

ÖLFLEX® FD- and UNITRONIC® FD Cables in Power Chain Systems

1. The choice of the power chain system (also cable track system) must be made in accordance with the needs of the required cables.

Note: It is very recommendable not to make use of cables with multi-layer construction if possible, e.g. > 25 cores, but to assign the necessary cores to a higher number of cables.

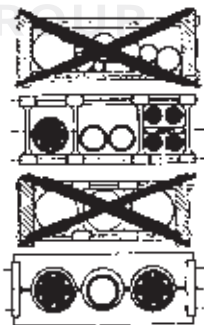
2. The minimum permissible bending radii of the cables must be strictly adhered to (please, find further appropriate information in the Technical Data of our Catalogue under bending radius for flexible use).
3. The cables must be laid out without twisting into the power chain system. Therefore, please, never pull off one cable end overhead from drums and coils which rest on their sides, but unroll the cables from the drum or the coil and lay them out or suspend them, if necessary. For the use in power chain systems, we recommend only to withdraw cables directly from drums standing or hanging vertically.

Warning: Along the cables, the imprints run gently spirally around their surfaces, conditionally of manufacturing. Therefore, the printing cannot be used as an indicator of the twist-free straightening of the cables. When the cables are drawn in, the chains should be laid out longitudinally. Afterwards, the power chains loaded with cables can be brought into operating position.



4. The cables must lie loosely next to each other in the chain stays. As far as possible they should be arranged individually, disjoined via separators and placed within individual holders in the neutral zone of the chain. The free space for the cables in the chain stay should be at least 10 per cent of the cable diameter. Arranging cables one above the other without using separators should be avoided.

Note: In case of a vertically suspended chain arrangement more free space must be provided regarding the height of the chain stay, because the cables are extended during operation. After a short period of operation, the length adjustment of the cables must be checked and, if necessary, corrected.



ÖLFLEX® FD- and UNITRONIC® FD Cables in Power Chain Systems

5. The cables **must not be fixed or tied together** in the chain.
6. The cables should be connected at both ends of the chain. In the case of long power chains with top trunks lying on and rubbing against bottom trunks, the cables may only be connected at the driven. The bending of the cables must not include their connection points. The distance between the end point of the bending movement and the connection point should be as large as possible (in the case of ÖLFLEX® SERVO FD 750 P, -760 CP and UNITRONIC® FD minimum 20 times the cable diameter. In the case of ÖLFLEX® FD CLASSIC, ÖLFLEX® FD, ÖLFLEX® SERVO FD 755 P -795 P and ÖLFLEX® FD ROBUST minimum 10 times the cable diameter).
7. Please, make sure, that the cables can move absolutely freely in the bending section of the power chain. Compulsory guide of the cables via the power chain must be excluded, so that relative movement of the cables with respect to each other and to the guide is possible. It is recommendable to check the position of the cable after a brief period of operation. This inspection must take place after thrust and tension movement.



8. If a power chain breaks, the cables must also be replaced, because damage due to excessive stretching cannot be ruled out.
9. In case your horizontally installed power chain will be long enough to have the top trunk gliding on top of the bottom trunk it is very important to allocate the cables within the chain in a way that horizontally symmetric distribution of the total weight of the cables is guaranteed. Only by respecting this rule, it is assured, that the top trunk will not cant in the bottom trunk through torsion of the top trunk as a consequence of one-sided weight distribution inside of it. Disregarding of this advice dramatically reduces cycle life of the power chain system.



SKINTOP® cable glands to be tightened by hand only (without using a tool).
Avoid bruising of the cables.

September 2009

■ ÖLFLEX® CRANE NSHTÖU, ÖLFLEX® CRANE VS (N)SHTÖU and ÖLFLEX® CRANE PUR

- The delivery drum should be transported as close as possible to the installation site. It should be also avoided to roll the drum needlessly over longer distances. If the drum can't be mounted closely enough on the plant or equipment it is necessary to unreeel the cable with the aid of idler pulleys by using a drag rope and a cable holding sleeve.
- During unreeeling process the cable may only pulled off straight from the top of pivot-mounted revolving drums. High tensile forces must be avoided and also the cable may not deflected or dragged over sharp edges. The cable temperature may not be below +5 °C during this procedure (normative reference to VDE 0298).
- Before cable assembling the whole cable installation length must be completely laid-out and stretched. It is very important not to rewind the cable directly from the shipping drum on the equipment drum. (see also chapter 4). When the cable is in laid position S-bends or other deflections must be avoided.



incorrect



incorrect

- The cable must be reeled on the reeling drum without any twists. It is also very important to avoid torsion during connection and fastening to the infeed. The core layer design of reelable ÖLFLEX® CRANE cables is manufactured with a S-stranding direction of the cores.

Depending on the position of the cable infeed resp. junction at the winding reel body it is highly recommended to observe the correct cable winding direction on the reeling drum as displayed on the illustration below:

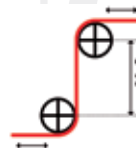


- If the infeed point is passed over during operation it will be necessary to use a compensating pulley of appropriate diameter carrying 1 – 2 cable windings. If the infeed is underground below the surface it will be necessary to provide a diverting funnel above the compensating pulley.
- It is essential to use sufficiently proportioned clamps or cable holding sleeves (length $\geq 4 \times D$) for fastening the cable at the end of the travel length in order to prevent crushing. The length of cable left unreeled before the fastening point must be at least $40 \times D$ but it is advisable to use also here a compensating pulley.
- At least 2 cable windings must remain on the equipment drum when the cable has been completely run out by reaching the maximum travel distance.
- For ÖLFLEX® CRANE NSHTÖU cables with an outside diameter of up to 21.5 mm the inner bending diameter should not be less than 10 times and above that figure 12.5 times the cable diameter. With ÖLFLEX® CRANE VS (N)SHTÖU

■ ÖLFLEX® CRANE NSHTÖU, ÖLFLEX® CRANE VS (N)SHTÖU and ÖLFLEX® CRANE PUR

the inner bending diameter must generally be at least 15 times the cable diameter. With ÖLFLEX® CRANE PUR the inner bending diameter should not be less than 15 times the cable diameter. The minimum bending radius is specified on the corresponding Catalogue page resp. in the product data sheet.

- S-bends in the cable must be avoided. However if this proves impossible in the case of cables with an outside diameter of up to 21.5 mm the center spacing of the two idlers must be at least 20 times and for those above 21.5 mm at least 25 times the cable diameter.



- The permissible reeling speed may be up to $v = 2 \text{ m/sec}$ at an acceleration of up to $a = 0.4 \text{ m/sec}^2$.
- The static continuous tension load should not exceed 15 N/mm^2 of the total copper cross-section and the dynamic peak tensile force may not exceed 25 N/mm^2 . For cables with very thick outer diameters it is recommended to use guide rollers to reduce high friction of the cable jacket during directional change.



Using sheaves the inner contact face may not have a concave shape to avoid cable twisting which can be caused due to permanent extensive jacket contact with the inner sheave surface. To ensure correct cable running the inner width of the guiding groove must be 10 – 15 % larger than the outer diameter of the cable.



correct



incorrect

- The actual current rating (I) in continuous operation depends on
 - the conductor cross-section (I_{max})
 - the ambient temperature (f_t)
 - the amount of cable reeled on the drum (f_2)

The maximum permissible strain imposed on the installed cable is obtained from the following formula:

$$I = I_{\text{max}} \times f_t \times f_2$$

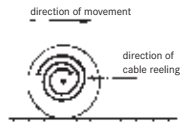
- The cables fulfil the requirements of VDE 0250. Further stress will limit the service life of the cable.

■ Lift Control Cables Type ÖLFLEX® LIFT, ÖLFLEX® LIFT T, ÖLFLEX® LIFT S

A General Notes

1. Cables installation should be done twist-free and at temperatures not below +5 °C. Power ampacity: see VDE 0298-4 / Lapp Table T12-1 column C.
2. The inner bending radius of the cable must not be less than 40 times cable diameter.
3. Maximum suspension height depends on the carrying core (see specifications). The maximum load must not be exceeded by more than 10 per cent.
4. The transporting drum should be driven to the application place. If possible, avoid rolling the drum. Otherwise the drum must be rolled on the floor only in the direction given in Figure 1.

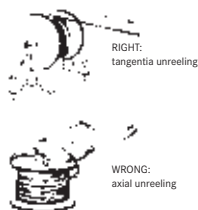
Fig. 1



B Suspending the Cables

1. When suspending the cables in the shaft, unreel them tangentially. Unreeling axially leads to cable torsion and interferences with the core twisting. This results in disturbances during operation (see Figure 2).
2. In order to guarantee torsion-free suspension, the cable must be loosely suspended in the shaft before final installation. This can be done best by installing the cable from the shaft bottom.
3. The free space between lift cabin and shaft bottom must be sufficiently large. It has to be used for the cable loop (see Figure 3).

Fig. 2



■ Lift Control Cables Type ÖLFLEX® LIFT, ÖLFLEX® LIFT T, ÖLFLEX® LIFT S

C Installing the Cables

1. It is indispensable to use large clamps for cable installation (for example Lapp wedged clamps type EKK or DKK). With suspension heights of 50 m and more the carrying core has to be damped separately.
2. The cable must be mounted to the shaft wall at least 2 m above half the driving length.
3. In case of unsteady movement, i.e. leaving the drop line during operation, the control cable must be twisted slightly at one of the mounting points until proper cable movement has been achieved.
4. If several control cables have to be installed in the lift device, it is recommended for technical reasons to install the cables in a way that the loops have height distances about 15 cm (stepwise suspension).

Fig. 3

