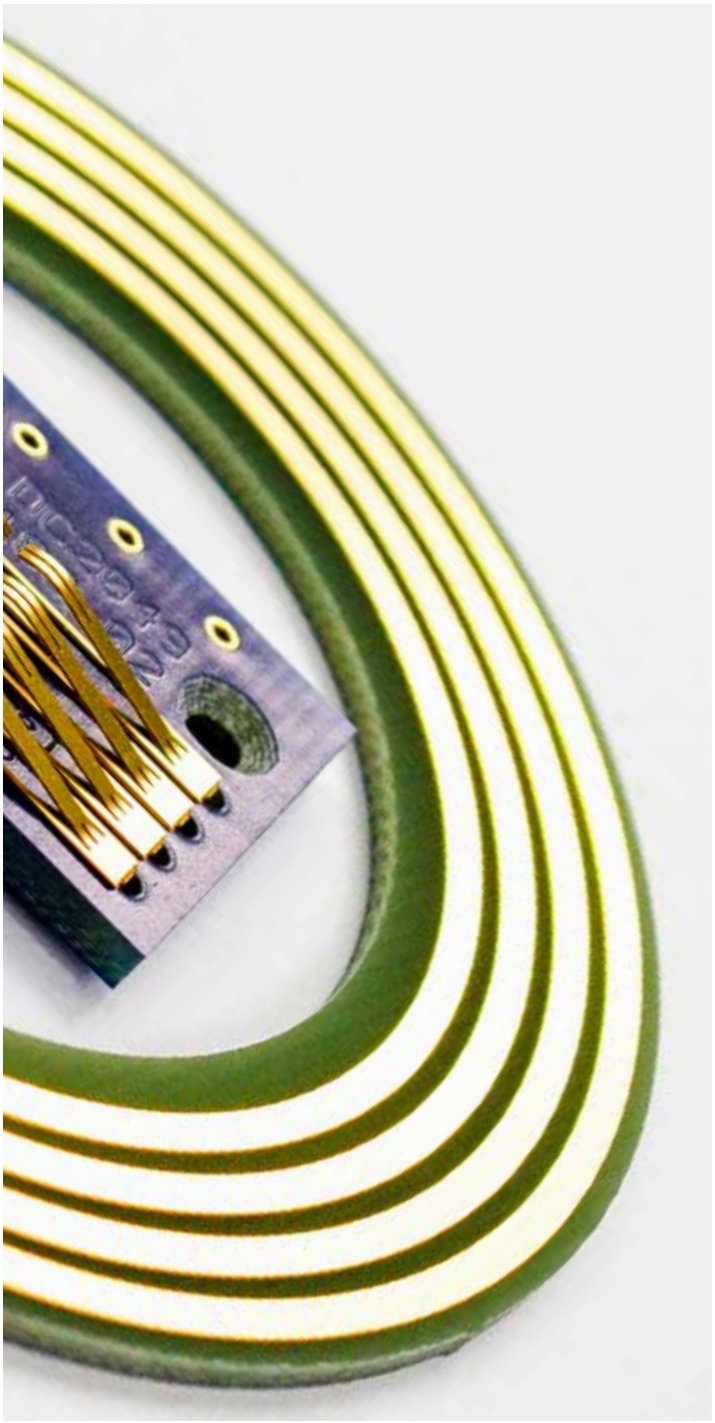
LTN Servotechnik GmbH

PRODUCT BROCHURE - SLIP RINGS
QUALITY COMBINED WITH HIGH VERTICAL INTEGRATION



LTN Servotechnik GmbH
Georg-Hardt-Strasse 4
83624 Otterfing, Germany
T +49 8024 6080-0
F +49 8024 6080-1000
ltn@ltn.de
www.ltn-servotechnik.com

Managing Directors: Alexander Tewes, Dr. Thomas Zentis
Trade register: München HRB 121158

ABOUT US

LTN Servotechnik GmbH is a manufacturer of customized transmission and feedback systems located in the south of Munich. For over 40 years we have continuously specialised in the development, design and series manufacture of components for apparatus, machinery and plant engineering customers worldwide.

Our product range includes slip rings for power, signal and data, resolvers for open & closed-loop control tasks and rotary joints for fibre-optic information systems. Our product portfolio are characterised by extraordinary diversity.

SLIP RINGS

Slip rings are electromechanical components which allow electrical power, signal and data transmission between stationary and rotating systems. The spectrum ranges from just a few mV or mA to many hundreds A and few thousand V. Our slip ring systems withstand harsh environmental influences such as corrosive, salty air or severe vibration. LTN slip ring systems are found in many electrical machines and ensure the reliable functionality of entire machine systems.

LTN slip rings meet all the requirements for error-free transmission of real time fieldbus systems. Of course, all our Fast, Gigabit and 10 Gigabit Ethernet slip rings are certified according to TIA-568 and EN 50173.

Our components conform to the highest standards of durability, sensitivity and reaction time and are therefore an important part of automation, robotics and all other highly dynamic applications.

In addition, we offer fibre-optic rotary joints for contactless transmission of high data rates.

RESOLVERS

Resolvers convert the angular position of a rotor to two voltages. The absolute position can be represented clearly in this way. Modern resolvers are usually brushless and the information is transmitted through induction. Resolvers provide an absolute signal within a single revolution and therefore do not have to be calibrated after switching on.

Resolvers are used for open and closed loop control tasks such as electric servo drives, positioning drives and machines with interdependent motors. The robustness and availability of the systems are of central importance. Our brushless resolvers operate without wear and are fail-safe – even in the harshest environmental conditions (e.g. extreme temperatures).

In addition, we offer electrical circuits for evaluating the resolver's analogue output signals. Rotary encoder output signals can be emulated, for example. Using our downstream electronics, the analogue signal can also be digitized.

OVERVIEW OF MOST COMMON SPECIFICATIONS

CUSTOMER SPECIFIC SOLUTIONS
even for higher demands are available on request

Type	Typical outer diameter	Typical inner diameter	Typical number of rings *more rings on request
SC012	12 mm	-	3 / 6 / 8 / 12 up to 15
SC020	20 mm / 22 mm	3 mm	6 / 12 / 18 / 24 up to 36
SC020-COAX	20 mm	-	2 rings for coax 75 Ω
SC040	40 mm	-	6
SC050	50 mm	17 mm	14
SC080	80 mm	30 mm	24
SC104-A01	104 mm	50 mm	6 / 12
SC104-L01	104 mm	50 mm	2 / 4
SC105	105 mm	50 mm	30
SC120	120 mm	70 mm	80
SC168	168 mm	-	45
SC2X0	up to 290 mm	up to 180 mm	up to 100
SC3X0	390 mm	190 mm	100
SH085-MSP	85 mm	-	4 / 6 / 8 / 10
SA030	29 mm	-	9
SDX	300 mm	170 mm	12
SMX	400 mm	300 mm	45
FORJ K32ST	32 mm	-	-

SLIP RINGS

Combinations consisting of slip rings and encoders or resolvers on request.

Length depending on ring quantity.

Typical max. current per ring	Typical max. voltage	Typical max. rotation speed	Typical protection class	Page
2 A (rated current 1 A)	48 V_{DC}	250 rpm	IP40	10
2 A (rated current 1 A)	48 V_{DC}	250 rpm	IP51	12
-	48 V_{DC}	10 rpm	IP51	14
10 A	230 V_{AC}	400 rpm	IP50 up to IP54, electrical interface IP00	16
10 A	100 V_{DC}	250 rpm	IP54	17
16 A	400 V_{AC}	250 rpm	IP54	18
10 A	480 V_{AC}	400 rpm	IP54	20
16 A	480 V_{AC}	800 rpm	IP54	22
16 A	400 V_{AC}	400 rpm	IP51 / IP65	24
30 A	400 V_{AC}	250 rpm	IP54 / IP65	25
120 A	400 V_{AC}	140 rpm	IP54 / IP65	26
300 A	690 V_{AC} / 1000 V_{DC}	60 rpm	IP54 / IP65	28
300 A	690 V_{AC} / 1000 V_{DC}	50 rpm	IP54 / IP65	30
25 A	250 V_{AC}	1500 rpm	IP00 IP50 with protection caps	32
16 A	48 V_{DC}	5 rpm	IP00	34
10 A	85 V_{AC}	100 rpm	IP00	35
45 A	400 V_{AC}	500 rpm	IP00	36
-	-	1200 rpm	IP54	37

	SC012	SC020	SC020 COAX	SC040	SC050	SC080	SC104 A01	SC104 L01	SC105	SC120
Analog	✓	✓		✓	✓	✓	✓	✓	✓	✓
Fieldbuses	✓	✓		✓	✓	✓	✓	✓	✓	✓
Fast Ethernet certified to 100-BaseT Cat.5e	✓	✓		✓		✓			✓	✓
Gigabit Ethernet certified to 1000-BaseT Cat.5e	✓	✓				✓			✓	
10G Ethernet certified to 10G-BaseT Cat.6		✓								
HD-SDI based on partly standard SMPTE 292M	✓	✓	✓							
3G-SDI partly based on standard SMPTE 424M	✓	✓	✓							
6G-SDI partly based on SMPTE ST 2081		✓	✓							
12G-SDI partly based on SMPTE ST 2082-10		✓	✓							
Fiber Optical Rotary Joint Passive for multi mode (FORJ-MM)		✓								
HDMI V1.4 up to 3840 x 2160p at 24Hz		✓								
USB 1.0 Low & Full Speed		✓								
USB 2.0 Hi-Speed		✓								
Page	10	12	14	16	17	18	20	22	24	25

Stated values are standard. Other configurations are available on request.

SC168	SC2X0	SC3X0	SH085 MSP	SA030	SDX	SM004	SM045	SM050	SM070	SM090	SM140	SM400	FORJ K32ST
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓		
✓	✓	✓		✓	✓								
				✓		✓							
				✓									
													✓
						✓							
						✓							

26 28 30 32 34 35 37

Stated values are standard. Other configurations are available on request.

SLIP RING PRODUCT GROUP

SC012

APPLICATION EXAMPLES

- Drain Inspection
- Metrology System
- Robotic
- Support Arm Lamp
- Surveillance Camera
- Video System / CCTV
- Cobot

FEATURES

- Small design with high transmission rates (outer diameter max. 12.8 mm)
- Minimum installation space
- Low torque
- Adaption / customer specific design possible

OPTIONS

- Ethernet; certified up to max. 1000BaseT, acc. to CAT5e (CAT6 upon request)
- HD-SDI, partly based on SMPTE standard 292M, 75 Ohm
- 3G-SDI, partly based on SMPTE standard 424M, 75 Ohm
- Various fieldbuses

DATA

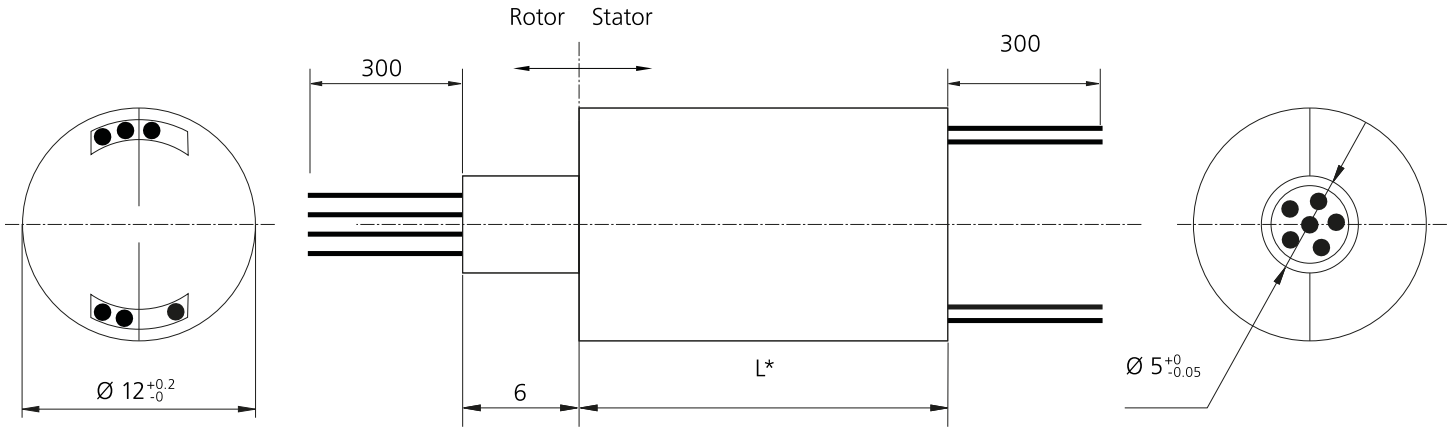
Number of rings:	3 / 6 / 8 / 12 / max. 15
Current per ring:	Rated current 1 A (max. 2 A)
Voltage:	48 V_{DC}
Dielectric strength:	250 V_{AC}, 50/60 Hz
Insulation resistance:	100 MΩ at 500 V_{DC}

Rotation speed:	Max. 250 rpm
Protection class:	IP40
Operating temperature:	-20 °C ... +80 °C
Electrical connection:	300 mm flying leads; AWG 28
Housing material:	Fiber-reinforced polycarbonate
Secure:	Body to be clamped or glued; flange optional

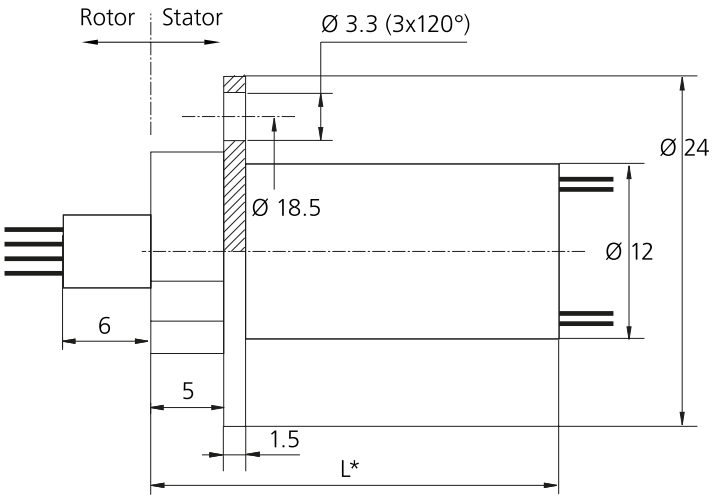
Customized configurations on request. Stated values are typical.

SC012

DESIGN EXAMPLES



Number of rings	3	6	8	12	15
L* (mm)	14.5	19	22	28	35

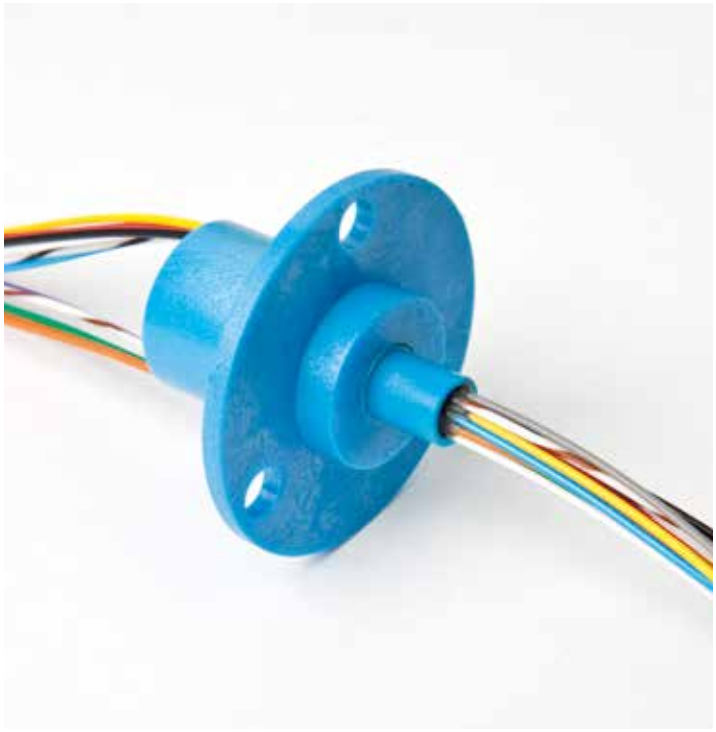


Standard Accessory: 4721621 Mounting flange

The operational life of the slip ring is dependent upon power rating, speed, temperature, vibration and environment.

SLIP RING PRODUCT GROUP

SC020



APPLICATION EXAMPLES

- Access System
- Airplane Cabin Attention System
- Drain Inspection
- Metrology System
- Packaging Machine
- Robotic
- Support Arm Lamp
- Surveillance Camera
- Video System / CCTV
- Cobot

FEATURES

- Small design with high transmission rates (outer diameter max. 22 mm)
- Variants up to 36 rings available in standard design
- Minimum installation space
- Low torque
- Adaption / customer specific design possible
- Combination with other slip rings possible (ex. SM045 or SC104)

OPTIONS

- Ethernet; certified up to max. 1000BaseT, acc. to CAT5e, (CAT6 upon request)
- HD-SDI, partly based on SMPTE standard 292M, 75 Ohm
- 3G-SDI, partly based on SMPTE standard 424M, 75 Ohm
- Various fieldbuses

DATA

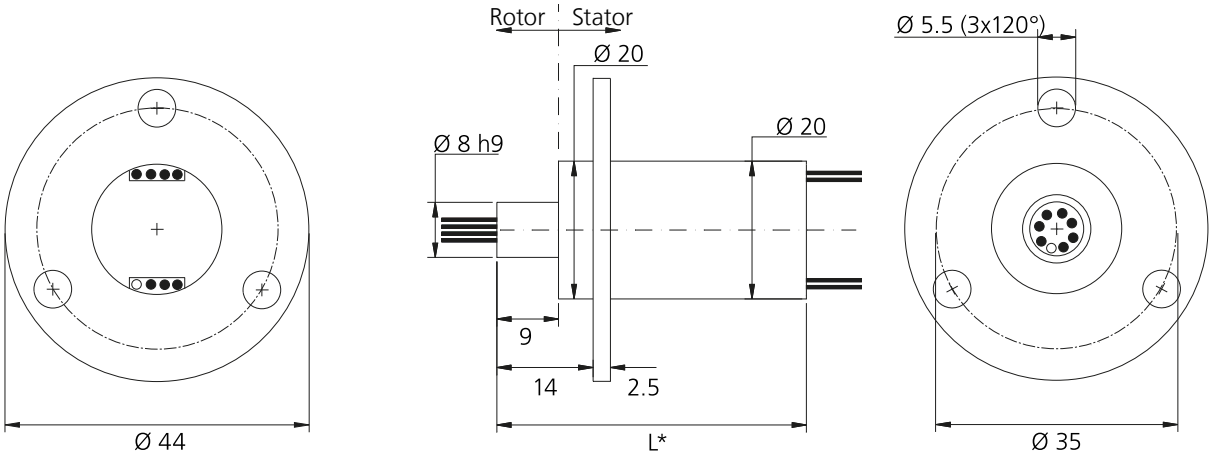
Number of rings:	Up to 36
Current per ring:	Rated current 1 A (max. 2 A) with 2 combined rings 2 A (max. 4 A)
Voltage:	48 V_{DC}
Dielectric strength:	250 V_{AC},50/60 Hz
Insulation resistance:	100 MΩ at 500 V_{DC}

Rotation speed:	max. 250 rpm
Protection class:	IP51
Operating temperature:	-20 °C ... +80 °C
Electrical connection:	300 / 600 / 1000 mm flying leads AWG 26 (36 ring version in AWG 28)
Housing material:	Fiber-reinforced polycarbonate / Aluminium

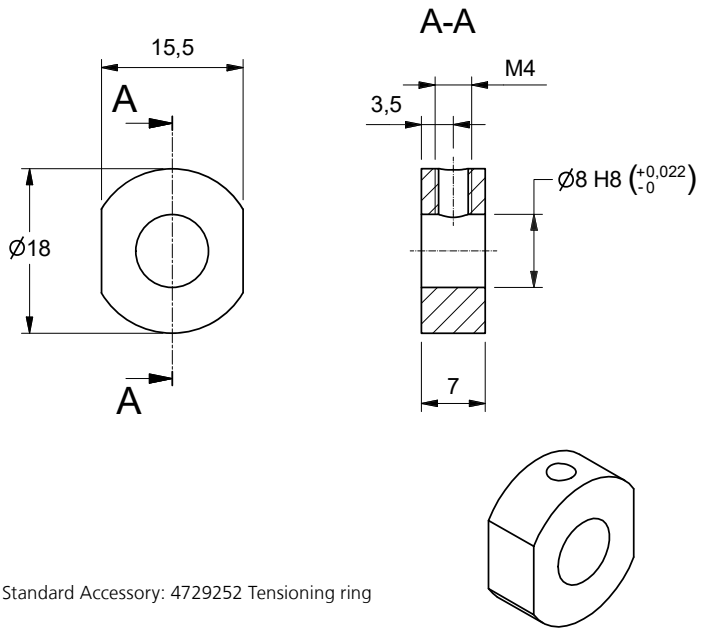
Customized configurations on request. Stated values are typical.

SC020

DESIGN EXAMPLE



Number of rings	6	12	18	24	36
L* (mm)	27	36	45	54	72



Standard Accessory: 4729252 Tensioning ring

The operational life of the slip ring is dependent upon power rating, speed, temperature, vibration and environment.

SLIP RING PRODUCT GROUP

SC020-COAX

APPLICATION EXAMPLES

- Video System / CCTV
- Drain Inspection
- Robotic
- Surveillance Camera
- Stabilized Remote Head
- Cobot

FEATURES

- Small design with high transmission rates (outer diameter max. 22 mm)
- Minimum installation space
- Low torque
- Adaption / customer specific design possible
- HD-SDI, partly based on SMPTE standard 292M, 75 Ohm
- 3G-SDI, partly based on SMPTE standard 424M, 75 Ohm
- 6G-SDI, partly based on SMPTE standard 2081, 75 Ohm

OPTIONS

- 12G-SDI, based on SMPTE standard 2082 (Single Link), 75 Ohm
- 50 Ohm variants upon request

DATA

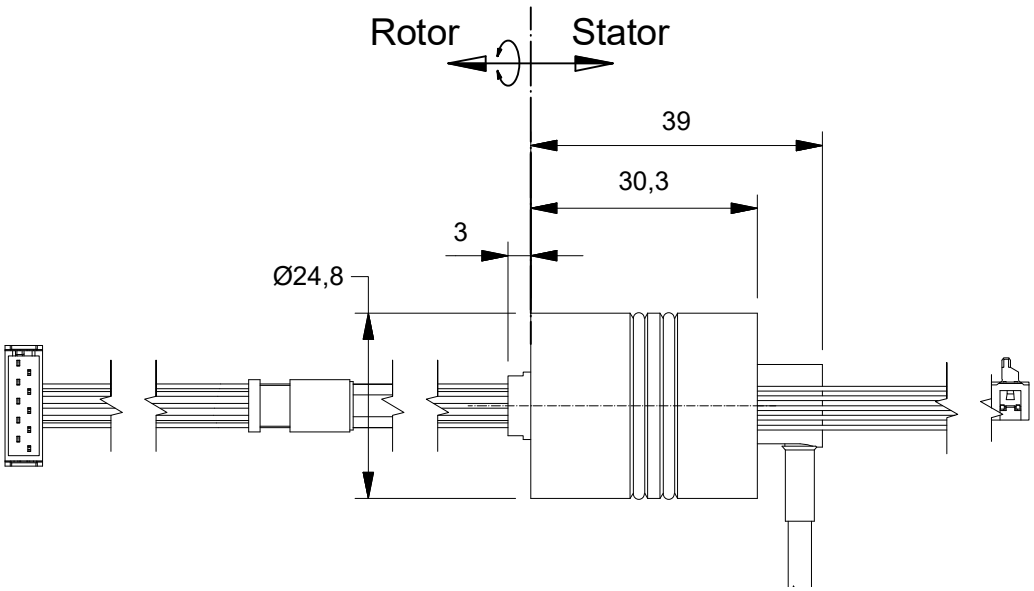
Number of rings:	One coax 75 Ω + up to 14 standard rings
Voltage:	Max. 48 V_{DC}
Dielectric strength:	250 V_{AC} at 50/60 Hz
Insulation resistance:	100 MΩ at 500 V_{DC}

Rotation speed:	Max. 10 rpm
Protection class:	IP51
	Operating temperature: -20 °C ... +80 °C
Rotor/Stator conn.:	0.41 / 1.9 AF FRNC cable
	BNC micro / BNC pro connector
	BNC micro / BNC pro connector
Housing material:	Fiber-reinforced polycarbonate / Aluminium

Customized configurations on request. Stated values are typical.

SC020-COAX

DESIGN EXAMPLE



The operational life of the slip ring is dependent upon power rating, speed, temperature, vibration and environment.

SLIP RING PRODUCT GROUP

SC040

APPLICATION EXAMPLES

- Food Processing
- Packaging Machine
- Rotary Milking Parlour

FEATURES

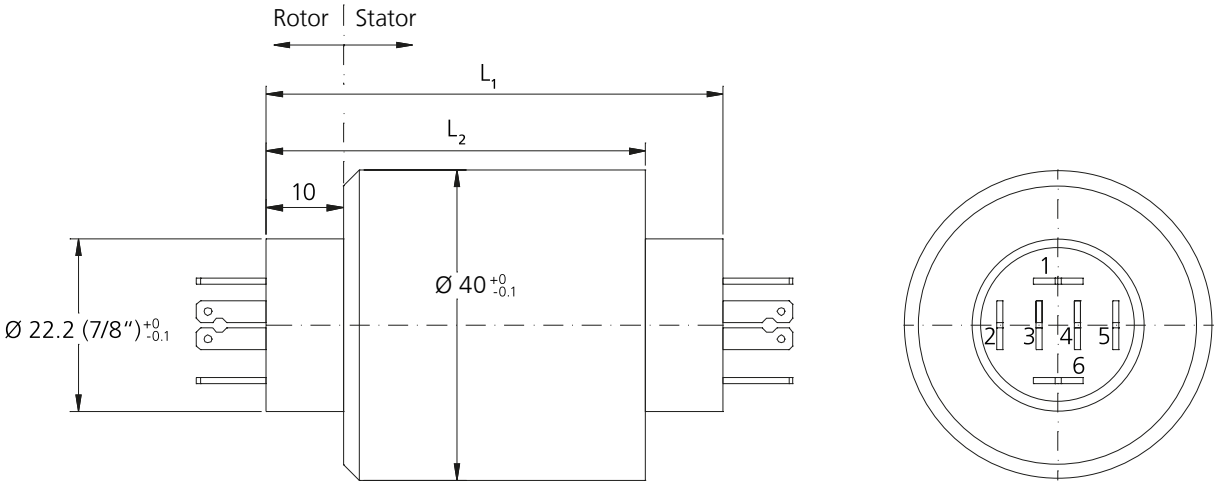
- Outer diameter: max. 40 mm
- Flat pin connector for socket 6.3 m or 2.8 mm
- Rings with 2 A or 10 A can be combined
- Fieldbuses
- Fast Ethernet (certified to 100-BaseT Cat.5e & Cat.6)
- Drive-Cliq

DATA

Number of rings:	max. 6
Current per ring:	max. 10 A (15 A on request)
Voltage:	max. 230 V_{AC}
Dielectric strength:	1000 V_{AC}
Insulation resistance:	500 MΩ at 500 V_{DC}

Rotation speed:	max. 400 rpm
Protection class:	IP50 up to IP54, electrical interface IP00
Operating temperature:	-20 °C ... +80 °C
Electrical connection:	flat pin connectors for socket (mating connectors included)
Housing material:	Fibre-reinforced polycarbonate / Aluminium
Length:	L_1/L_2 on request

DESIGN EXAMPLE



Stated values are standard. Other configurations are available on request.

SLIP RING PRODUCT GROUP

SC050

APPLICATION EXAMPLES

- Drain Inspection
- Packaging Machine

FEATURES

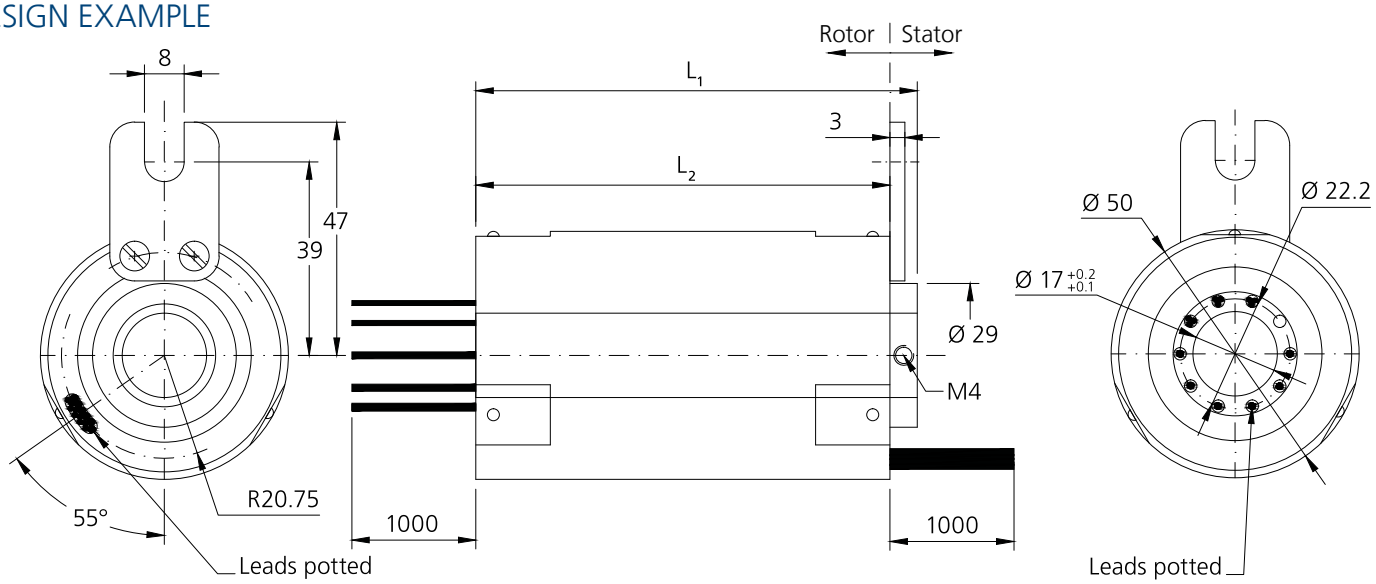
- Outer diameter: max. 50 mm
- Inner diameter: max. 17 mm
- Rings with 3 A or 10 A can be combined
- Special design possible
- Fieldbuses
- Fast Ethernet (certified to 100-BaseT Cat.5e & Cat.6)

DATA

Number of rings:	max. 14
Current per ring:	14 rings with 3 A or 7 rings with 10 A 16 A on request
Voltage:	max. 100 V_{DC}
Dielectric strength:	500 V_{AC}
Insulation resistance:	500 MΩ at 500 V_{DC}

Rotation speed:	max. 250 rpm
Protection class:	IP54
Operating temperature:	-20 °C ... +80 °C
Electrical connection:	1000 mm flying leads
Housing material:	Aluminium
Length:	L_1/L_2 on request

DESIGN EXAMPLE



Stated values are standard. Other configurations are available on request.

SLIP RING PRODUCT GROUP

SC080

APPLICATION EXAMPLES

- Beverage Filling System
- Drain Inspection
- Food Processing
- Metrology System
- Wind Turbine Pitch System

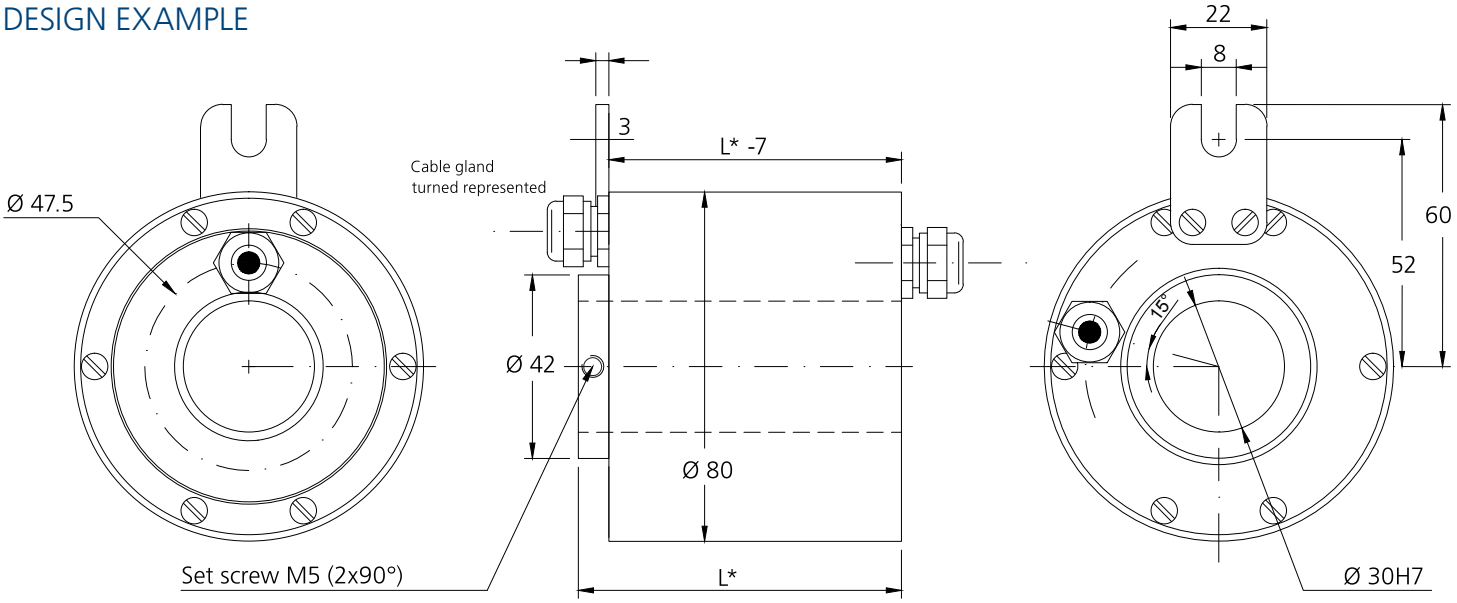
FEATURES

- Outer diameter: max. 80 mm
- Inner diameter: max. 30 mm
- Rings with 3 A or 16 A can be combined
- Special design possible
- Fieldbuses
- Fast Ethernet (certified to 100-BaseT Cat.5e & Cat.6)

DATA

Number of rings:	max. 24
Current per ring:	24 rings with 3 A or 12 rings with 16 A
Voltage:	max. 400 V_{AC}
Dielectric strength:	2000 V_{AC}
Insulation resistance:	>500 MΩ at 500 V_{DC}
Rotation speed:	max. 250 rpm
Protection class:	IP54
Operating temperature:	-20 °C ... +80 °C
Electrical connection:	1000 mm flying leads
Housing material:	Aluminuim

DESIGN EXAMPLE



Number of rings	2	3	4	6	9	12	18	24
Power (L*)	54	64	74	94	124	144	-	-
Signal (L*)	54	-	54	64	-	84	114	154

Stated values are standard. Other configurations are available on request.

SLIP RING PRODUCT GROUP

SC104-A01

APPLICATION EXAMPLES

- Access System
- Drain Inspection
- Packaging Machine

FEATURES

- Outer diameter: max. 104 mm
- Hollow shaft diameter: max. 50 mm
- Fieldbuses

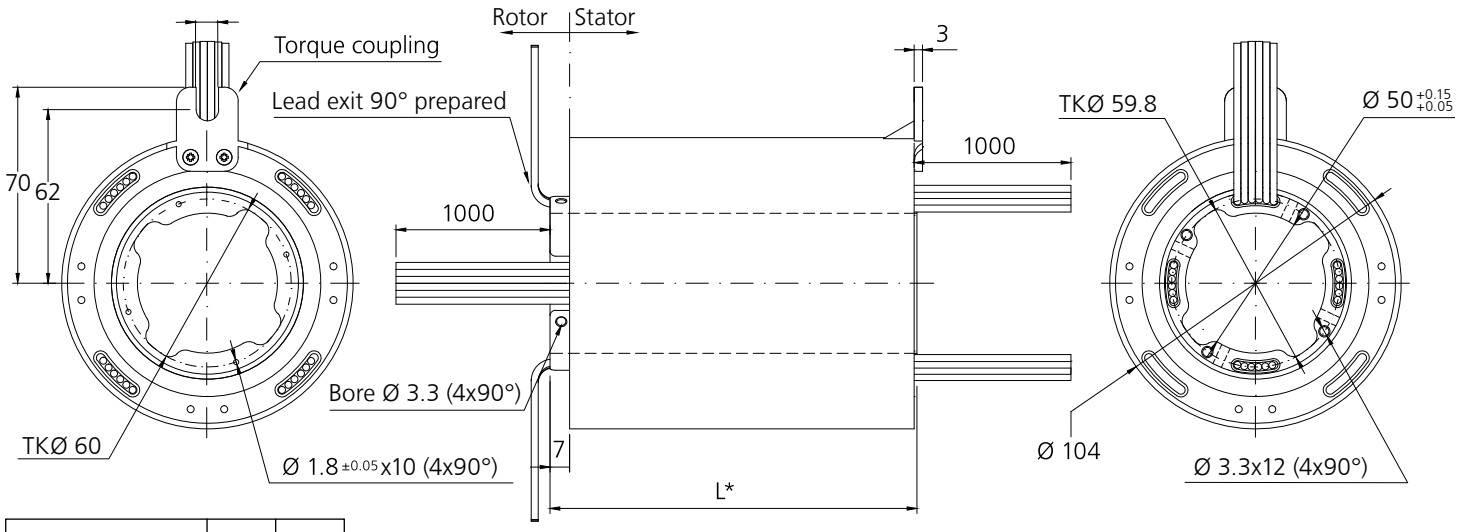
The system is maintenance free for up to 50 million rotations (depending on rotation speed and environmental conditions).

DATA

Number of rings:	6 / 12
Current per ring:	max. 10 A
Voltage:	480 V_{AC}
Dielectric strength:	1500 V_{AC}
Insulation resistance:	1000 MΩ at 500 V_{DC}

Rotation speed:	max. 400 rpm
Protection class:	IP54
Operating temperature:	-20 °C ... +80 °C
Electrical connection:	1000 mm leads; AWG 16 - leads (1.23 mm²) PVC
Housing material:	Fibre-reinforced polycarbonate

DESIGN EXAMPLE



Number of rings	6	12
L* (mm)	59	83

Stated values are standard. Other configurations are available on request.

ACCESSORIES ON REQUEST

- Adapter for slip ring SC020
- Shaft bushing (Inner diameter: 1.5"/ 38.1 mm)

* Extension by slip ring SC020 for additional channels, rotational speed max. 250 min^{-1} (see data sheet SC020).

Combination with slip ring SC020*

Shaft bushing (smaller inner diameter)

VARIANTS

Combination 2 systems SC104

Cable led out one-sided

Torque arm shifted by 90°

The SC104 is a standard slip ring with exceptionally durable industrial bearings. With additional slots for axial cable routings, it can be applied modularly as combination of up to three 12-pole-systems with 36 rings max. The torque support can be placed at the front or back side of the housing and with flexibility of 90°. All models are equipped with 1 meter lead wires, lead exit optionally on one side of the housing - to turn them on 0°, 90°, 180° and 270°.

SLIP RING PRODUCT GROUP

SC104-L01

APPLICATION EXAMPLES

- Access System
- Drain Inspection
- Packaging Machine

FEATURES

- Outer diameter: max. 104 mm
- Hollow shaft diameter: max. 50 mm
- Fieldbuses

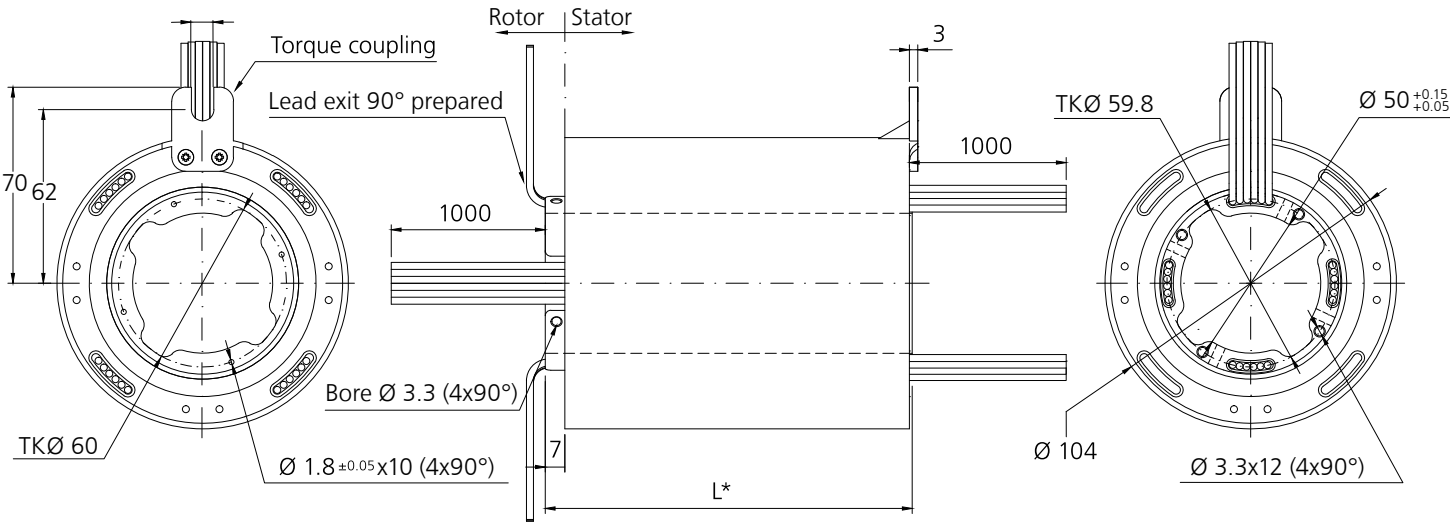
The system is maintenance free for up to 150 million rotation (depending on rotation speed and environmental conditions).
Brush block changeable for easy maintenance and extended life time.

DATA

Number of rings:	2 / 4
Current per ring:	max. 16 A
Voltage:	480 V_{AC}
Dielectric strength:	1500 V_{AC}
Insulation resistance:	>500 MΩ at 500 V_{DC}

Rotation speed:	max. 800 rpm
Protection class:	IP54
Operating temperature:	-20 °C ... +70 °C
Electrical connection:	1000 mm flying leads
	AWG16 -leads (1.23 mm²) PTFE
Housing material:	Fibre-reinforced polycarbonate

DESIGN EXAMPLE



Number of rings	2	4
L* (mm)	59	83

Stated values are standard. Other configurations are available on request.

ACCESSORIES ON REQUEST

Spare brush block for extended lifetime. Easely replaceable by dove tail guide and blade terminal.

Adapter for slip ring SC020 for additional channels, rotational speed max. 250 rpm (see data sheet SC020).

Shaft bushing. Smaller inner diameter: 1.5“ / 38.1 mm.

VARIANTS

Combination 2 systems
SC104 SC104-06-A01 (for Signal)
SC104-04-L01 (for Power)

Cable led out one-sided

Torque arm shifted by 90°

The SC104 is a standard slip ring with exceptionally durable industrial bearings. With additional slots for axial cable routings, it can be applied modularly as combination of up to four systems with 16 rings max. The torque support can be placed at the front or back side of the housing and with flexibility of 90°. All models are equipped with 1 meter lead wires, lead exit optionally on one side of the housing - to turn them on 0°, 90°, 180° and 270°.

SLIP RING PRODUCT GROUP

SC105

APPLICATION EXAMPLES

- Access System
- Beverage Filling System
- Drain Inspection
- Wind Turbine Pitch System

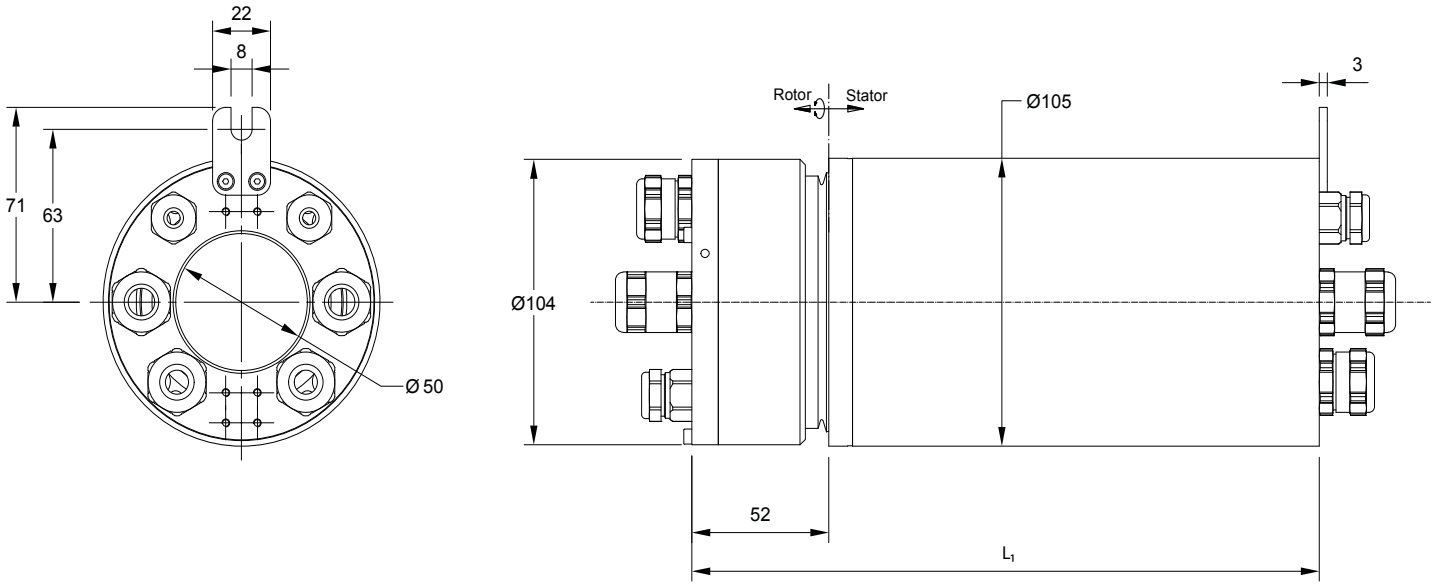
FEATURES

- Outer diameter: max. 105 mm
- Inner diameter: max. 50 mm
- Fieldbuses
- Fast Ethernet (certified to 100-BaseT Cat.5e & Cat.6)
- Gigabit Ethernet (certified to 1000-BaseT Cat.5e)
- Maintenance-free
- Standardised structure
- Flexibily configurable interfaces
- Various housing materials

DATA

Number of rings:	max. 30
Current per ring:	max. 16 A
Voltage:	max. 400 V_{AC}
Dielectric strength:	2000 V_{AC}
Insulation resistance:	>500 MΩ at 500 V_{DC}
Rotation speed:	max. 400 rpm
Protection class:	IP51 / IP65
Operating temperature:	-20 °C ... +70 °C
Electrical connection:	standardised (flying leads, cable or connector)
Housing material:	Aluminium
Length:	L_1 on request

DESIGN EXAMPLE



Stated values are standard. Other configurations are available on request.

SLIP RING PRODUCT GROUP

SC120

APPLICATION EXAMPLES

- Machine Tool
- Packaging Machine
- Wind Turbine Pitch System

FEATURES

- Outher diameter: max. 120 mm
- Inner diameter: max. 70 mm
- Fieldbuses
- Fast Ethernet (certified to 100-BaseT Cat.5e & Cat.6)
- Flexibily configurably interfaces

ACCESSORIES ON REQUEST

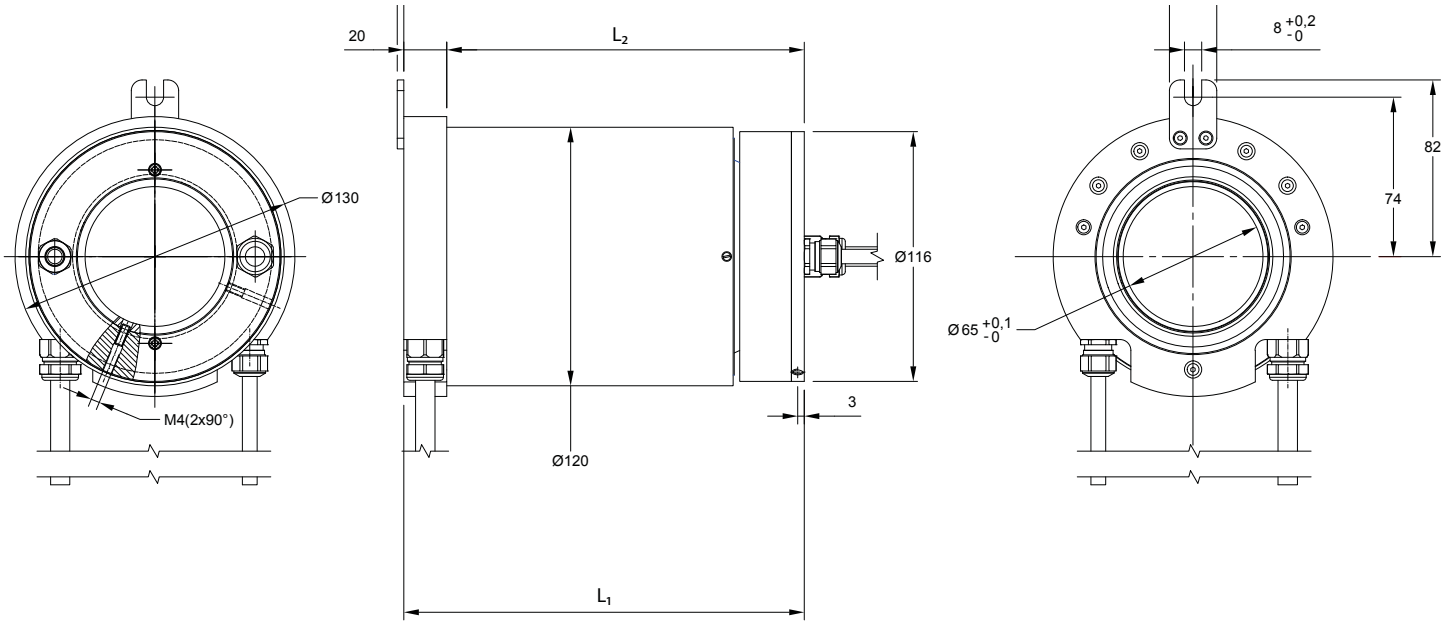
- Resolver
- Encoder
- FORJ
- Media Rotary Joint

DATA

Number of rings:	max. 80
Current per ring:	max. 30 A
Voltage:	max. 400 V_{AC}
Dielectric strength:	2000 V_{AC}
Insulation resistance:	>500 MΩ at 500 V_{DC}

Rotation speed:	max. 250 rpm
Protection class:	IP54 / IP65
Operating temperature:	-20 °C ... +70 °C
Electrical connection:	customized (flying leads, cable or connector)
Housing material:	Aluminium
Length:	L_1/L_2 on request

DESIGN EXAMPLE



Stated values are standard. Other configurations are available on request.

SLIP RING PRODUCT GROUP

SC168

APPLICATION EXAMPLES

- Machine Tool
- Milling Head
- Packaging Machine
- Wind Turbine and Tide Pitch System
- Special Machine

FEATURES

- Outer diameter: Typically 168 mm
- Combination of data, signal and power transmission possible
- Industrial Ethernet transmission (100-BaseT cert. acc. to CAT5e)
- Adaptation | customer specific design possible
- Shaft Connection Adapter

OPTIONS

- 1 channel FORJ (Fiber Optical Rotary Joint)
- Media Rotary Joint
- Encoder
- Additional bus systems upon request
- Anodized or passivated surfaces for the use in harsh environments
- Shaft Connection Adapter

DATA

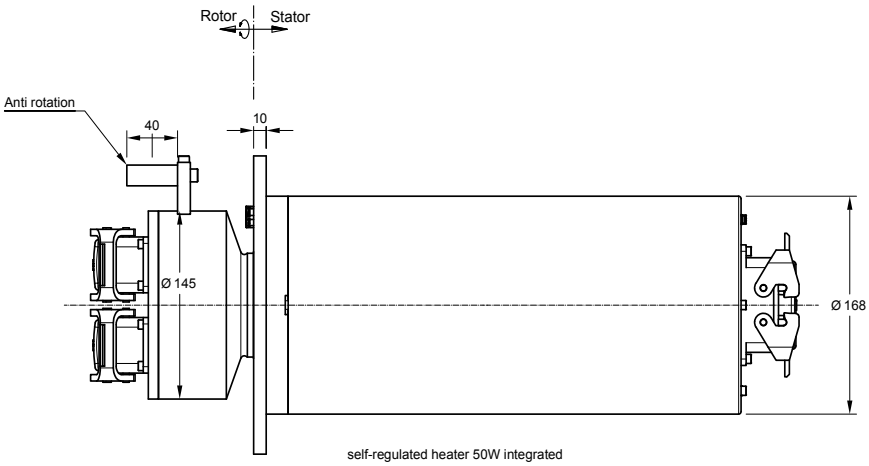
Number of rings:	45
Current per ring:	120 A
Voltage:	400 V_{AC}
Dielectric strength:	2000 V_{AC},50/60 Hz
Insulation resistance:	>500 MΩ at 500 V_{DC}

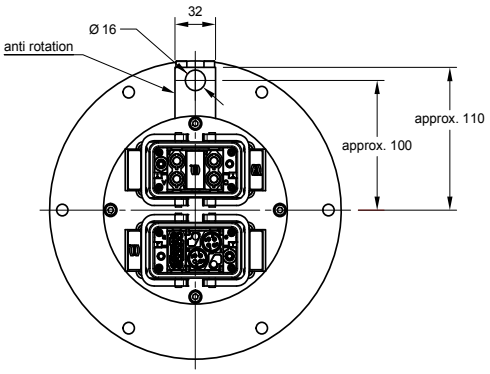
Rotation speed:	140 rpm
Protection class:	IP54 / IP65 (typically)
Operating temperature:	-30 °C ... +70 °C
Electrical connection:	Customized (flying leads, cable or connector)
Housing material:	Aluminium

Customized configurations on request. Stated values are typical.

SC168

DESIGN EXAMPLE





The operational life of the slip ring is dependent upon power rating, speed, temperature, vibration and environment.

SLIP RING PRODUCT GROUP

SC2X0

APPLICATION EXAMPLES

- Machine Tool
- Packaging Machine
- Special Machine
- Radar

FEATURES

- Outer diameter: up to 290 mm
- Hollow shaft up to 180 mm
- Combination of power, signal and data transmission possible
- Adaptation | customer specific design possible

OPTIONS

- Industrial Ethernet (typically 100 BaseT, certified acc. to CAT5e)
  the combination Industrial Ethernet and hollow shaft exceeding 110 mm is to be verified individually
- 1 channel FORJ (Fiber Optical Rotary Joint) - hollow shaft not possible
- HF Rotary Joint
- Media Rotary Joint
- Additional bus systems upon request
- Anodized or passivated surfaces for the use in harsh environments

DATA

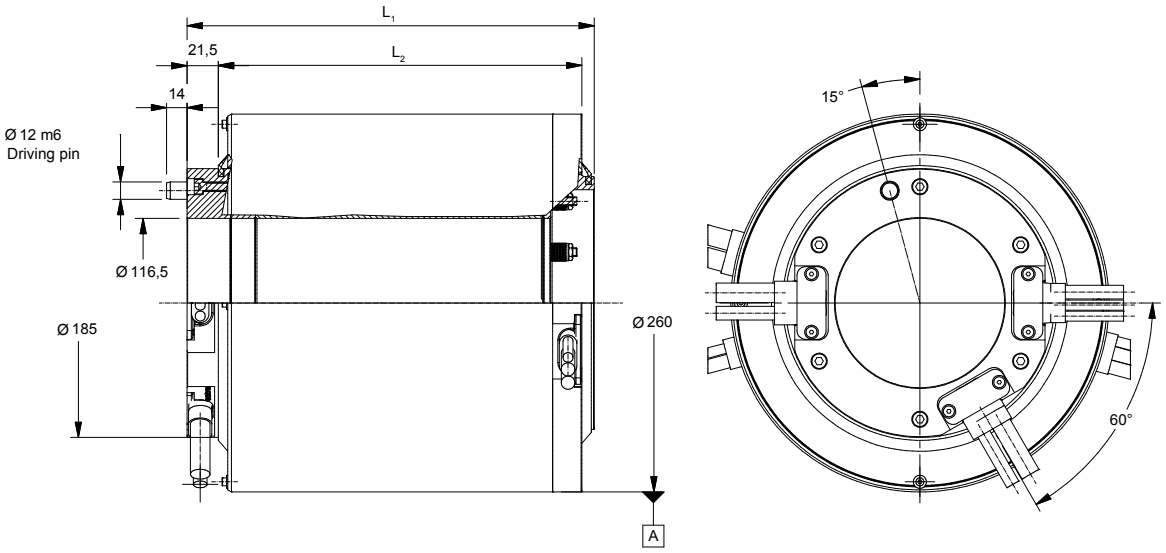
Number of rings:	Up to 100, variations upon request
Current per ring:	300 A
Voltage:	690 V_{AC} / 1000 V_{DC}
Dielectric strength:	Up to 3000 V_{AC}
Insulation resistance:	>500 MΩ at 500 V_{DC}

Rotation speed:	Max. 60 rpm
Protection class:	Typically IP54 / IP65
Operating temperature:	-30 °C ... +70 °C
Electrical connection:	Customized (flying leads, cable or connector)
Housing material:	Aluminium

Customized configurations on request. Stated values are typical.

SC2X0

DESIGN EXAMPLE



The operational life of the slip ring is dependent upon power rating, speed, temperature, vibration and environment.

SLIP RING PRODUCT GROUP

SC3X0

APPLICATION EXAMPLES

- Machine Tool
- Wind Turbine Pitch System
- Cranes

FEATURES

- Outer diameter: max. 390 mm
- Inner diameter: max. 190 mm
- Fieldbuses
- Fast Ethernet (certified to 100-BaseT Cat.5e & Cat.6)
- Flexibily configurable interfaces

ACCESSORIES ON REQUEST

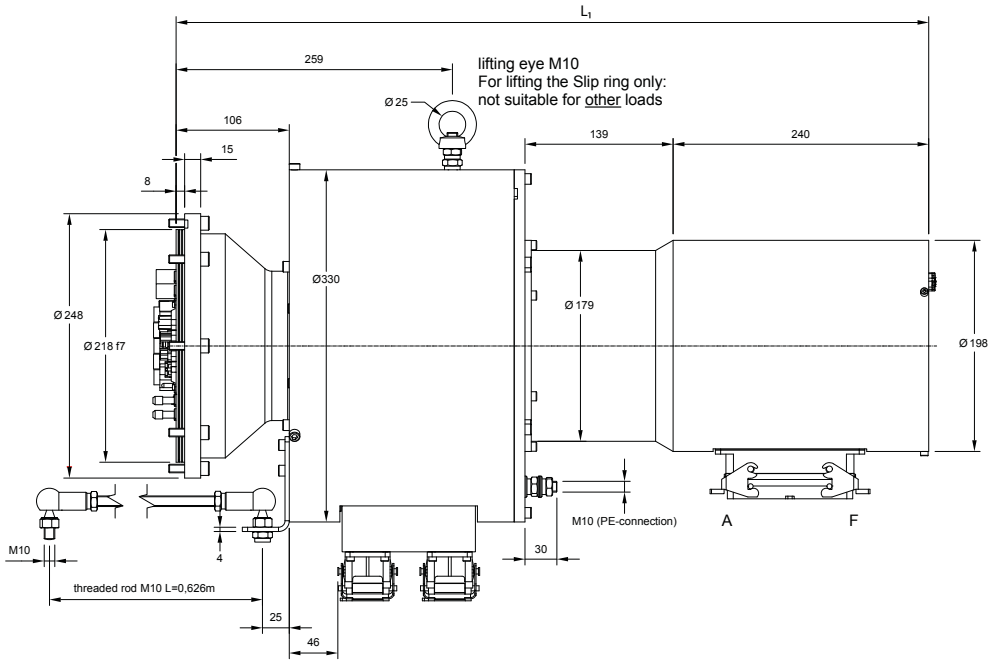
- Resolver
- Encoder
- FORJ
- Media Rotary Joint

DATA

Number of rings:	max. 100
Current per ring:	max. 300 A
Voltage:	max. 690 V_{AC} / 1000 V_{DC}
Dielectric strength:	2000 V_{AC}
Insulation resistance:	>500 MΩ at 500 V_{DC}

Rotation speed:	max. 50 rpm
Protection class:	IP54 / IP65
Operating temperature:	-30 °C ... +70 °C
Electrical connection:	customized (flying leads, cable or connector)
Housing material:	Aluminium
Length:	L_1 on request

DESIGN EXAMPLE



Stated values are standard. Other configurations are available on request.

SLIP RING PRODUCT GROUP

SH085-MSP

APPLICATION EXAMPLES

- Beverage Filling System
- Food Processing
- Packaging Machine

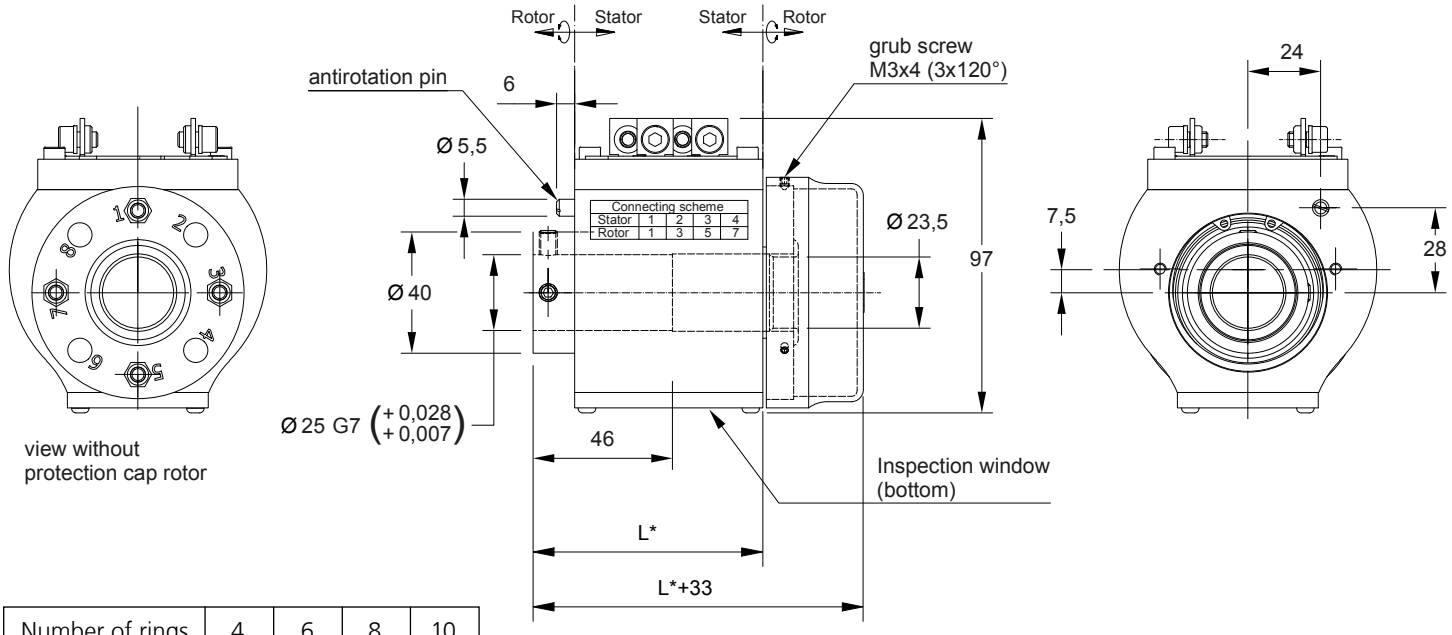
FEATURES

- Outer diameter: 85 mm
- Interchangeable brushblock
- Inspection window

OPTIONS

- Positioning-Disc
- Dust box
- Stator protection cap (with cable gland or connector on request)
- All options must be ordered separately and will be enclosed with the delivery

DESIGN EXAMPLE



Number of rings	4	6	8	10
L* (mm)	76	94	112	130

Stated values are standard. Other configurations are available on request.

DATA

Number of rings:	4 / 6 / 8 / 10
Current per ring:	max. 25 A
Voltage:	max. 250 V_{AC}
Dielectric strength:	1250 V_{AC}
Insulation resistance:	> 500 MΩ at 500 V_{DC}

Rotation speed:	max. 1500 rpm
Protection class:	IP00 (IP50 with protection caps)
Operating temperature:	-20 °C ... +80 °C
Electrical connection:	screw terminal M5
Hollow shaft:	Ø 25 G7 throughbore
Housing material:	Aluminium & Fibre-reinforced polycarbonate

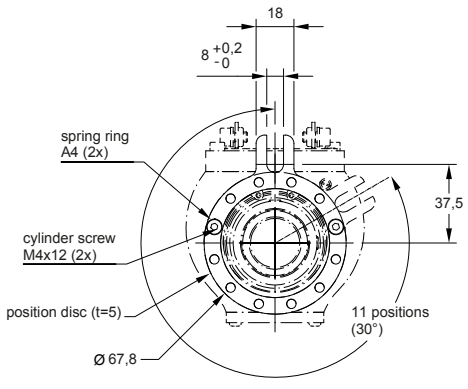
ORDER INFORMATION

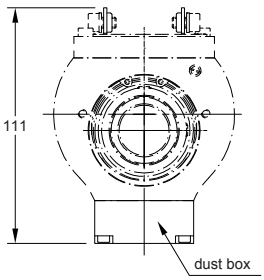
- Number of rings: 4 / 6 / 8 / 10
- Operating current
- Operating voltage
- Options: must be ordered separately and will be enclosed with the delivery

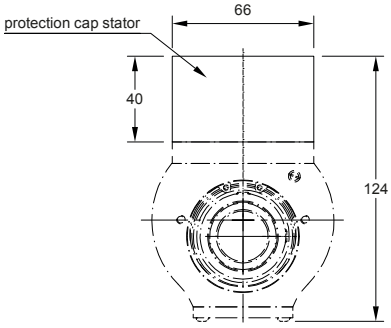
Positioning-Disc (mountable instead of the pin)

Dust box (mountable instead of the inspection window)

Stator protection cap







SLIP RING PRODUCT GROUP

SA030

APPLICATION EXAMPLES

- Medical Arm

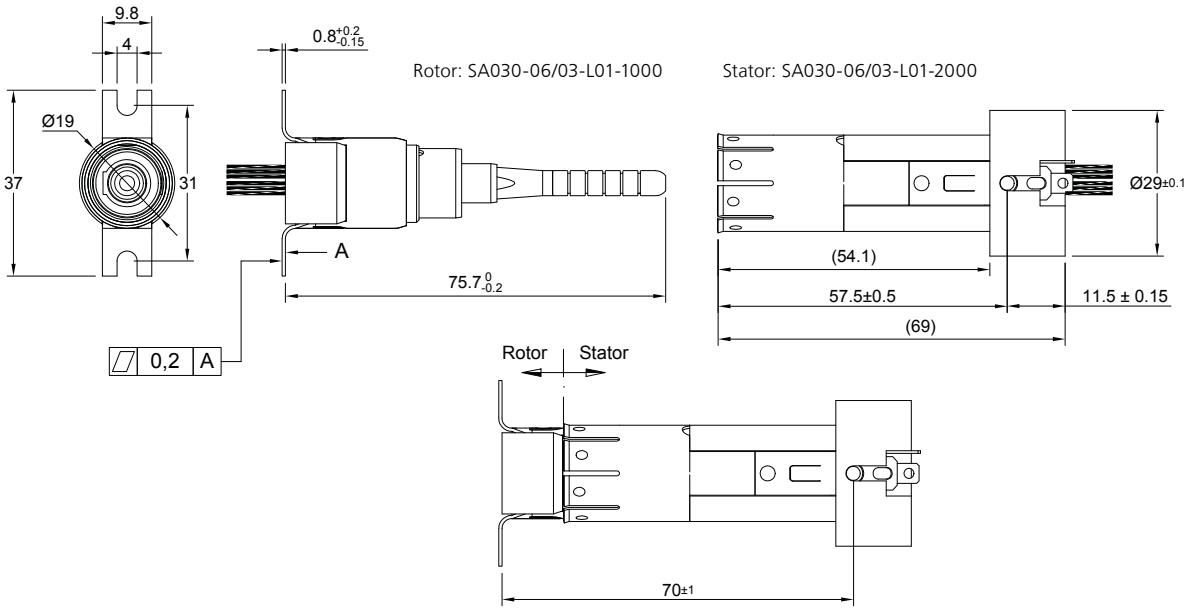
FEATURES

- Outer diameter: max. 29 mm
- Special design possible
- High frequency coupling possible
- Fieldbuses
- Fast Ethernet (certified to 100-BaseT Cat.5e & Cat.6)

DATA

Number of rings:	max. 9
Current per ring:	6 rings with 1 A and 3 rings with 16 A
Voltage:	max. 48 V_{DC}
Dielectric strength:	500 V_{AC}
Insulation resistance:	>500 MΩ at 500 V_{DC}
Rotation speed:	max. 5 rpm
Protection class:	IP00
Operating temperature:	-20 °C ... +80 °C
Electrical connection:	customized (flying leads, cable or connector)
Housing material:	Fibre-reinforced polycarbonate

DESIGN EXAMPLE



Stated values are standard. Other configurations are available on request.

DISC SLIP RING

SDX

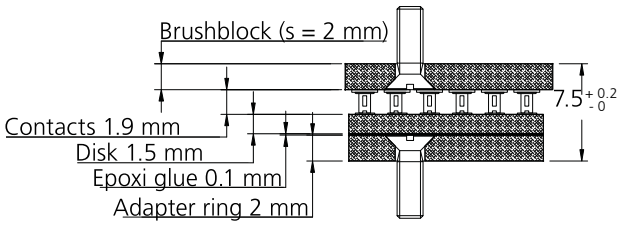
APPLICATION EXAMPLES

- Access System
- Robotic

FEATURES

- Outer diameter: max. 300 mm
- Inner diameter: max. 170 mm
- Special design possible
- Combination with electronic components possible
- Fieldbuses

ASSEMBLY



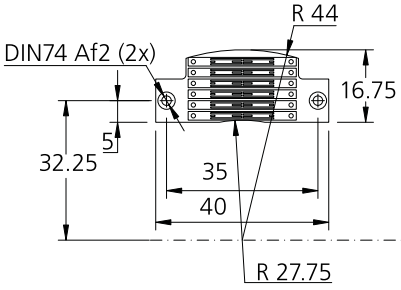
DATA

Number of rings:	max. 12
Current per ring:	max. 10 A
Voltage:	max. 85 V_{AC} / 120 V_{DC}
Dielectric strength:	500 V_{AC}
Insulation resistance:	>500 MΩ at 500 V_{DC}

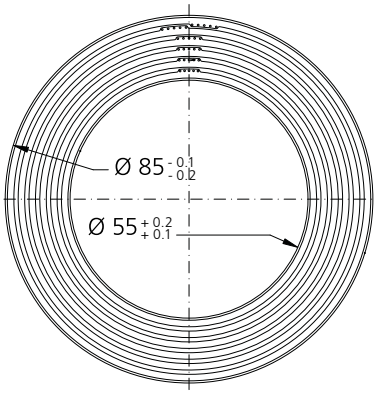
Rotation speed:	max. 100 rpm
Protection class:	IP00
Operating temperature:	-20 °C ... +80 °C
Electrical connection:	customized (flying leads, cable or connector)
Housing material:	FR4

DESIGN EXAMPLE

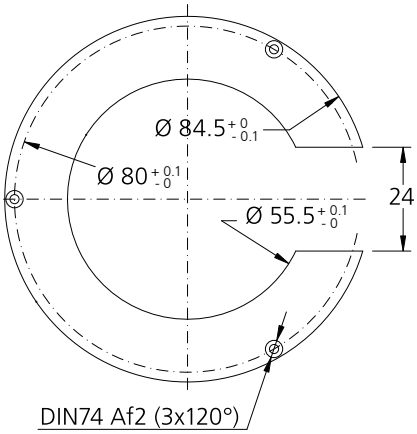
Brushblock (s = 2 mm)



Rotor (s = 1,5 mm)



Adapter ring (s = 2 mm)



All parts made of PCB-material FR4
5 screws M2x4 DIN963 free issued

Stated values are standard. Other configurations are available on request.

SLIP RING PRODUCT GROUP

SMX

APPLICATION EXAMPLES

- Cable Winding System
- Drain Inspection
- Packaging Machine
- Robotic
- Surveillance Camera
- Video System / CCTV

FEATURES

- Replaceable brush block
- Fieldbuses

	SM004	SM045	SM50	SM070	SM090	SM140	SM400
Outer diameter	3,8 mm	51 mm	52 mm	72 mm	90 mm	140 mm	400 mm
Inner diameter	-	25 mm	30 mm	50 mm	70 mm	100 mm	300 mm
Option	-	Replaceable brush block					
Max. number of rings	5	14	24	24	24	18	45
Max. current per ring	1 A	25 A	16 A	16 A	16 A	16 A	45 A
Max. voltage	24 V_{DC}	230 V_{AC}	400 V_{AC}	400 V_{AC}	400 V_{AC}	400 V_{AC}	400 V_{AC}
Dielectric strength	500 V_{AC}	1000 V_{AC}	2000 V_{AC}	2000 V_{AC}	2000 V_{AC}	2000 V_{AC}	2000 V_{AC}
Electrical insulation resistance	>500 MΩ at 500 V_{DC}						
Max. rotation speed	50 rpm	500 rpm					
Protection class	IP00						
Operating temperature	-20 °C ... +80 °C						
Electrical connection	Flying leads / terminals / connectors						
Housing material	Fibre- reinforced polycarbonate	Fibre-reinforced polycarbonate / Aluminium					

Stated values are standard. Other configurations are available on request.

CONTACTLESS TRANSMISSION

FORJ K32ST

APPLICATION EXAMPLES

- Drain Inspection
- Printing System
- Surveillance Camera
- Wind Turbine Pitch System
- Video System / CCTV

FEATURES

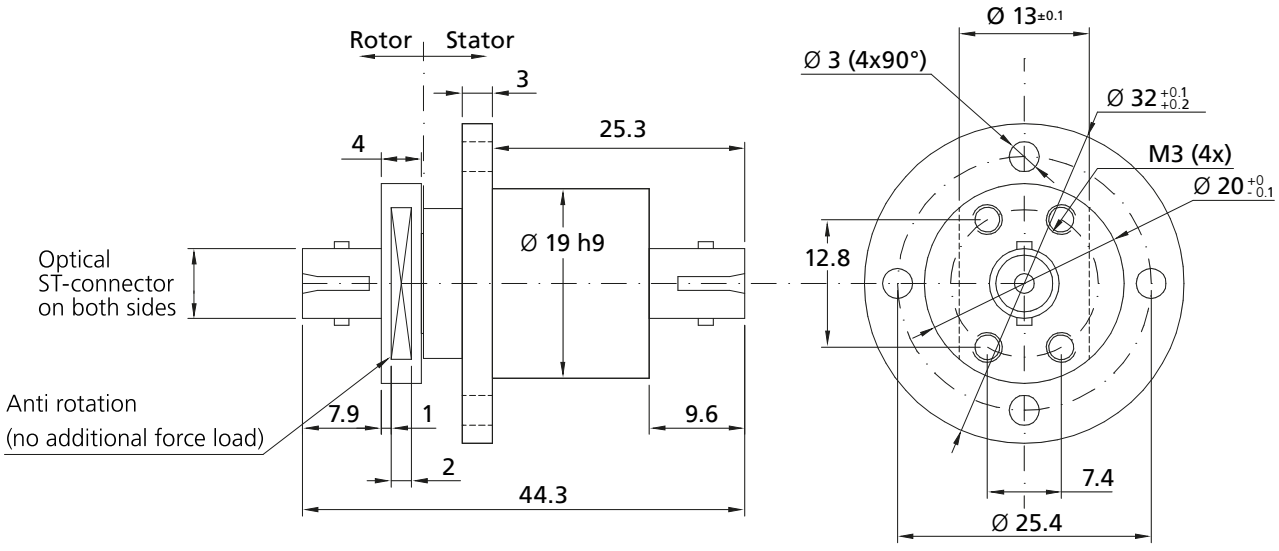
- Fibre optic rotary joint for 1 channel (path) multi mode
- Outer diameter: max. 32 mm
- Fiber Optical Rotary Joint Passive for multi mode (FORJ-MM)

DATA

Number of rings:	1 channel
Core diameter:	50 - 62.5 µm
Wave lenght:	830 or 1300 nm
Loss:	max. 4 dB

Rotation speed:	max. 1200 rpm
Protection class:	IP54
Temperature:	-20 °C ... +60 °C
Housing material:	Aluminium

DESIGN EXAMPLE



Stated values are standard. Other configurations are available on request.

HEADQUARTER & PRODUCTION

GERMANY
LTN Servotechnik GmbH
Georg-Hardt-Straße 4
83624 Otterfing, Germany
T +49 8024 6080-0
F +49 8024 6080-1000
ltn@ltn.de
www.ltn-servotechnik.com

AMERICA

BRAZIL
Leine & Linde Comercio de Produtos Eletronicos do Brasil Ltda.
Av. José Rocha Bonfim n° 214
Sala 217, Bloco Chicago,
Condomínio Praça Capital
13080-650 Santa Genebra,
Campinas-SP, Brazil
T +55 19 3367 5657
F +55 19 3367 5658
info@leinelinde.com.br
www.leinelinde.com

USA
HEIDENHAIN CORPORATION
333 E. State Parkway
Schaumburg, IL 60174 USA
Jonathan Dougherty
T +1 847 519 4218
Rebecca Feith
T +1 847 519 3396
info@heidenhain.com
www.heidenhain.us

ASIA

CHINA
Wuhan Lingsheng Technology Co., Ltd.
Cong Li
Room 1205, No. 88 Gaoxiong Road
Jiangan District of Wuhan City
Hubei Province, P.R. China
Postcode 430015
T +86 27 88585337
F +86 27 88585337
M +86 15611437180
licong@wulstec.com
www.wulstec.com

INDIA
Rajdeep Automation Pvt. Ltd.
S. No.143,
Vadgaon Dhayari, Sinhagad Road
Pune - 411041, India
T +91 22-4005 9466
T +91 22-2300 2837
info@rajdeep.in
www.rajdeep.in

JAPAN
HEIDENHAIN K.K.
Hulic Kojimachi Bldg., 9F
3-2 Kojimachi, Chiyoda-ku
Tokyo, 102-0083, Japan
T +81 3 323 477 81
F +81 3 326 225 39
sales@heidenhain.co.jp
www.heidenhain.co.jp

SOUTH KOREA
EMSINT Co.,Ltd.
Hong Youngguy
B-822, 205, Manhae-ro, Danwon-gu, Ansan-si, Gyeonggi-do,
Republic of Korea 15421
T +82 31 380 0400
F +82 31 380 0410
sales@emsint.co.kr
www.emsint.co.kr

SOUTH KOREA (WIND)
Leine & Linde Korea Ltd..
#1502, C Tower, 123, Centum Dong-ro; (The Sharp Centum Star)
Haeundae-gu, Busan,
Rep. of KOREA, 48050
T +82 51 746 5420
F +82 51 746 5421
info@leinelinde.co.kr
www.leinelinde.co.kr

EUROPE

AUSTRIA
InterTech Handels GmbH
Fritz Walcher
Hondastraße 3
2351 Wiener Neudorf, Austria
T +43 2236 360630
office@intertech-austria.at
www.intertech-austria.at

FRANCE / BELGIUM / LUXEMBOURG
Servotechnics
Ignace Giliberti
9, Avenue Alexandre Maistrasse
92500 Rueil-Malmaison, France
T +33 1 47 08 22 79
F +33 1 47 08 67 25
igiliberti@servotechnics.com
www.servotechnics.fr

ITALY
Leine & Linde LTN Italia S.r.l.
Fabio Camesasca
Via Giacomo Matteotti 7 A
20846 Macherio (MB), Italy
T +39 039 596 01 08
F +39 039 971 22 08
M +39 333 4841046
f.camesasca@leinelinde-ltn.it
www.leinelinde-ltn.it

SPAIN / PORTUGAL
Leine Linde LTN S.L.
Edificio La Plana
C/Pau Claris 18, 1°4ª
08130 Sta Perpetua de la Mogoda
Barcelona, Spain
T +34 93 574 23 02
F +34 93 560 57 60
info@leinelinde-ltn.es
www.leinelinde-ltn.es

TURKEY
BOR Endüstri Elektrik Elektronik Ticaret A.Ş. (Head Office)
Yenişehir Mah. Cumhuriyet Bulvarı
No. 12-4, Dumankaya Cadde D Blok
D:1 P.K. 34912,
Kurtköy - Pendik - İstanbul, Turkey
T +90 216 504 05 20
F +90 216 504 03 57
www.borelektronik.com.tr

UNITED KINGDOM / IRELAND
LTMB
Carol Bazen
9, Beta Road, Farnborough
Hampshire GU14 8PG,
United Kingdom
T +44 1252 517751
M +44 7900 215800
ltmb@ltmb.co.uk
www.ltmb.co.uk