

# Measurement and Sensor Systems



**Cable Drum**



# Cable Drum

with Length and Angular Transmitter

## The Cable Drums

can be used to measure the length, inclination and speed depending on the version. A further application is the possibility of transfer the supply voltage and measuring data via the measuring cable. They are mainly used for the measurement of telescopic arms and telescopic booms in cranes and lifting platforms as well as for the control of stage constructions in the event technology.



### The angle measurement

will be carried out e. g. via a **high-resolution micro-electro-mechanical inclination measuring system**. In the standard version is for the output a **current or a voltage signal** available.



### The length measurement

will be made according to the **wire measuring principle**. A multi-core measuring cable is used, which is wound one or multi-layered on a cable drum. The cable drum is equipped with a pull-back spring. In large measuring lengths a spindle roll guide makes sure that in case of multi-layered cable windings exactly lay on lay is wound.

The number of length proportional drum rotations will be measured, e. g. via a **magnetic angular transducer**, optional with **voltage or current output**.

In identical construction the length and inclination values can also be measured with digital transducer systems and read out in data type **CANopen**, also in **redundant version for security-relevant applications**, e. g. SIL2 according to IEC 61508.

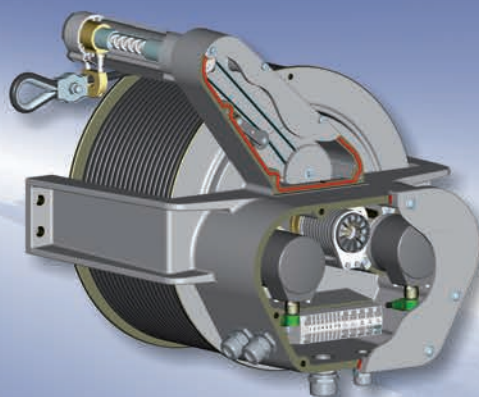
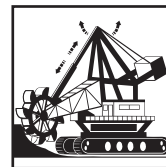
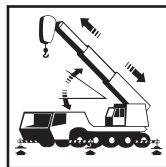


### The transmission

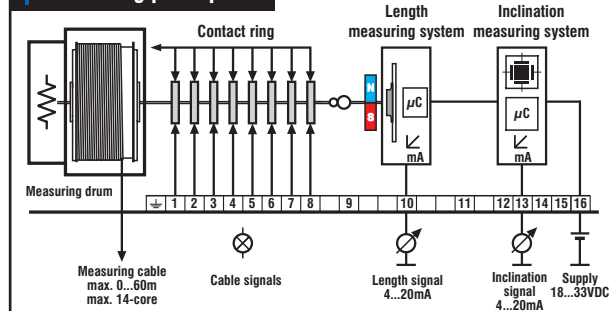
of the measuring data and control signals will be made via the cable conductors of the measuring cable, which will be gripped on a multi-layered slip ring body and bounded to terminal strip.

All electric components are inside of a completely closed aluminium casing of IP65

## Application range

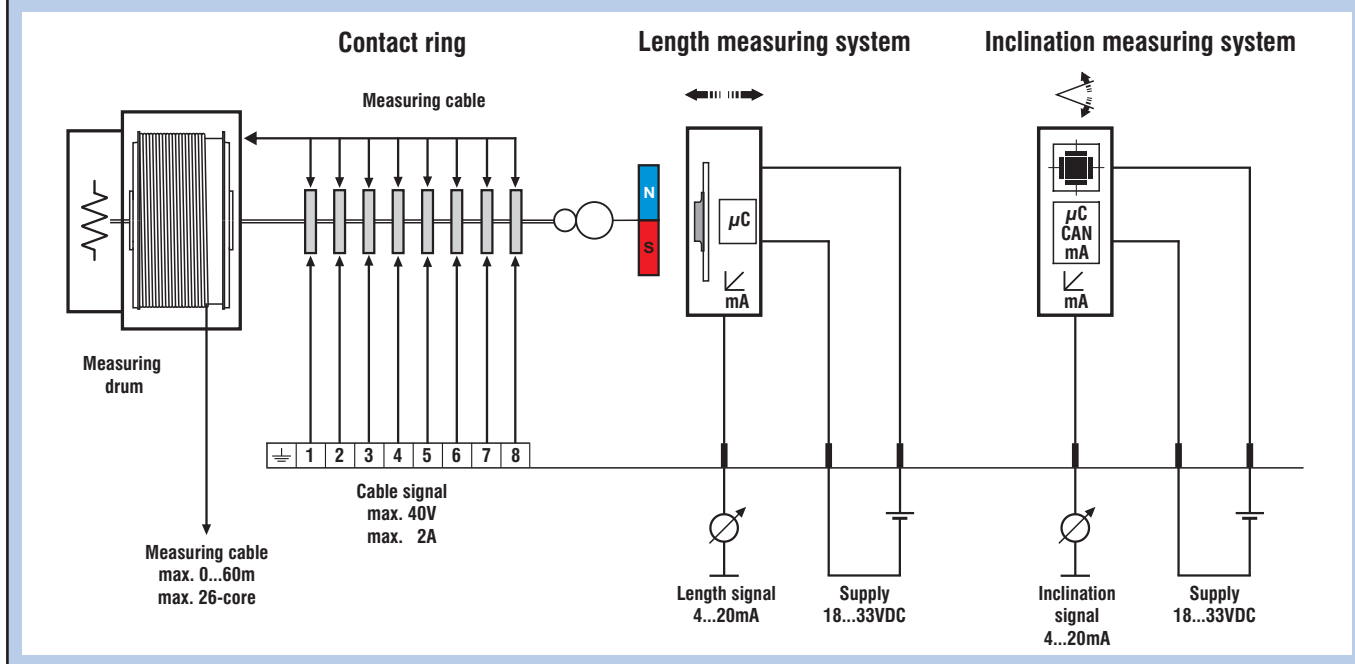


## Measuring principle

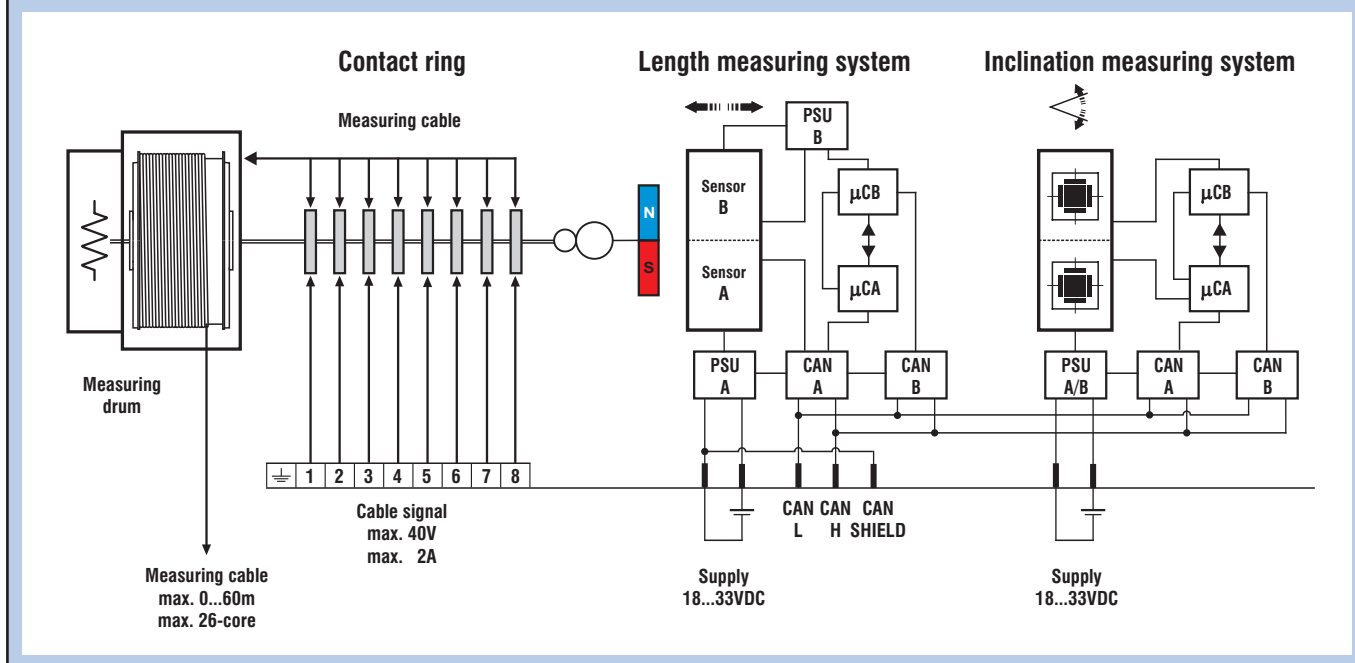


# Simplified diagrams

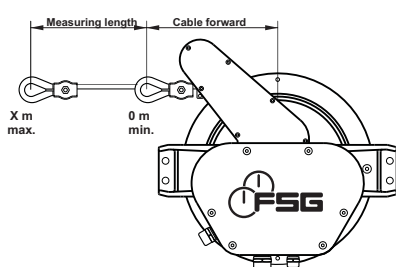
## Analogue signals



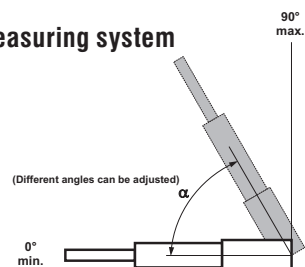
## CAN-signals




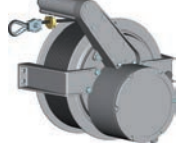

## Length measuring system



## Inclination measuring system






# Specifications

System versions	Length and Angle measurement			
<b>Models</b>				
<b>Series</b>	<b>WL 56</b>	<b>WL 020</b>	<b>WL 18</b>	<b>WL 32</b>

Mechanical data				
Connection and drum casing	Aluminium cast, grey coated	Aluminium cast, grey coated	Aluminium cast and steel plate	
IP code	IP 65			
Electrical connection	Series terminal strip (max. 2,5 mm <sup>2</sup> ) or connector assembly			
Weight	34 kg	20 kg	12 kg	14 kg
Clockwork Motor				
Initial force / end force	36 N / 70 N	30 N / 65 N	30 N / 60 N	
Haul-off speed	1 m/s			
Measuring length				
Up to max.	56 m	20 m	18 m	32 m
Measuring cable	12 x 0,5 mm <sup>2</sup> , type LiYCY	8 x 0,5 mm <sup>2</sup> , type LiYCY	12 x 0,5 mm <sup>2</sup>	3 x 0,22 mm <sup>2</sup>
Cable diameter	8 mm	7 mm	8 mm	3,9 mm
Circumference of drum <small>(with one-layered wire winding)</small>	756 mm	753 mm	904 mm	890 mm
Cable winding	Multi-layered (with layer winder)	Multi-layered (with layer winder)	Multi-layered	
Length accuracy	0,3 %	2 % (0,3 %)	2 %	

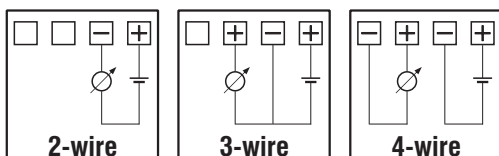
Electrical data				
Slip ring body, MS-hard-gold plated	max. 12-poles	max. 8-poles	12-poles	3-poles
Circuit data	40 V / 2 A			
Length transducer				
Resistance output	1, 2 or 5 k $\Omega$	1, 2 or 5 k $\Omega$	-	
Output analogue	4 - 20 mA or 0 - 10 V DC			
Output digital*	CANopen			
Inclination transducer				
Inclination angle	0 - 360°			
Angle accuracy	± 0,1°			
Resistance output	1, 2 or 5 k $\Omega$	1, 2 or 5 k $\Omega$	-	
Output analogue	4 - 20 mA or 0 - 10 V DC			
Output digital*	CANopen			

General data	
Supply	18 - 33 V DC
Temperature range	-30°C up to +70°C
Test voltage	500 V, 50 Hz, 1 min
EMC accord. to DIN	EN 61 000-6-2 / 3
Adjusting cycle	up to 200.000

System versions	Length measurement			
<b>Models</b>				
<b>Series</b>	<b>L 15</b>	<b>L 10</b>	<b>L 010</b>	<b>L 06</b>

Mechanical data				
Connection and drum casing	Aluminium cast, grey coated			
IP code	IP 65			
Electrical connection	Series terminal strip (max. 2,5 mm <sup>2</sup> ) or connector			
Weight	32 kg	13 kg	15 kg	8 kg
Clockwork motor				
Initial force / end force	80 N / 160 N	30 N / 50 N	30 N / 55 N	10 N / 20 N
Haul-off speed	1 m/s			
Measuring length				
Up to max.	15 m	10 m	15 m	6 m
Measuring cable	26 x 0,24 mm <sup>2</sup> , type LiYCY	5 x 0,34 mm <sup>2</sup> , type LiYCY		3 x 0,14 mm <sup>2</sup> , type LiYCY
Cable diameter	9,5 mm	5,2 mm		3 mm
Circumference of drum <small>(with one-layered wire winding)</small>	800 mm	733 mm		350 mm
Cable winding	One-layered			
Length accuracy	0,5 %	0,5 %		0,1 %
Electrical data				
Slip ring body, MS-hard-gold plated	26-poles	max. 5-poles		3-poles
Circuit data	40 V / 2 A			
Length transducer				
Resistance output	1, 2 or 5 kΩ	1, 2 or 5 kΩ		–
Output analogue	4 - 20 mA or 0 - 10 V DC			
Output digital*	CANopen			

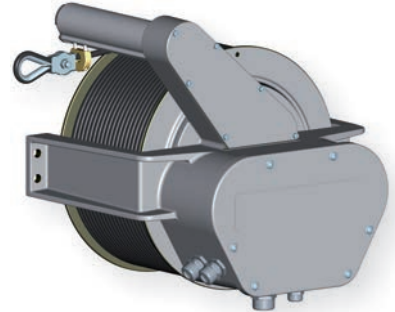
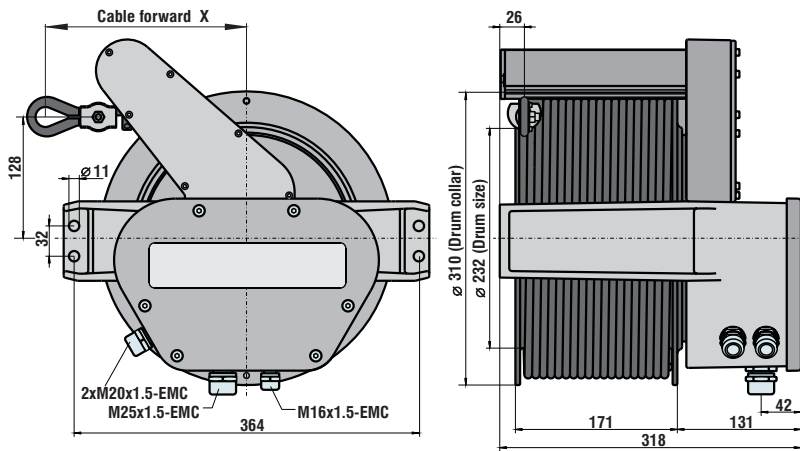
### Type of circuit



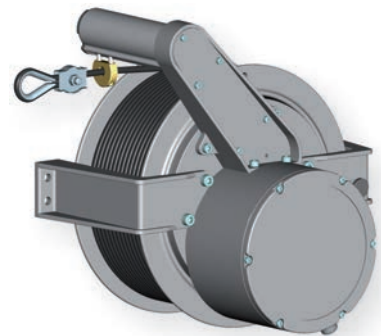
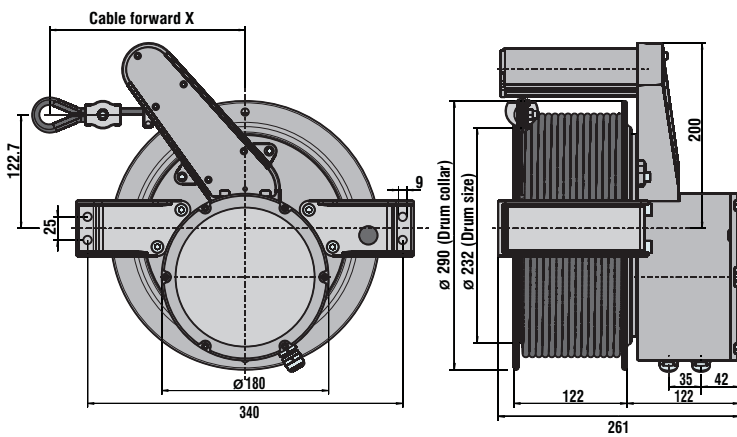
\* On request also in version according to IEC 61508, SIL (Safety Integrated Level) or ISO 13849, PL (Performance Level)

# Models

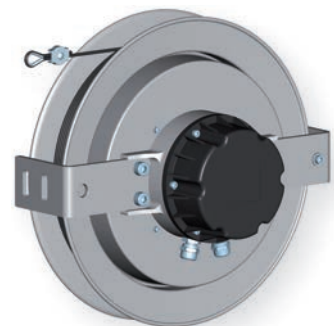
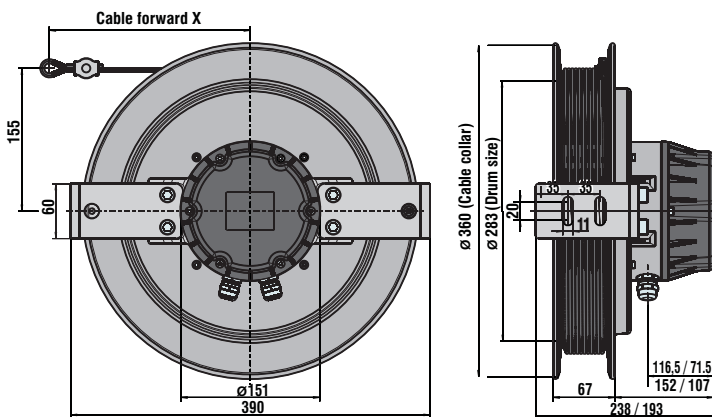
## WL 56



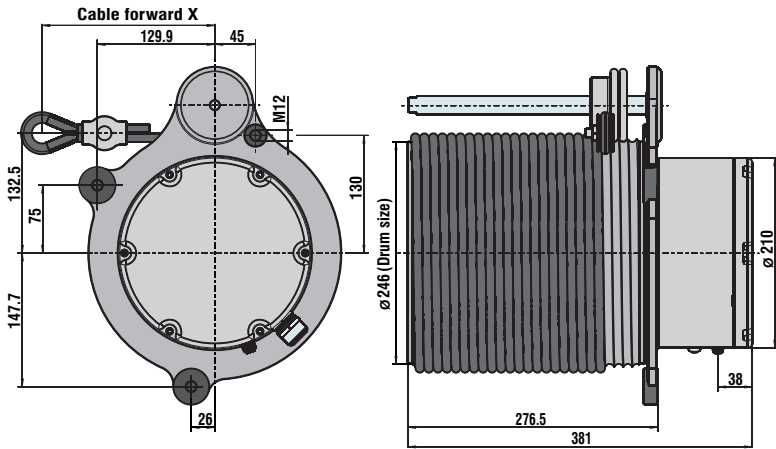
## WL 020



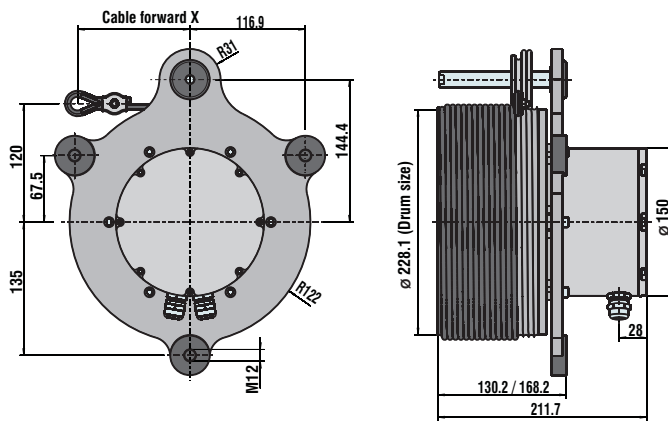
## WL 18 / WL 32



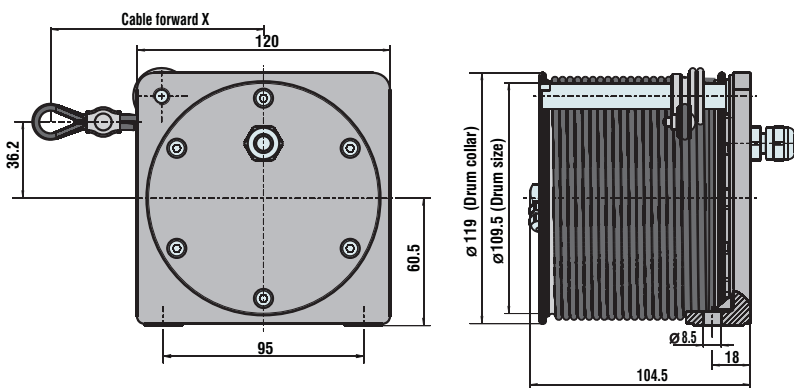
L 15



L 010 / L 015



L 06







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