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General

Electrical Data

Conductix-Wampfler - an experienced partner
Conductix-Wampfler offers a wide range of rotary transmissions, for energy, data and signal transmission as well as for the transmission of gasiform and fluid medias. The standard program allows to install slip ring assemblies for power and data/signal currents of any number of poles. Combinations that include additional rotary transmissions for liquid media (water, hydraulic oil, etc.) and gases (compressed air, argon etc.) are possible. Slip ring assemblies can be either supplied as an open built-in version that is adjusted to the customers' requirements or with a housing of impact-resistant plastic or steel.

Data transmission
The transmission of analogue and digital signals is used in several industrial applications as well as in many other areas. The communication works through all active transmission protocols. Depending on the application, different materials are used for the slip rings.

Note: The quality of transmission of the analog-to-digital signals, strongly depends on the quality of the complete system in which the SRA (Slip Ring Assembly) is only a part. An important role is also played by the cables, their construction and shielding. The number of cable connections, external perturbation, the type of automation devices and their adaption to each other are important factors, too. This should be considered by dimensioning of the complete system.

Options
• Internal heater to eliminate condensation in humid locations
• Installation of encoders and potentiometers
• Transparent windows and doors on the larger enclosures to aid maintenance

Special constructions
Our experts are happy to advise you concerning any specials requirements, such as assemblies with big diameters, extreme operating conditions, units that incorporate fiber optic swivels, and units designed for high voltages.

Easy assembly and maintenance
Our slip ring assemblies are easy to install and to maintain. By special request, rings and brush holders can be completely pre-wired using built-in terminal boxes and terminal strips. All connections are easy to access and the brushes are easy to replace.

Engineer standards
All slip ring assemblies built by Conductix-Wampfler employ the latest technologies available. We conform to the strictest requirements of the low voltage directive.

Standard Range

<table>
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<th>Type</th>
<th>I[°] [mA/A]</th>
<th>U [V]</th>
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<td>mA - 16 A</td>
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<td>30</td>
<td>Suitable for data transmission</td>
<td>8</td>
</tr>
<tr>
<td>ES/SS45/1</td>
<td>mA - 25 A</td>
<td>400 (415)[2]</td>
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<tr>
<td>ES/SS45/2</td>
<td>25 A</td>
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<td>ES/SS45/3</td>
<td>47 A</td>
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<td>ES/SS18</td>
<td>mA - 25 A</td>
<td>630 (690)[2]</td>
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<td>GS/SS18</td>
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<td>630 (690)[2]</td>
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<td>85</td>
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<tr>
<td>ES/SS15</td>
<td>90 A</td>
<td>1000</td>
<td>85</td>
<td></td>
<td>15</td>
</tr>
<tr>
<td>ES/SS16</td>
<td>100 A</td>
<td>1000</td>
<td>110</td>
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<tr>
<td>ES/SS19</td>
<td>150 A</td>
<td>1000</td>
<td>132</td>
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<td>17</td>
</tr>
<tr>
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<td>250 A</td>
<td>1000</td>
<td>210</td>
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<td>18</td>
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<tr>
<td>ES/SS29</td>
<td>400 A</td>
<td>1000</td>
<td>210</td>
<td></td>
<td>19</td>
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<tr>
<td>ES/SS260</td>
<td>mA - 47 A</td>
<td>630 (690)[2]</td>
<td>260</td>
<td>Suitable for data transmission</td>
<td>20</td>
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<tr>
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<td>630 (690)[2]</td>
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<tr>
<td>GS19/13/18</td>
<td>Combination</td>
<td></td>
<td></td>
<td></td>
<td>24</td>
</tr>
</tbody>
</table>

1) Note: referring to the stated amperages
Max. ampacity might be reduced by positioning of single cores inside the slip ring assembly, by positioning of the feed cables or due to the ambient temperature.

2) The voltages apply for slip ring assemblies, installed in systems (parts of systems) that are not directly fed by the low-voltage net (VDE 0110-1/2008-01: 4.3.2.2.2, table F-6).
On systems (part of systems) with direct feeding from the low-voltage net, the values in brackets are permissible for alternating current (VDE 0110-1/2008-01: 4.3.2.2.1, table F-3b).
Example of a Combined Slip Ring Assembly

Combined slip ring assembly
GS2104 / 1904 / 1504 / 1806 / 04 ML
3x250 A + PE + 4x150 A + 4x90 A + 6x25 A + 4x Data
A Developed and Comprehensive Standard Program

Some examples of slip ring applications: rotary cranes, water treatment works, roundabouts, manipulators, rotary tables, antenna arrays, theatre stages, packing machines and cable reels.

Rotating die-casting equipment of Krauss-Maffei Kunststofftechnik (Munich); in operation at Johnson Controls Interiors (Lüneburg)

Slip ring assembly in building machinery

Slip ring assembly in elevating platforms
Slip Ring Assembly

Built-in Slip Ring Assembly ES30 16A/400V (415V)

Electrical data
- Voltage:
  - max. 400 V = (415 V)¹
  - according to DIN VDE 0110
- Overvoltage category III
- Insulating material group II
- Degree of contamination 3
- Current: mA to 16 A, at max. 30°C
  - and 100% duty cycle
- Slip rings:
  - ø 30 x 6 mm, brass (MS)
  - Distance between rings 12 mm
- Brush holder assembly:
  - Brush holders with 2 pressed-in
    brushes (Cu) 20 x 6.4 mm
  - Connecting flat plug 4.8
    (DIN 46244) for flat socket 4.8
    (DIN 46247)
- Protection class: IP 00

Control and data transmission
- Ring with multi-layer coating (ML) and silver (Ag) brush holder assembly for the transfer of analog and digital signals
- Transmission of data and video signals requires additional consultation

Additional technical specifications
- Rotational speed: 1-100 min⁻¹
- Insulation: insulating parts, fiberglass reinforced polyamide
- Ambient temperature:
  - from -35°C up to max. +50°C
  - at > 30°C the max. current load has to be reduced accordingly
  - Higher temperatures possible on request
- Position of installation: vertical
  (other positions on request)
- Mounting shaft: d₀ = 15₉₀

Components included
- Complete slip ring assembly with brush holders and brushes
- Insulators
- Mounting shaft
  (secured on site against torsion with 2 threaded pins M5, DIN 914)
- Brush holder bolt not included

Order example:
ES30/R15-04
Built-in slip ring assembly
3-pole + PE
with tube d₀ = 15₉₀

Enclosed Slip Ring Assembly GS30 16A/400V (415V)

Electrical data
- According to type ES30
- Protection class: IP 65

Wiring and max. number of poles
- According to type ES30

Control and data transmission
- Ring with multi-layer coating (ML) and silver (Ag) brush holder assembly for the transfer of analog and digital signals
- Transmission of data and video signals requires additional consultation

Additional technical specifications
- Rotational speed: 1-100 min⁻¹
- Insulation: insulating parts, fiberglass reinforced polyamide
- Ambient temperature:
  - from -35°C up to max. +50°C
  - at > 30°C the max. current load has to be reduced accordingly
  - Higher temperatures possible on request
- Position of installation: vertical
  (other positions on request)
- Mounting shaft: Anti-friction bearing (sealed-for-life)
- Corrosion protection: Steel parts galvanized and/or powder coated
  RAL 1012
- Cable glands:
  - in the shaft hole ø 12 mm
    (with thread M20)
  - in the housing M20x1.5 included
    (elbow fitting on request)
- Option: With mounting flange

Components included
- Complete slip ring assembly with brush holders and brushes
- Insulators
- Mounting flange
  (secured on site against torsion with 2 threaded pins M5, DIN 914)
- Brush holder bolt not included

Order example:
GS30-04
Enclosed slip ring assembly
3-pole + PE

1) The voltages apply for slip ring assemblies, installed in systems (parts of systems) that are not directly fed by the low-voltage net (VDE 0110-1/2008-01: 4.3.2.2.2, table F.4).
On systems (parts of systems) with direct feeding from the low-voltage net, the values in brackets are permissible for alternating current (VDE 0110-1/2008-01: 4.3.2.2.1, table F.3a).

Order example:
ES30/R15-04
Built-in slip ring assembly
3-pole + PE
with tube d₀ = 15₉₀

Order example:
GS30-04
Enclosed slip ring assembly
3-pole + PE
**Slip Ring Assembly**

**Built-in Slip Ring Assembly ES45/1 25A/400V (415V)**

**Electrical data**
- Voltage:
  - max. 400 V = (415 V)
  - according to DIN VDE 0110
  - overtension category III
  - insulating material group II
  - degree of contamination 3
- Current: mA to 25 A, at max. 30°C and 100% duty cycle
- Slip rings:
  - ø 45 x 8 mm, brass (MS)
  - distance between rings 14 mm
- Brush holder assembly:
  - brush holders with 2 pressed-on brushes (Cu) 20 x 8 mm
  - Connecting fl at plug 6.3 (DIN 46244) for flat socket 6.3 (DIN 46247)
- Protection class: IP 00

**Control and data transmission**
- Ring with multi-layer coating (ML) and silver (Ag) brush holder assembly for the transfer of analog and digital signals

**Wiring and max. number of poles**
- Max. 18 completely wired with 2.5 mm² on a terminal board
- Up to 12 rings, connection to terminal posts
- 13 to 18 rings connection to insulated terminals

**Components included**
- Complete slip ring assembly with brush holders and brushes
- Insulators
- Mounting shaft (secure on site against torsion with 2 threaded pins M5, DIN 914)
- Brush bolt not included (see d₁)

**Order example:**
ES45/1/R22-04
Built-in slip ring assembly type 45/1, 3-pole with tube d₂ = 25h9

---

**Enclosed Slip Ring Assembly GS45/1 25A/400V (415V)**

**Electrical data**
- According to type ES45/1
- Protection class: IP 65

**Wiring and max. number of poles**
- According to type ES45/1

**Additional technical specifications**
- Rotational speed: 1-100 min⁻¹
- Insulation: insulating parts, fiberglass reinforced polyamide
- Ambient temperature:
  - from -35°C up to max. +50°C
  - at > 30°C the current load has to be reduced accordingly
- Higher temperatures possible on request
- Position of installation:
  - vertical
- Mounting shaft: d₃ = 25h9

**Options**
- Reinforced bearing

**Order example:**
GS45/1KS-04
Enclosed slip ring assembly type 45/1 with plastic housing, 3-pole + PE

---

1) The voltages apply for slip ring assemblies, installed in systems (parts of systems) that are not directly fed by the low-voltage net (VDE 0110-1/2008-01: 4.3.2.2.2, table F.3b). On systems (part of systems) with direct feeding from the low-voltage net, the values in brackets are permissible for alternating current (VDE 0110-1/2008-01: 4.3.2.2.1, table F.3b).
**Slip Ring Assembly**

**Built-in Slip Ring Assembly ES45/3 25A/1000V**

**Electrical data**

- Voltage:
  - max. 1000 V~
  - according to DIN VDE 0110
  - overtension category IV
  - insulating material group II
  - degree of contamination 3
- Current: 25 A, at max. 30°C and 100% duty cycle
- Slip rings:
  - ø 45 x 8 mm, brass (MS)
  - distance between rings 28 mm
- Brush holder assembly:
  - brush holders with 2 pressed-on brushes (Cu) 20 x 8 mm
  - Connecting fl  at plug 6.3 (DIN 46244) for fl  at socket 6.3 (DIN 46247)
- Protection class: IP 00

**Additional technical specifications**

- Rotational speed: 1-100 min⁻¹
- Insulation: insulating parts, fiberglass reinforced polyamide
- Ambient temperature:
  - from -35°C up to max. +50°C
  - at >30°C the max. current load has to be reduced accordingly
  - higher temperatures possible on request
- Position of installation: vertical (other positions on request)
- Mounting shaft: d₁ = 25h9

### Number of poles vs. d₂ [mm]

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<tr>
<th>Number of poles</th>
<th>d₂ [mm]</th>
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<td>3 - 4</td>
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<td>10.2</td>
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</tbody>
</table>

**Order example:**

ES45/3/R22-04
Built-in slip ring assembly type 45/3; 3-pole + PE
with tube d₁ = 25h9

---

**Enclosed Slip Ring Assembly GS45/3 25A/1000V**

**Electrical data**

- According to type ES45/3
- Protection class: IP 65

**Wiring and max. number of poles**

- According to type ES45/3

**Components included**

- Complete slip ring assembly with brush holders and brushes
- Insulator
- Mounting shaft (secure on site against torsion with 2 threaded pins M5, DIN 914)
- Brush holder bolt not included (see d₂)

**Wiring and max. number of poles**

- Max. 9 (incl. PE)
- Completely wired with 2.5 mm² on a terminal board (terminal posts)

**Order example:**

GS45/3KS-04
Enclosed slip ring assembly type 45/3 with plastic housing, 3-pole + PE

---

**Components included**

- Complete slip ring assembly with brush holders and brushes
- Insulator
- Mounting shaft (secure on site against torsion with 2 threaded pins M5, DIN 914)
- Brush holder bolt not included (see d₂)

**Order example:**

ES45/3/R22-04
Built-in slip ring assembly type 45/3; 3-pole + PE
with tube d₁ = 25h9

---

**Enclosed Slip Ring Assembly GS45/3 25A/1000V**

**Order example:**

GS45/3KS-04
Enclosed slip ring assembly type 45/3 with plastic housing, 3-pole + PE

---

**Enclosed Slip Ring Assembly GS45/3 25A/1000V**

**Components included**

- Complete slip ring assembly with brush holders and brushes
- Insulator
- Mounting shaft (secure on site against torsion with 2 threaded pins M5, DIN 914)
- Brush holder bolt not included (see d₂)

**Order example:**

ES45/3/R22-04
Built-in slip ring assembly type 45/3; 3-pole + PE
with tube d₁ = 25h9

---

**Enclosed Slip Ring Assembly GS45/3 25A/1000V**

**Order example:**

GS45/3KS-04
Enclosed slip ring assembly type 45/3 with plastic housing, 3-pole + PE

---

**Enclosed Slip Ring Assembly GS45/3 25A/1000V**

**Order example:**

GS45/3KS-04
Enclosed slip ring assembly type 45/3 with plastic housing, 3-pole + PE
Slip Ring Assembly

Built-in Slip Ring Assembly ES45/2 47A/1000V

Electrical data
- Voltage:
  - max. 1000 V~
  - according to DIN VDE 0110
  - overtension category IV
  - insulating material group II
  - degree of contamination 3
- Current: 47 A, at max. 30°C and 100% duty cycle
- Slip rings:
  - ø 45 x 17 mm, brass (MS)
  - distance between rings 36.6 mm
- Brush holder assembly:
  - brush holders with 2 brush holders and brushes with 2 pressed-on brushes (Cu) 20 x 8 mm
  - connecting flat plug 6.3 (DIN 46244) for flat socket 6.3 (DIN 46247)
- Protection class: IP 00

Wiring and max. number of poles
- Max. 5 (incl. PE)
- Completely wired with 6 mm² on a terminal board (terminal posts)
- Current collector in pairs per ring on connecting terminals

Additional technical specifications
- Rotational speed: 1-100 min⁻¹
- Insulation: insulating parts, fiberglass reinforced polyamide
- Ambient temperature:
  - from -35°C up to max. +50°C
  - at > 30°C the max. current load has to be reduced accordingly
  - higher temperatures on request
- Position of installation: vertical (other positions on request)
- Mounting shaft: da = 25h9

Components included
- Slip ring assembly complete with brush holders and brushes
- Insulator
- Mounting shaft (secure against torsion on site by means of 2 threaded pins M5, DIN 914)
- Brush holder bolt not included

Mounting advice:
The two brush holder assemblies per ring have to be connected always in parallel to a terminal board or similar.

Order example:
ES45/2/R22-04
Built-in slip ring assemblies type 45/2, 3-pole + PE with tube da = 25h9

Enclosed Slip Ring Assembly GS45/2 47 A/1000V

Electrical data
- According to type ES45/2
- Protection class: IP 65

Wiring and max. number of poles
- According to type ES45/2

Components included
- Slip ring assembly complete with brush holders and brushes
- Insulator
- Mounting shaft (secure against torsion on site by means of 2 threaded pins M5, DIN 914)
- Brush holder bolt not included

Mounting advice:
The two brush holder assemblies per ring have to be connected always in parallel to a terminal board or similar.

Order example:
GS45/2KS-04
Enclosed slip ring assembly type 45/2 with plastic housing, 3-pole + PE
Slip Ring Assembly

Built-in Slip Ring Assembly ES18 25A/630V (690V)

Electrical data
- Voltage:
  - max. 630V = (690V)\(^1\)
  - according to DIN VDE0110
  - overtension category III
  - insulating material group II / III
  - degree of contamination 3
- Current: mA to 25 A,
  at max. 30°C and 100% duty cycle
- Slip rings:
  - ø 102 mm, brass (MS)
  - distance between rings 15 mm
- Brush holder assembly:
  - brush holders with 2 contact springs, each with 3 bronze brush (Br) rivets
  - connection:
    - cable lug ring form M4 (DIN46237) or insulated flat socket 6.3 (DIN46245)
- Protection class: IP 00

Control and data transmission
- Ring with multi-layer coating (ML) and silver (Ag) brush holder assembly for the transfer of analog and digital signals
- Transmission of data and video signals requires additional consultation

Wiring and max. number of poles
- Standard construction:
  - up to 4 rings without terminal board
  - 6 to 36 rings on a terminal board with 2.5 mm\(^2\) (terminal posts)
  - 37 to 48 rings with strand wiring 1.5 mm\(^2\), 2 m from flange, without terminal board
- Special construction:
  - up to 48 rings wiring on a terminal board with 1.5 mm\(^2\) possible
  - up to max. 100 rings with strand wiring 1 mm\(^2\), 2 m from flange, without terminal board
  - 10 rings or more with supporting plate on top
  - 48 rings or more with intermediate supports

Additional technical specifications
- Rotational speed for:
  - standard construction (MS-rings and Br-brushes): 1-100 min\(^{-1}\)
  - data (ML-rings + Ag-brushes):
    - 1-30 min\(^{-1}\)
  - Insulation: insulating parts, fiberglass reinforced polyamide
  - Ambient temperature:
    - from -35°C up to max. +50°C
    - at > 30°C the max. current load has to be reduced accordingly
  - higher temperatures possible on request
  - Position of installation: vertical (other positions on request)
  - Flange diameter: d\(_H8\)
    - 45\(^{1/2}\)
    - 20\(^{1/2}\), 30\(^{1/2}\) and 35\(^{1/2}\) on request

Components included
- Slip ring assembly without brush bolt
- Brush holder assemblies loosely enclosed
- On request with brush bolt possible

Order example:
ES18/F45-24
Built-in slip ring assembly
type 18, 23-pole + PE
flange diameter d\(_H8\) = 45\(^{1/2}\)

---

\(^1\) The voltages apply for slip ring assemblies, installed in systems (parts of systems) that are not directly fed by the low-voltage net (VDE 0110-1/2008-01: 4.3.2.2.2, table F.4).

On systems (parts of systems) with direct feeding from the low-voltage net, the values in brackets are permissible for alternating current (VDE 0110-1/2008-01: 4.3.2.2.1, table F.3b).
Slip Ring Assembly

Enclosed Slip Ring Assembly GS18 25A/630V (690V)

Electrical data
• Voltage:
  - max. 630 V (= 690 V)\(^1\)
  - according to DIN VDE 0110
  - overtension category III
  - insulating material group II / III
  - degree of contamination 3
• Current: mA to 25 A,
  - at max. 30°C and 100% duty cycle
• Slip rings:
  - ø 102 mm, brass (MS)
  - distance between rings 15 mm
• Brush holder assembly:
  - brush holders with 2 contact springs, each with 3 bronze brush (Br) rivets
  - connection:
    - cable lug ring form M4 (DIN46237) or insulated flat socket 6.3 (DIN46245)
• Protection class: IP 65

Control and data transmission
• Ring with multi-layer coating (ML) and silver (Ag) brush holder assembly for the transfer of analog and digital signals
• Transmission of measured values and video signals requires additional consultation

Wiring and max. number of poles
• Standard construction:
  - up to 36 rings on a terminal board with 2.5 mm\(^2\)
  - 37 to 48 rings with strand wiring 1.5 mm\(^2\), 2 m from flange, without terminal board
• Special construction:
  - up to 48 rings wiring on a terminal board with 1.5 mm\(^2\) possible
  - up to max. 100 rings with strand wiring 1 mm\(^2\), 2 m from flange, without terminal board
  - 10 rings or more with supporting plate on top
  - 48 rings or more with intermediate supports

Additional technical specifications
• Rotational speed for
  - standard construction (MS-rings and Br-brushes): 1-100 min\(^{-1}\)
  - data (ML-rings + Ag-brushes): 1-30 min\(^{-1}\)
• Bearing: anti-friction bearing (sealed-for-life)
• Insulation: insulating parts, fiberglass-reinforced polyamide
• Ambient temperature:
  - from -35°C up to max. +50°C
  - at > 30°C the max. current load has to be reduced accordingly
  - higher temperatures possible on request
• Position of installation: vertical (other positions on request)
• Corrosion protection:
  - steel parts galvanized and/or powder coated
  - aluminium (powder coated)
  - standard housing of polyamide, up to 36 poles
  - >36 poles: steel housing (IP 54)

Components included
• Standard without glands
• On request with metric glands possible

Options
• Reinforced bearing
• Vent plug
• Heater
• Tube or rotary transmission (protection class IP 40, higher protection class on request)

Order example:
GS18KS-24/08ML/LI
Enclosed slip ring assembly type 18, 23-pole + PE,
8 multi-layer coated rings and strand wiring

---

\(1\) The voltages apply for slip ring assemblies, installed in systems (parts of systems) that are not directly fed by the low-voltage net (VDE 0110-1/2008-01: 4.3.2.2.2, table F.4).

On systems (part of systems) with direct feeding from the low-voltage net, the values in brackets are permissible for alternating current (VDE 0110-1/2008-01: 4.3.2.2.1, table F.3b).

---

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</tr>
</tbody>
</table>

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Components included
• Standard without glands
• On request with metric glands possible

Options
• Reinforced bearing
• Vent plug
• Heater
• Tube or rotary transmission (protection class IP 40, higher protection class on request)
Slip Ring Assembly

**Built-in Slip Ring Assembly ES13 50 A /1000 V**

**Electrical data**
- Voltage:  
  - max. 1000 V~  
  - according to DIN VDE 0110  
  - overtension category IV  
  - insulating material group II / III  
  - degree of contamination 3
- Current: 50 A,  
  - at max. 30°C and 100% duty cycle
- Slip rings:  
  - ø 85 x 12 mm, brass (MS)  
  - distance between rings 17 mm  
  - connection M 6
- Brush holder assembly:  
  - industrial double brush holder with two articulating brushes (Cu)  
  - 22 x 6.4 mm  
  - connection M 5
- Protection class: IP 00

**Wiring and max. number of poles**
- Max. 28 (incl. PE)  
  - completely wired with 10 mm²  
  - up to 14 poles on terminal board, connected to terminal posts  
  - Strand wiring 10 mm²  
  - up to 28 rings possible  
  - Construction with 8 rings or more with intermediate support

**Additional technical specifications**
- Rotational speed: 1-100 min⁻¹  
- Insulation:  
  - insulating parts, fiberglass reinforced polyamide  
  - glass filament, fabric tube HGW2375-4 DIN7735  
- Ambient temperature:  
  - from -35°C up to max. +50°C  
  - at >30°C the max. current load has to be reduced accordingly  
  - higher temperatures possible on request
- Position of installation: vertical  
- Bearing: anti-friction bearing (sealed-for-life)
- Corrosion protection:  
  - steel parts galvanized and/or powder coated RAL 1012  
  - aluminum (powder coated)

**Components included**
- Slip ring assembly complete with brush bolts and current collector  
- Insulating tubes

**Order example**  
ES13/F45-04
Built-in slip ring assembly  
type 13, 3-pole + PE,  
flange diameter d: 45 mm

---

**Enclosed Slip Ring Assembly GS13 50 A /1000 V**

**Electrical data**
- According to type ES13  
- Protection class: IP65

**Wiring and max. number of poles**
- According to type ES13

**Additional technical specifications**
- Rotational speed: 1-100 min⁻¹  
- Insulation:  
  - insulating parts, fiberglass reinforced polyamide  
  - glass filament, fabric tube HGW2375, 4 DIN7735  
- Ambient temperature:  
  - from -35°C up to max. +50°C  
  - at >30°C the max. current load has to be reduced accordingly  
  - higher temperatures possible on request
- Position of installation: vertical  
- Bearing: anti-friction bearing (sealed-for-life)
- Corrosion protection:  
  - steel parts galvanized and/or powder coated RAL 1012  
  - aluminum (powder coated)

**Components included**
- Standard housing of polyamide, up to 16 poles  
- 17 rings or more with steel housing  
- IP54

**Options**
- Heater  
- Rotary transmission for gases and liquids (protection class IP 40, higher protection class on request)

**Order example**  
GS13KS-04
Enclosed slip ring assembly  
type 13 with plastic housing, 3-pole + PE
Slide Ring Assembly

Built-in Slip Ring Assembly ES15 90 A / 1000 V

Electrical data
- Voltage:
  - max. 1000 V ~
  - according to DIN VDE 0110
  - degree of contamination 3
- Current: 90 A at max. 30°C and 100% duty cycle
- Slip rings:
  - ø 85 x 15 mm, brass (MS)
  - distance between rings 20 mm
  - connection M 8
  - max. 100 A
- Brush holder assembly:
  - industrial double brush holders with two articulating brushes (Cu)
  - 25 x 8 mm
  - connection M 6
  - max. 90 A
- Protection class: IP 00

Wiring and max. number of poles
- Max. 16 (incl. PE) completely wired with 16 mm²
- Up to 8 pole on a terminal board, connected to insulated terminal posts
- Strand wiring 16 mm² up to 16 rings possible
- Construction with 8 rings or more with intermediate support plate

Additional technical specifications
- Rotational speed: 1-100 min⁻¹
- Insulation:
  - insulating parts, fiberglass reinforced polyamide
  - glass filament, fabric tube HGW37,4 DIN7735
- Ambient temperature:
  - from -35°C up to max. +50°C
  - at > 30°C the max. current load has to be reduced accordingly
- Higher temperatures possible on request

Components included
- Slip ring assembly complete with brush bolts and current collector
- Insulating tubes

Order example:
ES15/F45-04
Built-in slip ring assembly type 15, 3-pole + PE, flange diameter d = 45

Enclosed Slip Ring Assembly GS15 90 A / 1000 V

Electrical data
- According to type ES15
- Protection class: IP 65

Wiring and max. number of poles
- According to type ES15

Additional technical specifications
- Rotational speed: 1-100 min⁻¹
- Ambient temperature:
  - from -35°C up to max. +50°C
  - at > 30°C the max. current load has to be reduced accordingly
- Higher temperatures possible on request
- Position of installation: vertical (other positions on request)
- Flange diameter d:
  - 45
  - 20”, 30”, and 35” on request

Components included
- Standard without glands (possible on request)
- Heater
- Rotary transmission for gases and liquids (protection class IP 40, higher protection class on request)

Order example:
GS15KS-04
Enclosed slip ring assembly type 15, 3-pole + PE, flange diameter d = 45
Slip Ring Assembly

Built-in Slip Ring Assembly ES16 100A/1000V

**Electrical data**
- Voltage:
  - max. 1000V =
  - according to DIN VDE 0110
  - overvoltage category IV
  - insulating material group II
  - degree of contamination 3
- Current: 100A at max. 30°C and 100% duty cycle
- Slip rings:
  - ø110 x 14 mm, brass (MS)
  - distance between rings 29 mm
  - connection M8
  - max. 100A
- Brush holder assembly:
  - industrial double brush holder with two mobile brushes (Cu) 32 x 10 mm
  - connection M8
  - max. 150A
- Protection class: IP 00

**Wiring and max. number of poles**
- Max. 12 (incl. PE), connection made by the customer with 35mm²
- Strand wiring 25mm² available on request
- ≥ 5 rings connecting bracket over brush bolts needed

**Additional technical specifications**
- Rotational speed: 1-100 min⁻¹
- Insulation: glass filament, fabric tube HGW2375,4 DIN7735
- Ambient temperature:
  - from -30°C up to max. +60°C
  - at > 30°C the max. current load has to be reduced accordingly
  - higher temperatures possible on request
- Position of installation: vertical (other positions on request)
- Flange diameter d:
  - 45H8
  - 35H8 on request

**Order example:**
ES16/F45-04
Built-in slip ring assembly
type 16, 3-pole + PE, flange diameter d = 45H8

Enclosed Slip Ring Assembly GS16 100A/1000V

**Electrical data**
- According to type ES16
- Protection class: IP 54 (higher protection class on request)

**Wiring and max. number of poles**
- Max. 9 (incl. PE)
- Further details according to type ES16

**Components included**
- Slip ring assembly complete with brush bolts and brush holder assembly
- Insulating tubes

**Order example:**
GS16-04
Enclosed slip ring assembly
type 16 with steel housing; 3-pole + PE

**Components included**
- Standard without cable glands
- with cable glands on request

**Options**
- Heater
- Rotary transmission for gases and liquids (protection class IP 40, higher protection class on request)

**Order example:**
ES16/F45-04
Built-in slip ring assembly
type 16, 3-pole + PE, flange diameter d = 45H8

Components included:
- Insulating tubes

Order example:
GS16-04
Enclosed slip ring assembly
type 16 with steel housing; 3-pole + PE
Slip Ring Assembly

**Built-in Slip Ring Assembly ES19 150A/1000V**

**Electrical data**
- Voltage: max. 1000V~
  - according to DIN VDE 0110
  - overvoltage category IV
  - Insulating material group II
  - degree of contamination 3
- Current: 150 A at max. 30°C and 100% duty cycle

**Wiring and max. number of poles**
- Max. 18 (incl. PE), connection made by the customer with 35 mm²
- Strand wiring 35 mm², available on request
- According to DIN VDE 0100-540 a outer conductor of 35 mm² cross section only requires a minimum cross section of the earth conductor of 16 mm²
- ≥ 5 rings connecting bracket over brush bolts needed

**Additional technical specifications**
- Rotational speed: 1-100 min⁻¹
- Insulation: glass filament, fabric tube HGW2375.4 DIN7735
- Ambient temperature:
  - from -30°C up to max. +60°C
  - at > 30°C the max. current load has to be reduced accordingly
  - higher temperatures possible on request
- Position of installation: vertical (other positions on request)
- Flange diameter dₙ:
  - 70 mm
  - 35 mm and 45 mm on request

**Components included**
- Slip ring assembly complete with brush bolts and brush holder assembly
- Insulating tubes

---

**Enclosed Slip Ring Assembly GS19 150A/1000V**

**Electrical data**
- According to type ES19
- Protection class: IP 54 (higher protection class on request)

**Wiring and max. number of poles**
- Max. 16
- Further details according to type ES19

**Additional technical specifications**
- Rotational speed: 1-100 min⁻¹
- Insulation: glass filament, fabric tube HGW2375.4 DIN7735
- Ambient temperature:
  - from -30°C up to max. +60°C
  - at > 30°C the max. current load has to be reduced accordingly
  - higher temperatures possible on request
- Position of installation: vertical (other positions on request)
- Bearing: anti-friction bearing (sealed-for-life)
- Corrosion protection: Steel parts galvanized and/or powder coated
- Protective cover:
  - removable vertical-up
  - available with a removable side door or with a side access window (protection class IP 40)

**Components included**
- Standard without cable glands
- Cable glands on request

**Options**
- Heater
- Rotary transmission for gases and liquids (protection class IP 40, higher protection class on request)

---

**Order example:**
- **ES19/F70-04**
  - Built-in slip ring assembly type 19, 3-pole + PE,
  - Flange diameter dₙ = 70 mm

**Order example:**
- **GS19-04**
  - Enclosed slip ring assembly type 19 with steel housing;
  - 3-pole + PE
Slip Ring Assembly

Built-in Slip Ring Assemblies ES21 250A/1000V

**Electrical data**
- Voltage:
  - max. 1000V =
  - according to DIN VDE 0110
- Insulating material group II
- Degree of contamination 3
- Current: 250A at max. 30°C and 100% duty cycle
- Slip rings:
  - ø 210 x 25 mm, brass (MS)
  - distance between rings: 44 mm
- Connection M 10 / M 12
- Brush holder assembly:
  - industrial double brush holder with two articulating brushes (Cu)
  - connection M 10
- Protection class: IP 00

**Wiring and max. number of poles**
- Max. 8 (incl. PE), connection made by the customer with 95 mm²
- Strand wiring 95 mm², available on request
- According to DIN VDE 0100-540 the minimum cross section for the earth conductor is 7% of the cross section of the outer conductor
- ≥ 5 rings connecting bracket over brush bolts needed

**Additional technical specifications**
- Rotational speed: 1-100 min⁻¹
- Insulation: glass filament, fabric tube HGW2375.4 DIN 7735
- Ambient temperature:
  - from -30°C up to max. +60°C
  - at > 30°C the max. current load has to be reduced accordingly
- Higher temperatures possible on request
- Position of installation: vertical (other positions on request)
- Flange diameter d: 70 mm

**Components included**
- Slip ring assembly complete with brush bolts and brush holder assembly
- Insulating tubes

Order example:
ES21/F70-04
Built-in slip ring assembly type 21, 3-pole + PE,
Flange diameter d = 70 mm

Enclosed Slip Ring Assembly GS21 250A/1000V

**Electrical data**
- According to type ES21
- Protection class: IP 54 (higher protection class on request)

**Wiring and max. number of poles**
- Max. 8 (incl. PE)
- Further details according to ES21

**Additional technical specifications**
- Rotational speed: 1-100 min⁻¹
- Insulation: glass filament, fabric tube HGW2375.4 DIN 7735
- Ambient temperature:
  - from -30°C up to max. +60°C
  - at > 30°C the max. current load has to be reduced accordingly
- Higher temperatures possible on request
- Position of installation: vertical (other positions on request)

**Components included**
- Standard without cable glands
- Cable glands on request

**Options**
- Heater
- Rotary transmission for gases and liquids (protection class IP-40, higher protection class on request)

Order example:
GS21-04
Enclosed slip ring assembly type 21 with steel housing;
3-pole + PE
Slip Ring Assembly

Built-in Slip Ring Assembly ES29 400A/1000V

Electrical data
- Voltage:
  - max. 1000V =
  - according to DIN VDE 0110
  - overvoltage category IV
  - insulating material group II
  - degree of contamination 3
- Current: 400A max. 30°C and 100% duty cycle
- Slip rings: ø 210 x 25 mm, brass (MS)
- distance between rings 44 mm
- connection M 12
- Brush holder assembly-phase:
  - industrial double brush holder with two articulating brushes (Cu) 50 x 20 mm
  - connection M 12

Wiring and max. number of poles
- Max. 4 (incl. PE), connection made by the customer with 2 x 95 mm²
- Strand wiring 2 x 95 mm², available on request
- According to DIN VDE 0100-540 the minimum cross section for the earth conductor is ½ x the cross section of the outer conductor
- ≥ 5 rings connecting bracket over brush bolts needed

Additional technical specifications
- Rotational speed: 1-100 min⁻¹
- Insulation: glass filament, fabric tube HWG 2375.4 DIN 7735
- Ambient temperature:
  - from -30°C up to max. +60°C
  - at > 30°C the max. current load has to be reduced accordingly
  - higher temperatures possible on request
- Position of installation: vertical (other positions on request)
- Flange diameter d; 70mm

Components included
- Slip ring assembly complete with brush bolts and brush holder assembly
- Insulating tubes

Order example:
ES29/F70-04
Built-in slip ring assembly type 29, 3-pole + PE, Flange diameter d. = 70mm

Enclosed Slip Ring Assembly GS29 400A/1000V

Electrical data
- According to type ES29
- Protection class: IP 54 (higher protection class on request)

Wiring and max. number of poles
- Max. 4 (incl. PE)
- Further details according to ES29

Additional technical specifications
- Rotational speed: 1-100 min⁻¹
- Insulation: glass filament, fabric tube HWG 2375.4 DIN 7735
- Ambient temperature:
  - from -30°C up to max. +60°C
  - at > 30°C the max. current load has to be reduced accordingly
  - higher temperatures possible on request
- Position of installation: vertical (other positions on request)

Components included
- Standard without cable glands
- Cable glands on request

Options
- Heater
- Rotary transmission for gases and liquids (protection class IP 40, higher protection class on request)

Order example:
GS29-04
Enclosed slip ring assembly type 29 with steel housing; 3-pole + PE
**Slip Ring Assembly**

### Built-in Slip Ring Assembly ES260 47A /630V (690V)**\(^1\)**

#### Electrical data
- **Voltage:**
  - max. 630 V / (690 V)**\(^1\)**
  - according to DIN VDE 0110
  - overload category IV
  - insulating material group II
  - degree of contamination 3
- **Current:** 47 A at max. 30°C and 100% duty cycle
- **Slip rings:**
  - ø 260 x 10 mm, brass (MS)
  - distance between rings 18 mm
  - connection M6
- **Brush holder assembly:**
  - industrial double brush holders with two articulating brushes (Cu)
  - 22 x 6.4 mm
  - connection M5
  - max. 50 A
- **Protection class:** IP 00

#### Wiring and max. number of poles
- Max. 24 (incl. PE) completely wired with 6 mm² on a terminal board
- Connection at terminal board M5
  - > 24 to 36 rings with strand wiring

#### Additional technical specifications
- **Rotational speed:** 1-60 min\(^{-1}\)
- **Insulation:**
  - slip ring holder polyamide
  - brush bolt glass filament fabric tube HGW2375, 4 DIN 7735
  - Corrosion protection: steel parts galvanized
  - Tube passage: max. ø 160 mm
- **Ambient temperature:**
  - from -30°C up to max. +60°C
  - > 30°C the max. current load has to be reduced accordingly
- **Higher temperatures possible on request**

**Order example:**
**ES260-04**
Built-in slip ring assembly type 260, 3-pole + PE

---

### Enclosed Slip Ring Assembly GS260 47A /630V (690V)**\(^1\)**

#### Electrical data
- **According to type ES260**
- **Protection class:** IP 54

#### Wiring and max. number of poles
- Max. 24 (incl. PE)
- Further details according to ES260

#### Additional technical specifications
- **Rotational speed:** 1-60 min\(^{-1}\)
- **Insulation:**
  - slip ring holder polyamide
  - brush bolt glass filament fabric tube HGW2375, 4 DIN 7735
  - Tube passage: max. ø 145 mm
- **Ambient temperature:**
  - from -30°C up to max. +60°C
  - > 30°C the max. current load has to be reduced accordingly
- **Higher temperatures possible on request**

**Order example:**
**GS260-08**
Enclosed slip ring assembly type 260, with steel housing 7-pole + PE

---

**Note:** The voltages apply for slip ring assemblies, installed in systems (parts of systems) that are not directly fed by the low-voltage net (VDE 0110-1/2008-01: 4.3.2.2.2, table F.4).

On systems (parts of systems) with direct feeding from the low-voltage net, the values in brackets are permissible for alternating current (VDE 0110-1/2008-01: 4.3.2.2.1, table F.3b).
Slip Ring Assembly

**Built-in Slip Ring Assembly ES170, ES200, ES285 47 A / 630 V (690 V)**

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<th>ø d [mm]</th>
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<td>120 – 3 x 120°</td>
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<td>ES185</td>
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<td>100</td>
<td>200</td>
<td>150 – 3 x 120°</td>
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<td>ES260</td>
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<td>ES285</td>
<td>158,5</td>
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<td>285</td>
<td>227 – 4 x 90°</td>
<td>400</td>
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</table>

**Electrical data**
- Voltage:
  - max. 630 V = (690 V)\(^1\) according to DIN VDE 0110
  - overvoltage category III
  - insulating material group II
  - degree of contamination 3
- Current: 47 A at max. 30°C and 100% duty cycle
- Protection class: IP 00

**Control and data transmission**
- Ring with multi-layer coating (ML) and silver (Ag) brush holder assembly for the transfer of analog and digital signals
- Transmission of measured values and video signals requires additional consultation

**Wiring and max. number of poles**
- Max. 18 (incl. PE) completely wired with 6 mm\(^2\) on terminal boards
- Connection at terminal board M5

**Additional technical specifications**
- Rotational speed: on request
- Insulation:
  - slip ring holder polyamide
  - brush bolt glass filament fabric tube HGW2375, 4 DIN 7735
  - Corrosion protection: steel parts galvanized
  - Tube passage: see table, diameter \( d \)

**Additional technical specifications**
- Ambient temperature:
  - from -30°C up to max. +60°C
  - at > 30°C the max. current load has to be reduced accordingly
  - higher temperatures possible on request
- Position of installation: vertical (other positions on request)
- Possibilities of installation:
  - with 3 screw bolts M 10
  - on line the brush bolts M 8 have to be screwed on top and at the bottom

**Components included**
- Slip ring assembly complete with brush bolts and brush holder assembly
- Insulating tubes

1) The voltages apply for slip ring assemblies, installed in systems (parts of systems) that are not directly fed by the low-voltage net (VDE 0110-1/2008-01: 4.3.2.2.2, table F.4).

Order example:
ES170-10
Built-in slip ring assembly type 170, 9-pole + PE
Combination of Slip Ring Assemblies

Enclosed Slip Ring Assembly GS323

**Electrical data, main current section**
- Voltage:
  - max. 1000 V~
  - according to DIN VDE 0110
  - overvoltage category IV
  - insulating material group II
- Degree of contamination 3
- Current:
  - 400 A at 60% duty cycle, higher current on request
- at parallel connection of rings
- Insulation: HGW 2375.4 DIN 7735
- General: other amperage and voltage combinations are possible
- Protection class: IP 54

**Control current section**
- In general, slip ring type 18 is used. Please find technical details on page 12.
- Additional technical information on request.

**Control and data transmission**
- Ring with multi-layer coating (ML) and silver (Ag) brush holder assembly for the transfer of analog and digital signals

**Wiring**
- Control current section completely wired on terminal bar or terminal board
- Main current section with strand wiring on request

**Please contact us with your specific requirements and we would be happy to design a customized solution for your application.**
Combination of Slip Ring Assemblies

Enclosed Slip Ring Assembly e.g. Type GS19/13/18

**Electrical data**
- Voltage: 
  - max. 1000/630 V (≈690V)\(^1\)
  - according to DIN VDE 0110
  - overtension category III
  - insulating material group II / III
  - degree of contamination 3
- Ring construction: 
  - 150 A + PE / 50 A / 25 A
- Protection class: IP 54
  (higher protection class on request)

**Additional technical specifications**
- Rotational speed for: 
  - standard type (MS-rings and Bi-brushes): 1-100 min\(^{-1}\)
  - data (ML-rings and Ag-brushes): 1-30 min\(^{-1}\)
- Bearing: anti-friction bearing (sealed-for-lifetime)
- Cable connection: 
  - Main current rings with strand wiring on request
  - control rings on terminal board
- Protective cover: 
  - removable vertical-up
  - available on request with divided cover (removable to the side) and/or side access window
- Corrosion protection: 
  - steel parts galvanized and/or powder coated
  - stainless steel enclosure on request
- Ambient temperature: 
  - from -35°C up to max. +50°C
  - at > 30°C the max. current load has to be reduced accordingly
  - higher temperatures possible on request
- Position of installation: vertical
  (other positions on request)

**Components included**
- Standard without glands
- Cable glands on request

**Options**
- Heater
- Rotary transmission for gases and liquids (protection class IP 40, higher protection class on request)

1) The voltages apply for slip ring assemblies, installed in systems (parts of systems) that are not directly fed by the low-voltage net (VDE 0110-1/2008-01: 4.3.2.2.2, table F.4). On systems (part of systems) with direct feeding from the low-voltage net, the values in brackets are permissible for alternating current (VDE 0110-1/2008-01: 4.3.2.2.1, table F.3b).

Please contact us with your specific requirements and we would be happy to design a customized solution for your application.
Combination of Slip Ring Assemblies

Enclosed Slip Ring Assembly combined with Rotary Transmission for Gases and Liquids

Besides premium slip ring assemblies for energy- and data transmission, Conductix-Wampfer offers rotary joints as well. The rotary joints are available in single or multi-channel design and in combination with our slip ring range. They are used in turntables, for machine tools, cranes and other industrial applications.

Rotary joints
• For gases and liquids (except oxygen)
• Design in single or multi-channel
• With and without enclosed slip rings for energy and data transmission
• For different pressures and temperatures

Combined design of slip ring assembly type 18 (see page 12) and single channel rotary joint for gas or liquid:

Please contact us with your specific requirements and we would be happy to design a customized solution for your application.
## Questionnaire | Specification Data

### Slip Ring Assemblies

Program 5100

### Construction of the slip ring assembly power section

<table>
<thead>
<tr>
<th>Number of poles</th>
<th>Amperages [A]</th>
<th>Voltage [V]</th>
<th>Frequency [Hz]</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ PE</td>
<td></td>
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<tr>
<td>+ PE</td>
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</tr>
</tbody>
</table>

### Environmental conditions

- Temperature: _______ °C up to _______ °C
- Dust: __________
- Humidity: ________ [%]
- Chemistry-Atmosphere: __________

### Data transmission or low voltage (up to 50V)

- PE: □ yes □ no
- Number of insulated shields/poles
- Analog
- Digital
- Data transfer rate [kBit/s]
- Transmission protocol e.g. Profibus, Fast-Ethernet

### Construction of the gas or fluid rotary joint

<table>
<thead>
<tr>
<th>Number of channels</th>
<th>Nominal width [mm]</th>
<th>Pressure [bar]</th>
<th>Medium</th>
</tr>
</thead>
</table>

### Application conditions

- Duty cycle: ________ [%]
- Rotational speed: ________ min⁻¹
- Stationary operation: □ yes □ no
  (Stationary oper. = rotational speed < 1/min and more than 60% of the max. current load for more than 10 min)
- Mounting position: □ vertical standing (standard) □ vertical hanging □ horizontal

### Space requirements

- Max. free diameter: ________ [mm]
- Max. mounting height: ________ [mm]
- Required tube passage inside-ø: ________ [mm]

### Accessories

- End switch: □ ________ [Number of]
- Heating: □ 24V □ 110V □ 230V

### Application area of the slip ring assembly / rotary joint, special conditions, special accessories

---

### Customer Data

Company: ________  Customer-No.: ________

FAO: ________

Address: ________

Phone: ________  Fax: ________

E-Mail: ________
Your Applications – our Solutions

Slip ring assemblies from Conductix-Wampfler represent only one of the many solutions made possible by the broad spectrum of Conductix-Wampfler components for the transport of energy, data and fluid media. The solutions we deliver for your applications are based on your specific requirements. In many cases, a combination of several different Conductix-Wampfler systems can prove advantageous. You can count on all of Conductix-Wampfler’s Business Units for hands-on engineering support - coupled with the perfect solution to meet your energy management and control needs.

Cable reels
Motorized reels and spring reels by Conductix-Wampfler hold their own wherever energy, data and media have to cover the most diverse distances within a short amount of time - in all directions, fast and safe.

Festoon systems
It’s hard to imagine Conductix-Wampfler cable trolleys not being used in virtually every industrial application. They’re reliable and robust and available in an enormous variety of dimensions and designs.

Conductor rails
Whether they’re enclosed conductor rails or expandable single-pole systems, the proven conductor rails by Conductix-Wampfler reliably move people and material.

Non-insulated conductor rails
Extremely robust, non-insulated conductor rails with copper heads or stainless steel surfaces provide the ideal basis for rough applications, for example in steel mills or shipyards.

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Energy guiding chains
The “Jack of all trades” when it comes to transferring energy, data, air and fluid hoses. With their wide range, these energy guiding chains are the ideal solution for many industrial applications.

Slip ring assemblies
Whenever things are really “moving in circles”, the proven slip ring assemblies by Conductix-Wampfler ensure the flawless transfer of energy and data. Here, everything revolves around flexibility and reliability!

Inductive Power Transfer IPT®
The no-contact system for transferring energy and data. For all tasks that depend on high speeds and absolute resistance to wear.

Reels, retractors and balancers
Whether for hoses or cables, as classical reels or high-precision positioning aids for tools, our range of reels and spring balancers take the load off your shoulders.

Jib boom
Complete with tool transporters, reels, or an entire media supply system - here, safety and flexibility are key to the completion of difficult tasks.

Conveyor systems
Whether manual, semiautomatic or with Power & Free – flexibility is achieved with full customization concerning layout and location.