

## DIGITAL HIGH PERFORMANCE LVDT SENSOR SX20 M DIGITAL



### Key points :

- Integrated digital electronics
- Robust design and stainless steel housing
- Error compensation
- M 12 connector
- Analogue and RS 485 Digital outputs



### GENERAL DESCRIPTION

The LVDT SX20M DIGITAL series of sensors combine the advantages of LVDT technology (strength, reliability, free from contact) with digital electronics.

The output signal, which is proportional to the core rod position, is available as both analogue (0/10 V and 4-20 mA) and digital (RS485) in MODBUS protocols. All three signals can be used at the same time.

A digital hybrid module (HCN) is used to improve the accuracy of the sensor, notably the thermal drift and non-linearity. This allows a non-linearity better than  $\pm 0.05\%$  of full scale on the output signal.

Measurement range is from  $\pm 2.5$  mm to  $\pm 150$  mm.

Gauge head kit is supplied as standard (without spring return for stroke 300 mm).

### APPLICATIONS

- Monitoring and sounding of large structures
- High accuracy dimensional control
- Industrial instrumentation in severe environments

### TECHNICAL CHARACTERISTICS

|  |  |
|--|--|
| Supply voltage                         | 12 to 30 V   |
| Consumption                            | 30 mA max (output current not included)                                    |
| Current output                         | 4 to 20 mA<br>Max load (Ohm) $(V_{\text{supply}}-3)/0.02$                  |
| Digital output                         | RS485 Mod BUS  |
| Voltage output                         | 0.01 V to 10 V   |
| Accuracy at 22,5°C <sup>(Note 1)</sup> | $\pm 0.1\%$ FS max : SX 20 MD 005 to 200<br>$\pm 0.2\%$ FS max : SX20MD300 |
| Non linearity                          | $\pm 0.05\%$ FS max : SX20MD005 to 200<br>$\pm 0.1\%$ FS max : SX20MD300   |
| Zero drift (- 40 to + 85 °C)           | $\pm 0.18\%$ FS max : SX20MD010 to 300<br>$\pm 0.3\%$ FS max : SX20MD005   |
| Sensitivity drift (- 40 to + 85 °C)    | $\pm 0.3\%$ max : SX20MD010 to 300<br>$\pm 0.5\%$ max : SX20MD005          |
| Working temperature                    | - 40 °C to + 85 °C   |
| Output noise                           | < 0.01 % FS within the bandwidth   |
| Bandwidth                              | (adjustable) from 1 to 100 Hz  |
| Protection                             | IP66   |
| Vibrations                             | 10 G rms 20 - 2000 Hz  |
| Shocks                                 | 100 G (11 ms) half sine  |
| Connector                              | M12, 8 contact   |
| CEM                                    | EN 61326-1 + A1 + A2   |

Note 1 : Accuracy at ambient includes non linearity, scale factor and offset errors. If the sensor is recalibrated by the user, ambient accuracy will only include the non linearity error.

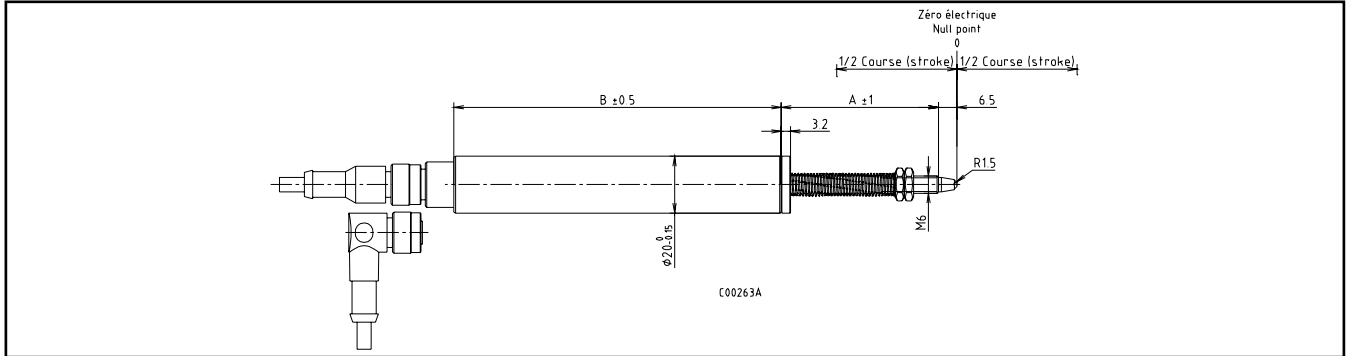
To calculate accuracy over a given temperature, the thermal drift error of sensitivity and zero must be added to the accuracy at ambient.

## SX20MD CONNECTOR M12



### CHARACTERISTICS & DIMENSIONS

Standard sensor : Includes bronze rod guide, spring (except for 300 mm stroke) and tip (M2.5 standard)



| Models                             |  | SX20 MD005 | SX20 MD010 | SX20 MD020 | SX20 MD030 | SX20 MD050 | SX20 MD100 | SX20 MD200 | SX20 MD300 |
|------------------------------------|--|------------|------------|------------|------------|------------|------------|------------|------------|
| Stroke (mm)                        | Electrical stroke                          | ± 2,5      | ± 5        | ± 10       | ± 15       | ± 25       | ± 50       | ± 100      | ± 150      |
|                                    | Mechanical stroke                          | ± 7,5      | ± 7,5      | ± 12,5     | ± 17,5     | ± 27,5     | ± 52,5     | ± 102,5    | ± 152,5    |
| Electrical characteristics (23 °C) | Nominal sensitivity Current output (µA/mm) | 3200       | 1600       | 800        | 533        | 320        | 160        | 80         | 53         |
|                                    | Nominal sensitivity Voltage output (mV/mm) | 2000       | 1000       | 500        | 333        | 200        | 100        | 50         | 33         |
| Dimensions (mm)                    | A  | 40         | 40         | 55         | 65         | 80         | 125        | 205        | 250        |
|                                    | B  | 99         | 99         | 115        | 144        | 173        | 259        | 400        | 495        |
| Environment                        | IP   | 66         |            |            |            |            |            |            |            |

### CONNECTIONS

| Pins | Wires color | Function           |
|------|-------------|--------------------|
| 1    | White       | Signal cold point  |
| 2    | Brown       | 0 VDC (Supply)     |
| 3    | Green       | Voltage output     |
| 4    | Yellow      | RS485 - (B)        |
| 5    | Grey        | Digital cold point |
| 6    | Pink        | Current output     |
| 7    | Blue        | RS485 + (A)        |
| 8    | Red         | + VDC (Supply)     |

Nb : Shield and connector are common.

## SPRING

Force at zero and stiffness

| Sensor ref.  | Stroke (mm) | Force at zéro (N) | Stiffness (N/mm) |
|--------------|-------------|-------------------|------------------|
| SX 20 MD 005 | ± 2.5       | 1,07              | 0,030            |
| SX 20 MD 010 | ± 5         | 0,87              | 0,026            |
| SX 20 MD 020 | ± 10        | 0,98              | 0,015            |
| SX 20 MD 030 | ±15         | 0,83              | 0,015            |
| SX 20 MD 050 | ± 25        | 0,90              | 0,010            |
| SX 20 MD 100 | ± 50        | 2,38              | 0,023            |
| SX 20 MD 200 | ± 100       | 2,36              | 0,012            |
| SX 20 MD 300 | ± 150       | /                 | /                |

## SELECTION GUIDE – CALIBRATION





The best accuracy is on the calibrated analogue output and digital output.

Reference according to calibration on current or voltage output.

| Sensor ref.  | Version I, current calibration | Version U, voltage calibration |
|--------------|--------------------------------|--------------------------------|
| SX 20 MD 005 | 690150602                      | 690150601                      |
| SX 20 MD 010 | 690150612                      | 690150611                      |
| SX 20 MD 020 | 690150622                      | 690150621                      |
| SX 20 MD 030 | 690150632                      | 690150631                      |
| SX 20 MD 050 | 690150642                      | 690150641                      |
| SX 20 MD 100 | 690150652                      | 690150651                      |
| SX 20 MD 200 | 690150662                      | 690150661                      |
| SX 20 MD 300 | 690150672                      | 690150671                      |

**ACCESSORIES**

**Molded lead**

|                                  | Cordon surmoulé blindé<br>fiche femelle droite M12<br>8 contacts                  |   | Cordon surmoulé blindé<br>fiche femelle coudée M12<br>8 contacts                  |   |
|----------------------------------|---|---|---|---|
| Lenght                           | 2 m   | 10 m  | 5 m   | 10 m  |
| Reference                        | 690 15 04 10  | 690 15 04 11  | 690 15 04 12  | 690 15 04 13  |
| Working<br>T°<br>-20°C à<br>85°C |  |  |  |  |

**Straight female plug for shielded cable**

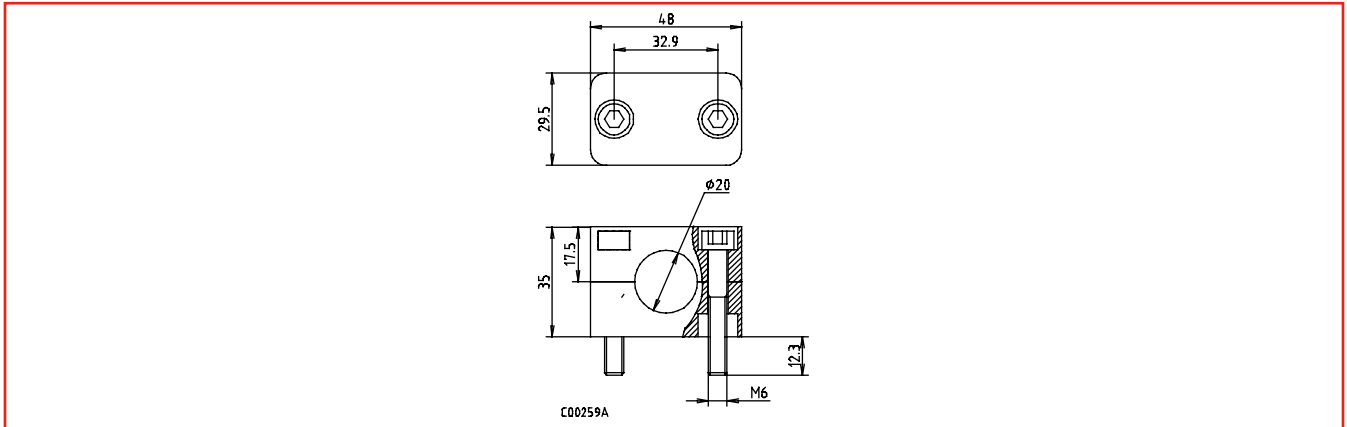
| Fiche femelle droite M12 pour cable<br>blindé Ø4 à Ø6<br>8 contacts |   |
|---|---|
| Référence   | 490 534 221   |
| T° usage<br>-40°C à<br>85°C   |  |

All accesories and options to be ordered seperately

The CD Rom (ref. 895 000 298) supplied with the SX20MD includes software for configuration, acquisition and visualisation (on Windows).

Also includes libraries for Labview, C, dll.

User manual included.



Plastic mounting flange BCX20P