



Installation Instructions

ZMGZ-Series

Force sensor rolls without shaft

Document Version 3.00
Issue Date / Author 11/2019 / NS



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

1 Table of contents

1	TABLE OF CONTENTS	2
2	SAFETY INSTRUCTIONS.....	3
2.1	Presentation of safety information	3
2.1.1	Danger that could result in minor or moderate injuries.....	3
2.1.2	Note regarding proper function	3
2.2	General safety information	3
3	PRODUCT INFORMATION.....	4
3.1	Product description	4
3.2	Functional description	4
3.3	Scope of delivery.....	4
3.4	Order code	5
4	INSTALLATION.....	6
4.1	Installation options	7
4.2	Fixed and floating bearing installation.....	8
4.3	Electrical connections	8
5	TECHNICAL DATA.....	10
5.1	Dimensions	11

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 ZMGZ-Series force sensor offers flexible installation options, and are designed for the measurement of tension on continuous material processing lines where idler rolls with integrated bearings without shaft are utilized. The product is available in two sizes. The shaft journals of 25 or 35 mm diameter accept standard bearings.

3.2 Functional description

The ZMGZ-Series force measuring sensor combines the bearing seat and the force sensor within the same housing, thus minimizing the required installation space. The substantial overload protection translates to eliminated / minimized calibration issues due to machine upset conditions. The movement of the bending beam, which is proportional to the applied force, is detected by strain gauges arranged in a full bridge circuit and then converted into an electrical signal. This simple measurement principle delivers precise results even with low material tension and small web wrap angles. The Red Point, as located on the sensor body, should be aligned with the direction of the resultant force due to web tension.

3.3 Scope of delivery

Included in scope of delivery

force sensor, straight connector (female), clip ring, installation screw with washer

Options

- H14 right-angle connector in scope of supply, replaces straight connector
- H16 temperature range up to 120 °C (248 °F)
- H18 with water tight, straight connector, replaces original connector
- H21 electrical connection with PG gland with 5 m (16 ft.) cable, replaces connector
- H28 red point offset 180 °
- H29 resistant against aggressive media, especially acids (please specify), up to 120 °C (248 °F)
- H30 resistant against aggressive media, especially hydrocarbons (please specify) up to 120 °C (248 °F)
- H31 for vacuum applications to 1E-7 hPa , 1E-5 Torr, temperature range up to 120 °C (248 °F)

Accessories

Bearing, prefabricated cable (specify length) with connector (straight or right-angle))

3.4 Order code

ZMGZ-Series : Order code				
ZMGZ	205	.100	.25	.H14.H16
				Options
				Journal diameter in mm
				Nominal force rating in N
				Size
				Series

Figure 1: order code

Datasheet_ZMGZ_series.indd

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

Bore pattern for the machine frame

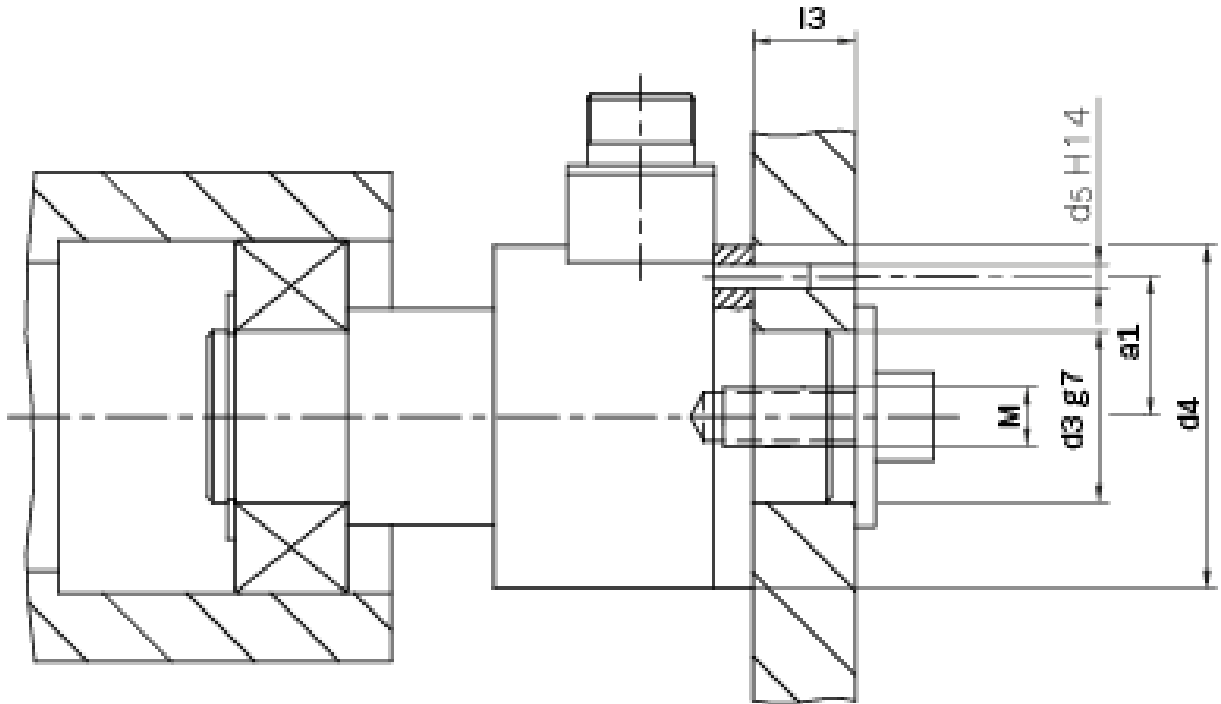


Figure 2: machine frame

ZMGZ_BA_Manual.ai

ZMGZ-Series : Specifications in mm (in.)										
Size	d1	d2	d3	d4	d5	M	a1	a2		
ZMGZ205	25 (0.98)	52 (2.05)	30 (1.18)	50 (1.97)	4 (0.16)	M10	20 (0.79)	54.5 (2.15)		
ZMGZ307	35 (1.38)	72 (2.84)	35 (1.38)	70 (2.76)	5 (0.20)	M12	28.5 (1.12)	66 (2.60)		

ZMGZ-Series : Specifications in mm (in.)						
Size	l1	l2	l3	l6	l7	l8
ZMGZ205	18 (0.71)	68.5 (2.70)	12-18 (0.47-0.71)	10 (0.40)	43.5 (1.71)	100 (3.94)
ZMGZ307	23 (0.91)	83 (3.27)	18-28 (0.71-1.10)	16 (0.63)	53 (2.09)	127.5 (5.02)

Figure 3: installation dimensions

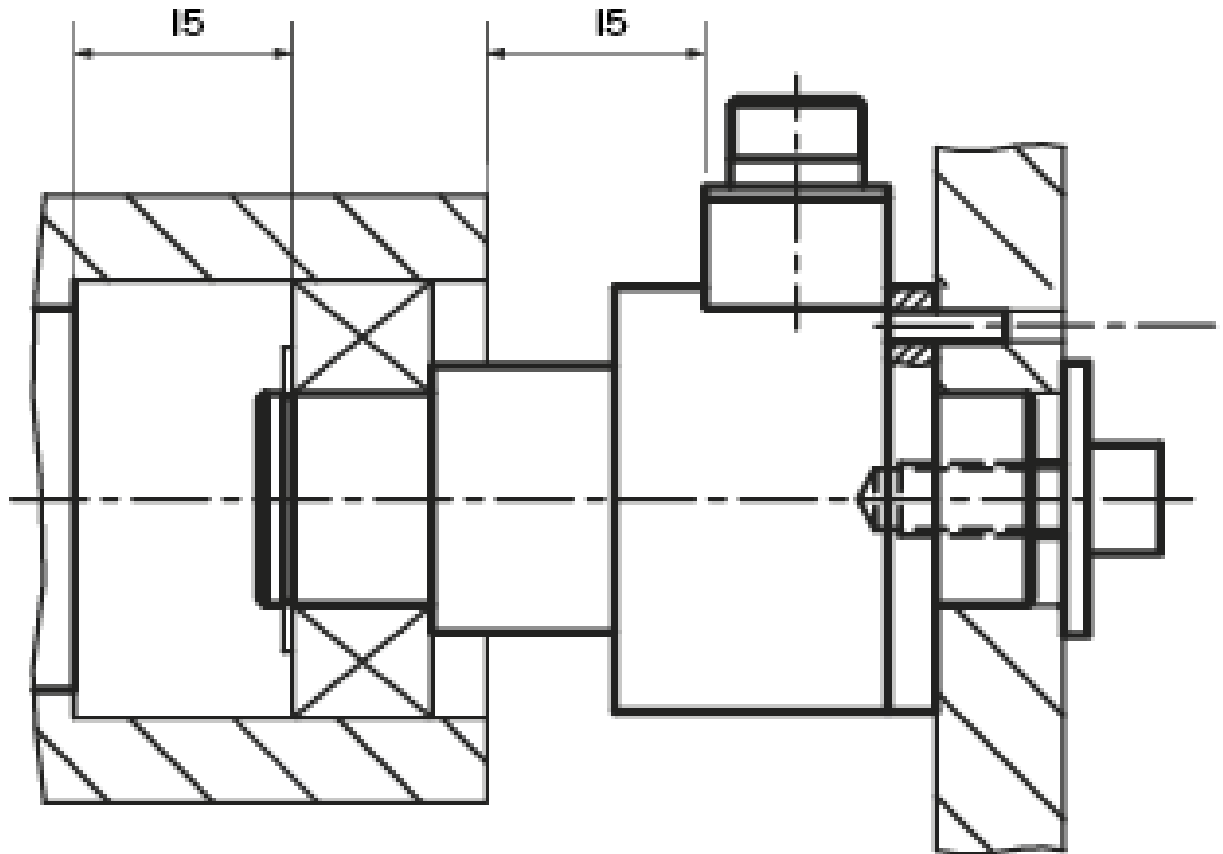
datasheet_ZMGZ_series.indd

Assembly dimension l5



Please note that the dimension l5 is of special importance.

This will allow to slide the force sensor into the roll for easy installation of the roll-forcer sensor assembly into the machine frame.



4.2 Fixed and floating bearing installation

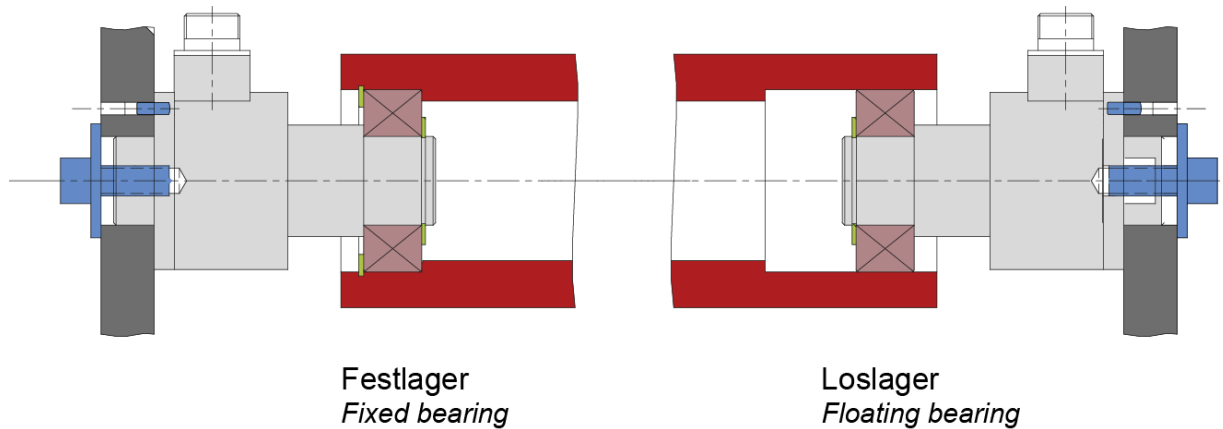
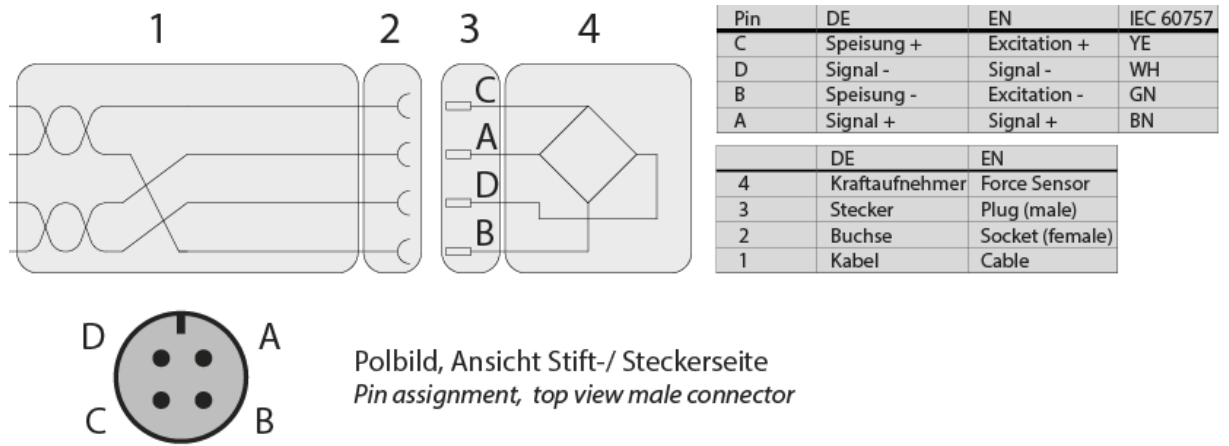


Figure 4: fixed and floating bearing side

ZMGZ_BA_Manual.ai

4.3 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

Pin_Assignment_Sensorkabel_Farben_Stecker.ai

5 Technical data

Technical data	
Sensitivity	1.8 mV/V
Tolerance of sensitivity	<± 0.5 %
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 7 VDC
Overload protection	10-times nominal force
Material	Stainless steel
Protection class	IP42
Electrical connection	Male receptacle, flange mounting, Amphenol, 4-pole
Measuring range	30:1

Table 1: technical data

5.1 Dimensions

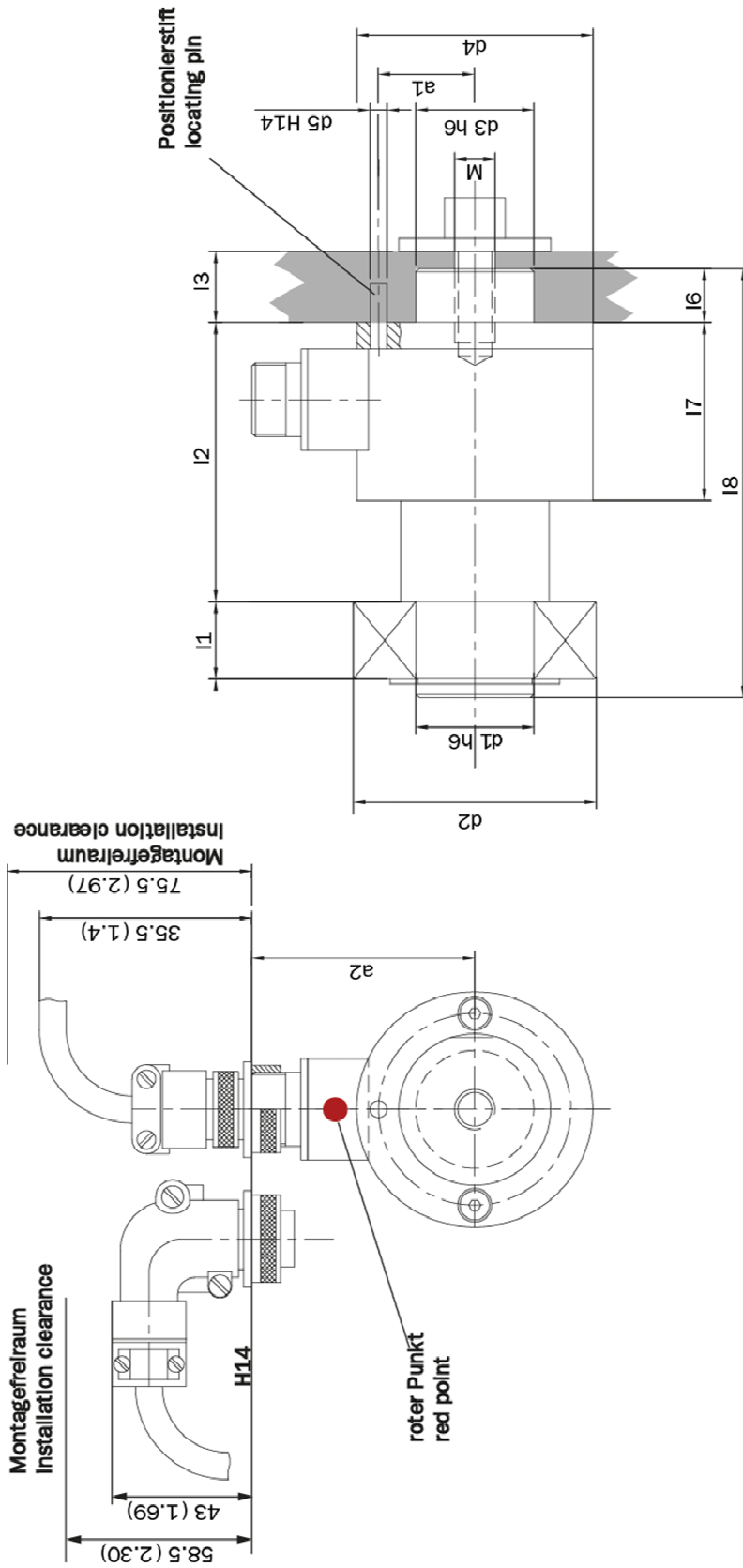


Figure 6: Dimensions

ZMGZ_BA_Manual.ai

ZMGZ-Series : Specifications in mm (in.)									
Size	d1	d2	d3	d4	d5	M	a1	a2	
ZMGZ205	25 (0.98)	52 (2.05)	30 (1.18)	50 (1.97)	4 (0.16)	M10	20 (0.79)	54.5 (2.15)	
ZMGZ307	35 (1.38)	72 (2.84)	35 (1.38)	70 (2.76)	5 (0.20)	M12	28.5 (1.12)	66 (2.60)	

ZMGZ-Series : Specifications in mm (in.)						
Size	l1	l2	l3	l6	l7	l8
ZMGZ205	18 (0.71)	68.5 (2.70)	12-18 (0.47-0.71)	10 (0.40)	43.5 (1.71)	100 (3.94)
ZMGZ307	23 (0.91)	83 (3.27)	18-28 (0.71-1.10)	16 (0.63)	53 (2.09)	127.5 (5.02)

ZMGZ-Series : Nominal forces, Deflection, Weight			
Size Typ	Nominal force N, kN (lbf.)	Deflection mm (in.)	Weight kg (.lbs)
ZMGZ205	100, 200, 375, 750, 1500 (22, 45, 84, 169, 337)	0.15 (0.0059)	1.0 (2.20)
ZMGZ307	100, 200, 375, 750, 1500, 3000 (22, 45, 84, 169, 337, 674)	0.15 (0.0059)	2.2 (4.85)

Figure 7: dimensions

Datenblatt_ZMGZ_series.indd



FMS Force Measuring Systems AG
 Aspstrasse 6
 8154 Oberglatt (Switzerland)
 Tel. 0041 1 852 80 80
 Fax 0041 1 850 60 06
 info@fms-technology.com
 www.fms-technology.com

FMS USA, Inc.
 2155 Stonington Avenue Suite 119
 Hoffman Estates, IL 60169 (USA)
 Tel. +1 847 519 4400
 Fax +1 847 519 4401
 fmsusa@fms-technology.com

FMS (UK)
 Aspstrasse 6
 8154 Oberglatt (Switzerland)
 Tel. +44 (0)1767 221 303
 fmsuk@fms-technology.com

FMS (Italy)
 Aspstrasse 6
 8154 Oberglatt (Switzerland)
 Tel. +39 02 39487035
 fmsit@fms-technology.com