Equipment for cable laying and overhead power lines

VETTER

Operating Instruction

(Copy of Original Manual)

Cable tray capstan winch with safety clamp



Cable tray capstan winch PSW 10-13S - Electric Motor
Frequency converter, with safety clamp

Operating instruction

Cable tray capstan winch with safety clamp

Version: 279.565/V15.2

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Operating instruction

Cable tray capstan winch with safety clamp

Version: 279.565/V15.2

1. General information

Manufacturer

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2. Product Designation

This winch, Type PSW, with one aluminium capstan may only be driven by plastic ropes, never by steel ropes. Depending on the pulling force required, the pulling rope is then lead-in from the bottom wrapped at least 4 to 5 times around the aluminium capstan of the winch. When the motor is now switched on, the capstan will turn but not pull the rope, which remains slack on the capstan. By pulling on the rope by hand, the operator increases the friction between the rope and the capstan and the full turning force of the motor is applied to the pulling rope. With the mounted safety clamp, this winch is suitable to work as a hoist. That means to pull cables at any vertical angle. Do not remove the safety clamp!

2.1 Configuration of the complete equipment

For easier and lighter handling of this equipment, it is separated in two parts:

1. Electric motor with capstan mounted on chassis, incl. mounted safety clamp for vertical pulls.
2. Control box with frequency converter and control panel fast and slow rope speed, and emergency stop with foot switch. These two devices will be connected on the site by a cable.

3. Intended use

This capstan winch for cable trays is a single drum capstan winch intended for pulling cables horizontally along long stretches in cable trays.

Although the electrical equipment of the unit is designed for use in wet areas, it is important to ensure that the foot switch and the frequency converter are always positioned in a dry place.

4. Warnings

4.1 Vertical lifting

With the mounted safety clamp, this winch is suitable to work as a hoist. That means to pull cables at any vertical angle. Do not remove the safety clamp!

4.2 Admissible pull ropes

This winch may not be used with steel ropes. The following original polyester ropes are necessary:

279.685, PKG 12 polyester rope, Ø 12 mm, minimum breaking load 36 KN, stretch 4-6 %

4.3 Admissible swivel

For this capstan winch with safety clamp for vertical pulls the only admissible swivel is with ball bearings: Code 537.360, FVD 30. See the following table Swivel.

5. Technical details

Code / Type	279.565	PSW 10-13S		
Capstan Aluminium	Diameter	120 mm		
Pull / Speed	kN	10 at 7 m/min.	6 at 10 m/min.	4 at 13 m/min.
Electro-gear-braking motor	SEW	230-400 V/1,5 kW		
Motor-Type	R 47	DRS90M4BE2/ASE1/TF		
Braking moment	Nm	20		
Protection motor	IP	54		
Protection foot switch	IP	65		
Gear oil	Shell / BP	90 / GR-XP220		
Gear oil capacity horizontal	Litre	0,7		
Gear oil capacity overhead	Litre	to refill to 2,5 Litre		
Weight winch/Frequency converter	kg	54 / 16		
Dimension	L/W/H	710x270x360		

6. Accessory for capstan winch

6.1 Plastic ropes



Covered polyester rope Ø 12 mm



Swivel FVD 30



Reel for plastic ropes

Polyester- Covered rope Ø 12 mm, with 1 spliced loop

Code	Type	Diameter	Length	Stretch	kN (MBL)	kg
279.685.12	PKG 12-125	12	125 m	4-6 %	36	11,30
279.685.25	PKG 12-250	12	250 m	4-6 %	36	22,50
279.685.30	PKG 12-300	12	300 m	4-6 %	36	27,00

6.2 Swivel

For this capstan winch with safety clamp for vertical pulls the only admissible swivel is the following:

Code	Type	Colour	Bearing	Ø	Fork	MBL	kg
537.360	FVD 30	Silver	Ball bearings	30	12	60 kN	0,500

6.3 Reel for polyester ropes

Code	Type	Designation	For rope	Max. length	Size	kg
279.720	PSH 600	Reel galv.	12 / 14 mm	300 / 250 m	D 600/200x250	19,00

7. Instruction for safe handling

The operating personnel must be trained and instructed by a qualified expert.

7.1 Power from the electric net

The control box is usually connected to 230 V. By using an adapter cable, the capstan winch can also be connected to 400 Volt.

7.2 Operation with emergency generator

If the electric connection is to an emergency generator, please proceed as following:

1. Ground emergency generator
2. Switch on emergency generator, run up to essential speed frequency
3. Connect emergency generator with winch
4. Unlock emergency stop and operate the winch

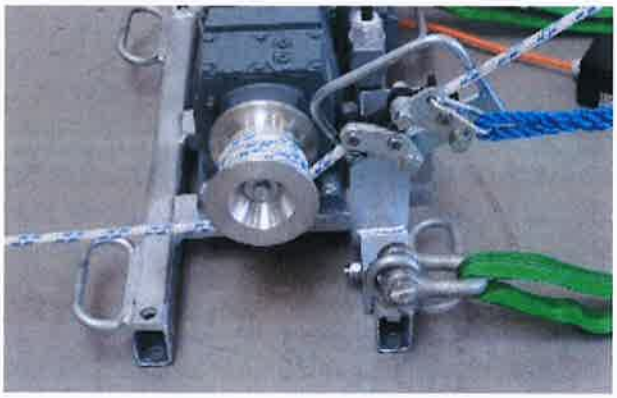
7.3 Safety rope clamp

This winch is equipped with a rope safety clamp. This makes the winch to a hoist. With this, it is possible and officially allowed to pull cables vertical. The load is in any case secured by the safety clamp. The load can be released or let downwards as following:

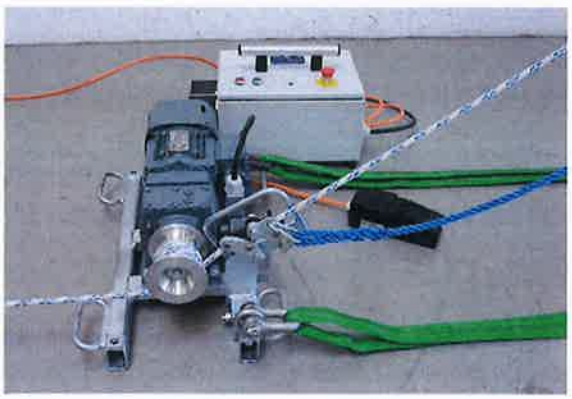
While holding taut the pulling rope the clamp can be released by a second short rope. In this way the load (cable) can be let down under control without starting the electric motor. As soon as the short rope is released, the load is hold safety again.

Attention:

Without this clamp, the load falls down immediately after the rope is released. Work only with the safety rope clamp and do never remove it!



The rope leads-in from the bottom, wrapped around the capstan and leads-out from the bottom



Under tension – the rope clamp controls securely the full load

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7.4 Starting the capstan winch

The plastic pulling rope is spread on the cable tray and connected to the cable grip. Depending on the pulling force required, the pulling rope is lead in from the bottom then wrapped at least 4-5 times around the aluminium capstan of the winch. When pulling vertically it is in any case essential to wrap the rope 5 times around the capstan.

When the motor is now switched on:

By using the foot switch, the capstan will turn but not pull the rope, which remains slack on the capstan. By pulling on the pulling rope, the operator increases the friction between the rope and capstan drum and the full turning force of the motor is applied to the pulling rope. This will be a pull of approximately 3 to 10 kN.

7.5 Accident risks:

Without this clamp, the load falls down immediately after the rope is released. Work only with the safety rope clamp and do never remove it!

- Never wrap the pilot rope around your hand.
- This is dangerous and could cause an accident. Always wear working gloves.
- The plastic rope should never be layered or crossed over on the capstan drum.
- Do not release the rope suddenly, this would cause uncontrolled recoiling

Clearing of cross-layered ropes see further down.

8. Installation and putting into service

8.1 Retain of the winch

In order to be able to take the maximum forces that arise during pulling without tearing loose, it is essential to attach the winch frame securely. The rope reel for the pulling rope must also be secured with a rope against slipping, should a sudden pull occur.

8.2 Retain of the rope reel

As well, the rope reel has to be retained by a rope or chain not to slip at a sudden rope stretch.

9. Cable pulling

The winch is pulling as long as the operator pulls the rope by hand. Releasing the stretched rope slowly, it can be relaxed under control.

When the winch is switched off at the foot switch, the brake incorporated in the electric motor of the winch keeps up the tension in the pulling rope as long as the operator holds the rope taut. The operator should release the rope slowly, allowing the stretched rope to relax in a controlled way.

9.1 Clearing of cross layered ropes

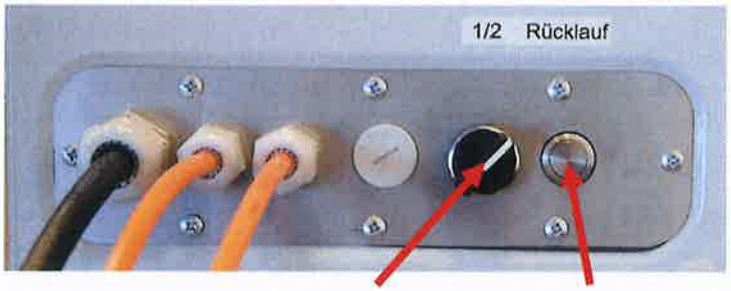
In case of overlapping of the pulling rope during the pull, the winch can be driven backwards as following:

- The safety clamp must be released by pulling the red rope.
- Before the winch is driven backwards by pushing the reverse button

On the outside of the control box, there is a reverse button, which has to be pushed only if the pulling rope is overlapped on the bollard. Prior to press the reverse button the safety clamp has to be released by pulling the red rope thus the pulling rope will become loose. If this procedure is not done the safety clamp will be torn off which leads to considerable damages!



Release the safety clamp



Speed 1 or 2 Reverse button

9.2 Safe rope deposit

During the pulling procedure, there must always be at least 20-30 metres or more of rope in loose coils on the ground, behind of the operator, between the winch and the reel/drum. (Eventually the whole quantity could lay on the ground, which can be winded on the drum after the pull is finished. In this way if the rope is suddenly released there is enough spare rope to take up the relaxation of the elastic stretch in the rope.

Never stand in, on, or among the loops of rope laying on the ground.

10. Safety instruction ropes

10.1 Polyester ropes

The minimum breaking load figures are data of new ropes. Stress and weathering reduce the breaking loads.

Make sure before each use that the rope is in perfect condition

Never pull ropes over sharp edges.

Avoid unnecessary chafing of rope-guiding elements. All metal parts should be smooth. Ropes should be protected on chafing points by whipping, sewn protective conduits or plastic encapsulation (e.g. PU).

10.2 Rope damages

Between rope and the pulled object there has to be mounted one swivel.

If there are still doubts despite careful inspection, you should stop to use the rope and contact the manufacturer.

10.3 Overloaded ropes

Overload of the rope is difficult to identify visually. Overloaded ropes show significantly reduced elongation under load.

10.4 Rope control

If you perform the inspection independently, control by section is recommended: Thoroughly inspect the rope from all sides every 300 mm. The inner surface and the core should also be inspected at the same distances.

10.5 Rope danger

Ropes under tension always represent great potential danger. Make sure that nobody is in the immediate vicinity of a rope under tension, in particular not behind the ends of the rope in pulling direction. Overloaded synthetic fibre ropes break with a jerk, release their stored energy and can cause significant injuries.

Unneeded loose materials or unsecured tools in the close surrounding of the cable laying route or cable laying rollers which are arranged on the cable laying route might be swept along by the broken rope and can cause

significant injuries. Ropes must not be improperly used. Misuse of ropes reduce the life span and can put the user at risk.

Never stand in, on, or among the loops of rope laying on the ground.

11. Service and Maintenance

Use by authorised and instructed persons only under consideration of the provisions (DGUV 54) of the institution for statutory accident insurance and prevention.

Inspection and repair by qualified experts only; test after particular incidents such as overload, damage and after each repair, but especially:

- Before each commissioning
- Before recommissioning after shutdown
- After major modifications
- However, at least once per year.

WARNING: The respective conditions of use may require shorter inspection intervals. Repair work must only be performed by specialist workshops using original spare parts. The inspection (mainly visual and functional tests) must include checking the safety devices for completeness and effectiveness and checking the condition of the device, the load-bearing medium, the equipment and load-bearing structure with regards to damage, wear, corrosion or other alterations.

Commissioning and recurring inspections must be documented. The inspection results and proof of proper repair must be presented on request. The device must be cleaned if soiled.

Exchange of components requires subsequent mandatory inspection by a competent person.

11.1 Maintenance of the motor

For maintenance of the motor see attached, SEW Inspection and Maintenance

11.2 Oil control and oil change

Oil change in the gear after latest 3 years. Lubrication: 0,7 l, Shell gear oil 90 or BP Energol GR-XP 220

Where the winch is required to operate in a certain position, i.e. upside down, the gear unit, which normally contains 0.6 litres of gear oil, must be topped up with an extra 1.9 litres of oil (2.5 litres altogether)

12.Attachments:

SEW Inspection and Maintenance

Instruction frequency converter