USE AND
MAINTENANCE
MANUAL

ROTOGEAR RE GEAR COUPLINGS

ROTOGEAR MANUAL ENGLISH 2022-07 COD. 24861-EN

WESTCAR s.r.l

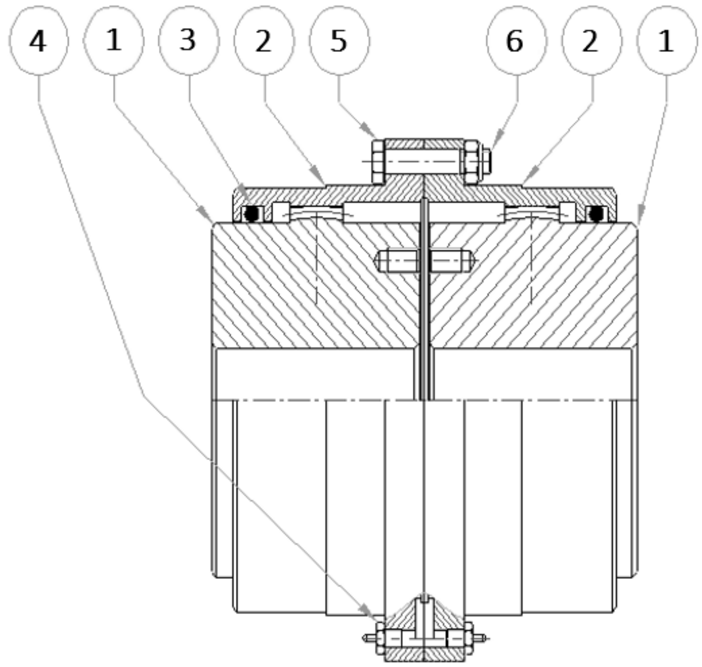
HEAD OFFICE
Sales Offices
Via Monte Rosa 14
20149 Milan – ITALY
Tel. +39 02-76110319
Fax +39 02.76110041

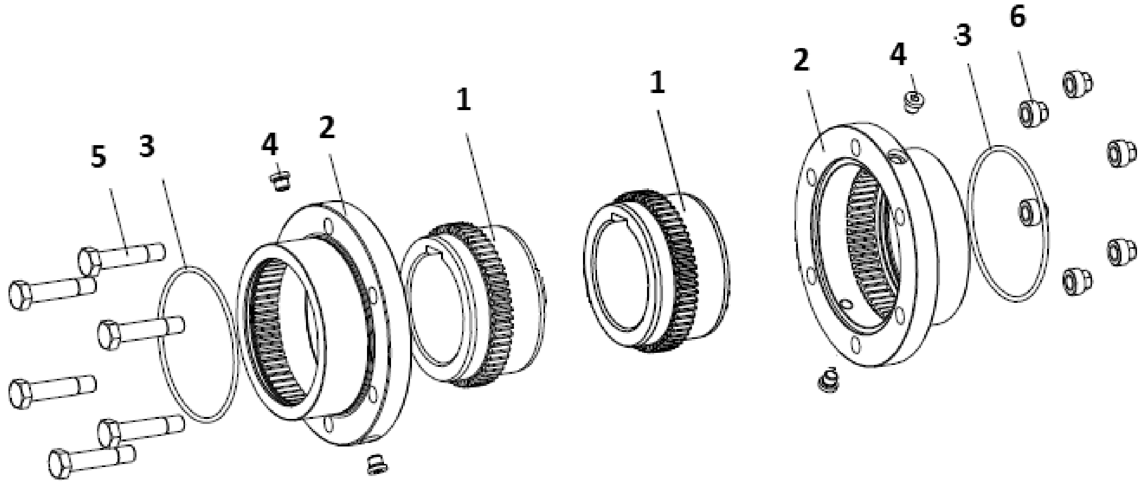
PRODUCTION FACILITY
Via Venezia 31
21058 Solbiate Olona
Varese – ITALY
Tel.+39 0331-641294
Fax +39 0331.376014

1) Coupling parts: construction components

1. Coupling hubs
2. Sleeves
3. O-ring gaskets
4. Grease nipples
5. Calibrated screws
6. Self-locking nuts

<u>Use original spare parts only</u>





2) Coupling installation

ROTOGEAR gear couplings are packed and shipped without lubricating grease. Couplings are supplied with special anti-corrosion protection. For assembly, please follow the instructions below carefully.
Warning: operations may only be performed with the drive motor switched off or in emergency mode and the relevant machine shaft locked.

2.1 Disassemble the coupling and thoroughly clean all surfaces to be coupled (hub and shaft bores).

2.2 If provided, place the key in the suitable keyseat on the shaft. Grease the O-ring (3) and insert it in the seat of the sleeve (2), then install the sleeve on the shaft (see paragraph 2.6 for indications on grease type); for sizes starting from 280 and above, insert the O-ring in the cover plate. Lastly, insert the hub (1) on the shaft so that the shaft head is aligned with the internal surface of the hub (when performing this operation, be careful not to damage the O-ring and use suitable tools for lifting large couplings). Repeat the same procedure with the other half coupling.
NB: In case of assembly with an interference fit between bore and shaft, the hubs may be heated uniformly in an oil bath (120–130 °C); alternatively, a flame may be used to heat the hubs from the outside without exceeding 130° C. During heating operations, the cover plates and O-rings must be adequately protected and must not come into contact with the hubs until hub temperature has fallen below 100 °C. All operations must be performed in maximum safety.

In areas at risk of explosion consider the danger of ignition

2.3 Position the machines and check that the distance G between the hubs corresponds to that shown in the table on page 5.

2.4 Align as indicated in paragraph **3** (page 6).

2.5 Lightly grease the teeth (see section 2.6 for indications on grease type) and slide the sleeves on the hubs. Apply joint adhesive (such as Loctite 510 liquid gasket) between the sleeve flanges; for measurements from 280 and above, also apply the adhesive on the contact surfaces of the cover plates. Bring the two sleeves together so that the grease nipples of the first sleeve are positioned at a 90° angle to the grease nipples of the second sleeve.
Warning: Before closing the sleeves, make sure that the hubs are at room temperature in order to avoid damaging the O-rings. Fit the screws (5) and the nuts (6), then proceed to tighten as indicated in the "Tightening torque" table on page 5.

In areas at risk of explosion, a medium threadlocker must be used (e.g. Loctite 222)

2.6 Grease: position the sleeves so that two grease nipples are facing upwards; remove the two upper grease nipples and pump grease alternately from the two lower grease nipples until the grease comes out the opposite side; finally, reassemble the upper grease nipples. Alternatively, it is possible to fill the compartment between each hub and the sleeve with a spatula before coupling the two sleeves (see paragraph 2.5), then proceed to complete the filling using the grease nipples. For the amounts of grease to be used, refer to the “Grease Quantity” table on page 5.

Do not use metal spatulas. Use plastic material only

LUBRICATION GREASE SPECIFICATIONS

Operating temperature	ASTM Penetration index	NLG1 Grade
-20 °C to 30 °C	350 – 380	0
-30 °C to +70 °C	300 – 350	1
below -20 °C	Consult our Technical Support Service	
above 70 °C		

For informational purposes only, we recommend the following lubricating greases:

AGIP: GR-MU/EPO (EP1) | API: APIGREASE PGX-0 | SHELL: ALVANIA EP GREASE 1
IP: ATHESIA-EPO | MOBIL: MOBILGREASE-SPECIAL | ESS: PEN-O-LED-EP 350

2.7 Check that the sleeves have free axial movement of ± G/2 (see table below)

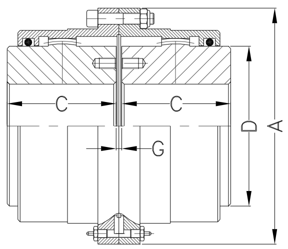
2.8 Provide adequate protection of the coupling (fixed guards on rotating parts).

DISTANCE BETWEEN HUBS

	40	55	70	85	100	120	140	160	180	200	220	250	280	320	360	400	450
RE.. RE..U RE..UU (G)	3	3	3	5	5	6	6	8	8	8	8	10	12	12	12	12	12
RE..R RE..UR (G1)	5	8	14	12	24	27	32	37	50	53	58	72	--	--	--	--	--
RE..RR (G2)	7	13	25	19	43	48	58	66	92	98	108	134	--	--	--	--	--
RE..V (G3)	23	23	31	31	43	48	58	66	92	98	108	134	140	140	140	150	150

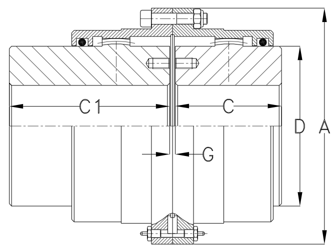
King

With 2 Standard hubs



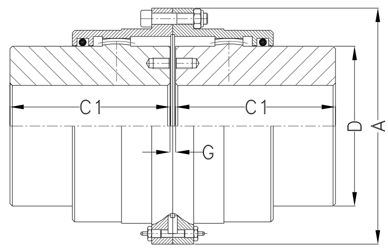
RE..U

With 1 standard hub and 1 long



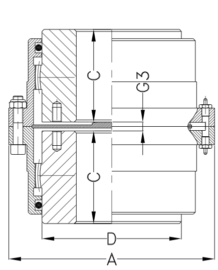
RE..UU

With 2 long hubs



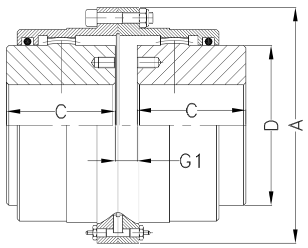
RE..F

Vertical coupling



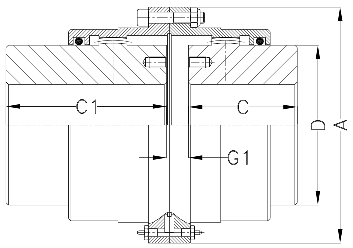
RE..R

With 1 standard hub and 1 reversed hub



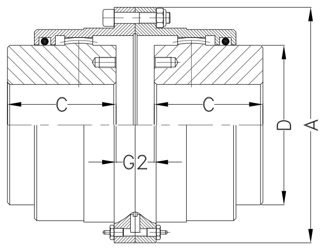
RE..UR

With 1 long hub and 1 reversed hub



RE..RR

With 2 reversed hubs



TORQUE VALUES

TYPE	METRIC SCREWS Dimensions mm	Nm
40	M8x1	20
55	M10x1.25	35
70		
85	M12x1.25	65
100		
120	M16x1.5	145
140		
160		
180	M18x1.5	225
200	M22x1.5	395
220		
250	M24x2	515
280	M27x2	660
320		
360	M30x2	1,200
400		
450		

GREASE QUANTITY

TYPE	for RE..,RE..R,RE..RR RE..U,RE..UU, RE..UR Kg.	for RE..F RE..FT RE..S RE..B Kg.
40	0.08	2x0.04
55	0.09	2x0.05
70	0.15	2x0.08
85	0.25	2x0.14
100	0.45	2x0.24
120	0.7	2x0.38
140	0.9	2x0.47
160	1.54	2x0.8
180	2.3	2x1.18
200	3.2	2x1.55
220	3.9	2x1.98
250	6.1	2x3.15
280	6.5	2x3.3
320	7.2	2x3.65
360	8.5	2x4.3
400	11.4	2x5.75
450	12.5	2x6.3

DIMENSIONS mm

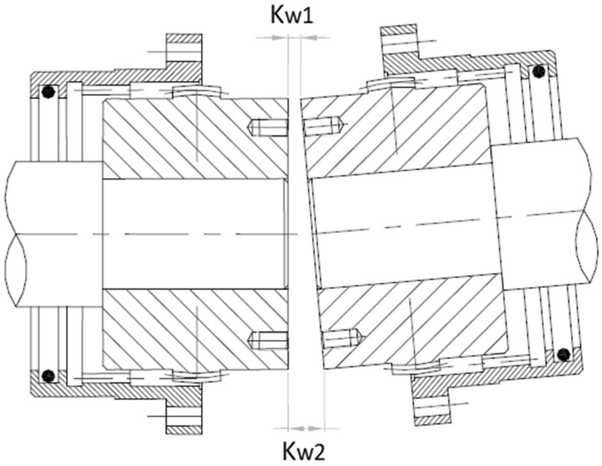
TYPE	A	S	C	C1
40	111	69	43	105
55	142	85	50	115
70	168	107	62	130
85	200	133	76	150
100	225	152	90	170
120	265	178	105	185
140	300	209	120	215
160	330	234	135	245
180	370	254	150	295
200	406	279	175	300
220	438	305	190	305
250	505	355	220	310
280	580	400	250	-
320	630	450	275	-
360	700	490	305	-
400	760	550	330	-
450	825	580	355	-

3) Coupling alignment

If installing in an explosive zone, the indicated values must be reduced by a half

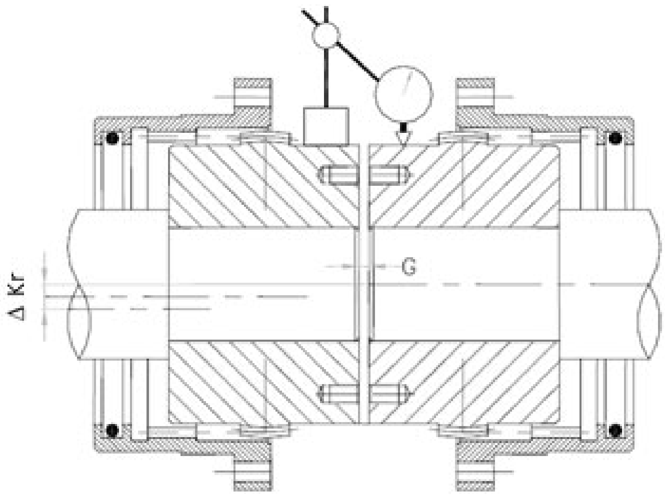
a) Angular Misalignment

- By rotating the coupling 360°, use a thickness gauge to determine the maximum deviation between Kw1 and Kw2 (perform a minimum of 4 measurements at 90° pitch).
- Calculate the angular misalignment
  ΔKw= Kw2 - Kw1
- Compare the value obtained with the table "Maximum misalignment values".



b) Radial/Parallel Misalignment

- By rotating the coupling 360°, use a dial indicator to determine the maximum deviation between Kr max and Kr min.
- Calculate the radial misalignment
  ΔKr = Kr max - Kr min
- Compare the value obtained with the table "Maximum misalignment values".



c) Axial Misalignment

Measure the axial gap and compare the identified G dimension with the "Distance between hubs" table on page 5.

MAXIMUM MISALIGNMENT VALUES

Coupling Size	Speed									
	≤ 250 rpm		≤ 500 rpm		≤ 1000 rpm		≤ 2000 rpm		≤ 4000 rpm	
	ΔKw	ΔKr	ΔKw	ΔKr	ΔKw	ΔKr	ΔKw	ΔKr	ΔKw	ΔKr
40 – 85	0.25mm	0.25mm	0.25mm	0.25mm	0.25mm	0.25mm	0.15mm	0.20mm	0.08mm	0.10mm
100-180	0.50mm	0.60mm	0.50mm	0.60mm	0.25mm	0.35mm	0.15mm	0.20mm	0.08mm	0.10mm
200-250	0.90mm	1.00mm	0.50mm	0.75mm	0.25mm	0.35mm	0.15mm	0.20mm	--	--
280-360	1.00mm	1.10mm	0.60mm	0.85mm	0.30mm	0.40mm	--	--	--	--
400-450	1.00mm	1.20mm	0.60mm	0.90mm	0.30mm	0.50mm	--	--	--	--

ATTENTION:

- the reference ΔKw values indicated are maximum with the relative ΔKr values equal to zero
- the reference ΔKr values indicated are maximum with the relative ΔKw values equal to zero
  NB: for the relationship between the maximum misalignment values, see the paragraph "Simultaneous misalignment" on page 7.

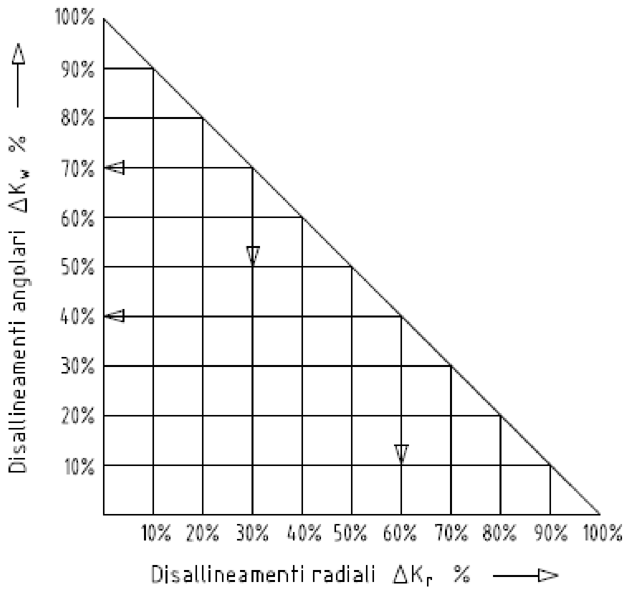
d) Simultaneous misalignment

Examples of simultaneous misalignment, sum of multiple misalignments:

example 1:
ΔKw = 30%
ΔKr = 70%

Example 2:
ΔKw = 40%
ΔKr = 60%

ΔKtotal =ΔKw +ΔKr ≤ 100%



4) Coupling maintenance

Once the coupling is commissioned, an inspection of the coupling must be carried out after 2,000 hours of operation and at the latest after 4 months. If during this first check there is little or no deterioration, is identified during the first inspection, further checks may be carried out (based on the same operating parameters) after 4,000 hours of operation and at the latest after 12 months.

Follow the instructions below:

- Remove the screws and move the sleeves aside.
  Warning: do not use tools that can damage the sealing surfaces when separating the two sleeve flanges.
- Check the condition of the teeth on the hubs and sleeves.
- Check the torsional clearance of the sleeves on the hubs.
- Check the condition of the O-rings and replace if worn.
- Check the alignment (see paragraph 3).
- Check the amount of grease inside the coupling.
- Close the sleeves and refasten the screws (see paragraph 2).
- If the grease level inside the coupling is low (it must cover the entire area of the teeth), top up with new grease via the grease nipples (see paragraph 2.6).
- check the free axial movement of the sleeves (see paragraph 2.7).

Every 8,000 hours of operation (max. after 2 years) inspect the coupling according to the instructions described above and completely replace the grease inside the coupling, taking care to carry out a thorough cleaning.

NB: if tooth wear is identified during the inspections, replace the coupling.

If installed in an explosive zone, reduce the indicated values by half

5) Coupling storage

- Protect the coupling with a protective anti-corrosion film.
- Store O-rings away from contact with acidic substances or corrosive oils and protect from direct sunlight.

6) Malfunctions, causes and solutions

PROBLEM	CAUSES	RISK IN EXPLOSIVE AREAS	SOLUTIONS
The onset of abnormal noises and/or vibrations	Misalignment	Ignition hazard due to hot surfaces and sparking	1) Stop the motor/take the coupling out of service 2) Eliminate the cause of misalignment, e.g. loose motor fixing bolts, crankcase structural failure, thermal expansion. 3) Evaluate the wear condition 4) Restore correct alignment
	No lubricating grease		1) Stop the motor/take the coupling out of service 2) Evaluate the wear condition 3) Replace the grease 4) Check the state of wear of the O-rings, replace if necessary
	Loose axial detent grub screws on the hub		1) Stop the motor/take the coupling out of service 2) Check alignment 3) Evaluate the wear condition 4) Tighten the hub detent grub screws and secure against further loosening
Excessive tooth wear	Motor vibrations		1) Stop the motor/take the coupling out of service 2) Disassemble the coupling and remove the wear residues 3) Inspect coupling components and replace any worn parts 4) Identifying and eliminating the cause of vibrations 5) Assemble the coupling 6) Align if necessary and proceed with filling the lubricating grease
	Excessive misalignment		1) Stop the motor/take the coupling out of service 2) Eliminate the cause of misalignment, e.g. loose motor fixing bolts, crankcase structural failure, thermal expansion 3) Evaluate the wear condition 4) Restore correct alignment
	No lubricating grease		1) Stop the motor/take the coupling out of service 2) Evaluate the wear condition 3) Replace the grease 4) Check the state of wear of the O-rings, replace if necessary
Loss / leakage of lubricating grease	Worn O-rings		1) Stop the motor/take the coupling out of service 2) Check alignment 3) Drain residual grease 4) Replace the O-rings 5) Fill the coupling with new grease
	O-rings damaged due to incorrect storage or damaged during assembly		1) Stop the motor/take the coupling out of service 2) Check alignment 3) Drain residual grease 4) Replace the O-rings 5) Make sure that the O-rings are stored and/or installed correctly 6) Fill the coupling with new grease
	Damaged O-rings due to contact with aggressive liquids and oils, contact with ozone, or exposure to high temperatures.		1) Stop the motor/take the coupling out of service 2) Check alignment 3) Drain residual grease 4) Eliminate the cause of O-ring contamination 5) Replace the O-rings 6) Fill the coupling with new grease
	Insufficient or deteriorated adhesive between the sleeve flanges		1) Stop the motor/take the coupling out of service 2) Check alignment 3) Drain residual grease 4) Clean the contact surfaces of the sleeve flanges 5) Apply new adhesive and reassemble the sleeves 6) Fill the coupling with new grease

PROBLEM	CAUSES	RISK IN EXPLOSIVE AREAS	SOLUTIONS
Broken teeth	Broken teeth due to overload	Ignition hazard due to hot surfaces and sparking	1) Stop the motor/take the coupling out of service 2) Disassemble the coupling and remove any breakage residues 3) Identify the cause of the overload 4) Replace the damaged coupling parts 5) Assemble the coupling 6) Align if necessary and proceed with filling the lubricating grease
	Usage parameters are not suitable for the installed coupling		1) Stop the motor/take the coupling out of service 2) Disassemble the coupling and remove any breakage residues 3) Review the selection parameters and if possible fit a larger coupling 4) Replace the damaged coupling parts 5) Assemble the coupling 6) Align if necessary and proceed with filling the lubricating grease
	No lubricating grease		1) Stop the motor/take the coupling out of service 2) Disassemble the coupling and remove any breakage residues 3) Check the state of wear of the O-rings, replace if necessary 4) Replace the damaged coupling parts 5) Align if necessary and proceed with filling the lubricating grease
	Excessive misalignment		1) Stop the motor/take the coupling out of service 2) Disassemble the coupling and remove any breakage residues 3) Check the state of wear of the O-rings, replace if necessary 4) Eliminate the cause of misalignment, e.g. loose motor fixing bolts, crankcase structural failure, thermal expansion 5) Replace the damaged coupling parts 6) Assemble the coupling 7) Align if necessary and proceed with filling the lubricating grease
Accumulation of electrostatic charge	Accumulation of electrostatic charge on metal parts	Possible spark formation	Metal parts that have a coefficient of friction (R<100 Ohm) comply with the ATEX directive
	Accumulation of electrostatic charge on coated parts		If painting is required, anti-static paints or coating thicknesses of less than 200 µm should be used

7) Disposal

The coupling should be disposed of in compliance with applicable environmental regulations.

8) Liabilities

This item must be used only for the purposes for which it was designed. It must be used in accordance with the standard safety parameters, considering the applicable operational parameters and information regarding use, assembly, alignment, control and maintenance indicated in the respective technical catalogue and in these assembly and maintenance instructions. Failure to comply with said information shall free WESTCAR from all liability in this regard.

9) Specific indications for hazardous areas

a. The ROTOGEAR gear coupling is suitable and confirmed for use in areas at risk of explosion. When using the coupling in these areas, observe the special instructions and measures stated in the catalogue and in these instructions.
b. ROTOGEAR gear couplings with attached parts capable of generating heat, sparks and electrostatic discharges (e.g. in combination with brake drums/discs and overload systems such as clutches, impellers, etc.) They are NOT permitted in explosive areas and a separate control is necessary.
c. In explosion hazard areas, detent grub screws and/or pins for fastening tapered sleeves must be secured against loosening e.g. bonding with Loctite (medium strength).
d. Use in explosive areas is NOT permissible in case of use of conical bushing without key or self-locking hubs and/or similar without key seat.
e. The greater the alignment accuracy of the coupling, the longer it will last.
   If used in areas at risk of explosion belonging to group IIC (marking II 2GD and IIC T) only half the misalignment values are permitted (see paragraph 3).
f. If the couplings are used in areas at risk of dust explosion and in mining areas, excessive accumulation of dust between the coupling and its protective cover must be prevented.
   The coupling must not operate in a dusty environment.
g. If the couplings are used as part of equipment group II, light metals should not be used as protective covers (stainless steel may be used). Aluminium may be used only if the Mg value is less than 7.5%. These guards must leave a gap from the coupling of at least 10mm and provide adequate ventilation holes.
h. If the couplings are used in mining (equipment groups I and M2), the cover shall not be made of light metal and shall also withstand mechanical stresses greater than those which the equipment of equipment group II can withstand.
i. If coated couplings (base, paint, etc.) are used in areas at risk of explosion, conductivity and layer thickness requirements must be observed. An electrostatic charge is not expected for applications of up to 200 µm. Multiple applications with thicknesses greater than 200 µm for Explosion group IIC are NOT permissible.