ZAPROJEKTOWANE DLA TWOJEGO BEZPIECZEŃSTWA

Installation & Operating Manual
W16 LADDER WINCH

Translation of original instructions

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EC DECLARATION OF CONFORMITY

According to the Machinery Directive 2006/42/EC, Annex II, 1.A

MANUFACTURER: DRABEST Sp. z o.o.
ADDRESS: 281, Mników, 32-084 Morawica, Poland
Declares that the following machine: WINCH
Type: W16
Meets the requirements of the following European Directives:
• Machinery Directive 2006/42/EC
• EMC Directive 2014/30/EU

And the requirements of the following harmonised standards:

Type A standards	
PN-EN ISO 12100	Safety of machinery — General principles for design — Risk assessment and risk reduction
Type B standards	
PN-EN ISO 13849-1	Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design
PN-EN ISO 13850	Safety of machinery. Emergency stop. Principles for design.
PN-EN 60204-1	Safety of machinery. Electrical equipment of machines — Part 1: General requirements
PN-EN 953+A1	Safety of machinery. Guards. General requirements for the design and construction of fixed and movable guards
PN-EN 61310-3:2010	Safety of machinery — Indication, marking and actuation — Part 3: Requirements for the location and operation of actuators
PN-EN ISO 13857:2010	Safety of machinery — Safety distances to prevent hazard zones being reached by upper and lower limbs
PN-EN ISO 14119:2014	Safety of machinery – Interlocking devices associated with guards – Principles for design and selection
PN-EN 1005-1+A1:2010	Safety of machinery — Human physical performance — Part 1: Terms and definitions
PN-EN 1991-1-1:2011	Eurocode 9 — Design of concrete structures — Part 1-1: General rules.

place & date	signature	first and l ast name and role of the authorised to sign

YEAR OF MANUFACTURE: .....

SERIAL NO.: .....

CONTENTS:

1. INTRODUCTION

The roofing rail winch by DRABEST is a versatile and reliable product, particularly recommended for fast handling of materials or photovoltaic panels. The robust and stable design enhances safety, and the easy, tool-free installation saves time and labour costs.
The winch is operated using a wired remote control. The lightweight ladder frames, which are connected by sliding and locking with a bolted connection, form a modular system that offers a lot of configuration options.

NOTICE:
CAREFULLY READ THE INSTALLATION AND OPERATING MANUAL BEFORE INSTALLING AND COMMISSIONING THIS UNIT; FOLLOW ALL INSTRUCTIONS, ESPECIALLY THOSE CONCERNING SAFETY.

The user of the ladder winch shall strictly comply with the principles of installation and operation explained in this manual, as well as with the general occupational health and safety requirements for work at height. Always keep the manual available at the installation and operating site of the ladder winch.
The personnel installing and operating the winch must understand this manual and pass an induction to occupational health and safety regulations mandatory for work at height. This winch shall be operated by a minimum of two people.

2. SPECIFICATIONS

Motor power	1050W
Supply voltage	230V
Maximum winch load capacity	do 125 kg
Max. load height	1200mm
Winch weight (with all components)	95 kg
Noise level	< 70 dB
Cable length	12 m
Cable diameter	4,5 mm
Breaking load	>1600 kg
Lifting speed	8 m/min.
Motor protection class	IP54 (*)

(*) – The IP rating consists of two digits which follow the abbreviation "IP".
The first digit indicates the degree of protection against access to parts inside the enclosure and protection against the penetration of solid foreign bodies.
(5 – Protection against access to hazardous parts. Dust ingress protection).
The second digit indicates the protection against the effects of water ingress.
This is the parameter that determines the water resistance of the unit.
(4 – Protection of the unit against splashing water from any direction).

2.1 RATING PLATE

The ladder winch has a rating plate permanently affixed to the winch drive base plate.

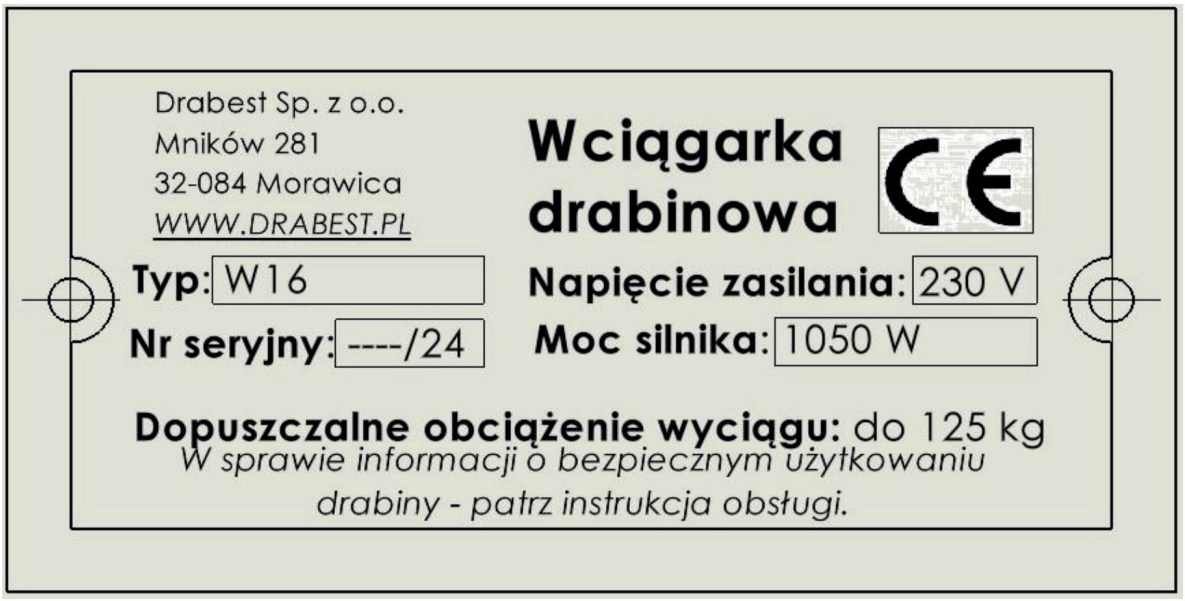


Fig. 1 Rating plate with an example of contents

3. LIST OF COMPONENTS

The ladder winch is a rigid, welded structure comprising stringers made of 82x25 mm aluminium profiles and aluminium rungs made of 28x28 profiles. Fig. 2 Diagram of the winch.

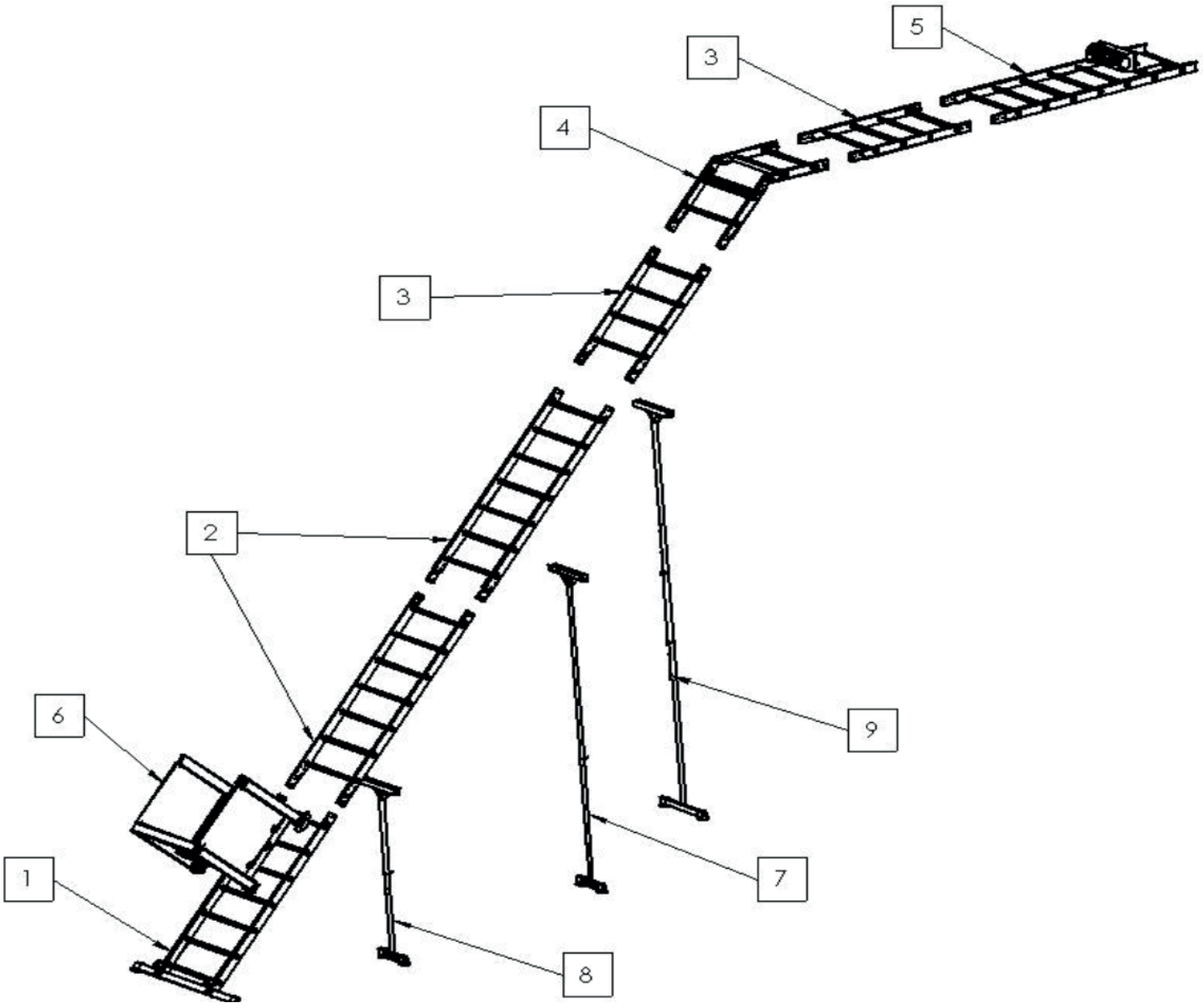
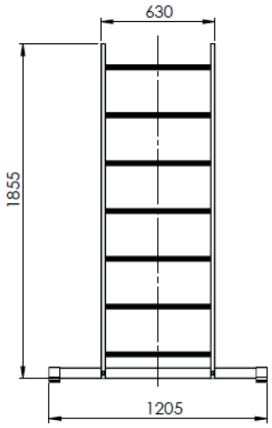
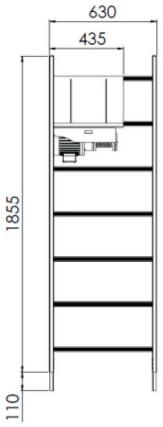


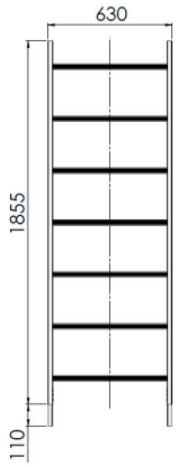
Fig. 2 Diagram of the winch.



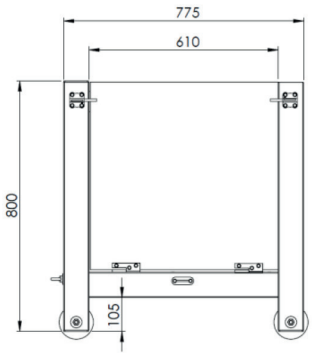
1) Ladder frame with stabiliser (1 pc.)
Ladder length – 1.85 [m]
Ladder width – 0.63 [m]
Stabiliser length – 1.2 [m]
Number of rungs: 7



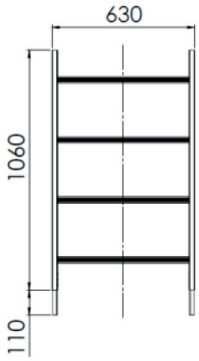
5) Drive frame – 1.85 m (1 pcs.)
Ladder length – 1.85 [m]
Ladder length including connector – 1.96 [m]
Ladder width – 0.63 [m]
The frame features a 230V AC electric winch and a component for fixing to the roof.



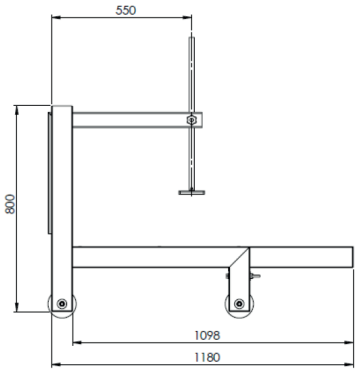
2) Ladder frame – 1.85 m (3 pcs.)
Ladder length – 1.85 [m]
Ladder length including connector – 1.96 [m]
Ladder width – 0.63 [m]
Number of rungs: 7



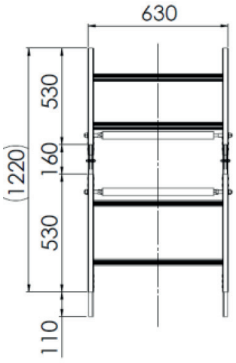
6) Transport trolley (*) (1 pcs.)
Height – 0.8 [m]
Width – 0.77 [m]
Depth – 0.72 [m]
Made of an aluminium frame and decked with non-slip waterproof plywood. It has removable side guards and handles to secure the load with a strap.



3) Ladder frame – 1.06 m (2 pcs.)
Ladder length – 1.06 [m]
Ladder length including connector – 1.17 [m]
Ladder width – 0.63 [m]
Number of rungs: 4



6) PV panel transport trolley (*) (1 pcs.)
Height – 0.8 [m]
Width – 1.18 [m]
Depth – 0.72 [m]
Made of aluminium frame and decked with non-slip waterproof plywood; this trolley is for handling PV panels. It has a dedicated safety clamp for retaining the PV panel.



4) Hinge frame – 1.2 m (1 pcs.)
Ladder length – 1.2 [m]
Ladder length including connector – 1.33 [m]
Ladder width – 0.63 [m]
The frame features components that act as a hinge, as well as pulleys for cable guidance.

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7) Telescopic support (1 pcs.)
Maximum height: 3.2 [m] Made of aluminium tubing, height adjustable.

8) Short telescopic support (1 pcs.)
Maximum height: 1.8 [m]
Made of aluminium tubing, height adjustable.

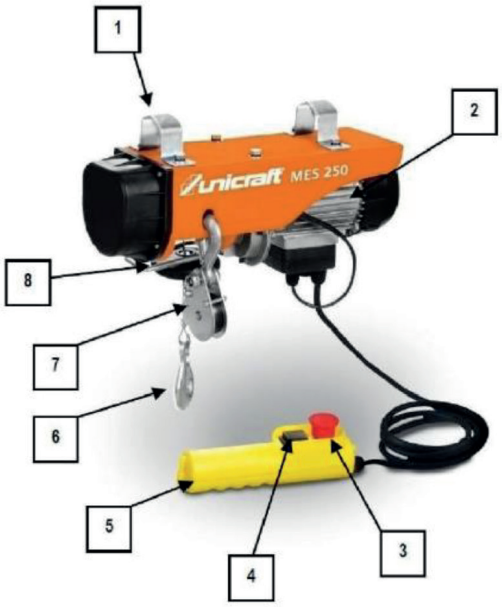
9) Long telescopic support (1 pcs.)
Maximum height: 4.5 [m]
Made of aluminium tubing, height adjustable.

Tab. 1 List of components.
(*) The trolley depends on the ordered ladder winch version.

4. ELECTRIC HOIST

The ladder winch features an electric hoist in addition to the structural components of the ladder on which the trolley runs.

DESCRIPTION OF HOIST COMPONENTS



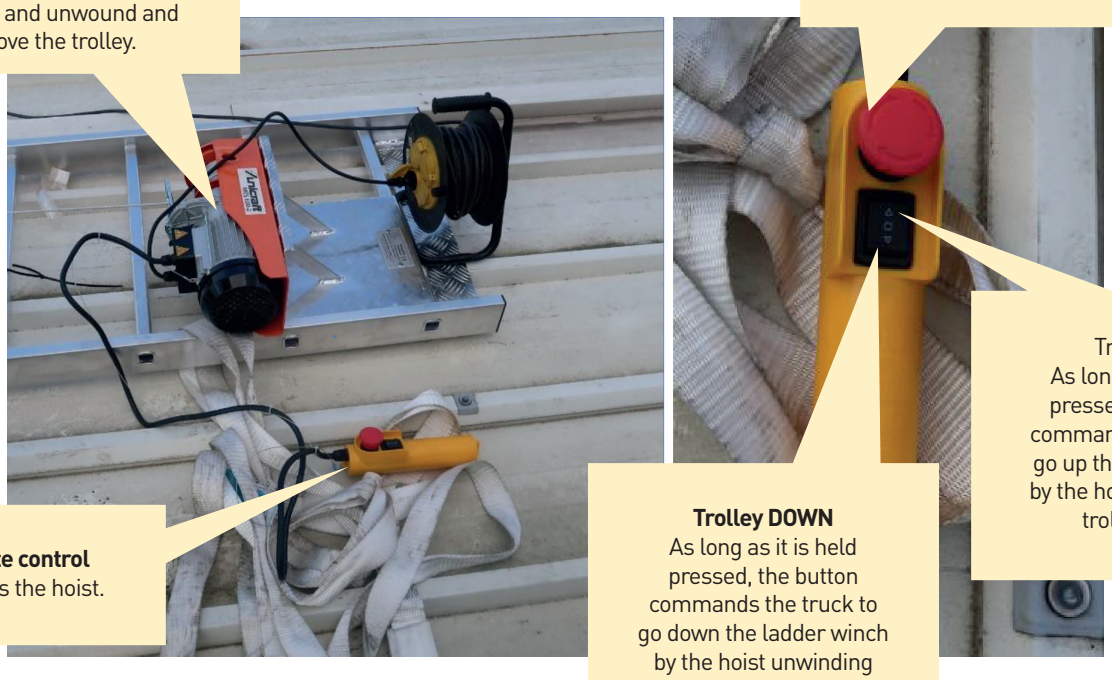
1. Clamping straps
2. Electric motor
3. Emergency stop
4. Control switch (raise/lower)
5. Control bar
6. Load hook
7. Swivel disc
8. Safety device

MES 600 SPECIFICATIONS

Return pulley	YES
Load capacity [kg]	125
Maximum lifting height [m]	12
Lifting speed [m/min]	8
Mains voltage	230 V /50Hz
Motor power	1050 W
Drive group	1Dm (M1)
Standstill times	S3-20% 10 min
Cable diameter	4,5 mm
Dimensions [mm] (L x W x H)	385 x 148 x 280
Weight	17,5 kg

Hoist drive
The electric motor causes the cable to be wound and unwound and move the trolley.

Emergency stop device (ESD)
This button stops the winch in an emergency.



Remote control
Operates the hoist.

Trolley DOWN
As long as it is held pressed, the button commands the truck to go down the ladder winch by the hoist unwinding the trolley cable.

Trolley UP
As long as it is held pressed, the button commands the truck to go up the ladder winch by the hoist winding the trolley cable.

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PERSONNEL REQUIREMENTS COMPETENCIES

The tasks explained in this Manual requires different qualifications from the personnel assigned to them.

WARNING

Danger from insufficient personnel qualifications! Insufficiently qualified personnel may act irresponsibly in areas of electrical equipment switching, which may lead to an incorrect assessment of risks and expose the personnel and bystanders to a risk of serious or fatal injury. All work tasks must be done by properly trained and qualified personnel. Insufficiently qualified personnel shall not approach the work area.

Work tasks shall be authorized only to the personnel expected to perform reliably. The personnel with the reflex/response time limited/hindered by drugs, alcohol or medications shall not be authorised to do any work tasks. The qualifications of personnel per each task type are specified in the following sections of this Manual:

Operator

The operator shall be instructed by the administrator about the nature of the work tasks assigned and the potential hazards caused by improper behaviour or performance. The operator may only carry out operating tasks in normal conditions if this is stated in this Manual and only if the administrator expressly assigns the operator to these tasks.

Qualified worker

A trained and qualified worker is, by virtue of his/her professional training, knowledge and experience, as well as the understanding of applicable standards and regulations, able to carry out the work assigned to him/her and to recognise and prevent possible dangers unassisted.

Manufacturer

Specific work tasks shall only be carried out by qualified personnel of the manufacturer. Other personnel are not authorised to carry out such work. Contact the Customer Service for this work.

- **PERSONAL PROTECTIVE EQUIPMENT**

Personal protective equipment (PPE) is intended to protect people from safety and health hazards at work. Personnel shall wear/use PPE when carrying out the various tasks on the winch as specified in the individual sections of this Manual.

The following section explains PPE:

- **Hard hat:** An industrial-grade hard hat protects the head from injury by falling objects or hitting stationary objects.
- **Safety eyewear:** The eyewear protects the eyes from ejected parts.
- **Protective gloves:** They protect hands from sharp edges, abrasions, scratches or deeper wounds.
- **Protective footwear:** They protect the feet from crushing, injury by falling parts and slipping on slippery ground.
- **Protective work garment:** The protective garment must be fitting snugly, done up to leave no loose parts, and have a low tear strength.
- **High visibility vest:** It facilitates easy visual identification of the wearer to warn against the wearer entering a hazardous area or inadvertently causing the wearer to enter one.

- **SAFETY FEATURES**

Emergency stop device (ESD)

The ESD shall be operated to trip immediately in an emergency that is or could be caused by malfunction of the winch. Once operated, the ESD stops the electric cable hoist. The ESD can be reset and made ready for use again by turning its knob in the direction shown by the arrows (clockwise). Before restarting the winch, make sure that it is operational and will not become hazardous to safe work.

Control switch

A monostable Up/Down command switch is provided, which initiates the movement of the cable up or down while the switch is held pressed up or down, respectively.

Motor overload protection

The electric hoist is not designed for continuous duty. If the designed duty time is exceeded, the motor will overheat and trip to stop the electric hoist. Once the motor cools down enough, the overload protection will reset itself and the motor will be ready to start again.

Safety limit switch

The electric hoist features an upper limit switch. When the load hook buffer makes contact with the head of the limit switch, the latter is actuated to break the electric circuit and immediately stop the electric hoist.

- **SAFETY WARNING SIGNS ON THE ELECTRIC HOIST**

Safety warning signs are displayed on the electric hoist. Do not remove any of the safety warning signs. Defaced or missing safety warning

signs may lead to incorrect actions, injury and damage. Immediately replace all defaced or missing signs. If any safety warning sign is not identifiable or legible at the first glance, remove the electric hoist from service until all safety warning signs are rectified.

- **GENERAL SAFETY PRINCIPLES**

HINT

The regulations of the country of operation (in their prevailing version) shall be followed at all times. Accessory installation/removal, conversion, maintenance and inspection shall only be attempted by qualified service personnel, with the winch locked and tagged out of service.

Unauthorised modifications or alterations in violation with safety requirements are strictly prohibited.

All operating personnel shall always respect the maximum load capacity of 125 kg.
Never walk or enter directly below the load handled on the winch: risk of loose objects falling down and causing injury!
NEVER ATTEMPT TO:

- Transport any people using the winch
- Enter the load lifting equipment
- Operate the hoist with the transport trolley removed
- Deploy this winch on unstable or uneven ground
- Operate the winch in rain or at wind speeds above 12 m/s.

- **SAFETY PRECAUTIONS FOR THE OPERATORS**

Do not attempt any operation that compromises the safety of the ladder winch. The operator shall ensure that unauthorised personnel do not work on the ladder winch (e.g. when commissioning the winch). The user shall inspect the ladder winch at least once a day before starting to operate it to verify there is no evident damage; any abnormalities must be reported (including operating malfunctions) if safety-critical.
The operator must ensure that the ladder winch is only operated in a perfectly sound condition. The operators (the top and bottom one) and other personnel tasked with loading and unloading the trolley shall wear protective work garment.
In principle, no safety features shall be removed, taken out of service, or defeated (danger of severe crushing injury and death).
If any safety features need to be removed for accessory replacement, repairs or maintenance, immediately reinstall these safety features.
The operator shall keep out of the cordoned-off work area with a radius of approx. 2 m from either lateral side of the ladder winch when any load is pulled up or the trolley goes down.

- **INTENDED USE**

The ladder winch is intended for handling loads with **a maximum weight of 125 kg**, placed on the trolley which is attached to the cable of the electric hoist. **The load is moved over the ladder which provides a running track for the transport trolley.** Do not use the ladder winch as a support or a replacement for proper load handling equipment.

The intended use of the ladder winch requires compliance with the specifications in this Manual.
Any other use is non-intended and considered to be a misuse. **All claims of damage or injury caused by non-intended use of the ladder winch will be rejected.**

- **PREDICTABLE MISUSE:**

If the ladder winch is used as intended with its electric hoist, no foreseeable misuse is feasible that could result in hazards to health or life.

Misuse:
• Handling of any loads heavier than 125 kg.
• Operating the winch in rain.
• Operating the winch at a wind speed above 12 m/s.
• One-man operation of the winch.
• Carrying any people or animals using the winch.
• Using the winch structure as a ladder for ingress or egress (walking/stepping on the structure).
• Operating the winch deployed on uneven or unstable ground.
• Operating the winch positioned at a wrong angle of inclination/orientation.
• Handling any loads without the trolley installed, meaning directly on the cable hook.
• Handling any PV panels on the dedicated transport trolley without the safety clamp engaged.

- **RESIDUAL RISKS**

Even if all safety requirements are complied with when operating the ladder winch, the following residual risks may still emerge.
All personnel working with the ladder winch must understand these residual risks and follow instructions of practice to avoid them and the resulting injury or damage:
• Operation of the winch may result in hazard of crushing upper or lower limbs by being run over by the trolley or entanglement of a limb by the cable spool of the hoist.
• Adjustment and accessory installation/removal at the installation site may require removal of safety features. This may result in various risks and hazards that every operator needs to be aware of; example: replacement of the steel wire cable of the hoist can be a hazard of upper limb injury.

- **PACKAGING**

All packaging materials and durable dunnage used are recyclable and must, in principle, be returned for reuse.
• Return the cardboard packaging components to a recycler.
• The film sheet is made of polyethylene (PE) and the air dunnage/spacers are polystyrene (PS). These are plastic materials to be returned to a recucler or an authorised waste disposal facility.

Storage

Protect the electric hoist and keep it in a dry room. Never stack anything on the electric hoist. The correct storage and transport temperatures range from -25°C to +55°C.
Hint! Protect the electric hoist from moisture.

- **INSTALLATION**

Installation and electrical wiring instructions:

Remove the electric hoist from its packaging and remove all protective film wrapping. Do not deploy or start the ladder winch in water or at high moisture/humidity levels.

- **PRE-INSTALLATION PRECAUTIONS:**

Do not connect the electric hoist to the mains before completing the ladder winch structure.
• Before installing the ladder winch structure, make sure that the ground on which the winch will be deployed is hard, firm, level, sound, and will keep the structure stable in operation.
• Before deploying the ladder winch structure, make sure that the roof structure will carry the load of the winch and allow it to be safely positioned and secured.

Wear protective gloves!

Wear protective work clothing!

- **ELECTRICAL WIRING PRECAUTIONS:**

DANGER!
• Live components are a direct hazard of death by electrocution if touched.
• Only a qualified electrician shall work on the electrical system.
• Always handle the power cable of the electric hoist by its plug; never handle by the cable sheath.

- **ELECTRICAL WIRING INSTRUCTIONS:**

1. Install the ladder winch structure on a firm and sound ground.
2. Make sure that the power switch is OFF before plugging the power cable to the mains.
3. Plug the power cable to a mains outlet.
4. Power on the ladder winch and operate the Up/Down switch on the remote control to verify correct operation of the electric hoist.

BEFORE THE FIRST START-UP

All commissioning operations of this ladder winch shall be done by qualified professionals only.
Step 1: Inspect all cables and plugs.
Step 2: Inspect the electric hoist for damage.
Step 3: Test all control functions of the electric hoist. Verify the Up/Down switch is operational.

- **OPERATION**

DANGER!

Falling loads may result in severe injury or death.
• Never walk, stay or work under any overhead loads.
• Improper retaining points may cause the load in motion to become stuck and fall down. Engage the electric hoist cable hook with the correct receiver on the transport trolley chassis.
• Handle loads on this ladder winch supervised by both operators at all times.
• Do not expose any loads being winched to wind or gusts of air.
• Never attempt to haul loads with a ladder winch whose components could be damaged or not securely assembled.
• Never use a defective electric hoist: risk of electric shock.
• Never attempt to leave any load unattended when on the ladder winch.
• When lifting and lowering the load, ensure that the bottom operator is always clear from the load within the 2-metre radius cordon.
• Before leaving the operating position, move the load on the trolley into the rest position, which is at the dead bottom, at the lower stops. Next, isolate the ladder winch from the mains voltage.
• Whenever the ladder winch is out of service, the transport trolley must be at the dead bottom, resting its wheels against the lower stops.
• Keep the work area dry, protected against all risks of fire or explosion, and free from any corrosive or toxic substances.
• **Inspecting the hoist cable for wear:** cable-operated power drives require regular maintenance and safety inspections. If any damage is found, immediately replace the cable with a new one.

TEST RUN

Prior to operating the ladder winch, do a test run without a load and verify that all functions are operational. Specifically, test the load lifting and lowering safety features (especially the upper limit switch).

- **HANDLING LOADS**

NOTE!
Before starting operation, make sure that the cable is correctly wound on the spool and that the minimum rope cross-sectional area is within specified tolerance limits. A minimum of 3 coils of the cable must remain on the spool to prevent damage to the cable-to-spool retaining hardware. Do not touch the limit switches during operation.

LOAD HANDLING PROCEDURE:
Step 1: Inspect the hoist cable and the electrical wiring and plugs.
Step 2: Inspect the hoist cable for damage; if any evidence of damage is found, scrap the cable and replace with a new one.
Step 3: Verify that the load attempted to be handled will not exceed the maximum load capacity.
Step 4: Secure the cable hook to the receiver on the transport trolley and make sure the safety clasp of the hook is securely engaged.

- **HINT!**
  - Do not wrap the load with the hoist cable.
  - Do not twist the hoist cable.
  - Identify the centre of gravity of the load relative to its position on the trolley and that the load is securely lashed to prevent the load from shifting or slipping out.
  - The cable hook shall not be left not secured with the safety clasp.
  - Close the safety clasp of the hook.
  - The transport trolley receiver must easily engage with the cable hook throat.

Step 5: Press and hold the Up/Down switch top part (the LIFT command) until the hoist spool takes up enough of the cable to make it taut.
Step 6: Start lifting the load to the height of choice.
Step 7: Lift the load steadily and without interruption.

DANGER!
DEADLY HAZARD FROM OVERLOADING!
Install the ladder winch with its electric hoist only on a ground which is a structure capable of withstanding the weight of the entire ladder winch with its transport trolley and the load being handled. If the maximum load capacity is exceeded, the electric hoist can fail and the load can fall.

Never attempt to lift any load in excess of the maximum load capacity.
NOTE! Before attempting to lift the load on the ladder winch, make sure the maximum load capacity of 125 kg is not exceeded!

ADDITIONAL SAFETY WARNINGS:
- Do not transport people or animals on the ladder winch.
- Keep bystanders, especially children, away from the work area.
- Never touch the cable when the electric hoist is running.
- Use the designated trolley to lift the load using the cable and with the trolley running on the ladder/track.
- If the load is stuck or cannot be easily pulled with the winch, do not attempt to handle it using the winch.
- Do not start and stop the winch repeatedly.

5. INSTALLATION

NOTICE:
This winch shall always be installed by a minimum of 2 people.

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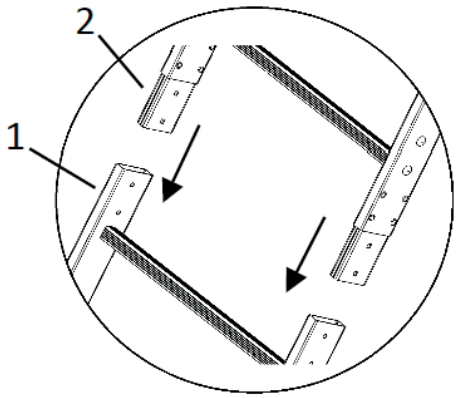
1A



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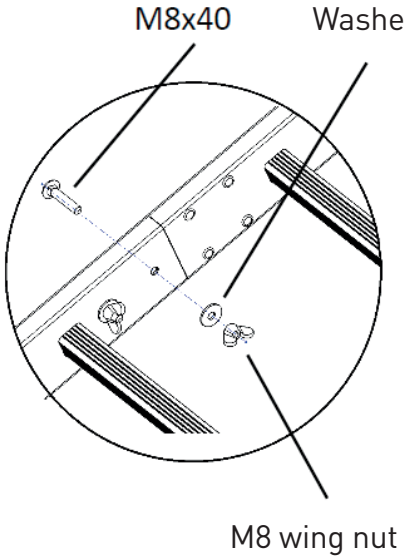
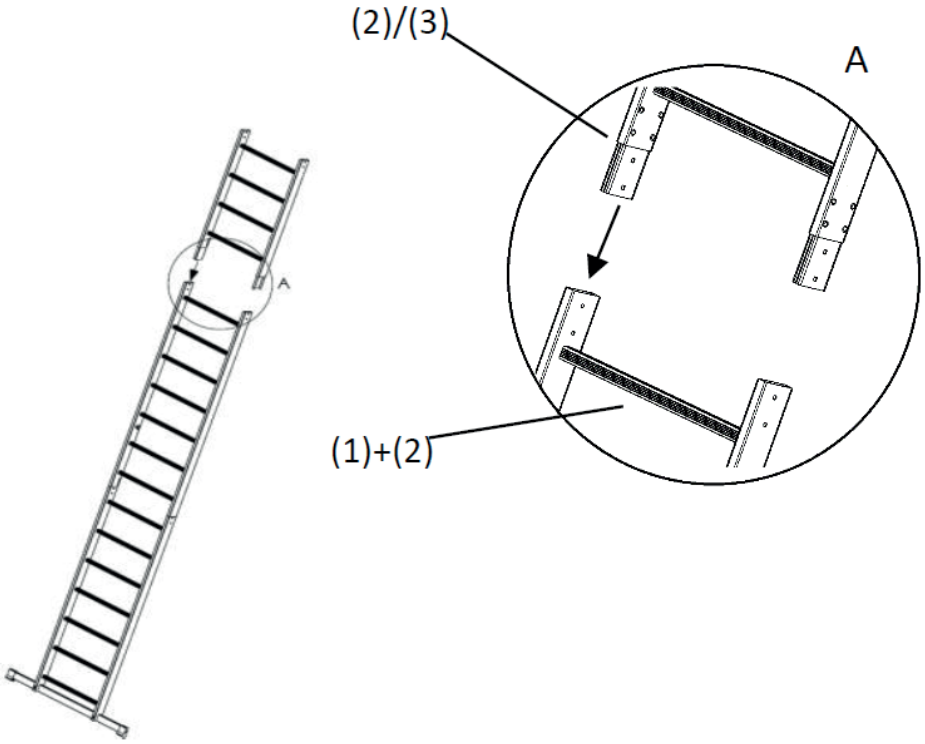
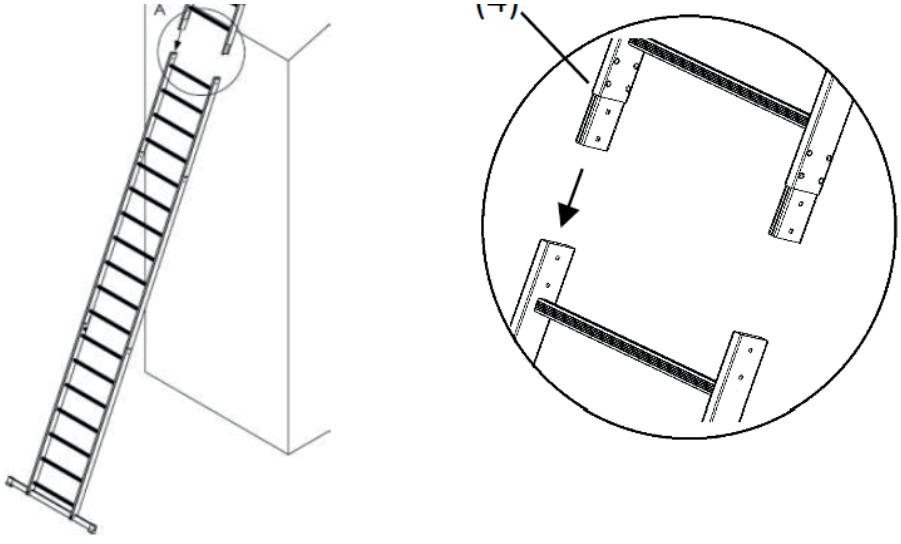


Connect the ladder frame, complete with the stabiliser (1) to another 1.85 m ladder frame (2) by sliding the steel connectors projecting from the frame (2) into the frame (1) and bolting them together using M8x40 carriage bolts and M8 wing nuts.



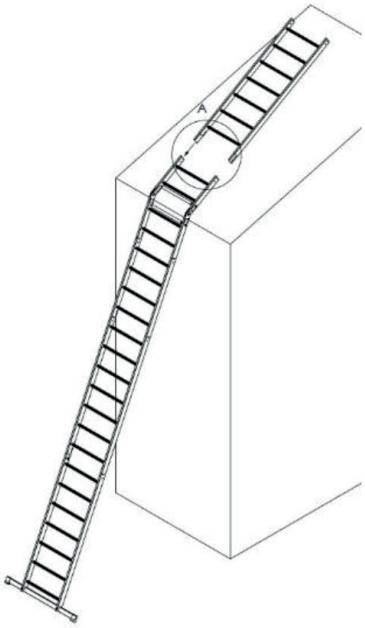
2

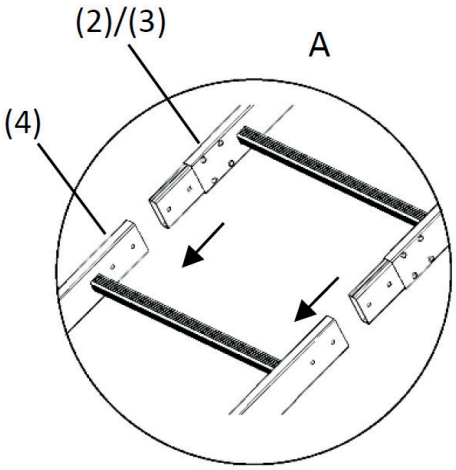
Connect consecutive 1.85m (2) or 1.06m (3) winch ladder frames as in step 1, as required.
(*) Do not exceed the dimensions of the assembled ladder winch (see Figure 2 below).



3

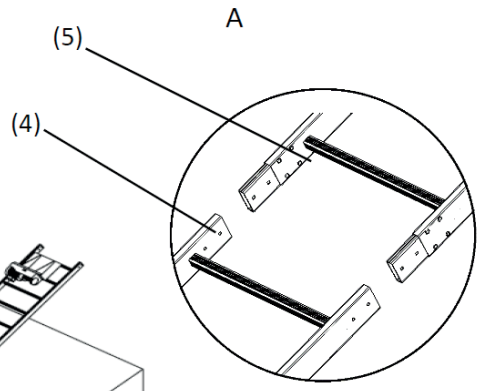
At the top of the building wall, where the roof structure begins, install the hinge frame (4), connecting it with the remaining components as in step 1 of this installation procedure.
(*) Steps 1 to 3 can be completed on a firm and level ground, followed by leaning the assembled ladder to the wall.

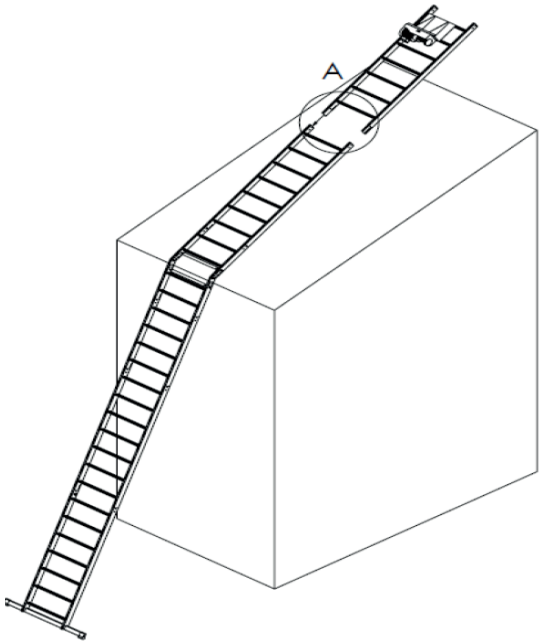




4

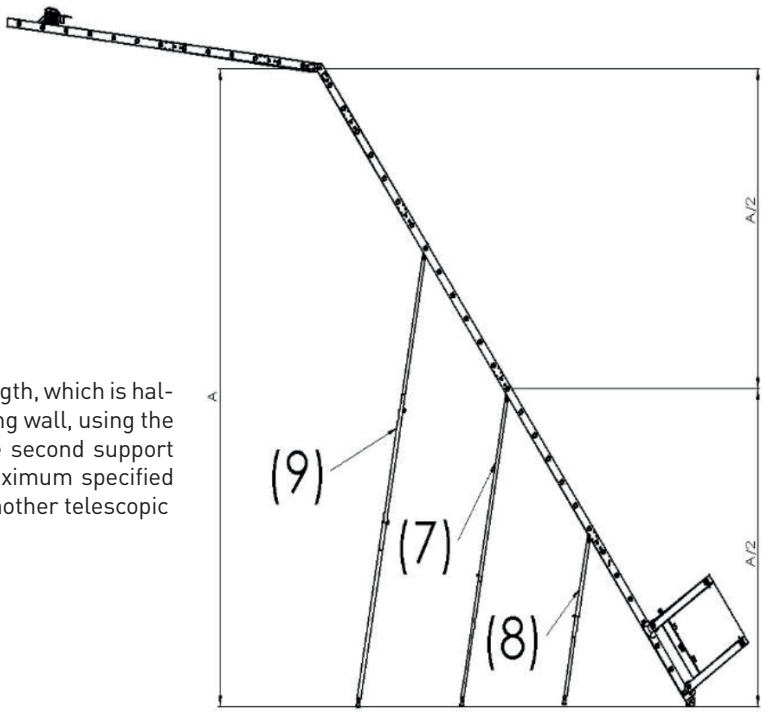
Connect consecutive 1.85m (2) or 1.06m (3) winch ladder frames as in step 1, as required. (*) Do not exceed the dimensions of the assembled ladder winch (see Figure 2 below).





5

As the last segment of the winch, the drive frame (5) is to be installed by connecting it with the remaining components as in step 1 of the installation procedure.
(*) The method of installing the roof section, including the drive frame, depending on the type of roof pitch. For roof slopes greater than 15° , assemble the drive frame with the roof section on level ground and lift it to the roof using a cable, following all applicable safety precautions. Once on the roof, secure the roof section to prevent it from sliding down until fully assembled with the remainder of the ladder winch.



6

Support the assembled ladder winch mid length, which is halfway from the ground to the top of the building wall, using the adjustable telescopic support (7). Place the second support (8) between segments (1) and (2). If the maximum specified number of ladder frames is installed, use another telescopic support (9).

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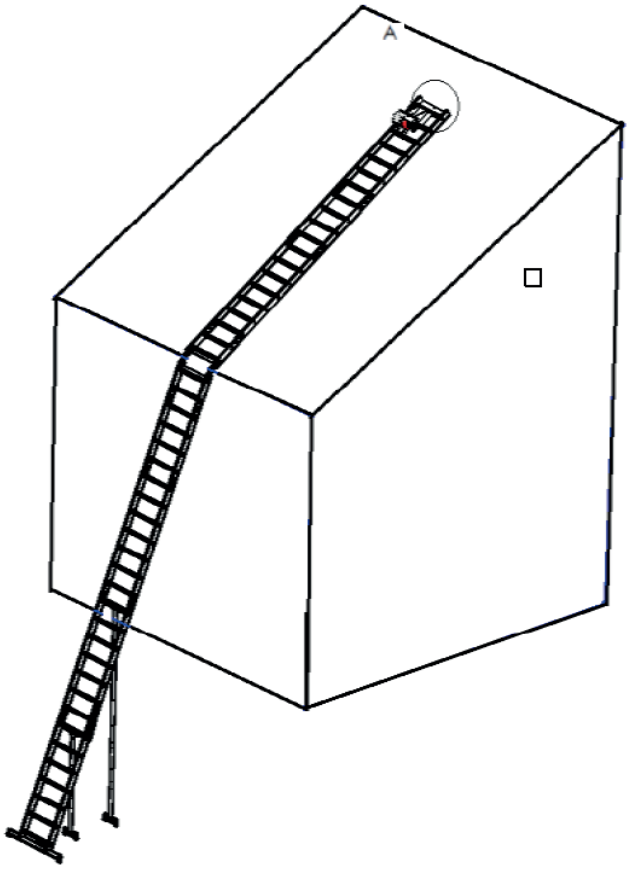
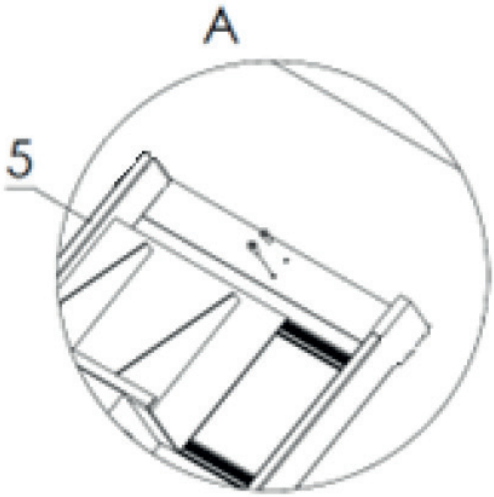


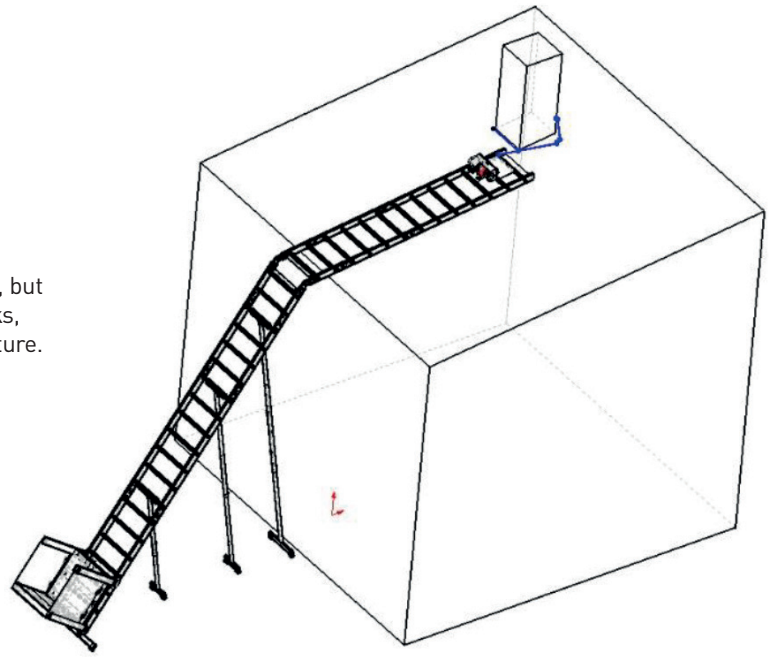
7A

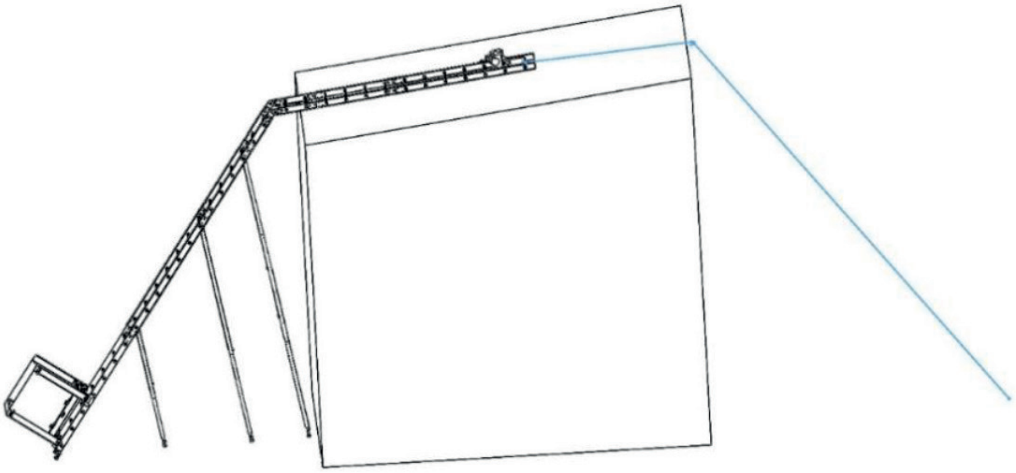
Connect the drive frame (5) securely to the roof structure (truss). The fixture for this purpose is permanently attached to the drive frame. Use 2x wood screws, size 6x50mm to secure the fixture to the truss. This solution is feasible when no roof skin is installed and the fasteners can be driven directly into the truss system of the roof.



7B

If the winch cannot be secured to the roof with its skin installed, but there are fixed features on the roof, like a chimney stack of bricks, use a lashing rope or cargo strap to secure the winch to such feature.



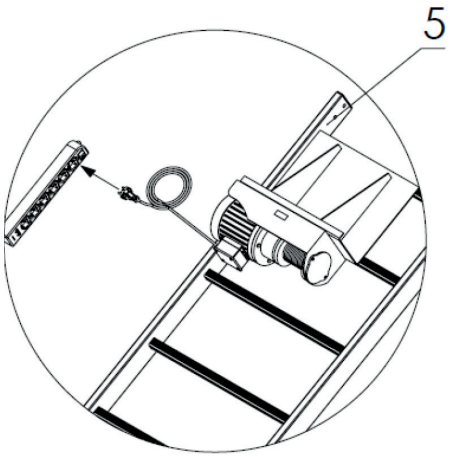


7C

If there are no structural features on the roof to which the winch can be safely attached, use a lashing rope or cargo strap by attaching one of its ends to the top of the winch and running the other end over the roof and securing it to an anchor suitable for the ground type.

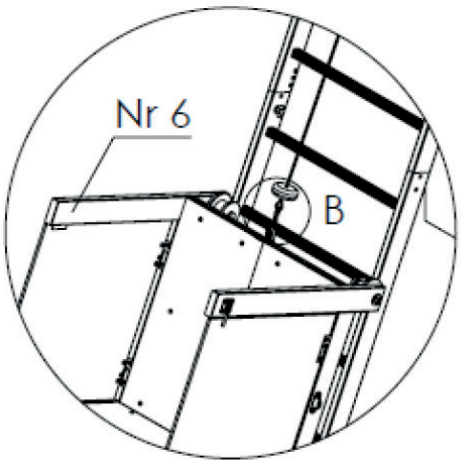
8

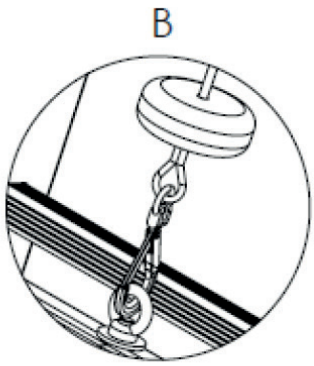
Once the winch is securely installed, connect the electric winch to the mains. Only an extension cable with protective earth shall be used.



9

Operate the electric hoist to lower the cable hook to the dead bottom of the winch. Place the transport trolley (6) on the winch ladder and connect its receiver to the cable hook.





Caution:
The roof section of the winch cannot operate on a perfectly horizontal surface. A substructure with a slope must be used when necessary (see Fig. 3), which is not provided with the winch.

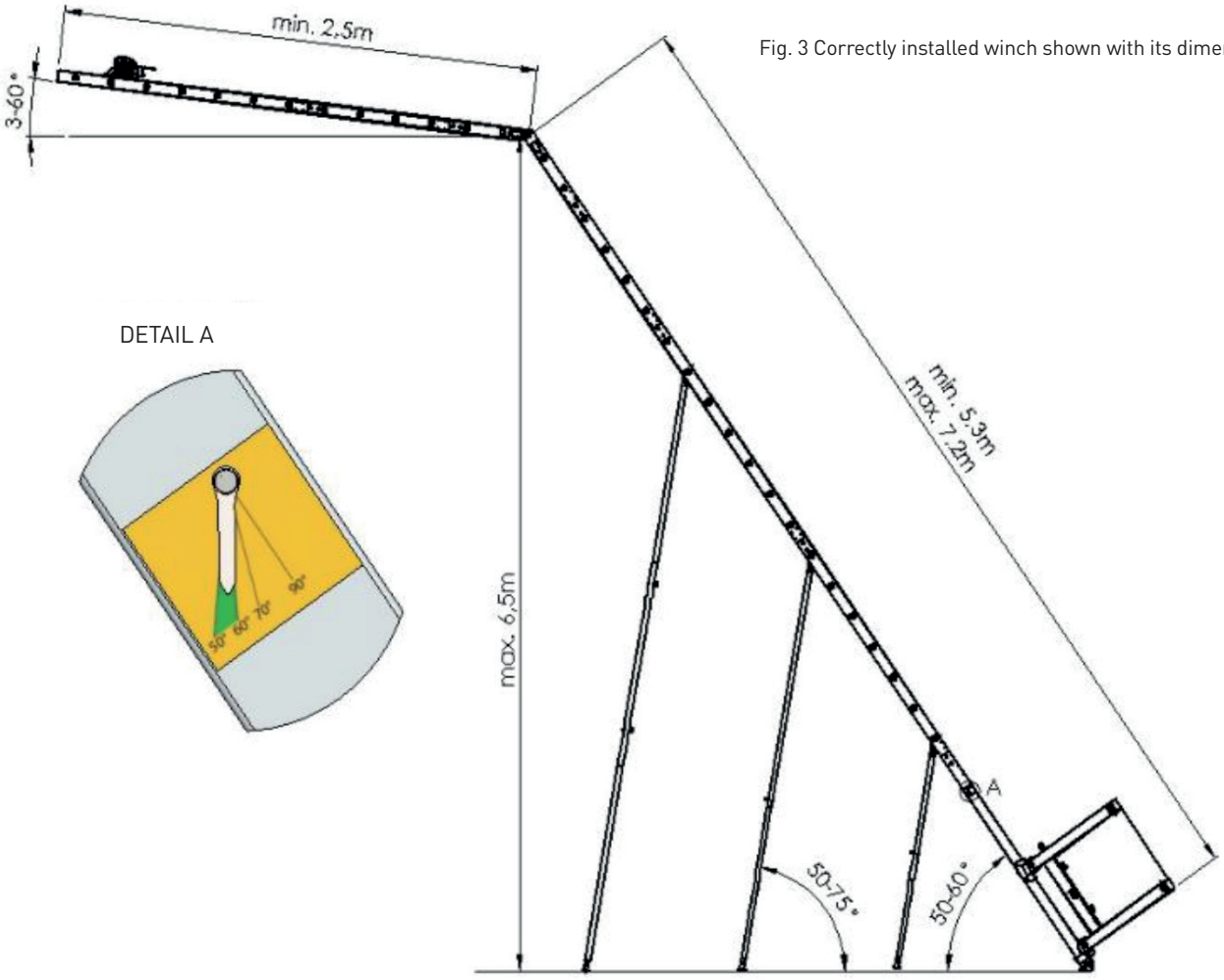


Fig. 3 Correctly installed winch shown with its dimensions

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ZAPROJEKTOWANE DLA TWOJEGO BEZPIECZEŃSTWA

6. SAFETY

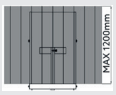
1. The winch operator shall read, understand and follow the Manual and all its directions and warnings. The operators require adequate training in occupational health and safety regulations applicable to work at height in the country of operation.
Assemble the ladder winch using genuine and undamaged components of the ladder winch system from Drabest. Before operation, verify that all components have been correctly installed.
3. The installation of the ladder winch must conform to this Manual; in the case of the installation of other structures using any components of this system, consult the manufacturer who will complete the relevant calculations and may authorise the application.
4. Install and operate the ladder winch only on a level and suitably paved ground.
5. It is essential to use the ladder supports as specified in the Manual (Section 6).
6. Do not attempt to install or operate this winch in specific weather, as explained below, due to live components. DO NOT OPERATE IN RAIN. If there is rain, cover the motor with a plastic sheet and unplug it from the mains to prevent electrocution hazards.
7. Do not attempt to install or operate this winch in specific weather, as explained below. DO NOT OPERATE IN HIGH WINDS above 12 m/s. Risk of the structure tilting and falling over. In these conditions, stop all work and secure the lean-to ladder section to the ground using a lashing rope or cargo strap.
8. Never climb the winch structure to access the roof.
9. If the transport trolley becomes stuck during operation, never climb on the winch frame. Use an A-frame ladder to attempt to free the trolley.
10. Each ladder winch must have an inspection and maintenance logbook maintained. Periodic safety inspections shall be done at least every 6 months and after any emergency involving the winch (see the Operating Logbook).
11. Connect the ladder frames together very carefully by inserting the steel connectors projecting from their ends into the next winch frame to be assembled and bolting them together using steel bolts (included with the winch).
12. Move the winch along the roof edge slowly and carefully to prevent separation or loosening of the components. The ladder winch should be installed and moved on the roof by two people, assisted by two more at the bottom end of the winch. During this operation, the winch frame shall be secured against sliding down the roof using a lashing rope or cargo strap attached to a permanent fixture on the roof.
13. Never attempt to pull the winch with ropes or power equipment.
14. Once the winch has been relocated, level it out and make sure that all connections are secure. During a prolonged downtime, it is recommended to secure the bottom end of the winch to the ground.
15. No other lifting equipment may be used on the winch except the hoist which has been factory provided by the manufacturer.
16. Lean the winch at an angle of 50 to 60 degrees to the wall of the building at which it is installed.
17. Never combine the ladder winch with other similar handling or access systems using planks or catwalks.
18. No personnel is allowed below the winch in operation.
Cordon off the work area of the ladder winch using e.g. cones with warning chains or tapes and NO ENTRY placards (Section 6, Explanation of pictograms, Pictogram 1). Only the operator is allowed to remain within 2 m from the winch, and only while placing or removing the load on/from the winch trolley.
19. The ladder winch requires two operators. One operator must be at the top of the winch and be able to safely monitor the moving load. The operator at the top initiates the load lifting operation. The other operator is at the bottom of the ladder winch and handles the load on and off the winch. Once the load is on the trolley, the bottom operator must move away to a safe location within 2 m of the winch. Both operators shall monitor the operation of the ladder winch and prevent unauthorised personnel from entering the work area while any load is handled on the winch.
20. The operators shall conform to all applicable occupational health and safety regulations, wear protective work garment, high visibility vests, hard hats, and suitable work footwear (see p. 12 and 13).
21. The operators shall communicate by voice using unambiguous commands, like “Start”, “Stop”, “Watch out!”, etc. If the operators cannot hear one another or cannot see one another, they shall use portable radios.
22. Never attempt to lift any load in excess of the maximum load capacity. Keep the load distributed on the transport trolley so that it remains stable on the ladder. Never attempt to handle any loads that are not secured to the trolley and may move during carriage on the winch.
23. Keep hands clear from the ladder stringers on which the transport trolley rides.
24. If PV panels are carried on the trolley without its side guards, they must be placed symmetrically and held with the safety clamp.

CAUTION! Before attempting to lift the load on the ladder winch, make sure the maximum load capacity of 125 kg is not exceeded!
ALWAYS KEEP CLEAR FROM THE LADDER AND THE ENTIRE WINCH WHEN LIFTING OR LOWERING ANY LOAD!

NOTICE:
To the extent not covered in this Manual, the installation and operation of the Drabest ladder winch is subject to the general operating requirements and health and safety regulations applicable to construction, demolition and work at height specified in the current Polish laws, regulations, standards, and official permits. These must be known by the operators.

7. EXPLANATION OF PICTOGRAMS

	NO ENTRY
	READ THE MANUAL
	WEAR HARD HATS
	WEAR PROTECTIVE GLOVES
	WEAR SAFETY BOOTS

	CAUTION: SUSPENDED LOADS
	CAUTION: CRUSHING HAZARD
	DO NOT CROSS THE PV PANEL TROLLEY DESCENT LINE
	DO NOT EXCEED THE MAXIMUM LOAD HEIGHT
	DO NOT EXCEED THE MAXIMUM LOAD CAPACITY OF THE WINCH

8. OPERATOR'S "DO NOT" LIST

- Do not operate this winch without reading and understanding the Manual first.
- Do not start the winch if it is suspected to be defective or damaged.
- Do not lift people.
- Do not lift loads more than 125 kg.
- Do not lift loads taller than 1200 mm.
- Do not lift loads not secured to the trolley.
- Do not remove any safety warning or notice labels.

9. EMERGENCY RESPONSE PROCEDURES

In the case of an accident:
- Understand the nature and location of the accident.
- If necessary, call for help and isolate the winch from the mains.
- Secure the accident site. If necessary and feasible to do so, remove the victim away from danger.
- Provide first aid and protect the victim from aggravating the injury.

In the case of a failure:
- Stop the winch with the ESD.
- Isolate the winch from the mains.
- Have the operator or an expert do a thorough visual inspection of the winch to determine the root cause of the failure and the nature/extent of damage.
- Report the failure to the manufacturer.
- Have the failure repaired by a professional.

10. DISASSEMBLY

NOTICE:
1. Disassemble the winch in the reverse order of installation and assembly.
2. Follow all applicable health and safety regulations during the disassembly process.
3. When disassembling the winch, never attempt to throw or drop any components on the ground.
4. The hoist cable unwound down the winch without a trolley on the hook must stay within the ladder section; if the hook snags a wrung, it may tear the wrung off.

11. MAINTENANCE, INSPECTION AND REPAIR

REPAIR:
The repair procedure is not explained in this Manual. When any component of the ladder winch is found to be defective, it must be replaced with a fully operational counterpart or repaired. Repairs to damaged components shall only be done by the manufacturer.

MAINTENANCE:
Clean the winch components after isolating the supply mains. Use water with commercially available detergents. Turpentine can be used to remove stains of paint or varnish.
• Do not clean electrical units (the hoist) with water.
• Caution: Prevent detergents/cleaners from escaping into the ground. Contain, collect, store, and dispose in compliance with the prevailing environmental protection regulations.

Safety inspection:
• The ladder winch has passed static and dynamic tests; the static safety factor is 1.5; the dynamic safety factor is 1.2.
• Before attempting to disassemble the ladder winch or while cleaning all of its components, inspect them for continued serviceability.

Pre-operating safety inspection:
1) Inspect the ladder frames for:
• Deformation
• Cracked welds
• Damaged stringers
• Damaged steel connectors and their fasteners
• Bent rungs

2) Inspect the hinge frame for:
• Deformation
• Cracked welds
• Damaged stringers
• Damaged steel connectors and their fasteners
• Bent rungs
• Proper operation of the hinge hardware and cable pulleys

3) Inspect the drive frame for:
• Deformation
• Cracked welds
• Damaged stringers
• Damaged steel connectors and their fasteners
• Bent rungs
• Loose hoist-to-frame fixture

4) Inspect the telescopic and roof support for:
• Deformation
• Cracked welds
• Failed threaded fasteners in the supports

5) Inspect the transport trolley for:
• Free rotation of the wheels
• Cracked welds on the chassis and cracked deck
• Failed threaded fasteners in the trolley

6) Inspect the electric hoist installed on the ladder winch by following this Manual.
Carefully inspect the following in particular:
• The hoist cable
• The cable hook
• The power cable and remote control harness for insulation damage
• Structural integrity of the drive unit (threaded fasteners and welds)

NOTICE:
If any item of the safety inspection is failed, the ladder winch is unserviceable. Remove it from service and have it repaired immediately before returning the winch to service. If the winch drive fails by e.g. motor overheating, the trolley will be stopped by an automatic emergency brake of the motor.

Electric hoist maintenance plan:
If regular maintenance reveals excessive tear and wear, reduce the necessary maintenance intervals appropriately to the actual wear.

MAINTENANCE INTERVALS

Maintenance intervals	Maintenance items
Every 200 hours (at least once a month)	Verify the steel wire cable retaining bolts are properly tightened.
Every 200 hours (at least once a week)	Test the operation of all safety limit switches and operating controls.
Every 200 hours (at least once a week)	Inspect the hoist cable for damage. Inspect and measure the wear of the cable hook.
Every year (at least every 6 months)	Safety inspection: Once commissioned for operation, the electric hoist requires safety inspections provided in the applicable lifting equipment operating safety regulations, with the findings put on record.

MAINTENANCE INSTRUCTIONS

Step 1: Lubricate all moving mechanical components of the electric hoist (gears and bearings) with high-quality grease.
Caution: Never lubricate the electrical components and the hoist cable.
Step 2: Inspect the electric hoist for visible damage before each use.
Step 3: Make sure that the safety warning signs on the electric hoist are in place and legible.

VISUAL INSPECTION AND MAINTENANCE

Maintenance intervals	Maintenance items
Before each use	Visually inspect the electric hoist for damage and wear, especially the cable, looking for cracks, deformation and corrosion.
Before each use	Check the cable hook for wear, pitting of material, and evidence of fatigue. If the wear is more than 10% of the standard weight, the cable hook shall be replaced.
Before each use	Inspect the retaining bolts and straps for proper and secure positioning on the brackets
As required	Lubricate the gears and bearings well

CAUTION!
DO A TEST RUN BEFORE EACH USE.

The test run procedure:
1. Securing a load on the trolley.
2. Running the trolley powered without any load.
3. Running the loaded trolley up and down with stopping at different height.
4. Inspect that the trolley is braked to stop when loaded or unloaded in any position.

OPERATING LOGBOOK

#	Maintenance work date	Notes	Service personnel sign-off
1			
2			
3			
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11			

#	Maintenance work date	Notes	Service personnel sign-off
12			
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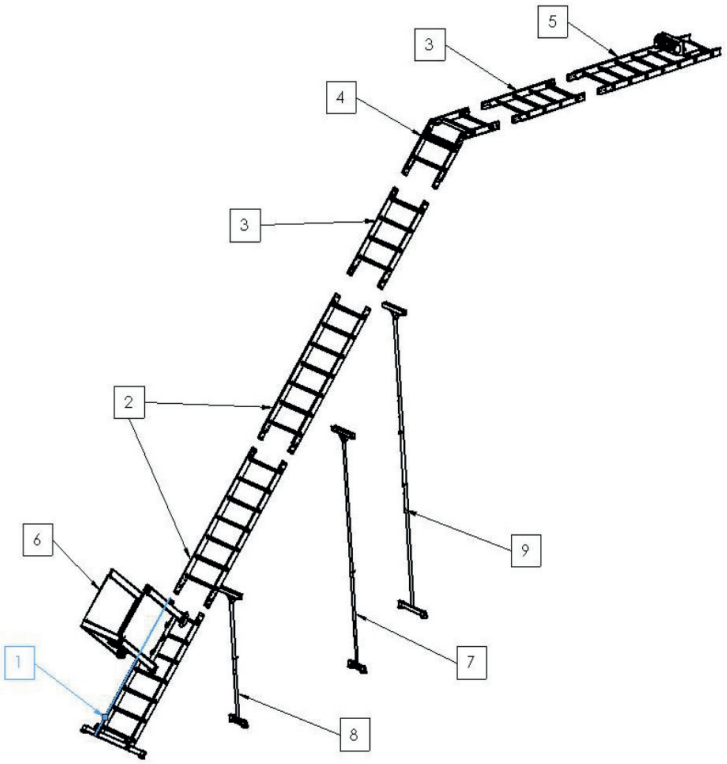
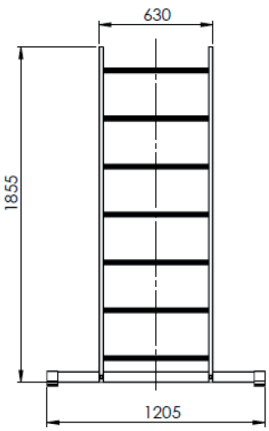
12. STORAGE

Plan and manage the storage of the ladder winch components to prevent their damage. Provide a dry, indoor storage location. It is best to store the winch laid flat. Transport the ladder winch components secured against shifting, collision, and falling. Do not throw any components while handling. Store the electric hoist in dry indoor locations only, away from water and moisture. Provide protection against water and condensation whenever necessary.

13. LIST OF SPARE PARTS



DIAGRAM



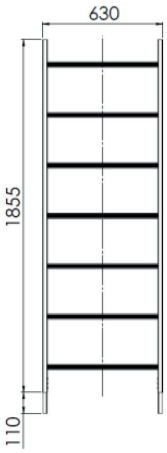
DESIGNATION

1) Ladder frame w/stabiliser

PRODUCT CODE

WT-RD-1.85M/S

DIAGRAM



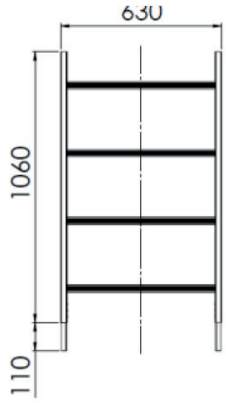
DESIGNATION

2) Ladder frame, 1.85 m

PRODUCT CODE

WT-RD-1.85M

DIAGRAM



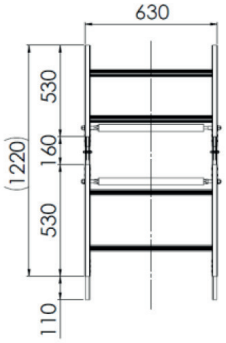
DESIGNATION

3) Ladder frame, 1.06 m

PRODUCT CODE

WT-RD-1.06M

DIAGRAM



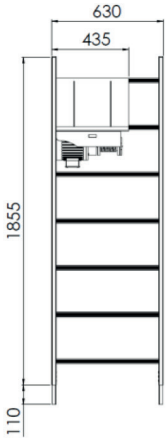
DESIGNATION

4) Hinge frame, 1.2 m

PRODUCT CODE

WT-RD-ZA-1.20M

DIAGRAM



DESIGNATION

5) Drive frame, 1.85 m

PRODUCT CODE

WT-RD-NA-1.85M/BS

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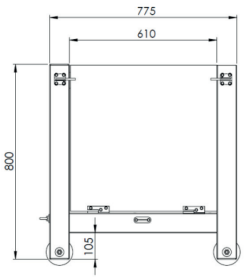
DIAGRAM



DESIGNATION

6) Transport trolley, standard version (*) (1 pcs.)

PRODUCT CODE

WT-WT

DIAGRAM

DESIGNATION

7) Telescopic support

PRODUCT CODE

WT-PT

DIAGRAM

DESIGNATION

8) Short telescopic support

PRODUCT CODE

WT-PT-K

DIAGRAM

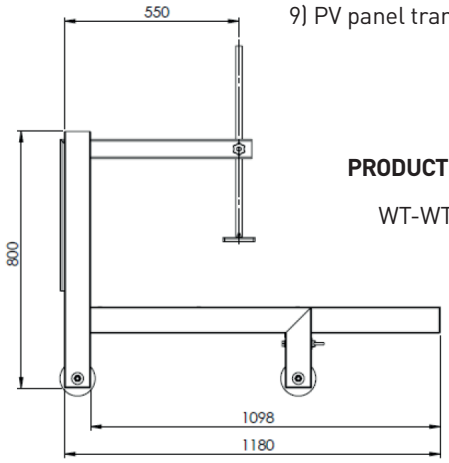
DESIGNATION

9) Long telescopic support

PRODUCT CODE

WT-PT-W

DIAGRAM



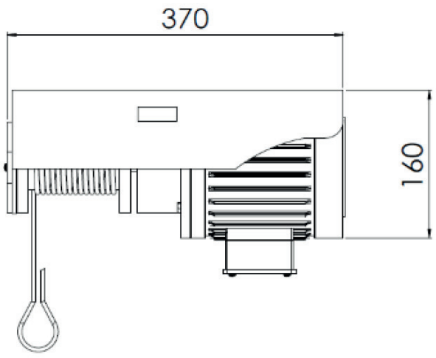
DESIGNATION

9) PV panel transport trolley

PRODUCT CODE

WT-WT-PV

DIAGRAM



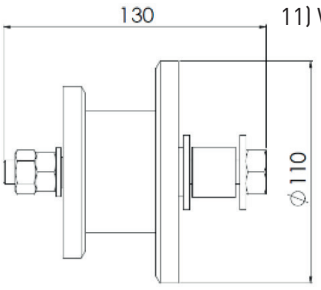
DESIGNATION

10) Electric winch, MES 600-2

PRODUCT CODE

MP-RU-WCIĄGARKAPRO

DIAGRAM



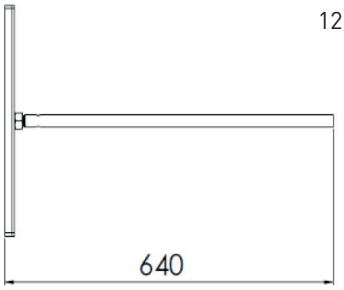
DESIGNATION

11) Wheel assembly, winch trolley

PRODUCT CODE

WW-ZA-UCH

DIAGRAM

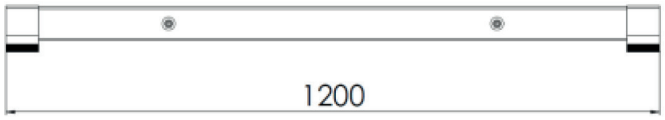
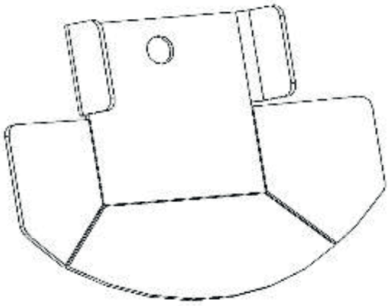
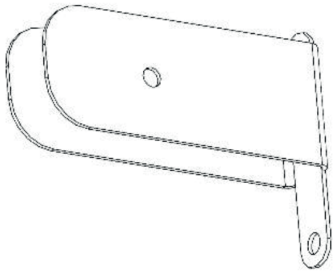


DESIGNATION

12) Safety clamp, PV panel transport trolley

PRODUCT CODE

WW-ZA-UCH

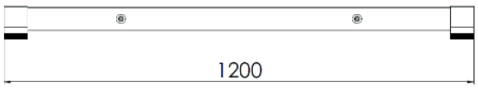
DIAGRAM	DESIGNATION	PRODUCT CODE
	13) Winch stabiliser, 60x20, L=1200 mm, assembly	AK-ST- W -60X20 - 1200-KPL
	14) Trolley guide, 2 pcs.	WD-1-02
	15) Trolley lower end stop, 2 pcs.	WD-1-03

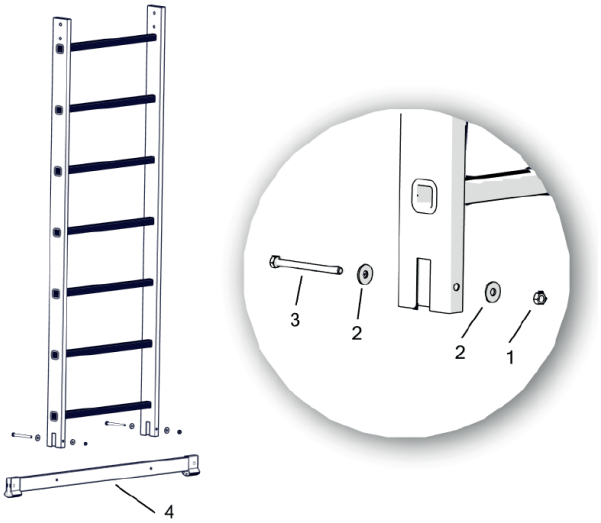
Tab. 2 List of spare parts

14. INSTALLATION OF SPARE PARTS

1

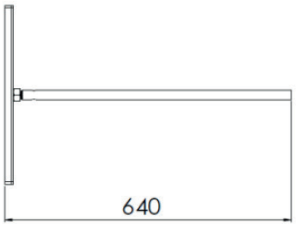
Winch stabiliser, 60x20, L=1200 mm
To replace the component, remove the nuts (1), washers (2) and bolts (3), replace the stabiliser (4) then reinstall items (1) (2) (3) in the same order.

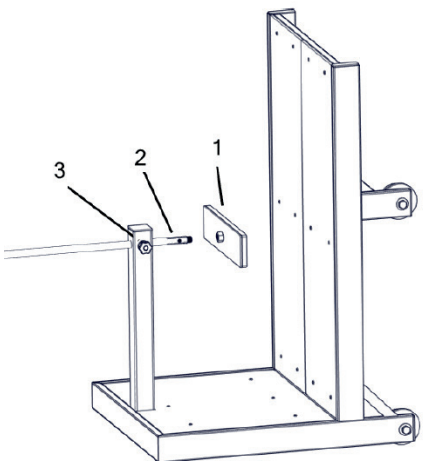




2

Safety clamp, PV panel transport trolley
To replace the component, remove the knob (3) and the safety clamp stem (2) from the base (3). After replacing components, install in the same order.





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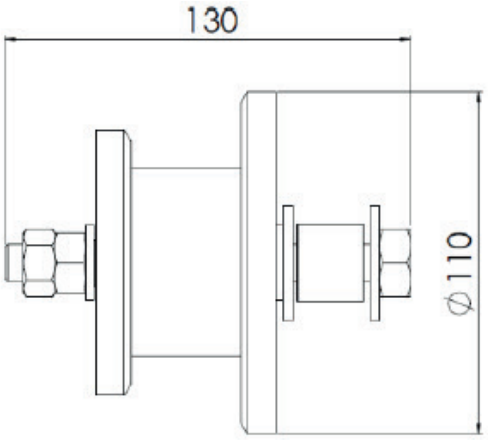
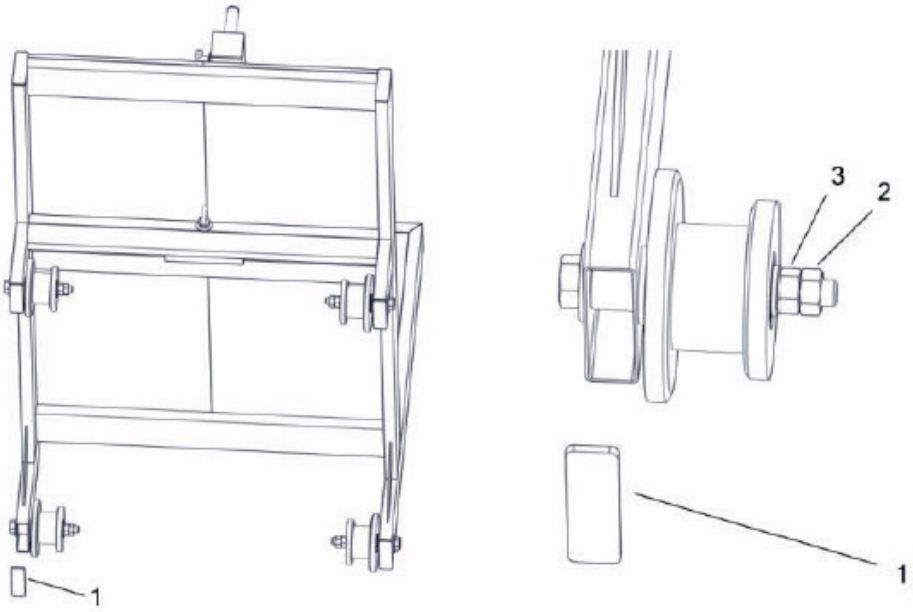
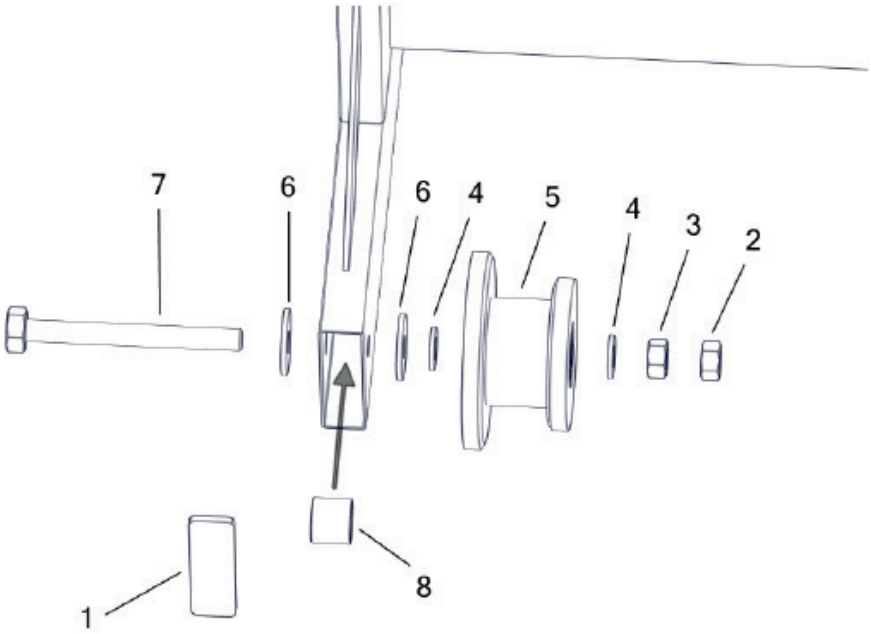
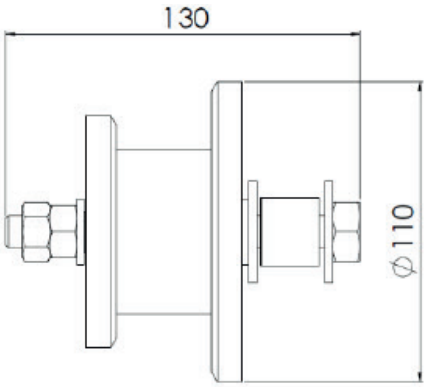


3

Wheel assembly, winch trolley
To replace the component, remove the end cap (1) and the nuts (2) (3). Replace and reinstall in the same order. The sleeve (8) is on the installed bolt within the profile.

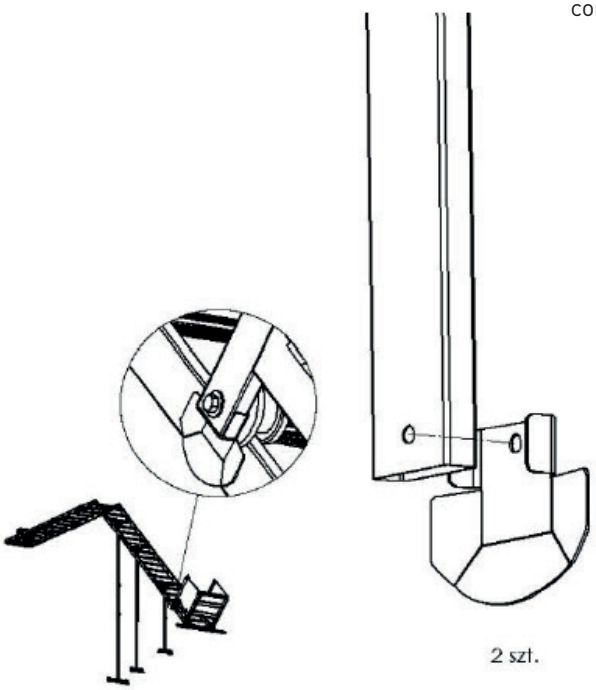






4

Rope winch, MES 600-2
To replace the component (1), remove the retaining bolts and washers (2) (3). Replace as shown in the component diagram.



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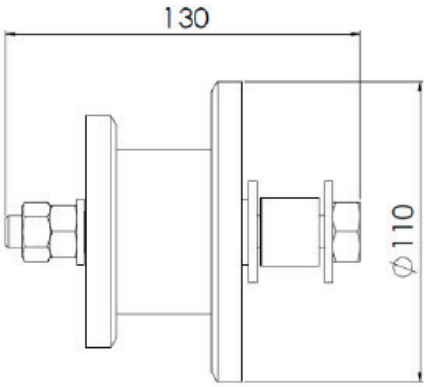
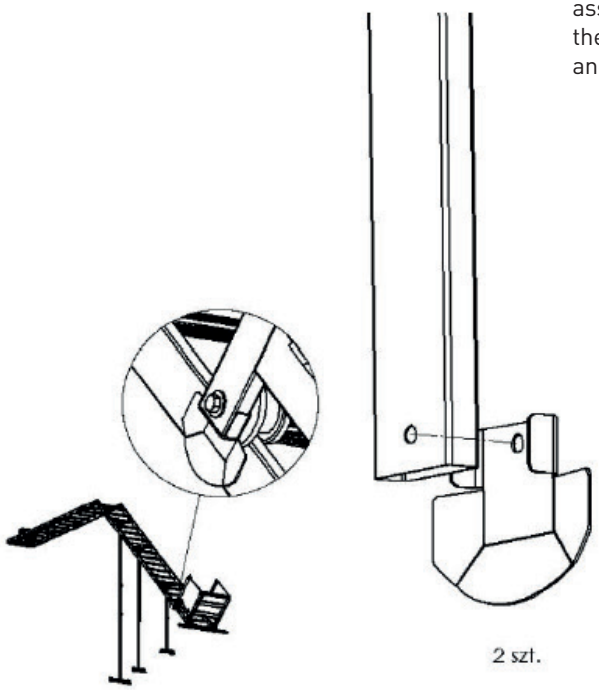
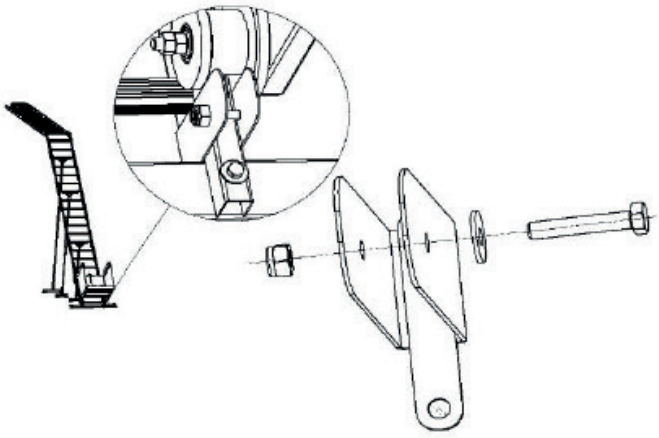


5

Wheel assembly, winch trolley – side guides need to be included

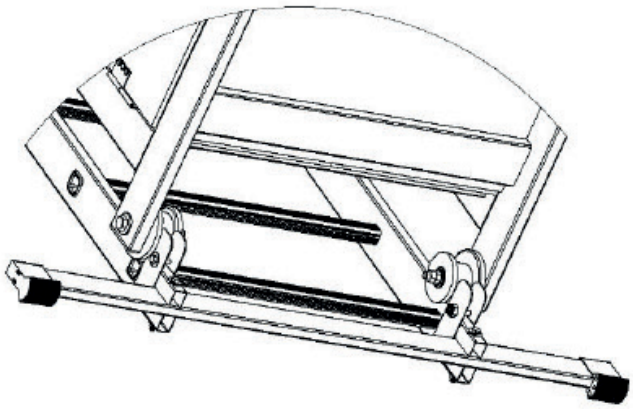
To install the component, remove the front wheel assemblies then insert the WD-1-2 guide in place of the washer on the inward side of the trolley. Replace and reinstall in the same order.





6

remove the retaining bolts and washers (2) (3). Replace as shown in the component diagram.



7

Extra support (9), height: 4.5 m

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15. WARRANTY

THE W16 LADDER WINCH IS PROVIDED WITH A LIMITED COMMERCIAL WARRANTY OF 12 MONTH FROM THE DATE OF ORIGINAL PURCHASE.

(This warranty applies only to the goods operated according to their intended use and the Installation & Operating Manual provided by Drabest with each product.)

Warranty exclusions:
Goods which have been altered or subject to unauthorised repairs without prior written approval by Drabest;
• Any consequences of using spare parts or accessories other than genuine Drabest products;
• Minor irregularities which do not negatively impact performance, safety, or value of the product;
• Any consequences of extreme weather phenomena.

Drabest shall not be liable for:
• Any consequences of incorrect assembly/disassembly or use of the products supplied, also by personnel unauthorised to do so and/or not trained in accordance with the regulations prevailing in the location of operation.
• Damage to the product or any loss resulting from mechanical damage not directly attributable to the intended use or operation in compliance with the product's manual, including misuse by overload, improper storage, or negligent maintenance.
• Damage to the product or any damage caused by wear and tear resulting from the intended use of the product or other natural wear.

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