torque range.

TECHNICAL CHARACTERISTICS

| No. | Model Accuracy class ² | Unit | LXT 980 0,5 Value | | | | | |
|--|--|--------------------|--------------------------|------------|---------------------------|------------|--------------|--------------|
| 1 | Linearity deviation incl. hysteresis | %ME ³ | < ±0,2 | | | | | |
| 2 | Rotational Signal Uniformity (RSU) | | < ±0,2 | | | | | |
| 3 | Repeatability | | < ±0,05 | | | | | |
| Output signal in general | | Unit | Value | | | | | |
| 4 | Frequency range, -3dB point, Bessel characteristics | Hz | 2.500 | | | | | |
| 5 | Analog signal | V mA | 0 ... 10 | | 4 ... 20 | | | |
| 6 | Signal at torque = Zero ⁴ | V mA | 5 | | 12 | | | |
| 7 | Signal at positive nominal torque ⁵ | V mA | 9 | | 20 | | | |
| 8 | Signal at negative nominal torque ⁵ | V mA | 1 | | 4 | | | |
| 9 | Calibration parameter (normed) ⁵ | V/Nm mA/Nm | 4 V/Measurement range | | 8 mA/Measurement range | | | |
| 10 | Error output | V mA | 0/10 | | <4/20< | | | |
| 11 | Output resistance (Voltage output) | Ω | 62 | | | | | |
| 12 | Output resistance (Current output) | k Ω | ≥ 600 | | | | | |
| Effect of temperature | | Unit | Value | | | | | |
| 13 | Zero point drift over temperature | %/10 K | < 0,2 | | | | | |
| 14 | Signal drift over temperature within nominal temperature range | %/10 K | < 0,5 | | | | | |
| Power supply | | Unit | Value | | | | | |
| 15 | Supply voltage | VDC | 11 ... 28 | | | | | |
| 16 | Current consumption (max.) | mA | 150 | | | | | |
| 17 | Start-up peak | mA | < 200 | | | | | |
| 18 | Absolute max. supply voltage | VDC | 30 | | | | | |
| General information | | Unit | Value | | | | | |
| 19 | Protection class according to EN 60529 ⁶ | IP | 50 | | | | | |
| 20 | Reference temperature | °C | +15 ... +35 | | | | | |
| 21 | Operational temperature range | °C | -40 ... +85 | | | | | |
| 22 | Storage temperature range | °C | -30 ... +85 | | | | | |
| Nominal torque (bi-directional) | | Nm | 50 | 100 | 250 | 500 | 1,000 | 2,000 |
| 23 | Weight | kg | 1,4 | | 2,5 | | 6 | |
| 24 | Moment of inertia | kg mm ² | 5,9 | | 59,5 | | 626 | |
| Load limits ⁷ | | Unit | Value | | | | | |
| 25 | Maximum measurable torque | % | 110 | | | | | |

² The accuracy class implies that taken separately both the linearity deviation as well as the rotational signal uniformity are either lower than or equal to the value of the accuracy class.

³ %ME: related to a full scale measurement range.

⁴ Zero point can be set to 5 V using a tare button.

⁵ The exact sensor-specific values can be found in the calibration certificate supplied.

⁶ Wiring connected.

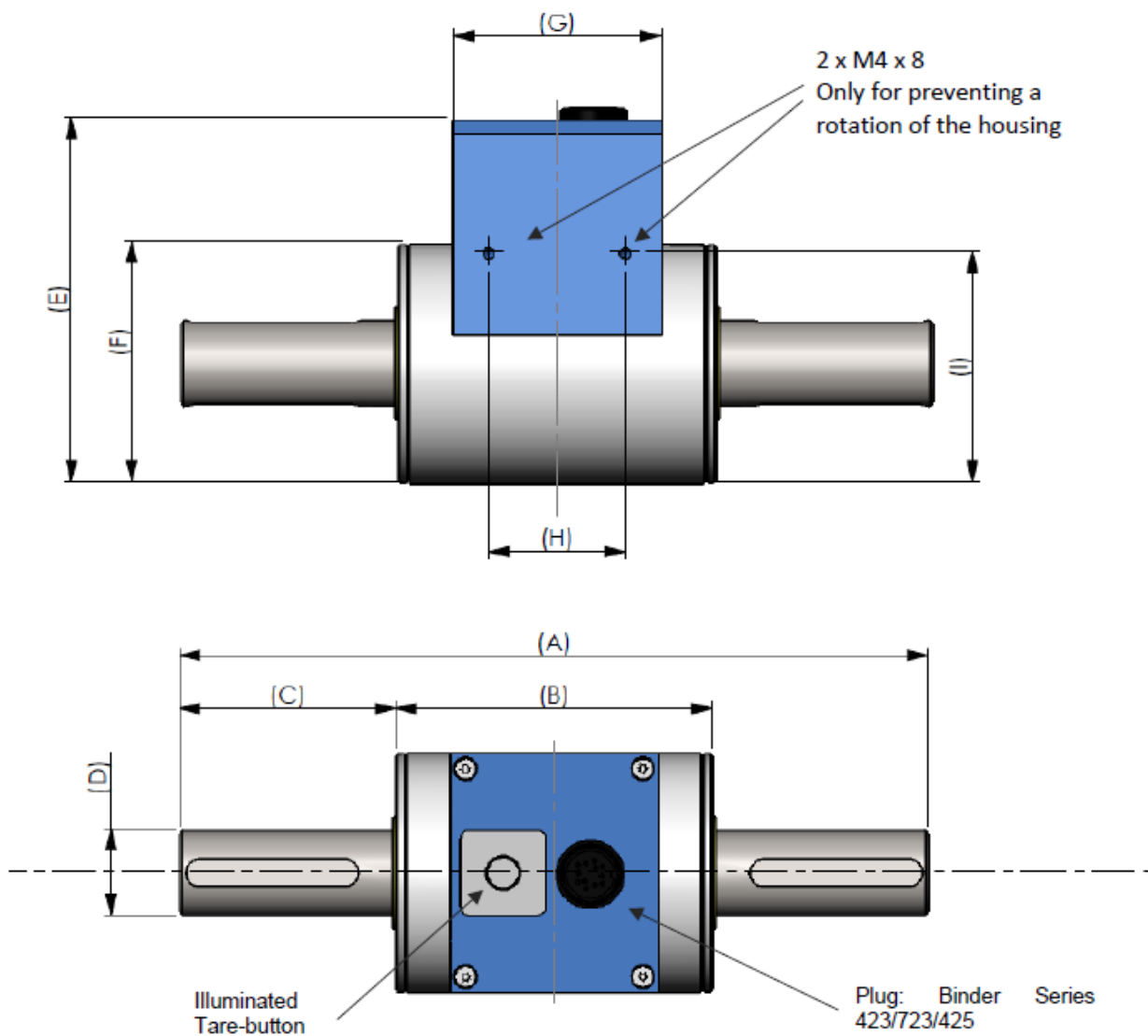
⁷ Based on the non-contact measurement principle the torque sensor is quite insensitive to bending and shearing forces. Self-aligning couplings are recommended in case of dynamic loads.

LOAD CHARACTERISTICS

| LXT 980 measuring range | Unit | Axial force (N) ¹ | Lateral limit force (N) | Bending limit moment (Nm) |
|-------------------------|------|------------------------------|-------------------------|---------------------------|
| 50 and 100 | [Nm] | 2.300 | 300 | 41,7 |
| 250 and 500 | | 7.000 | 800 | 176 |
| 1.000 and 2000 | | 24.000 | 2.000 | 700 |

Each type of irregular stress can only be permitted with its given limit value (bending moment, lateral force or axial force, exceeding the nominal torque) if none of the others can occur. Otherwise the permitted limits must be reduced. If for instance 30 % of the limited bending moment and also 30 % of the limited lateral force are present, only 40 % of the limited axial force are permitted, provided that the nominal torque is not exceeded.

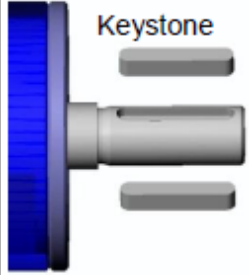
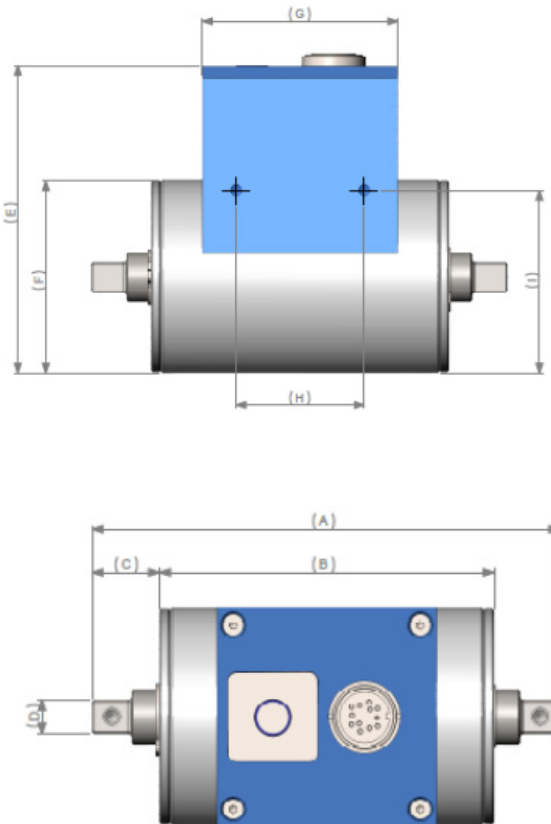
DIMENSIONS



¹ The specified values only apply to direct axial force on the shaft. If the axial force acts on the circlip, only 50% of the force is permitted.

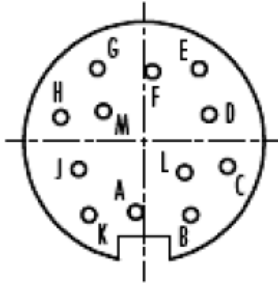
| Dimensions round shaft (in mm) | | | | | | |
|--------------------------------|-------|--------|--------|--------|----------|----------|
| | 50 Nm | 100 Nm | 250 Nm | 500 Nm | 1.000 Nm | 2.000 Nm |
| A | 160 | 160 | 220 | 220 | 350 | 350 |
| B | 93 | 93 | 101 | 101 | 130 | 130 |
| C | 33,5 | 33,5 | 59,5 | 59,5 | 110 | 110 |
| D | 15g6 | 15g6 | 25g6 | 25g6 | 40g6 | 40g6 |
| E | 96 | 96 | 106 | 106 | 126 | 126 |
| F | 60 | 60 | 70 | 70 | 90 | 90 |
| G | 61 | 61 | 61 | 61 | 80 | 80 |
| H | 40 | 40 | 40 | 40 | 60 | 60 |
| I | 57 | 57 | 67 | 67 | 87 | 87 |

| Dimensions keyway (mm) | | | | Keystones | | | Keystone position |
|------------------------|-------|-------|--------|-----------|--------|--------|-------------------|
| Shaft | Width | Depth | Length | Height | Length | Amount | Distance L |
| Ø 15 mm | 5N9 | 3 | 25,5 | 5 | 25 | 1 | 130,5 |
| Ø 25 mm | 8N9 | 4 | 50,5 | 7 | 50 | 2 | 165,5 |
| Ø 40 mm | 12N9 | 5 | 90,5 | 8 | 90 | 2 | 252,0 |

| Dimensions square shaft (in mm) | | | |
|---------------------------------|----------|----------|----------|
| | 50 Nm | 250 Nm | 1.000 Nm |
| A | 130 | 180 | 230 |
| B | 93 | 101 | 130 |
| C | 18,5 | 39,5 | 50 |
| D | 3/8 inch | 3/4 inch | 1 inch |
| E | 96 | 106 | 126 |
| F | 60 | 70 | 90 |
| G | 61 | 61 | 80 |
| H | 40 | 40 | 60 |
| I | 57 | 67 | 87 |

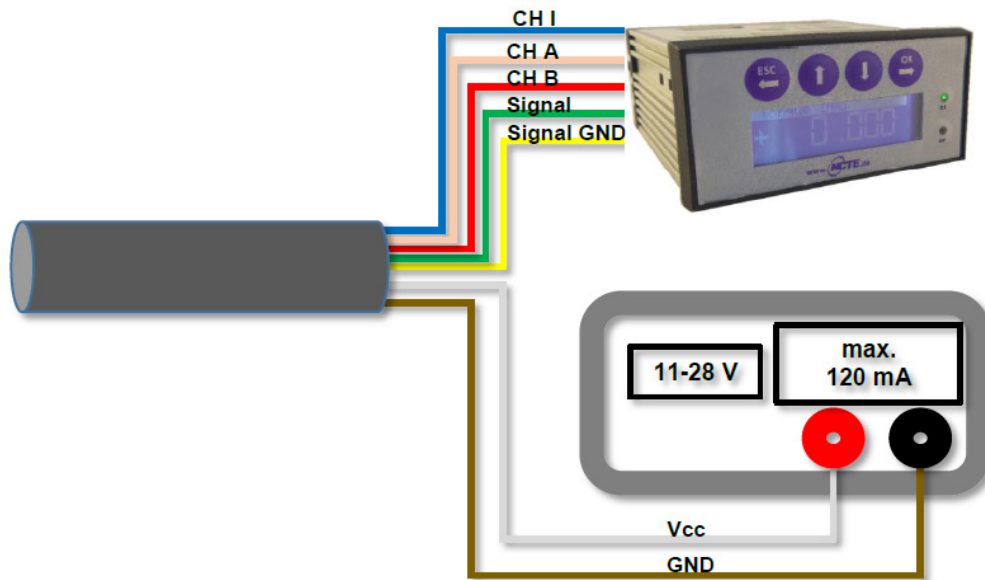
CONNECTION PLAN



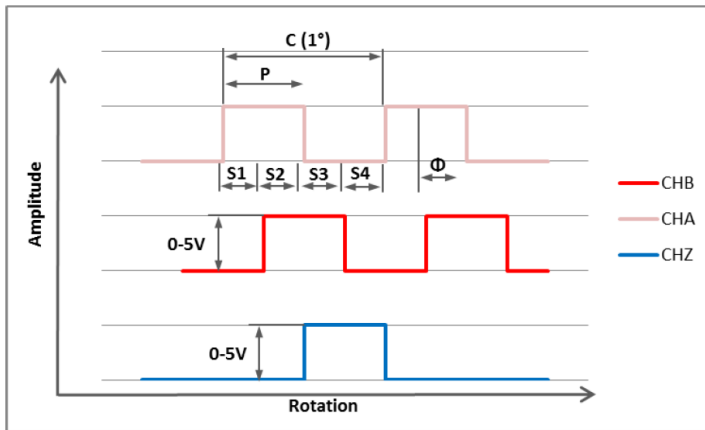
Connector
Power supply and outputs

| Type | Binder series s712-M9 connector IP67 color coding according to DIN 47100 | | |
|------|---|-------------------------|----------------|
| Pin | Color | Description | Value |
| A | White | Supply voltage V_{CC} | 11 V ... 28 V |
| B | Brown | Ground GND | - |
| C | Green | Analog Out | 0 V ... 10 V |
| D | Yellow | Analog GND | - |
| E | Grey | Analog Out | 4 mA ... 20 mA |
| F | Pink | Angle Ch A | 0 V ... 5 V |
| G | Blue | Angle Ch I | 0 V ... 5 V |
| H | Red | Angle Ch B | 0 V ... 5 V |
| J | Black | - | - |
| K | Violet | For internal use only | RX (TTL Pegel) |
| L | Grey-Pink | For internal use only | RX (TTL Pegel) |
| M | Red-Blue | Digital GND | - |

Connection example:



ANGLE SENSOR



| Parameter | Min | Type. | Max. | Units |
|---------------------------|---|-------|------|-------|
| High Level Output Voltage | 2,4 | 5 | - | V |
| Low Level Output Voltage | 0 | - | 0,4 | V |
| Parameter | Description | | | |
| C | One cycle of 360 CPR (degrees) | | | |
| P | The duration of high state of the output within one cycle. | | | |
| S | The number of electrical degrees between a transition in Channel A and the neighbouring transition in Channel B. | | | |
| Φ | The number of electrical degrees between the centre of high state of Channel A and the Centre of high state of Channel B. | | | |

LXT 980 accessories

Readout unit



A **Torque sensor input: Voltage output 0-5 V and 0-10 V**
 Order number: DFI 3000-A
 1 angle encoder input, A/B
 USB interface, Software for windows included
 SD card slot to use for data logging

S **Torque sensor input: current output 4-20 mA**
 Order number: DFI 3000-S
 1 angle encoder input, A/B
 USB interface, Software for Windows included
 SD card slot to use for data logging

Couplings



| Coupling Type | Used for | D2 max. |
|---------------|--------------------|---------|
| LXT-60 | KB4C/60-67-15-D2 | 32 |
| LXT-150 | KB4C/150-78-15-D2 | 42 |
| LXT-300 | KB4C/300-94-25-D2 | 60 |
| LXT-500 | KB4C/500-100-25-D2 | 70 |
| LXT-1400 | KB4/1400-168-40-D2 | 80 |
| LXT-300 | KB4C/300-94-19-D2 | 85 |

ORDER OPTIONS

| LXT 980 accuracy, 0,2% | | | | | | |
|---|--|---|---|---|---|------------------------------|
| Measurement range | | | | | | |
| 50 | Nm including 5 m cable and calibration certificate | | | | | |
| 100 | Nm including 5 m cable and calibration certificate | | | | | |
| 250 | Nm including 5 m cable and calibration certificate | | | | | |
| 500 | Nm including 5 m cable and calibration certificate | | | | | |
| 1.000 | Nm including 5 m cable and calibration certificate | | | | | |
| 2.000 | Nm including 5 m cable and calibration certificate | | | | | |
| Angle sensor | | | | | | |
| 0 | Without angle sensor | | | | | |
| 1 | Angle sensor 360CPR | | | | | |
| Analog output | | | | | | |
| A | Voltage output 0-10 V | | | | | |
| S | Current output 4-20 mA | | | | | |
| Shaft ends | | | | | | |
| 0 | Round shaft with keystone | | | | | |
| 1 | Square shaft (available with 50/250/1.000 Nm) | | | | | |
| Protection class according to EN 60529 | | | | | | |
| 0 | IP50 | | | | | |
| 980 | 100 | 1 | A | 0 | 1 | Example Sensor configuration |

Please contact one of our sales representatives for additional information.
sales@group-4.com | 800-419-1444

INSTRUCTION MANUAL

Scope of delivery

The torque sensor set consists of the sensor itself (signal pick-up and signal processing integrated into sensor housing), one connecting cable 5m with a soldered plug, key stones (round shaft) and the calibration certificate.

Installation and removal

Make sure to install the sensor shafts exactly with the proper aligned connecting shafts. The key stone adapter/square endings of the connecting shafts are to be attached force-less to the corresponding ones of the sensor. No external axial force should be on the housing of the sensor from distortion. A maximum cable length of 5m must not to be exceeded. Using a cable or connector other than supplied by Group Four, or a similar cable that is of a different length may affect the overall performance of the sensor.

Do not remove the shaft with torque applied to the sensor.

Offset adjustment

If required the zero point output signal (5 V or 12 mA) can be adjusted by pressing the Tare-button. By factory default the sensor is set to 5 V or 12 mA at zero torque.

Interface description

Mechanical connection:

The key stone adapters on both ends of the measurement shaft are intended for torque transmission.

Electrical connector:

On the sensor housing there is a socket for the power supply and the signal output (chapter connection plan).

Operation (in regular case or in optimal case)

Optimal measurement parameters can be achieved if the sensor is applied in accordance to the specification. By compliance with the specification the sensor works generally trouble-free and maintenance-free.

Irregular operation, measures against disturbance

The mechanical overload on the sensor (e. g. exceeding of maximum allowed torque or severe vibrations) may cause damage to the sensor and in consequence the incorrect signal output. In such cases please do not open the sensor. Contact Group Four directly for assistance.

Commissioning

After sensor installation pay attention to the following:

- Switch on the power supply unit and check the supply voltage. Peak voltage must be avoided! Be sure to verify the power supply voltage before connecting the sensor!
- Connect the sensor to the power supply unit by using the delivered cable.
- Connect the sensor output to a high-resistance device such as an A/D converter, oscilloscope, PC measurement board.
- The sensor should be in mechanical unloaded state while connecting it.

Tare function and error indication:

LXT 980 contains a LED button on the housing surface. Pressing the button (min. 3 seconds) will set the signal output to 5 V. The illumination of the button serves as a function/malfunction indicator.

Functional indicator:

LED off: missing power supply or sensor is damaged

LED on: Sensor is ready.

Error indicator:

LED flashes: The sensor is not ready.

Flashing of LED can have several possible causes. Various causes are interpreted through a flash code. After each flash code the LED makes a short pause before repeating the code.

2x flashing: Magnet field sensors defective. 4x flashing: Electronics defective.

Shaft coating

The shafts are protected on both sides with a film of anti corrosion wax. We recommend to leave the protection permanent. As far as technologically needed, the coating can be removed with spirit / ethanol.

Handling and transportation

While handling, storage and transportation keep the sensor away from magnetic or electromagnetic fields which may exceed the maximal intensity defined from EMC (chapter technical characteristics) like degaussing machines.

Precautions

- Opening the sensor and individual screws is generally not permitted.
- The shaft locking rings on the shaft ends must not be loosened.
- The fastening nut of the plug (see chapter Dimensions) must not be loosened or tightened.
- Only use voltage supplies that are separate from the mains voltage.
- With regard to the electrical and mechanical load on the sensor, the specifications in accordance with the sensor-specific rating plate and the table in (Chapter: Technical characteristics) must be observed.
- The sensor is not to be used as a support bearing. The existing mounting options are only used to secure the housing against twisting.
- To protect your system, we recommend increasing the torque over several stages.

Service and maintenance

As part of your test and measurement equipment management, we recommend regular inspection of your test and measurement equipment. Please also note the relevant standards and guidelines.

Recommended maintenance

Recalibration - 12 month

Control of wiring, plug and shaft - 12 month

Email: sales@group-4.com