
EXEL

SPRING OPERATED REELING DRUM

OPERATION AND INSTRUCTION MANUAL

INSTALLATION

COMMISSIONNING

MAINTENANCE

SPARE PARTS

"CE " DECLARATION OF CONFORMITY
(Only for reels with ratchet)

INSTALLATION

1 / PACKING

The EXEL spring operated reeling drums are delivered packed as follows :

- EXEL 1 - 2 - 3 : Cardboard box
- EXEL 4 - 5 - 6 : Light wooden box

2 / INSTALLING THE REELING DRUM

Ensure that the reel that has been delivered is suitable for your application, **and particularly check the winding direction. It will be opposite to the spring bending direction indicated by the arrow on the bending direction sticker.**



If you wish to **reverse that direction**, refer to "Maintenance".

There are 3 means of fixing the reel :

- mounting flange
- foot bracket
- swivel bracket

The central shaft of the reel must be horizontal in each case.

3 / FITTING YOUR OWN CABLE TO AN EXEL REEL (If reel delivered **without** cable) (If reel delivered **with** cable, go to step 4)

➔ Cut the cable at the **required length**

Required length = pay out + Δ l

Δ l = 1 dead turn + connections

	EXEL1	EXEL2	EXEL3	EXEL4	EXEL5	EXEL6
Δ l (meter)	2	2	3	4	4	5

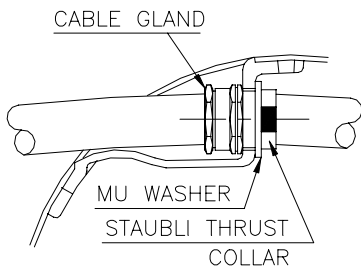
➔ Remove the collector housing and watertight seal

➔ Wind manually the reel in the bending direction until the spool stops.

➔ Hold the spool on the workbench so that it will not move.

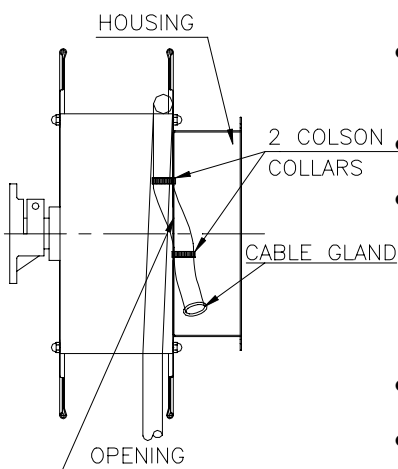
➔ Fitting the cable on the spool.

For EXEL 1 / 2 / 3 :



- The cable gland for access to the slip rings is mounted on the spool, alongside the flange
- Enter the cable into the gland allowing a sufficient length for electrical connections on the brush holders.
- Inside the spool, next to the cable gland, fit an MU ring and a STAUBLI thrust collar suitable for the cable diameter.
- Tighten the cable gland

For EXEL 4 / 5 / 6 :

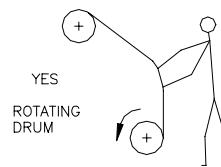
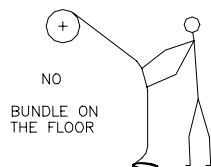


- The cable gland for access to the sliprings is mounted on the outside of the spool flange.
- The spool flange has an opening for the cable.
- Enter the cable :
 - Firstly through **the opening**
 - Then into **the cable gland** to allow a sufficient length for electrical connections on the brush holders.
- Tighten the cable gland
- Fasten the cable by means of 2 COLSON 319/13 collars (cf. sketch).

➔ Hold the cable firmly and release the spool.

➔ Reel in the cable slowly by using the springs and smoothly lay the cable regularly, especially for the first layer (the very first winding should be hard up against the spool flange)

NOTE : if the cable is not packed on a drum



➔ While the spring operated reeling drum securely held, connect the cable onto the brushes with / by means of cable connectors :

Type of slip ring *	C 8	C 080	P 050	P 080	P 120	P 180
FASTON 6,3 x 0,8 connector	X	X				
round connectors			M4	M6	M8	M12

* Compare with slip ring codification on the name plate of the collector housing or delivery note to identify the type of slip rings.

4 / CONNECTIONS TO THE SLIPRINGS

- Remove the cover and the seal (for access to the fixing screws on EXEL 1,2,3, remove the cable from the spool).
- Fit the cable into the gland and through the hollow shaft until it reaches the connection box and allow sufficient length for connections.
- Prepare the cable ends according to slip rings as follows :

Slip rings	C 8	C 080	P 050	P080	P 120	P180
Connection	lugs		M5	M6	M8	M12

- Make the connections
- Before tightening the cable gland, ***pull gently*** on the cable to remove any possible slack cable.
- **▲ For Control slipring, make sure that each brush is in contact with its corresponding ring.**
- Re-assemble the collector housing and the watertight seal (for access to the fixing screws on EXEL 1,2,3, remove the cable from the spool).

5. FITTING OF THE END OF THE CABLE ON THE SPOOL

5.1. Preloading

- Wind the cable onto the drum, and secure the free end of the cable (using a tie-wrap or a PVC tape, for instance).
- The reel must be stable in rotation.
- To **PRELOAD** the springs :
 - wind the spool and the cable in the direction of the arrow marked on the ***bending sticker*** .
 - .Preload or bend the springs by turning the spool as many times as indicated on the NA sticker (NA signifies number of preload turns).

- Once this step is completed, release free end of the cable.

- **Without rotating the spool**, remove a cable length = $\Delta l/2$

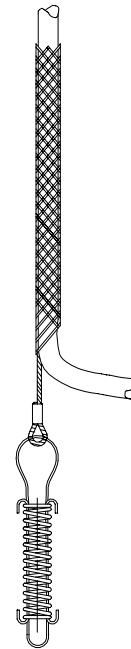
Note : If there is an extra length of cable for connections, remove that too, ***without rotating the spool.***

- Hold the cable end, bring it to the power supply ***to connect it and clamp it by means of a cable sleeve and shock absorber spring.***

5.2. Fixing of the cable

- The fixed *cable* connection must be in the axis of the spool.
- Compress the anchor-sock and slide it on to the cable.
In order to prevent movements from causing the anchor-sock to slip, use a clamp.
- Remove it by pushing
- Anchoring with one shock absorber spring

Leave some slack cable before connecting.



5.3. Electrical connections

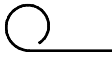

Make the electrical connections at the feed point.

COMMISSIONING

BEFORE START UP

- Check if the type of Exel is compatible with the use, in particular if the core section of the cable correspond to the amps.

USE WITH MAXIMUM VOLTAGE 500 V ~ / IP 55

Type of cable	Section		
TS	7G2,5	15 A	6 A
TS	12G2,5	12 A	4,8 A
GP	4G2,5	25 A	10 A
GP	4G6	42 A	16,8 A

- Check that the electrical circuit is correctly protected.
- Check that earth wire is not interrupted.
- Check that the **operators have been trained in the use of the reel.**

Reel with ratchet :

Unwind the cable, the ratchet passes over TOOTHED SUPPORT with a characteristic noise.

In this position, the cable can be released, the ratchet is engaged.

To **desengaged it**, pull on the cable as to disengage the ratchet from the toothed support. The cable is free.

NEVER RELEASE THE CABLE OUTSIDE OF THE TOOTHED SUPPORT

Automatic reel :

- Completely unwind the cable by hand including the dead turn.
- If every thing is correct, **rewind it.**
- If the **spool is jammed and if there is still cable** on it
 - count the number of the turns
 - reajuste the preloading spring and decrease the number of turns NA.

→ Make a few complete unwinding operations.

If you have following faults :

<i>Problem</i>	<i>Action</i>
<ul style="list-style-type: none"> ➤ No dead turn left on drum at maximum payout 	<ul style="list-style-type: none"> - The cable length is too short Not good : pull on the cable gland The cable has to be changed - The cable length is correct Too much cable has been used at the free end for connections. Release some cable.
<ul style="list-style-type: none"> ➤ Lack of cable tension during reeling 	<ul style="list-style-type: none"> - Check the preloading of the springs. - Check the conditions of operation Check if these conditions comply with the performance capability of the reel. <p style="text-align: center;">If any, correct the differences.</p> <p style="text-align: center;">Or call your nearest Delachaux agent.</p>
<ul style="list-style-type: none"> ➤ The cable does not lay properly on the spool 	<ul style="list-style-type: none"> - The connection is not on the axis of the reeling drum. Connect accordingly - Poor first wind of the cable. Lay the cable properly alongside the spool flange. - Unbalanced support. The axis of the drum shall be horizontal and perpendicular to the pay out. Level the drum - Cable with stresses Remove the cable for stress relieve Turn over cable if necessary

MAINTENANCE

ENTRETIEN

Every 2.000 hours of operation:

- Switch off the cable reel.
- Remove the collector housing.
- If the collector rings are either marked or worn, use a sand paper grade 320 to remove and polish the scratches.
- Caution : do not use sand paper on silver rings.
- Dust the rings and clean the insulators.
- Check the surface treatment, the wear of the brushes, the pull of the springs and the position of the brush holders on the collector rings.
- Adjust the position of the brush holders on the rings.
- Make sure that the cable glands are tight .
- Re-assemble the housing and the watertight seal.

REPLACING THE SPRINGS

To be made undertaken in a **workshop** on a **Workbench** :

Remove the spring operated reeling drum :

- remove the collector housing
- disconnect the cable from the fixed connection point.
- reel in the cable on the spool and tighten it by means of a piece of rope
- disconnect the cable from the rings
- release the cable gland at shaft's end
- re-assemble the collector housing.

1/ Removal of springs

- Place the reel upside down on a workbench (slipping side down).
- Remove the cable gland 1 and the bearing 2.
- Remove the flange 3 once the bolts 4 and the circlips 5 with the O-ring have been removed (parallel mounting of the springs).
- Remove the circlips 6 and the fastening ring 7 and then the protection flange of the springs 8.

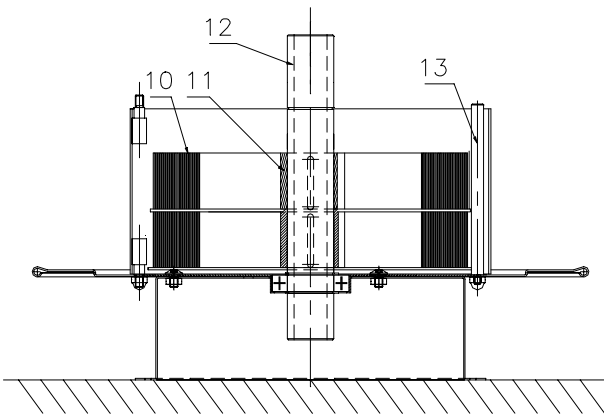
Caution : you have now access to the SPRINGS.

Types 1 - 2 - 3 - 4 - 5 are protected by an external safety belt.

Type 6 is not protected

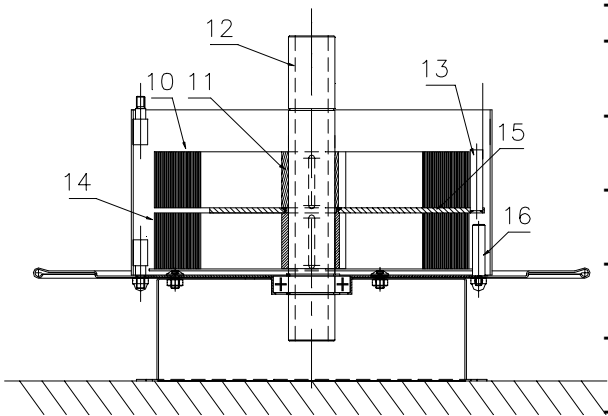
Before any operation, block it with 2 pliers

A) Reeling drum with springs mounted in parallel
 (can be identified by the circlips 5. See chapter I.1)



- Remove the spring + safety ring **10** and the hub **11**
- Slide this sub-assembly alongside the key shaft **12**
- Remove the outside spring loop from the fastening rod **13**
- Lay this sub-assembly flat on the workbench without turning it upside down
- Repeat this sequence for every spring

B) Reeling drum with springs mounted in series



- Remove the spring + safety ring **10** and the hub **11**
- Slide this sub-assembly along side the key shaft **12**
- Remove the outside spring loop from the fastening rod **13**
- Lay this sub-assembly flat on the workbench **without turning it upside down**
- The next spring **14** is mounted on a separation flange **15**
- Remove this sub-assembly and the outside spring loop from the fastening rod **16**
- Lay this sub-assembly flat on the work bench **without turning it upside down**
- Repeat this sequence for every spring.

The spring removal operation is now completed.

2/ Re-assembly of the springs

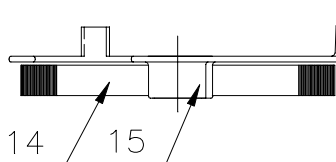
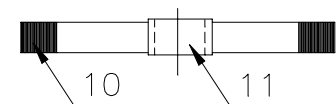
- Fit the new spring on the hub **11** or on separation flange **15**
- **Ensure that the spring is the same way up as the old spring**
- Re-assemble the parts in the reverse sequence to A) or/and B).
- Re-assemble the reeling drum on its support
- **Install** the reeling drum once again as described on pages 3 and 4.

CHANGING THE WINDING DIRECTION

1/ Removing the springs

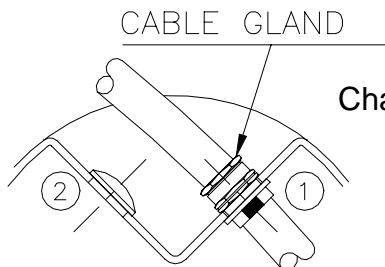
Follow the instructions on page 6 and 7 and also remove the cable.

2/ Re-fitting the springs



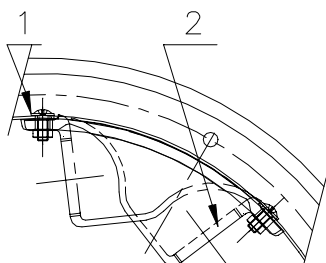
- Lay all the springs on the work bench and carefully check the original direction
- Spring and safety ring **10** + hub **11** : simply **turn these parts upside down** before fitting them on the shaft **12**
- Spring **14** + separation flange **15** :
 - * remove first the spring **14** from separation flange **15**
 - * turn the spring upside down
 - * fit the spring on the separation flange **15**
 - * fit these parts on the shaft **12**
- Re-assemble the parts of the reeling drum in the opposite sequence to the dismantling
- **Check that the spring winding direction is opposite to the former direction before** completing the re-assembly.
- Re-assemble the reeling drum on its support
- **Install** the reeling drum once again as described page 3 & 4.

3/ For EXEL 1



Change the cable gland output direction from **1** to **2**

4/ For EXEL 2 and 3



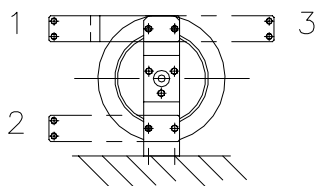
- Reverse the cable entry box on the spool
 - * remove the 4 bolts pos. **1**
 - * reverse the cable entry box and the seal pos. **2**
 - * fasten the fixing bolts

5/ Bending direction sticker

Remove the sticker and stick it the other way round.

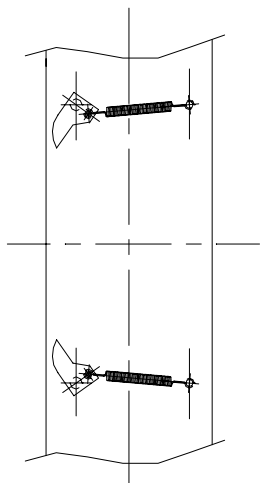
6/ Changing the options

BR option : roller guide



- bolted on the fixed bracket
- can be **fitted** on position **1** or **2** on pre-drilled holes as shown in the drawing.

K option : ratchet mechanism



- remove the ratchet wheel on the flange pos. **3**
- **replace the ratchet wheel by the alternative parts** (See spare parts list)
- **the ratchet spring and pawl remain the same but are fixed** on the opposite pre-drilled holes.

7/ Repeat the INSTALLATION of the reeling drum from chapter 2 onwards.

SPARE PARTS

(other items on request. Provide serial number when requesting)

	EXEL 1	EXEL 2	EXEL 3	EXEL 4	EXEL 5	EXEL 6
Return spring ref. n°	43R45015	43R45017	43R45018	43R45019	43R45020	43R45021
(Optional) Ratchet wheel standard reference n°	33R60001	33R60001	33R60001	33R60001	33R60003	
(Optional) Ratchet wheel opposite reference n°	33R60008	33R60008	33R60008	33R60008	33R60003	
(Optional) Ratchet pawl reference n°	43C52006	43C52006	43C52006	43C52012	43C52012	
(Optional) Ratchet spring reference n°	40170016	40170016	40170016	40170016	40170016	
(Optional) Cable roller box reference n°	433B0013	433B0010	433B0011	433B0012	433B0012	433B0014
Seal for slipping cover ref n°	43J10005	43J10016	43J10018	43J10018	43J10018	43J10019
Slipping sub-assembly type and reference n°						P180 - 1240C004
				P120 - 1230C004		
				P080 - 1220C004		
				C080 - 1222C004		
				P050 - 3210C005		
			C8 - 1299C008			

The quantity of springs and the number of slippings is provided in the Part Description or Codification of your EXEL spring reeling drum Note on the delivery note, order acknowledge, or the nameplate put on the drum during manufacture.

"CE" DECLARATION OF CONFORMITY (*)

The undersigned manufacturer :

Sté DELACHAUX - 30 Avenue Brillat Savarin - 01300 Belley - FRANCE

declares that the original equipment referred to below :

EXEL type 1 /... 2/... 3/... 4/... 5/... 6/... K

is conform :

- to the regulations defined in annexe I of the European directive 89/392 modified 91/364
- to decree n° 92-767 equivalent to european directives 89/392 of 14.6.89 and 91/368 of 20.6.91 with regard to the technical rules and procedures of certification wich are applicables to it.

Belley

20/07/1999

Name and position of Signatory :

Michel BERARD
Technical Manager

Signature :

(*) Only for hose reels with ratchet.