

In order to avoid damaging the apparatus, please follow the installation instructions detailed below carefully, proceeding with caution.

- > Failure to comply with the rules in this manual or those marked on the appliance will void the warranty.
- > The use of the appliance outside the technical and environmental conditions established in this manual implies loss of warranty.
- > Do not attempt to open or repair the appliance. Improper handling can damage the unit and cause loss of warranty.
- > This device has been checked, tested and is ready for use.
- > Hohner reserves the right to make changes to the design or specifications of the products referred to in this document at any time.
- > The acceptance of this device constitutes the acceptance of these conditions by the buyer.

ENVIRONMENTAL AND OPERATING CONDITIONS

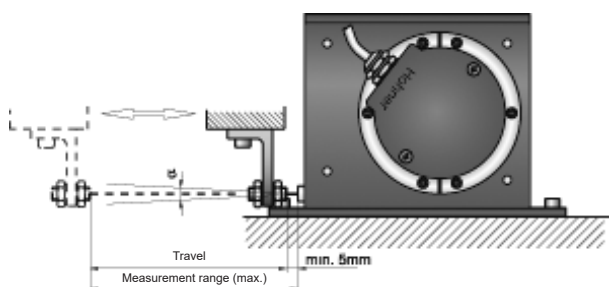
The internal mechanisms of the ENCO-METER are exposed to the environment. Moisture and abrasive particles can penetrate through the cable and damage your device.

The loss of tension of the cable can cause to wandering off the drum or the pulleys and the consequent failure of the device. Thoroughly observe the parameters of acceleration and maximum speed and avoid abrupt braking of the machine.

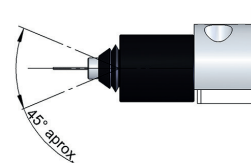
INSTALLATION

EM4 must be fixed to a flat surface of the machine with 4 screws M4.

- > All mounting positions are possible..
- > The cable must be correctly aligned ($\alpha < 2^\circ$).
- > When fastening the cable attachment to the moving part of the machine, it will be prevented from turning, keeping it fixed while tightening the nuts.



FLEXIBLE ACCESSORY(FX)



ENCO-METERS with flexible accessory FX (90.1404 FX, 90.1808 FX, 90.1810 FX) allow a misalignment of the extendable cable up to 45°.

CABLE HANDLING

The standard cable assembled is coated stainless steel, with a 19x7+0 wire structure. We have other possibilities on special demand.

- ⚠ Never overreach the maximum travelling distance.
- ⚠ The cable should never be loosened, and the recovery movement should always be slow and gentle
- ⚠ The cable should not touch any element.
- ⚠ Do not bend, twist or roll the cable.
- ℹ If the cable is guided by pulleys, their diameter should not be less than $\varnothing 14\text{mm}$.
- ℹ In environments with humidity, dust or dirt, regular cleaning of the cable (with a damp cloth) should be part of regular MAINTENANCE operations. Regular greasing increases cable life.

COUPLING OF A ROTARY ENCODER

The coupling of a rotary encoder, if not performed correctly, can lead to the destruction of the device. Therefore we recommend that it be carried out at our assembly plant.

Otherwise, the following warnings must be observed:

- ℹ The ENCO-METERS should not be connected to rotary encoders with inertia above 0.5 Kgcm^2 and/or a drive torque of more than 3 Ncm .
- ℹ The measuring device should always be connected to the shaft via an elastic coupling.
- ⚠ On no account should the shaft of these devices be tampered with, be it manually or with a tool or device. Any rotation of the shaft which is necessary for coupling should be done by pulling on the cable manually and making sure that it is always taut.

- i** Electronic output devices that are delivered coupled to an ENCO-METER have an orientation of 45°.
- i** If devices are not supplied assembled, we recommend mounting the sensor on the ENCO-METER measurement range.

+ INCREMENTAL OR ABSOLUTE ENCODER

The resolution (in mm) obtained for each pulse of the encoder will be:

$$r = \frac{D}{n} \quad \begin{array}{l} D = \text{ENCO-METER travel (mm)} \\ n = \text{number of pulses} \end{array}$$

Travel: EM4 = 200 mm, EM8 = 250 mm, EM10 = 300 mm

Hohner encoders Serie 20 and Serie 58 can be directly coupled to the ENCO-METER.

Absolute singleturn and multiturn encoders can be coupled to the ENCO-METER by special flanges.

Consult our catalog of encoders and/or contact our sales team if you want us to supply the whole package.

+ POTENTIOMETER

The output ratio obtained shall be calculated as:

$$r = \frac{R}{D \cdot n} \quad \begin{array}{l} D = \text{ENCO-METER travel (mm)} \\ R = \text{maximum potentiometer value} \\ n = \text{number of turns} \end{array}$$

Travel: EM4 = 200 mm, EM8 = 250 mm, EM10 = 300 mm

For example, with a potentiometer of 10KΩ and 10 turns, you will get an output ratio of 5Ω / mm.

We have precision potentiometers IP54 protected with cable output or DIN43650 connector, and mechanical reduction to get 20 turns. They can be supplied already coupled to the ENCO-METER.

When coupling the potentiometer to the ENCO-METER, to avoid problems with the mechanical stop, it will be necessary to take into account the travel limitation and the safety offset.

+ POTENTIOMETERS

Security offset **i**

To avoid reaching the lower mechanical stop of the potentiometer, a safety fraction should be left when the potentiometer is coupled to the ENCO-METER. This fraction of return or security angle offset must contemplate the possible extension of the cable due to elasticity, thermal dilation and structural elongation.

For normal use we recommend leaving about 40mm. per meter of cable. During coupling to the ENCO-METER, use the following procedure:

1. Fix the coupling to the potentiometer and screw the setscrew.
2. Turn the potentiometer shaft clockwise (CW) to the mechanical stop.
3. Turn back (in CCW direction or unscrewing), at least the fraction of return calculated according to:

$$\theta_{seg} = 0,2 \cdot L \quad L = \text{maximum cable length (m)}$$

For example, if the cable reaches 1 meter, it will have to go back 0.2 turns (72°).

4. Without moving the axis of the potentiometer, attach it to the Enco-meter so that a coupling setscrew fits in the plane of the axis of the Enco-meter. Fix the flanges.
5. Screw the coupling setscrews through the hood hole and fit the plastic shield.
6. We recommend checking the output value with a multimeter.

Limitation of cable travel **!**

The maximum cable extension distance for the ENCO-METER (limited by the potentiometer stroke) will be calculated as:

$$L_{max} = (n - \theta_{seg}) \cdot D \quad \begin{array}{l} n = \text{number of turns} \\ \theta_{seg} = \text{security offset angle} \\ D = \text{ENCO-METER travel (mm)} \end{array}$$

Travel: EM4 = 200 mm, EM8 = 250 mm, EM10 = 300 mm

Trying to overcome this distance will inevitably lead to the destruction of the Enco-meter, either by breaking the cable or by failing to fix the potentiometer.