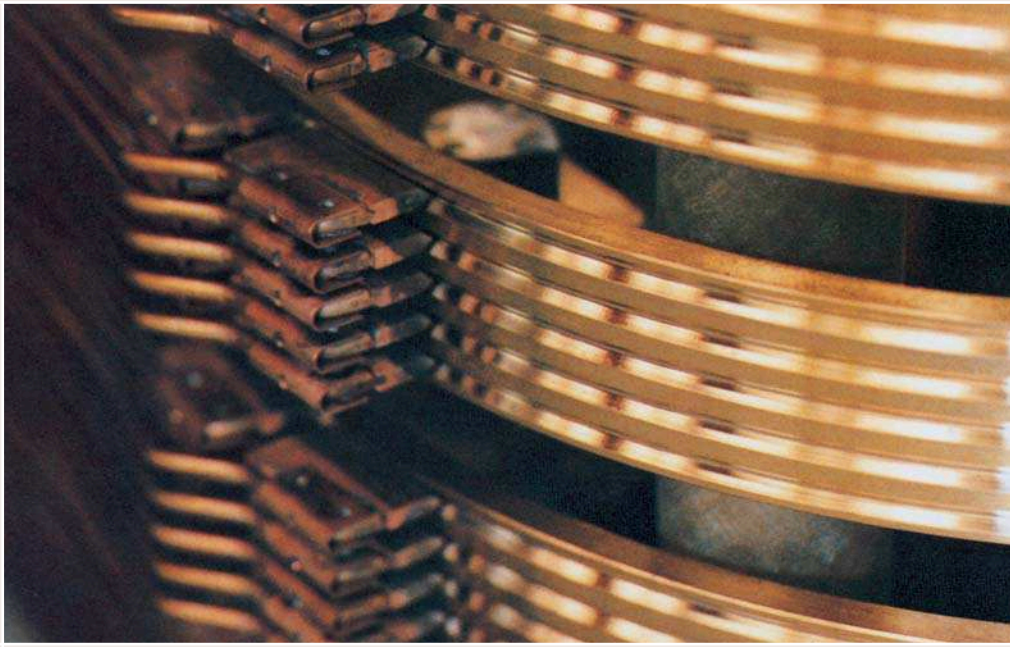
Slipring Columns



Manufactured by **Cavotec Specimas**

CAVOTEC

Slipring Columns

Who we are

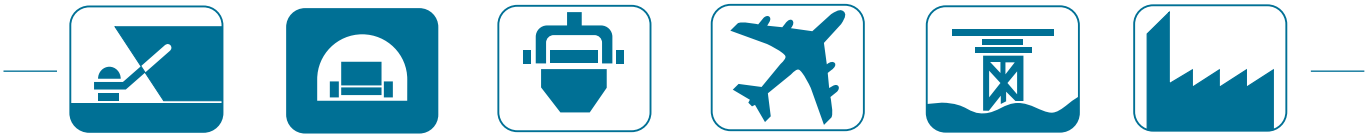
Cavotec is a multi-national group of companies serving the following industries: mining and tunnelling, ports and maritime, steel and aluminium, energy and offshore, airports, general industry and automation. In the early 1960's our main focus was the design and production of motorised cable reels primarily for manufacturers of tower cranes, harbour cranes and mining equipment. Today, Cavotec is connecting mobile equipment around the world in many diverse applications.

Where we are

The Cavotec Group consists of 7 manufacturing "Centres of Excellence" located in Canada, France, Germany, Italy, Norway and Sweden and by 5 local manufacturing units located in Australia, China, Germany and the USA. For the distribution of products and providing support to customers Cavotec has 27 sales companies which, together with a network of distributors, serve more than 30 countries in five continents.
The ultimate objective is to be perceived as "local everywhere".

How we work

Our aim is to work closely with our customers in order to build long-term partnerships. To achieve this aim we have created a working environment that attracts the best people, encourages them to stay and brings out their best qualities. By producing totally reliable systems and backing them with efficient service, we strive to create true customer satisfaction.



Slipring Columns

The products manufactured by Specimas described in the following pages, as well as other quality products in the field of crane and power technology, are distributed around the world by the Cavotec sales companies and by a network of selected Group distributors.

This brochure gives examples only of standard solutions of slipring columns. For more detailed information contact your nearest Cavotec sales company or Specimas.

Cavotec Group Organisation

As shown here the Cavotec Group is organised to support its customers around the world through its manufacturing units and sales companies.

Each Cavotec manufacturing company, no matter where it is located, aims at being a market leader in its field by providing innovative and reliable products to Group customers.

Each Cavotec sales company, in the 27 countries where they operate, aims at better serving its local market following the Group philosophy "to be local everywhere".

Manufacturing network

Centres of Excellence

France
Cavotec RMS
Spring Driven Reels

Germany
Cavotec Alfo
Spring Driven Reels
Slipring Columns

Cavotec Fladung
Aircraft Support Systems
Security Systems

Italy
Cavotec Specimas
Motorized Cable Reels
Panzerbelt Cable Protection
Slipring Columns

Norway
Cavotec Micro-control
Radio Remote Controls

Sweden
Cavotec Connectors
Electrical Plugs & Sockets

New Zealand
Cavotec MoorMaster
Automated Mooring Systems

Local Manufacturing

Australia
Cavotec Australia
Motorized Cable Reels

China
Cavotec China
Product Assembly

Germany
Cavotec Micro-control
Radio Remote Controls

Sweden
Cavotec Sweden
Product Assembly

USA
Cavotec USA
Product Assembly

Group Partners

Belgium
Gantry
Crane Rail Systems

Italy
Brevetti Stendalto
Cable Chains
Prysmian (Pirelli)
Flexible Cables
Tratos Cavi
Flexible Cables

Sales network

Cavotec Sales Companies

Cavotec Australia
Cavotec Belgium*
Cavotec BeNeLux
Cavotec Brazil*
Cavotec Canada
Cavotec Chile
Cavotec China
Cavotec Denmark
Cavotec Finland
Cavotec France
Cavotec Germany
Cavotec Hong Kong
Cavotec India
Cavotec Italy
Cavotec Korea
Cavotec Latin America
Cavotec Mexico
Cavotec Middle East
Cavotec Norway
Cavotec Russia*
Cavotec Singapore
Cavotec South Africa
Cavotec Sweden
Cavotec Turkey
Cavotec UK & Ireland
Cavotec USA

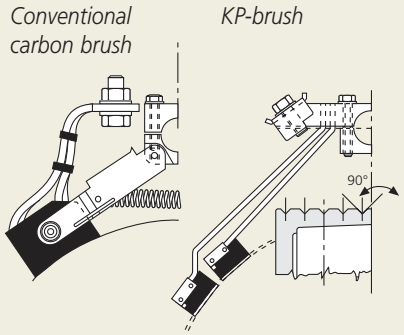
* Branch Office

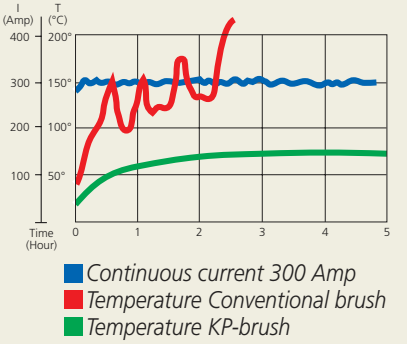
The slipring columns

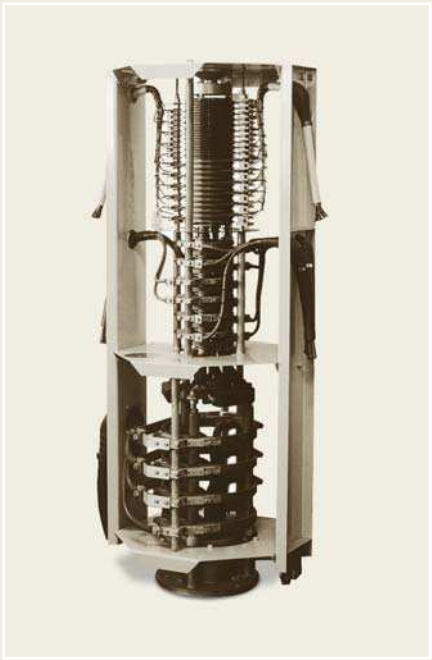
Specimas slipring columns are renown for quality, innovative design and outstanding reliability.
Thousands of units have been installed in the late 35 years in all parts of the world, in all types of harsh industrial environments.

Field of application
Applications include dockside cranes, ships, mobile cranes, pedestal cranes, access platforms, turntables and a wide variety of mechanical handling equipment.

KP brush
Stand still slipring applications often require a high degree of derating of the amperage carrying capacity of conventional carbon brushgear. Increasing the physical size of the brushes is not always a solution, since the actual contact area does not increase proportionally.
Specimas has overcome this(problem by developing a multicontact brushgear which has effectively doubled the capacity. This is achieved by dividing the brush into independent sections, thus ensuring an increased effective contact area. The diagram shows a comparison between a conventional brushgear (BG) and a multi-contact brushgear (KP) of the same physical size carrying 300 Amp continuous.







A Cavotec Specimas slipring dated 1965.

Main advantages

1. Reliability

The outstanding reliability of Specimas slipring columns is due to many innovative technical solutions backed by years of experience in this specialised field.

2. Resistance to corrosion

The extensive use of stainless steel for all mechanical parts, from the frame down to the fixings, guarantees an excellent mechanical resistance even in particulary hostile climates and environments, without maintenance.

3. Flexibility

A unique characteristic of the slipring columns is the possibility to meet almost any requirements by using a wide range of components especially developed and manufactured by Specimas.

4. Compactness

The special design of the Specimas rings enable the construction of very compact sections, still ensuring a high degree of electrical insulation and a perfect contact.

5. Wiring facilities

All side panels on the Specimas slipring column can easily be removed thus providing good access for wiring to rings and brushgear. The signal rings are, as standard, prewired to a numbered terminal block.

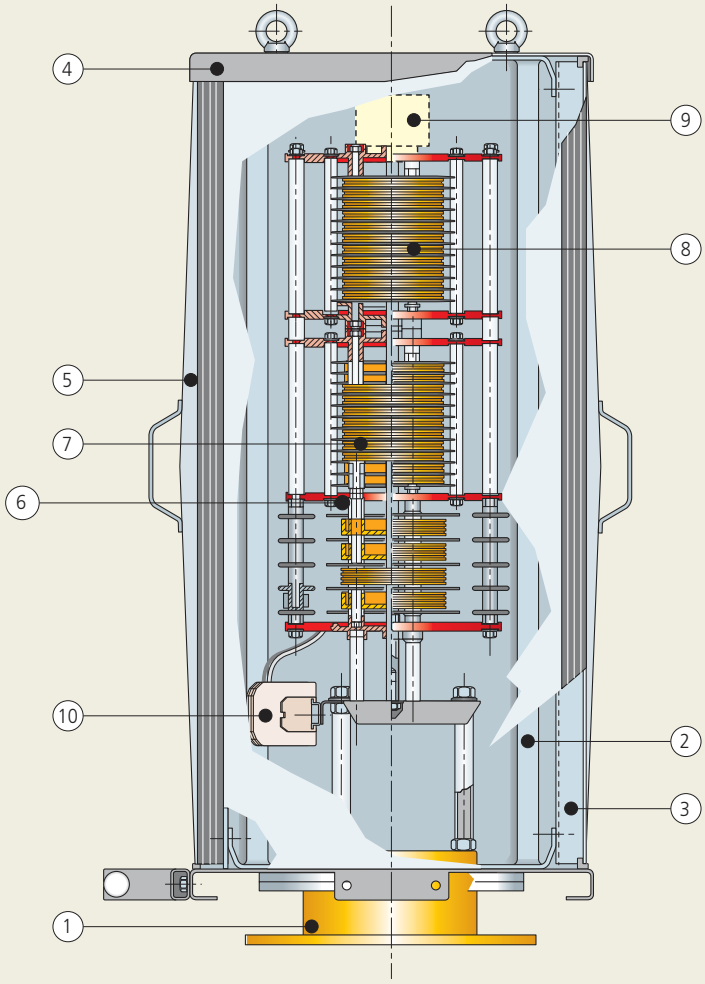
A Cavotec Specimas slipring dated 1999.

KK 135

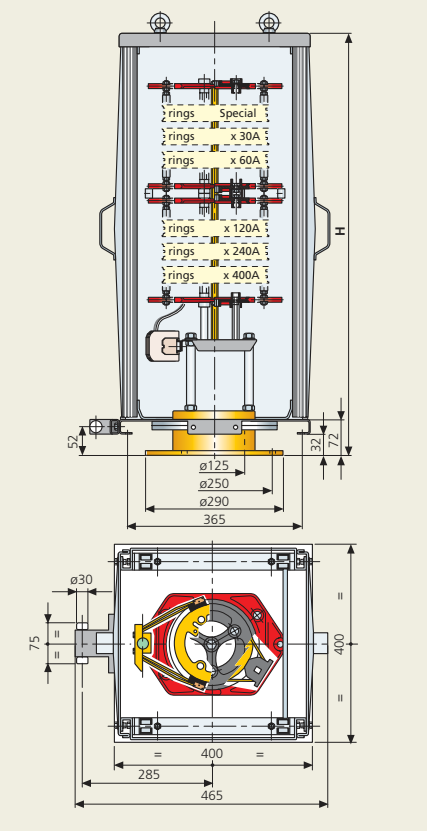
Max ring diameter 135mm - max current up to 400A

This type is normally used for cranes with a nominal current handling capacity of up to 400 Amp. All power and signal rings with a diametr of 135 mm are pre-wired to a common terminal block.
Nominal voltage for signals 600 V and for power 1000 V.
Ring formation is normally divided into 3 sections for power, auxiliary and signals.

Slipring columns are available in open version or closed with stainless steel side panels. (IP44 or on request IP55).
The strong base bearing, with a 125 mm centre passage, makes it also possible to mount the column upside down.



1 Pedestal base bearing
2 Inside frame work
3 Stainless steel panels
4 Cover
5 Doors
6 Power ring pack (400A)
7 Auxiliary power ring pack (240, 120A)
8 Control ring pack (60, 30A)
9 Options, see page 13
10 Terminals



Technical characteristics of KK 135

Rated voltage:	1000 V AC/600 V AC (control rings)
Test voltage:	3000 V AC/2000 V AC
Brushgear:	multi-contact copper/graphite brushes
Rings:	brass rings with V-shaped grooves
Wiring:	all rings pre-wired onto terminal block
Insulation matl:	makrolon/glass-fibre
Cable glands:	available on request for mounting on side panels/top cover
Construction:	modular design with independent sections for power/control
Bearing:	heavy duty base ball bearing with large cable passage
Housing:	side panels and doors in stainless steel sheet as standard
Protection:	IP44 type BC – IP55 type BD optional
Accessories:	self-regulating heating element available on request

Notes:
(1) silver plated with screened cable (connection of screen to be specified)
(2 max. 36 poles/section;
(3) max. 12 poles/section;
(4) max. 7 poles;
Use additional sections if required
* Subject to confirmation

Format	Current rating		Rings		Brushgear	
Nr. of poles	Nominal 60% ED (Amp)	Continuous 100% ED (Amp) Slipring rotating	Nr. & dia of ring (mm)	Max. cable section (mm^2)	Nr.& type of brushes	Max. cable section (mm^2)
	30 S (silverplated)	12	1 x 130 (1)	1 x 2,5	1 x Kp2	1 x 2,5
	30	12	1 x 130	1 x 2,5	1 x Kp2	1 x 2,5
	60	25	1 x 130	1 x 10	1 x Kp3	1 x 10
	120/240	60/120	1 x 130	1 x 25	1 x Kp4/Kp8	1 x 25
	400	200	1 x 135	1 x 70	1 x Kp12	1 x 70

Housing			
Section	Height (mm) Pitch x Nr poles + K	=	Subtotal
B (2)	7.5 x	+ 80=	For each section add 80
B (2)	7.5 x		
B (3)	15 x		
B (3)	15 x		
A (4)	33 x		

Weight*	kg	Housing dimensions* (std)		H_1	H_2	H_3	H_4
Bearing	14	Base	mm	400x400	400x400	400x400	
Housing		Height	mm	830	1080	1330	
Sliprings		Weight	kg	32	40	48	

Total		
A + B + 380	=	
Housing top clearance (C)	=	60
Height calculated H	=	

Specimas slipring assembly type:

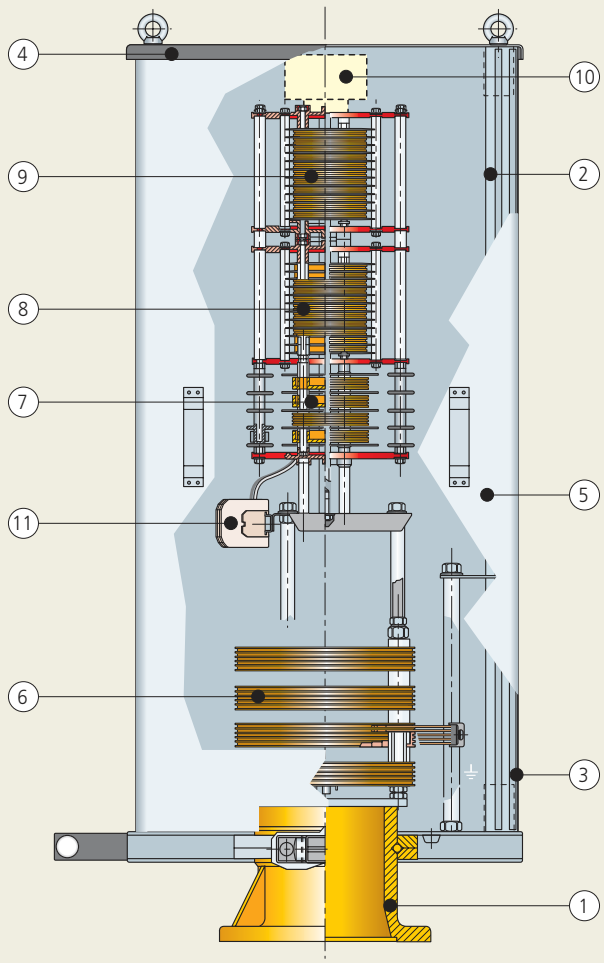
KK 135 Version | Earth | Power | Aux. power | Control | Silver

KK 270

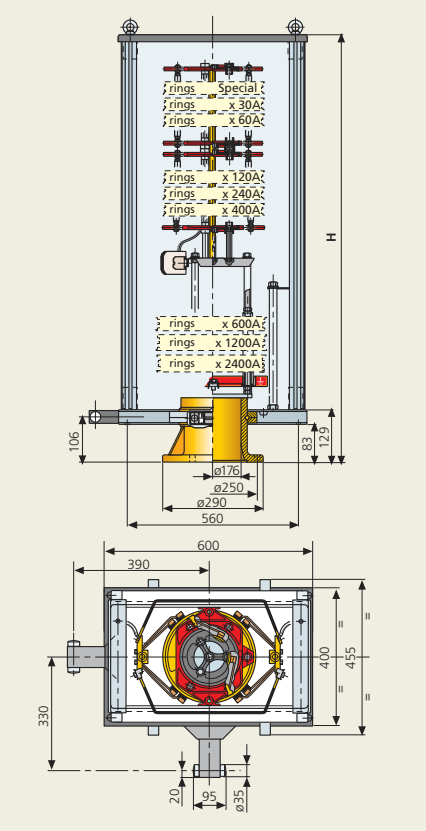
Max ring diameter 270mm - max current up to 2400A

A series of larger slipring columns for dockside cranes with a maximum nominal amperage of 2400 Amp and voltage up to 1000V. The power section consists of 270 mm diameter rings which are wired directly on the ring.
The 130 mm diameter signal and auxiliary rings are prewired to a separate terminal block.

Slipring columns are available in open version or closed with stainless steel side panels. (IP44 or on request IP55).
The strong base bearing, with a 180 mm centre passage, makes it also possible to mount the columns upside down.
Cable entry to brushes can be fitted to side panels or top cover.



1 Pedestal base bearing
2 Inside frame work
3 Stainless steel panels
4 Cover
5 Doors
6 Power ring pack (600 to 2400A)
7 Auxiliary power ring pack (400A)
8 Auxiliary power ring pack (240, 120A)
9 Control ring pack (60, 30A)
10 Options, see page 13
11 Terminals



Technical characteristics of KK 135

Rated voltage:	1000 V AC/600 V AC (control rings)
Test voltage:	3000 V AC/2000 V AC
Brushgear:	multi-contact copper/graphite brushes
Rings:	brass rings with V-shaped grooves
Wiring:	control/aux. power rings pre-wired onto terminal block
Insulation matl:	makrolon/glass-fibre
Cable glands:	available on request for mounting on side panels/top cover
Construction:	modular design with independent sections for power/control
Bearing:	heavy duty base ball bearing with large cable passage
Housing:	side panels and doors in stainless steel sheet as standard
Protection:	IP44 type CC – IP55 type CD optional
Accessories:	self-regulating heating element available on request

Notes:
(1) silver plated with screened cable (connection of screen to be specified)
(2) max. 36 poles/section;
(3) max. 12 poles/section;
(4) max. 7 poles;
(5) earth= one ring size smaller
Use additional sections if required
* Subject to confirmation
** Optional location of driving arm

Format	Current rating		Rings		Brushgear	
Nr. of poles	Nominal 60% ED (Amp)	Continuous 100% ED (Amp) Slipring rotating	Nr. & dia of ring (mm)	Max. cable section (mm²)	Nr & type of brushes	Max. cable section (mm²)
	30 S (silverplated)	12	1 x 130 (1)	1 x 2,5	1 x Kp2	1 x 2,5
	30	12	1 x 130	1 x 2,5	1 x Kp2	1 x 2,5
	60	25	1 x 130	1 x 10	1 x Kp3	1 x 10
	120/240	60/120	1 x 130	1 x 25	1 x Kp4/Kp8	1 x 25
	400	200	1 x 135	1 x 70	1 x Kp12	1 x 70
	600	300	1 x 270	2 x 150	1 x Kp20	2 x 150
	1200	600	1 x 270 (5)	2 x 150	2 x Kp20	2 x 150
	2400	1200	2 x 270 (5)	4 x 150	4 x Kp20	4 x 150

Housing			
Section	Height (mm) Pitch x Nr poles + K	=	Subtotal
C (2)	7.5 x	+ 80 =	
C (2)	7.5 x		
B (3)	15 x	+ 80 =	
B (3)	15 x		
B (4)	33 x		
A	50 x		
A	50 x		
A	85 x		

Weight*	kg	Housing dimensions* (std)		H_1	H_2	H_3	H_4
Bearing	25	Base	mm	400x600	400x600	400x600	
Housing		Height	mm	1130	1380	1630	
Sliprings		Weight	kg	60	70	80	

Total		
A + B + C + 460	=	
Housing top clearance (C)	=	60
Height calculated H	=	

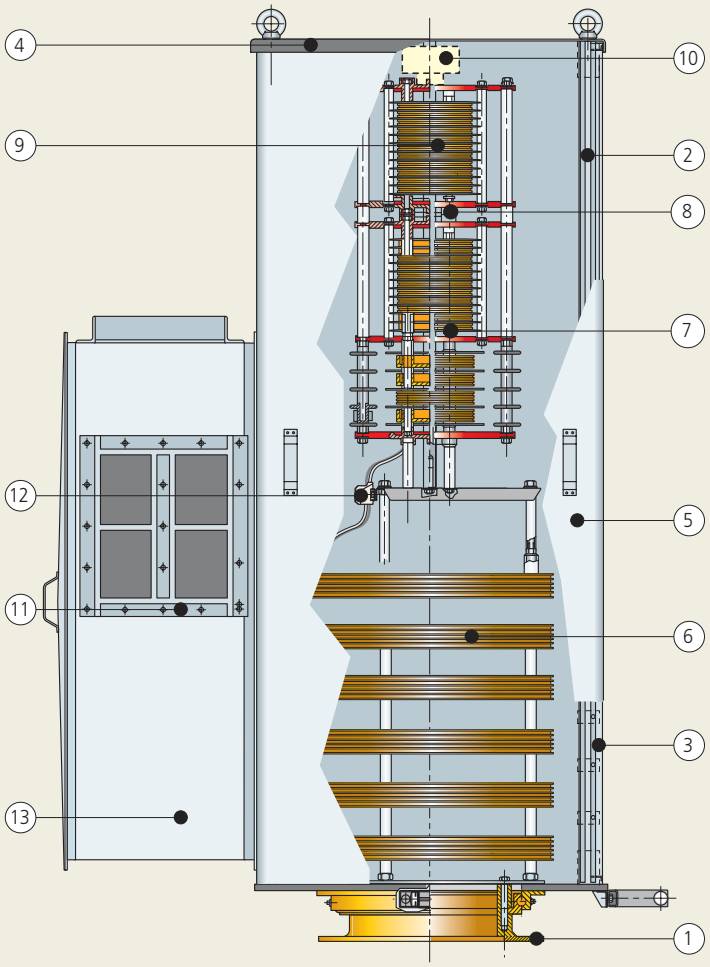
Specimas slipring assembly type:

KK 270 Version | Earth | Power | Aux. power | Control | Silver

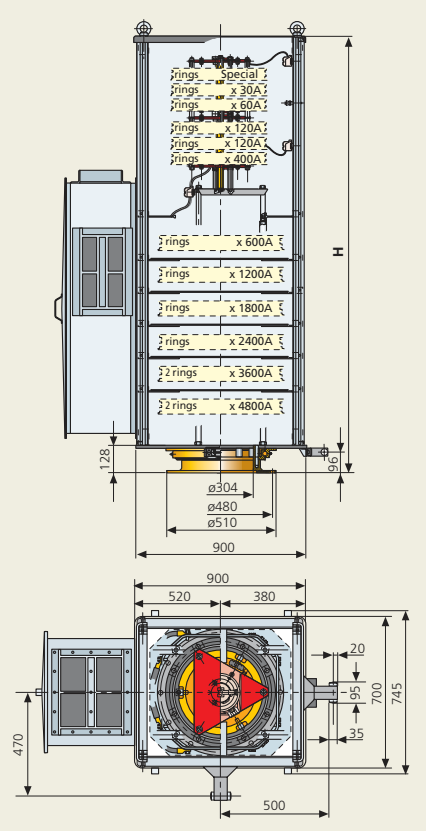
KK 450

Max ring diameter 450mm - max current up to 4800A

Slipring KK450 is the largest size available in the KK series. Max. current rating is 4800 A. The large diameter of power rings and ball bearing base offer an ample passage for power cables.
The construction is similar to KK135 and KK270 sliprings, that is with stainless steel removable side panles and doors in IP44 version, or IP55 on request, with a reinforced internal frame.
Optional cable inlet box may be provided fitted on side panel.
Auxiliary and control rings are assembled as a modular assembly and prewired to terminal blocks.



1 Pedestal base bearing
2 Inside frame work
3 Stainless steel panels
4 Cover
5 Doors
6 Power ring pack (600 to 4800A)
7 Auxiliary power ring pack (400A)
8 Auxiliary power ring pack (240, 120A)
9 Control ring pack (60, 30A)
10 Options, see page 13
11 Frame type cable entry
12 Terminals
13 Optional cable inlet box



Technical characteristics of KK 135

Rated voltage:	1000 V AC/600 V AC (control rings)
Test voltage:	3000 V AC/ 2000 V AC
Brushgear:	multi-contact copper/graphite brushes
Rings:	brass rings with V-shaped grooves
Wiring:	control/aux. power rings pre-wired onto terminal block
Insulation matl:	makrolon/glass-fibre
Cable glands:	available on request for mounting on side panels/cable inlet box
Construction:	modular design with independent sections for power/control
Bearing:	heavy duty base ball bearing with large cable passage
Housing:	side panels and doors in stainless steel sheet as standard
Protection:	IP44 type CC – IP55 type CD optional
Accessories:	self-regulating heating element available on request

Notes:
(1) silver plated with screened cable (connection of screen to be specified);
(2) max. 36 poles/section;
(3) max. 12 poles/section;
(4) max. 7 poles;
(5) earth= one ring size smaller
* Subject to confirmation
** Optional location of driving arm
Use additional sections if required

Format	Current rating		Rings		Brushgear	
Nr. of poles	Nominal 60% ED (Amp)	Continuous 100% ED (Amp) Slipring rotating	Nr. & dia of ring (mm)	Max. cable section (mm^2)	Nr.& type of brushes	Max. cable section (mm^2)
	30	15	1 x 130 (1)	1 x 1,5	1 x Kp2	1 x 2,5
	30	15	1 x 130 (2)	1 x 2,5	1 x Kp2	1 x 2,5
	60	20	1 x 130 (3)	1 x 10	1 x Kp3	1 x 10
	120/240	60/120	1 x 130	1 x 16	1 x Kp4	1 x 25
	400	200	1 x 135	1 x 70	1 x Kp12	1 x 70
	600	300	1 x 450	2 x 120	1 x Kp20/2 x BG450	2 x 120
	1200	600	1 x 450	2 x 120	2 x Kp20/4 x BG450	2 x 120
	1800	900	1 x 450	3 x 120	3 x Kp20	3 x 120
	2400	1200	2 x 450	4 x 120	4 x Kp20	4 x 120
	3600	1800	2 x 450	6 x 120	6 x Kp20	6 x 120
	4800	2400	2 x 450	8 x 120	8 x Kp20	8 x 120

Housing			
Section	Height (mm) Pitch poles + K =		Subtotal
C	7.5 x	+ 80 =	
C	7.5 x		
B	15 x	+ 80 =	
B	15 x		
B	33 x		
A	50 x	+ 460 =	
A	50 x		
A	50 x		
A	50 x		
A	85 x		
A	85 x		

Weight*	kg	Housing dimensions* (std)		H
Bearing	25	Base (To check dimension ask Specimas)	mm	700 x 900
Housing		Height (To check dimension ask Specimas)	mm	
Sliprings		Weight	kg	

Total		
A + B + C	=	
Housing top clearance (C)	=	60
Height calculated H	=	

The Specimas slipring assembly we suggest:

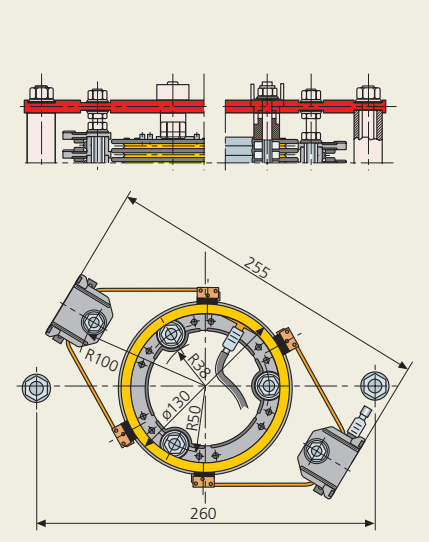
KK 450

Version	Earth	Power	Aux. power		Control	Silver

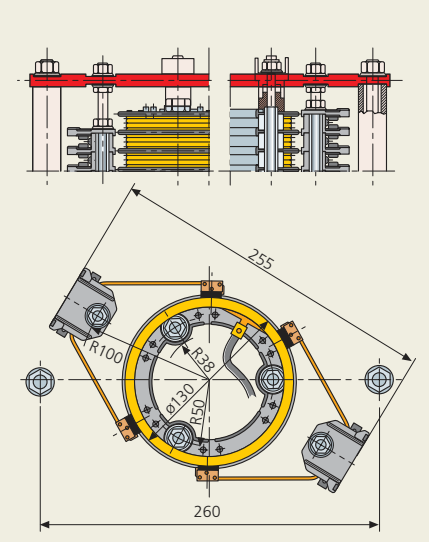
Dimensions of rings and brushes.

The following drawings show the available ring kits from nominal amperage rating of 30A to 4800A. Control rings (30A) plus auxiliary power rings up to 400A, are built in modular assemblies by means of 3 insulated studs. The single kit consists of one ring with an insulator spacer and one brush with its insulator. The brushes are fixed to two insulated tie-rods. The complete package is guided by means of special ball bearings which support the package and guide the rotating assembly. The special ball bearing can also be supplied with push on terminals for the signal rings.

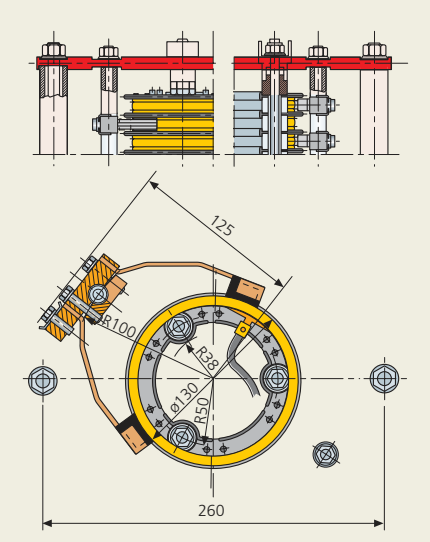
30A, max 600V – Ø 130mm
Brush KP2 (also silver plated)
p= 7,5mm
s= 3mm



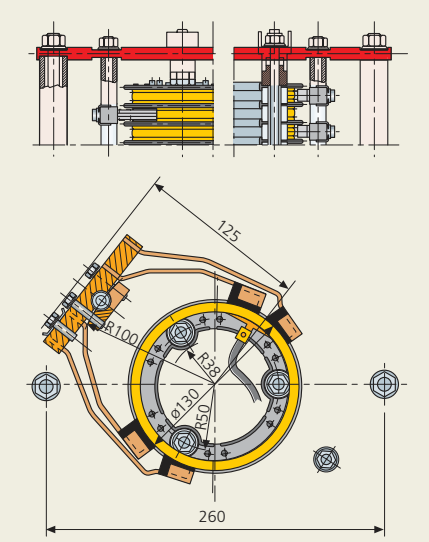
60A, max 600V – Ø 130mm
Brush KP3
p= 15mm
s= 10mm



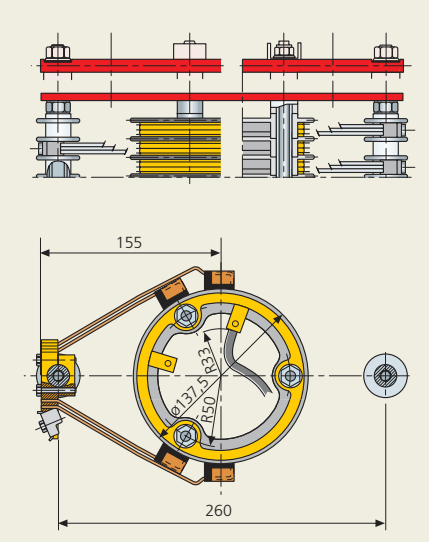
120A, max 600V – Ø 130mm
Brush KP4
p= 15mm
s= 10mm

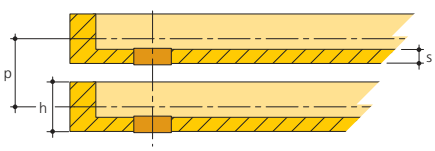


240A, max 600V – Ø 130mm
Brush KP8
p= 15mm
s= 10mm



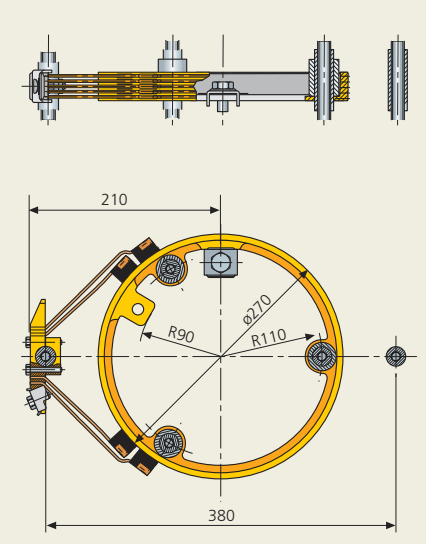
400A, max 1000V – Ø 137,5mm
Brush KP12
p= 35mm
s= 5mm
h= 20mm



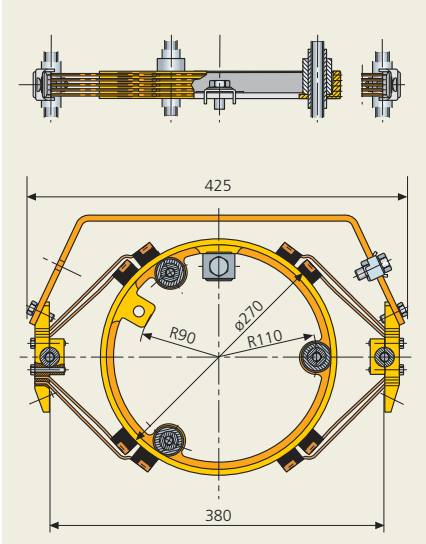


Note: p= ring pitch
s= fixing lug thichness
h= ring total height

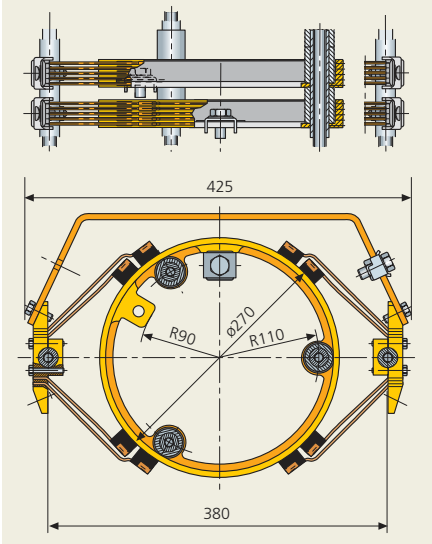
600A, max 1000V – Ø 270mm
Brush KP20
p= 50mm
s= 5mm
h= 30mm



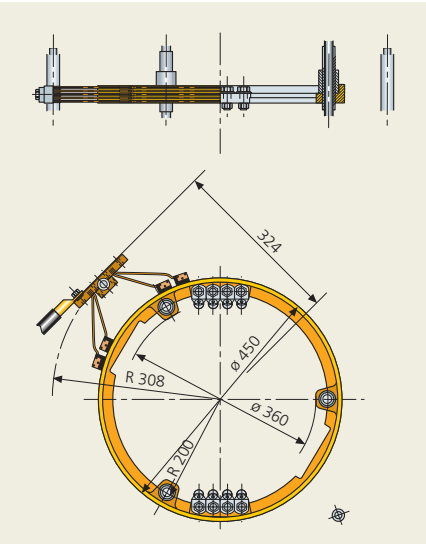
1200A, max 1000V – Ø 130mm
Brush KP3
p= 15mm
s= 10mm
h= 30mm



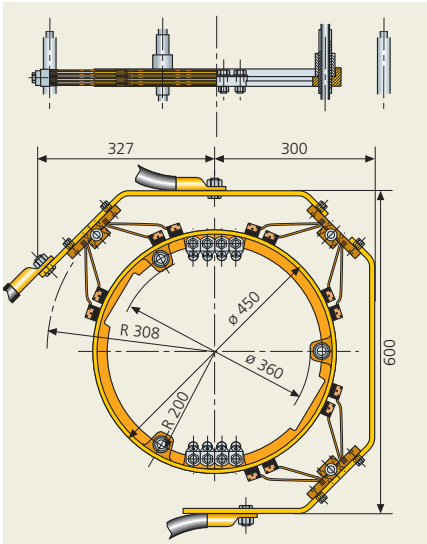
2400A, max 1000V – Ø 270mm
N° 2 rings of 1200A - Brush KP3
p= 85mm
s= 5mm
h= 30mm



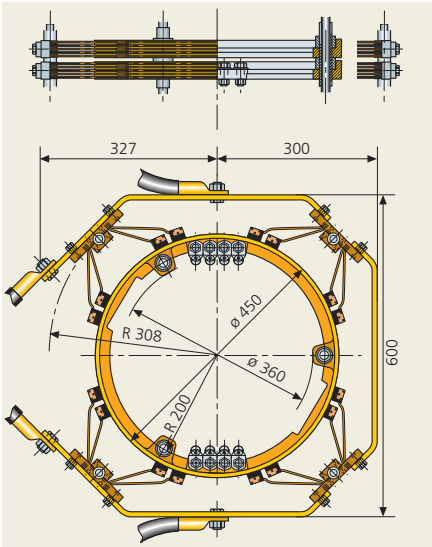
600A, max 1000V – Ø 450mm
Brush KP20
p= 50mm
s= 5mm
h= 30mm



1800A, max 1000V – Ø 450mm
Brush KP20
p= 50mm
s= 5mm
h= 30mm



4800A, max 1000V – Ø 450mm
N° 2 rings of 2400A - Brush 4xKP3 each ring
p= 85mm
s= 5mm
h= 30mm

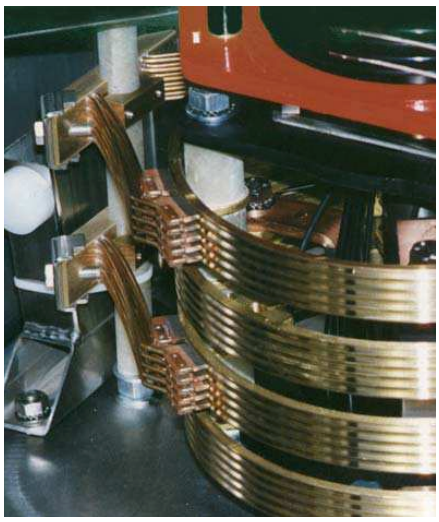


Rings and brushes data

Ring type	Ø	[2] 130/30	[2] [4] 130/30s	[2] 160/30	270/30	130/60	130/120	130/240	135/400	270/600	[9] 270/1200	[10] 450/600	450/1200	450/1800	450/2400
Nominal Amp.	A	30	30	30	30	60	120	240	400	600	1200	600	1200	1800	2400
Amp. 100% ED	A	12	12	12	12	25	60	120	200	300	600	300	600	900	1200
		Kp2	Kp2 Kp2/silver	Kp2/160	Kp2/270	Kp3	Kp4	Kp8	Kp12	Kp20/270	2 x Kp20	Kp20/450	2 x Kp20	3 x Kp20	4 x Kp20
		1(2)	1	1(2)	1(3)	1	1	1	1	1	2	1	2	3	4
Cable size	mm²	2,5	2,5	2,5	6	10	25	35	70	2x150	2x150	2x150	2x185	3x185	4x185
Resistance [5]	mOhm	<40±10	<5±0,5	<40±10	<40±10	<10±2	<1,5±1	<1,5±1	<1,5±1	<1±1		<1±1			
Mech. life revs.		>50E^6	>25E^6	>40E^6	>20E^6	>2E^6	>2E^6	>2E^6	>2E^6	>2E^6		>2E^6			
Brush press. [6]	N	3	3	3	3	3	8	8	9,5-7	10-6		10-6			
Torque	Ncm	20	20	20	20	40	150	175	200	750	1500	1250	2500	3750	5000
Ring section [7]	mm²	13,7	13,9	12,2	108	49,2	48	48	130	262		312			
Brush arm section [8]	mm²	6,28	6,28	6,28	6,28	18,84	28,2	56,4	84,8	140		140			
Brush carbon size		16x12x2	16x12x2 12x10x2	16x12x2	16x12x2	16x12x2	25x15x3	25x15x3	25x15x3	25x15x3		25x15x3			
No. of carbons		2	2	2	2	6	4	8	12	20		20			

Notes to brush/ring data:

(1) If sliprings operate in standstill for long periods: refer to Specimas.
(2) Brushes are always mounted on 2 studs at 120° angle, ring pitch= 7.5 mm, brush pitch= 15 mm
(3) Normally mounted quantity ( )= option for special applications
(4) Silver plated ring with copper graphite or silver–graphite brush
(5) Resistence from cable entry to cable exit
(6) Pressure of each brush arm
(7) Ring material is brass
(8) Brush arm is phosphor bronze
(9) Also available 2400 A: two rings in parallel
(10) Also available 3600 A and 4800 A: two rings in parallel 1800 A and two rings in parallel 2400 A



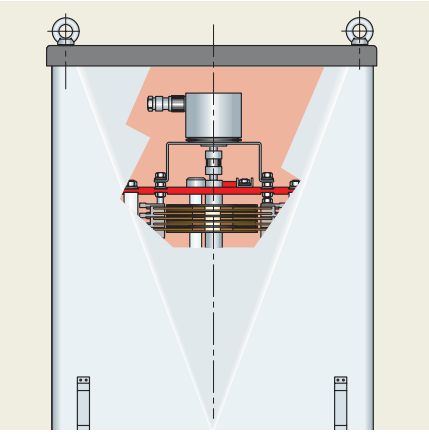
Optional equipment for type KK135, KK 270, KK450

The modular design of slipring makes it suitable to combine with optional devices as specified by the client.

Extra devices are generally mercury wetted signal sliprings such as Mercotac or gold plated signal slipring capsules such as Aurotac (refer to the specific catalogues) or swivels for air, water and oil.

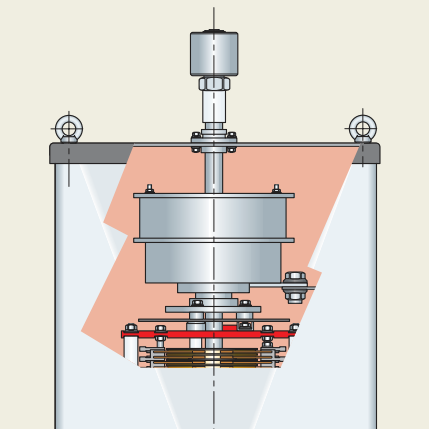
In some cases it is possible to combine slipring columns with fiber optic rotary joints.

Encoder



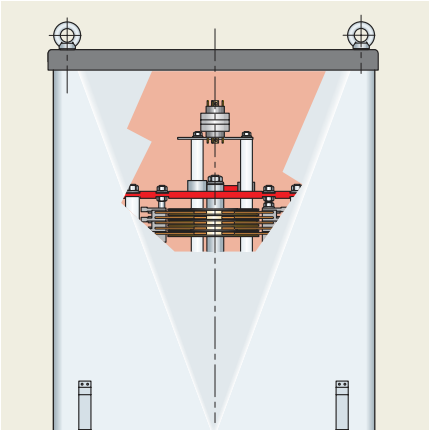
An encoder is mounted on the ring assembly top and driven by means of an elastic joint.

Pneumatic swivel



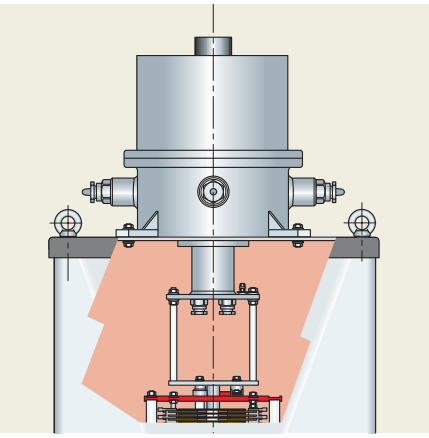
A pneumatic swivel – the tube is inserted inside the ring assembly.

Mercotac/Aurotac



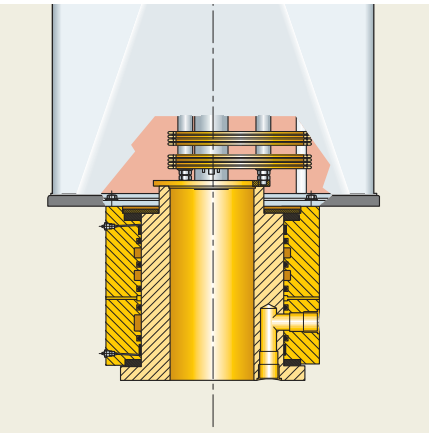
A signal slipring capsule Mercotac or Aurotac is arranged on top of the ring assembly.

Ex-proof slipring



An ex-proof slipring is fit on the slipring housing cover and driven by a stainless steel tube which is also the ex-proof collector cable conduit. Designed for easy maintenance.

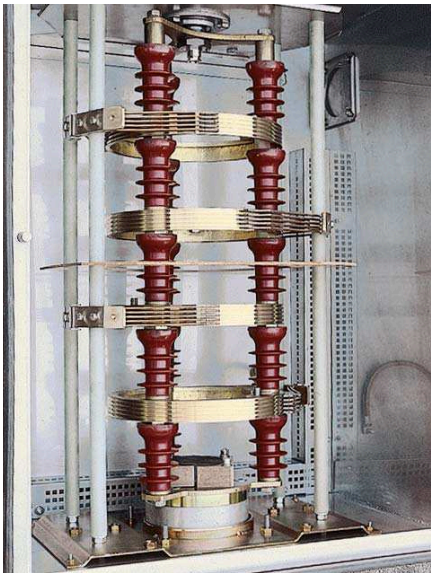
Hydraulic swivel



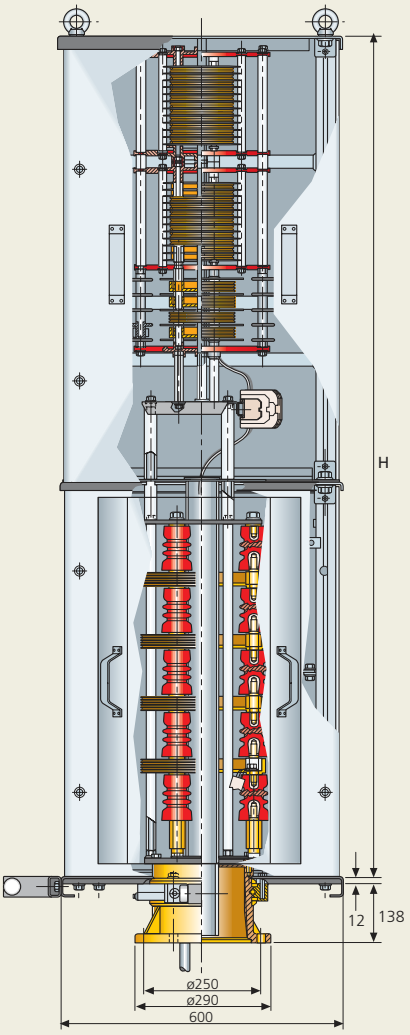
Oil, swivel (designed by Specimas according to client specifications) is fitted below the slipring and becomes also base bearing.

Medium voltage Slipring

Medium voltage slipring are also available (3kV up to 10kV).
Medium voltage section is segregated from the control section which is arranged on the top inside a separated enclosure.
A stainless steel tube through the medium voltage section, safeguards the control cables.
Rings and brushes are the same components as used in the low voltage sliprings, but the pitch is suitable for the operating voltage: resin cast medium voltage insulators are used in the assembly.



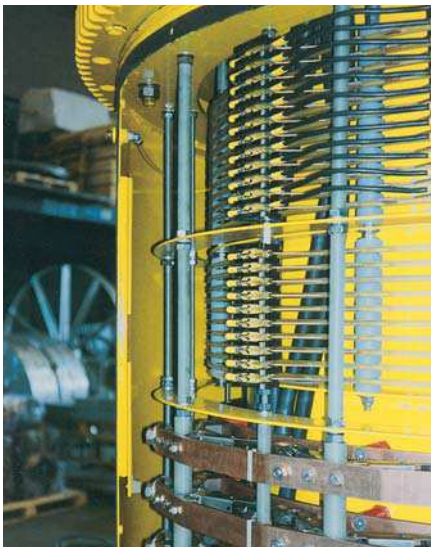
A medium voltage slipring with three phase rings plus earth, assembled by means of insulators suitable for 6 kV operating voltage.



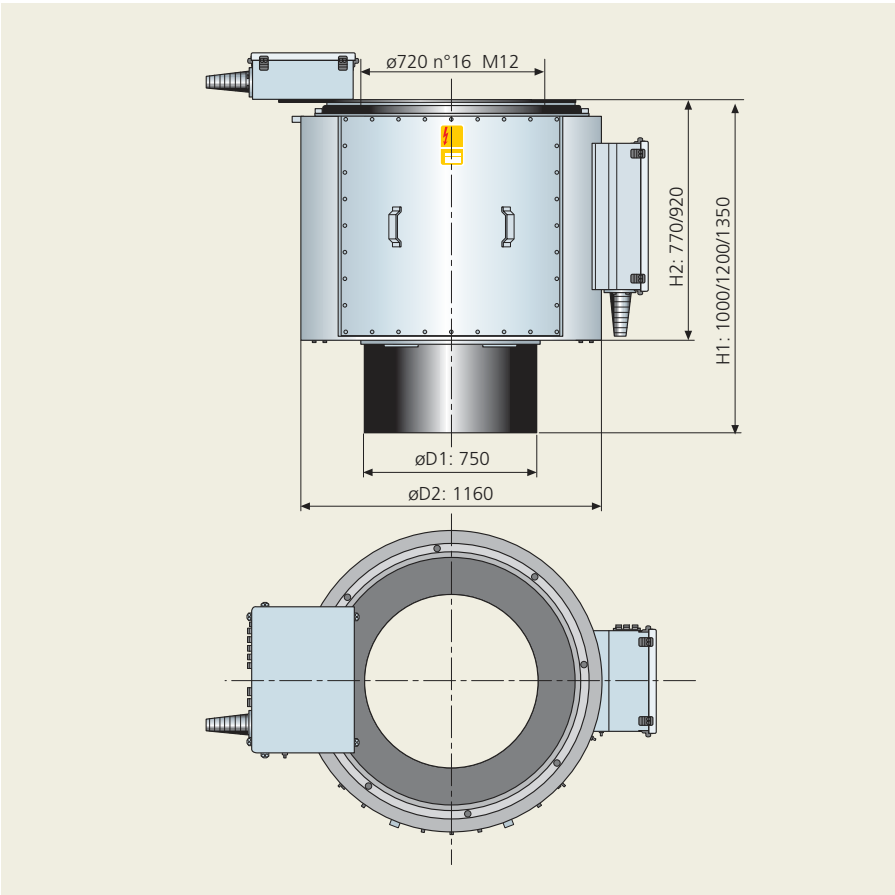
Slipring Columns with central hollow passage

Description
The slipring column is a single assembly built on a robust base-bearing. The ring column is connected to the inner ring of this base-bearing whilst the brushgear assembly is mounted on a internal structure bolted to a base plate fixed onto the outer ring of the base-bearing. The housing is built with a central hollow passage as required by client. A lateral door is supplied for access to rings and brushes. Cabling is made on both sides in designated terminal boxes. Optional client specified components can be mounted in the connection boxes if space is available.

Installation
The slipring assembly is designed to be installed in a vertical position.
The housing, supporting the brushgear assembly, is provided with a driving-fork which drives the rotating part of the slipring through a non-rigid system, in order to compensate for possible mounting misalignments between slipring and containing structure. It is important therefore to maintain this flexibility also in case a different driving system is adopted.



The lower part of the picture shows the power rings with copper bars which connect the brushes. In the upper section 28 control ring are arranged. Both rings and brushes may be prewired to junction boxes (see above illustration). A slewing ring allows an accurate and silent movement. Central passage diameter, enclosure height and other main dimensions may be designed on request to meet customer requirements.



High power Slipring Columns and special applications

Specimas custom-built slipring column for phase currents over 3000 Amps.

Specimas special sliprings for high power applications are at work in severe environmental conditions all over the world: in nuclear plants, steel plants and offshore applications.

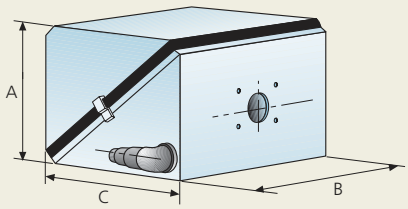
The design is customized according to the extreme performances required such as resistance to high vibrations, high temperature, corrosive atmosphere, etc.

Ring diameters over 2000 mm with high amperages and incorporated swivels for air, water or oil.

Also auxiliary power sliprings, signal sliprings with silver or gold plating and fibre optic transmission are some of the high technology features that can be combined with these high power slipring units.
Approval tests have been carried out by several certification companies such as DNV, Bureau Veritas, Germanische Lloyd.

Standard K-type Sliprings

Specimas standard K-range sliprings which as standard are used on all Specimas cable reels, can frequently also be used, with a support bearing or hydraulic swivel, as a stand–alone vertical slipring assembly.



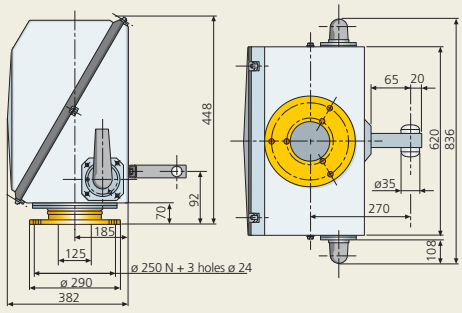
Standard K-type sliprings LOW VOLTAGE

Slipring type	Nominal rating A	Cont. rating A	Nominal Tension V	Max cable section mm²	Ring dia mm	Type of brushgear	n° of brushgear	Weight Kg	Housing dimension AxBxC
K12	30	12	600	1 x 2,5	130	Kp2	1	9	242x370x242
K24	30	12	600	1 x 2,5	130	Kp2	1	14	271x456x359
K37	30	12	600	1 x 2,5	130	Kp2	1	16	275x456x461
K48	30	12	600	1 x 2,5	130	Kp2	1	22	275x456x625
K406	60	25	600	1 x 10	130	Kp3	1	8	242x370x242
K412 (1) (2)	120	60	600	1 x 25	130	Kp4	1	8	242x370x242
K412/4	120/30	60/12	600	1 x 25/1 x 2,5	130/130	Kp4/Kp2	1	9	242x370x242
K424 (1) (2)	240	120	600	1 x2,5	130	Kp8	1	9	242x370x242
K440 (1) (2)	400	200	1000	1 x 70	135	Kp12	1	12	272x456x272
K440/4	400/30	200/12	1000	1 x 70/1 x 2,5	135/130	Kp12/Kp2	1	14	271x456x359
K450 (1) (2)	500	250	1000	1 x 120	170	Kp20	1	15	289x538x499
K460 (1) (2)	600	300	1000	1 x 150	270	Kp20	1	35	382x642x377
K4120 (2)	1200	600	1000	2 x 150	270	Kp20	2	40	382x642x377
K4121 (2)	1200	600	1000	2 x 150	270	Kp20	2	45	487x788x480
K4240 (2)	2400	1200	1000	4 x 185	270	Kp20	4	70	500x788x776

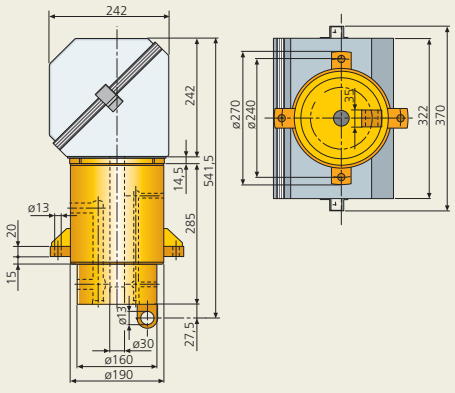
(1) These collectors are also available with a 5th. power ring: K512 - K524 - K540 - K560
(2) These collectors can be supplied with a pilot ring 30Amp. - /1

Examples:

Slipring KS 460



Slipring K12/B3 x 1"



Head Office

Cavotec MSL Holdings Ltd.
Cavotec MSL is listed on the AIM

Corporate Office

Cavotec (Swiss) SA
Via Serafino Balestra 27
CH-6900 Lugano, Switzerland

We are present in

Argentina
Australia
Belgium
Brazil
Canada
Chile
China
Denmark
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Hong Kong
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For more information please visit our website **www.cavotec.com**
or contact us directly at **info@cavotec.com**

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