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LM-C / LM-L / LS-A Installation Manual

Contactless linear position transducer with TWIIST technology

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REVISION HISTORY

Rev 0	8-04-2022	First release
Rev 1	24-01-2024	Add details about long stroke installation

SUMMARY

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1. GENERAL PRECAUTIONS

It is important to handle and install TWIIST sensors appropriately to ensure their safe usage.

It is highly and important to respect all the precautions illustrated in this manual.

- The transducer must be installed away from both static and dynamic magnetic field sources. External magnetic fields can change functional properties and may reduce sensor accuracy or damage core magnetization. Direct contact with magnetic clamps or other permanent magnets should be avoided (maximum external magnetic field strength on sensor surface: 20 mT).
- The sensor is factory calibrated to operate coupled with the magnetic core provided by Gefran. Do not use magnets or magnetic cores other than those provided.
  The magnetic field measured at the surface of the core is < 3.8 mT.
- Be careful if the application may present chips or dust of iron or other ferromagnetic metals. Ferromagnetic materials may be weakly attracted to the surface of the sensor core without degradation of rated performance. However, if ferromagnetic materials enter the core, they could create friction and wear on the sliding parts and rod, affecting the magnetic properties of the sensor. In this case, system functionality may no longer be guaranteed.
- It is recommended that ferrous metals should not be located closer than 6.5 mm from the sensor. Closer spacing can cause anomalies in the magnetic properties of the sensor which can show up as offsets, non-symmetry or non-linearity in the output signal. The use of screws and brackets in ferrous materials for mounting on the joints of the sensor is acceptable.
- The system should be used only in accordance with the foreseen protection grade. The core slides through a self-lubricating plastic bearing on the hard anodized aluminum rod.
  Do not grease or oil the rod.
- The sensor must be protected against accidental shock and used in accordance with the instrument's environmental and performance applications.

2. ELECTRICAL CONNECTION PRECAUTIONS

- The power supply must be dedicated to transducers or must be directly drawn on the power terminals and not far from the same.
- The transducer connection cable must be wired separate from power cables and/or solenoid valves, drive or contactor units.
- **The TEST pins are for internal use only, they must not be connected.**
- For optimal EMC behavior, it is strongly recommended to connect the sensor housing to the Earth/Chassis ground. Please, consider grounding during installation through ball joints or screws at both sensor side (rod and magnetic core).

3. CORRECT MOUNTING PRECAUTIONS

For correct mounting of TWIIST sensors, consider the following instruction:

- To correctly install TWIIST sensor use fixing screws or mechanical joints. As described in Table 1 axial or eye mechanical joints are available (to order separately). When mounting with screws, please note that it is absolutely forbidden to exceed the maximum screwing length corresponding to A = 7 mm, this length is valid for both ends.

Figure 1.

- To prevent damages, tighten fixing screws or mechanical joints with a maximum torque of 2 Nm, addition of a low strength threadlocker is suggested.
- To avoid damage, tighten the fixing screws or mechanical joints while keeping the connector head or steel case blocked (see Figure 3).
- Do not twist one end of the sensor during the other during locking with the joints or screws.
- The joint should not be mounted with the aid of a clamp.
- To prevent damages, tighten M12 output connector with a maximum torque of 0.6 Nm, addition of a low strength threadlocker is suggested.
- The maximum working offset for axial mechanical joints (PKIT 1565, PKIT 1566) must be ±5°
- The maximum working offset for rod end bearings (PKIT 1567 / 1568) must be ±5°.
- When mounting with screws (without provided mechanical joints), axiality must be within ±0.1°.

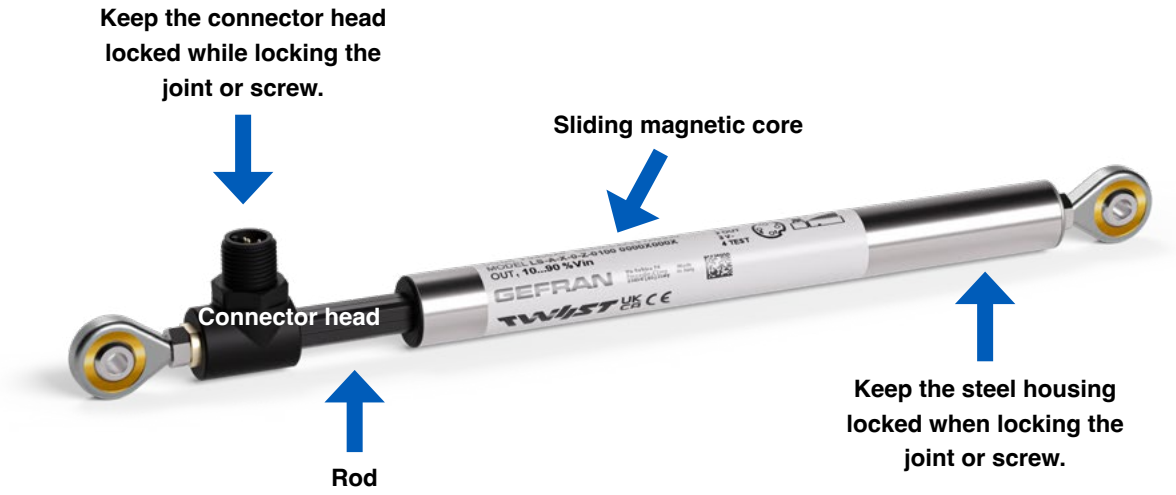
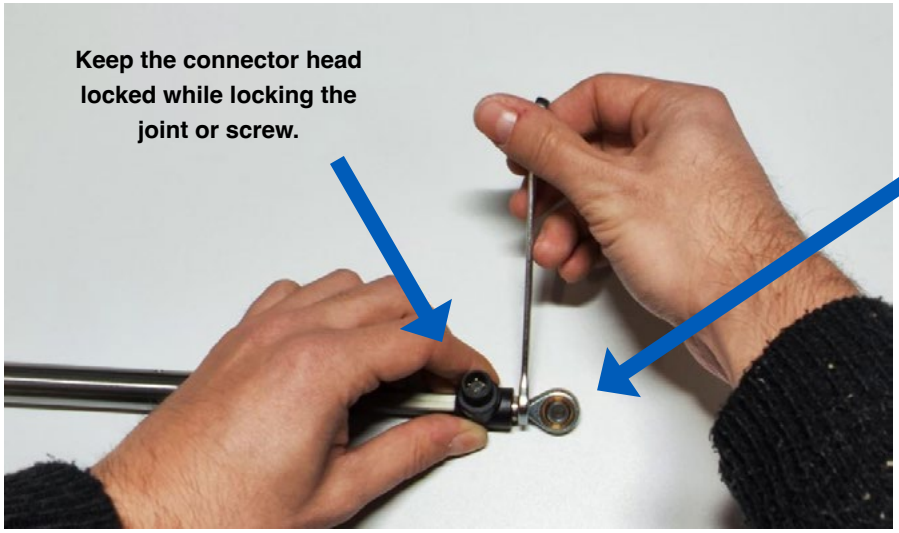


Figure 2.


Keep the connector head locked while locking the joint or screw.
Tighten fixing screws or mechanical joints.

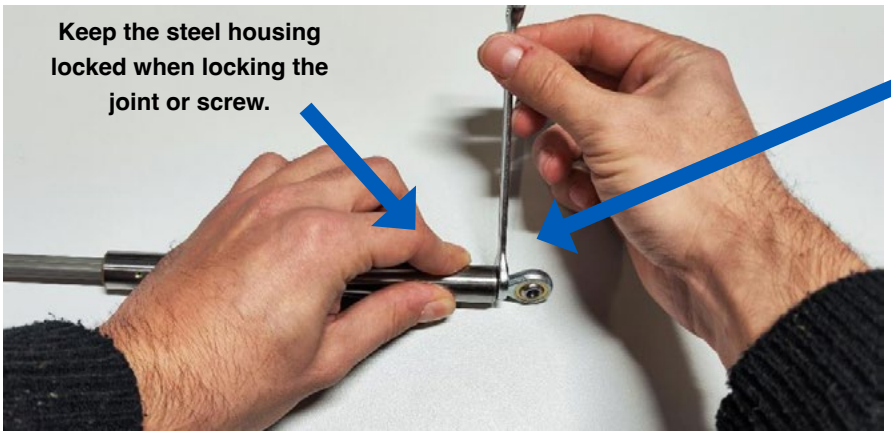

Keep the steel housing locked when locking the joint or screw.
Tighten fixing screws or mechanical joints.

Figure 3.

- For sensor strokes greater than 500 mm, we suggest vertical installation of the sensor.
- In case of horizontal mounting, a maximum bending of the sensor body of 5 mm must be considered, resulting in out of spec metrology.
- It would be advisable to use a mounting block, i.e. pillow block bearings, to guide and support the magnetic core and avoid bending.
- The sensor can be used either by moving the magnetic core and keeping the connector-side end fixed (fixed wiring), or by moving the end with the electrical connection and keeping the magnetic core-side end fixed. In the latter case, cable carries may be considered.

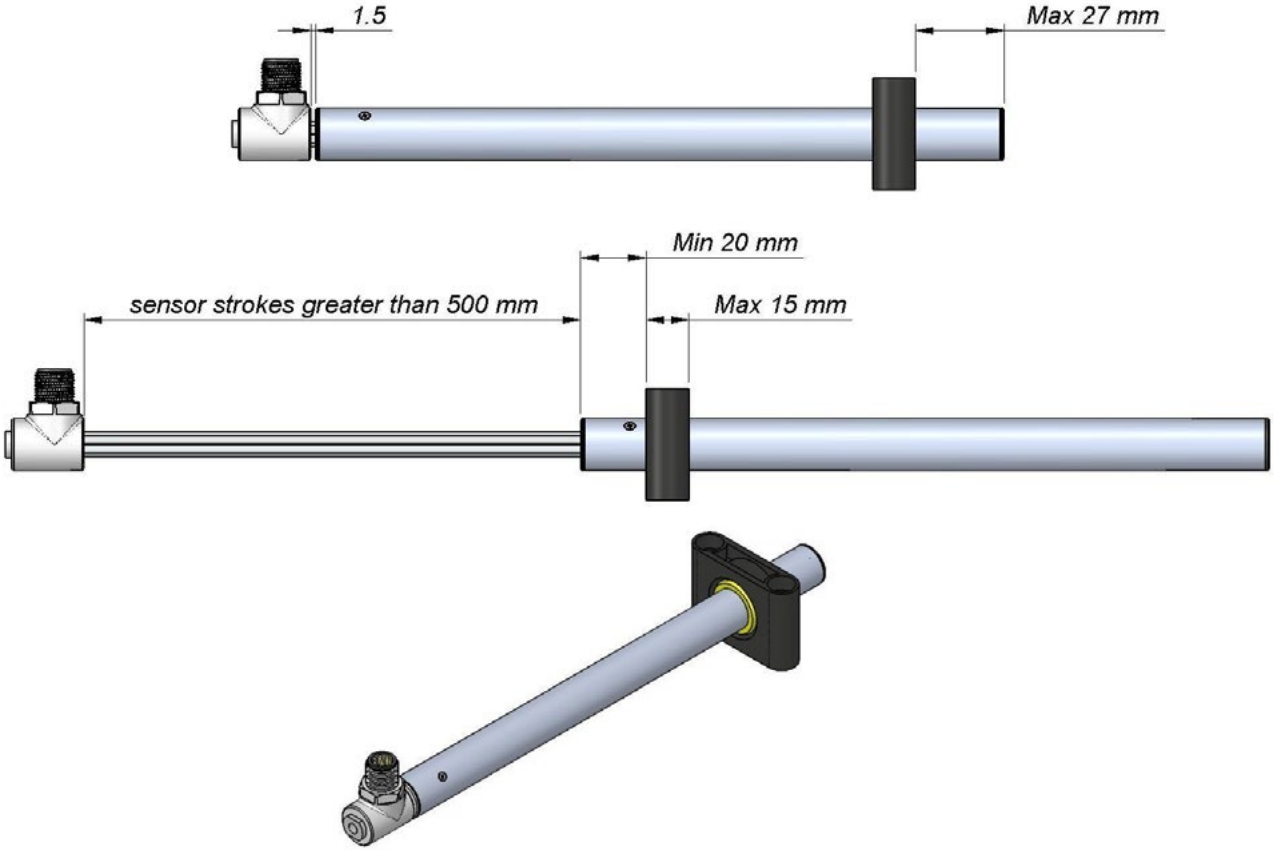


Figure 4.

- Pillow block bearing prevents harmful oscillations of the sensor body when completely extracted, limiting the sensor bending. Bearings can be realized as a self-lubricating plastic component in a joint or flange. Ferromagnetic bearings should be avoided.

3. CORRECT MOUNTING PRECAUTIONS

Table 1. Mechanical Connection Joints

PKIT 1567 **Ball joints**	
PKIT 1565 **Axial joints**	
PKIT 1566 **SS Axial joints (AISI316)**	
PKIT 1568 **SS Ball joints (AISI316)**	

4. SAFETY USAGE PRECAUTIONS

The movement of the sliding magnetic core on the rod could introduce a crush hazard due to the two movable parts which are moving towards one another, or one movable part moving towards a fixed one.

In particular, the hazard can affect human body parts, mechanical elements or cables and wiring interposed between the sliding core and the M12 output connector head.

For this reason, adjust the machines speed so that they operate smoothly and avoid any element between sliding core and M12 output connector head.

Figure 5.

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