

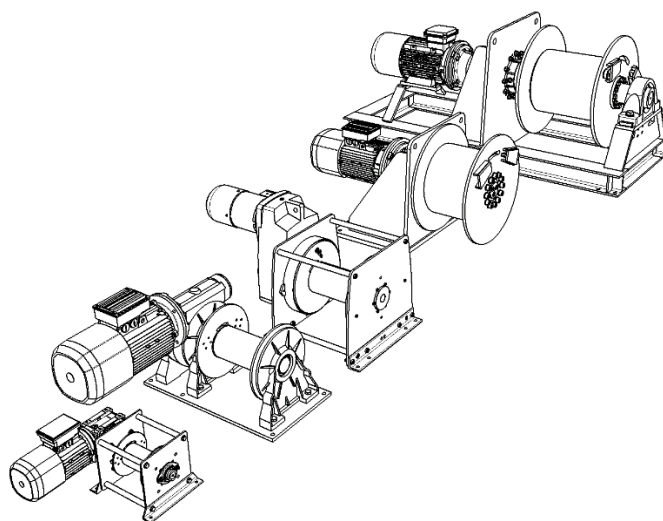
Translated version of the ORIGINAL OPERATING INSTRUCTIONS ROPE WINCHES



ALWAYS KEEP THIS MANUAL HANDY FOR QUICK REFERENCE.

To the customers

Thank you very much for choosing a quality product from PLANETA. All those who wish to operate this winch must read these operating instructions before using it for the first time. Our product has been developed in an environmentally friendly manner and is free of the hazardous substances according to the REACH regulation and the ECHER candidate list.



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PLANETA-Hebetechnik GmbH | Resser Str.17 | 44653 Herne



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1 INTRODUCTION



Read these instructions carefully before use and keep them.

This manual has been compiled by the manufacturer to provide information on the safe transport, handling, installation, maintenance and repair of winches. Failure to follow the information contained herein may, under certain circumstances, endanger the health and safety of the operator and cause damage to property. The documentation must be kept by an authorised person and must always be available for reference when needed. A copy of the user manual must be kept in the immediate vicinity of the winch working area. The manual reflects the state of the art at the time of sale of the winch. The manufacturer reserves the right to change, supplement or improve the manual without this publication being considered inadequate for this reason. Particularly significant sections of the manual and important information are highlighted by symbols, the meaning of which is described below.



Specific information on the winch

In addition to this manual, each winch is supplied with a specific document, the winch pass. This is enclosed with the winch and, like this manual, must remain with the winch. In addition to the exact technical data of the installed components and options, the winch pass contains information on the design and construction of the winch in the form of drawings, plans and spare parts lists. If the winch has been delivered with a control system, the circuit diagram of the control system is also included in this winch pass. The winch pass also contains the manufacturer's factory test certificates and declarations of conformity and also serves as an inspection logbook for the periodic tests to be carried out. There is only one winch pass for each winch. Which passport belongs to which winch can be determined by the serial number of the winch, which can be found on the type plate of the winch and on the cover sheet of the winch passport. In case of loss, a new copy - but without the original certificates - can be ordered from the manufacturer as a duplicate.

1.1 Details of the manufacturer

Name:	PLANETA-Hebetechnik GmbH	E-mail:	info@planeta-hebetechnik.de
Address:	Resser Straße 17, 44653 Herne, Germany	Phone:	+49-(0)- 2325 9580-0

1.2 CE declaration and declaration of incorporation

A ready-to-use machine with all its associated safety devices has a CE declaration of conformity and is labelled with a CE mark. Incomplete machines are supplied without a CE mark and only contain a Declaration of Incorporation in accordance with the current Machinery Directive.

1.3 Copyright information

These original operating instructions are protected by copyright. The authorised user has a simple right of use within the scope of the purpose of the contract. Any modified use or exploitation of the contents provided, in particular reproduction, modification or publication of any deviating kind, is only permitted with the prior consent of the manufacturer. If the operating instructions are lost or damaged, a new copy can be requested from the manufacturer. The manufacturer has the right to change the operating instructions without prior notification and is not obliged to replace earlier copies.

1.4 Limitation of liability

PLANETA-Hebetechnik, hereinafter referred to as the manufacturer, accepts no liability for personal injury, damage to property or other damage caused by failure to observe these original operating instructions. In particular, the manufacturer accepts no liability in the event of improper use of the product, unauthorised repairs or modifications to the product or other actions by untrained, unqualified or unauthorised specialist personnel.

1.5 Warranty

The manufacturer warrants to the user that the winch material and workmanship will be free from defects for a period of one year from the date of purchase. The manufacturer will repair, without charge, any defective product, including parts and labour, or, at its option, replace such products or refund the purchase price less a reasonable payment for depreciation in exchange for the product.

If a product proves to be defective within the actual one-year warranty period, it must be returned to an authorised dealer including proof of purchase or including winch data sheet/test certificate. The winch must be delivered freight prepaid. This warranty does not apply to products which are deemed by the manufacturer to have been improperly used or misused and improperly maintained by the purchaser, or where the malfunction or damage is due to the use of non-original spare parts.

The manufacturer makes no other warranties, and any implied warranties, including warranties of merchantability or fitness for a particular purpose, are limited to the duration of the stated warranty period as specified above. The maximum liability of the manufacturer is limited to the purchase price of the product and in no event shall the manufacturer be liable for any consequential, indirect, incidental or special damages of any kind arising out of the sale or use of the product, whether based on contract, tort or otherwise.

Any use other than that specified on the type plate, the winch pass or in the product data sheet of the winch will void any liability of the manufacturer.



If the type plate is missing, the product does not comply with the current Machinery Directive and the warranty ends.

The following information is necessary to ensure reliable delivery of spare parts:

Serial number (Prod. No.) (on type plate)
 Product type _____ (on type plate)
 Spare part number _____ (from Windenpass)
 Additional information such as type and/or description of parts _____ (from Windenpass)



The manufacturer cannot guarantee a smooth delivery of spare parts unless the above information is provided in full. If the nameplate has been removed or damaged, contact your dealer or supplier. The manufacturer reserves the right to modify and extend the winches it manufactures at any time and without prior notice and shall not be liable for any differences between winch characteristics and the specifications of this Use and Maintenance Manual. In the event that additional information is required on, for example, maintenance and repair work, contact the manufacturer's technical department. This user manual has been prepared with great care. However, the manufacturer cannot be held responsible for any errors that may appear in this publication and the consequences thereof. This user manual was written by the manufacturer.



Winches purchased directly from the manufacturer must be considered as "partial machines" as they are intended to be installed in an assembly consisting of, for example, a platform, suspension system, etc. Therefore, they are supplied without a CE mark, but with a Declaration of Incorporation in accordance with the current Machinery Directive. As they are equipped with selected safety options, the "parts" of the winch still comply with the EC requirements if the operator complies with the EC requirements of the whole system

2 SECURITY

2.1 Safety information



Most accidents when handling technical equipment are due to disregard of basic safety rules. Recognising a possible hazard can prevent an accident before it occurs. Consequently, the safety instructions in this manual and on the machine are not all-inclusive. The information, descriptions and illustrations in this manual are based on information available at the time of writing. If operating or maintenance procedures not specifically recommended by the manufacturer are carried out, it must be ensured that product safety is not jeopardised by the measures taken. If there is uncertainty about any step in the operating or maintenance procedures, the product must be safely shut down by personnel and the supervisor and/or manufacturer contacted for technical assistance. An appropriate hazard analysis for the use of work with the winch must be carried out by the operator.



Failure to observe the safety instructions may result in death or serious injury. PLANETA-Hebetechnik GmbH cannot foresee all possible circumstances that may contain potential hazards. The machine must not be used in any way that deviates from the considerations in these instructions. All applicable safety regulations and protective measures at the place of use must be observed, including site-related regulations and protective measures at the workplace.

2.2 Regulations

The basis for the installation, commissioning, testing and maintenance of the units in the Federal Republic of Germany and in the EC countries are essentially the regulations listed below and the information in these operating instructions. The listed directives and regulations of the employers' liability insurance association do not apply to every product.


Table 1 European directives

European guidelines	
Directive 2006/42/EC	Machinery Directive
Directive 2014/30/EU	electromagnetic compatibility
Directive 2014/35/EU	Low Voltage Directive
Directive 2014/34/EU	ATEX Directive
BetrSichV	Industrial Safety Ordinance

Table 2 Regulations of the Employer's Liability Insurance Association

Regulations of the employers' liability insurance association	
DGUV Regulation 1	Principles of prevention
DGUV Regulation 3	Electrical installations and equipment
DGUV Regulation 54	Winches, lifting and pulling equipment
BGG 956-1	Instructions for the testing of winch, hoisting and pulling equipment

2.3 Personal protective equipment

	<p>Appropriate work clothing must be worn for each task. For safety reasons, operators and other persons in the vicinity of the machine must wear personal protective equipment (PPE). There are different types of protective equipment that must be selected according to the requirements of the working environment. The chapter "Symbols and signal words" lists the Personal Protective Equipment that must be worn as a minimum.</p>
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2.4 Symbols, command signs and signal words

The instructions use symbols, signal words and notes to warn of hazards and to ensure safe operation. The symbols are shown and explained below.














	<p>Warning labels are used on a variety of components of the winch. Follow the warnings on these labels. If you have any questions regarding the meaning of a sign, contact the manufacturer.</p>
---	---

Table 3 Symbols and their meanings

	<p>Information This symbol indicates important information.</p>
	<p>Danger This symbol warns of an imminent danger to the health and life of persons. Failure to heed such a warning will result in serious injury, possibly resulting in death.</p>
	<p>Warning This symbol warns of situations that may potentially endanger the health and life of persons. Disregarding such a warning can lead to serious injuries, possibly resulting in death.</p>
	<p>Warning against suspended loads It is forbidden to stand under a suspended and/or moving load. This is dangerous to life!</p>
	<p>Warning of entrapment Risk of entrapment and cuts to hands and fingers, legs and other limbs. Sufficient personal protective equipment must be worn.</p>
	<p>Warning of explosive atmosphere Warning of an area in which explosive atmospheres may occur.</p>
	<p>Warning of live components Warning of an area where electrical voltages may occur.</p>
	<p>Use head protection</p>
	<p>Use hand protection</p>
	<p>Use protective clothing</p>
	<p>Wear hearing protection</p>
	<p>Use foot protection</p>

2.5 Duties of care of the operator



The requirements for maintaining safety and health protection have been met. However, this safety can only be achieved in operational practice if all the necessary measures are taken. The operator of the machine must plan these measures and check their implementation. The operator is responsible for the safe operation of the machine.

2.6 Requirements for the staff



The following safety instructions must be observed at all times when working on the machine. Failure to do so may result in death or serious injury.



The personnel must have the necessary training and experience as well as any necessary tools to be able to work on and with the machine. Personnel to be trained may only work on the component under the supervision of an experienced person.

Improperly performed work can cause hazards.

Do not carry out any work if the information on this in these instructions and in the applicable documents has not been read and understood. If work equipment, an action, a working method or a working technique is used that is not expressly suggested by PLANETA-Hebetechnik GmbH, the user himself must ensure safety for himself and other persons.

2.7 Intended,-unintended use Operator



ATTENTION! (This is not a fully comprehensive listing)



The **operator** must ensure that:

- the machine is used as intended.
- the machine is only operated in perfect working order and the required mechanical guards are in place.
- the operator must ensure that the unit, including the supporting structure, is inspected by a competent person before it is put into operation for the first time and after significant modifications before it is put back into operation.
- the operator must ensure that the unit, including the supporting structure, is inspected by an expert at least once a year. In addition, he must have them inspected by an expert in the meantime as required in accordance with the conditions of use and the operating conditions.
- operating instructions for occupational safety and accident prevention are issued.
- national accident prevention regulations and internal company regulations are observed.
- personal protective clothing is available if required.
- a copy of these instructions and all applicable documents are always available in a legible condition and complete at the place of use of the machine. It must be ensured that all persons who have to carry out activities on the machine can consult the instructions at any time.
- only personnel in accordance with the chapter "Personnel requirements" are used on the machine. the personnel must have understood the instructions and in particular the safety information contained therein.
- for safe working, careful instruction of the operating and maintenance personnel in these assembly, operating and maintenance instructions is urgently required.
- all danger and type labels attached to the machine are not removed and remain legible.
- the unit is only attached to such constructions and suspensions that are capable of safely absorbing the expected forces.
- the unit is set up, arranged or fastened in such a way that its position is not unintentionally changed by the forces occurring during operation.
- The operating and maintenance personnel must be instructed in good time before working with or on the product. These personnel must not wear loose clothing, long hair or jewellery, including rings, because of the risk of injury from being caught or pulled in. Persons under the influence of drugs, alcohol or medication affecting their ability to react must not carry out any work with or on the product .

2.8 Intended, unintended use Operator



ATTENTION! (This is not a fully comprehensive listing)



The **operator** must ensure that:

- have read and understood these instructions.
- have sufficient physical and mental abilities.
- have instruction in the operation and maintenance of the machine.
- only authorised dealers and qualified persons may adjust or repair the winch.
- observe the safety information and instructions in the manual.
- ensure that no loose clothing, open long hair or jewellery, including rings, are worn.
- observe the danger signs attached to the appliance and the instructions contained therein.
- make sure that no unauthorised persons are in the area of the machine.
- inform the operator or supervisory personnel in the event of malfunctions.
- Immediately report any changes that have occurred to the machine that could affect safety to the responsible supervisor and lock the machine / take it out of operation.
- before carrying out any maintenance or inspection on the winch, ensure that the product is not under load and that the power supply is switched off and disconnected.
- when operating and maintaining the device, the safety regulations, e.g. accident prevention regulations (UVV) and the official regulations must be observed, in particular the operating regulations for lifting equipment. In the Federal Republic of Germany, the UVV (BGV D8) "Winches, lifting and pulling equipment" applies. In other areas, the following safety instructions must be observed by the user of the chain hoist.
- the user must ensure that the permissible load on the chain hoist is not exceeded.
- If loads are to be lifted simultaneously with several winches, the contractor must ensure that the winches are selected and arranged in such a way that overloading is avoided even in the event of unfavourable load distribution.
- If the user detects obvious defects in the winch, including the suspension means, pulleys, equipment and support structure, he must rectify these immediately. If this is not part of his work or if he does not have the necessary expertise, he must, if necessary, put the winch out of operation and report the defect to the contractor.
- the user must not initiate a load movement until he is satisfied that the load is securely attached and that there are no persons in the danger zone, or after he has received a signal from the slinger.
- the user must observe all movements of the load and the load handling attachment.
- if the user cannot observe all movements of the load or the load handling attachment from the control stand, the operator must take appropriate measures to ensure that persons are not endangered by the load or the load handling attachment.
- the user must not leave the winch when the load is suspended.
- If the user has to leave the control stand when the load is suspended due to work, the user must create the conditions so that the danger zone under the load can be secured.
- the user must not transport persons with the load or the load handling attachment.
- the user must not transport flammable masses with the load or the load handling attachment.
- the unit must not be used to move loads that are stuck or that may get caught, jammed or stuck in their path.
- the controls and operation of the winch is fully functional.
- the winch attachment system is secure and firm.
- the oil level is checked regularly.

- if the winch is easily accessible by third parties, carry out the protective measures required by the Machinery Directive (2006/42/EC).
- proper operating signals are used when operating the winch.
- safety device are effective.
- the working conditions correspond to the lifting gear characteristics.
- the sling always rests on the bottom of the hook.
- the load-bearing capacity of the unit as well as the supporting structure must not be exceeded.
- the device must not be used to tear loose stuck loads.
- no wire ropes are touched without suitable gloves.
- the wire winding direction on the winch drum is correct and conforms to the direction specified in the winch data sheet. Correct winding helps to extend the functional life of the rope.
- rope does not show any damage such as broken strands or kinks.
- The removal or covering of labelling (e.g. by pasting over), warning notices or the type plate is prohibited.
- the load must never be moved in areas that are not visible to the operator. If necessary, the operator shall seek assistance.
- Inching operation is avoided.
- the load must never be lifted over people.
- Welding work on the unit is prohibited.
- People must never be transported with the unit.
- the removal of the hook jaw safety device from cargo hooks is prohibited.
- the tip of the hook must not be loaded.
- it is forbidden to twist in the loads that have been picked up.
- The control box, which is supplied as an option, may only be opened by electrically trained personnel. The control box must be closed during control operation to protect the operator from applied voltage and the control system from external influences. The five electrical safety rules must be applied.

2.9 Measures to achieve safe operating periods

The safety and health requirements of the EC directives make it a legal requirement to eliminate special hazards that can occur, for example, due to fatigue and ageing. Accordingly, the operator of series hoists is obliged to determine the actual use. The actual service life is determined and documented during the annual inspection by the customer service. If no further agreements are made, a general overhaul must be carried out after the theoretical service life has been reached or after 10 years at the latest. All inspections and the general overhaul must be arranged by the operator of the hoist. For electric hoists classified according to FEM 9.511, the following theoretical service life applies (converted into full load hours h):

Table 4 Classifications

Classifications				
M3 (1Bm)	M4 (1Am)	M5 (2m)	M6 (3m)	M7 (4m)
400 h	800 h	1600 h	3200 h	6300 h

2.10 Determination of the actual useful life S



The actual service life depends on the daily operating time and the load spectrum. The runtime is determined according to the operator's specifications or is recorded by an operating hours meter. The load spectrum is determined according to Table 5. With these two pieces of information, the annual service life results from Table 7.



The periodically calculated or read values shall be documented in the winch pass.

Table 5 Load spectra

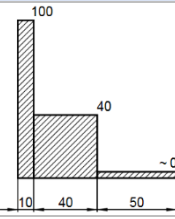
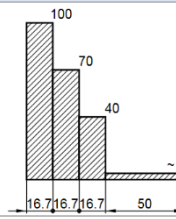
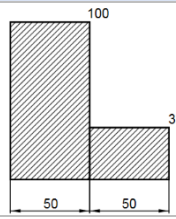
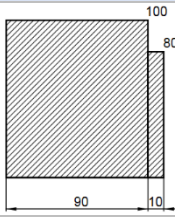
	Load type 1 slightly $k < 0.5$ $k = 0.5$		Load type 2 medium $0.5 < k < 0.5$ $k = 0.63$		Load type 3 heavy $0.63 < k < 0.8$ $k = 0.8$		Load type 4 Very heavy $0.8 < k < 1.00$ $k = 1.0$
% of the load		% of the load		% of the load		% of the load	
	% of operating time		% of operating time		% of operating time		% of operating time
	Only exceptionally full load, but predominantly only low load		Often full load, but continuously low load		Frequent full load, continuous medium load		Regular full load

Table 6 Annual useful life

Use per day (h)	≤ 0.25 (0.16)	≤ 0.50 (0.32)	≤ 1.0 (0.64)	≤ 2.0 (1.28)	≤ 4.0 (2.56)	≤ 8.0 (5.12)	≤ 16.0 (10.24)	> 16.0 (20.48)
Load spectrum	Annual useful life(h)							
k = 0.50	6	12	24	48	96	192	384	768
k = 0.63	12	24	48	96	192	384	768	1536
k = 0.80	24	48	96	192	384	768	1536	3072
k = 1.00	48	96	192	384	768	1536	3072	6144

2.11 General overhaul



When the theoretical service life is reached (after 10 years at the latest, if not otherwise specified, in the case of recording without PDA), a general overhaul must be carried out. In this case, the unit is put into a condition that allows safe operation for a further period of use (utilisation period).



The inspection and approval for further use must be carried out by a specialist company authorised by the manufacturer or by the manufacturer itself.

The verifier sets:

- what new theoretical use is possible
- the max. period until the next general overhaul

These data are to be documented in the enclosed winch pass.

2.12 Important protective devices of the winch



Depending on the equipment ordered, the winch is supplied ex works with protective devices which are required by the Machinery Directive to prevent damage to persons or objects during operation of the winch. The operator must ensure the function of these protective devices at all times when operating the winch.

The basic protective devices of a winch include:

- Emergency switch
- Protective covers and
- Overload protection and limit switch

2.12.1 Emergency switch

The controls of a winch **must be** equipped with an emergency switch that can be used to turn off the winch in an emergency situation. The winch operators must be informed of the location of the emergency switch(es).



Emergency switches must only be operated in an emergency situation.
The functionality of the emergency switch(es) must be checked regularly



After actuating the emergency switch, the reason for the emergency shutdown must be checked and rectified if necessary. After an emergency shutdown of the winch, it can be put back into operation by unscrewing the emergency switch.

2.12.2 Protective covers



When operating the winch, ensure that it is prevented from reaching into or pulling in clothing, persons or objects. For this purpose, the winch can be supplied ex works with a drum protection cover. Despite the installed cover, the operator must ensure that, for example, no person can reach into the open rope window, at the rope exit on the drum, into the running rope or pull an object into the rope drive. Fans for cooling the motor are also fitted with a cover and may only be removed for maintenance or repair purposes.

2.12.3 Overload protection



In order to comply with the Machinery Directive, winches with a load capacity of 1000 kg or more require an overload cut-off. This is usually realised by means of current monitoring and monitoring relays as part of the winch control. The relay is available as an option for every contactor control.



If the winch was ordered without control or with control but without overload protection, it is the operator's responsibility to retrofit an overload cut-off.

2.12.4 Limit switch



The operator must ensure that a limit switch prevents the movement generated by the winch from exceeding the design or desired limits.



For this purpose, the winch is optionally equipped with a spindle limit switch. Only a spindle limit switch with 4 contacts and corresponding wiring may be used for operation. Other versions as well as spindle limit switches with only 2 contacts only serve as emergency limit switches and must not be operated.

3 PRODUCT DESCRIPTION

3.1 Permissible working load



The user is responsible for ensuring that the permissible working load is not exceeded. The permissible working load is indicated on the type plate.





3.2 Scope of application



The basic version of the cable winch is designed for material transport within a closed, dry and clean building without large temperature fluctuations in a range between -10°C and +40°C up to max. 1,000m above sea level, without contact with corrosive or aggressive media. By means of various additional equipment, the cable winch can be built for other conditions. These include e.g. special paints, anti-condensation heaters, stainless steel screws, higher protection class and weather protection covers against wind, rain, snow and sunlight.



Attention must be paid to the type of use of the winch. Depending on the design, a distinction is made between hoisting and pulling winches. Please observe the marking on the type plate.

	TRAIN WINDOW ONLY SUITABLE FOR HORIZONTAL PULLING	
	HUBWIND FOR LIFTING AND LOWERING LOADS AND FOR HORIZONTAL PULLING	

3.3 Type plates



A type plate with product-specific information is attached to the unit. The type plate may differ from the illustration below.

PLANETA WINCH			
PLANETA-Hebetechnik GmbH Resser Str. 17 D-44653 Herne-Wanne Tel: (+49) 2325 9580-0 www.planeta-hebetechnik.de Bitte Handbuch beachten! Please read manual!	Typ / FEM (Type / FEM)		M3/1Bm
	Serien-Nr. / Baujahr (Serial-No. / Year)	218XXXX-01	2020
	SWL / Lage (SWL / Layer)	1x ... kg (1.) / 1x ... kg (n.)	
	Seilgeschw. / Lage (Line Speed / Layer)	... m/min (1.) / ... m/min (n.)	
	Betriebsspannung (Voltage)	3-Ph / 400 V / 50 Hz	
	Motorleistung (Motor power)	... kW / S3 - 60%	
	Seilkapazität / Lage (Rope-capacity / Layer)	1 x ... m (1.) / Ø ... mm	
	Seil (Rope)	6 x 36 + IWRC / MBF = ... kN	

*Image similar

3.4 Technical data



Characteristics and technical data are listed on the type plate attached to the winch and described in detail in the winch pass.

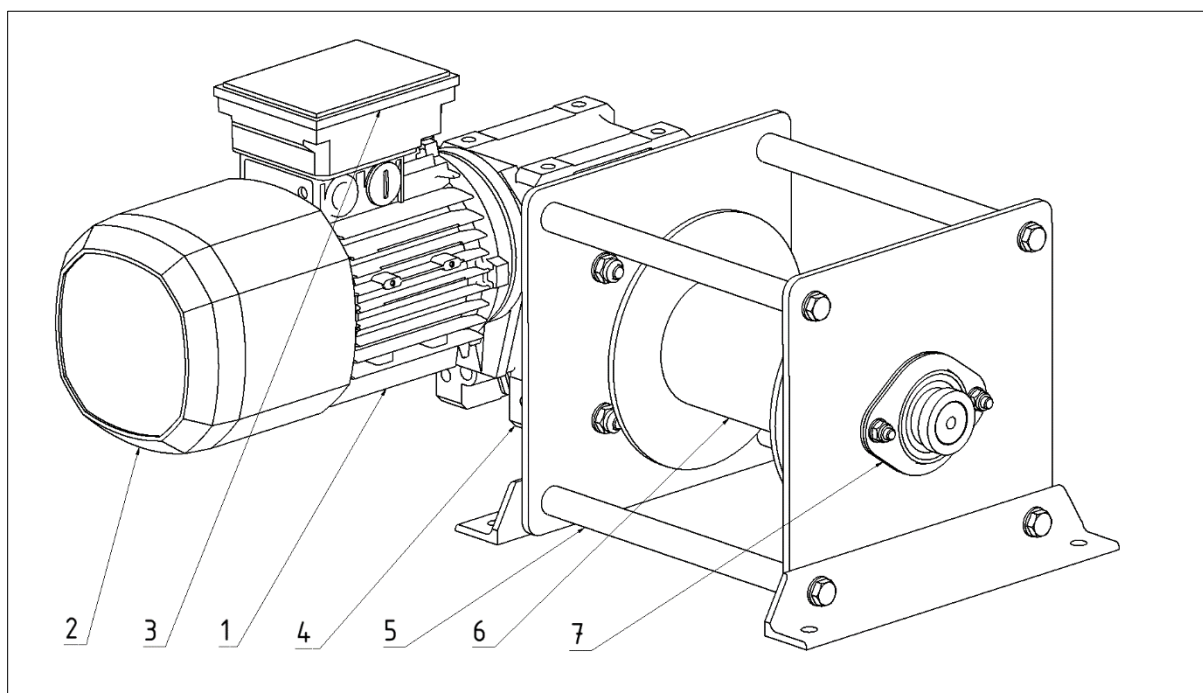


Standard winches are intended for use in an ambient temperature of -10° to $+40^{\circ}\text{C}$. Standard electric winches have IP 54 motors.

These winches are suitable for indoor use and, depending on the application, also for outdoor use. For offshore use, motors with protection class IP 56 TENV can be supplied.

Hydraulically and pneumatically operated winches are suitable for indoor use as well as outdoor use. The exact technical data, protection classes, voltages and design of the winch supplied can be found in the specific winch pass which is enclosed with each winch.

3.5 Schematic diagram of a winch



No.	Description	No.	Description
1	Motor	5	Frame
2	Brake	6	Rope drum
3	Terminal box	7	Drum bearing
4	Gearbox		

3.6 Rope



Basically, the design of the winches is based on the use of metallic ropes / wire ropes. However, the use of non-metallic textile ropes made of natural or synthetic fibres is also possible. If non-metallic ropes are to be used, the winches are usually already prepared accordingly in accordance with the enquiry.



Rope selection contrary to the recommendations or non-observance of the selection criteria can lead to rope failure or serious operational malfunctions.
If the rope breaks, there is a risk of death or serious bodily injury.
Rope selection contrary to the recommendations or failure to observe the selection criteria may result in reduced rope performance and service life.



The rope designs selected in cooperation with the equipment manufacturer are determined after extensive tests in optimal adaptation of the crane and rope properties and in accordance with the applicable standards and regulations. The selection of ropes for lifting equipment depends essentially on the intended use of the ropes and the properties fundamentally required there. This applies in particular with regard to abrasion and wear, surface treatment, mobility and make, rotation properties as well as properties specifically required for the application such as rope diameter tolerances, elongation, transverse pressure stability, etc. Due to the large number of necessary selection criteria, it is always recommended to select the original replacement rope when changing the rope. If a different wire rope is to be used, this must be done in consultation with the equipment manufacturer.

3.6.1 Steel cables for drum winches

Round strand ropes not rotation resistant

Non-rotation-free ropes generate high torques under load, which is why the rope ends must be secured against rotation. Typical non-rotation-free wire rope constructions are ropes with e.g. 6, 8, 9 or 10 outer strands. Areas of application for non-rotation-free ropes are small lifting heights with multiple reeving or paired use of similar right-hand and left-hand rope constructions. Under these conditions, non-rotation-free ropes achieve long service lives.

Round strand ropes rotation resistant

Low-twist ropes generate a reduced torque under load. This effect is achieved by an opposite lay direction of at least two strand layers stranded around a rope core. Typical examples are rope constructions such as 18x7 and 17x7. These types of ropes must never be used in combination with a swivel or without an anti-twist device, as this can lead to considerable personal injury and damage to property.

3.6.2 Fibre ropes for drum winches

Fibre ropes made of high-strength material have extremely high breaking forces. In both single and multi-layer winding, our synthetic ropes offer you excellent transverse pressure stability for pulling and lifting loads. Depending on the needs of our customers, we offer synthetic ropes with a wide variety of sheath constructions such as HMPE, PES or HMPE/PES combination.



When using fibre ropes, a smooth rope drum with a fine-finished surface and corresponding surface coating is to be preferred.
Alternatively, a grooved rope drum with increased groove pitch and with rounding of the groove heads can be used.
Grooved profile with fine-finished surface and chemical treatment for corrosion protection.



For hoisting winches: the minimum breaking strength of the textile rope used is 7 times the specified nominal load.

Avoid any sharp edges that are in contact with the rope in the rope winding and fastening area (e.g. by mechanical processing such as radii and fillets and/or by using protective plastic parts).



If you wish to retrofit your winch with a non-metallic rope, it is essential to implement the measures listed above in order to ensure a sufficient level of safety. In case of doubt, please contact the manufacturer.

3.7 Overrunning clutch (FLM)

3.7.1 Winch type PFW

The disengaging mechanism of the overrunning clutch is located on the side of the gearbox facing away from the cable drum. It is actuated by the push rod tensioner. When the push-rod tensioner is actuated, a spring is pre-tensioned and the drum is disconnected from the drive. The rope can now be easily unwound by hand and does not have to be unwound by motor at rope speed. To reconnect the drum, carefully release the push rod tensioner. If it does not return directly to the starting position, you can make it easier to engage by slowly pulling or unrolling the rope and at the same time slowly releasing the push rod tensioner.

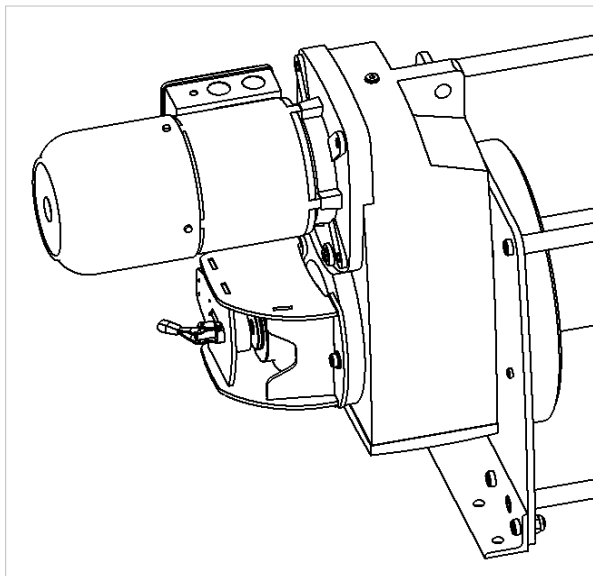


Illustration 1 Example overrunning clutch PFW



Before restarting electrical operation, check whether the clutch has re-engaged. To do this, after releasing the push rod tensioner, pull slowly on the cable until the clutch is audibly engaged again with a clear "click". Only then may the winch be operated electrically again.

The clutch is fully engaged when the push rod tensioner is in its initial position and has noticeable play. This is the only way to ensure that the connection between the drum and the gearbox is not interrupted during operation.



A switch is integrated in the coupling console, which can be used to automatically switch off the winch when the coupling is disengaged.

3.7.2 Winch type PHW, MC & PORTY

A disengagement lever is located between the gearbox and the drum, which disengages the drum from the drive shaft of the gearbox. By means of the locking latch, the disengagement lever can be locked in engaged or disengaged position, thus preventing unintentional opening or closing of the overrunning clutch.

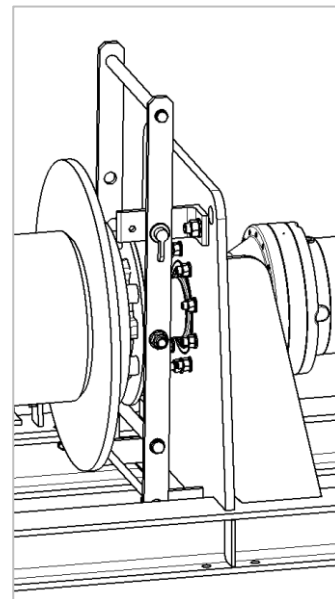


Illustration 2 Overrunning clutch PHW



Exposed and bare parts of the overrunning clutch must be lubricated with roller bearing grease at regular intervals. For lubrication intervals and greases, see chapter "Lubrication".

The power transmission in the engaged state takes place via radially arranged pins. To bring the clutch back into an engaged state, press the disengagement lever with slight pressure in the direction of the drum and turn it until the pins engage in the drum hub. Now lock the release lever with the help of the locking latch.



Overrunning clutches are only permitted for pulling winches. Personal protective equipment (gloves) must be worn when pulling off the rope manually.

3.8 Drum protection cover (TSH)



The drum protection cover serves to protect against injuries caused by being pulled into the rope drive. Please ensure that the standard rope window is in the correct position and large enough. If necessary, the opening can be enlarged.

3.8.1 Winch type PFW

The cover is divided into three parts, each part can be dismantled separately. To do this, please remove each of the four hinged cotter pins and lift the cover plate out of the pins.

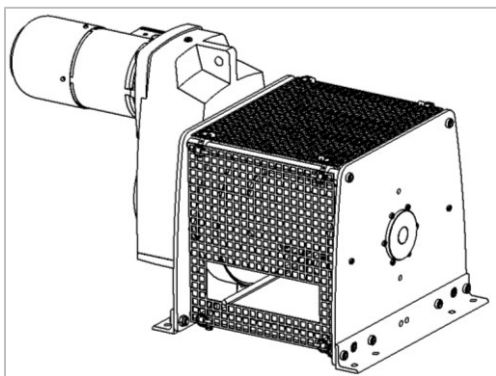


Illustration 3 Drum protection cover PFW

3.8.2 Winch type PHW, MC and PCW

The cover consists of a solid welded grid that is screwed to the respective base frame. The rope window was adjusted to the desired rope outlet at the factory.

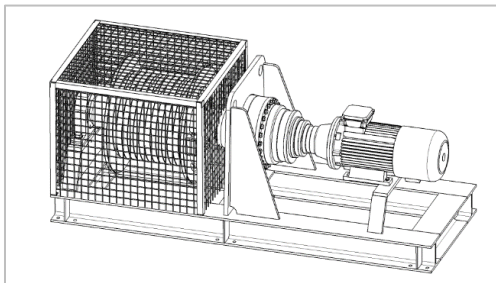


Illustration 4 Drum protection cover PHW

3.8.3 Winch type PORTY

The cover of the PORTY winch consists of a curved perforated plate that can be clamped directly onto the spacer bars of the PORTY frame via brackets and attached clamps. The cover can thus be removed completely without tools for maintenance purposes. To do this, bend the lower ends slightly apart and pull the cover off upwards.

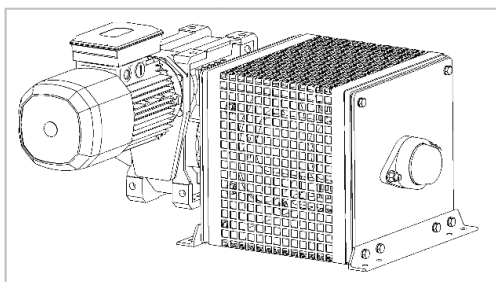




Illustration 5 Drum protection cover PORTY

3.9 Rope pressure roller (SAR)

	<p>The rope pressure roller supports orderly winding of the rope without load. The installation position depends on the rope departure.</p>
	<p>In order to be able to mount or dismount the rope pressure pulley, it is important to first unwind the spooled rope to the first layer. Caution, the rope pressure roller is pre-tensioned, there is a risk of jamming. When working on the rope pressure pulley, please ensure that the unit is disconnected from the power supply and secured against being switched on again. Regularly check the free movement of the roller and joints. Otherwise the rope and the pressure roller will be damaged.</p>

3.9.1 Winch type PFW

The rope pressure roller is supplied as a ready-made assembly that can be retrofitted without great assembly effort. The rope pressure roller can be mounted in all eight possible positions. For assembly and disassembly, please bring the pressure roller into maximum deflection and lock the position by mounting two screws (M6x16). You can now thread the rope pressure roller in or out.

Attention! Before commissioning, the screws (M6x16), which may have been pre-assembled by the manufacturer, must be dismantled by the customer. Otherwise, the rope pressure roller will not work! see illustrations below.

Illustration 7 Rope pressure roller

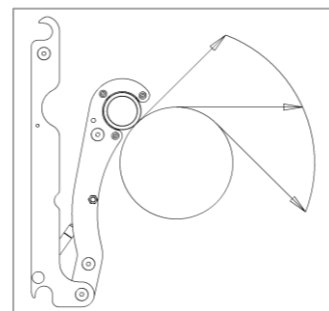
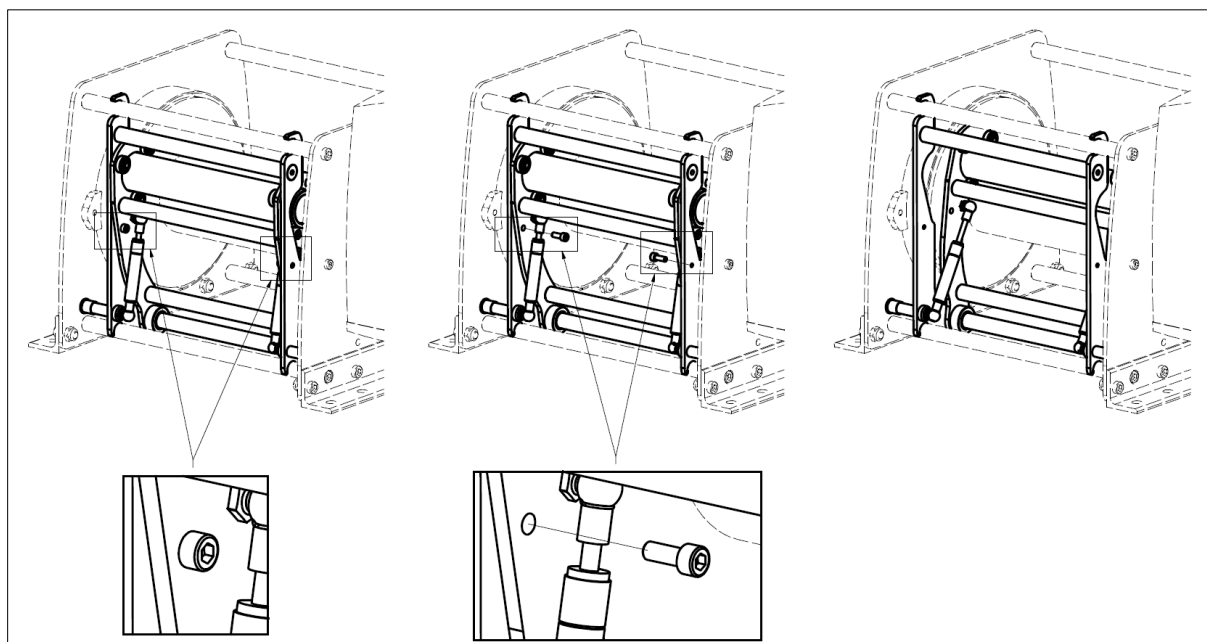


Illustration 6 Rope pressure roller PFW



3.9.2 Winch type PHW, MC and PCW

In the heavy-duty version of the rope pressure roller, this consists of a base console that is connected to the base frame of the winch ex works by means of a screw connection. The built-in compression springs press the roller, which is mounted on ball bearings, against the rope in the direction of the drum. During inspection and maintenance work on the cable pressure roller, be particularly careful with regard to the pre-tensioned pressure springs.

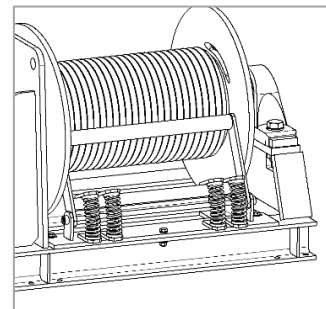


Illustration 8 Rope pressure roller PHW

3.9.3 Winch type PORTY

The rope pressure roller of the PORTY is mounted transversely to two spacer rods and can thus be adjusted ex works to any desired installation position to allow rope departure in any direction. The pressure roller is freely mounted and automatically centres itself on the drum by means of the flanges in contact with it.

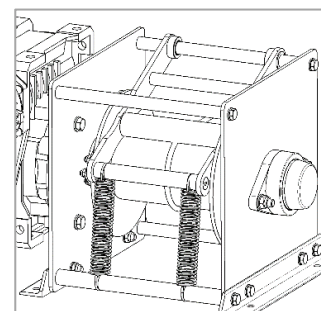


Illustration 9 Rope pressure roller PORTY

3.10 Spindle limit switch (GGS)



The spindle limit switch is used to limit the movement of the winch before damage can occur. It must always be set during installation.

3.10.1 Winch type PFW

For sizes 750 to 3000, there are two different installation positions for the spindle limit switch. On the gearbox side (ESG), the switch is mounted directly on the gearbox below the motor. For sizes 250 and 500, as well as for a built-in overload clutch and special motors, it is mounted on the bearing side (ESL). As standard, the PFW gear limit switches have an IP65 degree of protection.

3.10.2 Winch type PHW, MC, PCW

With these winch types, the spindle limit switch is attached and adjusted to the bearing block by means of a screwable bracket. Special spindle limit switches with higher protection classes and special contacts can be installed on request. It is also possible to fit an integrated incremental or absolute encoder on request.

3.10.3 Winch type PORTY

The PORTY's limit switch is directly connected to the drum shaft via a removable bracket and screwed to the gearbox. The gear limit switch for PHW, MC, PCW and PORTY has protection class IP55 as standard. The gear ratio of the limit switches is designed to match the rope capacity of the drum in order to ensure an optimum adjustment range in the switch.

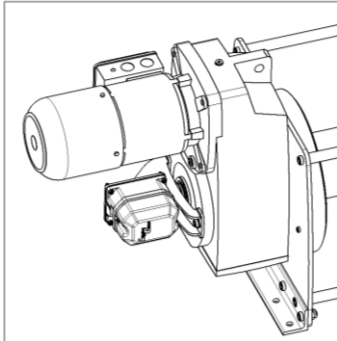


Illustration 10 Spindle limit switch PFW (ESG)

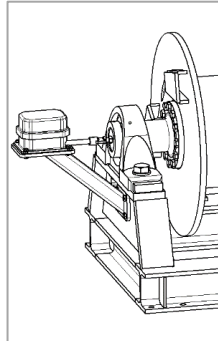


Illustration 11 Spindle limit switch PHW

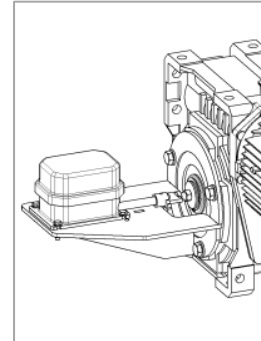


Illustration 12 Spindle limit switch PORTY

3.10.3.1 Cam adjustment

Each cam is provided with its own adjustment screw. The individual screws operate only the cam connected to the screw without affecting the position of the other cams. The adjustment is made by simply turning the screw with a normal screwdriver. A completely new system of connecting the individual cams in the cam controller minimises friction and at the same time increases the switching accuracy and reliability of the cams.

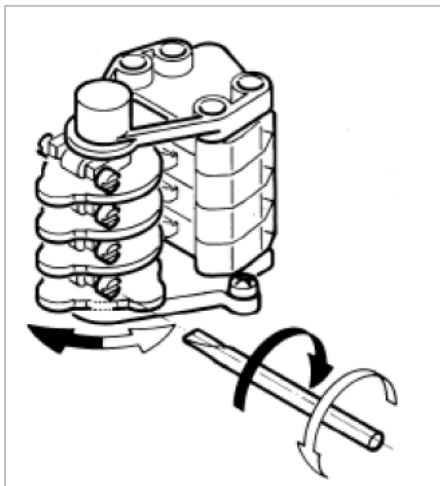


Illustration 13 Setting the cams



Use as emergency or operational limit switch

Only a spindle limit switch with 4 contacts and corresponding wiring may be operated. Other versions as well as spindle limit switches with only 2 contacts only serve as emergency limit switches and must not be operated. The switch of the PFW cable winch is equipped with 4 contacts as standard. On request, we can equip the switch with a key switch or push-button that allows the operator to override the operating limit switches and thus check the emergency limit switches.

Bei Verwendung
eines Endsalters
Brücken entfernen.

Prüfbarkeit Notendlagen
im Gehäuse des Endsalters

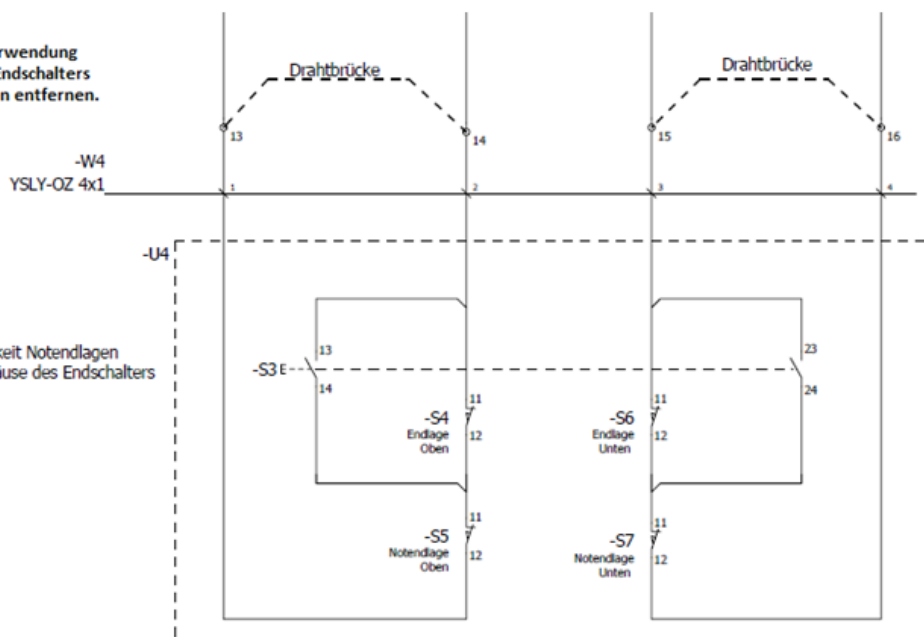


Illustration 14 Connection example for socket limit switch

3.11 Slack rope switch (SSS)

3.11.1 Setting the release point

A slack rope switch detects whether the rope is under load or not. The winch is automatically switched off as soon as the load is set down. On the PFW and PORTY winch types, the rope is pressed against the roller of the rocker under load by the springs. If the cable is no longer under load, the springs pull the rocker closer and the eccentric disc actuates the slack cable switch. This moment can be precisely adjusted by means of the screw located in the slotted hole of the eccentric disc. Simply loosen the screw and move it in the slot to influence the switching time. Then tighten the screw again. Depending on the winch type, the slack rope switch is more or less solid. On the PHW, PCW and MC winch types, the pretensioning of the switch pulley is realised without springs by the high dead weight of the pulley. However, this design provides for a horizontal rope drop.

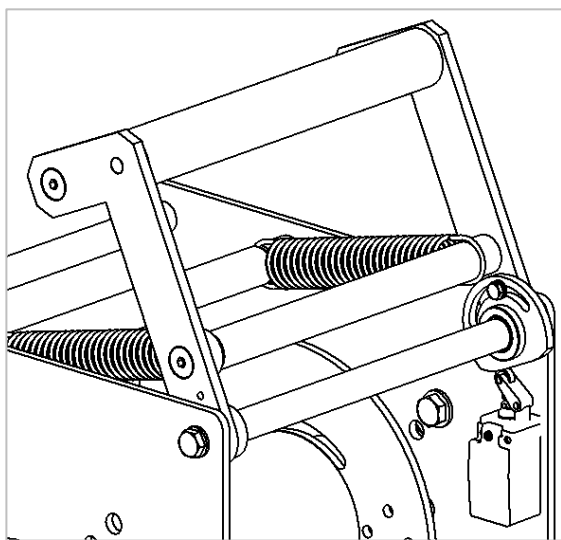


Illustration 15 Slack rope switch PFW

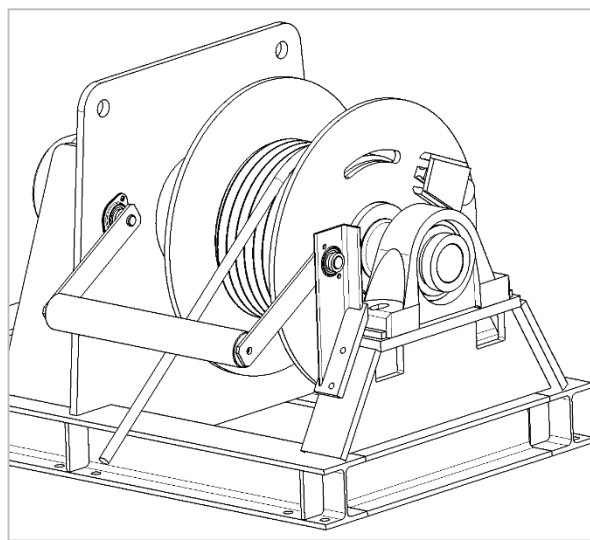


Illustration 16 Slack rope switch PHW

3.12 Handbrake release (HBL)

The motor is supplied with a brake release. You can release the brake manually by screwing the hand brake release lever into the housing and pulling it against the spring force. The brake is now released until you release the lever again. This allows you to release loads without current.



Please note that the load will accelerate uncontrollably. After using the handbrake release, the brake release lever must be returned to its original position. Otherwise the brake will not work! To do this, simply release the handbrake release lever again and it will be pushed back to its original position by spring force. To avoid accidental release of the handbrake release, you can unscrew the lever again and store it safely.

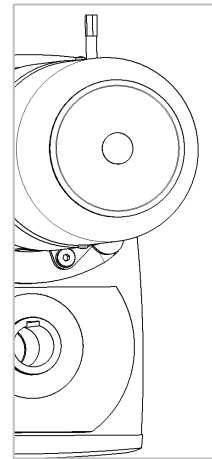


Illustration 17 Handbrake release PFW

The hand brake release is supplied, for example, with the PORTY winch type in combination with an emergency hand crank. To move the winch manually by crank, the brake must be released.

3.13 Emergency hand crank (NHK)

In the event of a power supply failure or emergency, you can operate the winch with the emergency hand crank. Now you can put the hand crank on the hand crank receptacle on the back of the motor.



Make sure that while the hand crank is on, the winch is de-energised and secured against being switched on again. If your winch is equipped with the emergency hand crank system, it is also automatically supplemented with a hand brake release so that you can release the brake while cranking. Please note that releasing the brake can cause the crank to start turning in an uncontrolled manner. There is a risk of injury here. Hold the crank securely and then slowly release the brake.

As a special option, the emergency hand crank can be equipped with an electrical plug-in monitor, for example on the PORTY winch type, which prevents the winch from starting with the crank inserted. Depending on the winch type, the emergency hand crank option is only permissible for pulling winches, as the load would accelerate uncontrollably when the brake is released without further securing or counter-holding on the crank.

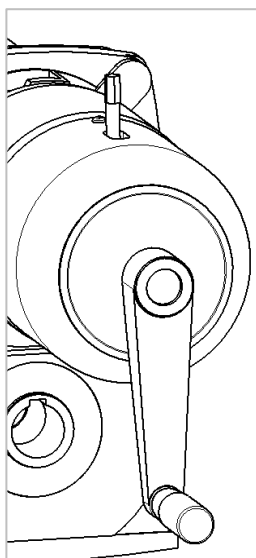


Illustration 18 Emergency hand crank PFW

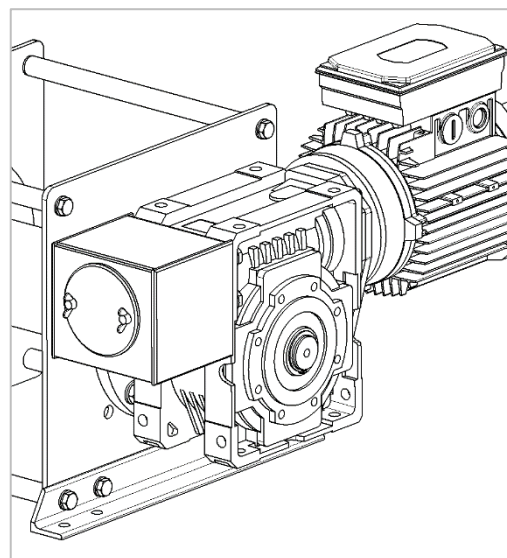


Illustration 19 Emergency hand crank attachment with monitoring box for PORTY

3.14 Overload protection (ULA)

In order to comply with the Machinery Directive, winches with a load capacity of 1000 kg or more and/or with a risk of jamming of the load require an overload cut-off as device protection. This is realised by means of current monitoring and the monitoring relay shown. The relay is available as an option for every contactor control. If your winch was ordered without a control and without an overload protection, it is your responsibility to retrofit an overload cut-off. The relay measures the motor current. The cut-off limit is between 110 and 125 percent of the specified rated load in the first position, measured in the first position. The time period in which measurement and switch-off takes place is a maximum of one second. The relay is preset at the factory. Subsequent adjustment should only be carried out by trained personnel.

The parameters to be set are as follows:

1. Start (time)- no function (Y1-Y2 jumpered at the factory)
2. max. I_N (current) - corresponds to the load setting. The value is set at the factory during the real load test with 1.25 times the overload and is theoretically based on the nominal current comparison of the motor at full load. 100% refers to the maximum current of the overload relay (5A - type 5AL10 / 10A - type 10AL10), which is compared with the rated current of the motor.
3. min. I_N (current) - 5% (minimum value to be set)
4. Delay - Delay time until the overload protection is triggered. The default value is a maximum of 1 second (s).
5. Function - O (Overload) must be set

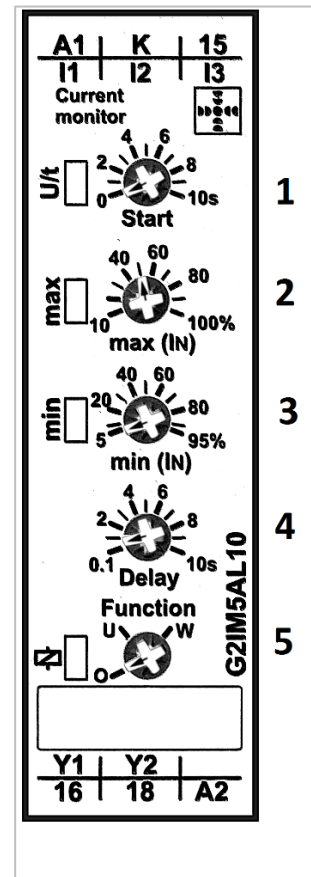


Illustration 20 Overload relay

3.15 Network monitoring (USW)

In order to ensure safe operation of the system, voltage and phase sequence (clockwise rotating field) must be correctly applied to the control unit. To ensure that the system switches to a safe fault state in the event of a fault, the mains supply is monitored with regard to undervoltage and overvoltage, phase failure and phase sequence. The status can be read off from the relay shown. If the lamp lights up at "R", the mains is OK. If the lamp lights up at "F", there is a fault and the system is switched off. In this case, the power supply should be checked and repaired.

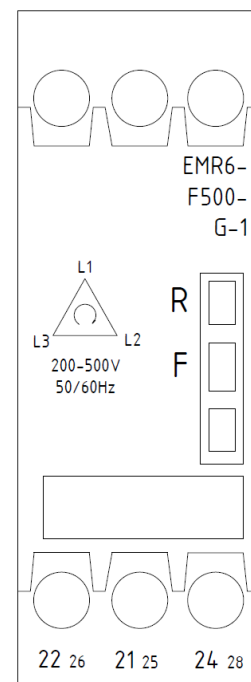


Illustration 21 Phase sequence relay

3.16 Description of the electrical circuit



Winches are supplied without controls as standard. The required voltage is stated in the chapter "Technical data" of the enclosed winch passport and on the type plate attached to the winch. The correct connection of the control to the motor and brake can be seen in the following chapter "Installation of the winch". Technical information about the optional electrical components can be found in the "Options" chapter. If the winch has been delivered with a control system, the electrical circuit diagram can be found in the winch passport supplied and as a copy in the electrical control box.

3.17 Special features for 1-phase 230V AC motors



If your winch is equipped with a single-phase 230V AC motor, it contains operating and starting capacitors. As these capacitors must charge and discharge during the lifting and lowering process, the so-called "inching operation" is not permitted. Therefore, there must be at least 3 seconds between the individual travel operations until the travel command may be pressed again.



If there is a humming noise from the motor when operating the winch, the capacitors have not had enough time to discharge. To avoid overheating or damage to the motor, switch the winch off for at least 30 seconds. After that, the winch can be used normally again. In load-free operation, increased running noise may occur.

4 ASSEMBLY, INSTALLATION AND COMMISSIONING



Each winch is delivered fully assembled, tested and packed on a pallet unless otherwise specified. Immediately check the integrity of the product upon delivery and report any damage found to the transport company immediately.

4.1 Setting up the winch

4.1.1 Lifting and transporting the winch



Never lift or transport the winch over people.



Only use approved and tested lifting gear for lifting and transporting the winch. It is essential to observe the permissible load capacity of the lifting gear and compare it with the dead load of the cable winch. Information on the weight of the cable winch can be found in the technical data in the enclosed winch pass.



Larger winches, especially of the types PHW and PCW, are firmly bolted to the delivered pallet ex works.



When transporting the winch, for example with a forklift truck or industrial truck, make sure that it is correctly attached to the pallet and secure it with lashing straps if necessary. During transport, pay attention to protruding components, such as the spindle limit switch, so as not to accidentally damage them when moving the winch.

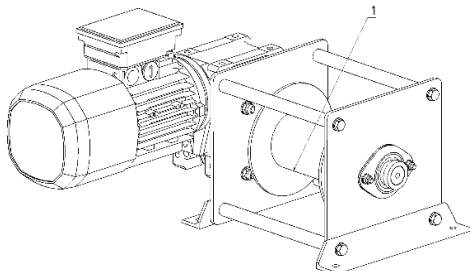
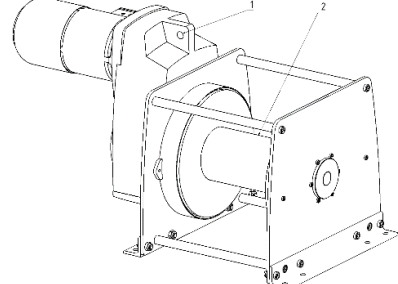
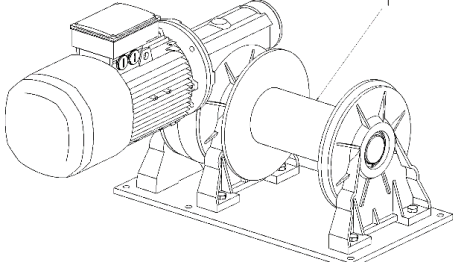
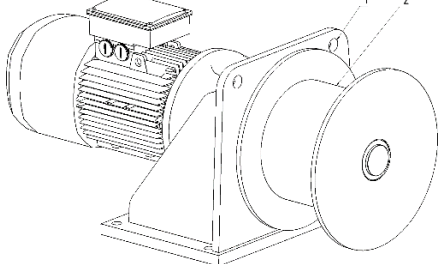
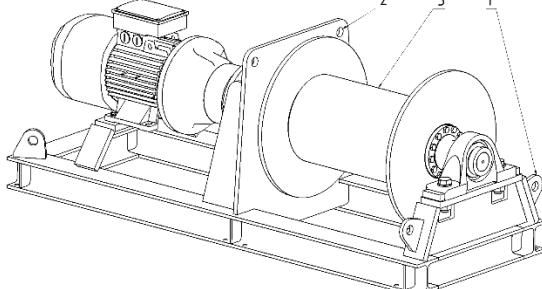


For lifting the respective winch types, the following possibilities should be used to connect the winches with a suitable sling. If attachments, such as the drum protection cover, prevent or hinder these possibilities, dismantle them for the period of installation of the winch.

Covers are connected to the winch by plug-in or screw connection for this purpose. Be sure to observe the operating instructions and special instructions for the slings used.

Lift all winch types a small distance first to check whether the winch is suspended in the centre of gravity and cannot slip during the lifting process. Only then lift or transport the winch to the intended installation point.

4.1.2 Attachment options for standard winch types

 <p><i>Illustration 22 PORTY slinging options</i></p>	<p>TYPE PORTY</p> <ol style="list-style-type: none"> 1. Use lifting straps around the drum and the gearbox. 2. To do this, place the lifting straps around the drum several times to prevent the winch from slipping out. <p>When lifting, pay attention to the correct position of the slings and the centre of gravity of the winch.</p>
 <p><i>Illustration 23 Attachment options PFW</i></p>	<p>TYPE PFW</p> <p>Use the attachment point on the gearbox to attach a suitable shackle.</p> <ol style="list-style-type: none"> 3. Use lifting straps around the drum. Place the lifting straps around the drum several times to prevent the winch from slipping out. <p>When lifting, pay attention to the correct position of the slings and the centre of gravity of the winch.</p>
 <p><i>Illustration 24 Attachment options MC</i></p>	<p>TYPE MC</p> <ol style="list-style-type: none"> 1. use lifting straps around the drum and gearbox. <p>To do this, place the lifting straps around the drum several times to prevent the winch from slipping out.</p> <p>When lifting, pay attention to the correct position of the slings and the centre of gravity of the winch.</p>
 <p><i>Illustration 25 Attachment options PC</i></p>	<p>TYPE PCW</p> <ol style="list-style-type: none"> 1. use the stop holes in the gearbox wall to attach a suitable shackle. <p>Use lifting slings around the drum and gearbox. Pay attention to the centre of gravity of the winch when lifting.</p>
 <p><i>Illustration 26 PHW attachment options</i></p>	<p>TYPE PHW</p> <p>Use the optional lifting lugs or attachment points on the frame (if fitted) with a sling chain harness or by shackle and sling.</p> <ol style="list-style-type: none"> 4. Use the stop holes in the gearbox wall to attach a suitable shackle. 5. Use lifting slings around the drum and gearbox. Pay attention to the centre of gravity of the winch when lifting.

4.1.3 Positioning and attaching the winch



To avoid damage to the winch during installation, observe the following points and contact the manufacturer if you have any queries.



NOTE!

ESSENCE OF THE CONNECTION SURFACE ± 1 mm








Should the winch be installed on an uneven surface, this will result in distortion of the frame and damage to the winch and will invalidate the warranty. Standard winches can be installed in any position. However, care must be taken during installation to ensure that the position of the ventilation plug in the gearbox is at the highest possible level. Otherwise leakage may occur and oil leakage is to be expected. If in doubt about the installation situation, please contact the manufacturer. The foundation of the winch must be flat and firm to avoid abnormal stresses which can cause rapid wear of internal parts. Fit suitable washers before tightening the foundation bolts if there is a gap between the foundation and the winch base and to compensate for unevenness in the foundation. Use high-strength foundation bolts through all existing foundation holes and tighten all bolts to the required torque.



When installing a pulley to deflect the rope, it must be exactly perpendicular to the rope drum axis and must be aligned centrally to the drum length used. Small deviations can lead to poor winding and increased wear of the rope drive. For more information on the positioning of rope defectors, see the chapter "Rope deflection angle".

4.2 Before commissioning

4.2.1 Electrical connection of motor and brake

	
	<p>Wear appropriate protective clothing, such as a work suit, work gloves, helmet, safety glasses and safety shoes. Failure to wear appropriate protective clothing and equipment may result in skin problems.</p>
	<p>For the electrical connections, two different plans are shown as examples. The connection types shown here represent the manufacturer's standard and should be used. However, each system has its own peculiarities that should be clarified with the manufacturer. Further information on connecting the motor or brake can be found on the motor's type plate. If the winch has been delivered with a ready-made control system, the motor and the brake are already correctly wired at the factory.</p>
 	<p>However, after connecting the optionally supplied control unit and before installing the rope, check that the motor runs correctly without a load applied. The direction of rotation must be checked as well as the opening of the brake, which can be perceived by a clear switching noise when opening and closing the brake.</p> <p>Optionally supplied controls have been designed and built for clockwise rotating panels, unless otherwise agreed. Check the correct direction of rotation of the connection, otherwise the optionally installed overload protection and limit switch may malfunction. If the direction of rotation of your mains does not have a clockwise rotating field, please contact the manufacturer.</p> <p>The correct direction of rotation for a supplied control unit and smooth drum can be recognised by the direction arrow stuck on the rope outlet. With a grooved drum, the direction of rotation is determined by the grooving. When pressing the "DOWN" button, the smooth drum must rotate in the direction of the arrow.</p>

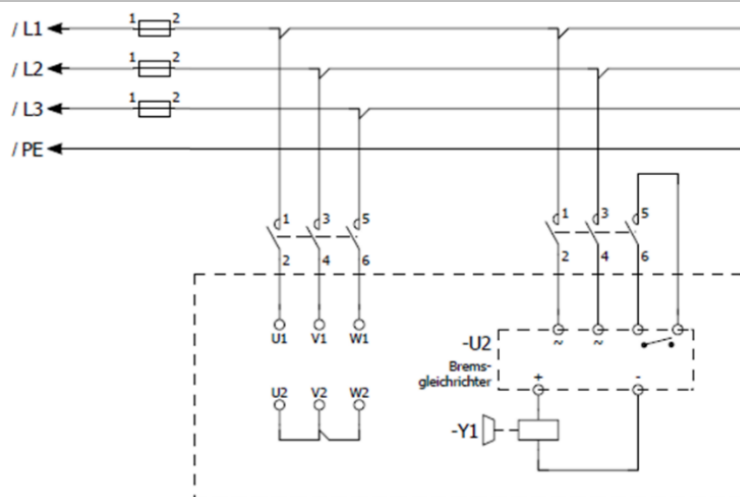


Illustration 27 Connection example

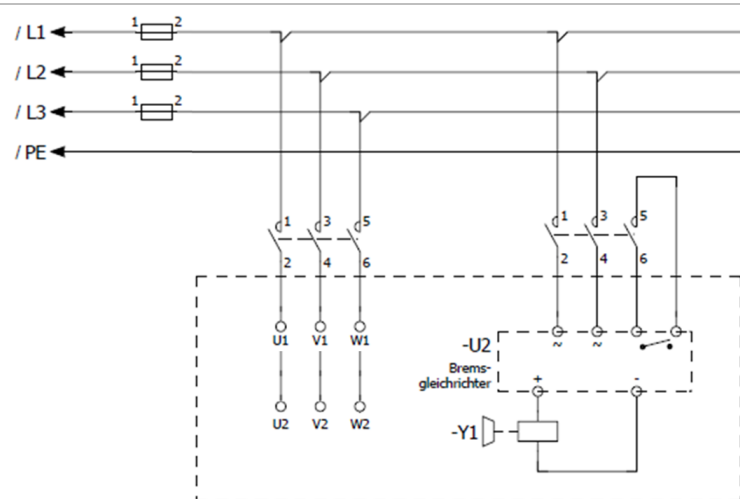


Illustration 28 Connection example

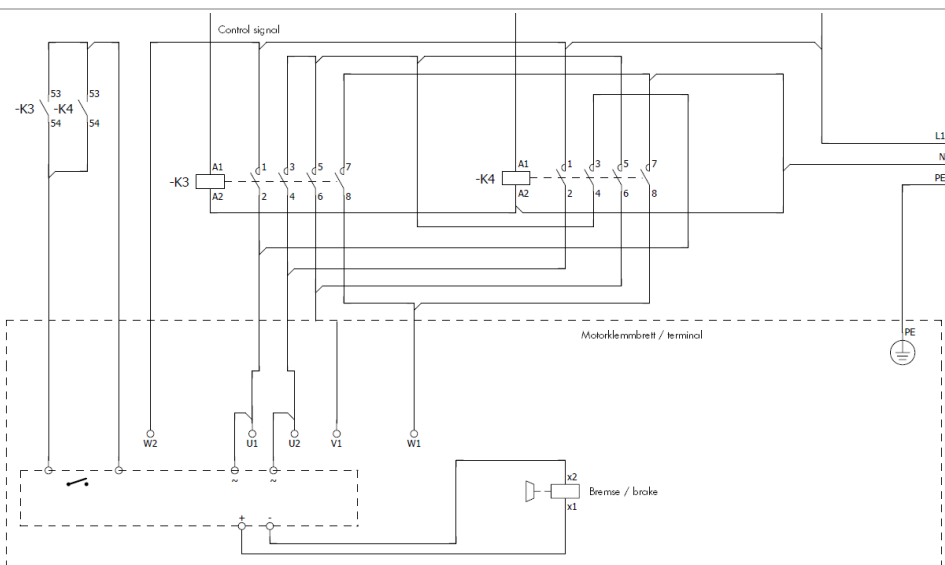


Illustration 29 Connection example 230V motor

4.2.2 Unwinding and uncoiling the rope



When using steel ropes, pay attention to the following:



By not using appropriate personal protective equipment (PPE), you can seriously endanger your health and face possible injury:

- Skin problems due to excessive contact with certain lubricants;
- Respiratory damage due to inhalation of gases when cutting ropes or embedding them in grouts;
- Injuries to the eye from sparks, wire fragments, wire and rope ends;
- Burns from sparks, melted lubricants or metals;
- other injuries due to wire and rope ends snapping back.

Wire ropes must be uncoiled or unwound by skilled personnel or under the supervision of skilled personnel.

Improper handling of wire ropes can be very dangerous. Significant damage to ropes can seriously endanger persons as well as equipment and installations. The use of wire ropes that do not comply with the manufacturer's instructions can cause serious hazards to personnel.



Excessive bending can damage the product and accelerate bending fatigue.

- For stranded ropes with a D/d ratio of less than 12, bending must be avoided at all costs when uncoiling.
- Use wooden supports or rollers to avoid direct contact of the rope with the floor.

The rope should be unrolled on a turntable or like a tyre on the floor (see Illustration 29). When uncoiling, however, it is important to ensure that the floor is clean so that dirt is not absorbed by the rope lubricant and combines to form an abrasive paste. A turntable can also be used when uncoiling from a reel (see Illustration 30), but especially with large reels and thick ropes it is more advisable to use a frame or coiling stand to uncoil the rope cleanly.

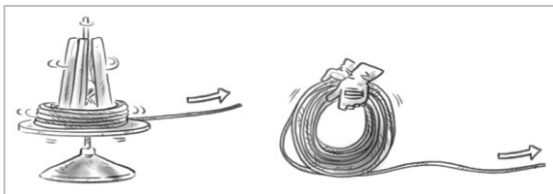


Illustration 30 Unwinding from a turntable or by hand

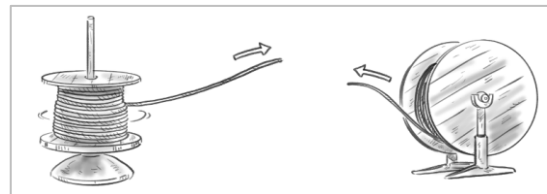


Illustration 31 Unwinding from a reel

4.2.3 Pulling the rope onto a winch



Improper rope installation can result in serious injury to persons involved in the installation and subsequent operation or damage to materials.

- Ropes may only be installed with due care by competent technicians and/or appropriately trained persons under expert supervision.
- Wear personal protective equipment (work clothes, helmet, gloves, eye protection, safety shoes) according to local safety regulations.
- Ensure that the retracting devices for rope installation are safe and cannot be started accidentally.
- Make sure that the tools and aids required for rope installation are available.
- During installation, ensure that the wire rope is not subjected to twisting or deformation, abrasion or other influences.

Rotation-free ropes, for example, can even be damaged at deflection angles α greater than 2° !



Wind the new rope slowly, preferably with a light load, several turns. A pre-tension of 2% to 5% of the strength of the wire rope helps to achieve a tight and even winding - especially in the first layer. Check that the new wire rope has been properly wound onto the drum and that there are no loose or crossed windings. Where multi-layer winding is unavoidable, subsequent layers must be wound evenly and level on the previous wire rope layers.

Ensure that the factory condition of the rope is maintained throughout the period of use and installation. Limit switches, if any, must be checked and adjusted if necessary after the rope has been installed.

Note the following information in the winch pass after installation is complete:

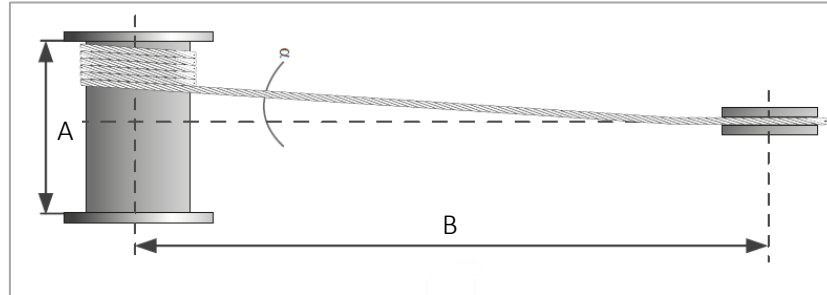
- Type of equipment,
- Place,
- Serial number,
- Hours of operation and date of installation as well as any assessments and signature of a qualified person.



During installation, the spool should be placed at a maximum distance from the first pulley or drum and without deflection, as deflection can cause the rope to twist.

Rotation free ropes	Ropes that do not rotate
$\alpha \leq 2^\circ$ $B/A \geq 15$	$\alpha \leq 4^\circ$ $B/A \geq 7$

For example, for a spool with 1m distance between the flanges (A), the distance between the spool and the first sheave (B) must be at least 15m for a rotation-free rope.



In the following table you will find the minimum and maximum deflection angles to be observed depending on the selected drum and rope version. Larger rope deflection angles lead to excessive wear, grinding noises and poor spooling behaviour. To obtain a correct rope deflection angle, align the drum of the winch at a right angle to the rope and average it to the first pulley.

Table 7 Rope deflection angle

	Smooth drum			Grooved drum single layer wound			Grooved drum wound in several layers*		
	Min.	Max. recom- mended	Max.	Min.	Max. recommended	Max.	Min.	Max. recom- mended	Max.
Non-rotational ropes (e.g. 6x19 or 6x36)	0,5°	1,5°	2,0°	0°	2,5°	4,0°	0,5°	1,5°	2,5°
Low-twist ropes (e.g. 17x7)	0,5°	1,2°	1,5°	0°	1,5°	2,0°	0,5°	1,5°	2,5°

* For grooved drums with more than 3 rope layers, the angles should be used as specified for smooth drums.

4.2.4 Retraining the rope on a winch



Usually the new rope is pulled in either through a leader rope or through the rope to be discarded. In both cases, a secure connection of these ropes must be ensured. When pulling in with a leader rope, make sure that it cannot twist. Ideally, non-twisting types of rope or 3- or 4-strand ropes are used. However, if conventional wire ropes are used, one should at least make sure that they have the same direction of lay as the wire rope to be pulled in.

If the new rope is pulled in using the old rope, it must be prevented that twist built up in the rope drive is not transferred from the old to the new rope. Therefore, welding the ends of steel ropes against each other is strongly discouraged. In the case of wire ropes, it is recommended to connect the wire ropes by means of two mounting eyes welded to the ends (see Illustration 31), also called mounting eyes, which are connected by means of strands or thin ropes. This connection is flexible and prevents the transmission of twist.



Illustration 32 Mounting eyelet

4.2.5 Attaching the rope to the winch drum

Direction of rope departure



For rope drums with a smooth drum base and fastening elements for the rope in two directions, you can choose the direction of rotation of the rope on the drum. For grooved drums, the direction of rotation of the rope on the drum is predefined. To attach the rope to the drum, follow the points below step by step.

Step 1: Extending the rope outwards

Guide the rope end from the winding area of the drum through the opening in the drum flange. (see Illustration 32) Depending on the winch type, the possibilities for fastening the rope differ:

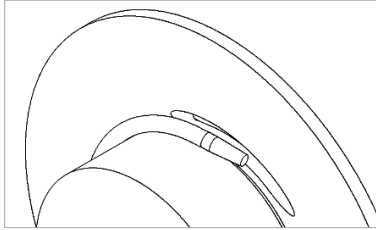


Illustration 33 Extending the rope outwards

Step 2a. Fastening the rope with a rope wedge

First make sure that the rope wedge without rope can be moved easily and up to the stop on the side walls of the rope bag in the rope bag. With some sizes, the rope wedge without rope even fits completely through the rope pocket. If it gets stuck, stop the rope installation and contact the manufacturer. Pass the rope through the rope pocket, make a loop around the rope wedge and then pass the rope wedge with rope loop into the rope pocket (see Illustration 33). Make sure that the free end of the rope that sticks out is at least five times the rope diameter. On the rope, pull the rope wedge into a fixed position (see Illustration 34).

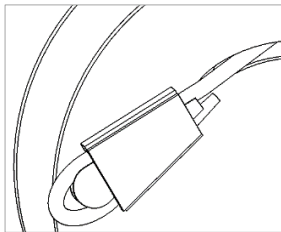


Illustration 34 Fastening the rope with a rope wedge

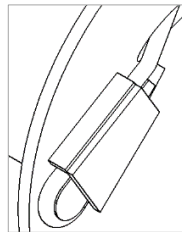


Illustration 35 Fastening the rope with a rope wedge

Step 2b. Fastening the rope with rope clamp

Attach the rope to the drum flange as shown in Illustration 35. Place the rope in the groove of the clamping piece and clamp it by tightening the screws. Make sure that the free, protruding end of the rope is at least five times the rope diameter. For tightening torques of the screws, please refer to the chapter "Technical data" of the enclosed winch passport. With the PFW DT2, pass the rope through the clamps twice by looping it around the drum. The DT2 drums have 3 clamps each as well as a 4th hole as a spare (see Illustration 36).

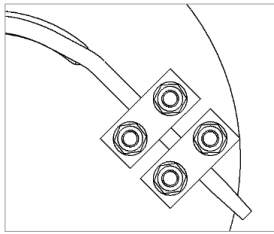


Illustration 36 Fastening the rope with rope clamp

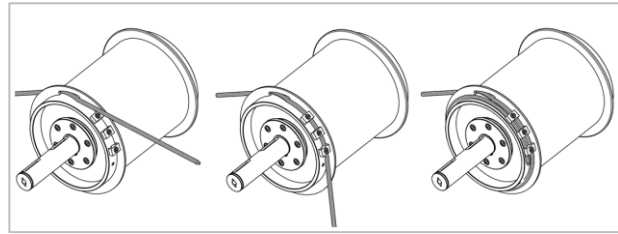


Illustration 37 Rope clamping on the PFW DT2

Step 2c. Fastening the rope with double round clamp

Loosen the two countersunk screws of the rope clamping piece on the inside of the flanged pulley. Guide the end of the rope from the winding area of the drum through the opening in the drum flange (see Illustration 37). Loop the rope 3/4 of a turn around the hub and guide it through the inner groove of the rope clamp. Loop the rope around the curve of the rope clamp and guide it through the outer groove of the rope clamp. Now tighten the screws of the rope clamp alternately and evenly. For the tightening torque, please refer to the chapter "Technical data" of the enclosed winch passport.

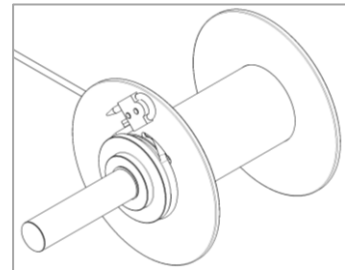
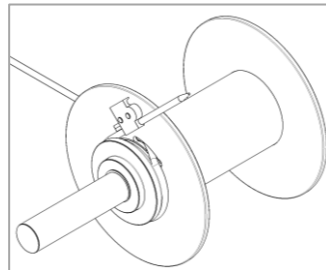
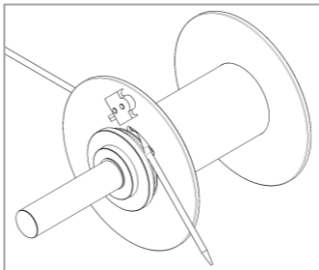


Illustration 38 Fastening the rope with double round clamp

Step 3. security wraps



Always keep a minimum of 3 turns of rope on the drum to guarantee safe holding of the load. The rope end attachment on the drum alone is not sufficient to hold the load.



Never use a rope that exceeds the maximum permissible length. This can prevent the creation of additional rope layers that do not comply with the safety regulations. The maximum rope length can be found on the type plate or in the chapter "Technical data" of the enclosed winch passport.



The first wrap of the rope to the drum must be positioned in such a way that a perfect bearing density of the rope wraps is obtained and no space is left between the wraps. Keep the rope under tension during the first winding process. The rope can easily be damaged if it is wedged under load between underlying non-compact layers.

4.3 Commissioning

4.3.1 Verification of the installation



Check that all points of the installation have been carried out carefully and conscientiously.

This includes the chapters:

- Setting up and securing the winch,
- Check and, if necessary, refill the gearbox oil and check the positioning of the breather screw,
- Electrical connection of motor and gearbox or wiring and connection of the optionally supplied control unit with subsequent connection test and first run without load and rope,
- Installation of the rope.

4.4 Statics and protocols



Before driving under load for the first time, it must be ensured that the on-site statics of the suspension are available. It is also necessary to check that the anchorage is installed in accordance with the regulations. This includes, depending on the installation site, a protocol for the installation of correctly selected dynamic anchors in concrete ceilings, walls or foundations or a protocol for the correct tightening of the connecting bolts with torque in steel constructions. Commissioning of the winch is otherwise not permitted.

4.5 Reduced load test

Now carry out some tests with reduced load (e.g. 25% of the nominal load), checking that the brakes are working properly and listening for excessive or unexplained noises.

4.6 Setting the limit switches



Now set the optionally supplied gear limit switches. In order to take the rope elongation into account, carry out this procedure with reduced load and leave enough play before constructive limits. The setting of the optionally supplied gear limit switches is explained in more detail in the chapter Product description.

4.7 Final load test and overload protection

Now drive the winch a short distance until the nominal load is suspended in the system and after waiting for 10 minutes, check whether any irregularities can be seen in the rope drive or the suspension. Only then drive to the outermost positions with the rated load attached to check the correct setting of the limit switches.



Check the function of any EMERGENCY STOP device by pressing the EMERGENCY STOP button or triggering the corresponding safety switches while driving under nominal load.

Finally, check the proper function of the overload protection with the corresponding test load. If the winch has been delivered with a factory-fitted overload protection as part of the control system, this has been set to a value between 1.1 and 1.25 times the specified nominal load in the first rope layer during the factory load test. The test report on the load test is stored in the enclosed winch pass.

4.8 Logging and CE marking

After successful completion, assembly and commissioning, the winch must be inspected by a competent person. This person must document the inspection on the EC declaration of incorporation and in the chapter "Inspections" of the enclosed winch pass and sign it responsibly. All records of the work carried out as well as the available statics must be stored in the winch pass for the periodic inspections to be carried out later (in Germany). Upon commissioning, the conformity of the entire system to the applicable regulations must be determined and a CE mark affixed by the responsible installation company or person. The declaration of conformity to be drawn up by the responsible installation company or person for the entire system must be deposited in the winch pass. The operator is responsible for maintaining conformity with the applicable directives. For important safety criteria with regard to conformity with the Machinery Directive of a winch, see also chapter "Important protective devices of the winch".

5 OPERATION

5.1 Before operating



Each user must have read this document in its entirety and understood its contents. The user is responsible for reading every part of this document and following all instructions contained therein.

5.2 Operation



Only persons who are familiar with the operation of the units may be entrusted with this task. They must be authorised by the employer to operate the unit. The entrepreneur must ensure that the operating instructions are available on the device and accessible to the operating personnel. Forcible pulling may possibly close the brake and the chain will no longer be transported. Set the selector lever to the lowering position, perform a few lowering operations and start lifting again.

Depending on whether your winch is equipped with a control system at the factory, there are various possible ways of operating it. Below you will find some of these possibilities for operating your winch correctly. If you have ordered your winch as a lifting winch, we speak of lowering the load when unwinding the cable and lifting the load when winding the cable.

5.2.1 Contactor control in the control cabinet

One equipment variant is the contactor control in the control cabinet. Depending on the design, there may be buttons on the cabinet for lifting and lowering the load at the various possible speeds. If your winch has a frequency converter operating mode, the control cabinet usually has a rotary switch for setting the speed. The emergency stop switch stops the motor and can be unscrewed after operation to continue operation.

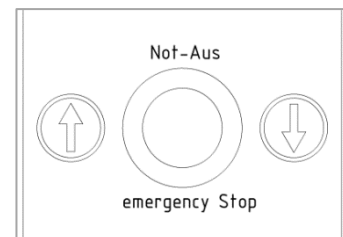


Illustration 39 Contactor control in the control cabinet

5.2.2 Manual push-button for direct control/contactor control

Depending on the equipment variant, there is a manual button with a control cable either directly on the motor or on the control cabinet for operating the winch. As a rule, this has buttons for unwinding and winding the cable as well as an emergency stop button for quickly stopping the motor. This can be unscrewed after actuation in order to continue operation.

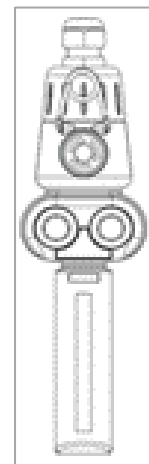


Illustration 40 Hand switch

5.2.3 Radio remote control

If your winch is equipped with a radio remote control at the factory, it offers you, depending on the equipment variant, the possibility of winding or unwinding the rope using the arrow keys. If, depending on the option, several speeds are equipped, this can also be controlled via the remote control. The emergency stop button is located on the underside of the radio remote control. It engages after being pressed and can only be released again by a turning movement if operation can be resumed.

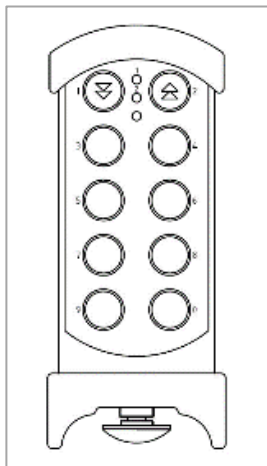


Illustration 41 Radio remote control

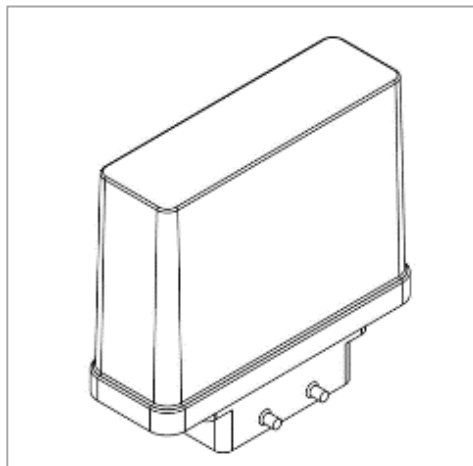


Illustration 42 Radio receiver



To activate the radio remote control, please make sure that the emergency stop button is unlocked and press the two buttons marked "Start" simultaneously. To switch off the radio remote control, press the emergency stop button.

5.2.4 Several operating modes

The control cabinet is designed with a selector switch depending on the selected option (for several operating modes). In addition to the positions "radio" and "manual" for the respective operating mode, there is often a third position of the switch via which the control can be switched off.

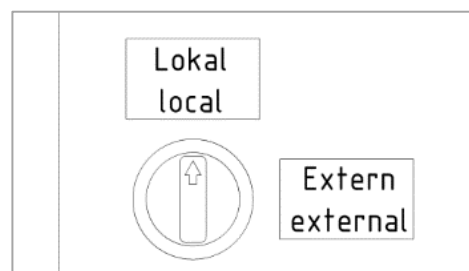


Illustration 43 Multiple operating modes

6 STORAGE



Winches that are stored for a longer period of time before being put into operation for the first time are subject to special storage conditions. In general, the winch including controls and accessories must be protected from extreme temperatures and moisture during storage.



Bare components, such as the drum, must be treated with a commercial corrosion protection agent (e.g. Tectyl 846K) before storage to prevent corrosion. Bearing points as well as ropes that have already been wound on or stored must be greased. Before storage, the winch must be checked for damaged paint and repaired. If the winch is to be stored for longer than 6 months, the gearbox must be completely filled with the oil intended for this purpose in order to prevent corrosion in the gearbox housing as well. Before commissioning, the correct oil filling quantity must be observed.



In the case of fluctuating temperatures deviating from +20°C and possible humidity >50% at the place of storage, the winch must be packed airtight and stored for a storage period of max. 6 months with the addition of desiccant. Seaworthy packaging in accordance with ISPM15 is recommended here to ensure additional mechanical protection during storage. In order to avoid damage during storage, the winch must be operated without load for at least 15 minutes after a maximum storage interval of 6 months. Special care must be taken to ensure that the brake opens and closes properly. During the 15 minutes, approx. 30 start and stop operations should be carried out. After the proper test run, the winch must be treated again as described above and can be packed accordingly for another 6 months. This test procedure must be documented in writing to the manufacturer.

7 INSPECTION , MAINTENANCE AND REPAIR



Inspection

The inspection comprises the examination of a facility. The actual condition of an object or machine is determined and documented. The functioning of the entire facility as well as all facility parts, settings and values are checked. The aim is to find out whether the object under consideration is in a proper, functioning and safe condition.

Maintenance

During maintenance, work is carried out on the system. The target condition is restored. Maintenance work should delay the progression of wear and tear or, in the best case, prevent it altogether. All measures carried out should be recorded in a log. Regularly performed and documented maintenance preserves the warranty claim and increases the resale value of a machine or system. Normally, the interval between two maintenance operations is one year.

Repair

If a defective system part is discovered and replaced during maintenance work, this is a repair measure. The target state, i.e. a faultless, functional operating behaviour, is restored.

Through inspections and maintenance, the system is observed, cared for and wear is inhibited. After a certain time, however, wear-related damage often occurs, even when a machine is used as intended. Repairs must be carried out immediately after the damage has been detected. The defective parts are either repaired or replaced, depending on the situation and costs. Entire assemblies can also be replaced. In the end, the operational capability and functional safety must be restored. All repair measures must also be entered in the maintenance log.

Possible reasons for defective components are:

- Wear
- Friction
- Corrosion
- Fatigue
- Embrittlement
- Ageing
- Poor maintenance
- Incorrect use
- Exposure to violence

7.1 Inspection classification



National law, as well as regulations, must be observed in any case. In addition, the inspection intervals must be observed depending on the application. They are based on the application of the hand lever hoist and the exposure to wear, ageing or malfunctions of the critical components.


Table 8 Inspection classification I

Classifications:	
Normal use: Normal conditions	Use with randomly distributed loads within the rated load limit or with uniform loads below 65 % of the max. load capacity for max. 15 % of the operating time.
Aggravated use: harsh conditions	Use in which the hand lever hoist is operated within the rated load limit and which exceeds normal use.
Extreme commitment: extreme conditions	Use in which the hand lever hoist is operated under normal or difficult conditions with abnormal operating conditions.

Table 9 Inspection classification II


Classifications:	
Daily Inspection:	by the operator or other specified persons before daily operation.
Frequent Inspection:	by the operator or other specified persons at intervals determined by the following criteria: <ul style="list-style-type: none"> • Normal use: monthly • Deployment under difficult conditions: weekly to monthly • Use under extreme conditions: daily to weekly No records need to be kept.
Periodic Inspection:	by specified persons at intervals determined by the following criteria: <ul style="list-style-type: none"> • Normal use: annually • Use under difficult conditions: every six months • Use under extreme conditions: quarterly Records shall be kept for the ongoing condition assessment of the hand lever hoist.

7.1.2 Frequent inspections

	<p>Frequent inspections should be carried out on equipment that is in continuous operation. This is best done by the operator at the beginning of each shift. In addition, visual inspections must be carried out during regular operation to detect damage or malfunctions (such as abnormal noises).</p> <p>Frequent inspections must be carried out on the following components:</p> <ul style="list-style-type: none"> • Winch, • Rope and sheathing of the rope, • Air system, • Control, • Brake, • Limit switches and • Lubrication
---	---


Subject	Mode of implementation and criteria
Winch	Visually inspect the winch housing, controls, brakes and drum for signs of damage before operating. Do not operate the winch unless the wire rope is evenly wound from the drum. Any deviation found must be further checked and controlled by authorised personnel trained in the operation, safety and maintenance of this winch.
Rope	<p>Check the rope for wear and damage. If damage is evident, do not operate the winch until the abnormalities have been checked and inspected by personnel trained in the operation, safety and maintenance of this winch. At any sign of wear, inspect the rope in accordance with the instructions in "Periodic inspections."</p> <p>Wire ropes: Look for deformations, volume reductions, wire breaks, kinks / crushes, corrosion, etc.</p> <p>Fibre ropes: Look out for deformations, volume reductions, cuts, discolourations / burns, etc.</p>
Rope reeving	Check the reeving and ensure that the rope is properly secured to the drum.
Air system	Visually inspect all connections, fittings, hoses and components for signs of air leaks. Repair any leaks or damage. Check and clean filters, if fitted. Check the lubrication operation.
Control	While operating the winch, check that the control feedback is fast and smooth. If the winch responds slowly or the movement is not satisfactory, do not operate the winch until all problems have been corrected.
Brake	Check the brakes during winch operation. The brakes must hold the load without slipping. Automatic brakes must release as soon as the motor starts. If the brakes do not hold the load or do not release properly, they must be adjusted or repaired.
Lubrication	For recommended procedures and lubricants, see chapter "Lubrication".
Limit switch	Check that the end position cut-off is correct.

7.2 Periodic inspection

	<p>The frequency of periodic inspections depends mainly on the severity of use and is to be determined by the operator through a risk assessment. Keep the accumulated written reports of periodic inspections to provide a basis for continuous assessment. Check all items listed in "Frequent Inspection".</p> <p>Periodic inspections must be carried out on the following components:</p> <ul style="list-style-type: none"> • Foundation and or support structure, • Nameplates, • Frame and stand, • Drum and reel, • Fasteners and • Brake
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Subject	Mode of implementation and criteria
Foundation and or supporting structure	Check for deformation, wear and continuous strength to support the winch and the rated load. Ensure that the winch is firmly mounted and the fasteners are in good and tight condition.
Type plates	Check for the presence and legibility of the type plate, warnings and labels. Replace damaged or missing plates.
Frame and stand	Check for bent, cracked or corroded main components. If external signs indicate the need for additional inspection, take the winch to the manufacturer for repair.
Drum and reel	Check for cracks, wear or damage. If necessary, replace them.
Fastener	Check retaining rings, dowel pins, screw caps, nuts and other fasteners on the winch including fixing bolts. Replace missing or damaged bolts and tighten loose bolts.
Brake	Test the brake to ensure proper operation. The brake must be able to withstand 1.25 times the rated load of the respective rope layer without slipping. In the event of poor operation or visible damage, return the winch to the manufacturer for repair. Check all brake surfaces for wear, deformation or foreign deposits. If the brake lining appears worn, dirty or damaged, the brake lining must be replaced. Clean and replace components as necessary.

7.3 Winches in irregular use

	<p>Units that have not been in operation for a period of one month or more, but less than six months, must be inspected according to the requirements in "Frequent Inspection" before being put into operation. Pay particular attention to the function of the brake, as longer periods of inactivity can cause the brake pads to "stick". Units that have not been in operation for a period of more than six months must receive a complete inspection in accordance with the requirements of "Periodic inspection" before commissioning.</p>
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7.4 Lubrication



Lubrication intervals are based on periodic operation of the winch, eight hours a day, five days a week. With more intensive use, the lubrication intervals increase. Also, the lubrication types are based on operation in an environment relatively free of dust, humidity and aggressive smoke.

7.4.1 Lubrication of the gearbox



In principle, all winches are delivered with lubricated gears. The chapter "Technical data" in the enclosed winch pass states which oil your winch is equipped with and in which quantity. Nevertheless, check whether there is actually oil in the gearbox. To do this, loosen the breather screw and carry out a visual check and, if necessary, an additional measuring check with a suitable dipstick. Top up with oil if necessary. The position of the breather screw is explained below. Additional details can also be found in chapter "Gearbox oil change and check". The gearboxes of winch types PFW and P 125 to 750 are provided with lifetime lubrication. Inspect the gearbox for leaks. No gearbox breather needs to be fitted when the winch is used as intended. If there is no bubble in the sight glass when the winch type P is first delivered, this is usually due to a slight and harmless overfilling of the gearbox and the transparent oil. In this case, check the oil level. Be careful when handling lubricants, protect your skin with gloves and dispose of residues and oily rags at an approved specialist disposal company.



Observe the duty cycle of the winch, which you will find on the type plate and in the technical data of the enclosed winch pass. Failure to do so may result in overheating and damage to the winch and burns to persons on contact with the components. The temperature of the lubricating oil must therefore never exceed a temperature of 100°C. Ensure the correct positioning of the loosely enclosed gearbox breather screw. This depends largely on the selected installation position. Basically, make sure that the breather is installed at the highest possible point of the gearbox, depending on the desired installation position, in order to avoid leaks when the internal pressure rises due to increased ambient and operating temperature. To do this, unscrew the top gearbox plug from the gearbox and replace it with the enclosed breather plug.



Position filler plug. Attach the bleed screw here.



Sight glass for oil level determination (if available).



Position drain plug for draining the gear oil (equipped with magnet if necessary).



Reference to factory-selected installation position (black for floor).

In addition to the breather, the gearbox is equipped with at least one drain plug and, if necessary, a sight glass to check the correct oil level. The position of the sight glass, oil inlet and drain plug can be identified on the winch by the adjacent symbols. Unless otherwise agreed, the symbols are based on a horizontal installation position with the base frame on the ground. You can recognise the preselected installation position by the adjacent symbol.

7.4.2 Lubrication of the pinions and threads



The use of thread lubricant or a lubricant composition is recommended for threaded shafts, screw caps and nuts. Remove old lubricant, clean the part with an acid-free solvent and apply a new layer of lubricant to the part before assembly.

7.4.3 Lubrication of the bearings and pivot points



Lubricate all grease fittings monthly or more frequently with a grease gun depending on the severity of operation. For temperatures from -29°C to 10°C use a lithium-based multi-purpose grease EP 1. For temperatures from 0°C to 49°C use a lithium-based multi-purpose grease EP 2.

7.4.4 Lubrication of the engine



The bearings of all electric motors have lifetime grease lubrication.

7.4.5 Lubrication of the wire rope



ATTENTION:

Failure to re-lubricate ropes in a timely manner can result in rope malfunction in the rope drive and external and internal corrosion. If too much or the wrong lubricant is applied, this can lead to excessive adhesion of dirt on the surface of the rope. This can lead to wear on the rope, the sheave and the rope drum. It also makes it much more difficult to recognise the discard criteria.



Only special rope lubricants, which are heavy viscosity oils or light greases containing adhesive additives with graphite, molybdenum bisulphite or sodium phosphate, may be used. Heavily soiled wire ropes should be cleaned regularly by mechanical means only, e.g. using hand wire brushes. Solvents and other cleaning agents must not be used. The lubricant used during manufacture protects the rope from corrosion during transport, storage and in the initial period of use. It is chosen by the rope manufacturer depending on the application of the rope and the environmental conditions to which the rope is exposed. Wire ropes must be relubricated at regular intervals depending on the operating conditions and before the rope shows signs of drying out or corrosion, especially in the area of the bending zones on the drum and sheaves. Well-lubricated ropes result in up to four times as many bending cycles as non-lubricated ropes under the same test conditions.



The relubricants must be compatible with the original rope lubrication. Lubricants, e.g. based on soap grease, must therefore not be used. Typical methods for applying the rope lubricant are lubrication by brush, drip lubrication, spraying from a spray can and pressure lubrication. The application of the spray lubricant may only be carried out outdoors or in well-ventilated rooms.

7.5 Checking the bolts and screw connections



Check the screw connections of the winch at regular intervals. Check the connections of the frame to the foundation and the screw connections on the winch. Screw connections from PLANETA are secured at the factory with low-strength threadlocker (e.g. Loctite 222 or similar) and tightened with tightening torques in accordance with the applicable DIN / ISO standard series. If you have to loosen screw connections, make sure when retightening them that you also use low-strength screw locking and tighten with tightening torques in accordance with the applicable DIN / ISO standard series.



All screws must be tightened to the following values and secured with a screw locking agent such as Loctite!

Table 10 Tightening torques

Standard thread	Friction value μ _{ges}	Shank screws			
		Clamping force F _{sp} in kN		Clamping torque M _{sp} in Nm	
		Strength class			
		8.8	10.9	8.8	10.9
M6	0,10	10,4	15,3	9,0	13,2
M8		19,2	28,0	21,3	31,8
M10		30,3	44,5	42,1	61,8
M12		44,1	64,9	73,5	108
M14		60,6	88,9	117	172
M16		82,9	122	180	264
M20		134	190	363	517
M24		192	274	625	890

7.6 Maintenance



The present winch is designed for a minimum of maintenance. Nevertheless, the following points must be observed:

- Anticorrosive agent,
- Gearbox oil change and check,
- Oil change and
- Adjusting the brakes

7.6.1 Corrosion inhibitor



Bare components, such as the drum, should be treated with a commercial corrosion protection agent (e.g. Tectyl 846) before storage to prevent corrosion. Bearing points as well as ropes that have already been wound on or stored must be greased. Before storage, the winch must be checked for damaged paint and repaired. If the winch is to be stored for longer than 6 months, the gearbox must be completely filled with the oil intended for this purpose in order to prevent corrosion in the gearbox housing as well. Before commissioning, the correct oil filling quantity must be observed.

7.6.2 Gearbox oil change and check



First check whether your winch has a lifetime lubricated gearbox or not. Gearboxes lubricated for life do not require an oil change and/or further checks.



Gearboxes of winch types PFW and P 125 to P 750 are provided with lifetime lubrication. There is no need to set a gearbox breather when used as intended.

For all other gearboxes, check the oil level monthly and top up if necessary. To do this, loosen the breather screw and carry out a visual check and, if necessary, an additional measuring check with a suitable dipstick. You can determine the almost exact oil level by draining the oil into a clean collecting vessel as for the oil change (steps 1-4), weighing it and comparing it with the required oil fill quantity. Then refill the oil and top up with any required oil. Optionally, you can also order an oil sight glass from which the oil level can be read directly. Information on the oil type and filling quantity can be found in the chapter "Technical data" of the enclosed winch pass.

7.6.2.1 Worm gear

Worm gears that need to be topped up with lubricating fluid are filled with mineral gear oil of category EP (high pressure - extreme pressure) of viscosity ISO VG 320. The oil must then be changed after the first 300 hours of operation. Subsequent oil changes then take place after every 4000 operating hours, but at least once a year.



Oil temperatures of up to 70 °C are normal.

7.6.2.2 Helical-bevel gearbox

Bevel spur gears that need to be topped up with lubricating fluid are filled with mineral gear oil of category EP (high pressure - extreme pressure) of viscosity ISO VG 220. The oil must then be changed after the first 300 hours of operation. Subsequent oil changes then take place after every 4000 operating hours, but at least once a year.

7.6.2.3 Planetary gear

All planetary gearboxes require EP classified mineral gear oil with ISO VG 150-220. Change the oil after the first 150 operating hours. Subsequent oil changes must be carried out at intervals of 2000 operating hours, or at least once a year. Gearboxes can be filled with synthetic oil in some cases (e.g. extreme operating or temperature fluctuation ranges). In this case, the oil will normally last for 8000 hours before a change is required.

7.6.3 Oil change

1. Use a sufficiently large container to collect the oil and place it under the oil drain plug. The positioning of the oil drain plug is explained in more detail in the chapter "Lubricating the gearbox". Pay attention to the symbols attached to the winch.
2. Remove the oil drain plug. If there are several oil drain outlets, remove all plugs when draining the oil to drain the oil from all gearbox stages.
3. Remove the oil filler plug or breather plug. The positioning is explained in more detail in the chapter "Lubricating the gearbox". Pay attention to the symbols on the winch.
4. Drain the oil completely.
5. Refit the oil drain plug(s).
6. Fill with new oil of the same type via the filler opening. Use a filling filter when filling. Information on the required oil type and the filling quantity can be found in the chapter "Technical data" of the enclosed winch pass. Remove any oil that may flow past immediately with suitable oil binding agents.
7. Refit the oil filler plug or breather plug.



After an oil change, operate the winch briefly without load to allow the oil to distribute in the gearbox.



Old lubricating oils must be disposed of in accordance with the applicable rules.

7.7 Adjusting the brake slack

If a brake motor has been installed on the winch, the brake play must be checked during maintenance and readjusted if necessary.



If the maximum air gap value is exceeded, this will have a negative effect on the function of the brake and the load may slip or fall. The brake may only be adjusted by qualified personnel. If you are unsure, contact the manufacturer or send the winch in for maintenance.



If a brake release lever is present, for example as part of the overrunning clutch option, opening the air gap too much can cause the braking torque to become zero because of the load on the brake release lever tie rods. In this case, adjust the brake gap tighter.



To check the brake gap, the fan cowl of the motor must be dismantled, depending on the design and winch type. This is usually done by means of screws that are concentrically attached to the fan cover and fix it to the motor.



After adjusting the brake gap, refit the fan guard to ensure that there is no interference with the rotating fan when operating the winch.



The three most common brake types are listed below. You can find out which brake is installed on the winch in the chapter "Technical data" in the enclosed winch pass.

7.7.1 Brake play adjustment for type FD

The spring-applied brake is largely maintenance-free. However, when the maximum value for the air gap T specified in the chapter "Technical data" of the enclosed winch passport is reached, the air gap T

must be readjusted (readjusted) to ensure safe operation of the brake. If, in individual cases, the brake functions beyond the maximum air gap, this does not change anything and the brake is then no longer being used properly. In any case, further wear will impair the functionality and safety function of the brake.

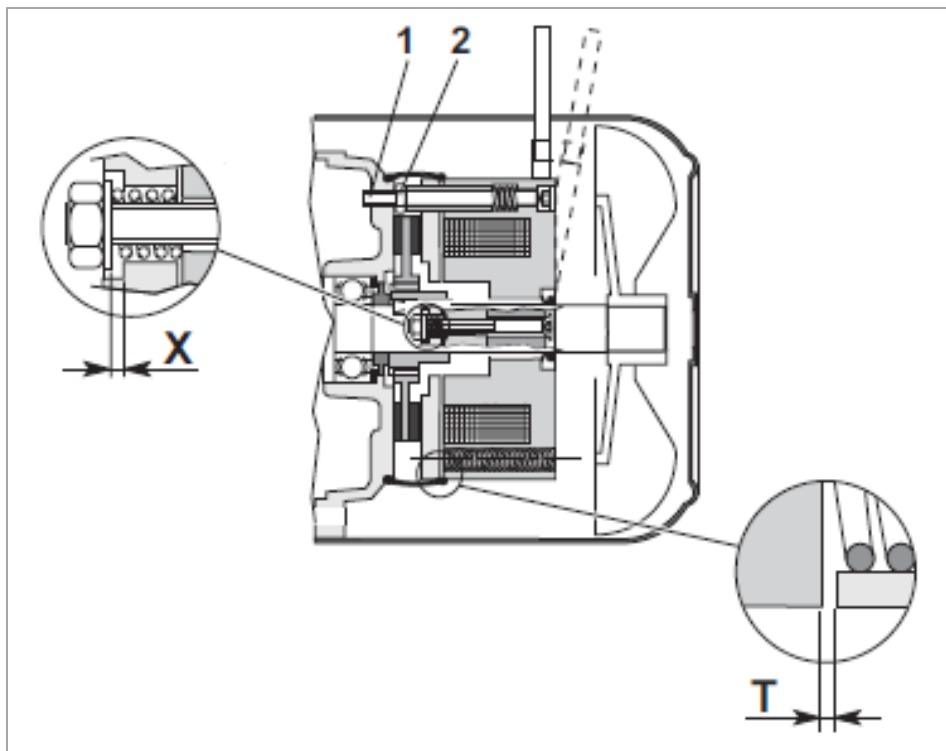


Illustration 44 Brake play adjustment type FD

Procedure for readjusting the air gap:

- Loosen the nuts 2.
- Depending on the motor size, the air gap T must be adjusted to the min. value of the range using the cylinder head screw (1) and the nut (2).
- Then the screw (1) must be locked by tightening the nut (2).
- The air gap value must be checked from time to time.
- The gap opening must be between the minimum and maximum values specified in the "Technical data" chapter of the enclosed winch passport. Air gap values higher than the maximum value will cause the braking noise to increase and the brake may not open properly.
- The distance "X" must be higher than or equal to the value specified in the chapter "Technical data" of the enclosed winch pass.
- The minimum thickness of the friction lining of the brake disc is 1.5 mm.

7.7.2 Brake play adjustment for types FDB / FDD

The spring-applied brake is largely maintenance-free. However, when the maximum value for the air gap a specified in the chapter "Technical data" of the enclosed winch passport is reached, the air gap a must be readjusted (readjusted) to ensure safe operation of the brake. If, in individual cases, the brake functions beyond the maximum air gap, this does not change anything and the brake is then no longer being used properly. In any case, further wear will impair the functionality and safety function of the brake.

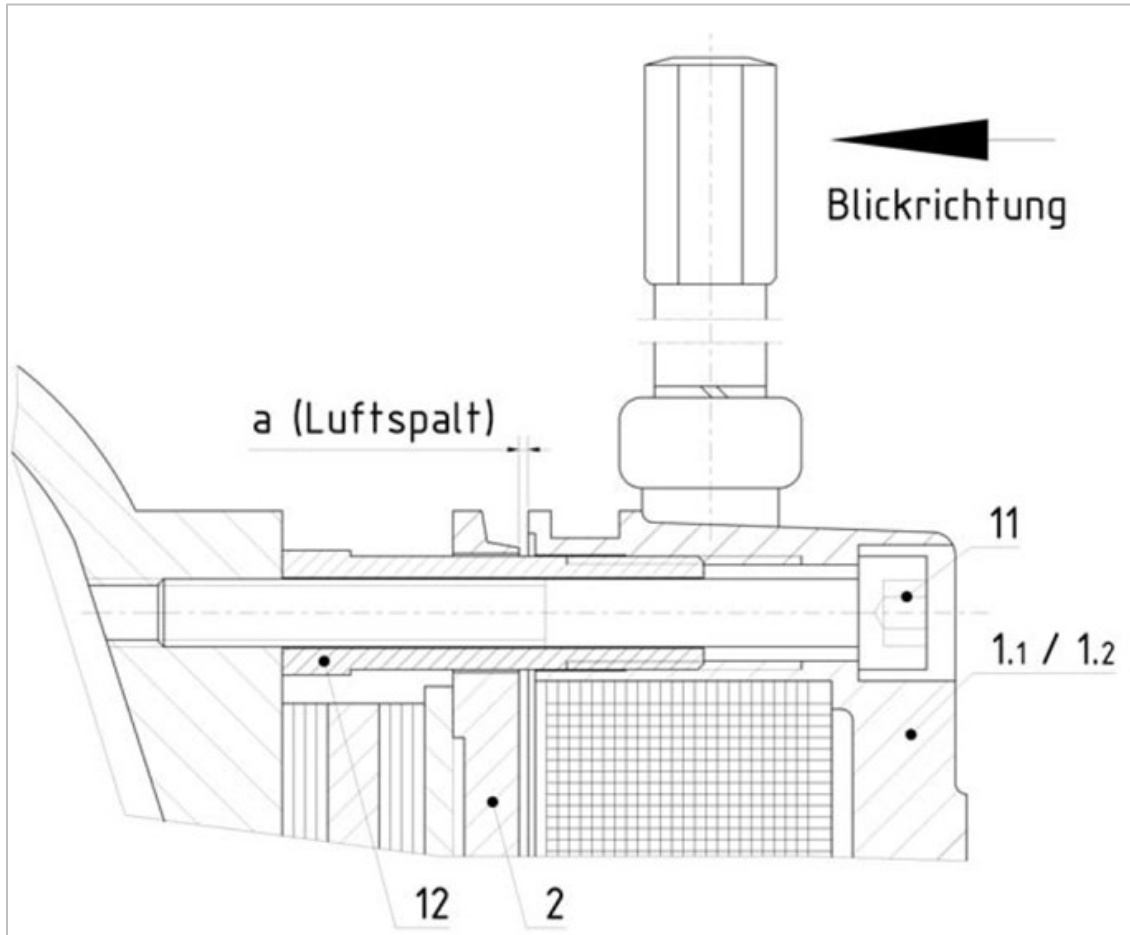


Illustration 45 Brake play adjustment type FDB / FDD

Procedure for readjusting the air gap:

- Facing the brake (see Illustration 6.4.2.1): Loosen the three fastening screws (pos. 11) by turning them half a turn counterclockwise.
- Screw the banjo bolts (pos. 12) into the magnet body, also by turning them anti-clockwise.
- Screw the fastening screws (clockwise) into the (motor) flange until the nominal air gap (measurement using feeler gauges) is present at three points on the circumference.
- Reposition the banjo bolts, i.e. unscrew them from the magnet body (clockwise) until they are firmly in contact with the counter friction surface.
- Tighten the fastening screws with the tightening torque according to the value from the chapter "Technical data" of the enclosed winch passport.
- Re-check the air gap and readjust the setting if necessary.

7.7.3 Brake play adjustment for the type K

The spring-applied brake is largely maintenance-free. However, when the maximum value for the air gap O specified in the chapter "Technical data" of the enclosed winch passport is reached, it is necessary to readjust the air gap O to ensure safe operation of the brake. If, in individual cases, the brake functions beyond the maximum air gap, this does not change anything and the brake is then no longer being used properly. In any case, further wear will impair the functionality and safety function of the brake.

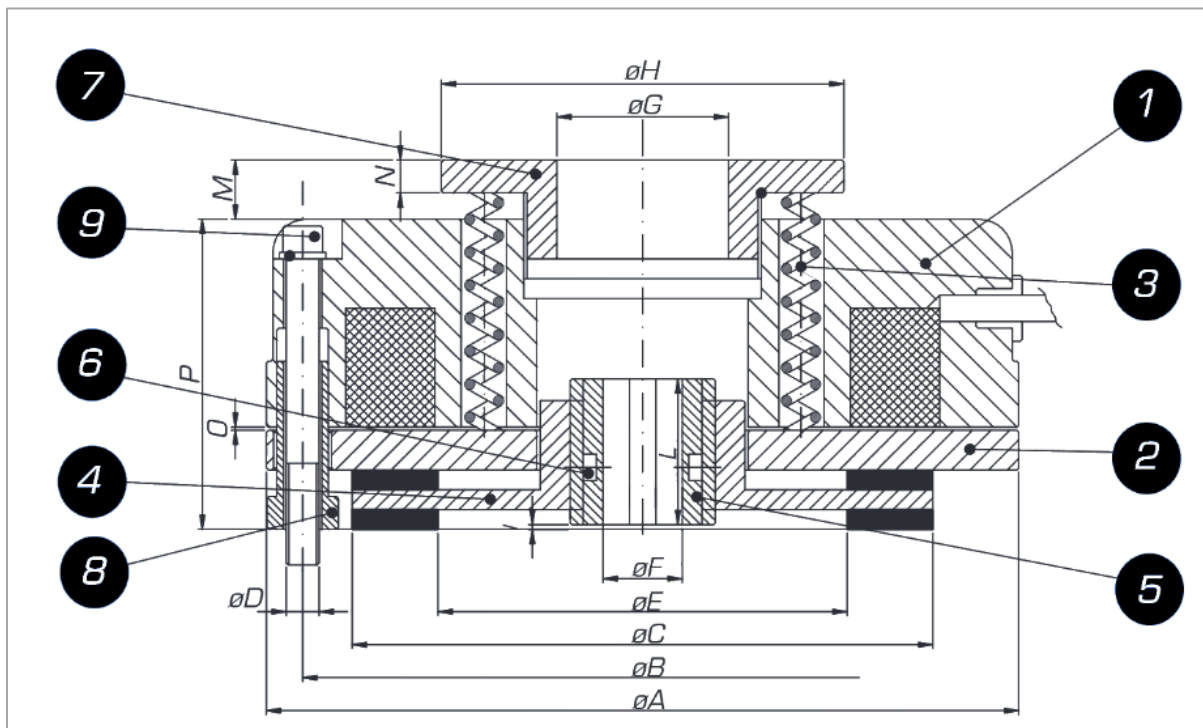


Illustration 46 Brake clearance adjustment type K

Procedure for readjusting the air gap:

- Before adjusting the air gap, make sure that the brake has cooled down.
- Loosen the locking screws (pos. 9) by turning them counter-clockwise half a turn.
- Now adjust the air gap O by means of the adjusting screws (pos. 8).
- Then retighten the locking screws (pos. 9) and check the air gap again.
- For the optimum value for the air gap, please refer to the chapter "Technical data" of the enclosed winch pass.
- The air gap tolerance to be maintained is $+0.05 / -0$
- The maximum permitted value is 0.7 mm, which can be reached through wear of the brake.
- Incorrect adjustment of the brake gap leads to overheating and damage to the brake as well as irreparable damage to the brake disc.

8 PERIODIC INSPECTIONS



The winch, including the supporting structure, must be inspected by an expert as required, but at least once a year, depending on the conditions of use (utilisation of the max. load capacity, operating frequency and ambient conditions). A system with a large number of operating hours, which also operates predominantly at full load, must be inspected more frequently than, for example, a chain hoist that is only used occasionally for assembly purposes and for which one inspection per year is sufficient. Dusty or aggressive atmospheres can also shorten the test interval. The test intervals deviating from the maximum test period of 1 year must therefore be determined by the contractor taking into account the conditions of use, in case of doubt in consultation with the manufacturer. The results of these tests must be documented in the test book.



The periodic inspection shall substantially include:

- Checking the identity of the installation with the information in the inspection booklet
- Checking the condition of components and equipment with regard to damage, wear, corrosion and other changes
- Checking the completeness and effectiveness of the safety devices and brakes
- Testing of the supporting structure
- Determination of the consumed portion of the theoretical service life
- Re-inspection if deficiencies affecting safety have been found and rectified.

8.1 Records and reports



The parts of the inspection records listing all components requiring periodic inspections must be kept for each winch. A written report must be made on the condition of the critical parts of each winch. These reports must be dated, signed by the person carrying out the inspection and kept in a place where they are easily accessible for processing. It is advisable to keep the records in the enclosed winch passport.

9 DISRUPTIONS

Problem	Possible cause	Remedial action
Winch does not work	No engine power	Check connections, circuits and supply lines.
	Product is overloaded	Check load
	Brake is not released	Release or clean the brake
		Check brake power circuit for leakage.
Load does not stop	Brake slips	Check brake air gap or replace brake
	Product is overloaded	Reduce load within the rated load capacity.
	Limit switch incorrectly set	Check the setting of the limit switch.
Winch is too slow	Product is overloaded	Reduce load within the rated load capacity.
	Insufficient oil or compressed air flow	Check flow in pressure line.
	Brake is not fully released	Release or clean the brake.
	Gearbox damaged	Check for back pressure in the return line.
		Check gearbox. (Listen for strange noises).
Oil leakage	Unsuitable oil plug	Install the correct oil plug with gasket
	Leakage of the seal	Fit new gasket.
	Oil breather screw in the wrong place	Place the screw at the highest point of the gearbox.
	Oil leakage in places other than the screw	in the gearbox for loose screws and tighten them.
		Check other seals or gaskets of the gearbox and replace if necessary.
Rope does not wind properly onto the drum	Excessive rope deflection angle	Keep rope deflection angle within acceptable limits (2° -4°)
	Winding in unloaded state	Keep rope under tension when winding
Winch vibrates	Loose foundation bolts	Tighten the foundation screws with the appropriate torque

10 DISMANTLING & RECYCLING



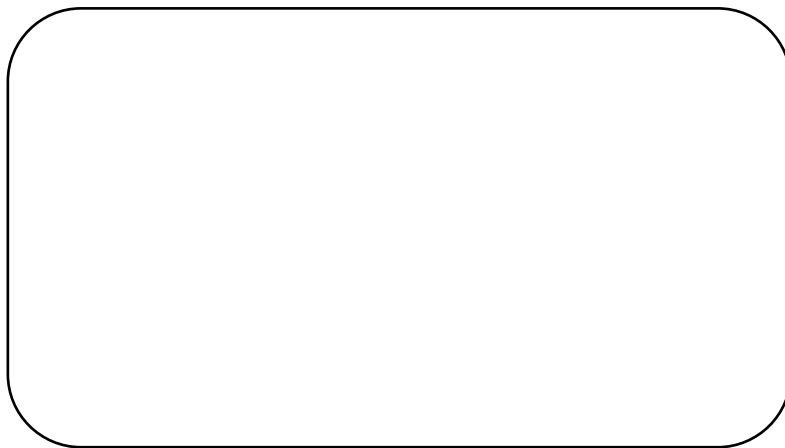
Disassembly of the winch is done in the reverse order to assembly. Observe the safety instructions in this chapter also during disassembly. When dismantling, make sure that the winch is out of operation and thus completely unloaded. The dismantling area must be cleared over a wide area. Operating materials must be disposed of properly according to their type. This applies in particular to lubricants from gearboxes (used oil) and bearings (grease). The winch can be returned to the manufacturer for disposal free of charge. In this case, contact your specialist dealer or the manufacturer directly.

11 ENCLOSED WINCH PASS



You will find the following contents / topics and information in the separate wind pass:

- **Notes on the winch pass**
 - Details of the manufacturer
 - Copyright information
 - Limitation of liability
 - Warranty
- **Specific information on the winch**
 - Technical data
 - Factory certificate for wire ropes according to DIN EN 10204-2.2
 - Factory certificate for load hooks according to DIN EN 10204-2.2
- **Spare parts and controls**
 - General drawings & parts lists
 - Circuit diagrams, terminal diagrams and parts lists
- **Contact address of the manufacturer & certificates**
 - Contact address of the manufacturer
 - CE and EC declarations of conformity
 - Factory test certificate of the manufacturer
- **Inspection book**
 - Commissioning / periodic inspections
 - Commissioning test
 - Periodic inspections
 - Proof of remaining useful life
- **Notes**



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