



Solutions for Transmission Technology

- Slip rings
- Fibre Optic Modules

# Our Product Portfolio



## Customer oriented solutions

### Position and Motion Sensors



- Incremental Encoders
- Absolute Encoders
- Draw-wire Systems
- Linear Measuring Systems
- Inclinometers

### Counters and Process Displays



- Display and Preset Counters
- Timers and Preset Hour Meters
- Frequency Meters and Tachometers
- Combination Time and Energy Meters
- Position Displays
- Process Displays and Controllers

### Connector and Signal Transmission Technology



- Slip rings
- Fibre Optic Modules
- Cables, Connectors and Cable Assemblies

### OEM Products and Systems (OPS)



- Customised Display, Measurement and Control Components
- Complete Systems Solutions: Sensor Technology, Electronics, Mechanics



### Kübler Slip rings

- Slip rings SR085 p. 4
- Slip rings SR060 p. 7



### Kübler LWL modules

- LWL modules RS422/HTL p. 8
- LWL modules SSI p. 10

Kübler GmbH develops, manufactures and markets leading-edge position and motion sensors, counters and transmission technology.

Founded in the year 1960, the family business is now led by the next generation, Gebhard and Lothar Kübler, and the export share of its turnover exceeds 60 percent. 6 subsidiaries and 50 exclusive representatives offer local product know-how, service and advice throughout the world.



Slip rings transmit power, signals or data from a stationary to a rotating platform. The transmission between the stator and rotor takes place via sliding contacts and is extremely reliable.

The construction of SR085 is modular and offers the greatest flexibility in a variety of applications.

### Flexible and Rugged:

- Modular construction system, load and signal/data channels can be combined as desired
- Rugged GFPC housing (glass-reinforced polycarbonate), 30% glass-fibre content for industrial usage
- Long service life and long maintenance cycles
- Individually replaceable brush rings
- Customised versions easily available

### Reliable with Safety-Trans™ Design

- Two-cavity system for load and signal transmission
- Labyrinth seal
- High vibration resistance
- Fieldbus signals such as Profibus, CANopen etc. up to 12 MBit/sec

### Application areas for Slip Rings:

- Packaging machines
- Textile machines
- Robots and handling equipment
- Cranes
- Pipeline inspection systems
- Video surveillance (CCTV) equipment
- Fairground rides
- Bottling plants
- Rotary tables

### Order code

for standard versions

IST - SR085 - XX - XX - XX - XXXXX - VXXX

#### 1 Flange mounting

00 = Media lead-through  
Hollow shaft mounting

20 = ø 20 mm  
24 = ø 24 mm  
25 = ø 25 mm  
30 = ø 30 mm  
1N = ø 1 Inch  
other options on request

#### 2 Number of signal/data channels <sup>1)</sup>

(only in pairs e.g. 2, 4, 6)

#### 3 Number of power (load) channels <sup>1)</sup>

4 Max. load current  
1 = 16 A, 240 V AC/DC  
2 = 40 A, 240 V AC/DC  
3 = 10 A, 400 V AC/DC  
4 = 20 A, 400 V AC/DC

#### 5 Mounting position

1 = Standing and horizontal (flange down)  
2 = Hanging and horizontal (flange up)

#### 6 Contact material for data channels

1 = Gold  
2 = Media lead-through

#### 7 Media lead-through

0 = none, Flange mounting  
1 = Air, connection 1/4"  
2 = Air, connection 1/2"  
3 = Air, connection 3/8"  
4 = Hydraulics, connection 1/2"  
5 = Hydraulics, connection 3/8"  
Hollow shaft mounting  
6 = Air, rotatable connector (up to 300 min<sup>-1</sup>)

#### 8 Protection rating

1 = IP 50  
2 = IP 64

#### 9 Version number (options)

V 100 = Standard without options

#### Options on request:

- > 20 channels
- other fixing options
- other types of connection e.g. plug connectors

### Accessories

#### Maintenance set

comprises brush and contact oil for signal contacts

Order No.: **IST-MS-01**

<sup>1)</sup> 20 combination max., for example 4 data channels and 16 power channels

# Transmission Technology

## Slip rings IST-SR085

### Technical Data (standard version)

<b>Dimensions</b>	see drawing	<b>Speed</b>	max. 800 1/min
<b>Overall length</b>	dependent on the number of transmission paths	<b>Operating temperature</b>	-30 ... +80 °C
<b>Bore diameter</b>	up to ø 30 mm	<b>Protection rating</b>	max. IP 64
<b>Voltage/current loading</b>	max. 40 A for 240 V AC/DC	<b>Service life</b>	> 500 Mio. revolutions
<b>Contact resistance load channel</b>	≤ 1 Ohm	<b>Maintenance cycles</b>	ca. 50 Mio. revolutions
<b>Contact resistance Signal/Data channel</b>	≤ 0,1 Ohm	<b>Number of rings</b>	ca. 20 (> 20 on request)
<b>Insulation resistance at 500 V DC</b>	10 <sup>3</sup> M Ohm	<b>on request)</b>	EN61010-1 2001, VDE 0110 part 1, VDE 0295/6.92, VDE 0100 part 523
<b>Dielectric strength</b>	1000 V eff. (60 sec.)		

### Modular Construction System

Simple installation



Stator ring with copper graphite pick-off spring for load currents, for a long service life



Insulator with slip ring for load currents



Stator ring with gold or copper alloy (90% gold content) pick-off spring for signal currents



Insulator with slip ring for signal currents, separate signal channels with contact guide



### Technology in detail

Easily accessible connections



Practical maintenance window



IP 64 version with rotor and stator protective cover



Hollow shaft mounting with pneumatic rotatable connector



Version with media leadthrough (air, hydraulics)



# Transmission Technology

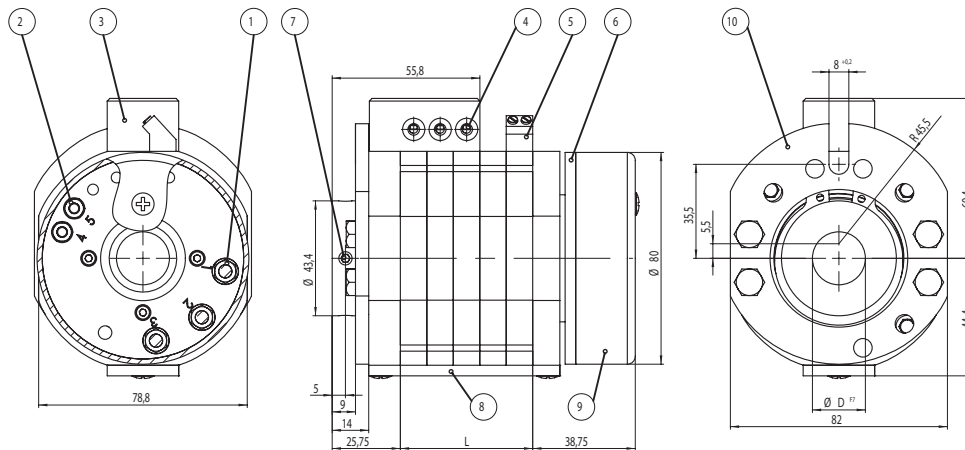
## Slip rings

## IST-SR085

### Dimensions

#### Air lead-through versions

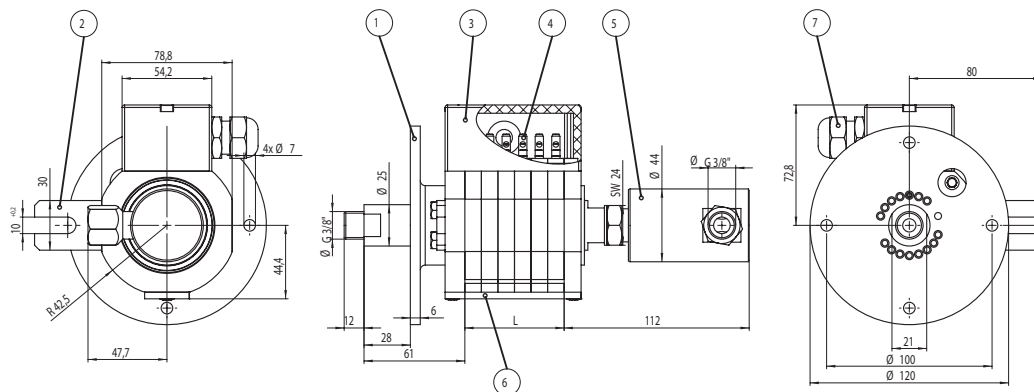
Example: Type IST-SR085-25-02-03-11101-V100  
(2 data channels, 3 power channels)



- 1 – Screw terminal M5 for load transmission
- 2 – Screw terminal for signal transmission
- 3 – Terminal clamp for load without wire protection, with shock-hazard touch protection
- 4 – Wire lead-in for load possible on both sides
- 5 – Terminal clamp for signal transmission
- 6 – Rotating connection ring
- 7 – 4 x socket set screw DIN 914 M6 x 10
- 8 – Maintenance window
- 9 – Protective cover for connections
- 10 – Torque stop

#### air lead-through versions

Example: Type IST-SR085-00-00-06-11131-V123



- 1 – Mounting flange
- 2 – Torque stop
- 3 – Stator protective cover
- 4 – Terminal clamp
- 5 – Media lead-through
- 6 – Maintenance window
- 7 – Cable gland

### Calculation of the overall length

Basic dimensions	
slip ring with hollow shaft	64,5 mm
slip ring with flange mounting and media lead-through 3/8"	185 mm
slip ring with flange mounting and media lead-through 1/4"	168 mm
Additionsmaße	
+ number of signal/data channels	+ 10 mm / 2 Data channels
+ number of power channels, order variant 1 (16 A, 240 V)	+ 10 mm per power channel
+ number of power channels, order variant 2 (40 A, 240 V)	+ 10 mm per power channel + 10 mm, if only power + 20 mm
+ number of power channels, order variants 3 and 4 (10 or 20 A, 400 V)	+ 20 mm per power channel, if only power + 10 mm
+ Labyrinth isolation ring for power and signal transmission	+ 10 mm

# Transmission Technology

## Slip rings **IST-SR060**



The SR060 is a compact, economical slip ring for up to 3 load and 2 signal transmissions from a stationary to a rotating platform.

The transmission between the stator and rotor units occurs extremely reliably via sliding contacts.

### Compact

- Dimensions 60 x 98 mm
- Can be used as a pair starting from just 60 mm shaft distance of the sealing rollers
- Various component configurations for the transmission paths, max. 3 x load and 2 x signal transmission

### Efficient

- Economical – thanks to minimization of individual components, favourable mounting and component part design to suit
- Fully encapsulated in high-grade glass reinforced plastic housing shells
- Ideally suited for the heating of sealing drums (rollers) in packaging machines

### Application areas for Slip Rings

- Packaging machines
- Textile machines
- Robots and handling equipment
- Cranes
- Pipeline inspection
- Video surveillance equipment
- Fairground rides
- Bottling plants
- Rotary tables

### Order code

IST - SR060 - XX - X - X - V01

**1** Hollow shaft diameter

- 18 = ø 18 mm
- 20 = ø 20 mm
- 24 = ø 24 mm
- 25 = ø 25 mm (other diameters on request)

**2** Number of signal transmission paths (max. 2)

**3** Number of load transmission paths (max. 3)

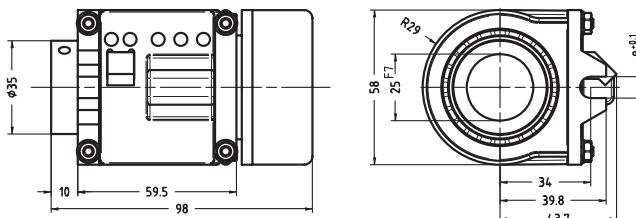
**4** Version number V01 Standard

### Technical Data (standard version):

Dimensions	see drawing
Overall length	dependent on the number of transmission paths
Hollow shaft diameter	up to max. ø 25 mm
Current loading	max. 16 A (at 240 V AC)
Voltage/current loading	240 V AC (dependent on the current loading)
Contact resistance signal channel	< 0.1 Ohm

Contact resistance load channel	< 1 Ohm
Insulation resistance at 500 V DC	10 <sup>3</sup> MOhm
Dielectric strength	1000 V eff. (60 sec.)
Speed	max. 500
Operating temperature	0 ° ... 75 °C
Protection rating:	IP 50
Service life	> 500 Mio. revolutions
Maintenance cycles	approx. 50 Mio. revolutions

### Dimensions



### Easily accessible connections:



# Connection Technology

## Optical fibre signal transmission

RS422/HTL



**eco plus**

Cost advantage compared to conventional wiring over 150 m length\*

### The solution for tough signal transmission.

The system is made up of an optical fibre transmitter and an optical fibre receiver. The optical fibre transmitter converts the electrical signals of an usual incremental encoder into a light signal for transmission by means of an optical fibre.

The receiving module converts the optical signal back into electrical signals. Up to 4 channels may be transmitted safely.

### Innovative

- Signal transmission thanks to a simple glass fibre
- Safe signal transmission up to 1000 m
- Input frequency up to 400 kHz
- Input level 10 – 30 V or RS 422
- Inverted input signals
- Resists extremely strong electro-magnetical fields

### Compact

- Only 22 mm wide
- DIN rail mounting, small size

### Application areas

- Process control technology and automation technology
- Interference-sensitive applications
- High voltage plants
- Plants with long transmission distances
- Potential separation
- Explosive areas

### Order code

#### Optical fibre transmitter

$U_B = 10 \dots 30$  V DC, input RS 422

**6.LWLS.1**

$U_B = 10 \dots 30$  V DC, input HTL

**6.LWLS.2**

without inversions

$U_B = 5$  V DC, input RS 422

**6.LWLS.4**

$U_B = 10 \dots 30$  V DC, input HTL

**6.LWLS.5**

#### Optical fibre receiver

$U_B = 10 \dots 30$  V DC, output RS 422

**6.LWLE.1**

$U_B = 5$  V DC, output RS 422

**6.LWLE.4**

$U_B = 10 \dots 30$  V DC, output HTL

**6.LWLE.5**

**Scope of delivery:** - Optical fibre module  
- Multilingual operating manual

### Accessories

#### Simplex Patch cable ST-ST – Multimode

Connector: 2xST/PC, Optical fibre: 1 x 50/125

Standard lengths: 2 m, 5 m, 8 m, 10 m, 15 m, 20 m, ... (in 5 m steps)

Order code:

**05.B09-B09-821-L XXX**

①

①

Length in m

#### ST Multimode coupling

Barrel: ceramic, slotted

Order No.:

**05.LWLK.001**

\* Comparison of costs:

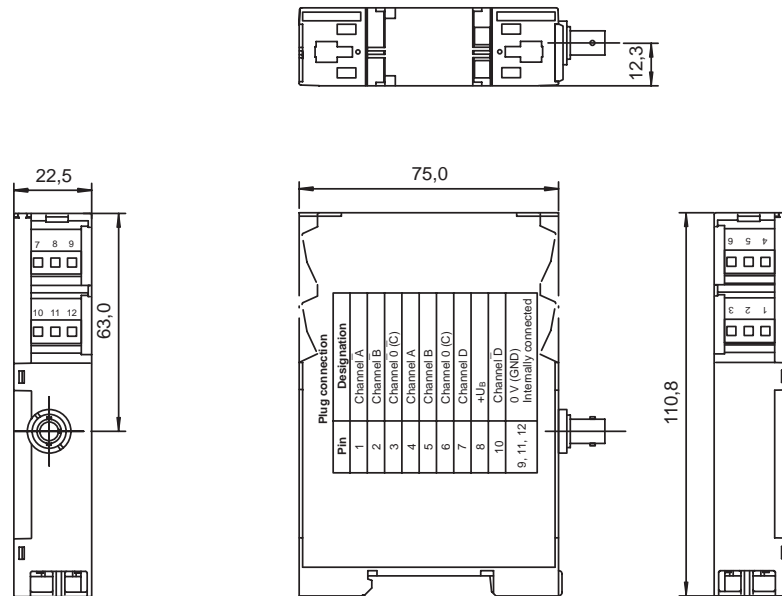
Costs per meter standard copper cable compared to costs per meter optical fibre signal cable + costs of transmitter + costs of receiver

# Connection Technology

## Optical fibre signal transmission RS422/HTL

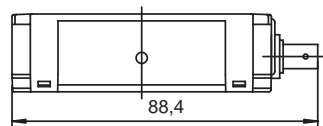
Technical data	
<b>Supply voltage</b>	10 ... 30 V or 5 V $\pm$ 5%
<b>Power consumption per module</b>	< 2 W
<b>Operating voltage reverse connection protection</b>	available
<b>Encoder inputs</b>	optical fibre transmitter Channels A, A $\bar{}$ , B, B $\bar{}$ , 0, 0 $\bar{}$
<b>Max. input frequency and output frequency</b>	optical fibre transmitter optical fibre receiver 400 kHz
<b>Input level</b>	optical fibre transmitter 10 ... 30 V bzw. RS 422
<b>Optical wavelength</b>	820 nm
<b>Optical transmission rate</b>	120 Mbit/s
<b>Optical fibre synchronisation display</b>	LED on the receiver
<b>Optical fibre connection</b>	ST connector, 13 mm, $\varnothing$ 9 mm, on the bottom side of the housing
<b>Glass fibre</b>	multimode fibre, 50/125 $\mu$ m, 62.5/125 $\mu$ m
<b>Input signals sampling rate</b>	10 MSamples/s
<b>Max. optical fibre transmission distance</b>	1000 m
<b>Dimensions</b>	(W x L x H) 22.5 x 110.8 x 88.4 mm
<b>Protection</b>	IP 40, terminals IP 20
<b>Terminals</b>	protected against contact, max. conductor diameter 2.5 mm <sup>2</sup>
<b>Temperature range</b>	-10 °C ... +60 °C
<b>Weight</b>	95 g
<b>Standards</b>	EN 55 011 Class B1 EN 61 000-6-2: 2006

### Dimensions



### Connecting diagram of the optical fibre transmitter and receiver

Pin	Description
1	Channel A $\bar{}$
2	Channel B $\bar{}$
3	Channel 0 (C)
4	Channel A
5	Channel B
6	Channel 0 (C)
7	Channel D $\bar{}$
8	+ U <sub>B</sub>
10	Channel D
9, 11, 12	0 V, GND, linked internally



## Optical fibre signal transmission

## SSI



Cost advantage compared to conventional wiring over 150 m length\*

### Optical fibre transmission system for SSI absolute encoders

The system is made up of an optical fibre transmitter and an optical fibre receiver.

The optical fibre transmitter converts the electrical signals of a normal absolute encoder with Synchronous Serial Interface (SSI) into a light signal for transmission by means of an optical fibre. The receiving module converts the optical signal back into electrical signals. Absolute signals can be transmitted safely through one glass fibre over distances of up to 1500 m.

The resolution of 13 bit for a singleturn encoder or 25 bit for a multi-turn encoder can be defined by means of a DIP-switch on the front side of the module.

### Reliable transmission

- Safe signal transmission up to 1500 m
- Resists extremely strong electro-magnetic fields

### Easy installation

- Signal transmission via a single glass fibre.
- Resolution of 13 bit or 25 bit can be set via DIP-switch
- LED for monitoring of power supply, clock and date
- DIN-rail mounting – requires min. installation space – only 22 mm wide

### Application areas

- Process control technology and automation technology
- Interference-sensitive applications
- High voltage plant
- Plant with long transmission distances
- Potential separation
- Hazardous areas

### Order code

#### Optical fibre transmitter

$U_B = 10 \dots 30 \text{ V DC}$

$U_B = 5 \text{ V DC}$

**6.LWLS.A1**

**6.LWLS.A4**

#### Optical fibre receiver

$U_B = 10 \dots 30 \text{ V DC}$

$U_B = 5 \text{ V DC}$

**6.LWLE.A1**

**6.LWLE.A4**

**Scope of delivery:** - Optical fibre module  
- Multilingual operating manual

### Accessories

#### Simplex Patch cable ST-ST – Multimode

Connector: 2xST/PC, Optical fibre: 1 x 50/125

Standard lengths: 2 m, 5 m, 8 m, 10 m, 15 m, 20 m, ... (in 5 m steps)

Order code:

**05.B09-B09-821-L XXX**



**1** Length in m

#### ST Multimode coupling

Barrel: ceramic, slotted

Order No.:

**05.LWLK.001**

\* Comparison of costs:

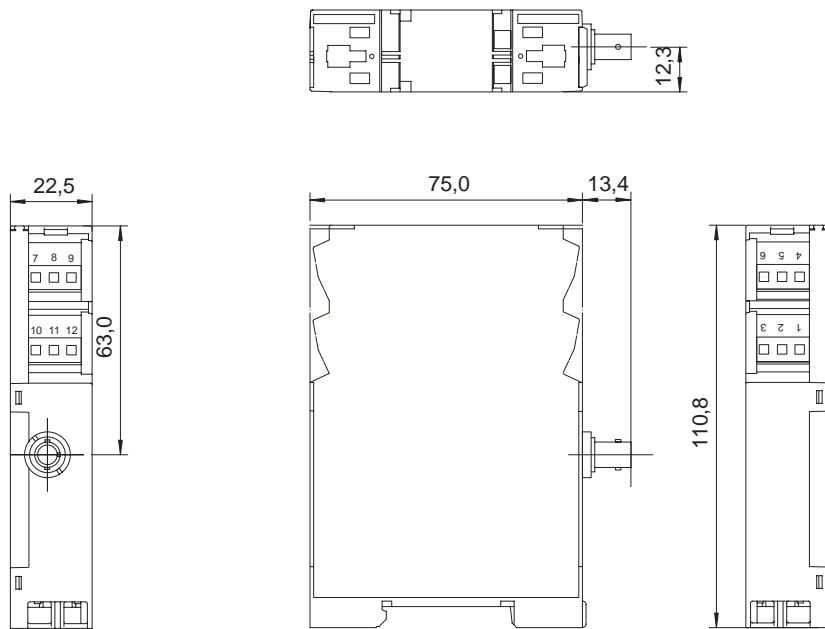
Costs per meter standard copper cable compared to costs per meter optical fibre signal cable + costs of transmitter + costs of receiver

# Connection Technology

## Optical fibre signal transmission SSI

Technical data					
<b>Supply voltage</b>	10 ... 30 V or 5 V $\pm$ 5%				
<b>Power consumption per module</b>	<table border="0"> <tr> <td><math>U_B</math> 10 ... 30 V DC</td> <td>max 1,6 W</td> </tr> <tr> <td><math>U_B</math> 5 V DC</td> <td>max 0,8 W</td> </tr> </table>	$U_B$ 10 ... 30 V DC	max 1,6 W	$U_B$ 5 V DC	max 0,8 W
$U_B$ 10 ... 30 V DC	max 1,6 W				
$U_B$ 5 V DC	max 0,8 W				
<b>Operating voltage reverse connection protection</b>	available				
<b>Encoder inputs</b>	optical fibre transmitter -T, +T and -D, +D				
<b>SSI clock rate</b>	500 kHz fixed setting				
<b>Optical wavelength</b>	820 nm				
<b>Optical transmission rate</b>	120 Mbit/s				
<b>Optical fibre connection</b>	ST connector, 13 mm, $\phi$ 9 mm on the bottom side of the housing				
<b>Glass fibre</b>	multimode fibre, 50/125 $\mu$ m, 62.5/125 $\mu$ m				
<b>Max. optical fibre transmission distance</b>	max. 1500 m				
<b>Dimensions</b>	(W x L x H) 22.5 x 110.8 x 88.4 mm				
<b>Protection</b>	IP 40, terminals IP 20				
<b>Terminals</b>	protected against contact, max. conductor diameter 2.5 mm <sup>2</sup>				
<b>Temperature range</b>	-10 °C ... +60 °C				
<b>Weight</b>	approx. 100 g				
<b>Standards</b>	EN 55 011 Class B1 EN 61 000-6-2: 2006				

### Dimensions



### Connecting diagram Optical fibre transmitter:

Pin	signal
1	0 V (GND)
2	+ $U_B$
3	+ T
4	- T
5	+ D
6	- D
7	0 V (GND)
8	+ $U_B$

### Connecting diagram Optical fibre receiver:

Pin	signal	connection
1	0 V (GND)	from power supply
2	+ $U_B$	
3	+ D	to controller
4	- D	
5	+ T	from controller
6	- T	
7	emitter (-)	optocoupler output alarm output
8	collector (+)	

## Information about our products

Further information on Kübler products and system solutions is provided by the following catalogues:

### Sensor Technology

- Encoders
- Draw wire encoders
- Magnetic measurement systems
- Inclinometers
- Slip rings
- Connection technology
- Accessories



Order Code: german **100.568**

Order Code: english **100.569**

### Counting and Process Technology

- Pulse Counters
- Preset Counters
- Timers / Hour Meters
- Tachometer
- Position Displays
- Multifunction Counters
- Energy Counters
- Process Displays
- Temperature Displays



Order Code: german **100.156**

Order Code: english **100.157**