

10.HOISTS

10.1 ASTRO HOIST E86 AND E89

10.1.1 GENERAL

Models: Single phase: Astro Hoist E86-CTO with Central Control box
 Three phase: Astro Hoist E89-CTO with Central Control box
 Conform to EN 1808 (1999) and Machine Directive 98/37 EC

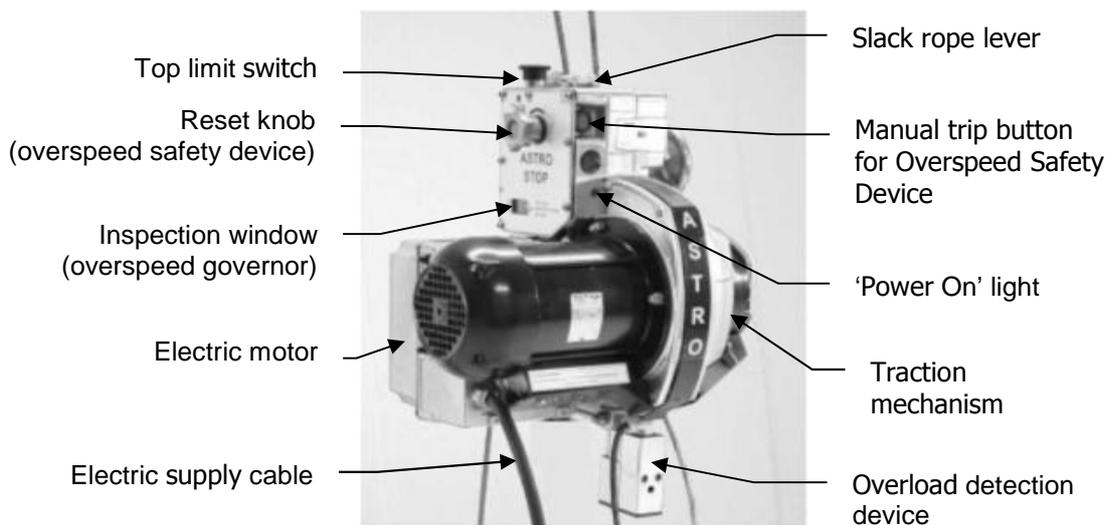
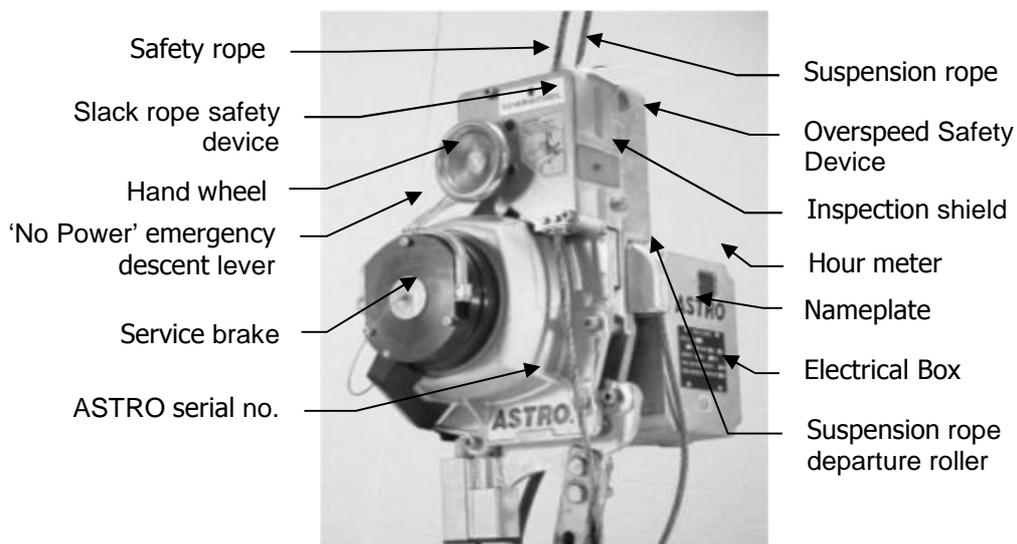


WARNING:

- All persons operating this equipment must read and completely understand this manual.
- All persons must be thoroughly trained in the use of the equipment, it's operational and safety features, and they must also be capable of carrying out the daily checklist.
- Only authorized and physically fit persons shall operate the equipment.
- Any operation in violation of these instructions is at the operator's own risk and may result in serious injuries.
- Keep this manual with the hoist at all times.
- Only use spare parts and steel wire rope from POWER CLIMBER,
- It is not allowed to put the machinery into service until the machinery into which it is incorporated or of which it is to be a component, has been found and declared to be in conformity with the provisions of Directive 98/37/EC and with national implementing regulation.

Manufacturer: Power Climber b.v.b.a, Satenrozen 7, B-2550 Kontich BELGIUM

		E86-CTO Single Phase	E89-CTO Three Phase
Working Load Limit (W.L.L.)		6000N (600 kg)	8000N (800 kg)
Power Supply		230V / 50Hz + E	3 x 400V / 50Hz + N + E
Amperage at W.L.L.	RUN	7.0 A	3.5 A
	START	28.0 A	10.5 A
Motor Power		1.0 kW	1.1 kW
Wire Rope Diameter		8.4 mm or 9.5mm	9.5 mm
Hoisting Speed		8.5 m/min	8.5 m/min
Noise level	UP	84 dBA	84 dBA
	DOWN	80 dBA	80 dBA
Self-weight of hoist		52kg	52kg



10.1.2 CENTRAL CONTROL BOX

Overload warning lights (Left/Right)

RED warning light is ON when either or both electro-mechanical overload detection devices are triggered.

Hoist Selector Switch (Left / Both / Right)

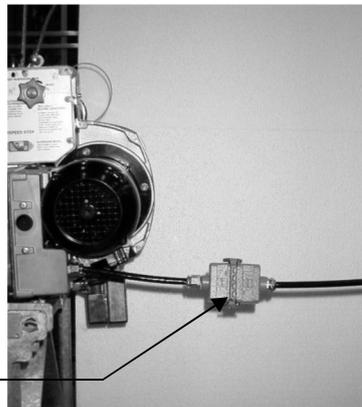
Allows operation of individual hoist for reeving /de-reeving or leveling.
Set on '2' for normal operation with both hoists.



Hold-to-Run Up/Down Push Buttons

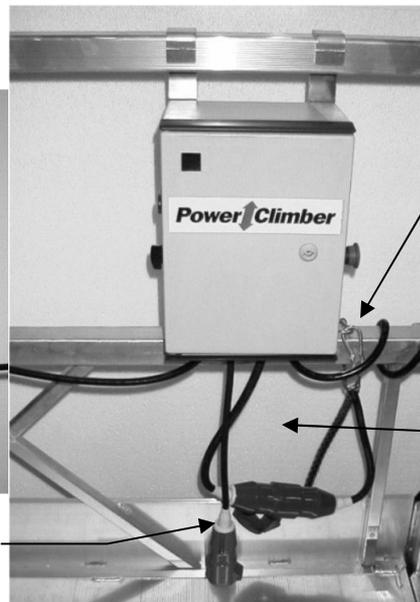
Emergency Stop Button

Press to cut ALL power.
To reset, twist the knob in the direction of the arrow on the top of the knob.



Connection
plug to hoist:
10 pole steel
Harting plug

Female CEE plug outlet for
power tools
single phase
(230V/50Hz/16 Amp)



Cable
retainer

Male CEE plug for
incoming main
power supply

The ASTRO hoist is a self-reeving traction hoist, powered by an electric motor.

The hoists and the central control box (CCB) are mounted on Temporary Suspended Platforms (TSP) and suspended with steel wire ropes from a suspension system.

The strength of the platform and the suspension system used in combination with the hoists must be in relation to the Working Load Limit (WLL) of the hoist.

10.1.3 INSTALLATION

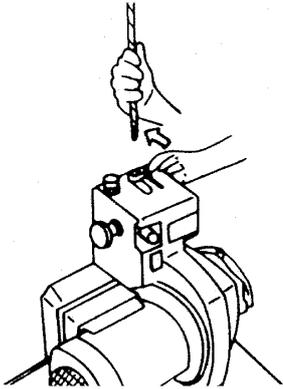
A. Install CCB and connect Power Supply

1. Install CCB on the rear platform guardrail away from the working area.
2. Connect the control cables from the CCB to each Astro hoist, in the transport container.
3. Connect the main power supply cable to the male plug on the CCB, and secure it to the mid-rail of the platform using the cable retainer.

Note: Both hoists have to be connected to the CCB for either hoist to operate.

B. Reeve the suspension ropes in the ASTRO hoist

At roof level, uncoil the suspension ropes and lay them on the roof surface. Attach the suspension ropes to the suspension system with the safety hooks fitted to the ropes and lower the ropes to the ground.



Tip: Before reeving the suspension rope check that the overspeed safety device is reset by turning the reset knob in the direction of the arrow.

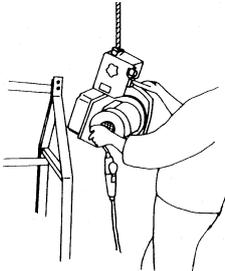
1. Push back the slack rope lever and insert the suspension rope through the eye of the slack rope lever and into the top of the ASTRO hoist.
2. Push the suspension rope past an initial slight resistance, until the rope is all the way in and stops.
3. Push the 'up' button on the CCB and the steel wire rope passes through the hoist automatically. The end of the rope will come out at the departure roller.

Tip 1: If there is any difficulty reeving the suspension rope it helps to put a small bend in the end of the rope before feeding it into the hoist.

Tip 2: If the tip of the suspension rope is damaged or poorly made, it can get stuck in the departure roller cover. Insert a screwdriver or small rod in the hole in the top of the

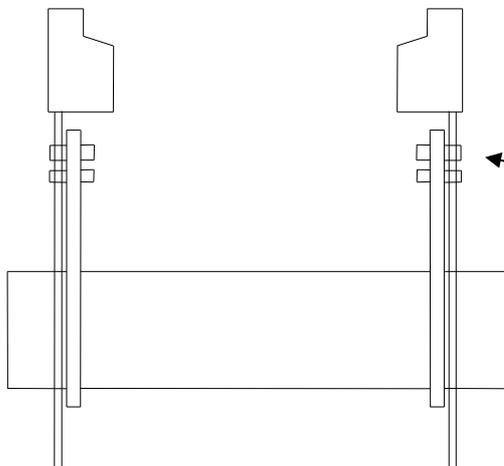
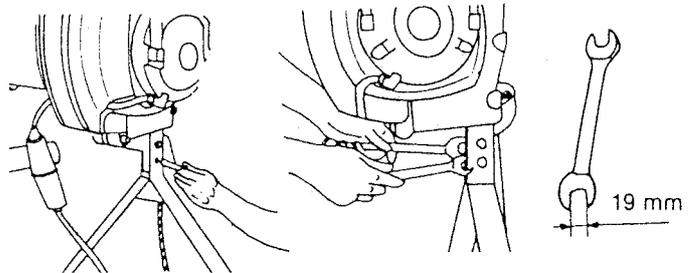
departure roller cover to free rope or repeat reeving procedure.

C. Attach the ASTRO hoist to the stirrup

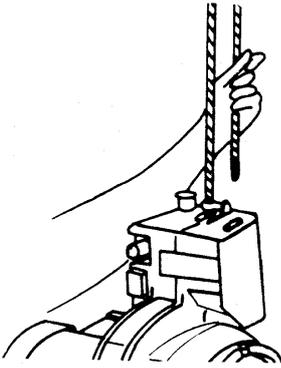


1. Lift the ASTRO hoist out of its box by pushing the 'up' button on the CCB. Line up the holes in the stirrup bar with the holes in the stirrup and push home the bolts.
2. Attach the ASTRO hoist to the stirrup of the platform with M12 bolts and self-locking nuts. Make sure that the ASTRO hoist is mounted with the suspension rope departure roller

and the tail end of the steel wire rope to the outside of the platform.



Lead the steel wire rope over the wire guiding.
(Only by the walk-through stirrup)



D. Reeve the safety rope in the ASTRO hoist

At roof level, uncoil the safety ropes and lay them on the roof surface. Attach the safety ropes to the suspension system with the safety hooks fitted to the ropes and lower the ropes to the ground.

Push back the slack rope lever to open the jaws of the slack rope safety device and push the safety rope through the slack rope compartment. Take out all slack by putting a weight on the tail end of the safety rope.

The rope tension weight has to have a ground clearance of approx. 200 mm.

Take care that the rope tension weight can't:

- slip off the rope
- be lifted by the platform.

Tip: Separately reeving the safety rope and the suspension rope, will avoid getting them twisted together.

E. Carry out Daily Checklist

Carry out the Daily Checklist prior to your first ascent to install the top limit switch striker plates. Always check the suspension system for stability and safety before launching the platform.

F. Install Top Limit Switch Striker Plates

The striker plate activates the top limit switch and must be clamped on the safety wire at a distance of min. 200mm from the Talurit clamp.

IMPORTANT

Clamp the striker plate to the safety rope ONLY so that the suspension rope passes freely through the slot in the plate.

REMOVING the steel wire rope from the ASTRO hoist

Tip: Remove the safety rope first and keep the suspension rope taut, so that the slack rope safety device stays open and allows easy passage of the safety rope.

Safety rope	Manually pull the safety rope out of the slack rope safety device by hand.
Suspension rope	<p>Push the 'down' button on the CCB until the suspension rope no longer comes out of the top of the hoist and pull out the remainder of the rope by hand.</p> <p>Tip: Remove the last part of steel wire rope slowly to avoid activating the overspeed safety device. Reset if required</p> <p>Cautions: To avoid rope jams, push up on the slack rope lever when removing the suspension rope.</p>

After work is over check that:

- The platform is cleared of tools and equipment.
- All power has been switched off.
- Equipment has been secured where it will not be accessible to be tampered with.

10.1.4 MAINTENANCE

ROUTINE MAINTENANCE: at least every 3 months under normal use, or 50hrs, which ever comes first.

Note: No specialised training is required to perform this basic maintenance.

1. Check all plugs socket connections of the hoist and central control box for any signs of water penetration.
2. Make a general inspection of hoist for excessive wear and damage.
3. Open chain cover and inspect chain assembly for any signs of excessive dirt and corrosion. If required, blow out with air or rinse with water.
4. Check that chain rollers rotates when the reeving/de-reeving the steel wire rope through the hoist.
5. Open the inspection window on the slack rope safety device and inspect the compartment for excessive dirt and corrosion. Check that the slack rope lever can move smoothly up and down. If necessary, lubricate with a dry wax-based spray lubricant.
6. Carry out the Daily Check List before using the platform.
7. Write a maintenance record indicating:
 - Any discrepancies noted and action taken.
 - Hour meter reading of the hoist.

ANNUAL MAINTENANCE: to be carried out by an authorized service centre

1. Completely strip the hoist, clean and inspect all parts for wear and damage. Replace worn parts as necessary.
2. Clean, lubricate and re-assemble the hoist. Particular attention must be given to the chain assembly and slack rope safety device.
3. Place the hoist on a test rig and test that it can lift the rated Working Load Limit.
8. Check all plugs socket connections of the hoist and central control box for any signs of water penetration.
4. Reinstall the hoist and control box back on the platform and carry out the Daily Check List.
5. Write a maintenance record indicating:
 - Repairs carried out and/or parts replaced.
 - Hour meter reading of the hoist.

Special conditions:

The frequency of inspection and maintenance also depends upon the environmental and working conditions:

- When working with abrasive, adhesive or corrosive materials (epoxy, paint, cement, sand blasting, acids, salt water, spraying), the hoist should be protected with a suitable cover and the daily checklist carried out at least once a day.
- Always exercise caution regarding grounding, arcing and insulation, whenever welding or using electrical equipment.

10.1.5 TROUBLESHOOTING

Problem	Probable cause	Solution
Hoists do not work when pressing the 'up/down' push button	No Mains power (check that the "power on" light is illuminated)	Check power that power plug is properly connected or go down using the emergency manual descent
	Emergency stop button has been depressed	Release emergency stop button
	Both hoists are not connected to the CCB	Check that both hoists are correctly plugged in the CCB
Three phase hoists do not work when pressing the 'up/down' push button	Phases are reversed (check phase protector indicator light in the CCB)	Connect phases correctly
During reeving, the hoist works in the 'up' direction, but the suspension rope does not reeve through	Steel wire rope is jammed in the exit roller	Check 'bullet-end' of steel wire rope is in good condition
	Steel wire rope is not entering the hoist properly	Remove steel wire rope and repeat reeving procedure (see Tips)
Hoists work for just a moment and then stop	The platform is overloaded (overload warning light on the CCB is ON)	Remove excessive load to automatically reset overload
The hoists do not work in the up direction	Top limit switch has been activated	Check for obstruction (e.g. hitting the striker plate)
Hoist hums, starts slowly or is sluggish, or fails to lift the loaded platform.	Serious voltage drop	Check the power supply and the specifications of the power supply cable
	Single phase hoist: start capacitor is defective	Hoist to be checked by an approved service centre
	Service brake failure	Hoist to be checked by an approved service centre
The hoists work for a long time and then stop. The electric motors are hot.	The thermal protection has been activated	Let the motors cool down to reset automatically. <i>Tip: The 'no power' descent will still operate when the overheating protector is tripped.</i>
The hoist turn both in the 'up' and 'down' direction, but the platform does not come down	The slack rope safety device is activated	Check that the platform has not come to rest on an obstruction and is properly level
The hoist works in up direction only, and the platform does not come down.	Overspeed safety device is activated.	Turn overspeed reset knob clockwise (see arrow) to reset. Caution: never reset the overspeed until reason for tripping has been determined and the problem solved
Overspeed flywheel is not turning	Dirt or corrosion in the overspeed safety device.	Hoist to be checked by an approved service centre
Overspeed safety device cannot be reset	Too much load on the overspeed safety device	Push the 'up' button to relief load on the overspeed safety device
Slack rope lever does not pivot properly	Slack rope mechanism is contaminated by grit or corrosion	Clean and lubricate slack rope safety device
IF PROBLEM PERSISTS, CONTACT YOUR LOCAL SERVICE REPRESENTATIVE.		

10.1.6 SAFETY DEVICES

1 Automatic slack rope safety device:

The automatic slack rope safety device locks onto the safety rope if:

- The suspension rope loses tension or breaks.
- The platform gets out of level by approximately 14 degrees. The slack rope safety device on the lower hoist will lock onto the safety rope.

2 Overspeed Safety device:

The overspeed safety device locks onto the suspension rope when the suspension rope passes through the hoist (descent speed) at more than 15 m/min.

The overspeed safety device can also be triggered manually by pressing the manual release button.

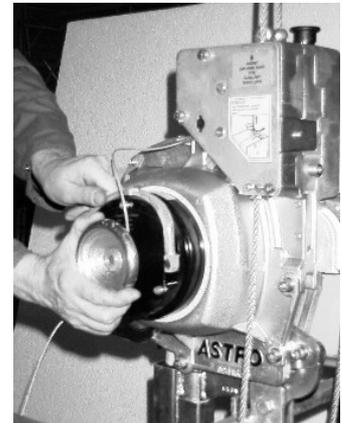
An electrical interlock switch cuts off the function of the 'down' button when the overspeed safety device is activated.

To reset the overspeed safety device, first drive the hoist up a few centimetres and then turn the reset knob clockwise in the direction of the arrow.

Use of Hand Wheel to reset overspeed in case of power failure:

If the overspeed safety device has triggered and there is no power to the platform, it will be necessary to wind the hoist up a few centimetres manually, to be able to turn the reset knob.

- Pull out main power plug to cut off power supply.
- Remove plastic plug in the service brake to expose shaft for hand wheel.
- Remove the hand wheel from its storage position and insert shaft into hub.
- Wind the hoist in the up-direction clockwise $\frac{1}{2}$ turn at the same time as you pull the brake lever to open the brake.
- Release brake lever and repeat.



TIP: *Grab the hand wheel firmly while opening the brake to prevent it from turning and going back down.*

- Put plastic plug back on and return hand wheel to its storage position after use!
- Reset overspeed safety device
- Plug in main power plug and resume.

IMPORTANT: *When the overspeed is triggered and the platform is driven in the 'up' direction so far that the top limit switch is activated by the striker plate, then both the 'up' and 'down' movement will be halted.*

3 Overload detection device:

The overload detection device of each hoist is factory set to stop the 'up' direction of travel if the Working Load Limit (WLL) of the hoist is exceeded by 25%.

There is a red overload warning light for each overload detection device on the central control box.

The overload detection devices of both hoists are connected in series. If one overload detection device is triggered, then the up movement of both hoists is halted.

To release the overload detection device, remove the excessive load.

Tip: *In addition to removing the excessive load, it may be required to remove part of the normal load in order to reset the overload detection device. Once the overload detection device is reset, the platform can once again be loaded with the full normal load.*

4 'No-Power' descent

In the event of a power failure the platform can be lowered at a controlled speed

(6 m/min.), by pulling the 'No-Power' descent lever on the electro-magnetic service brake.

Warning: *Never use the emergency manual descent when normal powered movement is possible.*

5 Top limit switch

The top limit switch cuts the up movement when it is activated by the striker plate, which is clamped onto the safety rope at the top of travel.

When the top limit switch is triggered, the platform can be driven down but not up.

The top limit switches of both hoists are connected in series. If one top limit switch is activated, then the 'up' movement of both hoists is halted.

6 Phase Protection (for three phase power supply only)

All central control boxes built to suit a three-phase power supply are fitted with a phase protector.

The phase protector has a GREEN indicator light. If the GREEN light is ON, the phases are correctly connected and the platform will operate.

If the GREEN indicator light is OFF, the phases are NOT connected properly in the mains power supply. Change over two phases until the GREEN light is ON.

WARNING: DO NOT change any connections in the central control box.

7 Automatic Levelling System

The central control box is fitted with an automatic levelling system that allows the platform to maintain a stable horizontal position.

An out of level condition can occur when one of the hoists is working faster than the other, or if the load in the platform is not evenly distributed.

When the platform is in motion, the automatic levelling system stops the hoist that is going too fast and allows the other hoist to catch up.

When both hoists are level again, the levelling system is deactivated and both hoists will function simultaneously.

The automatic levelling system is activated when the platform is out of level by 3-6°.

Testing of Automatic Levelling System

1. Run the platform 2m in the 'up' direction.
2. Set the hoist selector switch on 'L' (left) and run the platform in the 'down' direction until the automatic levelling device is triggered and the hoist automatically stops.
3. Set the hoist selector switch to '2' (both) and run the platform in the 'down' direction.
4. Only the right hoist will run at first. The left hoist will start running when the platform is level once again.

Repeat this procedure starting with 'R' (right) hoist.

8 Overheating protection for hoist electric motor

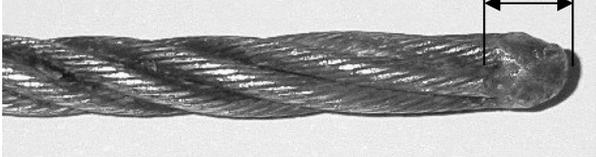
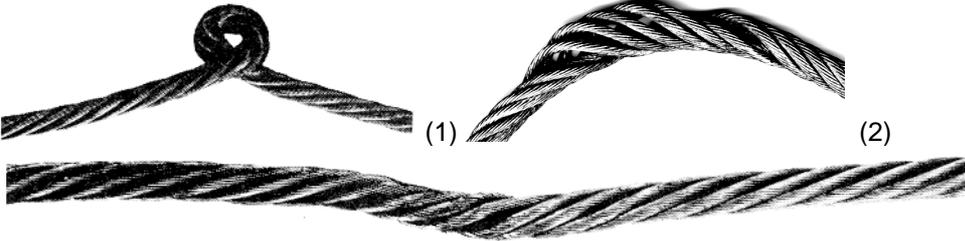
The hoist motors are fitted with a thermo-magnetic relay, which cuts power to the motors in case of overheating.

When the overheating protection is activated, the 'up' movement is halted.

If a hoist motor has overheated, allow it to cool down to continue.

The overheating protectors of both hoists are connected in series. If one overheating protector is triggered, then the 'up' movement of both hoists is halted.

10.1.7 STEEL WIRE ROPE

ONLY USE POWER CLIMBER RECOMMENDED STEEL WIRE ROPES		
Type	Greenflex	Greenflex
Diameter	8.4 mm	9.5mm
For use with hoist model	Astro E-86 (600kg)	Astro E-86 (600kg) Astro E-89 (800kg)
Construction	5 x 26 WSR (*) + HDPP (**) core	5 x 26 WSR (*) + HDPP (**) core
Structure	Right Hand Cross Lay - Light Preformed	Right Hand Cross Lay - Light Preformed
Tolerance	(+0/-0.2mm)	(+0/-0.3mm)
Tensile strength of wires	1960 N/mm ²	1960 N/mm ²
Minimum Breaking Load (actual)	52.3 kN	66.8 kN
Minimum Breaking Load (calculated)	66.0 kN	80.0 kN
Weight	0.255 kg/m	0.340 kg/m
Treatment	Galvanized	Galvanized
Identification mark	Green strand	Green strand
<ul style="list-style-type: none"> The end of the steel wire rope should be brazed to form a 'bullet' end with a maximum length of 10mm, without loose or broken wires. Use protective gloves to manipulate the Steel Wire Ropes. If Steel Wire Ropes are too long, carefully wind any extra cable into a loop (or onto the wire holders) and tie up, leaving the coil suspended just clear of the ground. 		
<p style="text-align: center;">WARNING:</p> <p>Steel Wires Ropes must be replaced in any of the following conditions:</p> <ul style="list-style-type: none"> More than 10 wires are broken on a length of 240mm. Excessive corrosion Damage due to heat Reduction of the nominal diameter by more than 10% Kinking (1), crushing (2), bird caging (3) or any other distortion of the wire rope structure. 		

(*) WSR: Warrington Seale Compacted (**) HDPP: High Density Polypropylene

10.1.8 PRECAUTIONS

See European Standard EN1808 for details on applications that are excluded from the EN1808 and other relevant exclusions.

TSP= Temporary Suspended Platform

1 Power Supply to the TSP must be fitted with

- a) Main switch
- b) Residual current device (or earth leakage circuit breaker) of 30 mA
- c) Overcurrent protective device (automatic fuse Type C)

Note: check that the specifications of the electrical supply cable match the power requirement of the platform and will avoid a voltage drop due to cable length.

2 Weather conditions

Temperature range:	+5°C and +55° C
Humidity range:	30 % - 95 %
Contaminants:	Degree of protection IP 54
Max. wind speed:	12.5m/s (see note)

Note: For TSP with a lifting height over 40m and intended to be used on locations exposed to wind speeds over 14 m/s, an adequate restraint system shall be provided.

3 Precautions prior to use

- a) Before using the equipment, operators must carry out the daily checks and make sure that the equipment is in perfect working condition.
- b) Before use, modular TSP equipment must be checked to prevent mixing of inappropriate components.
- c) Before use, check that sufficient space is available for operating the TSP.
- d) Before using the equipment the suspension system must be checked to ensure the stability of the TSP at all times.
- e) In case the area below the TSP is open to the public, preventive measures have to be taken to safeguard the people below (e.g. barriers, roof protected walkways, etc.).
- f) All hazards related to the platform encountering obstructions are not completely covered by the TSP's safety devices. The operator shall check for obstructions along the travel of the platform.
- g) Overload detection device may not protect TSP platforms in all configurations. The operator shall check that the loading of the platform is in accordance with the rated load indicated on the nameplate.
- h) An area must be available to allow operators to get on and off the platform.

4 Precautions during use

- a) The operators must stop working with the equipment and notify the supervisor if faults, damage to the equipment or other circumstances may jeopardize safety.
- b) A suitable communication between the operator and the supervisor is recommended.

5 Suspension System

- a) The platform can be suspended on different types of suspension systems such as roof beams (with counterweights), parapet clamps, davits, fixed suspension points, custom made suspension systems, roof rigs made from tubular scaffolding etc.
- b) Roof systems to be calculated for a max. load of W.L.L. x 3 (Maximum allowable stresses below yield.)
- c) Check that roof beams are properly counterweighted (if applicable).
- d) Ensure that the suspension rig is directly above the platform prior to installation.

10.1.9 DAILY CHECKLIST

TESTS MUST BE CARRIED OUT EVERY TIME BEFORE USING THE PLATFORM	
1	Visually inspect the platform for damaged, loose or missing parts.
2	Check the suspension system for stability before launching the platform. Check that all counterweights are in place and secured. Check that all steel wire ropes are hooked on properly to the suspension system
3	Check that ' Power On ' indicator lights on each hoist are ON.
4	Check that the ' Up/Down ' push buttons and the hoist selector switch are functioning.
5	Push emergency stop button and check that the platform cannot go up or down
6	Push down on the Top Limit Switch and check that it cuts the 'up' direction, but that platform can be driven in the 'down' direction. Repeat procedure for other hoist.
↑ Drive the platform 1-2 meters off the ground to continue the tests ↑	
7	a) ON ONE HOIST ONLY, Pull on the ' No Power ' emergency descent lever and check that the hoist can be lowered at a controlled speed. b) Continue releasing the service brake until the slack rope safety device is activated (about 14 degrees) and keeps the platform from tilting further. c) Repeat the procedure by manually lowering the other end of the platform.
8	Run the platform up and down 1 m and check that the overspeed governor is rotating by looking through the inspection window. Also check that the weights on the overspeed governor are not stuck and moving slightly as the governor rotates.
9	a) Run the platform down and press the overspeed manual trip button on ONE of the hoists. Down movement of hoist is cut off. b) Pull on the ' No Power ' emergency descent lever and check that no further down movement is possible. c) To reset, power the hoist up about 10 cm and turn the reset knob anti-clockwise till the overspeed safety device clicks back into its 'open' position and is rearmed. d) Repeat procedure for the other hoist. IMPORTANT: Make sure that the Overspeed Safety device is reset before running the platform. Failure to do so may result in a ROPE JAM.
10	Run the platform to the top and during travel inspect the steel wire ropes for kinks, broken wires or other damage. Inspect the trailing electrical supply cable for damage. At the top of travel, check that the top limit switch striker plates are correctly fitted and also that the top limit switches are operated by the striker plates.
DO NOT USE EQUIPMENT THAT IS NOT OPERATING PROPERLY	
NEVER OVERRIDE LIMIT SWITCHES AND SAFETY DEVICES	

