



Installation Instructions

F-Series

Ultra-flat, stainless steel force measuring bearing

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**Diese Bedienungsanleitung ist auch in Deutsch erhältlich.
Bitte kontaktieren Sie Ihre nächstgelegene FMS Vertretung.**

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2 Safety instructions

All safety related regulations, local codes and instructions that appear in the manual or on equipment must be observed to ensure personal safety and to prevent damage to the equipment connected to it. If equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Do not stress the equipment over the specification limits neither during assembly nor operation. To do so can be potentially harmful to persons or equipment in the event of a fault to the equipment.

2.1 Presentation of safety information

The following safety symbols appear in this manual.

2.1.1 Danger that could result in minor or moderate injuries



Danger, warning, caution

Failure to follow wiring instructions in this manual may result in equipment damage or personal injury.

2.1.2 Note regarding proper function



Note

Note regarding proper operation
Simplification of operation
Ensuring function

2.2 General safety information



The force sensors may not be stressed over the specification limits neither during assembly nor operation. The unit's overload protection value may not be exceeded.



The attachment points for the force sensor on the machine frame must be properly designed. The bearings need to be appropriately mounted.



For proper installation and operation, follow the electrical wiring diagram and instructions in this manual.

3 Product information

3.1 Product description

The force measuring bearings of the F-Series feature an extremely slim design. They are designed for the measurement of tension on continuous material processing lines where live shaft idler rolls are utilized. The installation on the machine is simply realized with two shoulder bolts.

3.2 Functional description

The force sensors of the C-Series combine force sensor and the bearing seat. The C-Series design, incorporating dual bending beams, eliminates the load-specific influences of torque. The movement of the bending beams is detected by a set of strain gages arranged in a full bridge circuit and converted into an electrical signal. This simple measurement principle delivers precise results even with low material tension and low web wrap angles.

3.3 Scope of delivery

Included in scope of delivery

Force sensor, clip ring

Options

None

Accessories

Bearing, prefabricated cable (specify length) with connector (straight or right-angle), dowel screw $\varnothing 6 \times 30$, M5, dowel pin $\varnothing 6 \text{ h}6 \times 20$

3.4 Order code

F-Series : Order code			
F	202	.50	.15
			Shaft diameter in mm
			Nominal force rating in N
			Size
			Series

Figure 1: order code

4 Installation

Force sensors are defined as “partly completed machinery” according to the Directives 2006/42/EC, article 2. In order to assure a proper functionality of the parts and assure the essential safety requirements of operators working with it, the following conditions for the assembly must be met:



The force sensor may not be stressed over the specification limits neither during assembly nor operation. The unit's overload protection value may not be exceeded.



The mounting points for the force sensor on the machine frame must be properly designed. The bearings need to be appropriately mounted.



For proper installation and operation, follow the electrical wiring diagram and instructions in this manual.

4.1 Installation options

The force sensors of the F-series can be installed in different ways.

You can use the accessories:

- dowel screw $\varnothing 6 \times 30$, M5
- dowel pin $\varnothing 6 \text{ h6} \times 20$

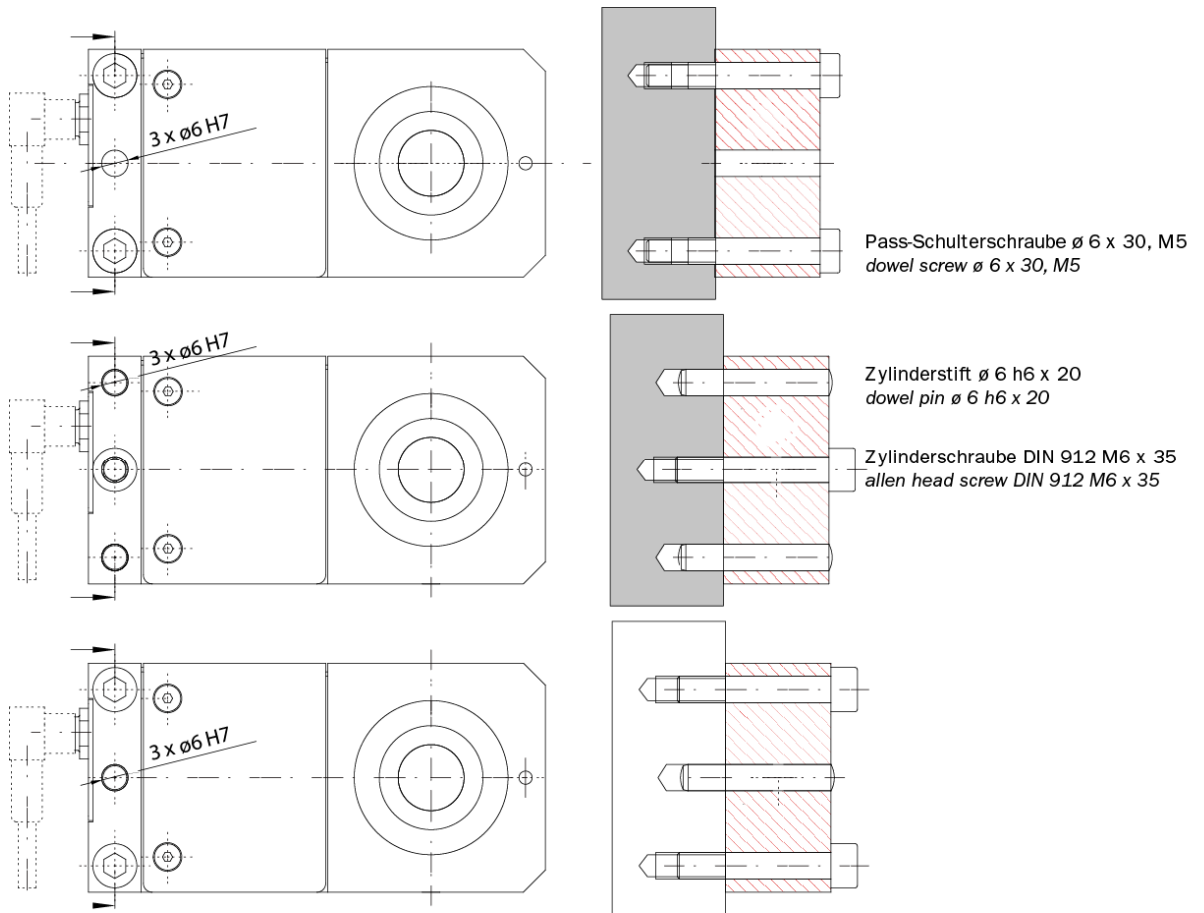


Figure 2: installation options

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We recommend the first two mounting options since they can absorb potential moments of tilt more efficiently.

4.2 Bearings

Self-aligning bearings

We recommend to use self-aligning bearings



If the installation bores on both sides of the machine's frames are not aligned properly, this will cause a preload of the roller and bearings. In this case the measuring result of the force sensors will be faulty.

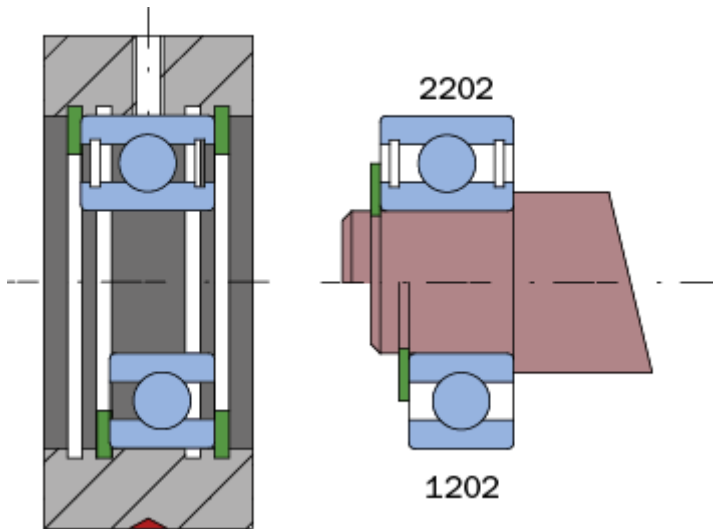
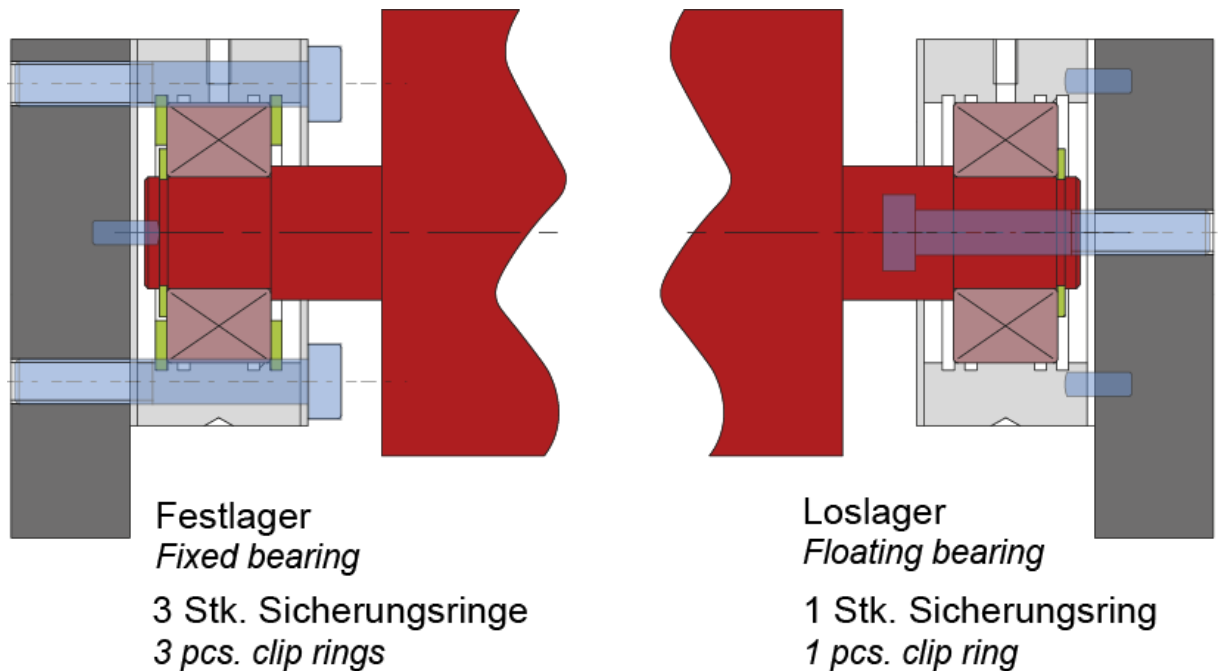


Figure 3: bearings

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Festlager
Fixed bearing

3 Stk. Sicherungsringe
3 pcs. clip rings

Loslager
Floating bearing

1 Stk. Sicherungsring
1 pcs. clip ring

Figure 4: Fixed and floating bearing installation

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4.3 Installation

Bearings on roll

- Clean the shaft, check tolerance and cylindric shape of the bearing seat.
- Install both bearings on the shaft ends
- Secure the bearings with the clip rings on the shaft

Bearing and shaft in force sensor, fixed bearing side

- Insert mounting screws and pin into force sensor
- Insert clip ring towards the frame side of the force sensor
- Slide bearing with roll into the force sensor until clip ring touches bearing
- Secure bearing with second clip ring on the shaft. The second clip ring can be taken from the force sensor of the floating bearing side.

Bearing and shaft in force sensor, floating bearing side

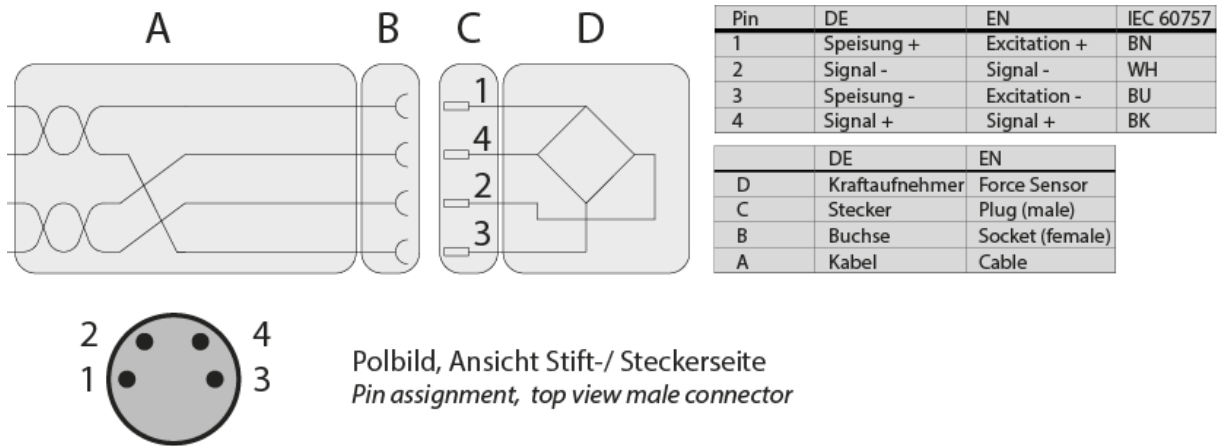
- Insert mounting screws and pin into force sensor
- Slide bearing with roll into the force sensor

Inserting the roll in the machine frame

- Slide floating force sensor towards the roll as far as possible
- Insert roll with force sensors into the machine frame.
- Align fixed bearing force sensor in regards of the orientation of the red point
- Tighten screws.
- Align floating bearing force sensor in regards of the orientation of the red point
- Tighten screws.
- Check for free spinning roll.

4.4 Electrical connections

Connection between the Force Measuring Rollers and machine controller is realized by means of a 5-pole cable with a cross-section of 0.25mm². The cable must be installed separate from power lines.



Farbangaben (IEC60757) und Codierung gelten nur für FMS Komponenten!
 Color scheme (IEC60757) and pin codes are valid for FMS components, only!

Figure 5: pin assignment M8

Pin_Assignment_Sensorkabel_Farben_Stecker.ai

5 Technical data

Technical data	
Sensitivity	1.8 mV/V
Tolerance of sensitivity	<± 2 %
Accuracy class	±0.5% of nominal force rating
Temperature coefficient	±0.1%/10K
Temperature range	-10 to +60°C
Input resistance	350Ω
Excitation voltage	1 to 12 VDC
Overload protection	10 times nominal force
Material	Stainless steel
Protection class	IP42
Electrical connection	Male connector M8, 4-pole
Measuring range	30:1

Table 1: technical data

6 Dimensions

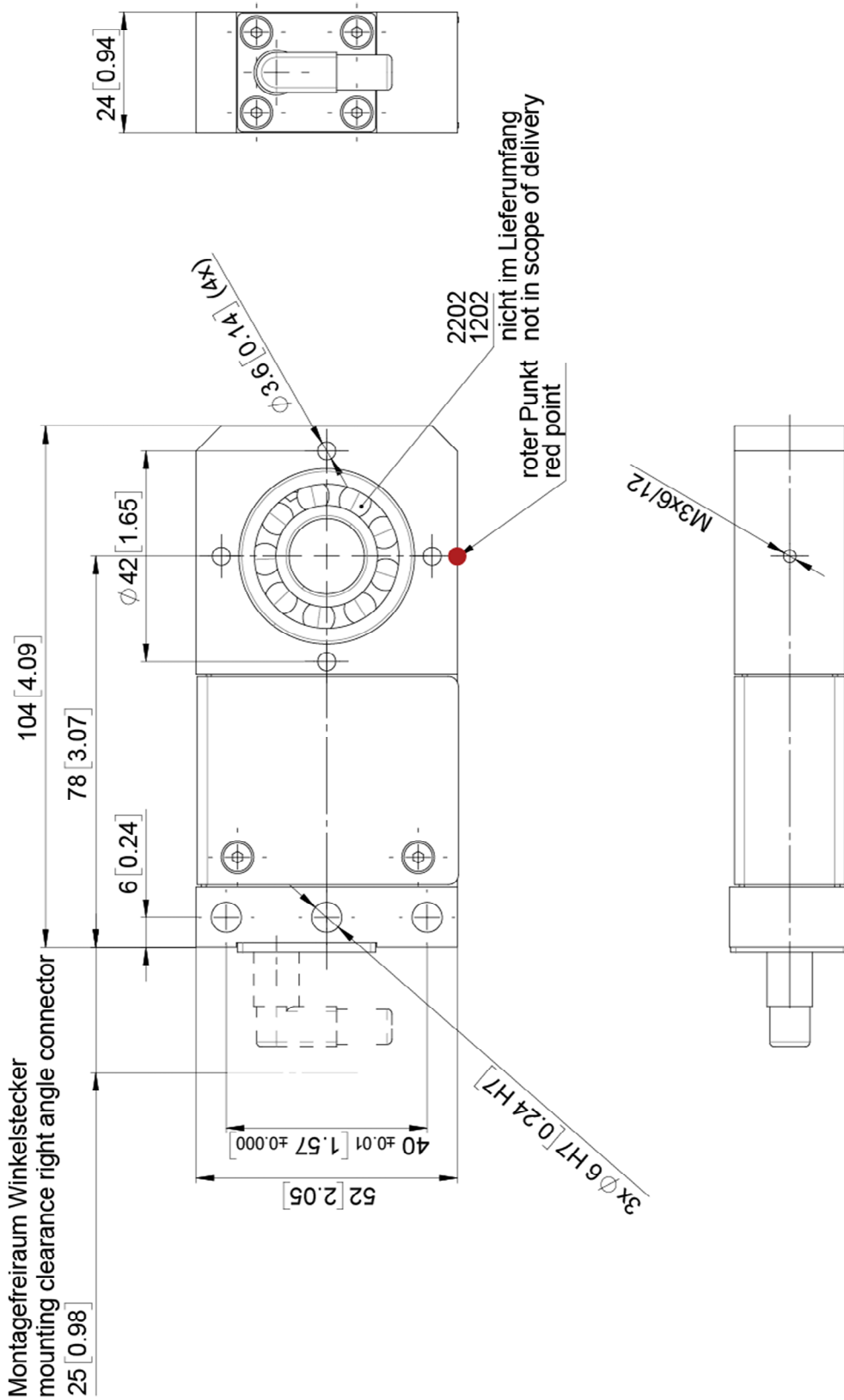


Figure 6: Dimensions

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