Installation Instructions RMGZ9-Series

Freely configurable cantilever force measuring roller

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 roper operation
Simplification of operation
Ensuring function

2.2 General safety information

The Force Measuring Rollers 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 Measuring Rollers 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 rollers of the RMGZ9-Series combine force sensor and roller. The RMGZ9-Series design, incorporating dual bending beams, eliminates the load-specific influences of torque and ensures accurate measurement at any position on the roller while maintaining the parallel position of the material and eliminating angular deflection. The movement of the bending beams is detected by a set of strain gages arranged in a full bridge circuit. The resulting electrical signal, which is proportional to the applied force, is then amplified for use in monitoring or controlling web tension. With the superior performance of the RMGZ9-Series, accurate tension readings are obtained even with low web wrap angles and low material tension.

3.2 Functional description

The RMGZ9-Series force measuring rollers are designed as self-contained cantilever mount sensors that minimize machine space requirements in continuous material processing applications. They can be mounted horizontally or vertically directly or by means of an optionally available flange to the machine frame. Force measuring rollers of the RMGZ9-Series are available with a huge variety of roller materials and surface finishing, as well as a wide range of different dimensions.

3.3 Overview and designation

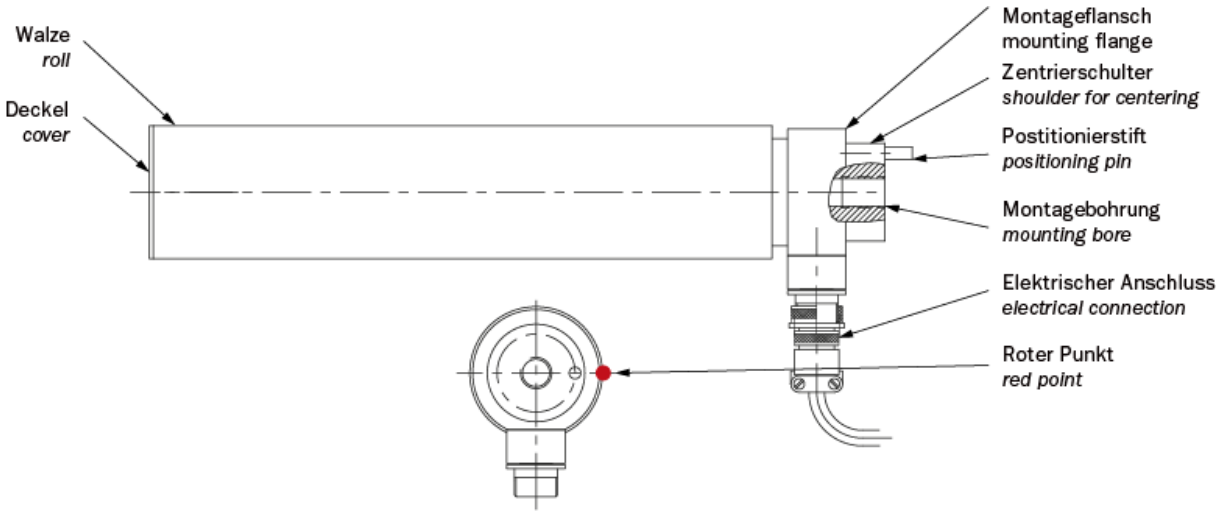


Figure 1: Overview and designation

3.4 Order code

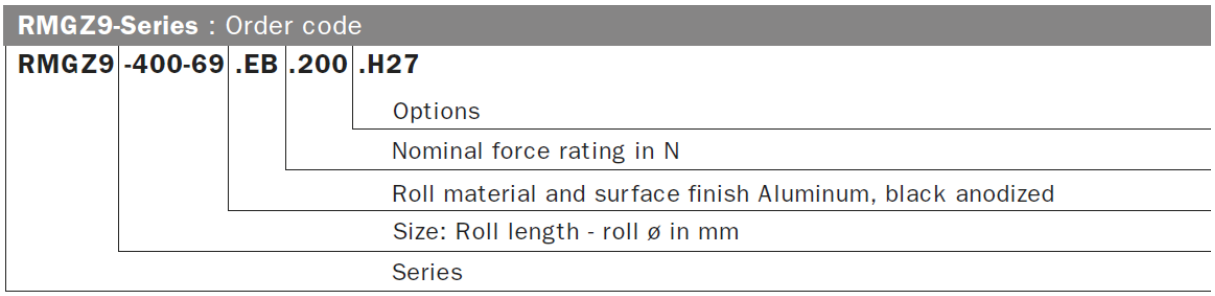


Figure 2: order code

3.5 Scope of delivery

Included in scope of delivery

Force sensor, straight connector (female)

Options

H11 small connector, round type C 091

H12 Axial electrical connection, repaces radial, small connector, round type C 091

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 conector

H21 electrical connection with PG gland with 5 m (16 ft.) cable, replaces connector

H27 connector offset 90° ,red point on opposite side of connector

H31 for vacuum applications to 10-7 hPa , 10-5 Torr, connector conditionally suitable for vacuum; temperature range up to 120°C (248°F)

Accessories

Prefabricated cable (specify length) with connector (straight or right-angle), installation flange

4 Installation

4.1 Installation conditions

The Force Measuring Roller 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 Measuring Rollers 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 Measuring Rollers 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.

4.2 Direct installation on machine frame

For force sensors of the RMGZ9-series are directly bolted to the machine frame.

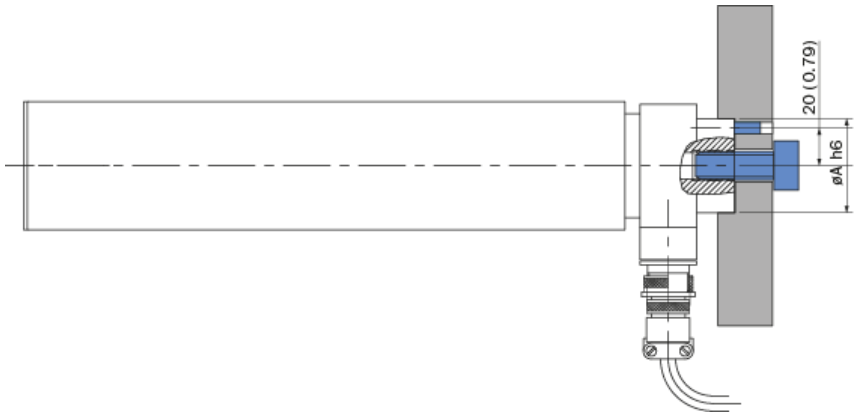


Figure 3: direct installation

4.3 Installation flange

The installation flange is available as accessory.

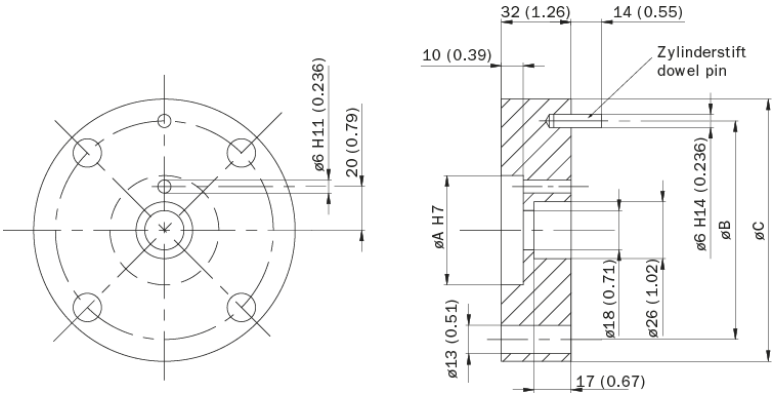


Figure 4: dimensions flange

Size	A	B	C
RMGZ900.581699	50 (1.97)	100 (3.94)	120 (4.72)
RMGZ900.582185	75 (2.95)	125 (4.92)	150 (5.91)

Table 1: dimensions flagne

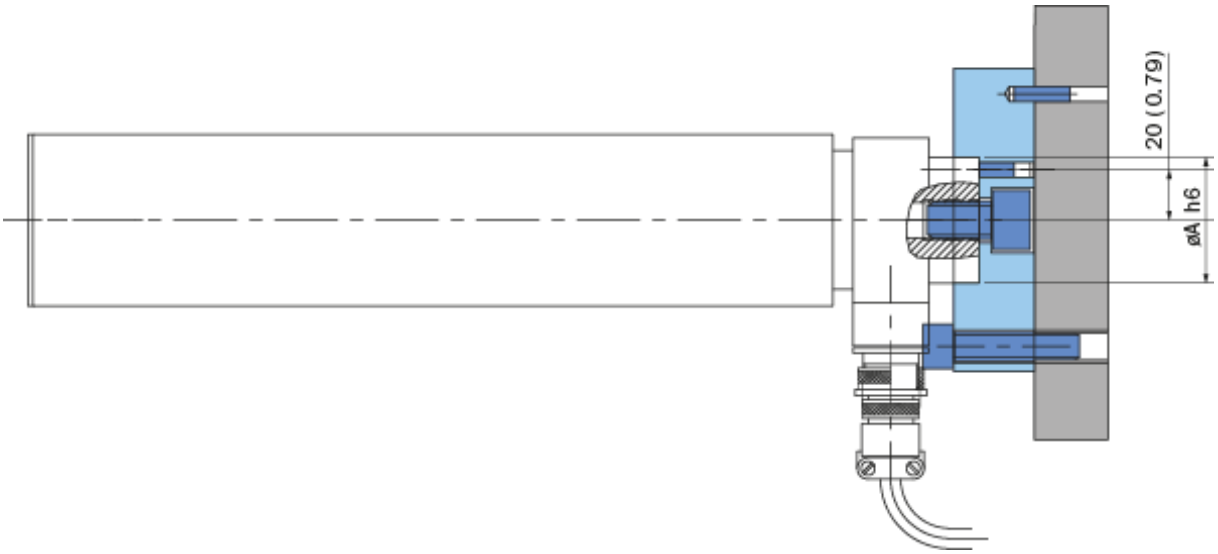
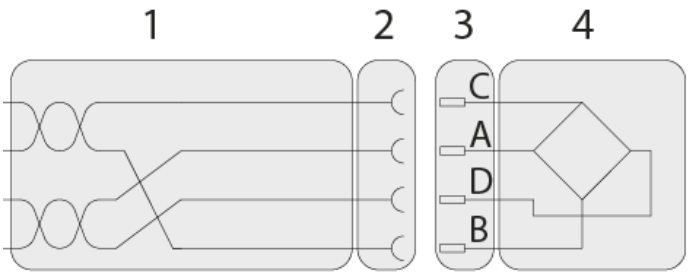


Figure 5: installation flange

4.4 Electrical connections

Connection between force sensor and measuring amplifier is realized by means of a 2 x 2 x 0.25mm² shielded, twisted-pair cable. The cable must be installed separate from power lines.

Connect the shielding only on the side of the measuring amplifier.



Pin	DE	EN	IEC 60757
C	Speisung +	Excitation +	YE
D	Signal -	Signal -	WH
B	Speisung -	Excitation -	GN
A	Signal +	Signal +	BN

	DE	EN
4	Kraftaufnehmer	Force Sensor
3	Stecker	Plug (male)
2	Buchse	Socket (female)
1	Kabel	Cable

Polbild, Ansicht Stift-/ Steckerseite
Pin assignment, top view male connector

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

Figure 6: pin assignment

5 Maintenance

The included bearings are lifetime lubricated. The force sensor is maintenance-free. If any maintenance should be necessary, we recommend contacting FMS customer service and to send the unit FMS for maintenance.

WARNING

The measuring body and the roll are delicate parts and may be damaged by improper handling!

Maintenance must be carried out by trained service personal only.

5.1 Exchange of the bearings

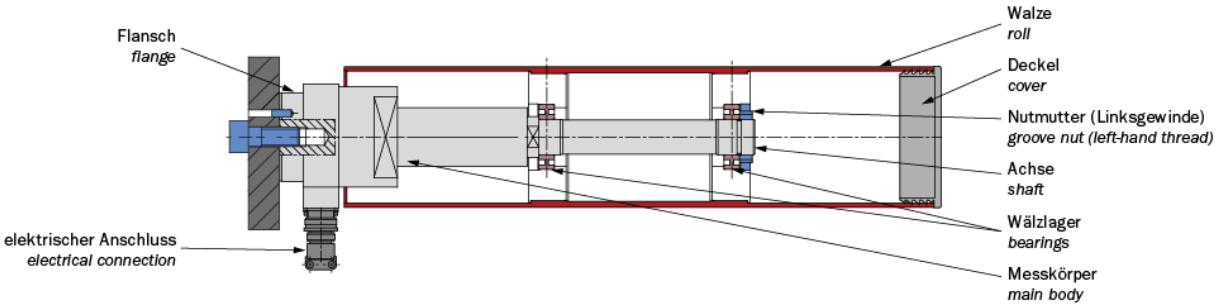


Figure 7: cross section RMGZ9-series

Sequence disassembly, assembly

- place force sensor in vice. Use soft jaws, clamp on the flange
- remove the cover
- loosen groove nut (left-hand thread)
- slide roll off the shaft manually
- clean the shaft
- slightly grease the bearing seats
- replace bearings (see table below)
- reinstall roll
- slightly grease the thread
- reinstall groove nut
- tighten groove nut until roll no longer turns freely
- slightly loosen groove nut until roll turn freely (appr. 30°)
- check for axial play of the roll
- if there is play, tighten the nut in small steps until axial play is eliminated
- reinstall cover

roll-ø mm	Dimensions bearings mm	Type bearings
40	ø12 / ø32 x 10	6201ZR [1)]
69	ø30 / ø55 x 13	6006ZR [1)]
99	ø 50 / ø90 x 20	6210ZR [1)]
119	ø 50 / ø110 x 27	6310ZR [1)]

[1)] Grease ball bearing slightly with special ball bearing lubricant Klüber Isoflex Topas L32. With other lubricants, life time lubrication is not guaranteed due to worse adherence.

5.2 Technical data

Technical data	
Sensitivity	1.8 mV/ V
Tolerance of sensitivity	< ± 0.2 %
Accuracy class	± 0.3 % (F_{Nom})
Measuring range	30:1
Temperature coefficient	± 0.1 % / 10 K
Temperature range	–10 bis +60 °C (14 to 140 F)
Protection class	IP42
Input resistance	350 Ω
Power supply	1 bis 12 VDC
Overload protection	10-times nominal force
Material main body	Stainless steel
Electrical connection	Male flange connector Amphenol, 4-pole
Measuring range	30:1

Table 2: technical data

6 Dimensions

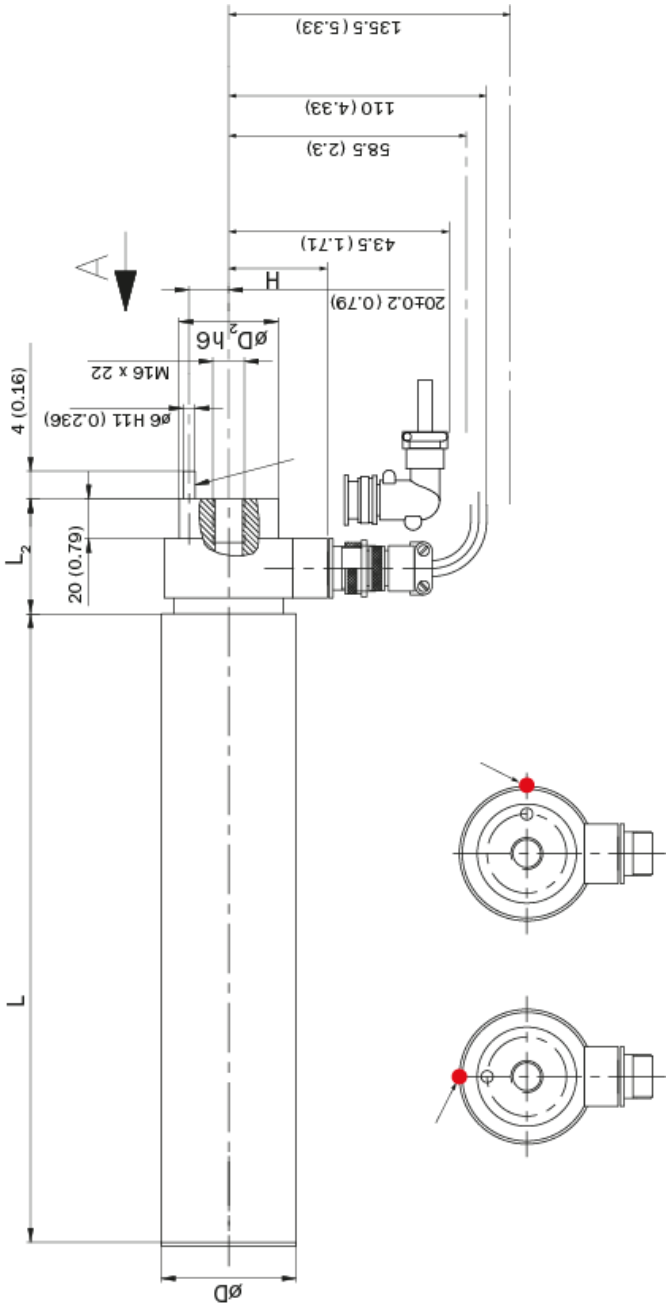


Figure 8: dimensions

RMGZ9-Series : Dimensions										
Size	**Dimensions** mm (.in)									
Type	L		L2		D		D2		H	
RMGZ9-250-69	250	(9.84)	58	(2.28)	69	(2.72)	50	(1.97)	63.5	(2.5)
RMGZ9-320-69	320	(12.60)	58	(2.28)	69	(2.72)	50	(1.97)	63.5	(2.5)
RMGZ9-400-69	400	(15.75)	58	(2.28)	69	(2.72)	50	(1.97)	63.5	(2.5)
RMGZ9-500-99	500	(19.69)	55	(2.17)	99	(3.90)	75	(2.95)	77	(3.03)
RMGZ9-630-99	630	(24.80)	55	(2.17)	99	(3.90)	75	(2.95)	77	(3.03)
RMGZ9-800-119	800	(31.50)	58	(2.28)	119	(4.69)	75	(2.95)	77	(3.03)
RMGZ9-900-119	900	(35.43)	60	(2.36)	119	(4.69)	75	(2.95)	77	(3.03)

Other dimensions, roller material and surface treatments available on request.

RMGZ9-Series : Nominal forces, Shaft diameter, Weight						
Size	**Nominal force for all sizes**		**Shaft diameter**		**Weight**	
Type	N (.lbf)		mm (.in)		kg (.lbs)	
RMGZ9-250-69	50	(11.24)	0.15	(0.0059)	4.2	(9.26)
RMGZ9-320-69	100	(22.48)	0.13	(0.0051)	4.4	(9.70)
RMGZ9-400-69	200	(44.96)	0.16	(0.0063)	4.6	(10.14)
RMGZ9-500-99	500	(112.40)	0.15	(0.0059)	9.4	(20.72)
RMGZ9-630-99	750	(168.61)	0.13	(0.0051)	13.0	(28.66)
RMGZ9-800-119	1000	(224.81)	0.12	(0.0047)	18.4	(40.57)
RMGZ9-900-119					21.2	(39.09)

The RMGZ9-series force measuring rollers can be mounted in 2 different ways. Either directly with a pilot hole to the machine or with a mounting flange which can be ordered as an accessory.

Figure 9: dimensions

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