Installation Manual RMGZ200

Force Measuring Roller

Version 1.10 01/2017 NS

Diese Bedienungsanleitung ist auch in Deutsch erhältlich.
Bitte kontaktieren Sie Ihren nächstgelegenen FMS Vertreter.

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1 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.

1.1 Description Conditions

a) Danger of health injury or loss of life

Danger
This symbol refers to high risk for persons to get health injury or loss life. It has to be followed strictly.

b) Risk of damage of machines

Caution
This symbol refers to information, that, if ignored, could cause heavy mechanical damage. This warning has to be followed absolutely.

c) Note for proper function

Note
This symbol refers to an important information about proper use. If not followed, malfunction can be the result.

The Force Measuring 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 Measuring Sensors on the machine frame must be properly designed. The bearings need to be appropriately mounted.

It is of paramount importance to compensate the centrifugal forces caused by the rotating base plate of the stranding machine. The measuring results will be wrong, if this rule is broken.

2 Product Information

2.1 Dimensions

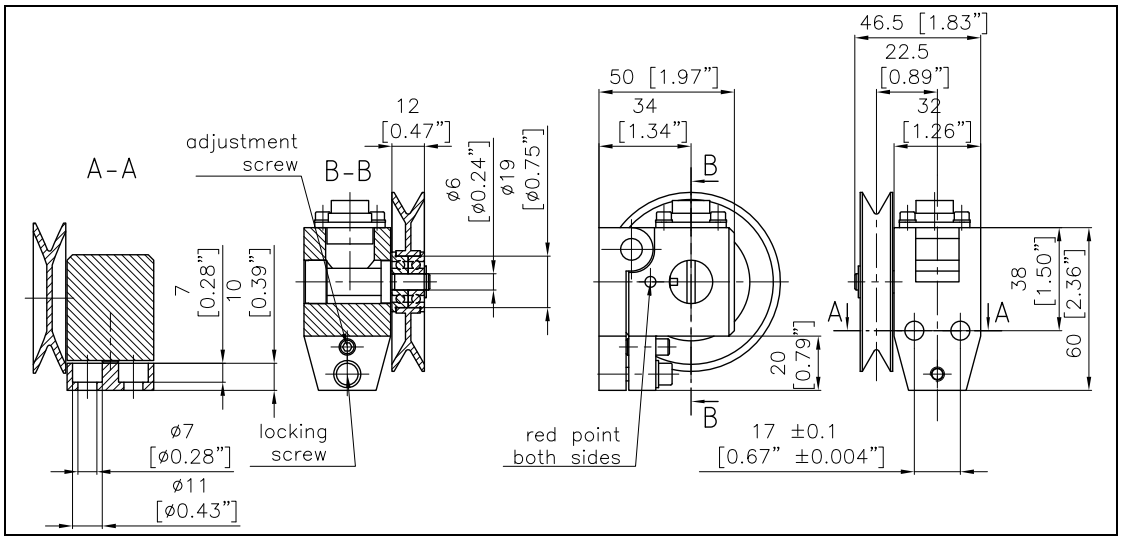

Fig. 1: Outline Drawing RMGZ200 R200001us

Nominal Force N	[lbs]	Order code FMS	Speed Limit rpm	Weight kg [lbs]
6	[1.33]	RMGZ206		
10	[2.2]	RMGZ211		
20	[4.5]	RMGZ212	40 000	0.57 [1.26]
50	[11.2]	RMGZ215		
100	[22]	RMGZ221		
300	[67]	RMGZ223		

Order Code (example): RMGZ221.H14

Options:
H14 = right angle connector
H16 = high temperature range up to 120°C [248°F]

2.2 Scope of Delivery

Scope of delivery:

1 sensor, 1 locking screw, 1 adjusting screw, 1 connector, 1 operation manual

Not included:

Mounting screws, sheave

3 Assembly Preparations

3.1 Assembly Conditions

The Force Measuring Roller RMGZ200 is 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 guarantee the essential health and safety requirements of operators working with it, the following conditions for the assembly of RMGZ200 must be met:

Caution

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.

Caution

The attachment points for the Force Measuring Rollers on the machine frame must be properly designed. The bearings need to be appropriately mounted.

Caution

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

3.2 Assembly Preparations

The force measuring roller RMGZ200 works in conjunction with a customer specific pulley. Before the measuring roller is installed it must be equipped with the pulley. The measuring roller contains a special flange for this purpose.
The machine must be prepared for the installation of the RMGZ200. The two corresponding mounting holes must be drilled. For the dimension of the holes refer to outline drawing **Fig.1**

3.3 Installation of the Measuring Roller in Rotating Applications

1. Mount the force measuring roller in the previously prepared position of the machine with two screws.
2. Close the hinge using the locking screw. Make sure that the locking screw is not completely tightened.
3. Attach the adjusting screw and tighten it until the air gap is parallel to the mounting surface of the machine.
4. The Red Point indicates the positive measuring direction of the sensor. The adjusting screw is used to align the position of the Red Point with high accuracy.

3.4 Red Point alignment in rotating applications

In rotating applications (e.g. in stranding machines) the force measuring rollers are mounted such that centrifugal forces are compensated. If using the RMGZ 200 this can be achieved by turning the measuring axes of the sensor parallel to the rotation axis and in direction of the positive force component (refer to **Fig.2**)

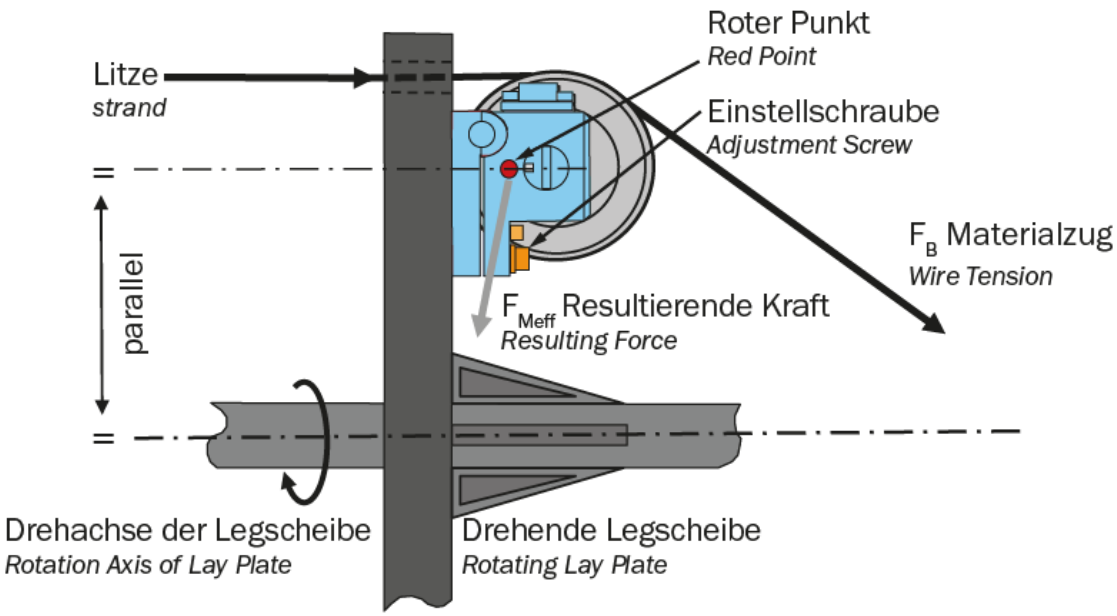

Fig. 2: RMGZ200 Red Point alignment on rotating machines
Red_Point_Allignment.ai

The position of the Red Point and thus the parallelism of both axes can be precisely adjusted with the adjustment screw.

> ***Caution***
>
> ***It is of paramount importance to compensate the centrifugal forces caused by the rotating base plate of the stranding machine. The measuring results will be wrong, if this rule is broken.***

> ***Note***
>
> ***The adjustment of the Red Point can be tested after offset compensation and calibration. If the reading of an unloaded load cell stays at zero (zero N) regardless of the load cell position (e.g. at 12 o'clock, at 6 o'clock or any other position), the red point is correctly aligned.***

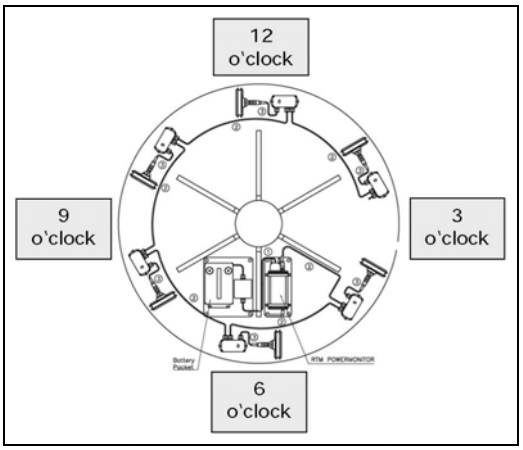

Fig. 3: Position of measuring rollers
RTM00020d

3.5 Red Point alignment in static applications

In static applications the force measuring rollers are mounted in a way that the red point is aligned in the direction of the resulting force .

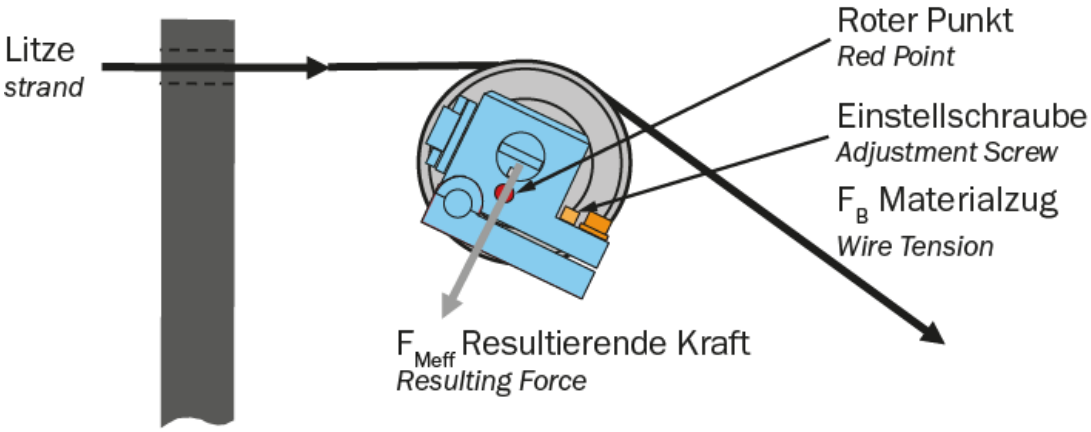

Fig. 2: RMGZ200 Red Point alignment on rotating machines
Red_Point_Allignment.ai

3.6 Wiring

Connection between Force Measuring Roller and electronics is done by using 2x2x0.25mm² [AWG23] shielded twisted-pair cable. With cable length exceeding 15m, 2x2x0.75 mm² [AWG18] is also suitable. The cable must be installed separate from power lines.

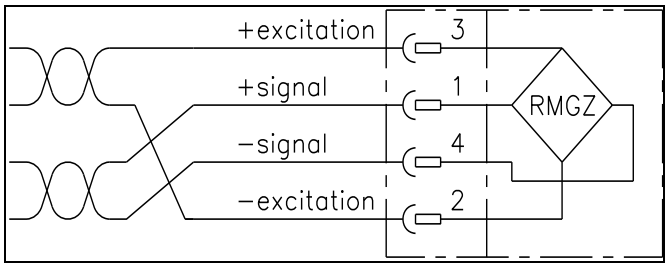

Fig. 4: Wiring diagram R100002e

The connection has to be done referring to **Fig. 4.** The shield has to be connected only to the measuring amplifier.

4 Design and Functionality

4.1 Functional Description

The Force Measuring Roller RMGZ200 series is used to measure the material tension in wire and cable producing machinery such as planetary cage, tubular, rigid frame stranding machines, bunchers and twisters. Its basic design is that of the RMGZ100B sensor but incorporating an accurate mechanism for the “Red Point” adjustment.

The Force Measuring Roller is equipped with two lifetime lubricated deep groove ball bearings. The customer specific sheave is mounted to them. The RMGZ200 works according to the principle of a dual flexion beam design. A quadruple foil type strain gauge mounted in a full Wheatstone bridge configuration performs the actual tension measurement. Overload protection devices prevent deformation of the wires caused by overload. The load must always be applied in the middle of the two bearings to ensure reproducible measuring results.

4.2 Technical Data

Sensitivity	1.8mV/V
Tolerance of sensitivity	< ±0.2%
Accuracy class	±0.5%
Load rating of bearing	C dynamic. = 4.61 kN [1036 lbf]
Temperature coefficient	±0.1% / 10K [±0.0055% / °F]
Temperature range	–10...+60°C [14...140°F] Option H16: –10...+120°C [14...248°F]
Input resistance	350 Ω
Supply voltage	1...12VDC
Overload protection	> 10 times nominal force
Protection class	Protected against dust (IP42)
Sensor Material	Stainless steel

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