

Installation, Operating, and Maintenance Instructions Manual



Spring Cable Reels SR10 | SR20 | SR30



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A General information



This equipment is not designed to be used in EXplosive Atmospheres (ATEX)
in accordance with the definition in directive 2014/34/UE dated 29 march 2014



A.1 Information on the IOM Instructions Manual

This manual is intended to facilitate safe installation and use of the equipment. It is an integral part of the equipment and must be kept in close proximity to so as to allow its consultation by the staff at any time. Before starting the work, staff must read these instructions carefully and understand them. It is a basic requirement for safe working to respect all safety instructions and procedures in this manual.

Local regulations for accident prevention and general safety rules applicable for the area of use of the device must also be met. Illustrations are provided for information only and may differ from the actual installation of the spring driven reel.

A.2 Limit of liability

All the information and instructions contained in this manual has been compiled taking into account the standards and regulations in force, the best engineering practices, and the results of the experience that Conductix-wampfler has accumulated over many years.

The manufacturer is in no case responsible for damages resulting from:

- Non-compliance with the instructions contained in this manual,
- Incorrect use,
- Use by unqualified personnel,
- Unauthorized modifications to the reel,
- Technical modifications to the installation,
- Use of unauthorized spare parts and/or accessories.

The equipment actually delivered may differ from the one presented in the explanations and illustrations described here if special variants or additional options are used, or due to recent technical changes.

The obligations contained in the delivery contract and in our general conditions of sale apply, as well as the conditions of delivery of the manufacturer and all regulations applicable at the time when the contract was concluded.

All products can be subject to technical modifications within the framework of improvement in the function and the technological development of components.

Conductix-wampfler has tested and validated cables that are suitable for its reels and guarantee optimum lifetime of the reel and cable combination. Conductix-wampfler disclaims any responsibility for the lifetime of the cable if it is not of its supply and if the information allowing its sizing is incorrect: minimum and maximum diameters, minimum bend radius, maximum pull in service, maximum current, voltage drop, maximum and minimum working temperatures, and maximum speed of use on the reel.

A.3 Copyright

These Instructions for installation and use are subject to copyright and intended exclusively for internal use.

The provision of installation and operating instructions to third parties, copying, in any form, even in part, as well as the reuse and/or the disclosure of their contents are not permitted without the written approval of the manufacturer, except for internal use. Any violation will be subject to damages; additional claims not being excluded.

A.4 Spare parts

Spare parts must be supplied exclusively by authorized re-sellers or directly from the manufacturer. The address appears on the first page of this manual.



WARNING

Safety risk due to poor spare parts!

Incorrect or faulty spare parts can cause damage, malfunctions or total failure of the equipment, as well as affecting safety.

Therefore:

- Use only original manufacturer's spare parts!
- Fastenings must be replaced by fastenings of quality classes and dimensions equivalent to the original.

A.5 Warranty

The warranty conditions are shown in the manufacturer's "General conditions of sale".

A.6 Customer service

Our customer service team is available for technical information. The address appears on the first page of this manual.

Our staff is also always interested in new information and experiences in the field that could be useful for the improvement of our products.

B Safety instructions

B.1 Definition of symbols

The safety instructions are identified in this manual by symbols.

Warnings are used to indicate the degree of danger. Always observe danger and safety information and work with care to avoid accidents, bodily harm or damage to the equipment!



Indicates an immediately hazardous situation, which if not avoided, may result in death or serious injury.



Indicates a possibly hazardous situation, which if not avoided, may result in death or serious injury.



Indicates a possibly hazardous situation, which if not avoided, may result in moderate or minor injury and property damage.



Tips and recommendations:

Refers to useful tips and recommendations as well as information for efficient and trouble-free operation.

B.2 Personnel requirements

B.2.1 Qualifications



Injury due to insufficient qualification!

Improper use can result in serious injury and property damage.

Therefore:

- All activities may only be performed by qualified personnel!

The following qualifications have been mentioned in these IOM instructions for different areas of operation:

- Trained personnel/operators have been instructed by the operating body about the tasks assigned to him/her and the possible hazards resulting from improper use.
- Qualified specialists due to their specialized training, knowledge, and experience, as well as knowledge of applicable regulations, are capable of carrying out work assigned to them, while independently recognizing and avoiding possible risk.
- Only those persons are authorized as personnel who can be expected to perform their work reliably. People whose capacity for reaction is influenced e.g. by drugs, alcohol, or medications are not authorized.
- When selecting personnel, follow all age- and occupation-specific guidelines applicable at the location of use.

B.2.2 Unauthorized personnel



Danger due to unauthorized personnel!

Unauthorized personnel who do not meet the requirements described here do not understand the danger in the working area.

Therefore:

- Keep unauthorized personnel away from the working area.
- In case of doubt, address the persons and direct them away from the working area.
- Stop work as long as unauthorized personnel is in the working area.

B.2.3 Instruction

Before commissioning the equipment, personnel must be instructed by the operating body.

For better tracking, log the implementation of the instruction as follows:

Date	Name	Type of instruction	Given by	Signature
01/01/2016	Pierpol Jacques	First aid training for personnel	Jacques Pierre-Paul	

B.3 Personal protective equipment

B.3.1 Mandatory protection during any intervention



Hard hat / Helmet

for protection from falling and flying parts and materials.



Protective gloves

for the protection of hands from friction, scrapes, stabbing, or deep wounds, as well as from contact with hot surfaces.



Work safety clothing

is close-fitting work clothing that has a low tearing strength with tight arms and no parts that protrude. It is mostly used as protection from getting caught by moving machine parts. Do not wear any rings, chains or any other jewelry!



Safety shoes

used to protect from falling heavy parts and slipping on slippery floors.

B.3.2 Additional protection

When carrying out particular tasks, special safety equipment is required. The individual sections of these instructions specify this equipment in detail. The following particular safety gear is explained below:



Safety glasses

for the protection of the eyes.



Mask

For protection against materials, particles and organisms.
Especially: wear dust from slip rings or brushes.

B.4 Intended use



WARNING

Possible injury resulting from improper use!

Any application that deviates from or goes beyond the intended use of the machine can result in a hazardous situation.

Therefore:

- The spring cable reel may only be used as intended.
- Comply strictly with all specifications of these installation and operating instructions.

The following uses of the device are forbidden:

- Using the device with unapproved accessories not authorized by the manufacturer.
- Operation of the device by untrained personnel.
- Operation of the device when installed on an improper foundation / base.
- Operation under conditions other than the agreed environmental and operating conditions.

The equipment is exclusively designed and built for the intended use described here.

The spring cable reel is used for the winding and unwinding of a mobile power supply line (cable suitable for the use on reels) for a mobile machine.

Claims of any kind due to damages from improper use are excluded.

The operator bears sole liability for all damages resulting from unintended use.

B.5 Protective measures

The device is used in the commercial/industrial sector. The operating body of the device is thus subject to legal obligations for workplace safety. In addition to the safety guidelines in these installation and operating instructions, the safety, accident protection, and environmental protection regulations applicable to the place of operation of the unit must be followed.

This particularly includes:

- The operator must be informed of applicable workplace safety guidelines and identify any additional hazards that result from the special working conditions at the location of use of the device. These must be expressed in the form of operating instructions for operation of the device.
- The operator must verify during the entire time the device is in use that the operating instructions provided still correspond to the current state of regulations, and adapt the instructions as necessary.
- The operator must clearly regulate and determine responsibilities for installation, operation, troubleshooting, and maintenance.
- The operator must ensure that all employees involved with the unit have read and understood these installation and operating instructions. He must furthermore train personnel at regular intervals and inform them of hazards.
- The operator must provide personnel with all required safety gear.

The operator is furthermore responsible for ensuring that the device is always in a technically trouble-free condition. The following thus applies:

- The operator must ensure that the maintenance schedule described in these installation and operating instructions is followed.
- The operator must have all safety systems regularly inspected for functionality and completeness.

B.6 Specific hazards

The following section lists residual risks determined based on a risk assessment.

Follow the safety instructions listed here and the warnings in other sections of these installation and operating instructions in order to reduce health hazards and avoid dangerous situations.



DANGER

Danger of death from electrocution!

The equipment is fed by an electric current. Upon contact with live components or in case of damaged insulation, there is a danger of fatal injury.

Therefore:

- Operate the system only with complete safety systems in working order!
- Replace loose or damaged cables and lines immediately!
- Avoid contact with live parts!
- Use insulated tools!
- When disconnecting the safety measures, e.g. during commissioning, troubleshooting, and maintenance, shut the system down and secure it against unauthorized, unintentional, or accidental activation!
- Check that no voltage is applied to the system before any work on it!



DANGER

Danger of death by electrocution!

The slip ring housing and its mounting on the reel are not designed to withstand external mechanical loads other than those identified for the normal operation of the installation.

Therefore:

- Do not climb or walk on the slip ring housing.



WARNING

Danger of death due to suspended loads!

During loading / unloading operations, there is a danger of death from falling parts or those swinging out of control.

Therefore:

- Never step under suspended loads.
- Follow the specifications for the lifting points provided.
- Use only authorized lifting appliances and separate lifting accessories with sufficient load capacity.
- Do not use torn or worn ropes, textile slings or straps.
- Do not attach ropes or straps to sharp corners and edges, and do not knot or twist them.
- Only move loads under supervision.
- Set down the load when leaving the workplace.

**WARNING****Risk of falls!**

The spring cable reel is mostly composed of rotating moving parts. The reel and its bracket are not designed to withstand mechanical loads other than those identified during normal operation of the installation.

Therefore:

- Do not climb or walk on the reel.

**CAUTION****Danger of pinching, crushing and shearing injuries!**

Locations:

- Between cable and cable
- Between cable and drum flanges
- Between cable and drum body
- Between rotating parts and optional bracket 'SE' (if supplied)
- Between cable and optional roller guide arm 'BR' (if supplied)
- At the pivot of the optional swivel bracket 'SP' (if supplied)

Therefore:

- Never work on moving parts.
- During commissioning, operation and maintenance, take protective measures (e.g. safety fence) or keep a minimum distance from rotating parts to rule out danger.
- When disconnecting the safety means, e.g. during commissioning, troubleshooting, and maintenance, shut the system down and secure it against unauthorized, unintentional, or accidental activation.

**CAUTION****Danger of injuries by friction and scrapes!**

During operation of the system, the rotation of the reel and its projecting threaded rods and other parts may cause friction or scrapes.

Therefore:

- Do not stay near the reel.
- Take protective measures (e.g. safety fence) to keep a minimum distance from the rotating reel to rule out danger.

B.7 Actions in the event of accidents and faults**B.7.1 Measures in the event of accidents:**

- Secure the location of the accident.
- Shut down the system and secure it against unauthorized, unintentional, and/or accidental activation.
- Evacuate personnel from of the danger area.
- Notify rescue services.
- Take first-aid measures.
- Inform responsible parties at the place of operation.
- Inform rescue services in detail.

B.7.2 Measures to be taken in case of malfunction:

- Shut down the system and secure it against unauthorized, unintentional, and/or accidental activation.
- Secure the work area against entry.
- Involve qualified personnel for fault analysis.

C Specifications

C.1 General information

The spring cable reel is used for the automatic winding and unwinding of a mobile power supply line (cable suitable for the use on reels) for a mobile machine. The exact specifications of the spring driven reel can be found in the order confirmation. The dimensions of the spring driven reel can be found in the dimension sheet.

C.2 Operating conditions

C.2.1 General conditions



WARNING

Risk of injury due to incorrect use!

The reel is designed to be used only in a neutral industrial environment, and according to the criteria listed below.

Therefore:

Conductix-wampfler declines any responsibility in the event of:

- Non-compliance with the terms and conditions of use
- Damage to all or part of the reel caused by shock, excessive vibration or any other unanticipated use.

Criteria	Value	Unit
Ambient temperature	-20 up to +60	°C
Max. relative humidity	≤ 95	%
Max. operating travel speed	60 (retrieve application) 30 (lift application)	m/min
Max. acceleration	0.3	m/s ²

C.2.2 Specific conditions

Low temperature option: from -40 up to +40°C

Specific conditions **defined and validated** with the customer may apply in place of the general conditions.

C.3 Identification

C.3.1 Spring cable reel

Order No. / Serial No.

Reel designation

The type label of the reel is located at the rear of the slip ring housing.

When communicating about the specific cable reel provided (e.g. spare parts, modifications, etc.), please specify the type and order number.



Fig.1

C.3.2 Slip ring assembly

The identification label is located on the slip ring assembly, on the side nearest the connection terminals.

Use this information in any communication concerning the slip ring assembly.

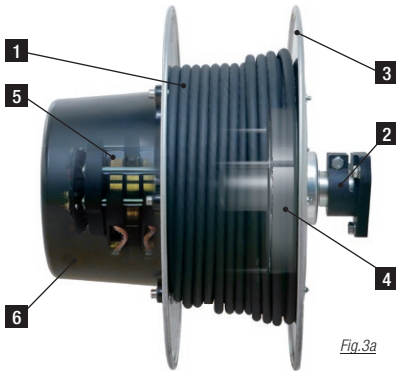


Fig.2

D Product description and mode of operation

D.1 Assembly and designation

■ Overview of components



1. (Wound) cable
2. Mounting flange
3. Cable drum
4. Spring motor
5. Slip ring assembly
6. Slip ring housing

Fig.3a

■ Winding direction



Unless otherwise specified when ordering, spring reels SR are built according to a **winding direction 1** (clockwise direction viewed from slip ring housing).

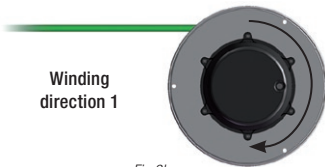
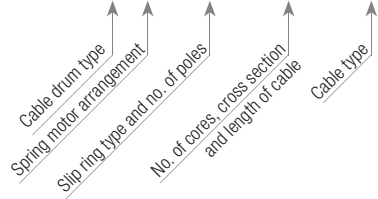


Fig.3b

■ Reel designation

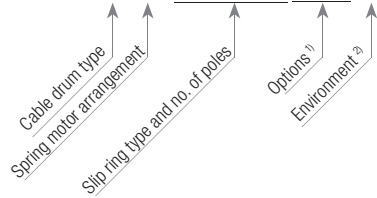
Reels SR-Express:

SR20 2SR 4GD050 040420 GPM-RF



Other reels SR:

SR30 2PA 4GD090+7B CM SE EO



¹⁾ Options

- 'CM': steel slip ring housing, see §D.8.1.
- 'SE', 'BR' or 'SP': brackets, see §D.8.2.
- 'AB': adapter flange, see §D.8.3.

²⁾ Environment

- EO: standard conditions
- E1: low temperature
- E3: severe conditions

D.2 Cable



WARNING

Risk of malfunction!

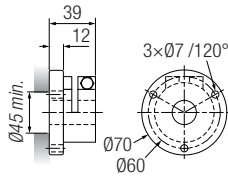
Conductix-wamplifier has tested and validated cables that are suitable for its reels and guarantee optimum lifetime of the reel and cable combination.

Therefore:

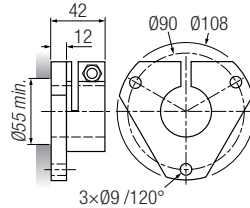
Conductix-wamplifier disclaims any responsibility on the service life of the cable if it is not of its supply and if the information allowing the sizing is incorrect:

- Min./max. cable OD, min. bending radius, max. operating voltage, max. carrying current capacity, voltage drop, min./max. operating temperatures, max. reeling speed.

D.3 Mounting flange



SR10



SR20 - SR30

D.4 Cable drum

The cable drum consists primarily of:

- A drum body made from reinforced plastic (containing the spring motor)
- Two profiled steel flanges
- A hollow shaft
- A pair of sealed, lubricated for life ball bearings.

The drum body is equipped with two cable entries: **S1** for clockwise winding direction, **S2** for counter-clockwise winding direction.

Cable drum	SR10	SR20	SR30
ØA [mm]	170	220	270
ØB [mm]	320	400	450
C [mm]	114	129	179
Min./max. cable OD [mm]	8 / 16	8 / 21	8 / 27
Max. winding diameter [mm]	270	340	400

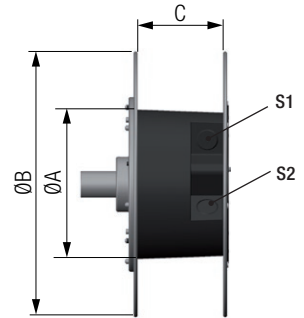


Fig.4

D.5 Spring motor



For safety reasons, the springs are neither accessible nor removable individually (glued bolts). If a spring breaks, the entire cable drum must be replaced (See § J.4.)

The spring motor is fitted inside the cable drum. Depending on the model, it is composed of 1 to 3 springs linked together in series or in parallel.

Spring motor designation

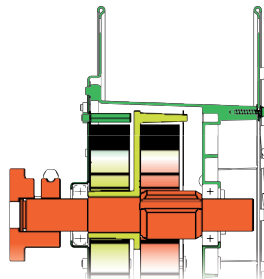
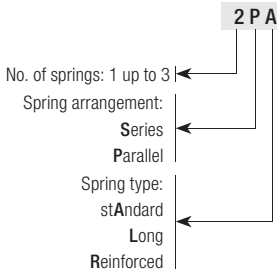


Fig.5a

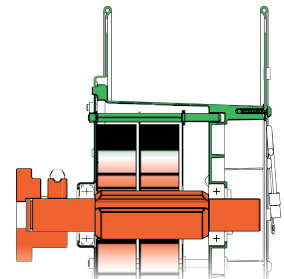


Fig.5b

- A motor with two identical springs in series allows twice the number of working turns.
- A motor with two identical springs in parallel generates twice the tensile pull.

D.6 Slip rings



The slip rings can be used with a TN power supply system referenced to the Earth. An isolation transformer (delta wired at the secondary, with neutral to earth) is always necessary for circuits, whether asymmetrically earthed or not.

D.6.1 General information

The slip ring is used to ensure the electrical connection (power, controls and signals) between the rotating part of the reel (cable drum) and the fixed part (mounting flange and shaft):

- The rings are connected to the fixed cable through the fixed part of the reel (shaft).
- The brush holders are driven in rotation by the rotating part of the reel (cable drum) and are connected to the wound cable.

Max. operating voltage	690 V-AC / 600 V-DC
Max. rotation speed	USR050 : 140 min ⁻¹ USR090 : 80 min ⁻¹
Frequency	50/60 Hz sinusoidal
Min./max. ambient temperature	-20°C / +60°C (derating above +30°C)
Max. relative humidity	90 % (w/o condensation)



Performance data pertain to rotating operation, not stationary operation.

Deviations may be possible on a project-specific basis, for example connection plates or strand connections with or without terminal boxes.

D.6.2 Pole marking

- The Earth pole 'PE' is always positioned first on the drum side
- The power poles (phases) are ordered from 'Pn' to 'P1' from the pole 'PE'
- The control poles (phases) are ordered from 'n' to '1' from the pole 'P1'

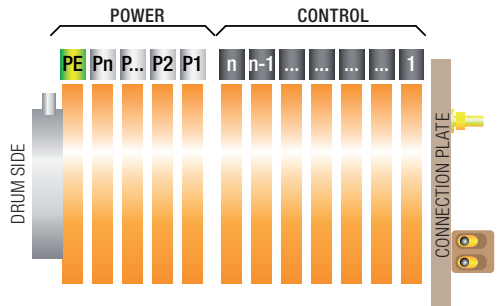


Fig.6a



To identify the connection between the brush holder and the ring, refer to the markings on the conductors.

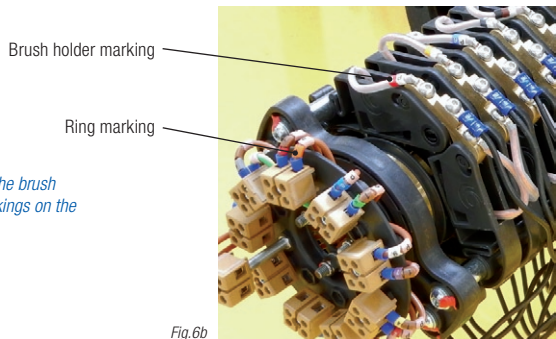
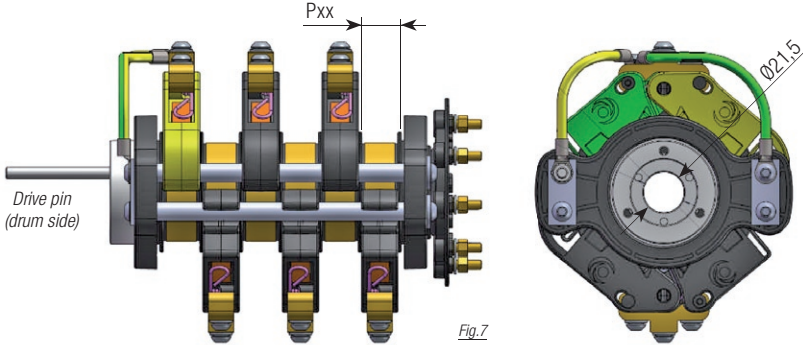


Fig.6b

D.6.3 Slip ring type USR050



Ring type	A050	B050	D050	E050	U050	W050
Amperage [A] ¹⁾	12	25	50	92	analogic signals 4-20 mA	digital signals max. 12 Mbps
Diameter [mm]	50					
Pxx [mm]	9	10	15	21	9	9
Ring material	brass				silver-plated brass	gold-plated brass
Brush material	copper graphite				silver graphite	

¹⁾ Slip rings in motion (rotation), @ +30°C and duty 100%. Above 30°C, amperage value must be de-rated.

■ Connection plates

Connections of the fixed cable cores (through the shaft) to the rings.

Several configurations are possible depending on the type and the number of rings.

Connections on threaded rods (≤5 poles)

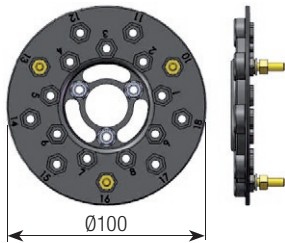


Fig.8a

Connections on terminal blocks (> 5 poles)

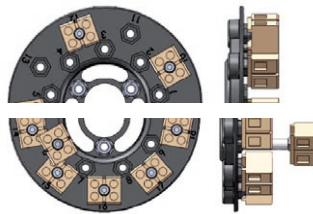


Fig.8b

Brush holder connections

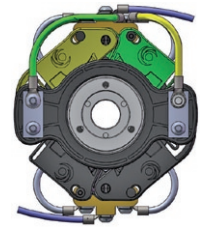


Fig.8c

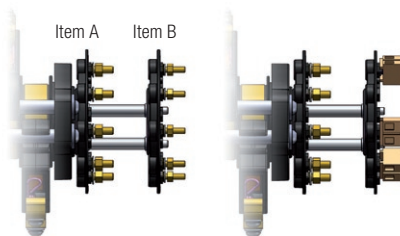


Fig.8d



If the slip ring assembly is equipped with 2 connection plates, the plate item A is reserved for the power conductors and is always equipped with threaded rods.

D.6.4 Slip ring type USR090

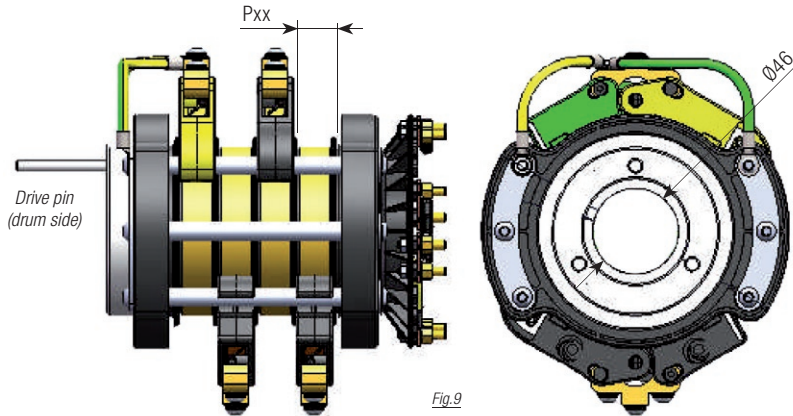


Fig. 9

Ring type	A90	B090	D090	E090	F090	U090	W090
Amperage [A] ¹⁾	18	23	65	100	147	Analogic signals 4-20 mA	Digital signals Bus 12Mbps maxi
Diameter [mm]	90						
Pxx [mm]	9	10	15	21	27	9	9
Ring material	Brass					Silver-plated brass	Gold-plated brass
Brush material	Copper graphite					Silver graphite	

¹⁾ Slip rings in motion (rotation), @ +30°C and duty 100%. Above 30°C, amperage value must be de-rated.

■ Connection plates

Connections of the fixed cable cores (through the shaft) to the rings.

Several configurations are possible depending on the type and the number of rings.

Connections on threaded rods (≤ 24 poles)

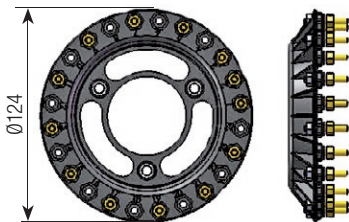


Fig. 10a

Connections on threaded rods (≤ 48 poles)

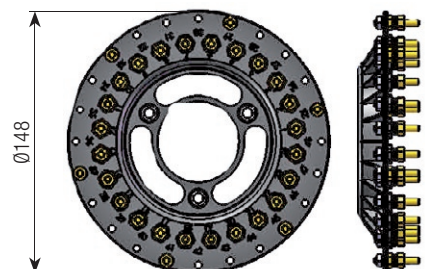
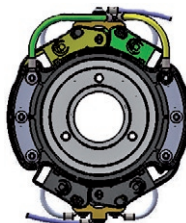


Fig. 10b

Brush holder connections

Fig. 10c

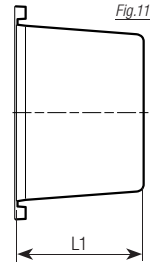


D.7 Slip ring housing

The standard reel is equipped with a slip ring housing made from impact resistant plastic.

The reel can be equipped with a steel slip ring housing (option 'CM').

The slip ring housing is equipped with a breather and a flat seal ¹⁾ and is fixed on the drum flange by captive screws.



Housing	SR10 - SR20			SR30		
	Plastic	Steel		Plastic	Steel	
Material	Plastic	Steel		Plastic	Steel	
Outside diameter [mm]	220	220		330	300	310
L1 [mm]	129 159 209	209 315		159 209 314	209 315	450

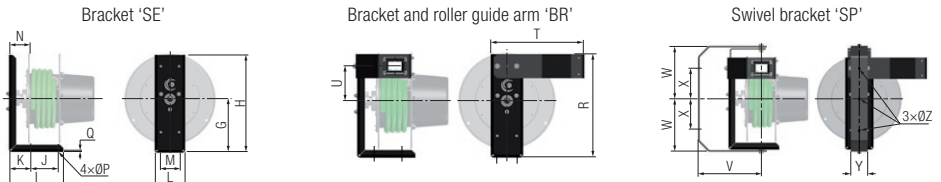
¹⁾ Glued on the slip ring housing: SR10 and SR20 | Glued on the cable drum flank: SR30.

D.8 Options

D.8.1 Steel slip ring housing 'CM'

See § D.7.

D.8.2 Brackets 'SE', 'BR' and 'SP'



	G	H	I	J	K	L	M	N	ØP	Q	R	T	U	V	W	X	Y	ØZ
SR10	213	384	204	120	64	110	80	79	13	6	394	375	131	250	225	130	60	13
SR20	236	431	240	125	95	134	80	92	13	6	431	387	145	300	250	150	80	13
SR30	278	530	276	125	114	134	80	88	13	6	530	428	195	350	295	195	110	13

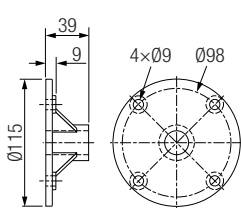
D.8.3 Adapter flange 'AB'

The adaptor flanges 'AB' allow an SR reel to be fitted in place of a reel from another range without changing the existing support. Adaptor flanges are delivered separately from the reel (not fitted).

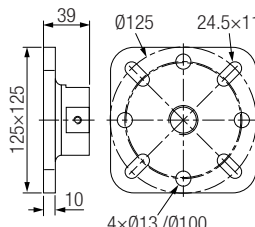


An SR spring reel can be installed in place of an EXEL spring reel (of equivalent size) without adaptor flange.

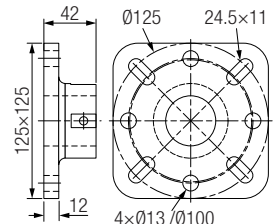
Installation of a reel...	... in place of a reel								Adapter flange Order No.	
	BEF				SIRIO					
	15	18	22	26	0	1	2	3	4	
SR10	AB15				AB00					3194944
		AB18		AB26						3171907
SR20		AB18	AB22	AB26		AB01	AB02	AB03	AB04	3171897
SR30		AB18	AB22	AB26		AB01	AB02	AB03	AB04	



Order No. 3194944



Order No. 3171907



Order No. 3171897

E Handling, packaging and storage

E.1 Handling

E.1.1 Safety Instructions



Danger of death due to suspended loads!

During loading / unloading operations, there is a danger of death from falling parts or those swinging out of control.

Therefore:

- Never step under suspended loads.
- Follow the specifications for the lifting points provided.
- Use only authorized lifting appliances and separate lifting accessories with sufficient load capacity.
- Do not use torn or worn ropes, textile slings or straps.
- Do not attach ropes or straps to sharp corners and edges, and do not knot or twist them.
- Only move loads under supervision.
- Set down the load when leaving the workplace.



Risk of injury due to loads moved!

During loading / unloading operations, there is a risk of injury by crushing.

Therefore:

- Always wear adequate protection: safety shoes, safety helmet, etc.



Possible damage from improper transport!

Improper transport can result in substantial property damage.

Therefore:

- Act with care when unloading packaged parts upon delivery as well as during internal transport, and observe the symbols and the hazard information on the packaging.
- Use only the attachment points provided.
- Wait to remove packaging material until just before installation.

Wear suitable protection equipment during all loading / unloading operations.

- Helmet
- Safety shoes
- Protective gloves
- Work safety clothing



E.1.2 Transport inspection

Check the delivery for completeness and transport damage immediately upon receipt. If transport damage is externally visible, proceed as follows:

- Do not accept delivery, or accept it only with reservations.
- Note the scope of damage on the transport documents or on the transporter's delivery note.
- File a complaint.



Claim every defect as soon as it is detected.

Damage compensation claims may only be made within the applicable claim periods.

E.2 Packaging

Only environmentally friendly materials have been used for packaging. The packaging must protect the individual components from transport damages, corrosion, and other damage until installation.

Thus do not destroy the packaging and remove it only just before installation.

- Handling packaging materials

Dispose of packaging material according to valid legal regulations and local guidelines.



Environmental damage due to improper disposal!

Packaging material is a valuable resource and can be reused, processed or recycled in many cases.

Therefore:

- Dispose of packaging materials in an environmentally appropriate manner.
- Comply with locally applicable disposal guidelines. If necessary, engage a specialist with disposal.

E.3 Storage of packed parts

Store packed parts under the following conditions:

- **Do not store outdoors.** Store in a dry, dust-free place. Protect from direct sunlight.
- Storage temperature: +15 to +35°C, relative humidity: 60% maxi
- Do not expose to aggressive media.
- Avoid mechanical vibrations.
- For elastomer (e.g. seals): no ozone-generating equipment such as fluorescent light fixtures, mercury arc vapor lamps, or high-voltage electrical equipment may be located in the storerooms.
- When storing for more than 3 months, check the general condition of all parts and the packaging at regular intervals. If necessary, add or replace the preservative.



Under some circumstances, there may be instructions for storage on the packed parts which go beyond the requirements listed here. Follow them appropriately!

F Installation

F.1 Safety



DANGER

Danger of death from electrocution!

The product operates using voltage current. Upon contact with live components or in case of damaged insulation, there is a danger of fatal injury.

Therefore:

- Operate the system only with complete safety systems in working order!
- Replace loose or damaged cables and lines immediately!
- Avoid contact with live parts!
- Use insulating tools!
- When disconnecting the safety measures, shut the system down and secure it against unauthorized, unintentional, or accidental activation!
- Check absence of voltage before starting any work on the equipment.



DANGER

Danger of death due to insufficient qualifications!

Improper connection of the cable can result in serious injury to person and property.

Therefore:

- The installation, the crimping of the terminals on the conductors and the connection of the cables must be carried out by a trained and authorized person.



DANGER

Danger of death from electrocution!

The slip ring housing and its mounting on the reel are not designed to withstand external mechanical loads other than those identified for the normal operation of the installation.

Therefore:

- Do not climb or walk on the slip ring housing.



WARNING

Danger of death due to suspended loads!

During loading / unloading operations, there is a danger of death from falling parts or those swinging out of control.

Therefore:

- Never step under suspended loads.
- Follow the specifications for the lifting points provided.
- Use only authorized lifting appliances and separate lifting accessories with sufficient load capacity.
- Do not use torn or worn ropes, textile slings or straps.
- Do not attach ropes or straps to sharp corners and edges, and do not knot or twist them.
- Only move loads under supervision.
- Set down the load when leaving the workplace.



Risk of falls!

The spring cable reel is mostly composed of rotating moving parts. The reel and its bracket are not designed to withstand mechanical loads other than those identified during normal operation of the installation.

Therefore:

- Do not climb or walk on the reel.



Risk of injury due to poor installation!

Poor installation may result in serious personal injury and material damage.

Therefore:

- Before starting the work, clear sufficient space for assembly.
- Handle open components and/or those with sharp edges with care.
- Maintain order and cleanliness in the work area! Poorly stacked components and scattered tools are a source of accidents.
- Install components properly. Observe the recommended tightening torques for the screws.
- Place components so that they cannot fall or overturn.



Danger of pinching, crushing and shearing injuries!

Locations:

- Between cable and cable
- Between cable and drum flanges
- Between cable and drum body
- Between rotating parts and optional bracket 'SE' (if supplied)
- Between cable and optional roller guide arm 'BR' (if supplied)
- At the pivot of the optional swivel bracket 'SP' (if supplied)

Therefore:

- Never work on moving parts.
- During installation, take protective measures (e.g. safety fence) or keep a minimum distance between rotating parts and stationary parts to rule out danger.
- When disconnecting the safety measures, shut the system down and secure it against unauthorized, unintentional, or accidental activation.



Danger of injuries by friction and scrapes!

During operation of the system, the rotation of the reel and its projecting threaded rods and other parts may cause friction or scrapes.

Therefore:

- Do not stay near the reel and the moving parts.
- Take protective measures (e.g. safety fence) to keep a minimum distance from the rotating reel to rule out danger.

■ Personnel

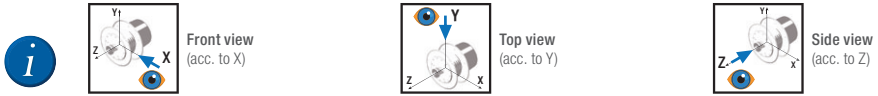
Installation and initial commissioning may only be carried out by specially trained technicians!

Wear the following protective gear during all work of installation and initial commissioning:

- Work safety clothing
- Helmet
- Safety shoes
- Protective gloves



The images in the following chapters are accompanied by pictogram which indicates the orientation of the view.



The X axis is parallel to the laying path of the cable (retrieve application).
 The Z axis is perpendicular to the laying path of the cable.

F.2 Delivery condition

With the exception of some models SR30 with option 'SE', 'BR' or 'SP' delivered in an open wooden crate, all spring reels are delivered in a cardboard box. The reels can be delivered in different configurations.

Spring reel	Optional bracket	Spring motor	Slip ring
Supplied without cable	Without	Not pre-tensioned	Not connected
	'SE', 'BR' or 'SP' (not mounted)		
	'SP'		
Supplied with cable	'BR' or 'SP'	Not pre-tensioned	Connected
	Without		
	'SE', 'BR' or 'SP' (not mounted)	Pre-tensioned	
	'BR' or 'SP'		

Consequently some installation steps described below may not be applicable.

i Before starting installation, the delivery must be checked for completeness and defect-free condition. Damage to components must be reported immediately!

i Check that the delivered reel corresponds to the implementation and intended use, and in particular its winding direction. The winding direction is the opposite of the pre-tensioning (bending) direction indicated on the flank of the cable drum (yellow label) ⇒



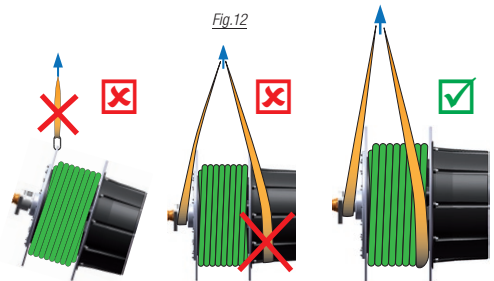
F.3 Installation of the reel

F.3.1 Handling

If the installation of the reel cannot be done manually, place two textile slings according to the opposite figure.

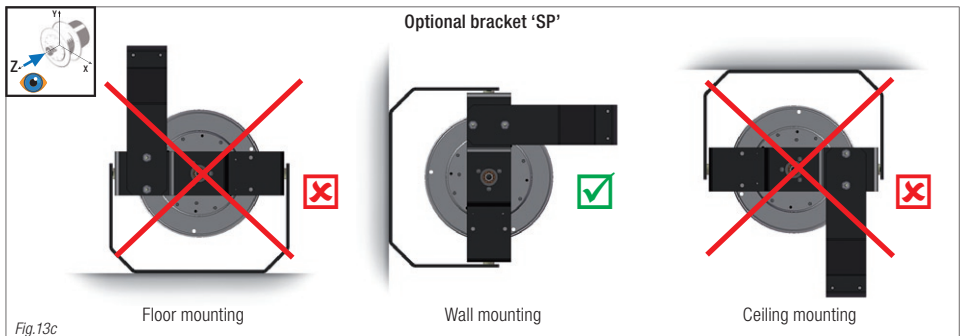
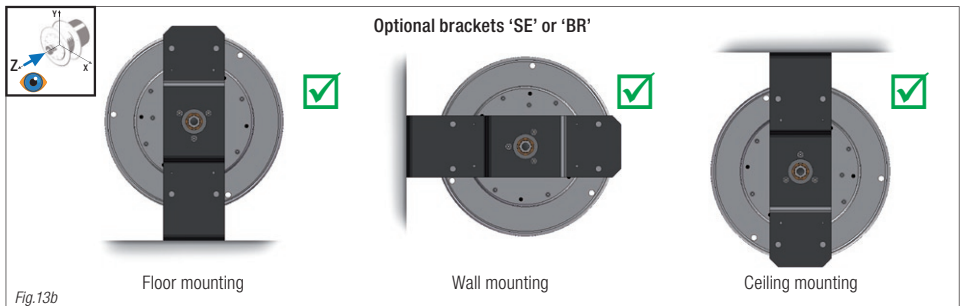
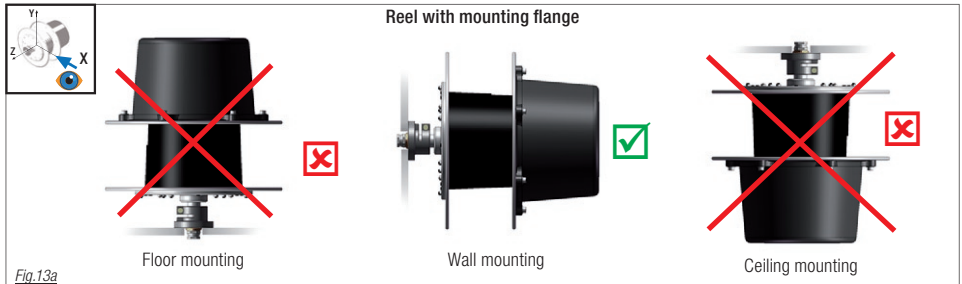
The load must be balanced to avoid any slippage of the slings.

Only use slings in good condition and of suitable length: slings that are too short can cause deformation (cable drum flanges).



i When handling, be careful not to bump the flanges of the cable drum: **deformed flanges do not allow a correct positioning of the cable on the drum.**

F.3.2 Orientation of the reel



WARNING

Risk of pinching or sectioning!

When installed with the optional swivel bracket 'SP', the reel is free to rotate in both directions around its axis.

Therefore:

- Lock the rotation of the reel around its axis mechanically during the mounting of the swivel bracket 'SP'.

F.3.3 Cable laying path

- Reel with flange and reel with option 'SE' - Fig.14a

To ensure correct positioning of the cable on the drum, **the rotation axis of the reel must be perpendicular to the path of the cable.**

- Reel with option 'BR' - Fig.14b

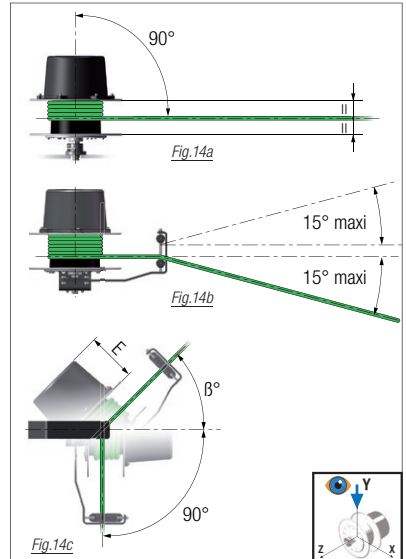
When using a roller guide arm, the deflection angle of the cable must be limited to $\pm 15^\circ$ in relation to the axis of the cable path.

- Reel with option 'SP' - Fig.14c

The maximum swivelling angle β° of the reel is limited by the length of the slip ring housing, according to the table below:

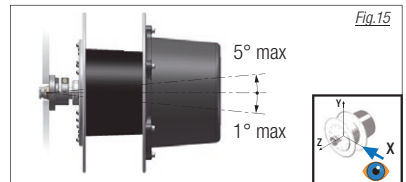
L1 housing ¹⁾ [mm]	E [mm] / β° maxi		
	SR10	SR20	SR30
129	137 / 90	137 / 90	-
159	167 / 55	167 / 90	170 / 90
209	217 / 55	217 / 60	220 / 50
314	-	-	336 / 50

¹⁾ See §D.7.



F.3.4 Rotation axis

The rotation axis of the reel must be **horizontal** and within the tolerances shown on fig.15.



F.3.5 Fastenings



WARNING

Risk of injury due to poor mounting!

Inadequate or inappropriate mounting of the reel assembly can cause its fall.

Therefore:

- The bracket must be rigid and sufficiently sized to withstand the weight of the reel assembly (cable and optional bracket) as well as a maximum tension of 72 daN in the direction of the cable pay-out.
- Only use screws and bolts of class 8.8 minimum.
- Check for the presence of spring washers under each nut.
- Tighten all nuts to the recommended tightening torque.
- All the reel mounting holes (flange or bracket) must be fitted with suitable screws.

The reel must be fixed:

- By its mounting flange: Standard flange, see § D.3. / Adapter flange 'AB' option, see § D.8.2.
- By the bracket 'SE' or the swivel bracket 'SP' (optional): see § D.8.1.

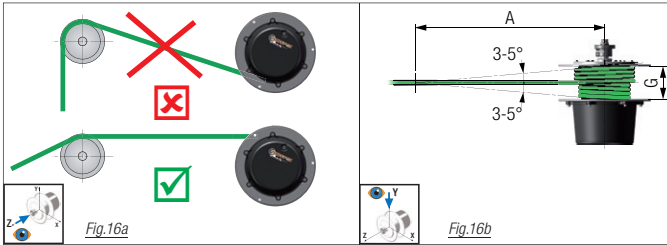
Tightening torque and preload of the metric thread screws, quality 8.8

Diameter × Pitch	Preload [N]	Tightening torque Cs [Nm]
M8 × 1.25	15 240	23
M10 × 1.5	24 275	52
M12 × 1.75	35 400	79

For 90% of use at 0.2% of the elastic limit.

ISO thread, average friction coefficient $\mu = 0.15$

F.3.6 Use with deflecting pulley



Type	G [mm]	A [mm]	
		3°	5°
SR10	114	1100	650
SR20	129	1240	750
SR30	179	1700	1050

F.4 Installation of the wound cable



If the reel is supplied with its wound cable installed and connected, go directly to § F.5



WARNING

Risk of injury due to incorrect installation!

At least one turn of cable ("safety turn") must always be wound on the drum.

Therefore:

- Never unwind the cable beyond the limit defined for the application, up to blockage of the springs. This can cause damage to the springs and the breakage of the reel mounting flange.



CAUTION

Caution!

Protective means of the conductors such as fuses and/or magneto-thermal circuit breakers and cut-out in the event of a fault should be installed by the customer according to the rules in force.

F.4.1 Cable length

The total length of the cable should be:

Cable length = working length + ΔL

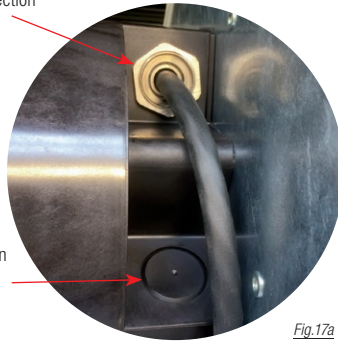
with : ΔL = 1 safety turn (always wound on the drum) + length required for the connections to slip rings and to the fixed point

Type	SR10	SR20	SR30
ΔL [m]	2	2	3

F.4.2 Installation on the cable drum

- Turn the drum manually in the direction on the winding label until blockage. **Do not force beyond this limit.**
- Immobilise the drum in this position mechanically.
- Remove the slip ring housing.
- Insert a sufficient length of cable into the cable gland to allow electrical connection of the conductors to the brush holders of the slip ring assembly.
- Tighten the cable gland.
- Install a Mu washer and a STAUBLI (or equivalent) locking collar on the cable (on the inner side of the cable drum) and press it onto the cable gland.

Cable gland location
Clockwise winding direction



Cable gland location
Counterclockwise winding direction

Fig. 17a

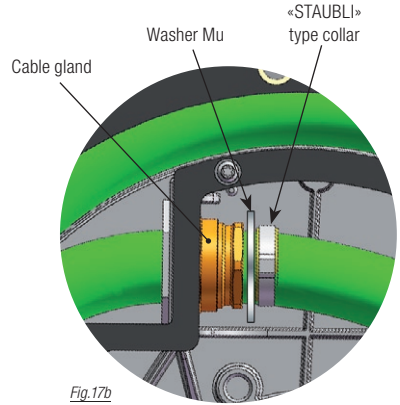


Fig. 17b

- Hold the cable firmly before releasing the cable drum.
- Slowly wrap the cable using the action of the springs. Guide the cable so that the first turn is applied against the drum flange, then the next turns against each other without overlapping
- Proceed with the connection of the conductors on the slip ring brush holders : see §F.6.1.
- Refit the slip ring housing with its flat gasket.

F.5 Installation of the fixed cable



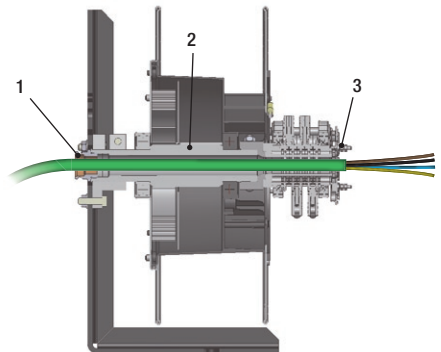
CAUTION

The cable glands supplied with the reel are intended to hold the cable, not to eliminate a tension applied to the cable. It is up to the integrator to ensure that no force is transmitted by the cable to the cable gland.

Therefore:

- Do not exert a force tending to extract or to bend the fixed cable at the cable gland. If such a force occurs, attach the cable so that no force is applied to the cable gland.

- Remove the slip ring housing and its gasket.
- Insert the cable in the cable gland (1) and then into the hollow shaft of the reel (2) beyond the connection plate of the slip ring (3).
- Make the connections to the slip rings: see §F.6.2.
- Before tightening the cable gland at the end of the shaft, pull the cable back gently to absorb any excess length of the conductors.
- Refit the slip ring housing with its gasket.



(Optional bracket 'SE')

Fig. 18

F.6 Slip ring connections



Danger of death by electrocution!

The earth ring must always be connected to the earth of the installation. This can be done via the cable of the reel or via a specific conductor if the cable does not have an earth conductor. It must be colored green / yellow and be clearly identifiable.



Danger of death by electrocution!

Never disconnect the earth shunt between the slip ring and the drum flange.



Use only insulated terminals or ferrules, preferably made from poly carbonate (for temperature resistance). The terminals or ferrules should be crimped with suitable tools according to the section of the conductors.

The rules and installation recommendations of the manufacturer of the terminals must be respected.

Operators must be certified.



Each shield must be connected to a specific ring of the slip ring, not shared with other earth or shield connections.

	Brush holder	Connection plate	
		On threaded rods	On terminal blocks
Max. number of lugs per connection point	4 ¹⁾	3 ¹⁾	1 (ferrule)

¹⁾ Position the lugs so as not to bend them.

F.6.1 Connections to the brush holders (wound cable)

The brush holders are provided with screws and washers (cable and terminals by others).

■ Earth brush holder

- Prepare the G/Y conductor of adequate section and length and crimp on an insulated connection lug.
- Remove the screw (1) and the washer (2)
- Fit the lug (3)
- Refit the washer and the screw and tighten to the recommended torque.

Ring type	Cond. section [mm ²]	Screw dia. rep.1	Tightening torque [Nm]
A	max. 1.5	M4	1.5
B	max. 4		
D	max. 10	M6	3.0
E			

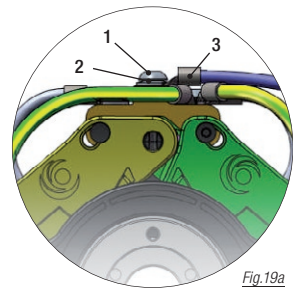


Fig.19a

■ Power and control brush holders

- Prepare each conductor of adequate section and length and crimp on an insulated connection lug.
- Remove the screws (1) and the washer (2)
- Fit the lugs (3)
- Refit the washer and the screw and tighten to the recommended torque.

Ring type	Cond. section [mm ²]	Screw dia. rep.1	Tightening torque [Nm]
U or W	0.5	M4	1.5
A	1.5		
B	4		
D	10	M6	3.0
E	10 (x2)		

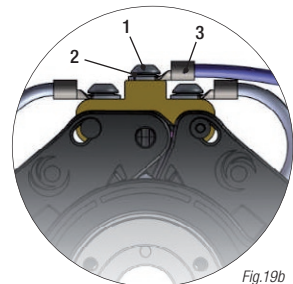


Fig.19b

F.6.2 Connections to the rings (fixed cable)

The threaded rods are provided with nuts and washers (cables and lugs by others).

- Earth conductor on threaded rod
 - Prepare the G/Y conductor of adequate section and length and crimp on an insulated connection lug.
 - Remove the nut (1) and the washer (2)
 - Fit the lug (3) on the threaded rod.
 - Refit the washer and the nut and tighten to the recommended torque.

Ring type	Cond. section [mm ²]	Screw dia. rep.1	Tightening torque [Nm]
U or W	0.5	M4	1.5
A	1.5		
B	4		
D	10	M5	2.0
E	10 (x2)	M5 (x2)	2.0

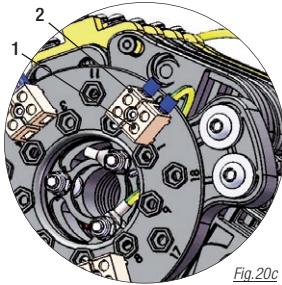
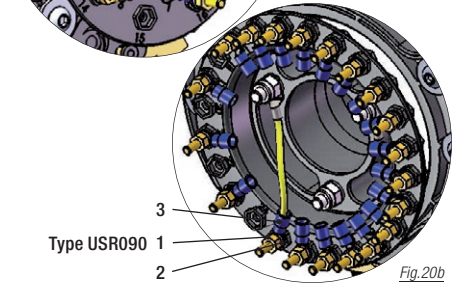
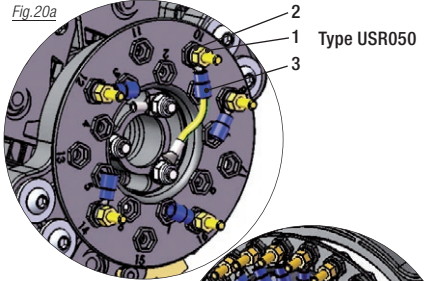


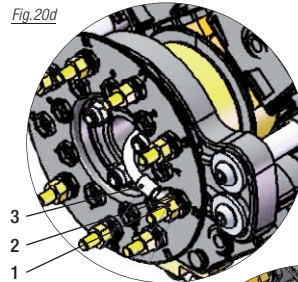
Fig. 20c

- Power and control conductors on threaded rod
 - Prepare each conductor of adequate section and length and crimp on an insulated connection lug.
 - Remove the nut (1) and the washer (2)
 - Fit the lug (3) on the threaded rod.
 - Refit the washer and the nut and tighten to the recommended torque Cs.

Ring type	Cond. section [mm ²]	Screw dia. rep.1	Tightening torque [Nm]
U or W	0.5	M4	1.5
A	1.5		
B	4		
D	10	M5	2.0
E	10 (x2)	M5 (x2)	2.0



- Earth conductor on connection terminal (USR050)
 - Prepare the G/Y conductor of adequate section and length and crimp on an insulated connection terminal.
 - Loosen the bolt (1) of the terminal block (2)
 - Fit the terminal in the terminal block.
 - Tighten the terminal block screw



Type USR050

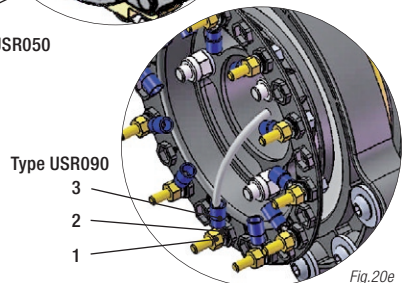


Fig. 20e

- Power and control conductors on terminal blocks (USR050)
 - Prepare each conductor of adequate section and length and crimp on an insulated connection terminal.
 - Loosen the screw (1) of the corresponding terminal block (2)
 - Fit the ferrule (3) in the terminal block.
 - Tighten the terminal block screw.

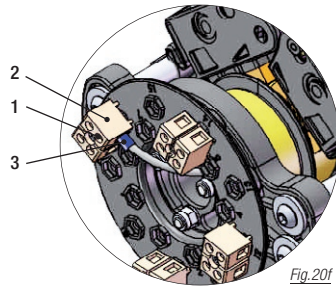


Fig. 20f

F.7 Pre-tensioning of the spring motor



It is imperative to respect the number of pre-tensioning (bending) turns 'NA' indicated on the yellow label!



WARNING

Risk of injury by impact, rubbing or shearing!

The reel is equipped with powerful springs. If the cable drum is released while the springs are bent, it rotates at high speed, in an uncontrolled manner, until the springs are relaxed.

Therefore:

- Prevent the cable unwinding during the springs pre-tensioning phase.
- Prevent a sudden release of the tension of the springs.
- Do not attempt to stop the rotation of the cable drum with your hands.
- Wear protective gloves.



The reels equipped with a cable stop (options 'BR' and 'SP') are delivered with the spring motor pre-tensioned.

- The cable is wound on the reel drum, with the free end of the cable attached to the drum by means of a cord.
- The reel is blocked in rotation.
- To obtain the initial tension of the spring motor or BENDING:
 - Rotate the drum and the cable in the direction of rotation indicated by the arrow on the yellow label on the side of the drum.
 - Perform the number of revolutions ('NA') indicated on the side of the drum.
- Detach the cord to release the end of the cable.
- Remove a cable length equal to $\Delta L / 2$ from the drum **without rotating it** (see § F.4.1.)

Note: In some cases, an extra length of cable is provided for connection to the attachment point. Also remove this extra cable length from the drum without rotating it.
- Grasp the cable end and move it to the anchor point (release the rotation of the drum and pay out the cable normally). Attach the cable end with a cable grip and a spring impact absorber (see § F.8.).

F.8 Securing of the cable to the anchor point



WARNING

Danger of injury by impact, and getting caught up!

In the event of sudden failure of the anchor point, the spring reel pulls the cable back at high speed which causes a whiplash effect that is dangerous for people and equipment in the vicinity.

Therefore:

- The anchor point must be sufficiently sized and secured to resist the permanent tensile forces generated by the reel and the cable.

■ Construction of the anchor point

There are different solutions for the construction of the anchor point. The absorption of the tension and the return are handled by a cable grip (suitable for horizontal or vertical cables).

1. Cable grip (mesh)
2. Spring impact absorber



Fig. 21

- The cable anchor point must be located on the axis of the drum (see § F.3.3)
- To install the cable grip (1), compress it slightly before sliding and positioning it around the cable. Provide enough cable to have an "S" shaped loop before the connection box.
- Attach the cable grip to the spring impact absorber (2)
- Make the electrical connection of the cable to the anchor point.



Fig.22

G Commissioning



This equipment is not designed to be used in Explosive ATmospheres (ATEX)
in accordance with the definition in directive 2014/34/UE dated 29 march 2014



G.1 Safety



DANGER

Danger of death by electrocution!

The slip ring housing and its mounting on the reel are not designed to withstand external mechanical loads other than those identified for the normal operation of the installation.

Therefore:

- Do not climb or walk on the slip ring housing.



WARNING

Risk of falls!

The spring cable reel is mostly composed of rotating moving parts. The reel and its bracket are not designed to withstand mechanical loads other than those identified during normal operation of the installation.

Therefore:

- Do not climb or walk on the reel.



WARNING

Risk of injury due to poor commissioning!

Commissioning carried out incorrectly can lead to dangerous situations for users.

Therefore:

- Before commissioning perform the tests on the manufacturer's check-list.



CAUTION

Danger of pinching, crushing and shearing injuries!

Locations:

- Between cable and cable
- Between cable and drum flanges
- Between cable and drum body
- Between rotating parts and optional bracket 'SE' (if supplied)
- Between cable and optional roller guide arm 'BR' (if supplied)
- At the pivot of the optional swivel bracket 'SP' (if supplied)

Therefore:

- Never work on moving parts.
- During commissioning, take protective measures (e.g. safety fence) or keep a minimum distance between rotating parts and stationary parts to rule out danger.
- When disconnecting the safety means, shut the system down and secure it against unauthorized, unintentional, or accidental activation.



CAUTION

Danger of injuries by friction and scrapes!

During operation of the system, the rotation of the reel and its projecting threaded rods and other parts may cause friction or scrapes.

Therefore:

- Do not stay near the reel.
- Take protective measures (e.g. safety fence) to keep a minimum distance from the rotating reel to rule out danger.

G.2 General information

The commissioning of the reel is performed jointly with the user of the system and is documented. All the staff required for the commissioning (operators, electricians and installation technicians) must be made available by the user of the system for the whole duration of the operation. Free access to the system must be provided. Once the commissioning is completed, Conductix-wampfler will receive from the user a protocol of final acceptance in which it is stipulated that the system meets the requirements of the application.

G.3 Check-list before commissioning

- Check if the characteristics of the spring reel are compatible with the use, especially if the section of cable conductors is compatible with the current consumed by the mobile unit fed taking into account the de-rating factors below.
- Check that the maximum current of the cable is lower than the current capacity of the slip rings.
- Check that the electrical circuit is properly protected.
- Check the continuity of the earth.
- Make sure that the operators are trained in the use of the spring reel.

Use with max. voltage 690V-AC or 600V-DC

- Max. amperage for one conductor (in operation @+30°C, 100% duty)

Section [mm ²]	1	1.5	2.5	4	6	10	16
Amperage [A]	15	20	25	35	45	63	84

- Derating factor according to the number of conductors (< 10 mm²)

No. of conductors	4	5	7	12	18	24
Factor	1	0.75	0.65	0.53	0.44	0.40

- Derating factor according to the ambient temperature

Temperature [°C]	30	40	50	55	60
Factor	1	0.90	0.80	0.74	0.65

- Derating factor for multi-layers of cable

No. of layers	1	2	3+
Factor	1.00	0.80	0.65

G.4 Operation tests



WARNING

Risk of injury due to incorrect installation!

At least one turn of cable ('safety turn') must always be wound on the drum.

Therefore:

- Never unwind the cable beyond the limit defined for the application, up to blockage of the springs. This can cause damage to the springs and the breakage of the reel mounting flange.

Unwind the cable from the reel completely by hand, including the safety turn. If everything is correct, wind up the cable. If the drum blocks and there is still some cable on it:

- Count the number of remaining spires of cable on the drum,
- Redo the pre-tensioning procedure of the spring motor reducing the number of turns 'NA' by the number of remaining turns.

Perform complete translations with stopping and starting.

During the first test, it is necessary to check that the cable winds up correctly on the drum, without torsion, over the entire length of the travel.

The cable must form a slight curve during the winding and unwinding according to the opposite figure.

A: Excessive tensile pull in the cable

B: Correct tensile pull

C: Insufficient tensile pull in the cable

In the event of a fault, investigate the cause by referring to §1. «Troubleshooting».

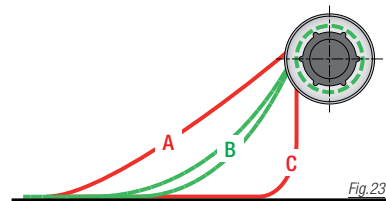


Fig.23

H Operation

H.1 Safety



DANGER

Danger of death from electrocution!

The slip ring housing and its mounting on the reel are not designed to withstand external mechanical loads other than those identified for the normal operation of the installation.

Therefore:

- Do not climb or walk on the slip ring housing.



WARNING

Danger of injury due to improper operation!

Improper operation can result in serious injury to person and property.

Therefore:

- Carry out all operating steps according to the specifications of these operating instructions.
- Before starting work, be sure that all covers and safety systems are installed and working properly.
- Never disable the safety systems during operation.
- Maintain order and cleanliness in the working area! Loosely stacked or scattered components and tools are a source of accidents.



WARNING

Danger of death from electrocution!

The cable must be able to wind and unwind freely, without contact or external friction that could damage its insulation.

Therefore:

- Do not drive or walk on the cable.
- Do not place a load on the cable.
- Check visually the general condition of the cable regularly (insulating sheath).



WARNING

Danger of injury due to improper operation!

The cable must be able to wind and unwind freely, without external mechanical loading that could damage or break it suddenly (risk of 'whiplash').

Therefore:

- Before every operation, check that the cable track is free of any source of blocking or friction. Check that there are no sharp edges in the vicinity of the cable.
- Check visually the general condition of the cable regularly (insulating sheath).



WARNING

Danger for unauthorized personnel!

Unauthorized personnel who do not meet the requirements described here do not understand the danger in the working area.

Therefore:

- Keep unauthorized personnel away from the working area.
- In case of doubt, address the person and direct them away from the working area.
- Stop work as long as unauthorized personnel is in the working area.



WARNING

Danger due to entanglement!

During operation of the system, the rotation of the reel and its projecting threaded rods and other parts can pick up and drag surrounding objects.

Therefore:

- Do not stay near the reel. During operation, take protective measures (e.g. safety fence) or keep a minimum distance from the rotating reel to rule out danger.



WARNING

Risk of tripping!

During operation of the system, there is a risk of tripping resulting in injury due to the movement of the wound cable.

Therefore:

- During operation, keep a safety distance from the cable deposit track.



Danger of pinching, crushing and shearing injuries!

Locations:

- Between cable and cable
- Between cable and drum flanges
- Between cable and drum body
- Between rotating parts and optional bracket 'SE' (if supplied)
- Between cable and optional roller guide arm 'BR' (if supplied)
- At the pivot of the optional swivel bracket 'SP' (if supplied)

Therefore:

- Never work on moving parts.
- During operation, take protective measures (e.g. safety fence) or keep a minimum distance between rotating parts and stationary parts to rule out danger.
- When disconnecting the safety measures, shut the system down and secure it against unauthorized, unintentional, or accidental activation.



Danger of injuries by friction and scrapes!

During operation of the system, the rotation of the reel and its projecting threaded rods and other parts may cause friction or scrapes.

Therefore:

- Do not stay near the reel and the moving parts.
- Take protective measures (e.g. safety fence) to keep a minimum distance from the rotating reel to rule out danger.



Risk of falls!

The spring cable reel is mostly composed of rotating moving parts. The reel and its bracket are not designed to withstand mechanical loads other than those identified during normal operation of the installation.

Therefore:

- Do not climb or walk on the reel.

■ Personnel

The equipment can only be used by qualified personnel.

Personal protection equipment (must be worn during all jobs):

- Work safety clothing
- Helmet
- Safety shoes
- Protective gloves



H.2 Operation

The operation of the spring reel is fully automatic. No action is necessary on the product during normal and usual use.

Troubleshooting

I.1 Safety



DANGER

Danger of death from electrocution!

The equipment is fed by an electric current. Upon contact with live components or in case of damaged insulation, there is a danger of fatal injury.

Therefore:

- Operate the system only with complete safety systems in working order!
- Replace loose or damaged cables and lines immediately!
- Avoid contact with live parts!
- Use insulating tools!
- Before disconnecting the safety measures, shut the system down and secure it against unauthorized, unintentional, or accidental activation!
- Check absence of voltage before starting any work on the equipment.



DANGER

Danger of death from electrocution!

The slip ring housing and its mounting on the reel are not designed to withstand external mechanical loads other than those identified for the normal operation of the installation.

Therefore:

- Do not climb or walk on the slip ring housing.



WARNING

Danger of burns!

During (or just after) operation, certain parts or external surfaces of the reel can be hot.

The slip ring assembly is a component that heats up in normal operation, regardless of the rotation of the reel.

Therefore:

- Wear suitable protection equipment before any intervention on the spring reel.
- Before any intervention on the slip rings, check that its constituent parts are not hot before touching them.



WARNING

Risk of cuts and sectioning!

The spring motor is dangerous component. It is not designed to be replaced. The direct accessibility of the springs is prevented by a closing flange and by captive screws.

Therefore:

- Do not attempt to remove the screws.
- Do not attempt to access the springs directly by any means.



WARNING

Danger of injuries due to improper troubleshooting!

Improper troubleshooting can result in serious injury to person and property.

Therefore:

- Contact the manufacturer in case of malfunction.
- Allow troubleshooting to be carried out only by personnel from or authorized by the manufacturer.



WARNING

Risk of injury by pinching!

The slip ring assembly is a rotating electrical component.

Therefore:

- Before starting any intervention on the slip ring assembly: make sure that it cannot rotate unexpectedly.



WARNING

Risk of bodily harm!

In the event of unexpected jamming of the cable, there is a risk of 'whiplash'.

Therefore:

- Evacuate the area. Identify and remove the jam with caution.



WARNING

Risk of falls!

The spring cable reel is mostly composed of rotating moving parts. The reel and its bracket are not designed to withstand mechanical loads other than those identified during normal operation of the installation.

Therefore:

- Do not climb or walk on the reel.

**Danger of pinching, crushing and shearing injuries!**

Locations:

- Between cable and cable
- Between cable and drum flanges
- Between cable and drum body
- Between rotating parts and optional bracket 'SE' (if supplied)
- Between cable and optional roller guide arm 'BR' (if supplied)
- At the pivot of the optional swivel bracket 'SP' (if supplied)

Therefore:

- Never work on moving parts.
- During maintenance, take protective measures (e.g. safety fence) or keep a minimum distance between rotating parts and stationary parts to rule out danger.
- Before disconnecting the safety measures, shut the system down and secure it against unauthorized, unintentional, or accidental activation.

I.2 Spring reel and cable

Mechanical disturbance	Possible cause	Elimination	See
Absence of safety turn at travel end	- Cable too short	- Replace the cable.	§F.4.1.
	- Cable used in excess at the anchor point	- Retrieve a sufficient length of cable from the anchor point	§F.8.
Tension too low during winding	- Incorrect pre-tensioning of spring motor	- Check. Correct if necessary.	§F.7.
	- Check the actual conditions of operation (height, speed, run-up time)	- Correct variations. <i>In the event of impossibility, contact Conductix-wamplifier</i>	-
Incorrect storage positioning of the cable on the drum	- Reel rotation axis not horizontal	- Correct / shim the reel bracket	§F.3.4.
	- Reel axis not perpendicular to the travel	- Correct / shim the reel bracket	§F.3.3.
	- Cable anchor point off centre.	- Align the cable anchor point and the axis of the cable drum	§F.3.3.
	- Poor positioning during winding of the first layer of cable on the drum	- Wind up the cable by forcing the first coil against the flange of the cable drum	§F.4.2.
	- Sticky cable	- Unwind and clean the cable over its entire length (cloth + water)	-
	- Cable too 'nervous', pre-stressed cable	- Secure the drum so that it cannot turn but so that all the cable is unwound. - Disconnect the cable at the anchor point and lay it on the ground to stabilize - Help it by turning it by hand if necessary.	-
Impossible to unwind the cable over the entire travel	- Incorrect pre-tensioning of the spring motor	- Disconnect the cable at the anchor point. - Redo the entire pre-tensioning procedure	§F.7.

I.3 Slip rings

Mechanical disturbance	Possible cause	Elimination	See	
Electrical fault	- Connection to the brush holders	- Tighten the connections screws	§F.6.1.	
	- Internal connection of the rings	- Contact Conductix-Wamplifier	-	
	- Rapid wear of the brushes	- Check the condition of the contact surface of the ring	- Replace the complete brush holder	§J.3.3.
		- Destroyed or pitted rings		
	- Short-circuits and/or electric shocks	- Contact Conductix-Wamplifier	-	
	- Presence of soiling	- Clean using a light jet of dry air	-	
	- Presence of condensation	- Check the efficiency of the anti-condensation heating, if it exists.	-	
Mechanical fault	- Difficult and/or noisy rotation	- Check the condition of the bearings	-	
		- Replace the slip ring assembly if necessary		

J Maintenance

J.1 Safety



DANGER

Danger of death from electrocution!

The equipment is fed by an electric current. Upon contact with live components or in case of damaged insulation, there is a danger of fatal injury.

Therefore:

- Operate the system only with complete safety systems in working order!
- Replace loose or damaged cables and lines immediately!
- Avoid contact with live parts!
- Use insulating tools!
- Before disconnecting the safety measures, shut the system down and secure it against unauthorized, unintentional, or accidental activation!
- Check absence of voltage before starting any work on the equipment.



DANGER

Danger of death from electrocution!

The slip ring housing and its mounting on the reel are not designed to withstand external mechanical loads other than those identified for the normal operation of the installation.

Therefore:

- Do not climb or walk on the slip ring housing.



WARNING

Risk of injury due to poor maintenance!

Faulty servicing may result in serious personal injury and material damage.

Therefore:

- Before starting the work, clear sufficient space for assembly.
- Maintain order and cleanliness in the assembly area! Poorly stacked components and scattered tools are a source of accidents.
- If components have been removed, be sure to reinstall them correctly, to replace all the fastenings and comply with the recommended tightening torques for screws.
- After the maintenance operations, reinstall all safety covers and all the locks.



WARNING

Danger of death due to suspended loads!

During loading / unloading operations, there is a danger of death from falling parts or those swinging out of control.

Therefore:

- Never step under suspended loads.
- Follow the specifications for the lifting points provided.
- Use only authorized lifting appliances and separate lifting accessories with sufficient load capacity.
- Do not use torn or worn ropes, textile slings or straps.
- Do not attach ropes or straps to sharp corners and edges, and do not knot or twist them.
- Only move loads under supervision.
- Set down the load when leaving the workplace.



WARNING

Risk of falls!

The spring cable reel is mostly composed of rotating moving parts. The reel and its bracket are not designed to withstand mechanical loads other than those identified during normal operation of the installation.

Therefore:

- Do not climb or walk on the reel.



CAUTION

Danger of injuries by friction and scrapes!

During operation of the system, the rotation of the reel and its projecting threaded rods and other parts may cause friction or scrapes.

Therefore:

- Do not stay near the reel and the moving parts.
- Take protective measures (e.g. safety fence) to keep a minimum distance from the rotating reel to rule out danger.



CAUTION

Danger of pinching, crushing and shearing injuries!

Locations:

- Between cable and cable
- Between cable and drum flanges
- Between cable and drum body
- Between rotating parts and optional bracket 'SE' (if supplied)
- Between cable and optional roller guide arm 'BR' (if supplied)
- At the pivot of the optional swivel bracket 'SP' (if supplied)

Therefore:

- Never work on moving parts.
- During maintenance, take protective measures (e.g. safety fence) or keep a minimum distance between rotating parts and stationary parts to rule out danger.
- Before disconnecting the safety measures, shut the system down and secure it against unauthorized, unintentional, or accidental activation.

J.2 Maintenance schedule

In order to keep the warranty rights and to avoid damage to the equipment, the system operator is responsible for the execution of the following maintenance tasks. The maintenance tasks must be performed by trained and qualified technicians.

The following sections describe the maintenance tasks required for optimized and problem-free functioning.

If, in the course of regular checks, wear appears faster than expected, the corresponding maintenance intervals should be shortened to take into account the actual findings of wear.

For all questions concerning the maintenance operations and intervals, contact the manufacturer.



DANGER

Danger of death from electrocution!

The equipment is fed by an electric current. Upon contact with live components or in case of damaged insulation, there is a danger of fatal injury.

Therefore:

- After any operation on the reel, the continuity of the equipotential protection circuit must be checked (according to EN60204-1). The permissible voltage drop must be less than 1V with a stabilized current of 10A.

J.3 Servicing

J.3.1 Cleaning



DANGER

Danger of death from electrocution!

The equipment is fed by an electric current. Upon contact with live components or in case of damaged insulation, there is a danger of fatal injury.

Therefore:

- Switch power off before cleaning the spring reel.
- Do not use a high pressure cleaner.

J.3.2 Cable

Periodically check:

- The cable geometry: weaving, snaking. Replace the cable if necessary.
- The outer sheath of the cable: abrasion or perforation. It must not be sticky. Clean if necessary.

J.3.3 Slip rings



DANGER

Risk of reaction, irritation of the mucous membranes and respiratory disease due to dust!

The residues of abrasion of the contact brushes accumulate in the slip ring body. This dust is very fine and presents a health risk.

Therefore:

- During cleaning, wear a suitable equipment: safety glasses and an FFP3 class mask.
- Do not blow the dust with compressed air, but rather vacuum it up. The vacuum cleaner must be equipped with a fine class H filter.
- Do not eat, drink or smoke during work!



CAUTION

Risk of injury by crushing!

Location: brush holders

Therefore:

- Before unlocking, removing, or inserting and locking the brush holders, make sure that there is no possible relative rotation between the brush holders and the rings and the terminal block.
- If necessary, use appropriate protection gloves.

Depending on the limit that is reached first, perform the regular maintenance after:

- One million revolutions;
- One year of operation;
- A machine shut down of at least two months.

■ Procedure

- Check the contact surface of the rings (if necessary, clean using a very dry cloth);
- Remove the dust from the insulating spacers between the rings;
- Clean the rings using a light jet of dry air;
- Check the connections;
- Check tightening of bolts and threaded rods of the rings;
- Check the condition and the cleaning of brushes;
- Check the wear of the brushes: replacement if $X \geq 20$ mm (opposite fig.)

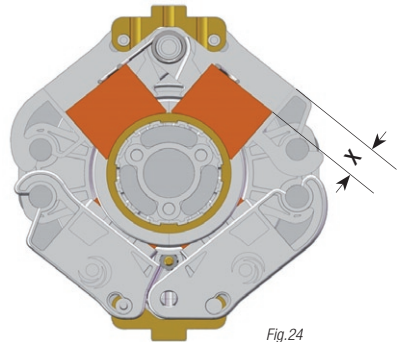


Fig. 24

■ Replacement of the brush holders

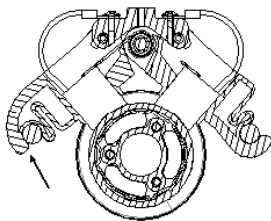


Fig. 25a

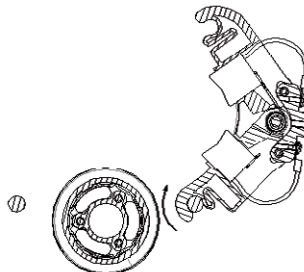


Fig. 25b

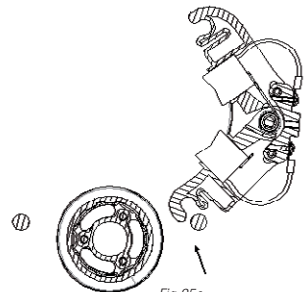


Fig. 25c

The first restart after maintenance must be performed without the slip ring housing and without transmission of electrical energy and / or signals, in order to observe the correct rotation of the rings.

J.4 Spare parts



Safety risk due to poor spare parts!

Incorrect or faulty spare parts can cause damage, malfunctions or total failure of the equipment, as well as affecting safety.

Therefore:

- Use only original manufacturer's spare parts!
- Screws, nuts and washers must be replaced by fastenings of quality class and dimensions equivalent to the original.



In all correspondence, please specify the references of the reel (see § C.3.1.)

J.4.1 Model SR10

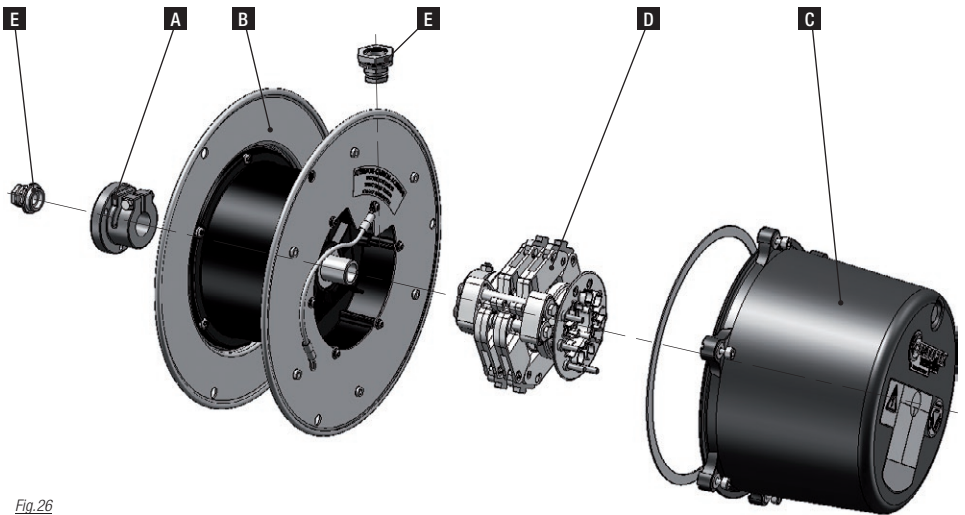


Fig.26

Item	Description of the kit	Order No.	See
	Mounting flange SR10	Consult us	§D.3.
A	Adapter flange SR10 AB15	3194944	§D.8.3.
	Adapter flange SR10 AB00 - AB18 - AB26	3179107	
B	Cable drum SR10 with spring motor 1SA ¹⁾	3172040	§D.4.
	Cable drum SR10 with spring motor 2SA ¹⁾		§D.5.
	Cable drum SR10 with spring motor 2PA ¹⁾		
	Cable drum SR10 with spring motor 1SL ¹⁾		
C	Plastic slip ring housing Ø220 - L1 = 129	Consult us	§D.7.
	Plastic slip ring housing Ø220 - L1 = 159		
	Plastic slip ring housing Ø220 - L1 = 209		
D	Slip ring assembly USR ²⁾	Consult us	§D.6.
	Brush holder ²⁾		
	Complete ring unit ²⁾ (w/o brush holder)		
E	Cable gland		§J.4.4.

¹⁾ Specify winding direction (unless otherwise stated: winding direction 1)

²⁾ Specify the type and the serial no. of the slip ring assembly (see §C.3.2.)

J.4.2 Model SR20

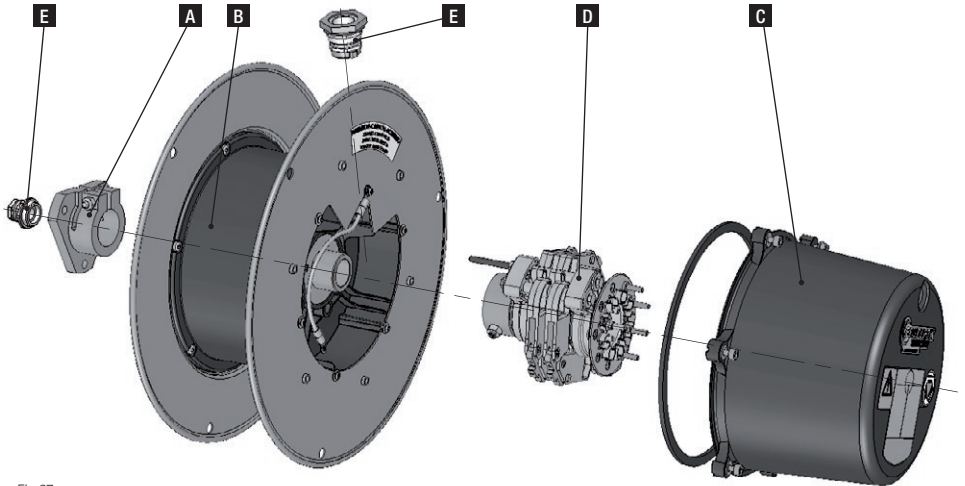


Fig.27

Item	Designation of the kit	Order No.	See
A	Mounting flange SR20	Consult us	§D.3.
	Adapter flange SR20 AB01 - AB02 - AB03 - AB04 - AB18 - AB22 - AB26	3171897	§D.8.3.
B	Cable drum SR20 with spring motor 1SA ¹⁾	3172082	§D.4. §D.5.
	Cable drum SR20 with spring motor 2SA ¹⁾		
	Cable drum SR20 with spring motor 2PA ¹⁾		
	Cable drum SR20 with spring motor 1SR ¹⁾		
	Cable drum SR20 with spring motor 2SR ¹⁾		
	Cable drum SR20 with spring motor 2PR ¹⁾		
C	Plastic slip ring housing Ø220 - L1 = 129	Consult us	§D.7.
	Plastic slip ring housing Ø220 - L1 = 209		
D	Slip ring assembly USR ²⁾	Consult us	§D.6.
	Brush holder ²⁾		
	Complete ring unit ²⁾ (w/o brush holder)		
E	Cable gland		§J.4.4.

¹⁾ Specify winding direction (unless otherwise stated: winding direction 1)

²⁾ Specify the type and the serial no. of the slip ring assembly (see §C.3.2.)

J.4.3 Model SR30

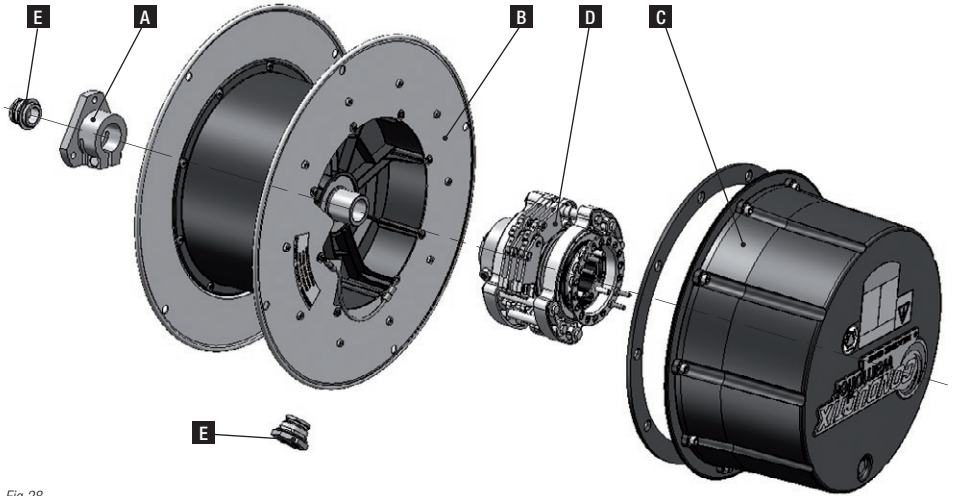


Fig.28

Item	Designation of the kit	Order No.	See
A	Mounting flange SR30	Consult us	§D.3.
	Adapter flange SR30 AB01 - AB02 - AB03 - AB04 - AB18 - AB22 - AB26	3171897	§D.8.3.
B	Cable drum SR30 with spring motor 1SA ¹⁾	3172084	§D.4. §D.5.
	Cable drum SR30 with spring motor 2SA ¹⁾		
	Cable drum SR30 with spring motor 3SA ¹⁾		
	Cable drum SR30 with spring motor 2PA ¹⁾		
	Cable drum SR30 with spring motor 3PA ¹⁾		
	Cable drum SR30 with spring motor 1SR ¹⁾	3172086	
	Cable drum SR30 with spring motor 2SR ¹⁾		
	Cable drum SR30 with spring motor 3SR ¹⁾		
	Cable drum SR30 with spring motor 2PR ¹⁾		
	Cable drum SR30 with spring motor 3PR ¹⁾		
C	Plastic slip ring housing Ø330 - L1 = 159	Consult us	§D.7.
	Plastic slip ring housing Ø330 - L1 = 209		
	Plastic slip ring housing Ø330 - L1 = 314		
D	Slip ring assembly USR ²⁾	Consult us	§D.6.
	Brush holder ²⁾		
E	Complete ring unit ²⁾ (w/o brush holder)	Consult us	§D.6.
	Cable gland		

¹⁾ Specify winding direction (unless otherwise stated: winding direction 1)

²⁾ Specify the type and the serial no. of the slip ring assembly (see §C.3.2.)

K.1.1 Cable glands

Model	Order No.	SR10	SR20	SR30	cable OD
Cable gland ISO16 N05 N, nickel-plated brass	FR-3092069	✓	✓	✓	8 up to 9,5
Cable gland ISO20 N06 N, nickel-plated brass	FR-3092047	✓	✓	✓	8,5 up to 13
Cable gland ISO25 N07 N, nickel-plated brass	FR-3092048	✓	✓	✓	12 up to 17
Cable gland ISO32 N08 N, nickel-plated brass	FR-3092049	✓	✓	✓	15 up to 22
Cable gland ISO40 N09 N, nickel-plated brass	FR-3092061		✓	✓	19,5 up to 28
Flat fiber gasket for ISO16	FR-221645-000				
Flat fiber gasket for ISO20	FR-0404035				
Flat fiber gasket for ISO25	FR-0404036				
Flat fiber gasket for ISO32	FR-0404041				
Flat fiber gasket for ISO40	FR-0404042				

K Dismantling and disposal

K.1 Safety



Danger of injury due to improper disassembly!

Poor dismantling may result in serious personal injury and material damage.

Therefore:

- Before starting the work, clear sufficient space for assembly.
- Maintain order and cleanliness in the work area! Loosely stacked or scattered components and tools are a source of accidents.
- Dismount components properly. Note the high weight of some components. If necessary, use lifting gear.
- Handle open, sharp-edges components carefully.
- Secure components so that they cannot fall or fall over.
- Involve the manufacturer in case of any unclear points.



Danger of death due to suspended loads!

During loading / unloading operations, there is a danger of death from falling parts or those swinging out of control.

Therefore:

- Never step under suspended loads.
- Follow the specifications for the lifting points provided.
- Use only authorized lifting appliances and separate lifting accessories with sufficient load capacity.
- Do not use torn or worn ropes, textile slings or straps.
- Do not attach ropes or straps to sharp corners and edges, and do not knot or twist them.
- Only move loads under supervision.
- Set down the load when leaving the workplace.



Risk of falls!

The spring cable reel is mostly composed of rotating moving parts. The reel and its bracket are not designed to withstand mechanical loads other than those identified during normal operation of the installation.

Therefore:

- Do not climb or walk on the reel.

K.2 Dismantling

After the system is no longer in use, the device must be disassembled and environmentally friendly disposal carried out.

Before starting disassembly:

- Remove operating and auxiliary materials as well as residual processing material, and dispose of them in an environmentally appropriate manner.
- Then clean the assemblies and components properly and disassemble them as required by applicable local workplace safety and environmental protection regulations.



WARNING

Danger of sectioning and severe cuts!

Springs are dangerous elements. When disassembling, take all necessary precautions to avoid sudden release and unfolding of the springs.

K.3 Disposal

Properly disassembled components are to be recycled if no return or disposal agreement has been made.

- Scrap metals.
- Take plastic elements for recycling.
- The other components are to be disposed of according to their material composition.

Local community officials or special disposal companies can provide information about environmentally appropriate disposal.



CAUTION

Environmental damage due to improper disposal!

Electrical waste, electronic components, lubricants, and other auxiliary materials are subject to hazardous waste disposal regulations and may only be disposed of by authorized specialists.

S.A.S. CONDUCTIX-WAMPFLER

30 avenue Brillât Savarin | BP39 | 01300 Belley | France

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The undersigned manufacturer :

CONDUCTIX-WAMPFLER France S.A.S.
30, Avenue Brillat Savarin
01300 BELLEY - France

declares that for the equipment described below:

Description: **SPRING REEL**

Identification / Type:

the following essential health and safety requirements of the Machinery Directive 2006/42/CE of 17th May 2006 have been taken into account:

- * E.H.S.R. 1.1.2 Principles of safety integration
- * E.H.S.R. 1.1.3 Materials and products
- * E.H.S.R. 1.1.5 Design of machinery to facilitate its handling
- * E.H.S.R. 1.1.6 Ergonomics
- * E.H.S.R. 1.2 Control systems (only if the « control panel » option is supplied)
- * E.H.S.R. 1.3 Protection against mechanical hazards
- * E.H.S.R. 1.4 Required characteristics of guards and protective devices
- * E.H.S.R. 1.5 Risks due to other hazards
- * E.H.S.R. 1.6 Maintenance
- * E.H.S.R. 1.7 Information

the relevant technical documentation has been composed according to Machinery Directive 2006/42/CE – Part B - Annex VII,

and that this equipment is designed in accordance to the requirements of the following directives:

- * Low Voltage Directive 2014/35/EU of 26th February 2014,
- * EMC Directive 2014/30/EU of 26th February 2014,

It is forbidden to put it into service,

as long as the machine in which it is destined to be incorporated or,
as long as the whole of the interdependent machines to which it must be fitted,

has not been declared conform to the requirements of Machinery Directive 2006/42/CE.

If the equipment is delivered incomplete further to the specific request of the customer, the latter is responsible for any adaptations he might make on this non-standard material. The responsibility of the manufacturer is restricted to the supplied parts.

Bertrand FONTENEAU - 30 avenue Brillat Savarin 01300 BELLEY - France - is authorized to compose the technical file.

He agrees to provide, further to a justified request of the National Authorities, the relevant information on this equipment in the most appropriate form.

Belley, on 07 March 2017

Name and position: B. FONTENEAU - Reel systems R&D manager

