Atlas Copco Instruction Manual

User and maintenance manual
for light towers
English

HiLight H5+/H2 Hd ESF | 1 B 50

Atlas Copco

HiLight H5+/H2 Hd ESF

User and maintenance manual for light towers

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Circuit diagrams 95

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Neglecting maintenance or making changes to the setup of the machine can result in major hazards, including fire risk.
While every effort has been made to ensure that the information in this manual is correct, Atlas Copco does not assume responsibility for possible errors.

Congratulations on the purchase of your HiLight on-site light tower. It is a solid, safe and reliable machine, built according to the latest technology. Follow the instructions in this booklet and we guarantee you years of trouble free operation. Please read the following instructions carefully before starting to use your machine. While every effort has been made to ensure that the information in this manual is correct, Atlas Copco does not assume responsibility for possible errors. Atlas Copco reserves the right to make changes without prior notice.

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1 Safety precautions

To be read attentively and acted accordingly before towing, lifting, operating, performing maintenance or repairing the light tower.

1.1 Introduction

The policy of Atlas Copco is to provide the users of their equipment with safe, reliable and efficient products. Factors taken into account are among others:

- the intended and predictable future use of the products, and the environments in which they are expected to operate,
- applicable rules, codes and regulations,
- the expected useful product life, assuming proper service and maintenance,
- providing the manual with up-to-date information.

Before handling any product, take time to read the relevant instruction manual. Besides giving detailed operating instructions, it also gives specific information about safety, preventive maintenance, etc.
Keep the manual always at the unit location, easy accessible to the operating personnel.

See also the safety precautions of the engine and possible other equipment, which are separately sent along or are mentioned on the equipment or parts of the unit.

These safety precautions are general and some statements will therefore not always apply to a particular unit.

Only people that have the right skills should be allowed to operate, adjust, perform maintenance or repair on Atlas Copco equipment. It is the responsibility of management to appoint operators with the appropriate training and skill for each category of job.

Skill level 1: Operator

An operator is trained in all aspects of operating the unit with the push-buttons, and is trained to know the safety aspects.

Skill level 2: Mechanical technician

A mechanical technician is trained to operate the unit the same as the operator. In addition, the mechanical technician is also trained to perform maintenance and repair, as described in the instruction manual, and is allowed to change settings of the control and safety system. A mechanical technician does not work on live electrical components.

Skill level 3: Electrical technician

An electrical technician is trained and has the same qualifications as both the operator and the mechanical technician. In addition, the electrical technician may carry out electrical repairs within the various enclosures of the unit. This includes work on live electrical components.

Skill level 4: Specialist from the manufacturer

This is a skilled specialist sent by the manufacturer or its agent to perform complex repairs or modifications to the equipment.

In general it is recommended that not more than two people operate the unit, more operators could lead to unsafe operating conditions. Take necessary steps to keep unauthorized persons away from the unit and eliminate all possible sources of danger at the unit.

When handling, operating, overhauling and/or performing maintenance or repair on Atlas Copco equipment, the mechanics are expected to use safe engineering practices and to observe all relevant local safety requirements and ordinances. The following list is a reminder of special safety directives and precautions mainly applicable to Atlas Copco equipment.

Neglecting the safety precautions may endanger people as well as environment and machinery:

- endanger people due to electrical, mechanical or chemical influences,
- endanger the environment due to leakage of oil, solvents or other substances,
- endanger the machinery due to function failures.

All responsibility for any damage or injury resulting from neglecting these precautions or by non-observance of ordinary caution and due care required in handling, operating, maintenance or repair, also if not expressly mentioned in this instruction manual, is disclaimed by Atlas Copco.

The manufacturer does not accept any liability for any damage arising from the use of non-original parts and for modifications, additions or conversions made without the manufacturer's approval in writing.

If any statement in this manual does not comply with local legislation, the stricter of the two shall be applied.

Statements in these safety precautions should not be interpreted as suggestions, recommendations or inducements that it should be used in violation of any applicable laws or regulations.

1.2 General safety precautions

1 The owner is responsible for maintaining the unit in a safe operating condition. Unit parts and accessories must be replaced if missing or unsuitable for safe operation.

2 The supervisor, or the responsible person, shall at all times make sure that all instructions regarding machinery and equipment operation and maintenance are strictly followed and that the machines with all accessories and safety devices, as well as the consuming devices, are in good repair, free of abnormal wear or abuse, and are not tampered with.

3 Whenever there is an indication or any suspicion that an internal part of a machine is overheated, the machine shall be stopped but no inspection covers shall be opened before sufficient cooling time has elapsed; this to avoid the risk of spontaneous ignition of oil vapour when air is admitted.

4 Normal ratings (pressures, temperatures, speeds, etc.) shall be durably marked.

5 Operate the unit only for the intended purpose and within its rated limits (pressure, temperature, speeds, etc.).

6 The machinery and equipment shall be kept clean, i.e. as free as possible from oil, dust or other deposits.

7 To prevent an increase in working temperature, inspect and clean heat transfer surfaces (cooler fins, intercoolers, water jackets, etc.) regularly. See the maintenance schedule.

8 All regulating and safety devices shall be maintained with due care to ensure that they function properly. They may not be put out of action.

9 Pressure and temperature gauges shall be checked regularly with regard to their accuracy. They shall be replaced whenever outside acceptable tolerances.

10 Safety devices shall be tested as described in the maintenance schedule of the instruction manual to determine that they are in good operating condition.

11 Mind the markings and information labels on the unit.

12 In the event the safety labels are damaged or destroyed, they must be replaced to ensure operator safety.

13 Keep the work area neat. Lack of order will increase the risk of accidents.

14 When working on the unit, wear safety clothing. Depending on the kind of activities these are: safety glasses, ear protection, safety helmet (including visor), safety gloves, protective clothing, safety shoes. Do not wear the hair long and loose (protect long hair with a hairnet), or wear loose clothing or jewellery.

15 Take precautions against fire. Handle fuel, oil and anti-freeze with care because they are inflammable substances. Do not smoke or approach with naked flame when handling such substances. Keep a fire-extinguisher in the vicinity.

16a **On-site light towers (with earthing pin):**

Earth the light tower as well as the load properly.

1.3 Safety during transport and installation

To lift a unit, all loose or pivoting parts, e.g. doors and towbar, shall first be securely fastened.

Do not attach cables, chains or ropes directly to the lifting eye; apply a crane hook or lifting shackle meeting local safety regulations. Never allow sharp bends in lifting cables, chains or ropes.

Helicopter lifting is not allowed.
It is strictly forbidden to dwell or stay in the risk zone under a lifted load. Never lift the unit over people or residential areas. Lifting acceleration and deceleration shall be kept within safe limits.

1 Before towing the unit:
- check the towbar, the brake system and the towing eye. Also check the coupling of the towing vehicle,
- check the towing and brake capability of the towing vehicle,
- check that the towbar, jockey wheel or stand leg is safely locked in the raised position,
- ascertain that the towing eye can swivel freely on the hook,
- check that the wheels are secure and that the tyres are in good condition and inflated correctly,
- connect the signalisation cable, check all lights and connect the pneumatic brake couplers,
- attach the safety break-away cable or safety chain to the towing vehicle,
- remove wheel chocks, if applied, and disengage the parking brake.

2 To tow a unit use a towing vehicle of ample capacity. Refer to the documentation of the towing vehicle.

3 If a unit is to be backed up by a towing vehicle, disengage the overrun brake mechanism (if it is not an automatic mechanism).

4 In case of transporting a non-trailer unit on a truck, fasten it to the truck by attaching straps via fork lift holes, via the holes in the frame at the front and back or via the lifting beam. To prevent damage, never put straps on the roof surface of the unit.

5 Never exceed the maximum towing speed of the unit (mind the local regulations).

6 Place the unit on level ground and apply the parking brake before disconnecting the unit from the towing vehicle. Unclip the safety break-away cable or safety chain. If the unit has no parking brake or jockey wheel, immobilize the unit by placing chocks in front of and/or behind the wheels. When the towbar can be positioned vertically, the locking device must be applied and kept in good order.

7 To lift heavy parts, a hoist of ample capacity, tested and approved according to local safety regulations, shall be used.

8 Lifting hooks, eyes, shackles, etc., shall never be bent and shall only have stress in line with their design load axis. The capacity of a lifting device diminishes when the lifting force is applied at an angle to its load axis.

9 For maximum safety and efficiency of the lifting apparatus all lifting members shall be applied as near to perpendicular as possible. If required, a lifting beam shall be applied between hoist and load.

10 Never leave a load hanging on a hoist.

11 A hoist has to be installed in such a way that the object will be lifted perpendicular. If that is not possible, the necessary precautions must be taken to prevent load-swinging, e.g. by using two hoists, each at approximately the same angle not exceeding 30° from the vertical.

12 Locate the unit at least 1 meter away from walls. Take all precautions to ensure that hot air exhausted from the engine and driven machine cooling systems cannot be re-circulated. If such hot air is taken in by the engine or driven machine cooling fan, this may cause overheating of the unit; if taken in for combustion, the engine power will be reduced.

13 light towers shall be stalled on an even, solid floor, in a clean location with sufficient ventilation. If the floor is not level or can vary in inclination, consult Atlas Copco.

14 The electrical connections shall correspond to local codes. The machines shall be earthed and protected against short circuits by fuses or circuit breakers.

15 Never connect the light tower outlets to an installation which is also connected to a public mains.

16 Before connecting a load, switch off the corresponding circuit breaker, and check whether frequency, voltage, current and power factor comply with the ratings of the light tower.

17 Before transportation of the unit, switch off all the circuit breakers.

1.4 Safety during use and operation

1 When the unit has to operate in a fire-hazardous environment, each engine exhaust has to be provided with a spark arrester to trap incendiary sparks.

2 The exhaust contains carbon monoxide which is a lethal gas. When the unit is used in a confined space, conduct the engine exhaust to the outside atmosphere by a pipe of sufficient diameter; do this in such a way that no extra back pressure is created for the engine. If necessary, install an extractor. Observe any existing local regulations.

Make sure that the unit has sufficient air intake for operation. If necessary, install extra air intake ducts.

3 When operating in a dust-laden atmosphere, place the unit so that dust is not carried towards it by the wind. Operation in clean surroundings considerably extends the intervals for cleaning the air intake filters and the cores of the coolers.

4 Never remove a filler cap of the cooling water system of a hot engine. Wait until the engine has sufficiently cooled down.

5 Never refill fuel while the unit is running, unless otherwise stated in the Atlas Copco Instruction Book (AIB). Keep fuel away from hot parts such as air outlet pipes or the engine exhaust. Do not smoke when fuelling. When fuelling from an automatic pump, an earthing cable should be connected to the unit to discharge static electricity. Never spill nor leave oil, fuel, coolant or cleansing agent in or around the unit.

6 All doors shall be shut during operation so as not to disturb the cooling air flow inside the bodywork and/or render the silencing less effective. A door should be kept open for a short period only e.g. for inspection or adjustment.

7 Periodically carry out maintenance works according to the maintenance schedule.

8 Stationary housing guards are provided on all rotating or reciprocating parts not otherwise protected and which may be hazardous to personnel. Machinery shall never be put into operation, when such guards have been removed, before the guards are securely reinstalled.

9 Noise, even at reasonable levels, can cause irritation and disturbance which, over a long period of time, may cause severe injuries to the nervous system of human beings.
When the sound pressure level, at any point where personnel normally has to attend, is:
- below 70 dB(A): no action needs to be taken,
- above 70 dB(A): noise-protective devices should be provided for people continuously being present in the room,
- below 85 dB(A): no action needs to be taken for occasional visitors staying a limited time only,
- above 85 dB(A): room to be classified as a noise-hazardous area and an obvious warning shall be placed permanently at each entrance to alert people entering the room, for even relatively short times, about the need to wear ear protectors,
- above 95 dB(A): the warning(s) at the entrance(s) shall be completed with the recommendation that also occasional visitors shall wear ear protectors,
- above 105 dB(A): special ear protectors that are adequate for this noise level and the spectral composition of the noise shall be provided and a special warning to that effect shall be placed at each entrance.

10 The unit has parts of which the temperature can be in excess of 80 °C (176 °F), and which may be accidentally touched by personnel when opening the machine during or just after operation. Insulation or safety guards protecting these parts shall not be removed before the parts have cooled down sufficiently, and must be re-installed before operating the machine. As it is not possible to insulate or protect all hot parts by guards (e.g. exhaust manifold, exhaust turbine), the operator / service engineer must always be aware not to touch hot parts when opening a machine door.

11 Never operate the unit in surroundings where there is a possibility of taking in flammable or toxic fumes.

12 If the working process produces fumes, dust or vibration hazards, etc., take the necessary steps to eliminate the risk of personnel injury.

13 When using compressed air or inert gas to clean down equipment, do so with caution and use the appropriate protection, at least safety glasses, for the operator as well as for any bystander. Do not apply compressed air or inert gas to your skin or direct an air or gas stream at people. Never use it to clean dirt from your clothes.

14 When washing parts in or with a cleaning solvent, provide the required ventilation and use appropriate protection such as a breathing filter, safety glasses, rubber apron and gloves, etc.

15 Safety shoes should be compulsory in any workshop and if there is a risk, however small, of falling objects, wearing of a safety helmet should be included.

16 If there is a risk of inhaling hazardous gases, fumes or dust, the respiratory organs must be protected and depending on the nature of the hazard, so must the eyes and skin.

17 Remember that where there is visible dust, the finer, invisible particles will almost certainly be present too; but the fact that no dust can be seen is not a reliable indication that dangerous, invisible dust is not present in the air.

18 Never operate the light tower in excess of its limits as indicated in the technical specifications and avoid long no-load sequences.

19 Never operate the light tower in a humid atmosphere. Excessive moisture causes worsening of the light tower insulation.

20 Do not open electrical cabinets, cubicles or other equipment while voltage is supplied. If such cannot be avoided, e.g. for measurements, tests or adjustments, have the action carried out by a qualified electrician only, with appropriate tools, and ascertain that the required bodily protection against electrical hazards is applied.

21 Never touch the power terminals during operation of the machine.

22 Whenever an abnormal condition arises, e.g. excessive vibration, noise, odour, etc., switch the circuit breakers to OFF and stop the engine. Correct the faulty condition before restarting.

23 Check the electric cables regularly. Damaged cables and insufficient tightening of connections may cause electric shocks. Whenever damaged wires or dangerous conditions are observed, switch the circuit breakers to OFF and stop the engine. Replace the damaged wires or correct the dangerous condition before restarting. Make sure that all electric connections are securely tightened.

24 Avoid overloading the light tower. The light tower is provided with circuit breakers for overload protection. When a breaker has tripped, reduce the concerned load before restarting.

25 Never remove the cover of the output terminals during operation. Before connecting or disconnecting wires, switch off the load and the circuit breakers, stop the machine and make sure that the machine cannot be started inadvertently or there is any residual voltage on the power circuit.

26 Running the light tower at low load for long periods will reduce the lifetime of the engine.

27 When operating the light tower in Remote or Auto mode, observe all relevant local legislation.

28 When deploying the light tower mast, keep in mind following safety precautions:
- Do not deploy the mast unless the machine is standing on an even surface and the stabilizers have been fully adjusted.
- Do not deploy the mast in the vicinity of overhead power cables: DANGER OF ELECTROCUTION.
- Make sure that nobody is standing too close to the light tower when the mast is being deployed.
- Do not deploy the mast if the wind is stronger than 80 Km/h.

1.5 Safety during maintenance and repair

Maintenance, overhaul and repair work shall only be carried out by adequately trained personnel; if required, under supervision of someone qualified for the job.

1 Use only the correct tools for maintenance and repair work, and only tools which are in good condition.

2 Parts shall only be replaced by genuine Atlas Copco replacement parts.

3 All maintenance work, other than routine attention, shall only be undertaken when the unit is stopped. Steps shall be taken to prevent inadvertent starting. In addition, a warning sign bearing a legend such as "work in progress; do not start" shall be attached to the starting equipment.
On engine-driven units the battery shall be disconnected and removed or the terminals covered by insulating caps.
On electrically driven units the main switch shall be locked in open position and the fuses shall be taken out. A warning sign bearing a legend such as "work in progress; do not supply voltage" shall be attached to the fuse box or main switch.

4 Prior to stripping an engine or other machine or undertaking major overhaul on it, prevent all movable parts from rolling over or moving.

5 Make sure that no tools, loose parts or rags are left in or on the machine. Never leave rags or loose clothing near the engine air intake.

6 Never use flammable solvents for cleaning (fire-risk).

7 Take safety precautions against toxic vapours of cleaning liquids.

8 Never use machine parts as a climbing aid.

9 Observe scrupulous cleanliness during maintenance and repair. Keep away dirt, cover the parts and exposed openings with a clean cloth, paper or tape.

10 Never weld on or perform any operation involving heat near the fuel or oil systems. Fuel and oil tanks must be completely purged, e.g. by steam-cleaning, before carrying out such operations. Never weld on, or in any way modify, pressure vessels. Disconnect the alternator cables during arc welding on the unit.

11 Support the towbar and the axle(s) securely if working underneath the unit or when removing a wheel. Do not rely on jacks.

12 Do not remove any of, or tamper with, the sound-damping material. Keep the material free of dirt and liquids such as fuel, oil and cleansing agents. If any sound-damping material is damaged, replace it to prevent the sound pressure level from increasing.

13 Use only lubricating oils and greases recommended or approved by Atlas Copco or the machine manufacturer. Ascertain that the selected lubricants comply with all applicable safety regulations, especially with regard to explosion or fire-risk and the possibility of decomposition or generation of hazardous gases. Never mix synthetic with mineral oil.

14 Protect the engine, alternator, air intake filter, electrical and regulating components, etc., to prevent moisture ingress, e.g. when steam-cleaning.

15 When performing any operation involving heat, flames or sparks on a machine, the surrounding components shall first be screened with non-flammable material.

16 Never use a light source with open flame for inspecting the interior of a machine.

17 When repair has been completed, the machine shall be barred over at least one revolution for reciprocating machines, several revolutions for rotary ones to ensure that there is no mechanical interference within the machine or driver. Check the direction of rotation of electric motors when starting up the machine initially and after any alteration to the electrical connection(s) or switch gear, to check that the oil pump and the fan function properly.

18 Maintenance and repair work should be recorded in an operator's logbook for all machinery. Frequency and nature of repairs can reveal unsafe conditions.

19 When hot parts have to be handled, e.g. shrink fitting, special heat-resistant gloves shall be used and, if required, other body protection shall be applied.

20 When using cartridge type breathing filter equipment, ascertain that the correct type of cartridge is used and that its useful service life is not surpassed.

21 Make sure that oil, solvents and other substances likely to pollute the environment are properly disposed of.

22 Before clearing the light tower for use after maintenance or overhaul, submit it to a testrun, check that the AC power performance is correct and that the control and shutdown devices function correctly.

1.6 Tool applications safety

Apply the proper tool for each job. With the knowledge of correct tool use and knowing the limitations of tools, along with some common sense, many accidents can be prevented.

Special service tools are available for specific jobs and should be used when recommended. The use of these tools will save time and prevent damage to parts.

1.7 Battery safety precautions

When servicing batteries, always wear protecting clothing and glasses.

1 The electrolyte in batteries is a sulphuric acid solution which is fatal if it hits your eyes, and which can cause burns if it contacts your skin. Therefore, be careful when handling batteries, e.g. when checking the charge condition.

2 Install a sign prohibiting fire, open flame and smoking at the post where batteries are being charged.

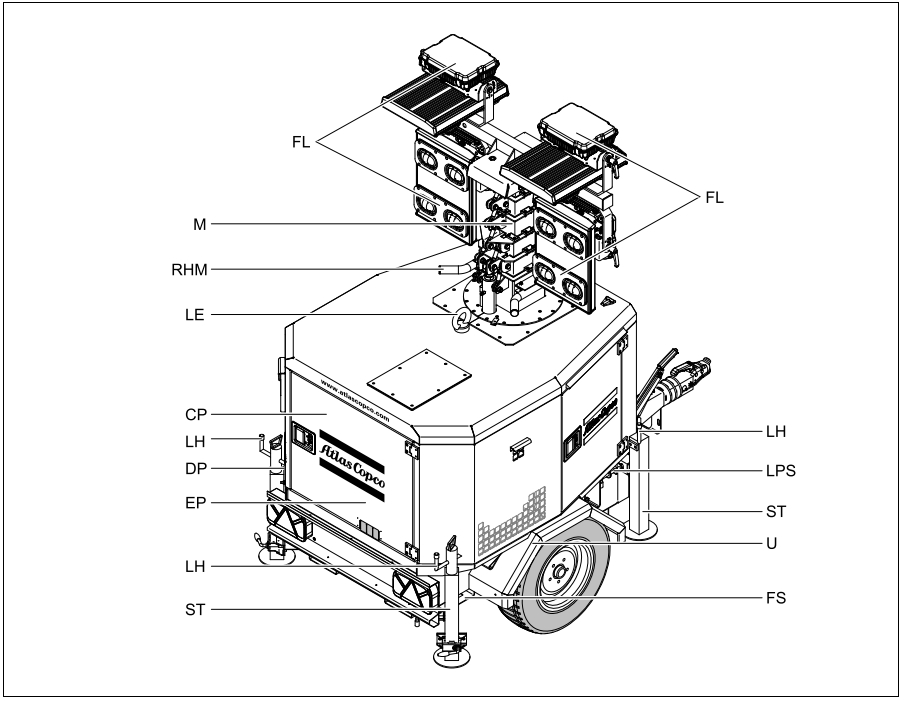
3 When batteries are being charged, an explosive gas mixture forms in the cells and might escape through the vent holes in the plugs.
Thus an explosive atmosphere may form around the battery if ventilation is poor, and can remain in and around the battery for several hours after it has been charged. Therefore:
- never smoke near batteries being, or having recently been, charged,
- never break live circuits at battery terminals, because a spark usually occurs.

4 When connecting an auxiliary battery (AB) in parallel to the unit battery (CB) with booster cables: connect the + pole of AB to the + pole of CB, then connect the - pole of CB to the mass of the unit. Disconnect in the reverse order.

2 Main parts

2.1 General description

The light tower provides an undercarriage (frame, axle and towbar) and 4 floodlights of 4x350 W LED or 4x400W Metal Halide. The light tower is very useful for construction sites where no electricity nor lighting is available.



CP	Control panel
DP	Data plate
EP	Earth pin (optional)
FL	Floodlights
FS	Forklift slots
LE	Lifting eye
LH	Levelling handle, to adjust the height of the supporting foot
LPS	Locking pin stabilizer
M	Mast
RHM	Rotating handles mast
ST	Stabilizer and supporting foot
U	Undercarriage

2.2 Markings

Markings provide instructions and information. They also warn of hazards. For convenience and safety, keep all markings in legible condition, replacing them when damaged or missing. Replacement markings are available from the factory.

A brief description of all markings provided on the light tower is given hereafter. The precise location of all markings can be found in the parts manual of this light tower.

Indicates that an electric voltage, dangerous to life, is present. Never touch the electric terminals during operation.

Indicates that the engine exhaust is a hot and harmful gas, which is toxic in case of inhalation. Always make sure that the unit is operated outside or in a well-ventilated room.

Indicates that these parts can become very hot during operation (e.g. engine, cooler, etc.). Always make sure that these parts are cooled down before touching them.

Indicates a risk of fire. This label is required for On Road transport into the European Union according to the European agreement concerning international carriage of Dangerous goods by Road, Annex A.

Indicates that the mast should not be extended near electric wires.

Indicates the locking pin of the stabilizers.

Indicates the forklift slots.

Indicates the drain plug for the engine fuel.

Indicates the drain for the engine oil.

Indicates that the light tower may be refuelled with diesel fuel only.

Use PAROIL E only.

Indicates the sound power level in accordance with Directive 2000/14/EC (expressed in dB (A)).

Indicates that the alternator should not be cleaned with high pressurised water.

Indicates that the unit may start automatically and that the instruction book has to be consulted prior to use.

Read the instruction manual before using the lifting eye.

Indicates the location of the battery. Avoid water ingress as this could cause short circuits.

Indicates the earthing connections on the light tower.

Indicates the danger of touching rotating parts of the unit.

Indicates the different service packs, liquids and critical parts. These parts can be ordered to the factory.

2.3 Mechanical features

The mechanical features described in this chapter are standard provided on this light tower. For all optional mechanical features, see chapter “Overview of the mechanical options” on page 66.

2.3.1 Engine and alternator

The alternator is driven by an air-cooled diesel engine. The engine’s power is transmitted through a direct conical coupling.

The light tower houses a single bearing alternator with a dedicated excitation system for light tower application.

The synchronous brushless alternator has Class H rotor and stator windings in an IP21 housing.

2.3.2 Cooling system

The engine and alternator are air cooled by means of mechanical fans. An additional electrical fan is installed to guarantee maximum cooling efficiency.

2.3.3 Safety devices

The unit controller monitors the engine and electrical parameters and generates warning and shutdown signals when the parameters reach a preset treshold value.

2.3.4 Bodywork

The alternator, the engine, the cooling system, etc. are enclosed in a sound-insulated bodywork that can be opened by means of service doors.

The HiLight H5+/H2 can be lifted by using the lifting eye integrated in the bodywork (roof). Double galvanized forklift slots are provided in the frame, to allow lifting of the unit from both sides.

2.3.5 Control panel

The control panel grouping the controller, fuses, automatic switches, sockets, etc., is accessible by opening the door at the front.

2.3.6 Data plate and serial number

The light tower is furnished with a data plate showing the product code, serial number and power output (see chapter “Data plate” on page 93). It is located on the left corner panel, below the emergency stop button.

2.3.7 Filler caps

The fuel filler cap and oil filler cap are located inside the unit. They are easily accessible by opening the front door.

2.3.8 Spillage free frame

A spillage free frame with forklift slots allows the customer to transport the light tower easily with a forklift. It avoids accidental spilling of engine fluids and thus helps to protect the environment.

The leaking fluid can be removed via a drain hole, secured by a drain plug. Tighten the plug firmly and check for leakages. When removing the leaking fluid, observe all relevant local legislation.

2.3.9 Mast and floodlights

The 100% galvanized hydraulic light tower mast consists of 6 mast sections and can be extended up to 8 metres in 25 sec. It is operated by up and down buttons. The mast can be rotated through 340°.

The HiLight H5+ provides 4 LEDs of 350 Watt with a maximum lighting capacity of 154.000 lumen. The HiLight H2 provides 4 metal halide floodlights of 400 Watt with a maximum lighting capacity of 144.000 lumen. Each lamp can be separately positioned and inclined.

2.3.10 Undercarriage, road lights and reflectors

There are 2 variants of undercarriage available for HiLight H5+/H2 light towers:

- homologated for road use, fixed tow bar (standard)
- not homologated for road use (max. towing speed: 20 km/h) (option)

The homologated light tower undercarriages are manufactured according to ISO/European road standards currently applicable.

The undercarriage is equipped with a fixed tow bar and several towing eyes are available.

For more details on the available undercarriages, their main features and available towing eyes, see “Undercarriage” on page 66.

Road lights and reflectors are standard on the road homologated version.

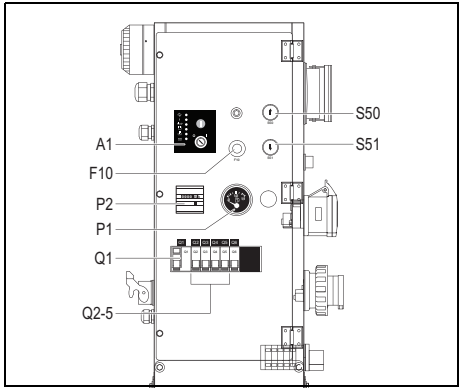
2.4 Electrical features

The electrical features described in this chapter are standard provided on this light tower. For all optional electrical features, see chapter "Overview of the electrical options" on page 68.

2.4.1 Lc1001™ control and indicator panel

Overview control panel

For basic operation of the light tower the Lc1001™ control panel is installed.



A1 ..... Lc1001™ controller

F10..... Fuse 10A

The fuse trips when the current from the battery to the engine control circuit exceeds its setting. The fuse can be reset by pushing the button.

Q1..... General circuit breaker with ELCB or differential protection

Interrupts the power supply when a short-circuit occurs at the load side, or when the earth leak detector (30 mA) or the overcurrent protection are activated. It must be reset manually after eliminating the problem.

P1..... Fuel level gauge

P2..... Run meter

Q2-5.... Circuit breakers for lamps

The control panel provides 4 circuit breakers for the lamps (one for each lamp). The 4 lamps are controlled by the Lc1001™ controller, by means of relays.

S50 ..... UP button

Push the UP button to extend the mast.

S51 ..... DOWN button

Push the DOWN button to lower the mast.

Features of the Lc1001™ controller

The dedicated Lc1001™ controller provides basic features for light tower application, such as:

- Configurable Auto and Manual Start versions
  - Remote start input available (when in auto start mode)
  - Auxiliary shutdown input available (when in manual start mode)
- Automatic engine pre-heat
- A range of engine monitoring and protection features:
  - Inputs to monitor low oil pressure, high engine temperature and overspeed.

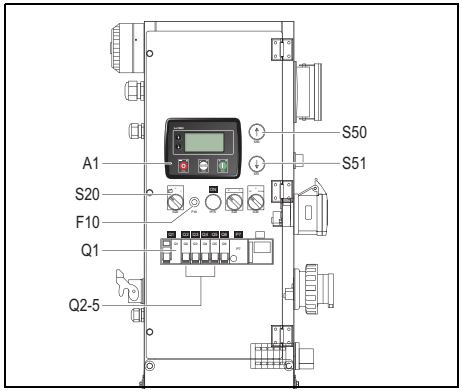
    When the module detects any of the above faults it will automatically shut down the engine.
  - The capability to monitor battery charging by utilising the WL terminal on the charge alternator.

    On detecting a battery charging fault, it will light the warning LED on the front panel.
- LED status indication. An overview of the LEDs is given on page 58.

2.4.2 Lc1003™ control and indicator panel

Overview control panel

For more advanced light tower applications the Lc1003™ control panel is installed.



A1 ..... Lc1003™ digital controller

F10..... Fuse 10A

The fuse trips when the current from the battery to the engine control circuit exceeds its setting. The fuse can be reset by pushing the button.

Q1 ..... General circuit breaker with ELCB or differential protection

Interrupts the power supply when a short-circuit occurs at the load side, or when the earth leak detector (30 mA) or the overcurrent protection are activated. It must be reset manually after eliminating the problem.

Q2-5.... Circuit breakers for lamps

The control panel provides 4 circuit breakers for the lamps (one for each lamp). The 4 lamps are controlled by the Lc1003™ controller, by means of relays.

S20 ..... REMOTE/ON/OFF switch

Position ⊿ : REMOTE START, for Auto Photocell or weekly timer start option

Position I: ON, for manual start

Position O: OFF, to isolate the controller

S50..... UP button

Push the UP button to extend the mast.

S51..... DOWN button

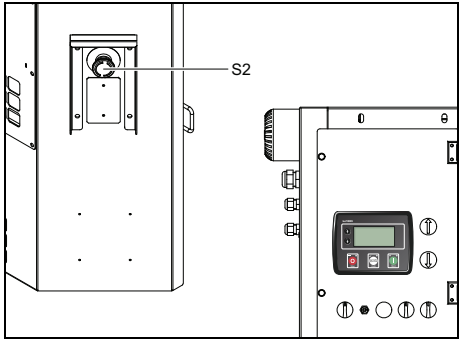
Push the DOWN button to lower the mast.

Features of the Lc1003™ controller

The dedicated Lc1003™ controller provides unique features and benefits for light tower application, such as:

- Reliability/functionality: sequence 4 lighting output
- 8 event scheduler: weekly timer
- Fuel efficiency: auto lamps shutdown
- User friendly operation
- Remote start with photocell as an option

2.4.3 Emergency stop button



S2 ..... Emergency stop button

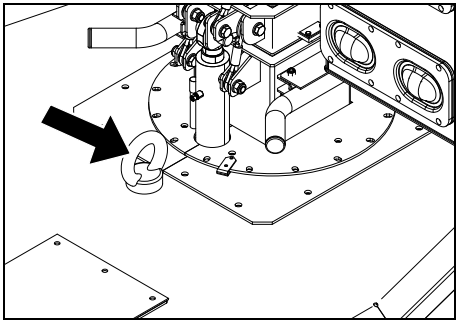
Push the button to stop the light tower in case of an emergency. When the button is pressed, it must be unlocked by rotating it clockwise, before the light tower can be restarted.

3 Installation and connection

3.1 Lifting

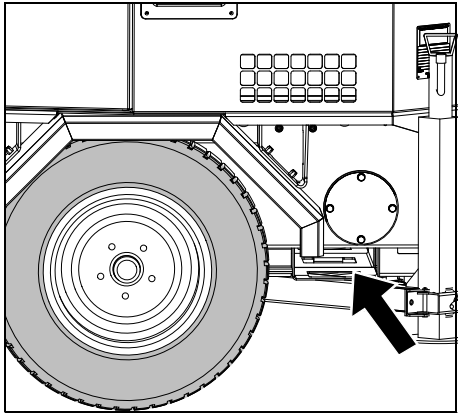
The lifting eye, to lift the light tower by means of a hoist, is integrated in the bodywork and easily accessible from the outside.

When lifting the light tower, the hoist has to be placed in such a way that the light tower, which must be placed level, will be lifted vertically.



Lifting acceleration and deceleration must be kept within safe limits (max. 2 g).
Helicopter lifting is not allowed.

To be able to lift the light tower by means of a forklift, forklift slots are provided in the frame at the left and right side of the unit.

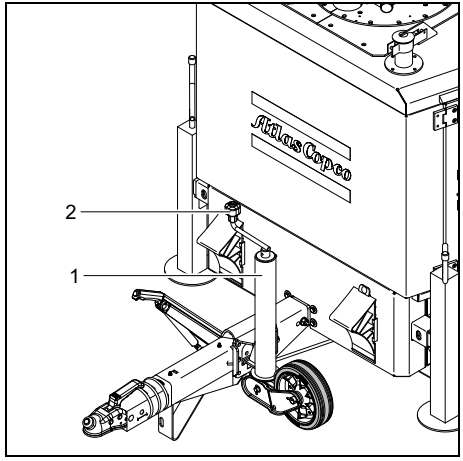


3.2 Parking and towing

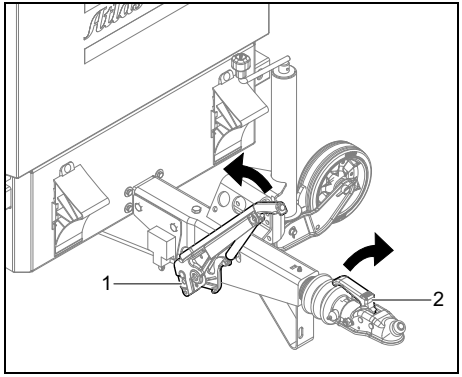
The operator is expected to apply all relevant safety precautions, including those mentioned on page 9 to page 14 of this booklet.

3.2.1 Unhooking the light tower

1. Secure the support leg/jockey wheel (1) to support the light tower in a level position.
2. Adjust the height of the support leg/jockey wheel using the handle (2).



To release the light tower from the towing vehicle, carefully follow the procedure below:



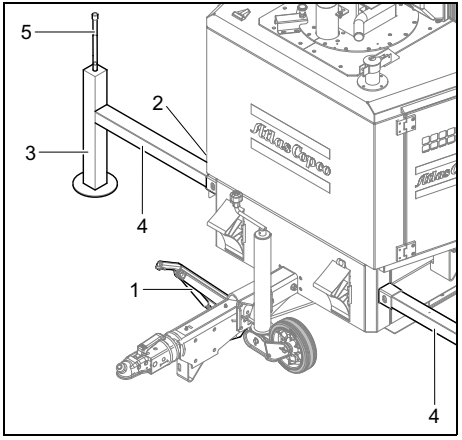
1. Engage the handbrake (1), if provided.
2. Disconnect the cable plug for the trailer lights.
3. Adjust the height of the support leg/jockey wheel to level the light tower and to support its weight.
4. Disconnect the safety wire from the towing vehicle.
5. Uncouple the trailer from the towing vehicle. Release the locking lever of the towbar coupler (2), if applicable.
6. Proceed with positioning, to set up the light tower.

To reconnect the light tower to the towing vehicle, proceed as above but in the reverse order (see also “Towing” on page 25).

3.2.2 Positioning the light tower

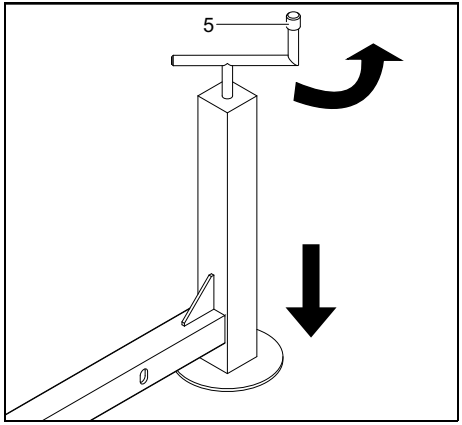
Follow the steps below to position the light tower:

1. Ensure that the handbrake (1) is engaged, if available, and make sure that the mast is down.
2. For the stabilizers; release the locking pin of the stabilizer (2) by lifting it up and pull the supporting foot (3) at the maximum extension of the stabilizer (4).

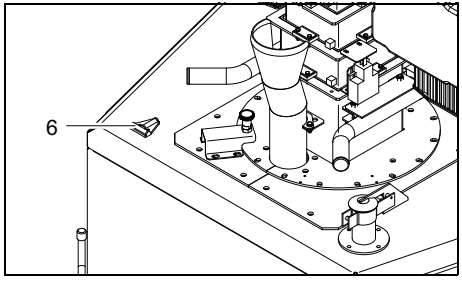


3. Once the stabilizers (4) have been extended, release the locking pin (2) to lock them in position.

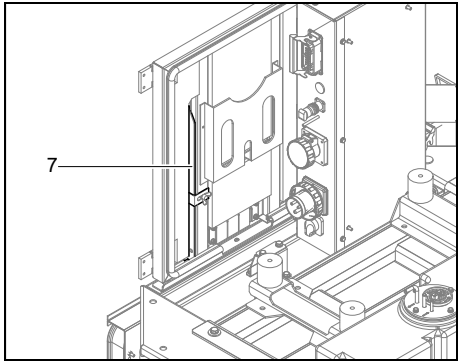
4. Turn the handle (5) at the top of the supporting feet anticlockwise to lower them and get the light tower in a level position.



Check the levels (6) on top of the light tower to ensure that the unit is in a level position.



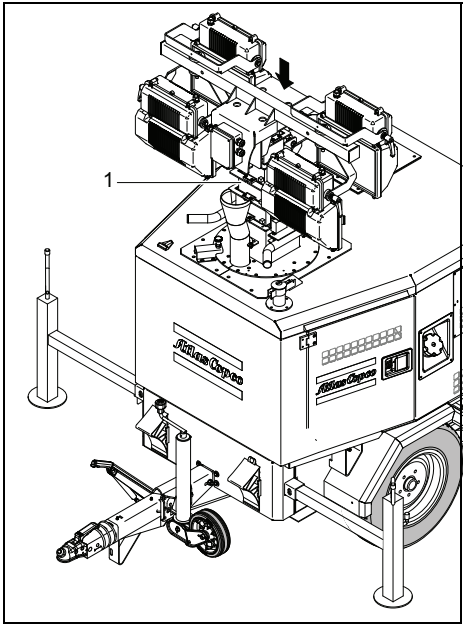
5. Once the light tower is correctly positioned, install a suitable earthing (e.g. the optional earth pin (7)) and make sure that it is correctly connected to the light tower.



For more detailed installation instructions, see also "Installation" on page 26.

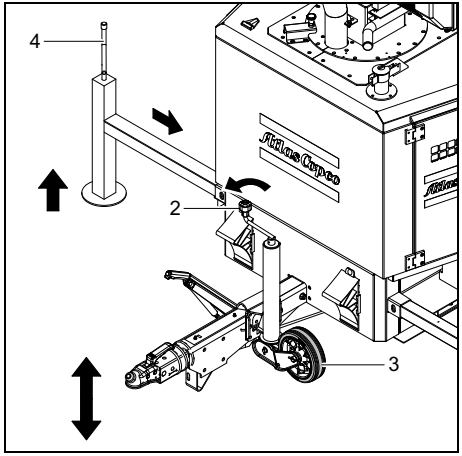
3.2.3 Positioning for transport

1. Make sure the mast is lowered completely and turned 90° (1). See also "Lowering the mast" on page 32.

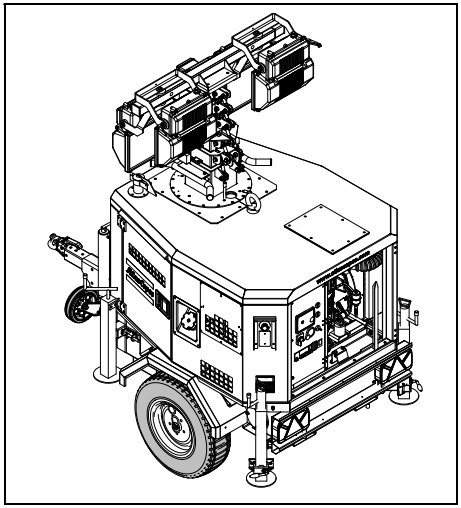


2. Make sure that the jockey wheel (if available) is safely fastened by its own locking lever to ensure that the light tower is still stable once the stabilizing feet are removed.

3. Adjust the height of the support leg/jockey wheel using the handle (2) on top. The support leg/ jockey wheel (3) should never touch the ground once the light tower is coupled to the hook of the towing vehicle.



4. Retract the 4 feet (4) and the stabilizers and ensure their locking pins following the reverse order of the procedure described in “Positioning the light tower” on page 23.

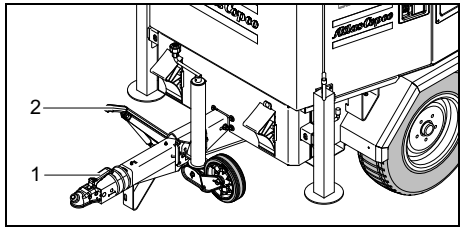


Once all the above operations are complete, you will have returned the light tower to the same state as it was before the positioning procedure (see figure above). At this point the light tower is correctly arranged for transport.

3.2.4 Towing

Before commencing towing, ensure you follow the procedure below:

1. Check that the coupler (1) of the undercarriage of the light tower is safely coupled to the towing hook of the towing vehicle.



2. Connect the cabling plug to the towing vehicle so that the rear lights of the light tower work (indicators, lights, brake lights).
3. Check that the pressure and condition of the tires are suitable for the road and the climatic conditions.
4. Release the handbrake (2), if provided.

Do not proceed with towing if you notice any broken or faulty parts.

Drive carefully according to the road and climatic conditions.

Keep in mind that for the low speed off-road non-homologated trailer, the maximum speed is 20 Km/h!

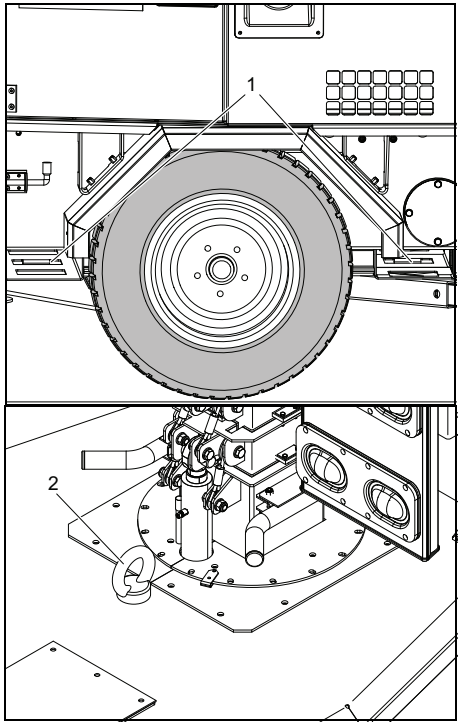
3.2.5 Transportation and positioning of the light tower onto vehicles

As well as the ability to be towed, the light tower can also be easily lifted and moved to difficult areas thanks to its central lifting eye and fork lift holes in its frame. All that is needed is a fork lift truck or a mechanical arm.

The fork lift holes and the lifting eye can also be used to place the light tower onto trucks for road transportation.

If the light towers are carried on trucks or similar vehicles:

1. Ensure that the machine is stable and secure.
2. Check that the light tower is placed perfectly horizontally (check the levels on top of the unit).
3. To ensure stability, use the fork lift slots (1) and lifting eye (2) to fix the light tower to the transport vehicle.
4. Use straps or other means of anchoring, provided that these do not affect the machine's safe transportation and integrity.
5. It is recommended that the machine is covered by a tarpaulin to protect it against bad weather conditions if it is transported on an open truck.



3.3 Installation

3.3.1 Indoor installation

If the machine is operated in a closed environment, make sure that there is enough ventilation to remove the exhaust gases from the room where the engine is running; also ensure that the exhaust gases are discharged at a distance that will not allow them to be drawn back into the engine. Install an exhaust pipe of sufficient diameter to duct the engine exhaust towards the outside. Check for sufficient ventilation so that the cooling air is not re-circulated.

Place the machine at least at 1m from each wall and the ceiling and provide suitable openings to allow sufficient air flow for adequate cooling and good engine combustion.

For more information about indoor installation, consult your local Atlas Copco dealer.

3.3.2 Outdoor installation

- Place the light tower on a horizontal, even and solid floor. Check the levels on top of the light tower to ensure its level position.
- The light tower should be kept with the doors closed, in order to avoid the ingress of water and dust. Dust ingress reduces the lifetime of filters and may reduce your light tower's performance.
- Check that the engine exhaust is not directed towards people.
- Locate the rear end of the light tower upwind, away from contaminated wind streams and walls. Avoid re-circulation of exhaust air from the engine. This causes overheating and engine power decrease.
- Leave enough space for operation, inspection and maintenance (at least 1 meter at each side).
- Check that the inner earthing system is in compliance with the local legislation.
- Use PARCOOL EG for the engine cooling system.
- Use a cable of suitable section to connect the PE terminal to an earth plate that can ensure an earth resistance suited to the characteristics of the light tower.
- Check that the cable end of the earth pin is connected to the earth terminal.

The light tower is wired for a TN-system to IEC 364-3, i.e. one point in the power source directly earthed - in this case the neutral. The exposed conductive parts of the electric installation must be directly connected to the functional earth.

3.4 Connecting the light tower

3.4.1 Precautions for non-linear and sensitive loads

Non-linear loads draw currents with high contents in harmonics, causing distortion in the wave form of the voltage generated by the alternator.

The most common non-linear loads are thyristor/ rectifier-controlled loads, such as convertors supplying voltage to variable speed motors, uninterruptable power supplies and Telecom supplies. Gas-discharge lighting arranged in single-phase circuits generate high 3rd harmonics and risk for excessive neutral current.

Loads most sensitive to voltage distortion include incandescent lamps, discharge lamps, computers, X-ray equipment, audio amplifiers and elevators.

Consult Atlas Copco for measures against the adverse influence of non-linear loads.

4 Operating instructions

In your own interest, always strictly observe all relevant safety instructions.
Do not operate the light tower in excess of the limitations mentioned in the Technical Specifications.
Local rules concerning the setting up of low voltage power installations (below 1000 V) must be respected when connecting site distribution panels, switch gear or loads to the light tower generator.
At each start-up and at any time a new load is connected, the earthing and protections (GB trip and earth leakage relay) of the light tower must be verified. Earthing must be done either by the earth pin or, if available, by an existing, suitable earthing installation. The protective system against excessive contact voltage is not effective unless a suitable earthing is made.

4.1 Before starting

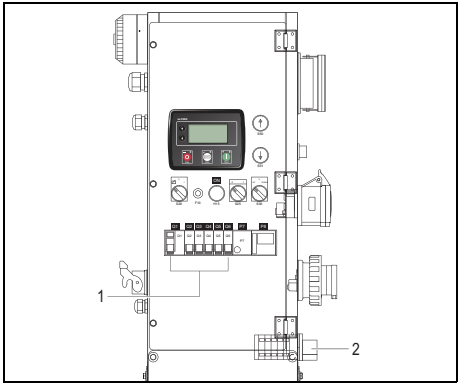
- Perform all daily checks and maintenance as specified in the "Maintenance schedule" on page 41.
- With the light tower standing level, check the engine oil level and top up if necessary. The oil level must be between the MIN and MAX levels on the engine oil level dipstick.
- Check the fuel level and top up if necessary. It is recommended to fill the tank after the day's operation to prevent water vapour in a nearly empty tank from condensing.
- Check the tightness of all bolts and nuts. For torque values, see chapter "Critical bolt connections" on page 82.
- Check that circuit breaker Q1 is switched off.
- Check that the fuses have not tripped and that the emergency stop is in the OUT position.
- Check that the load is switched off.

4.2 Operating the light tower

Carefully read and follow in sequence all the operating instructions in the Engine's manual as well as those contained in this manual!

4.2.1 Before the engine is started

1. Before starting the engine, check that all the automatic switches (general ELCB, sockets protection and lamp circuit breakers) are in the OFF position (1).



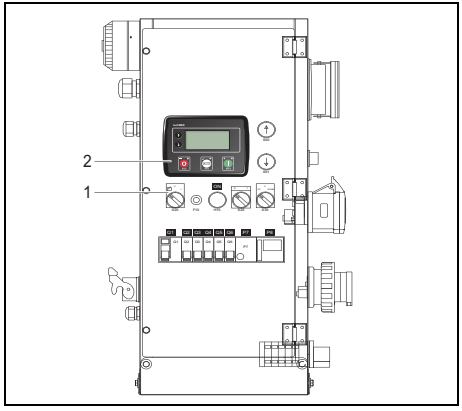
2. If the optional External power input (230 VAC) is installed, select the desired operating mode with S10 (Genset/OFF/Mains) (2). See also chapter "External power input (230 VAC), with battery charger" on page 69.

4.2.2 Starting the engine

1. For Lc1003™, put starter switch S20 in position I (ON) (1) and push the START button (2).

   For Lc1001™, turn the ignition key to position I (ON).

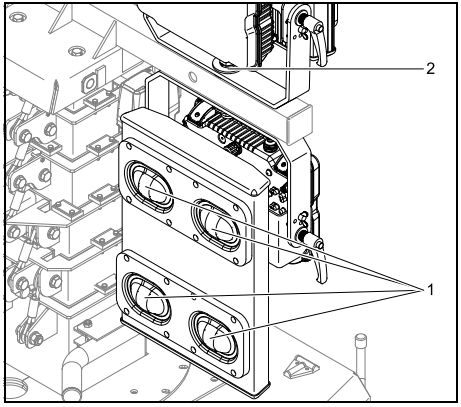
2. Once the machine starts, the controller will check that all functioning conditions are OK. If there is any failure (low oil pressure, high coolant temperature, etc...), the controller will display a signal.



4.2.3 Positioning the floodlights

Rotation

1. Check that the glass panes of the lights (1) are in good condition.



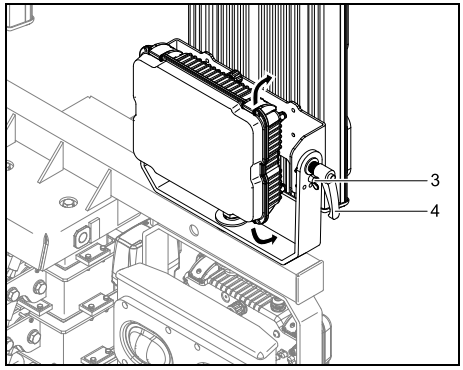
2. Adjust the rotation of the floodlight by loosening the bolt (2) on the bracket of the support.
3. After adjusting the floodlight rotation, fasten the bolt again. Carefully check the tightness of the bolt, torque if necessary.

Inclination

Each floodlight has a central handle and thumb screw that is used to set the angle.

1. Loosen the wing screw (3).
2. Untighten the central handle (4) slightly.
3. Select one of the configured positions and tighten the wing screw.
4. Tighten the central handle again.

Carefully tighten the wing screws after adjusting the inclination of the floodlights to avoid any unexpected inclination.



Maximum luminosity is obtained when the tilting angle is 70°.

Refer to section 10.4 for more detailed information on the installation of the floodlights.

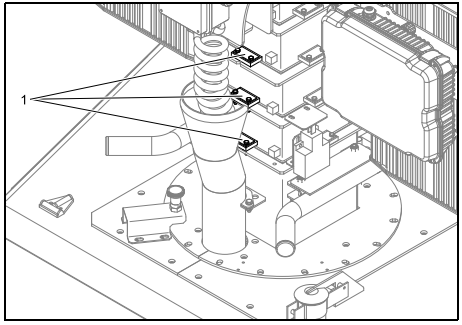
5. Proceed with extending the mast as described below.

4.2.4 Extending the mast

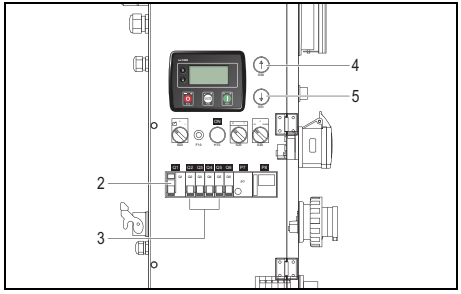
If an optional "Photocell" is provided and the Auto start lighting level option is enabled, the mast will be extended automatically.

Before extending the mast, and in particular when the Auto start lighting level option is enabled, make sure that the lighting tower is properly positioned, away from overhead power cables or other obstructions.

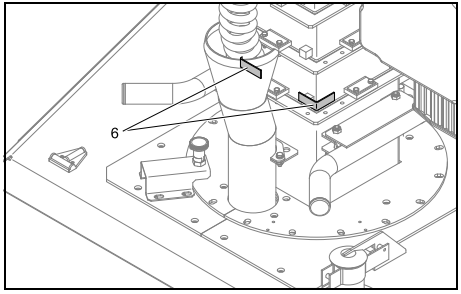
1. Check that the emergency push button has not been pushed. (If it has been pushed, a message will appear on the display.)
2. Check whether the plastic spacers on top of the mast sections (1) are in good condition. Replace if necessary.



3. Switch ON the main circuit breaker Q1 (2) and make sure all other breakers are switched OFF (3).



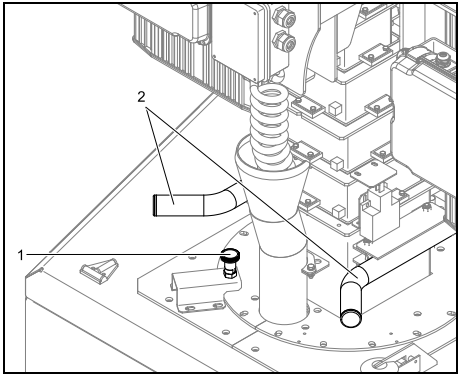
4. Use the UP (4) and DOWN (5) buttons on the control panel to extend and adjust the mast to the desired height up to the red indication on the mast (6) (max 8 metres).



Do not extend the mast at a wind speed stronger than 80 km/h.

4.2.5 Rotating the mast

1. Unlock the locking pin (1) of the mast (located on its rotating base) and rotate the light tower using the mast handles (2) to further adjust the light beam. The mast can be rotated through 340°.



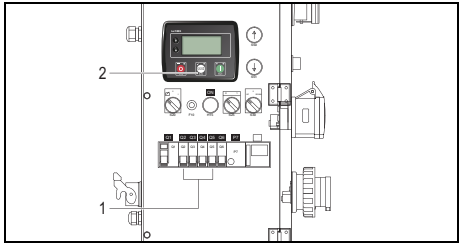
2. Lock the mast again using its locking pin (1).

4.2.6 Switching on/off the floodlights

4.2.6.1 Switching on the floodlights manually

1. Make sure the mast is up and in the desired operating position. See section 4.2.4.
2. Switch ON the 4 circuit breakers (Q2-5) (1).

On light towers with Lc1001™ module the flood lights are now ignited.



3. Push the AUTO button on the Lc1003™ module (2) to ignite the lamps.

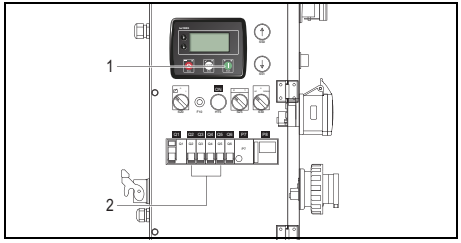
   In sequence, every 2 seconds one lamp will ignite automatically.

When the light tower is connected to the mains ("External power input (230 VAC), with battery charger" option, S10 in position 2, see section 7.4.3.) all lights will ignite at the same time, as soon as circuit breakers Q2-Q5 are switched ON.

4.2.6.2 Switching off the floodlights manually

To switch the lights off manually, follow the procedure described below and proceed to lower the mast.

1. Push the START button on the Lc1003™ module (1) to shut down the lamps.
2. Place the 4 automatic switches (Q2-5) (2) in their OFF position.

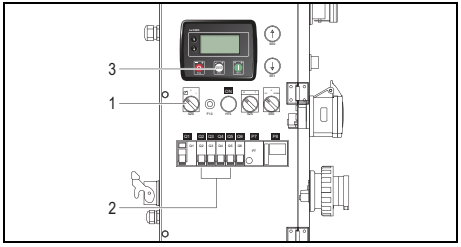


On light towers with Lc1001™ module the flood lights can be switched on/off manually by switching ON/OFF the automatic switches (Q2-Q5).

4.2.6.3 Switching on/off the floodlights automatically

Only applicable with timer or optional Photocell, see section 7.4.7.

1. Make sure the mast is up and in the desired operating position. See section 4.2.4.
2. Put the starter switch S20 in position REMOTE (1).
3. Switch ON the 4 circuit breakers (Q2-5) (2).



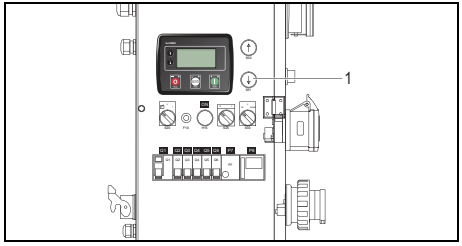
4. Push the AUTO button on the Lc1003™ module (3) to activate AUTO mode.

   The floodlights will ignite/switch off automatically depending on the luminosity (optional Photocell) or a set time schedule.

When the light tower is connected to the mains ("External power input (230 VAC), with battery charger" option, S10 in position 2, see section 7.4.3.) all lights will ignite at the same time, as soon as circuit breakers Q2-Q5 are switched ON.

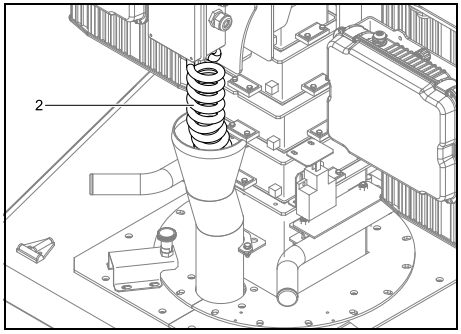
4.2.7 Lowering the mast

1. If the floodlights are not to be used again, lower the mast using the DOWN button on the control panel (1).



Mind your head while lowering the mast!

When lowering the mast, check that the power cord on the mast (spiral cable (2)) collapses freely into its holder and does not become pinched or tangled!

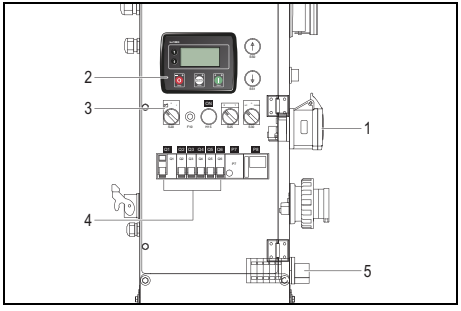


If an optional "Photocell" is provided and the Auto start lighting level option is enabled, the mast will be lowered automatically.
A buzzer will indicate that the mast is moving.

4.2.8 Stopping the engine

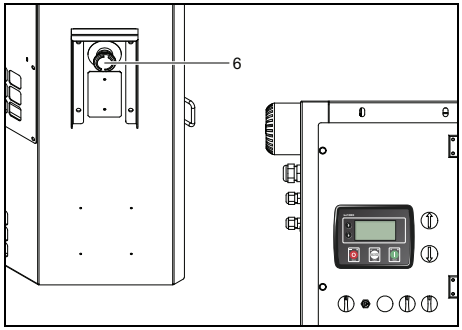
Follow the instructions below to switch the engine off correctly:

1. Lower the mast. See section 4.2.7.
2. Disconnect the electrical appliances connected to the socket (1), if applicable.
3. Push the STOP button on the Lc1003™ module (2) to go into cool down.
4. After cool down, which takes approx. 30 sec.:
   - For Lc1003™, put the starter switch S20 in position O (OFF) (3).
   - For Lc1001™, turn the ignition key to position O (OFF).
5. Place all the automatic switches in their OFF position (4).



6. If the optional External power input (230 VAC) is installed, switch S10 to O (OFF) (5). See also chapter "External power input (230 VAC), with battery charger" on page 69.

Should an emergency arise, it is also possible to stop the machine by pressing the EMERGENCY 'STOP' button (6). If the light tower has been stopped in this way, the emergency stop button must be released by rotating it clockwise, for next operation.

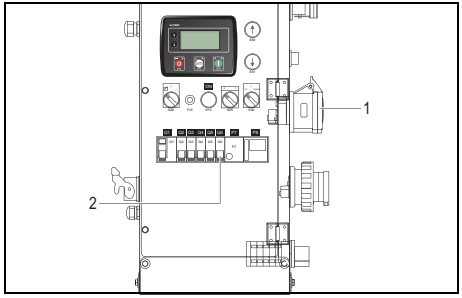


4.3 Connecting appliances

Keep in mind that this machine is a light tower, not a generator set!

1. Start the engine. See section 4.2.2.
2. Wait 3 or 4 minutes before connecting the appliances to allow the engine to warm up. Then plug in the socket (X1) (1).

   For more details on optional outlet socket X1, refer to chapter “” on page 72.



3. Make sure that a correct voltage is displayed.
4. Switch on circuit breaker Q6 (2).
5. Switch on your appliance.

Power is limited to 10 Amps!

6. If circuit breaker Q6 trips (10 A), adjust the load until it falls within the maximum power limit allowed.

If the 4 lamps are switched ON and the load of the socket is exceeded, an Under voltage or Over current alarm will be triggered and the engine will shutdown.

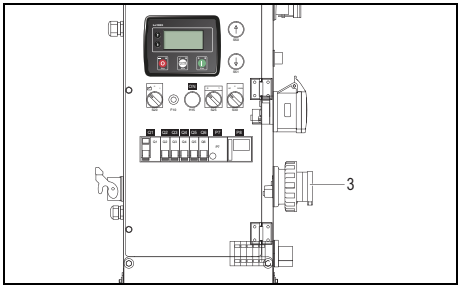
7. Make sure that the load does not exceed the nominal power of the generating set as indicated in the technical data sheet and guaranteed with a tolerance of ± 5% when the engine has run in.

   For derating values, check the derating table on page 80.

8. Make sure the load does not exceed the nominal current capacity of the socket or the cable connected to it.

Avoid long low-load periods (< 30%). In this case, an output drop and higher oil consumption of the engine could occur. Refer to chapter “Preventing low loads”.

9. Only connect the light tower directly to the mains, if the optional External power input (230 VAC) is installed. In this case use the X2 socket (3). See also chapter “External power input (230 VAC), with battery charger” on page 69.



To correctly disconnect the appliances from the light tower generator, first turn the switch to OFF to isolate the electric load and only then remove the plug.

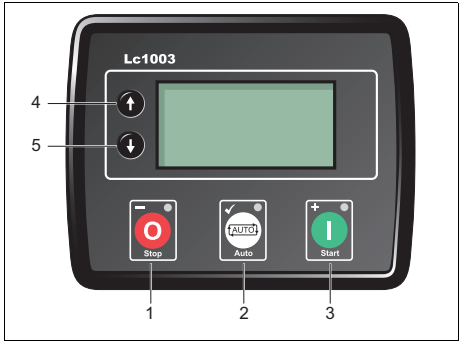
10. Stop the engine. See section 4.2.8.

4.4 Setting the Lc1003™ controller

Controller settings should only be performed by a qualified technician.

4.4.1 Push button and LED functions

Following push buttons are used on the Lc1003™:



1 

STOP: Is used to activate Stop/Reset mode. When pressing the STOP button, the generator will unload (Light Output 1, 2, 3 & 4 becomes inactive (if used)), the fuel supply de-energises and the engine shuts down. Pressing the STOP button will also clear any alarm conditions for which the triggering criteria have been removed.

2 

AUTO: Is used to activate Auto mode.
It is also used for floodlight operation:

- switch on the floodlights manually (S20: ON)
- switch on/off the floodlights automatically, in REMOTE mode (S20: REMOTE)

3 

START: Is used to start the unit in Manual mode.
It is also used to switch off the floodlights manually (S20: ON).

4 

UP: Is used for navigating the instrumentation, event log and configuration screens and to go to the previous parameter level.

5 

DOWN: Is used for navigating the instrumentation, event log and configuration screens and to go to the next parameter level.

Following LEDs are used on the Lc1003™:

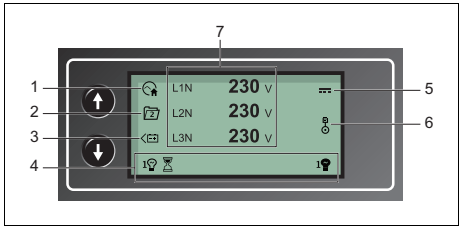
1	**Stop**	LED indicates that the unit is in Stop/ Reset Mode.
2	**Auto**	LED indicates that the unit is in Auto Mode.
3	**Start**	LED indicates that the unit is in Manual/Start Mode.

Atlas Copco

4.4.2 Module display

4.4.2.1 Home page

The home page is the page displayed when no other page has been selected:



1	Instrumentation icon
2	Active configuration
3	FPE/Auto run
4	Light output icons
5	Alarm icon
6	Mode icon
7	Instrumentation and Unit e.g. voltage reading

4.4.3 Icon overview

4.4.3.1 Instrumentation icons

Display	Description
	The default home page which displays Generator voltage and the Auto Run icon
	Generator voltage and frequency instrumentation screen
	Current and load instrumentation screen
	Engine speed instrumentation screen
	Hours run instrumentation screen
	Battery voltage instrumentation screen
	Oil pressure instrumentation screen
	Coolant temperature instrumentation screen
	Fuel sender instrumentation screen

Display	Description
	Appears when the event log is being displayed
	Current time held in the unit
	The current value of the scheduler run time and duration
	ECU diagnostic trouble codes
	Oil Filter maintenance timers
	Air Filter maintenance timers
	Fuel Filter maintenance timers

4.4.3.2 Active configuration

Display	Description
	Appears when the main configuration is selected.
	Appears when the alternative configuration is selected.

4.4.3.3 Front panel editor (FPE) / Auto Run icons

Display	Description
	Appears when a remote start input is active
	Appears when a low battery run is active
	Appears when a scheduled run is active

4.4.3.4 Mode icons

Display	Description
	Appears when the engine is at rest and the unit is in stop mode.
	Appears when the engine is at rest and the unit is in auto mode.
	Appears when the engine is at rest and the unit is waiting for a manual start.
	Appears when a timer is active, for example cranking time, crank rest etc.
	Appears when the engine is running, and all timers have expired, either on or off load. The animation speed is reduced when running in idle mode.
	Appears when the unit is in the front panel editor.
	Appears when a USB connection is made to the controller.
	Appears if either the configuration file or engine file becomes corrupted.

4.4.3.5 Light output icons

Display	Description
	Appears when the corresponding light output has been configured and is not active.
	Appears when the corresponding light output has been configured and is active.
	Appears when a timer to delay the light output activating or de-activating is in progress

4.4.3.6 Alarm icons

To indicate the alarm that is currently active on the controller, an icon is displayed in the Alarm Icon section.

For an overview of all controller alarms, see chapter “Solving Lc1003™ controller alarms” on page 59.

4.4.4 Navigation menu

To enter the navigation menu, press both the UP and DOWN buttons simultaneously.

To navigate to the desired page, select the corresponding icon by pressing the UP and DOWN button and press the AUTO (Accept) button to enter.

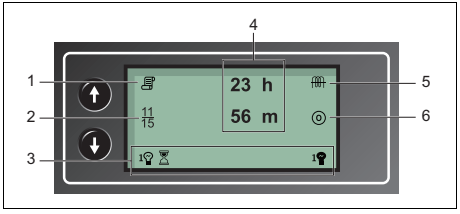
If the AUTO button is not pressed, the display automatically returns to the home page.

Display	Description
	Home and generator voltage and frequency instrumentation
	Generator current and load instrumentation
	Engine instrumentation
	Module information
	Engine DTCs (Diagnostic Trouble Codes) if active
	Event Log

4.4.5 Event log

The Lc1003™ module's event log contains a list of the last 15 record electrical trip or shutdown events and the engine hours at which they occurred.

Once the log is full, any subsequent electrical trip or shutdown alarms over writes the oldest entry in the log. Hence, the log always contains the most recent shutdown alarms. The module logs the alarm, along with the engine running hours.



1	Icon to indicate that the event log is currently displayed
2	Number of event displayed out
3	Light output status
4	The engine hours at which the event occurred
5	Icon to indicate the electrical trip or shutdown alarm that has been recorded
6	Current operating state of the module

To view the event log:

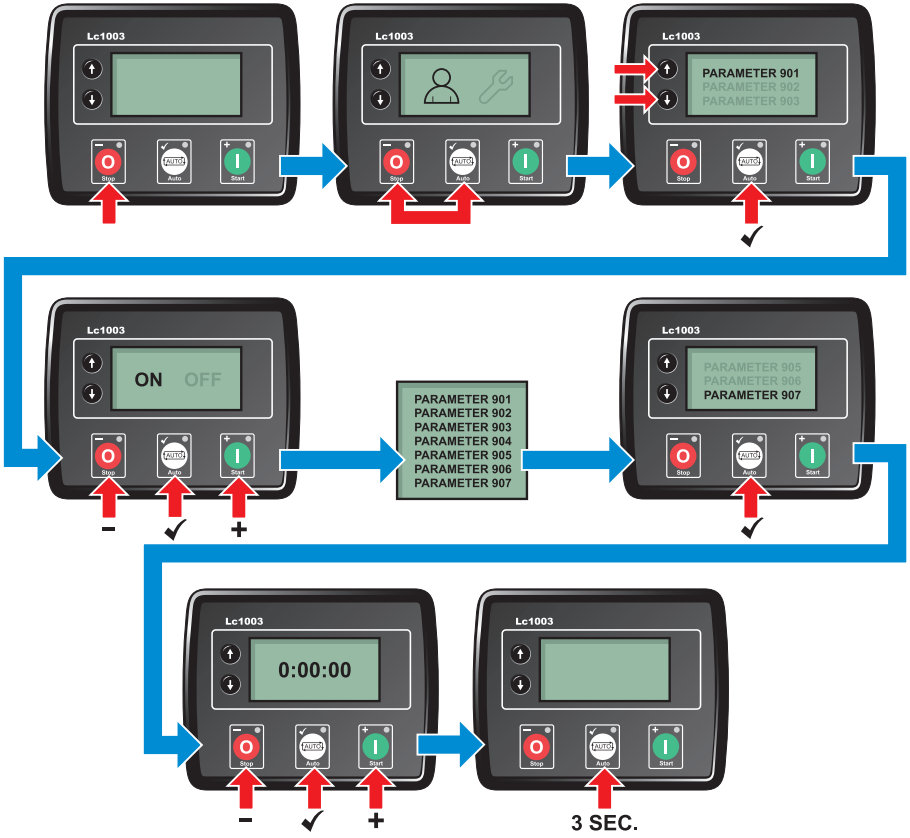
1. Press the UP and DOWN buttons simultaneously to display the navigation menu.
2. Once entered, cycle to the event log section (1) and enter.
3. To view the event log, repeatedly press the UP or DOWN buttons until the LCD screen displays the desired event.
4. Continuing to press the UP or DOWN buttons will cycle through the past alarms.
5. To exit the event log, press the UP and DOWN buttons simultaneously.

4.4.6 Setting the Lc1003™ clock and timer

The Lc1003™ controller provides a basic scheduler that allows the operator to set a detailed time schedule following which the igniting of the floodlights can be programmed.

To set the Lc1003™ timer, follow the flow on the next page.

Menu flow



Configuration Parameters – Scheduler		
901	Enable Scheduler	On (1), Off (0)
902	Schedule Run On or Off Load	On (1), Off (0)
903	Schedule Period	Weekly (0), Monthly (1)
904	Scheduler (1) Start Time	0:00:00
905	Scheduler (1) Start Day	0 (1=Monday)
906	Scheduler (1) Start Week	1,2,3,4
907	Scheduler (1) Duration	0:00:00
908	Scheduler (2) Start Time	0:00:00
...		
935	Scheduler (8) Duration	0:00:00

Configuration Parameters – Clock		
1001	Time of Day	0:00:00
1002	Day of Month	00
1003	Month of Year	00
1004	Year	0000

Setting the Lc1003™ clock

1. Enter the weekly timer menu by pressing the STOP and AUTO button simultaneously.

   The Operator and Service icon appear on the display.
2. To toggle between both icons, press the START (+) and STOP (-) button.
3. When the Operator icon lights up, press the AUTO button.

   The scheduler parameter list appears on the display.
4. Scroll through the parameter list by pressing the UP/DOWN button, till parameter **1001** (Time of Day) is highlighted.
5. Press the AUTO (Accept) button to enter the parameter.
6. Scroll through the parameter values by pressing the START (+) and STOP (-) button.
7. When the desired value is reached, press the AUTO (Accept) button.

   After setting a parameter, the parameter list appears again on the display.
8. Set parameters **1002**, **1003** and **1004** following the same procedure.
9. To exit the parameter list, press the AUTO button for three seconds.

Setting the Lc1003™ timer

1. Enter the weekly timer menu as described above.
2. Select following parameters and settings to enable/set up the timer:

   901 Enable scheduler: ON

   902 Schedule run On or Off load: ON
3. To program the settings for Event 1, proceed as follows:

   903 Schedule period
   - 0 = Weekly: Event 1 repeats every week
   - 1 = Monthly: Event 1 repeats every month

   Suggested: Weekly (0)

   904 Scheduler start time period
   Set the desired time period. Therefore, the Lc1003™ clock should be set first.

   905 Scheduler start day
   - 1 = Monday
   - 2 = Tuesday
   - ...

   For one Event only one week day can be selected. To set several week days, more Events should be programmed.

   906 Scheduler start week
   - 1 = monthly week 1
   - 2 = monthly week 2
   - ...

   If for parameter 903 “week” schedule “0” has been selected, parameter 906 is set by default “monthly week 1”.

   907 Scheduler duration
   Set the desired time period. When this value is set, Event 1 is closed.
4. To program the next event (Event 2), select and program parameter **908**. Continue with parameters **909**, **910** and **911** to complete Event 2.
5. Following this procedure up to 8 events can be programmed, e.g. 1 event per week day.
6. To exit the parameter list, press the AUTO button for three seconds.
7. To enable the weekly timer, put switch S20 to remote mode and push the AUTO button on the controller.

5 Periodic maintenance

5.1 Maintenance schedule

Before carrying out any maintenance activity, check that the ignition switch is in position OFF and that no electrical power is present on the terminals.

Maintenance schedule	Daily	50 hours after initial start-up	Every 500 hours	Every 1000 hours	Yearly
Service pack	-	-	1636 3104 13	-	-
For the most important sub-assemblies, Atlas Copco has developed service kits that combine all wear parts. These service kits offer you the benefits of genuine parts, save on administration costs and are offered at reduced price, compared to the loose components. Refer to the parts list for more information on the contents of the service kits.					
Engine					
Drain water from fuel filter	x				
Check/Fill fuel level (3)	x				
Empty air filter vacuator valve	x				
Check engine oil level (if necessary top up)	x				
Check control panel for alarms and warnings	x				
Check on abnormal noise	x				
Replace air filter element (1)			x		x
Check/Replace safety cartridge			x		
Change engine oil (2) (6)		x	x		x
Clean engine oil filter		x	x		x
Replace fuel (primary) filter (5)			x		x
Replace fuel (secondary) filter (5)			x		x
Check/test emergency stop (13)	x				x

Maintenance schedule	Daily	50 hours after initial start-up	Every 500 hours	Every 1000 hours	Yearly
Service pack	-	-	**1636 3104 13**	-	-
Drain condensate and water from spillage-free frame (8)			x		x
Check for leaks in engine-air-, oil-, or fuel system (8)			x		x
Inspect/Replace hoses and clamps			x		x
Check electrical system cables for wear			x		x
Check/Test glow plugs			x		x
Check torque on critical bolt connections (12)			x		x
Check electrolyte (if applicable) battery terminals (10)			x		x
Grease locks and hinges			x		x
Check rubber flexibles (9)			x		x
Drain/Clean fuel tank water and sediment (1) (14)					x
Replace fuel tank breather filter			x		x
Adjust engine inlet and outlet valves (2)			x		
Check engine protective devices (15)				x	x
Inspect starter motor				x	x
Inspect charging alternator				x	x
Alternator					
Measure alternator diodes				x	x
Measure alternator windings insulation resistance (11)				x	x
Test Earth Leakage breaker (13)				x	x
Check alternator and cubicle electrical system and cables for wear				x	x
Check alternator cable connections on terminals (12)				x	x

Maintenance schedule	Daily	50 hours after initial start-up	Every 500 hours	Every 1000 hours	Yearly
Service pack	-	-	1636 3104 13	-	-
Check Alternator vibration damper				x	x
Light tower					
Check if mast cables are not frayed or damaged. Replace immediately if damaged.	x				
Check support connection bolt of projectors			x		x
Check adjustable plates condition					x
Check electrical cable condition and upper fixation clamp				x	x
Grease the mast collar				x	x
Grease the mast adjustable plates (contact surface only)				x	x
Grease cylinder rotule				x	x
Change hydraulic oil					x
Inspection by Atlas Copco Service technician	⚠	**Light towers in stand-by application have to be tested on a regular basis. At least once a month the engine should run for minimum 30 minutes at a high load (50% - 70%) that the engine reaches its operating temperature.**			

Maintenance schedule (km)	Every 500 km	Yearly
Engine		
Check tyre pressure	x	x
Check tyres for uneven wear	x	x
Check torque of wheel nuts (120 Nm)	x	x
Check torque of coupling head (82 Nm)	x	x
Check the actuator of the handbrake and its levers and mobile parts.	x	x
Grease coupling head and towbar bearings.		x
Check brake system (if installed) and adjust if necessary		x
Oil or grease brake lever and moving parts such as bolts and joints		x
Grease sliding points on height adjusting parts		x
Check safety cable for damage	x	x
Check electrical cable towards road signalisation		x
Check brake pads wear		x
Change wheel hub bearing grease		x

Notes:

(1) More frequently when operating in a dusty environment.

(2) Refer to engine operation manual.

(3) After a days work.

(4) Yearly is only valid when using PARCOOL/ GENCOOL. Change coolant every 5 years.

(5) Gummed or clogged filters will lead to fuel starvation and reduced engine performance. Reduce service interval in heavy duty application.

(6) See section oil specification.

(7) The following part numbers can be ordered from Atlas Copco to check on inhibitors and freezing points:

2913 0028 00 refractometer

2913 0029 00 pH meter.

(8) See also chapter “Before starting”.

(9) Replace all rubber flexibles every 5years.

(10) See section “Battery maintenance and safety recommendations”.

(11) See section “Measuring the alternator insulation resistance”.

(12) See section “Critical bolts”.

(13) The function of this protection should be tested minimum on every new installation.

(14) Water in fuel tank can be detected by means of 2914 8700 00. Drain fuel tank when water is detected.

(15) See chapter “Testing engine protections” in the Engine Operation Manual.

(16) For other specific engine and alternator requirements, refer to their manuals.

5.1.1 Precautions

– Before proceeding with any type of maintenance, please take all the necessary precautions to avoid accidentally starting the engine: disconnect the battery and switch off the control module.

– Do not carry out any change or modification to any part of the light tower or its electric system.

– Do not carry out any maintenance when the engine is running.

– Be careful when close to any moving parts (e.g. pulleys, fans …) and to any hot parts (e.g. muffler, engine block, coolants, lubricants …).

5.1.2 Use of maintenance schedule

Regular maintenance is essential for the optimum performance, safe operation and a longer working life of the machine.

The maintenance schedule contains a summary of the maintenance instructions. Read the respective section before taking maintenance measures.

When servicing, replace all disengaged packing, e.g. gaskets, O-rings, washers.

For engine maintenance refer to the chapter “Maintenance schedule” and the Engine Operation Manual.

The maintenance schedule has to be considered as a guideline for units operating in a dusty environment typical to light tower applications. The maintenance schedule can be adapted depending on application, environment and quality of maintenance.

5.1.3 Use of service packs

Service packs include all genuine parts needed for normal maintenance of both light tower and engine. Service packs minimize downtime and keep your maintenance budget low.

The order number of the service packs are listed in the Atlas Copco Parts list (ASL). Order service packs at your local Atlas Copco dealer.

5.2 Preventing low loads

5.2.1 General

All engine parts are designed with tolerances to allow work under full load conditions. When operating at low load, these tolerances allow more lube oil to pass between valve guides, stems, liners and pistons due to the lower engine temperatures.

Lower combustion pressure has an influence on the piston ring operation and the combustion temperature. Low boost pressure will cause oil leakage over the turbo shaft seal.

5.2.2 Risks of low load operation

- Cylinder glazing: the cylinder bore troughs become filled with lacquer, displacing oil and thus preventing correct ring lubrication.
- Bore polishing: the bore surface becomes polished, all peaks and most troughs become worn away, also preventing correct ring lubrication.
- Heavy carbon buildup: on pistons, piston ring grooves, valves and turbo charger. Carbon buildup on pistons can cause seizure when later operating at full load.
- High oil consumption: prolonged no-load/low load operation of the engine may cause it to blue/ gray smoke at low rpm with an associated increase in oil consumption
- Low combustion temperature: this will result in insufficiently burnt fuel, which will cause diluting of the lube oil. Also, unburnt fuel and lube oil can enter the exhaust manifold and eventually leak out through joints in the exhaust manifold.
- Risk for fire

5.2.3 Best practices

Reduce the low load periods to a minimum. This should be achieved by adequately sizing the unit for the application.

It is recommended that a unit is always used with a load > 30% of nominal. Corrective actions should be taken if due to circumstances this minimum load capacity cannot be obtained.

Operate the unit at full load capacity after any low load operating period. Therefore, connect the unit periodically to a load bank. Increase the load in steps of 25% every 30 minutes and allow the unit to run for 1 hour in full load condition. Gradually return the unit to the operating load.

The interval between load bank connections may vary according to the conditions present on site and the amount of load. However, a rule of thumb is to connect a unit to a load bank after every maintenance operation.

For more info, please contact your Atlas Copco Service Center.

When a failure occurs and is deemed due to low load operation, the repairs fall outside warranty coverage.

5.3 Maintenance of the alternator

The alternator does not require any specific general maintenance. However, please follow the indications in the Alternator Operation Manual that accompanies the light tower.

5.3.1 Measuring the alternator insulation resistance

A 500 V megger is required to measure the alternator insulation resistance.

If the N-terminal is connected to the earthing system, it must be disconnected from the earth terminal.

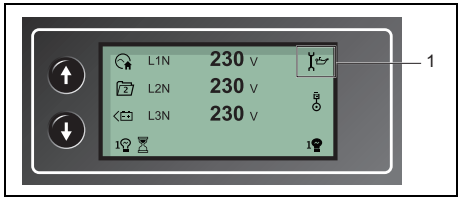
Refer to the Alternator operating and maintenance instructions for more details.

5.4 Engine maintenance procedures

5.4.1 General instructions

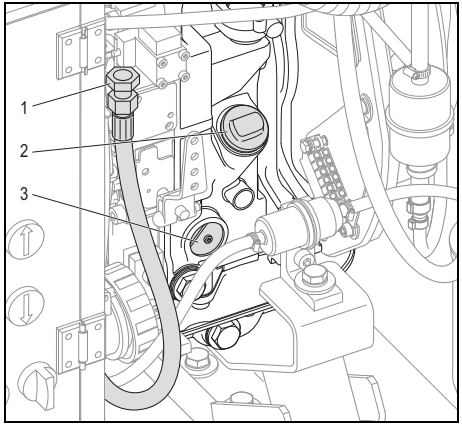
- Regularly perform maintenance work and replace parts as indicated in the Engine Operation Manual.
- The engine should never run before filters have been correctly installed.
- Open the access doors of the light tower to access the engine and perform all necessary maintenance operations.
  - Unlock the access doors by using the key.
  - Open the access doors by pushing the black push button next to the key hole.
- Regularly check the controller display, to see if a service alarm icon (1) is present. In this case an urgent maintenance action is requested.

  Example:



- Do not smoke and maintain a safe distance from flames and sparks while maintenance is being carried out and when fuels and solvents are being used.
- Carefully follow all the instructions contained in the Engine Operation Manual that accompanies the light tower.

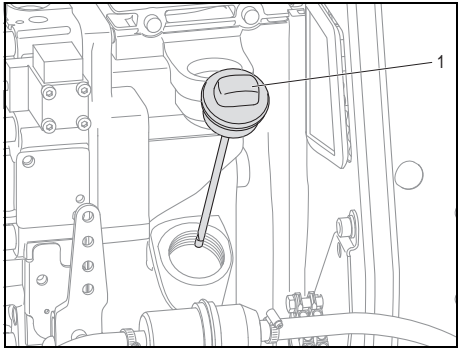
5.4.2 Engine oil system



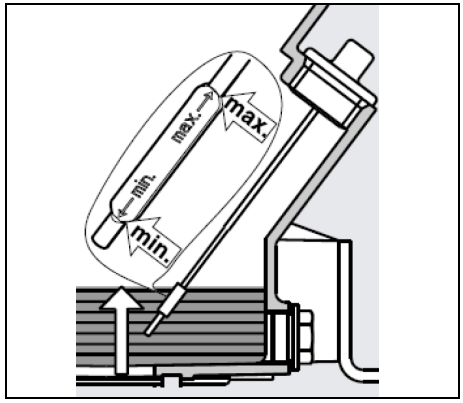
1	Oil drain tube
2	Oil level dipstick and oil filler neck
3	Oil filter

5.4.2.1 Engine oil level check

1. Make sure the light tower is standing level.
2. Switch off the engine and wait several minutes till all engine oil has been collected in the crank housing.
3. Remove the oil level dipstick (1) and swipe it clean. Reinstall the oil level dipstick and screw it tight. Unscrew the oil level dipstick and check the oil level.



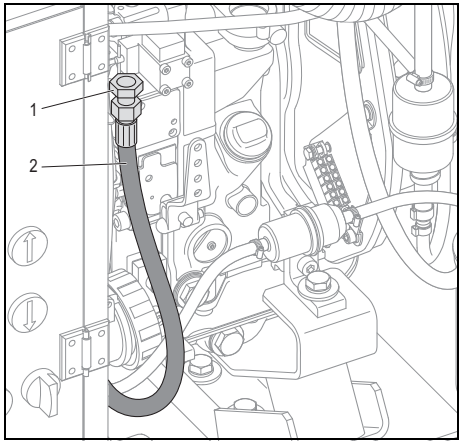
4. If the oil level is close to the MIN level indicator, top up engine oil to the MAX level indicator.



5. Reinstall the oil level dipstick and screw it tight.

5.4.2.2 Changing the engine oil

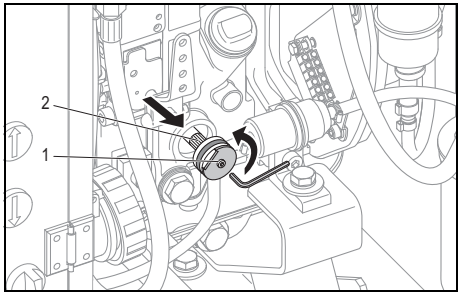
1. Start the engine and let it run for a while to warm up.
2. Stop the engine.
3. Remove the plug (1) from the oil drain hose (2).



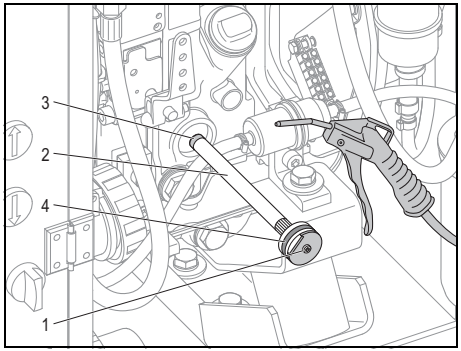
4. Blow the oil filter with clean air (see chapter "Cleaning the oil filter")
5. Reinstall the plug (1) with a new sealing washer and tighten it.
6. Pour in engine oil.

5.4.2.3 Cleaning the oil filter

1. Loosen the fixation bolt (1).



2. Remove the oil filter (2) from its housing.
3. Blow out the oil filter (2) with compressed air, from the inside to the outside.



4. Replace the upper gasket (4) and slightly oil the upper and lower gaskets (3, 4) before reinstalling them.
5. Reinstall the oil filter (2) and tighten the fixation bolt (1).

5.5 Adjustments and service procedures

5.5.1 Battery care

Before handling batteries, read the relevant safety precautions and act accordingly.
Always wear protective gloves and goggles when handling the battery - battery fluid contains sulphuric acid that can cause burns. If your skin or your clothes come in contact with the battery fluid, rinse immediately with plenty of water. If even a tiny quantity is swallowed, seek immediate medical help.

If the battery is still dry, it must be activated as described in chapter "Activating a dry-charged battery".

The battery must be in operation within 2 months from being activated; if not, it needs to be recharged first.

5.5.1.1 Electrolyte

Read the safety instructions carefully.

Electrolyte in batteries is a sulphuric acid solution in distilled water.

The solution must be made up before being introduced into the battery.

5.5.1.2 Activating a dry-charged battery

Always remove the battery and disconnect the terminals before carrying out any operation (charging or refilling).

- Take out the battery.
- Battery and electrolyte must be at equal temperature above 10°C.
- Remove cover and/or plug from each cell.
- Fill each cell with electrolyte until the level reaches 10 to 15 mm above the plates, or to the level marked on the battery.
- Rock the battery a few times so that possible air bubbles can escape; wait 10 minutes and check the level in each cell once more; if required, add electrolyte.
- Refit plugs and/or cover.
- Place the battery in the light tower.
- ALWAYS connect the positive (+) terminal first and the negative (-) terminal second.

5.5.1.3 Recharging a battery

Before and after charging a battery, always check the electrolyte level in each cell; if required, top up with distilled water only. When charging batteries, each cell must be open, i.e. plugs and/or cover removed.

Use a commercial automatic battery charger according to its manufacturer's instructions.

Apply with preference the slow charging method and adjust the charge current according to the following rule of thumb: battery capacity in Ah divided by 20 gives safe charging current in Amp.

5.5.1.4 Make-up distilled water

The amount of water evaporating from batteries is largely dependant on the operating conditions, i.e. temperatures, number of starts, running time between start and stop, etc...

If a battery starts to need excessive make-up water, this points to overcharging. Most common causes are high temperatures or a too high voltage regulator setting.

If a battery does not need any make-up water at all over a considerable time of operation, an undercharged battery condition may be caused by poor cable connections or a too low voltage regulator setting.

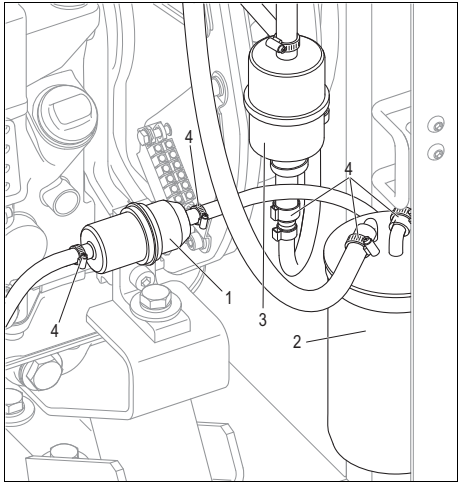
5.5.1.5 Periodic battery service

- Keep the battery clean and dry.
- Keep the electrolyte level at 10 to 15 mm above the plates or at the indicated level; top up with distilled water only. Never overfill, as this will cause poor performance and excessive corrosion.
- Record the quantity of distilled water added.
- Keep the terminals and clamps tight, clean, and lightly covered with petroleum jelly.

– Carry out periodic condition tests. Test intervals of 1 to 3 months, depending on climate and operating conditions, are recommended.
– If doubtful conditions are noticed or malfunctions arise, keep in mind that the cause may be in the electrical system, e.g. loose terminals, voltage regulator maladjusted, poor performance of generator, etc...

Never charge the battery or refill the fluid when the battery is still installed in the machine! Possible spillage could damage vital parts of the generating set.
Atlas Copco accepts no responsibility for any damage to the light tower caused by spilling of the battery fluid.

5.5.2 Replacing the fuel filters

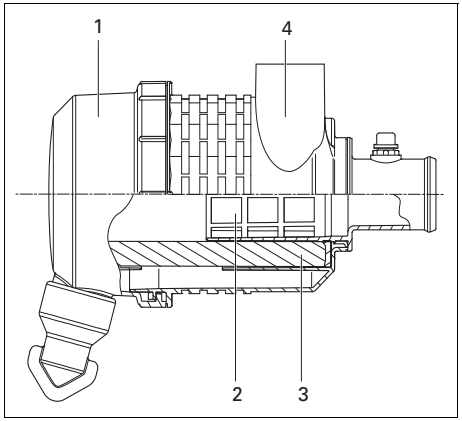


1	Pre fuel filter
2	Water separator filter
3	Fuel filter

– Loosen the hose clamps (4) and remove them from the filters (1, 2, 3).
– Unscrew the filter element from the adapter head.
– Clean the adapter head sealing surface.
– Lightly oil the gasket of the new filter element and screw the latter onto the header until the gasket is properly seated, then tighten with both hands.
– Reconnect the hoses and tighten the clamps (4).
– Check for fuel leaks once the engine has been restarted.

5.5.3 Servicing air filter engine

5.5.3.1 Main parts



1	Dust trap
2	Safety cartridge
3	Filter element
4	Filter housing

5.5.3.2 Recommendation

The Atlas Copco air filters are specially designed for this application. The use of non-genuine air filters may lead to severe damage of engine and/or alternator. Never run the light tower without air filter element.

- New elements must also be inspected for tears or punctures before installation.
- Discard the filter element (3) when damaged.
- In heavy duty applications it is recommended to install a safety cartridge which can be ordered with the part number mentioned on the service label on the control panel door.
- A dirty safety cartridge (2) is an indication of a malfunctioning air filter element (3). Replace the element and the safety cartridge in this case.
- The safety cartridge (2) cannot be cleaned.

5.5.3.3 Cleaning the dust trap

To remove dust from the dust trap (1), clean it with a dry rag.

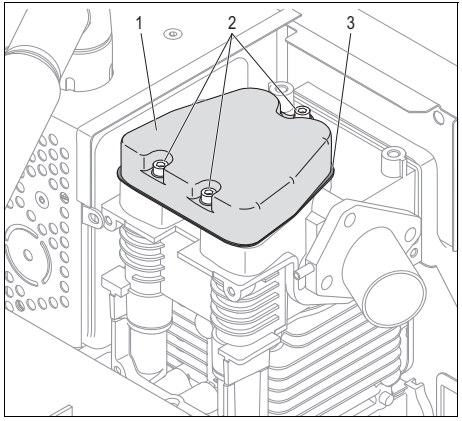
5.5.3.4 Replacing the air filter element

- Remove the dust trap (1). Clean the trap.
- Remove the element (3) from the housing (4).
- Reassemble in reverse order of dismantling.
- Inspect and tighten all air intake connections.

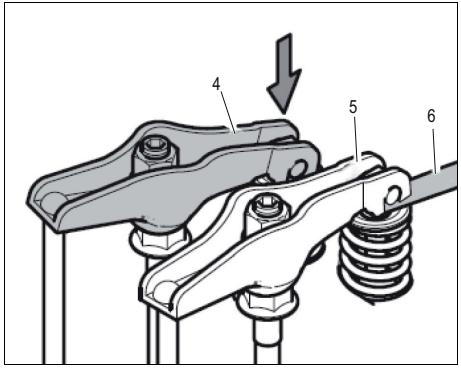
5.5.4 Checking and adjusting valve clearance

Remove the access plate from the canopy roof to perform this action.

1. Clean the surface of the cylinder head cover (1).
2. Remove the bolts (2) and take off the cylinder cover (1) and the gasket (3).

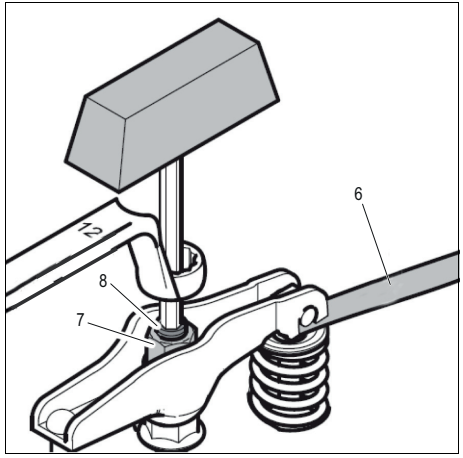


3. Turn the engine in the rotation direction until the first rocker arm (4) has fully opened the outlet valve.
4. Check the clearance at the second rocker arm (5) with a feeler gauge (6).
5. Turn the engine in the rotation direction until the second rocker arm (5) has fully opened the intake valve.
6. Check the clearance at the first rocker arm (4).



The valve clearance of the inlet/outlet must be 0.10 mm.

7. If the valve clearance has to be corrected, release the bolt (7) and turn the hexagon nut (8) so the feeler gauge (6) can be pulled through with a barely perceptible resistance after the bolt (7) is tightened again.



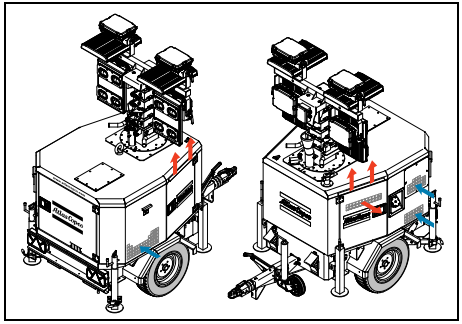
8. Reinstall the cylinder head cover (1) with the new gasket.

5.5.5 Air cooling circuit

Check every day that none of the air cooling circuits are clogged with dust or other particles. If any circuit is obstructed, it must be cleaned.

5.5.5.1 Air cooling circuit HiLight H5+

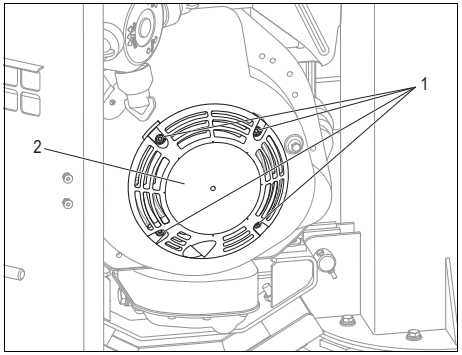
Air flow



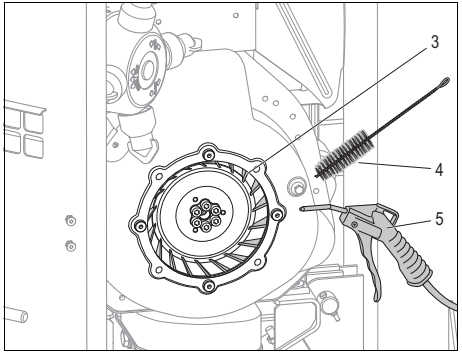
The air flows from the grids in the doors towards the grids in the roof and rear panel. This means that cold air enters via the engine and alternator door and hot air exits through the outlets in the roof and service plate.

Cleaning the cooling air area

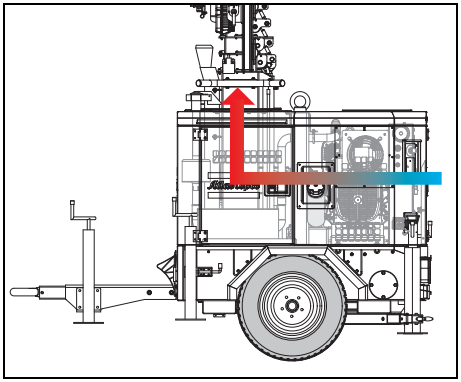
1. Remove the 4 bolts (1) and take off the cover (2).



2. Clean the fan blades (3) with a suitable brush (4), then blow it clean with compressed air (5).



5.5.5.2 Air cooling circuit HiLight H2

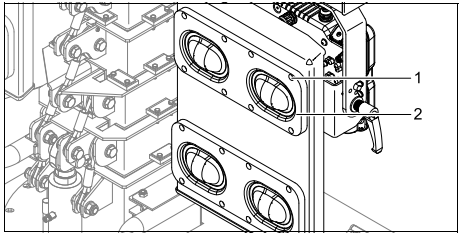


The air flows from the front (towbar side) towards the rear side of the machine. This means, cold air enters at the front side and hot air exits at the rear side of the machine.

5.5.6 Replacing the floodlights

5.5.6.1 Replacing the HiLight H5+ LED's

1. Loosen and remove the 8 screws (1) and remove the protection lenses (2) in front of the LEDs.

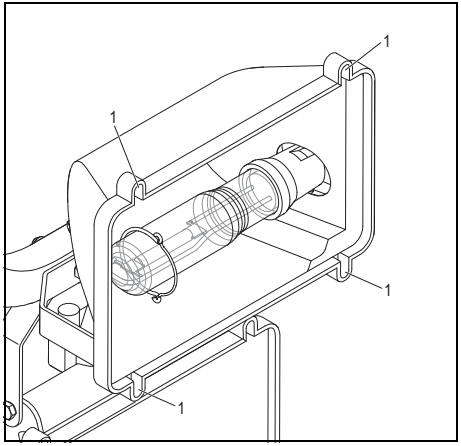


2. Disconnect the LED power wires.
3. Replace the LED and connect the power wires to the new LED.
4. Reinstall the protection lenses and the 8 screws. Carefully tighten the 8 screws with a screwdriver.

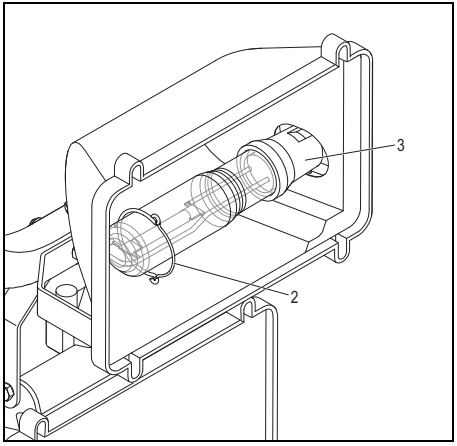
5.5.6.2 Replacing the HiLight H2 lamps

Do not touch the lamps when they are still hot without having taken all necessary precautions. It is recommended that protective gloves are always worn.

1. Release the 4 clamps (1) and rotate them to open the protection glass. The glass must stay hinged on the bottom part of the floodlight.



2. Remove the lamp, first releasing the safety spring (2) placed around the lamp and then unscrewing the lamp from its seat (3).



3. Install the new lamp and re-install the safety spring (2).
4. Lock the protective glass using the 4 clamps and remember to carefully tighten the screws with a screwdriver.

5.5.7 Ordering spare parts

It is possible to order spare parts for the light tower by making reference to the parts as mentioned in the enclosed Parts List manual.

Always quote the part number, the designation and the quantity of the parts required, as well as the type and the serial number of the machine.

5.6 Engine consumable specifications

5.6.1 Engine fuel specifications

For fuel specifications, please contact your Atlas Copco Customer Center.

5.6.2 Engine oil specifications

It is strongly recommended to use Atlas Copco branded lubrication oils.

High-quality, mineral, hydraulic or synthesized hydrocarbon oil with rust and oxidation inhibitors, anti-foam and anti-wear properties is recommended. The viscosity grade should correspond to the ambient temperature and ISO 3448, as follows.

Engine	Type of lubricant
between -10°C and 50°C	PAROIL E
between -25°C and 50°C	PAROIL Extra

Never mix synthetic with mineral oil.
When changing from mineral to synthetic oil (or the other way around), you will need to do an extra rinse.
After doing the complete change procedure to synthetic oil, run the unit for a few minutes to allow good and complete circulation of the synthetic oil. Then drain the synthetic oil again and fill again with new synthetic oil. To set correct oil levels, proceed as in normal instruction.

Specifications PAROIL

PAROIL from Atlas Copco is the ONLY oil tested and approved for use in all engines built into Atlas Copco compressors, generators and light towers.
Extensive laboratory and field endurance tests on Atlas Copco equipment have proven PAROIL to match all lubrication demands in varied conditions. It meets stringent quality control specifications to ensure your equipment will run smoothly and reliably.

The quality lubricant additives in PAROIL allow for extended oil change intervals without any loss in performance or longevity.

PAROIL provides wear protection under extreme conditions. Powerful oxidation resistance, high chemical stability and rust- inhibiting additives help reduce corrosion, even within engines left idle for extended periods.

PAROIL contains high quality anti-oxidants to control deposits, sludge and contaminants that tend to build up under very high temperatures.
PAROIL's detergent additives keep sludge forming particles in a fine suspension instead of allowing them to clog your filter and accumulate in the valve/rocker cover area.

PAROIL releases excess heat efficiently, whilst maintaining excellent bore-polish protection to limit oil consumption.
PAROIL has an excellent Total Base Number (TBN) retention and more alkalinity to control acid formation.

PAROIL prevents Soot build-up.

PAROIL is optimized for the latest low emission EURO -3 & -2, EPA TIER II, III and IV engines running on low sulphur diesel for lower oil and fuel consumption.

PAROIL Extra

PAROIL Extra is a synthetic ultra high performance diesel engine oil with a high viscosity-index. Atlas Copco PAROIL Extra is designed to provide excellent lubrication from start-up in temperatures as low as -25°C.

	Litre	US gal	Imp gal	cu.ft	Order number
can	5	1.3	1.1	0.175	1630 0135 00
barrel	20	5.3	4.4	0.7	1630 0136 00

PAROIL E

PAROIL E is a mineral based high performance diesel engine oil with a high viscosity-index. Atlas Copco PAROIL E is designed to provide a high level of performance and protection in standard ambient conditions as from -10°C.

	Litre	US gal	Imp gal	cu.ft	Order number
can	5	1.3	1.1	0.175	1615 5953 00
can	20	5.3	4.4	0.7	1615 5954 00
barrel	209	55.2	46	7.32	1615 5955 00

6 Checks and trouble shooting

Never perform a test run with connected power cables. Never touch an electrical connector without a voltage check.
When a failure occurs, always report what you experienced before, during and after the failure. Information with regard to the load (type, size, power factor, etc.), vibrations, exhaust gas colour, insulation check, odours, output voltage, leaks and damaged parts, ambient temperature, daily and normal maintenance and altitude might be helpful to quickly locate the problem. Also report any information regarding the humidity and location of the light tower (e.g. close to sea).

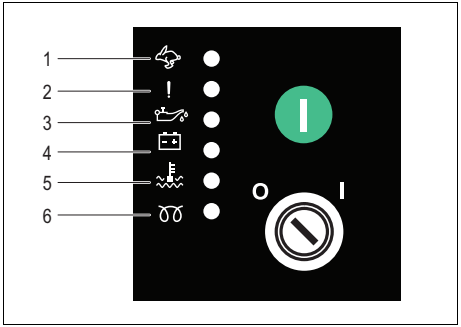
6.1 Engine troubleshooting

Refer to the Engine Operation manual for engine troubleshooting.

6.2 Solving Lc1001™ controller alarms

6.2.1 Alarm overview Lc1001™

Following LEDs are used on the Lc1001™:



1	**Overspeed**	The engine speed has risen above the over speed pre alarm setting.
2	**Alarm conditions**	An external alarm condition has occurred. E.g. Fail to Start.
3	**Low oil pressure**	The controller detects that the engine oil pressure has fallen below the low oil pressure pre-alarm setting level after the Safety On timer has expired.
4	**Battery under/over voltage**	The auxiliary charge alternator voltage is low as measured from the W/L terminal.

5	**Engine high temperature**	The controller detects that the engine coolant temperature has exceeded the high engine temperature pre-alarm setting level after the Safety On timer has expired.
6	**Preheat**	The LED illuminates when the preheat/configurable output is activated.

A **flashing LED** indicates a **shutdown** alarm. Shutdowns are critical alarm conditions that stop the engine and draw the operator's attention to an undesirable condition. Shutdown alarms are latching. The fault must be removed and the key switch turned to the O position to reset the module.

A **steady LED** indicates a **warning** alarm. Warnings are non-critical alarm conditions and do not affect the operation of the generator system, they serve to draw the operators attention to an undesirable condition. Warning alarms are self-resetting when the fault condition is removed.

6.3 Solving Lc1003™ controller alarms

6.3.1 General

If an alarm condition occurs, an icon is displayed in the Alarm Icon section of the Lc1003™ LCD to indicate the alarm that is current active on the controller.

In the event of a **warning alarm**, the LCD only displays the Alarm Icon.

In the event of an **electrical trip or shutdown alarm**, the module displays the Alarm Icon and the STOP button LED begins to flash.

If multiple alarms are active at the same time, the Alarm Icon automatically cycles through all the appropriate icons to indicate each alarm which is active.

6.3.2 Alarm overview Lc1003™

6.3.2.1 Warning alarm icons

Warnings are non-critical alarm conditions and do not affect the operation of the light tower, they serve to draw the operators attention to an undesirable condition. By default, warning alarms are self-resetting when the fault condition is removed.

Display	Description	Reason
	Fail to stop	The module has detected a condition that indicates that the engine is running when it has been instructed to stop.  **'Fail to Stop' could indicate a faulty oil pressure sensor. If the engine is at rest, check the oil sensor wiring and configuration.**
	Charge failure	The auxiliary charge alternator voltage is low as measured from the W/L terminal.
	Low fuel level	The level detected by the fuel level sensor is below the low fuel level setting.
	Battery Under Voltage	The DC supply has fallen below or risen above the low volts setting level.
	Battery Over Voltage	The DC supply has risen above the high volts setting level.
	Generator Under Voltage	The generator output voltage has fallen below the pre-set pre-alarm setting after the Safety On timer has expired.
	Generator Over Voltage	The generator output voltage has risen above the pre-set pre-alarm setting.

Display	Description	Reason
	Generator Under Frequency	The generator output frequency has fallen below the pre-set pre-alarm setting after the Safety On timer has expired.
	Generator Over Frequency	The generator output frequency has risen above the pre-set pre-alarm setting.
	Immediate Over Current	The measured current has risen above the configured trip level.
	Delayed Over Current	The measured current has risen above the configured trip level for a configured duration.
	Low Current	The measured current has fallen below the configured trip level. This is used to detect lamp failure.
	Oil Filter Maintenance Alarm	Maintenance due for oil filter.
	Air Filter Maintenance Alarm	Maintenance due for air filter
	Fuel Filter Maintenance Alarm	Maintenance due for fuel filter.

6.3.2.2 Electrical trip alarm icons

Electrical trips are latching and stop the light tower, but in a controlled manner. On initiation of the electrical trip condition the Lc1003™ module de-energises all the 'Light Output' outputs to remove the load from the light tower. Once this has occurred the Lc1003™ module starts the Cooling timer and allows the engine to cool off-load before shutting down the engine. The alarm must be accepted and cleared, and the fault removed to reset the Lc1003™ module.

Electrical trips are latching alarms and to remove the fault, press the STOP button on the Lc1003™ module.

The alarm condition must be rectified before a reset will take place. If the alarm condition remains, it is not possible to reset the unit.

Display	Description	Reason
	Engine High Temperature	The module detects that the engine coolant temperature has exceeded the high engine temperature pre-alarm setting level after the Safety On timer has expired.
	Low Fuel Level	The level detected by the fuel level sensor is below the low fuel level setting.
	Delayed Over Current	The measured current has risen above the configured trip level for a configured duration.
	Low Current	The measured current has fallen below the configured trip level. This is used to detect lamp failure.

6.3.2.3 Shutdown alarm icons

Shutdown alarms are latching and immediately stop the light tower. On initiation of the shutdown condition the Lc1003™ module de-energises all the 'Light Output' outputs to remove the load from the light tower. Once this has occurred, the Lc1003™ module shuts the light tower down immediately to prevent further damage. The alarm must be accepted and cleared, and the fault removed to reset the Lc1003™ module.

Shutdowns are latching alarms and to remove the fault, press the STOP button on the Lc1003™ module.

The alarm condition must be rectified before a reset will take place. If the alarm condition remains, it is not possible to reset the unit.

Display	Description	Reason
	Fail To Start	The engine has failed to start after the configured number of start attempts
	Low Oil Pressure	The module detects that the engine oil pressure has fallen below the low oil pressure pre-alarm setting level after the Safety On timer has expired.
	Under Speed	The engine speed has fallen below the under speed pre-alarm setting
	Over Speed	The engine speed has risen above the over speed pre-alarm setting
	Charge failure	The auxiliary charge alternator voltage is low as measured from the W/L terminal.
	Low fuel level	The level detected by the fuel level sensor is below the low fuel level setting.
	Battery Under Voltage	The DC supply has fallen below or risen above the low volts setting level.

Display	Description	Reason
	Battery Over Voltage	The DC supply has risen above the high volts setting level.
	Generator Under Voltage	The generator output voltage has fallen below the pre-set pre-alarm setting after the Safety On timer has expired
	Generator Over Voltage	The generator output voltage has risen above the pre-set pre-alarm setting.
	Generator Under Frequency	The generator output frequency has fallen below the pre-set pre-alarm setting after the Safety On timer has expired.
	Generator Over Frequency	The generator output frequency has risen above the pre-set pre-alarm setting.
	Emergency Stop	The emergency stop button has been depressed. This fail-safe (normally closed to emergency stop) input immediately stops the set, should the signal be removed.
	Oil Sender Open Circuit	The oil pressure sensor has been detected as being open circuit.
	Coolant Temperature Sender Open Circuit	The coolant temperature sensor has been detected as being open circuit.
	Delayed Over Current	The measured current has risen above the configured trip level for a configured duration.
	Low Current	The measured current has fallen below the configured trip level. This is used to detect lamp failure.

Display	Description	Reason
	Oil Filter Maintenance Alarm	Maintenance due for oil filter.
	Air Filter Maintenance Alarm	Maintenance due for air filter
	Fuel Filter Maintenance Alarm	Maintenance due for fuel filter.

7 Options available for HiLight H5+/H2 units

7.1 Overview of the mechanical options

The following mechanical options are available:

- Undercarriage
- Oil field kit - Spark arrester
- Wheel chocks
- Double license plate
- Special colour

7.2 Description of the mechanical options

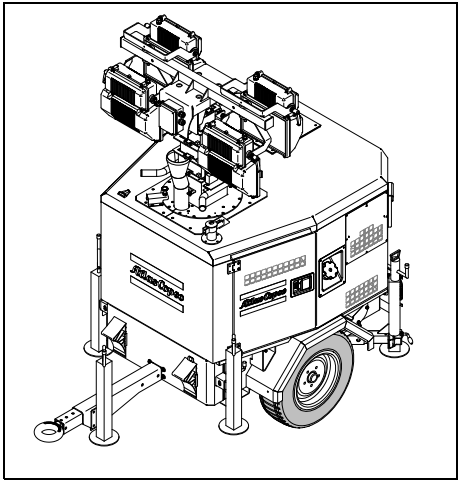
7.2.1 Undercarriage

There are 2 variants of undercarriage available for HiLight H5+/H2 light towers. Each variant has its own specific features. An overview is given hereafter.

Not homologated for road use (max speed 20 km/h)

This undercarriage provides:

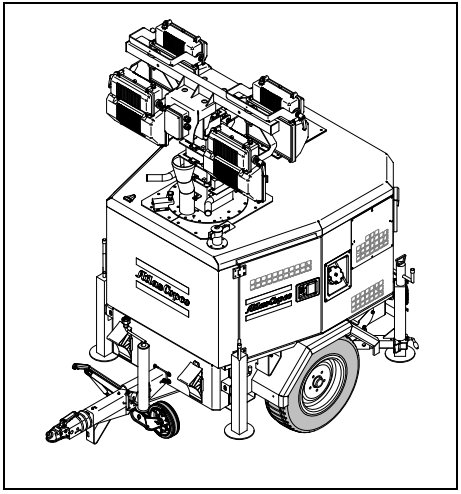
- Fixed towbar, without inertia coupling
- Rigid axle, without brake
- Adjustable support
- Wheel
- Mudguard



Homologated for road use, fixed towbar

This undercarriage provides:

- Fixed towbar, with inertia coupling
- Axle with rubber suspension, with brake
- Wheel
- Jockey wheel
- Mudguard
- Electrical kit
- License plate support

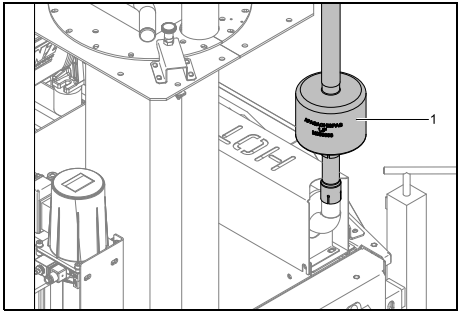


The homologated light tower trolleys are manufactured according to ISO/European road standards currently applicable.

The undercarriage is equipped with a fixed towbar with French-eye, DIN-eye, GB-eye, ITA-eye, NATO-eye or ball coupling, with or without handbrake. For more detailed information on the different towing eyes, please consult the parts manual.

Make sure that the towing equipment of the vehicle matches the towing eye before towing the light tower.

7.2.2 Oil field kit - Spark arrester



7.3 Overview of the electrical options

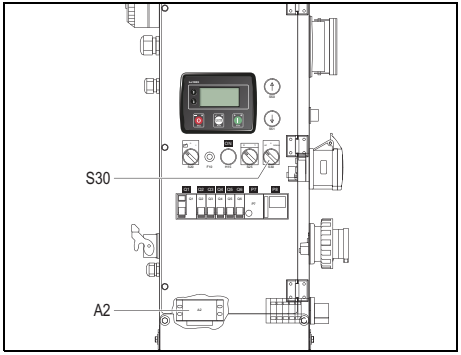
The following electrical options are available:

- Auto tilt
- Earth pin
- External power input (230 VAC), with battery charger
- Battery switch
- MSA connector
- 1-phase socket: RIM, PIN and CE + CB or no socket
- AC type earth leakage relay
- A type earth leakage relay
- ASM (Auto Rise and Lower Safety Mast)
- Advanced cubicle
- Standard cubicle

7.4 Description of the electrical options

7.4.1 Auto tilt

The auto tilt option allows to set the inclination angle of the floodlights via the control panel.



S30 .....Auto tilt switch

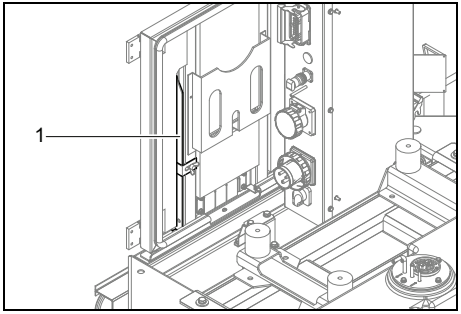
Turn the switch to UP to increase the inclination angle of the floodlights.

Turn the switch to DOWN to decrease the inclination angle of the floodlights.

A2 .....Actuator DC supply and control

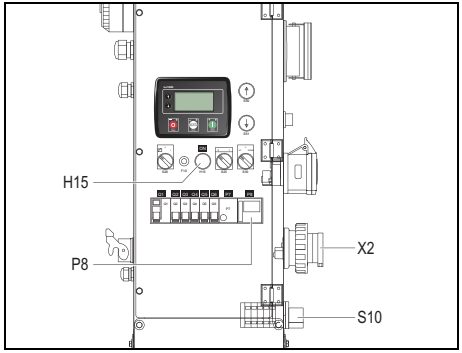
7.4.2 Earth pin

The earth pin (1), to be connected to the light tower's earth terminal is located at the bottom of the frame on the outside.



7.4.3 External power input (230 VAC), with battery charger

Only available in combination with the advanced Lc1003™ cubicle.



H15 ..... Indicator of Mains available

Illuminated LED indicates that the unit is running on external mains.

P8..... Timer (scheduler)

Is used for setting a time schedule for the lamps of the light tower to switch on / off.

S10 ..... Input power selector

Position 1: running on Diesel engine

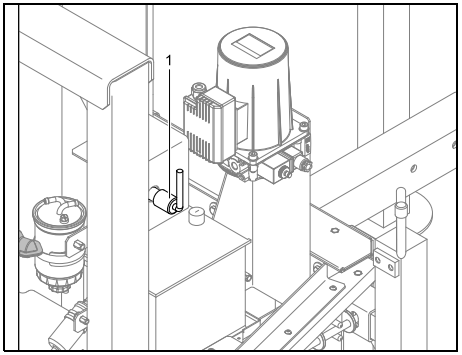
Position 0: neutral position

Position 2: running on external mains

X2 ..... Inlet socket for connection to the mains (32A)

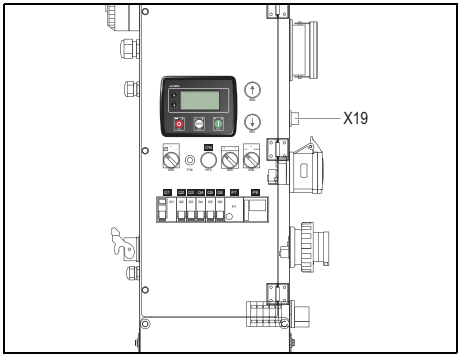
7.4.4 Battery switch

The battery switch is installed near the battery and allows to disconnect the battery power.



7.4.5 MSA connector

The MSA connector is located in the cubicle and allows remote emergency stops.

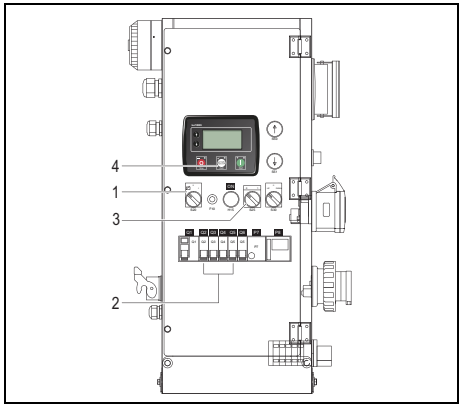


X19 ..... MSA connector

7.4.6 ASM (Auto Rise and Lower Safety Mast)

The ASM option provides the possibility to not only switch on/off the floodlights automatically, but also to extend/lower the mast automatically.

Before activating the ASM option, make sure that the lighting tower is properly positioned, away from overhead power cables or other obstructions.



To enable automatic mast operation, proceed as follows:

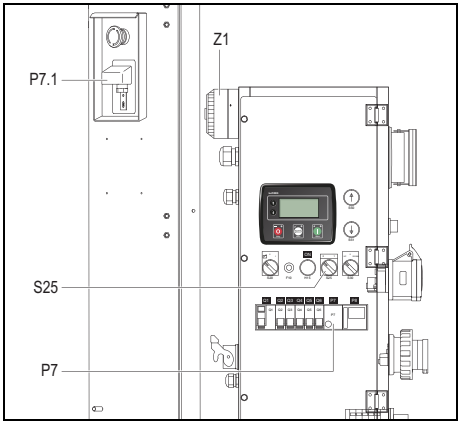
1. Put the starter switch S20 in position REMOTE (1).
2. Switch ON the 4 circuit breakers (Q2-5) (2).
3. Put the auto positioning switch S25 in position AUTO (3).
4. Push the AUTO button on the Lc1003™ module (4) to activate AUTO mode.
5. A remote start signal (Sunset or Weekly timer start) will trigger the following actions:
   - Start engine
   - Activate buzzer
   - Rise mast
   - Sequence lamp start
6. A remote stop signal (Sunrise or Weekly timer stop) will trigger the following actions:
   - Sequence lamp stop
   - Activate buzzer
   - Lower mast
   - Stop engine

7.4.7 Advanced cubicle

The advanced cubicle includes:

- Lc1003™ controller
- Auto start: photocell and weekly timer
- Working mode selector
- Floodlight switches

7.4.7.1 Photocell



P7.1.....Photocell

Measures the luminosity and can be activated by sunlight.

P7.....Photocell sensitivity regulator

Is used for regulating the luminosity sensitivity level of the photocell.

S25 ..... Auto positioning switch

Put the switch in position AUTO to activate ASM (Auto Rise and Lower Safety Mast).

Put the switch in position MAN to de-activate ASM.

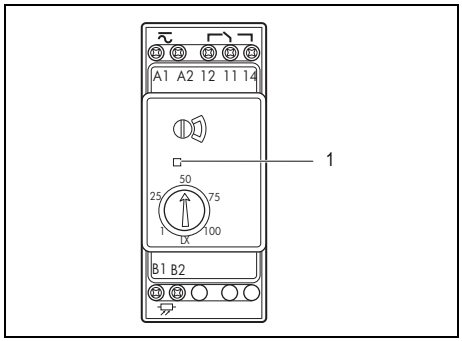
H1 ..... Buzzer

An intermittent alarm sound indicates that the mast is being extended/lowered.

Setting the sensitivity regulator

The photocell sensitivity regulator is used for regulating the luminosity sensitivity level of the photocell.

When the red LED (1) on the regulator is blinking, the regulator is reading the luminosity level measured by the photocell.



There are 2 blinking levels:

– Level 1: slow blinking

  The photocell detects there is enough light, according to its set sensitivity level.

– Level 2: fast blinking

  The photocell detects there is a prolonged luminosity change that falls below the set sensitivity level. Remote start will be triggered and the floodlights of the light tower will switch on automatically (if Remote start and Auto mode are selected, see also chapter “Operating the light tower” on page 28).

The recommended value to set the regulator is at 50 Lux.

– < 50 Lux: the floodlights switch on.

– > 50 Lux: the floodlights switch off.

The luminosity level can be adjusted to a desired higher/lower level, according to the specific operating conditions of the light tower.

7.4.7.2 Weekly timer

Setting the timer

menu	Press the menu key to enter the editing menu. When in the editing menu, press the menu key to return to Auto mode, without saving the last change.
+ / -	Navigation and value setting keys
ok	Flashing information validation key.

At first use (or after Reset):

– Choose the language (French, English,...).

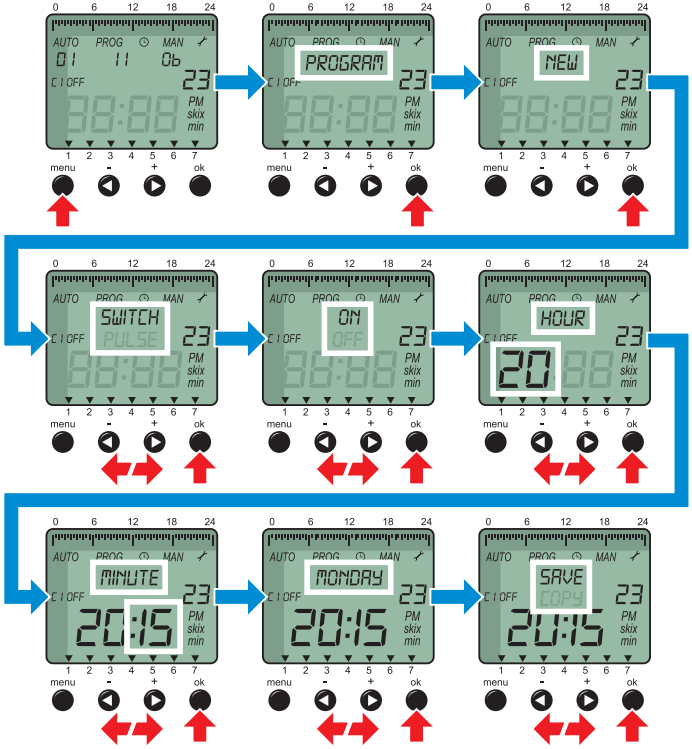
– Choose to delete or to keep the default set program.

– Set the year, day and time.

– Choose the summer/winter time change over parameters.

Setting the ON and OFF triggers of the timer

To program the ON trigger proceed as follows:



To program the OFF trigger follow the menu flow above and select OFF after selecting ‘SWITCH’.

When both the photocell and the timer option are installed, the lamps of the light tower will switch on/off, depending on which of both options triggers first.

7.4.8 Standard cubicle

The standard cubicle includes:

- Oil pressure signal
- Water temperature signal
- Low fuel level
- Fuel gauge
- Running hour meter
- Floodlight switches

8 Storage of the light tower

8.1 Storage

– Store the light tower horizontally in a dry, frost-free room which is well ventilated.

– Run the engine regularly, e.g. once a week, until it is warmed up. This will ensure that the machine remains operational and is ready to be used when needed. If this is impossible, extra precautions must be taken:
  • Consult the engine's operator manual.
  • Remove the battery. Store it in a dry, frost-free room. Keep the battery clean and its terminals lightly covered with petroleum jelly. Recharge the battery regularly.
  • Clean the light tower and protect all electrical components against moisture.
  • Place silica gel bags, VCI paper (Volatile Corrosion Inhibitor) or another drying agent inside the light tower and close the doors.
  • Stick sheets of VCI paper with adhesive tape on the bodywork to close off all openings.
  • Wrap the light tower, except the bottom, with a protective tarpaulin to avoid possible damage and corrosion due to environmental conditions.

8.2 Preparing for operation after storage

Before operating the light tower again, remove the wrapping, VCI paper and silica gel bags and check the light tower thoroughly (go through the checklist "Before starting" on page 28).

– Consult the engine's operator manual.

– Check that the insulation resistance of the alternator exceeds 5 MΩ.

– Replace the fuel filter and fill the fuel tank. Vent the fuel system.

– Reinstall and connect the battery, if necessary after being recharged.

– Submit the light tower to a test run.

9 Disposal

9.1 General

When developing products and services, Atlas Copco tries to understand, address, and minimize the negative environmental effects that the products and services may have, when being manufactured, distributed, and used, as well as at their disposal.

Recycling and disposal policy are part of the development of all Atlas Copco products. Atlas Copco company standards determine strict requirements.

Selecting materials the substantial recyclability, the disassembly possibilities and the separability of materials and assemblies are considered as well as the environmental perils and dangers to health during the recycling and disposal of the unavoidable rates of not recyclable materials.

Your Atlas Copco light tower mainly consists of metallic materials, that can be re-melted in steelworks and smelting works and that is therefore almost infinite recyclable. The plastic used is labelled; sorting and fractioning of the materials for recycling in the future is foreseen.

This concept can only succeed with your help. Support us by disposing professionally. By assuring a correct disposal of the product you help to prevent possible negative consequences for environment and health, that can occur with an inappropriate waste handling.
Recycling and re-usage of material helps to preserve natural resources.

9.2 Disposal of materials

Dispose contaminated substances and material separately, according to local applicable environmental legislation.

Before dismantling a machine at the end of its operating lifetime drain all fluids and dispose of according the applicable local disposal regulations.

Remove the batteries. Do not throw batteries into the fire (explosion risk) or into the residual waste. Separate the machine into metal, electronics, wiring, hoses, insulation and plastic parts.

Dispose all components according to the applicable disposal regulations.

Remove spilled fluid mechanically; pick up the rest with absorbing agent (for example sand, sawdust) and dispose it according the applicable local disposal regulations. Do not drain into the sewage system or surface water.

10 Technical specifications of the light tower

10.1 Technical specifications of the engine/alternator/unit

		H2	H5+
Reference conditions 1)	Rated frequency	50 Hz	50 Hz
	Rated speed	1500 rpm	1500 rpm
	Generator service duty	PRP	PRP
	Absolute air inlet pressure	1 bar(a)	1 bar(a)
	Relative air humidity	30%	30%
	Air inlet temperature	25 °C	25 °C
Limitations 2)	Maximum ambient temperature	50 °C	50 °C
	Altitude capability	3000 m	3000 m
	Maximum relative air humidity	80%	80%
	Minimum starting temperature	-10 °C	-10 °C
	Minimum starting temperature, with coldstart equipment (option)	-25 °C	-25 °C
Performance data 2) 3) 4) 5)	Rated active power (PRP)	2.7 kW	2.7 kW
	Rated apparent power (PRP)	2.7 kVA	2.7 kVA
	Rated voltage line to line voltage	230 V	230 V
	Rated current	11.74 A	11.74 A
	Performance class (acc. ISO 8528-5:2005)	G1	G1
	Single step load acceptance	100%	100%
		2.7 kW	2.7 kW
	Frequency droop	<8%	<8%
	Fuel consumption at 0% load	0.24 kg/h	0.24 kg/h
	Fuel consumption at 50% load	0.66 kg/h	0.66 kg/h
	Fuel consumption at 75% load	0.72 kg/h	0.72 kg/h
	Fuel consumption at 100% load	0.86 kg/h	0.86 kg/h
	Specific fuel consumption	0.319 kg/kWh	0.319 kg/kWh
	Fuel autonomy at full load with standard tank	131 h	131 h

	Maximum oil consumption at full load (max. 1% of fuel consumption)	0,001 l/h	0,001 l/h
	Maximum sound power level (Lw) complies with 2000/14/EC	88 dB(A)	88 dB(A)
	Capacity of standard fuel tank	131 l	131 l
	Single step load capability	100%	100%
		2.7 kW	2.7 kW
Application data	Mode of operation	PRP	PRP
	Site	land use	land use
	Operation	single	single
	Start-up and control mode	manual/auto	manual/auto
	Start-up time	unspecified	unspecified
	Mobility/Config. acc. to ISO 8528-1:1993	transportable	transportable
		D	D
	Mounting	fully resilient	fully resilient
	Climatic exposure	open air	open air
Design data engine	Standard	ISO 3046	ISO 3046
		ISO 8528-2	ISO 8528-2
	Make	HATZ	HATZ
	Model	1B50T	1B50T
	Rated net output	3.5 kW	3.5 kW
	Rating type (acc. ISO 3046-7)	ICXN	ICXN
	Coolant	Air	Air
	Combustion system	direct injection	direct injection
	Aspiration	natural aspirated	natural aspirated
	Number of cylinders	1	1
	Swept volume	0.517 l	0.517 l
	Speed governing	mechanical	mechanical
	Capacity of oil sump - Initial fill	3.5 l	3.5 l
	Electrical system	12 Vdc	12 Vdc
Design data alternator 4)	Standard	IEC34-1	IEC34-1
		ISO 8528-3	ISO 8528-3

	Make	LINZ	LINZ
	Model	E1C13S A/4	E1C13S A/4
	Rated output, class H temperature rise	5.5 kVA	5.5 kVA
	Rating type (acc. ISO 8528-3)	125/40°C	125/40°C
	Degree of protection (IP index acc. NF EN 60-529)	IP 23	IP 23
	Insulation stator class	H	H
	Insulation rotor class	H	H
	Number of wires	4	4
Electrical power circuit	**Circuit-breaker 1ph:**		
	Number of poles	2	2
	Thermal release (lt)	13 A	–
	Fault current protection, residual current release, Idn	0.03 A	0.03 A
	Circuit-breaker 1ph:		
	Number of poles	1	1
	Thermal release (lt)	6 A	6 A
	Magnetic release (lm)	C curve	C curve
	Circuit-breaker 1ph:		
	Number of poles	1	1
	Thermal release (lt)	10 A	10 A
	Magnetic release (lm)	C curve	C curve
	Fault current protection, insulation resistance (option)	1-200 kΩ	1-200 kΩ
Lights	Number of lights	4	4
	Type of lights	Metal Halide	LED
	Light output	400 W	350 W
	Lamp current	1.93 A	1.52 A
	Tower height	7.8 m	8.1 m
Dimensions	Fully deployed - on road (LxWxH)	1920 x 2344 x 7810 mm	1920 x 2344 x 8129 mm
	Transport mode - on road (LxWxH)	2054 x 1280 x 2263mm	2054 x 1280 x 2504 mm
	Total unit weight - on road	958.5-1091.2 kg	988.5-1121.2 kg

Notes

1) Reference conditions for engine performance to ISO 3046-1.

2) See derating diagram below or consult the factory for other conditions.

3) At reference conditions unless otherwise stated.

4) Rating definition (ISO 8528-1):
LTP: Limited Time Power is the maximum electrical power which a generating set is capable of delivering (at variable load), in the event of a utility power failure (for up to 500 hours per year of which a maximum of 300 hours is continuous running). No overload is permitted on these ratings. The alternator is peak continuous rated (as defined in ISO 8528-3) at 25°C.
PRP: Prime Power is the maximum power available during a variable power sequence, which may be run for an unlimited number of hours per year, between stated maintenance intervals and under the stated ambient conditions. A 10% overload is permitted for 1 hour in 12 hours. The permissible average power output during a 24h period shall not exceed the stated load factor as indicated on the AML.

5) Specific mass fuel used: 0.86 kg/l.

6) Thermal release is higher at 25°C.

Derating table (in %) 50 Hz - Humidity 20%

Height (m)	Px (kPa)	Temperature (ºC)										
		0	5	10	15	20	25	30	35	40	45	50
0	**101,4**	111%	109%	107%	105%	104%	102%	100%	99%	97%	95%	93%
500	**95,3**	103%	101%	100%	98%	96%	95%	93%	92%	90%	88%	87%
1000	**89,6**	96%	94%	93%	91%	90%	88%	87%	85%	83%	82%	80%
1500	**84,2**	89%	87%	86%	85%	83%	82%	80%	79%	77%	76%	74%
2000	**79,2**	83%	81%	80%	78%	77%	76%	74%	73%	71%	70%	69%
2500	**74,4**	77%	75%	74%	73%	71%	70%	69%	67%	66%	65%	63%
3000	**70**	71%	70%	68%	67%	66%	65%	64%	62%	61%	60%	58%
3500	**65,8**	66%	64%	63%	62%	61%	60%	59%	57%	56%	55%	54%
4000	**61,8**	61%	60%	58%	57%	56%	55%	54%	53%	52%	50%	49%
4500	**58,1**	56%	55%	54%	53%	52%	51%	50%	49%	47%	46%	45%
5000	**54,6**	52%	51%	50%	49%	48%	47%	46%	45%	43%	42%	41%

Derating table (in %) 50 Hz - Humidity 40%

Height (m)	Px (kPa)	Temperature (ºC)										
		0	5	10	15	20	25	30	35	40	45	50
0	**101,4**	111%	109%	107%	105%	103%	101%	99%	97%	95%	93%	91%
500	**95,3**	103%	101%	99%	98%	96%	94%	92%	90%	88%	86%	84%
1000	**89,6**	96%	94%	92%	91%	89%	87%	86%	84%	82%	80%	78%
1500	**84,2**	89%	87%	86%	84%	83%	81%	79%	78%	76%	74%	72%
2000	**79,2**	82%	81%	80%	78%	77%	75%	73%	72%	70%	68%	66%
2500	**74,4**	76%	75%	74%	72%	71%	69%	68%	66%	64%	63%	61%
3000	**70**	71%	69%	68%	67%	65%	64%	63%	61%	59%	58%	56%
3500	**65,8**	65%	64%	63%	62%	60%	59%	58%	56%	55%	53%	51%
4000	**61,8**	61%	59%	58%	57%	56%	54%	53%	52%	50%	48%	47%
4500	**58,1**	56%	55%	54%	52%	51%	50%	49%	47%	46%	44%	43%
5000	**54,6**	51%	50%	49%	48%	47%	46%	45%	43%	42%	40%	39%

Derating table (in %) 50 Hz - Humidity 60%

Height	Px	Temperature (ºC)										
(m)	(kPa)	0	5	10	15	20	25	30	35	40	45	50
0	**101,4**	110%	109%	107%	105%	103%	100%	98%	96%	93%	90%	87%
500	**95,3**	103%	101%	99%	97%	95%	93%	91%	89%	86%	83%	80%
1000	**89,6**	95%	94%	92%	90%	88%	86%	84%	82%	80%	77%	74%
1500	**84,2**	89%	87%	85%	84%	82%	80%	78%	76%	73%	71%	68%
2000	**79,2**	82%	81%	79%	78%	76%	74%	72%	70%	68%	65%	62%
2500	**74,4**	76%	75%	73%	72%	70%	68%	67%	64%	62%	60%	57%
3000	**70**	71%	69%	68%	66%	65%	63%	61%	59%	57%	55%	52%
3500	**65,8**	65%	64%	63%	61%	60%	58%	56%	54%	52%	50%	47%
4000	**61,8**	60%	59%	58%	57%	55%	54%	52%	50%	48%	45%	43%
4500	**58,1**	56%	54%	53%	52%	51%	49%	47%	46%	44%	41%	39%
5000	**54,6**	51%	50%	49%	48%	46%	45%	43%	42%	40%	37%	35%

Derating table (in %) 50 Hz - Humidity 80%

Height	Px	Temperature (ºC)										
(m)	(kPa)	0	5	10	15	20	25	30	35	40	45	50
0	**101,4**	110%	108%	106%	104%	102%	100%	97%	95%	92%	88%	85%
500	**95,3**	103%	101%	99%	97%	95%	93%	90%	88%	85%	82%	78%
1000	**89,6**	95%	94%	92%	90%	88%	86%	83%	81%	8%	75%	72%
1500	**84,2**	88%	87%	85%	83%	81%	79%	77%	75%	72%	69%	66%
2000	**79,2**	82%	81%	79%	77%	75%	73%	71%	69%	66%	63%	60%
2500	**74,4**	76%	75%	73%	71%	70%	68%	66%	63%	61%	58%	55%
3000	**70**	70%	69%	68%	66%	64%	63%	61%	58%	56%	53%	50%
3500	**65,8**	65%	64%	62%	61%	59%	58%	56%	53%	51%	48%	45%
4000	**61,8**	60%	59%	58%	56%	55%	53%	51%	48%	46%	44%	41%
4500	**58,1**	55%	54%	53%	52%	50%	48%	47%	45%	42%	40%	37%
5000	**54,6**	51%	50%	49%	47%	46%	44%	43%	41%	38%	36%	33%

For use of the light tower outside these conditions, please contact Atlas Copco.

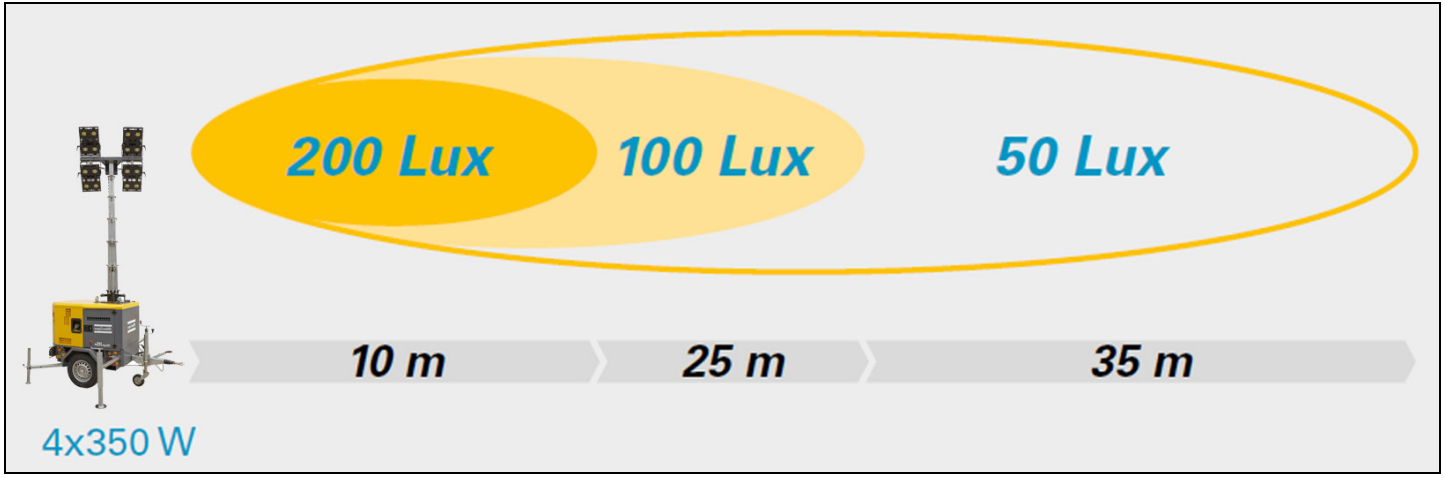
10.2 Critical bolt connections

Parts to assembly A	Parts to assembly B	Dimension	Quality	Torque (Nm)	Allowed deviation (Nm)	Additional treatment	Applicable standard
Lower rotation system (central hole)	Base frame	M14	8.8	115	± 29		TEST
Lower rotation system	Base frame	M10	8.8	48.2	± 5		AC - STD 4369
Mast - Rotatory system	Lower rotation system	M8	8.8	24.3	± 5		AC - STD 4369
Upper rotation system	Canopy / Lifting beam	M8	8.8	24.3	± 5		AC - STD 4369
Friction plates	Mast segments	M5	8.8	6	± 0,5		AC - STD 4369
Fuel tank (plastic)	Support	M10	8.8	7.5	± 0		ROTOBASQUE STD
Support M6	Base frame	M6	8.8	10.1	± 1		AC - STD 4369
Support M8	Base frame	M8	8.8	24.3	± 2,5		AC - STD 4369
Lifting beam	Base frame	M10	8.8	48,2	± 5		AC - STD 4369
Roof	Lifting beam	M8	8.8	24.3	± 2,5		AC - STD 4369
Engine	Alternator flange	M10	8.8	25		Loctite 2107	LINZ STD
Engine	Shock absorber	M10	8.8	16.8			LESOL STD
Engine support	Floor	M10	8.8	48.2	± 5		AC - STD 4369
Alternator	Shock absorber	M10	8.8	16.8			AC - STD 4369
Alternator support	Floor	M10	8.8	48.2	± 5		AC - STD 4369
Floor	Base frame	M10	8.8	48.2	± 5		AC - STD 4369
Upper mast segment	Mast head	M10	8.8	48.2	± 5		AC - STD 4369
Mast head	LED floodlight support	M18	8.8	75		Loctite 2107	TEST
LED floodlight support	LED floodlight	M10	8.8	20			TEST
Mast head	MH floodlight support	M12	8.8	45		Loctite 2107	TEST
MH floodlight support	MH floodlight	M10	8.8	25		Loctite 2107	TEST

Wheel	Axle	M12 conical		120			AL-KO STD
Axle	Base frame	M12	8.8	83			AL-KO STD
Towbar	Base frame	M12	8.8	85			AL-KO STD
Coupling	Towbar	M12	8.8	85			AL-KO STD

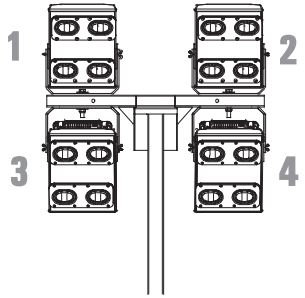
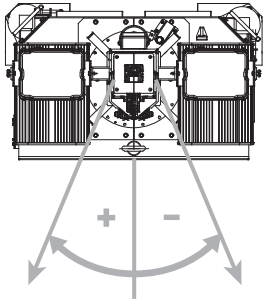
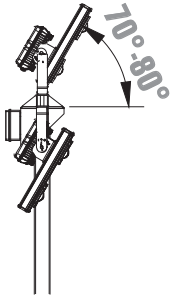
Parts to assembly A	Parts to assembly B	Dimension	Quality	Torque (Nm)	Allowed deviation (Nm)	Additional treatment	Applicable standard
Standard torques for metric bolted joints		M4	8.8	2.51	± 0.63		AC - STD 4369
		M5	8.8	4.96	± 1.24		AC - STD 4369
		M6	8.8	8.40	± 2.1		AC - STD 4369
		M8	8.8	20.30	± 5		AC - STD 4369
		M10	8.8	40.20	± 10		AC - STD 4369
		M12	8.8	69.00	± 17		AC - STD 4369
		M14	8.8	109.00	± 28		AC - STD 4369

10.3 Average illumination versus distance

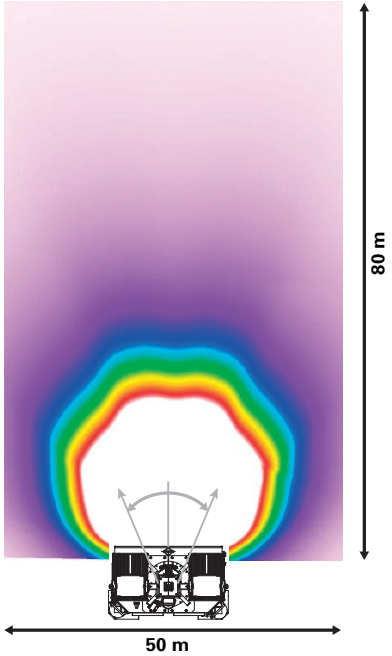
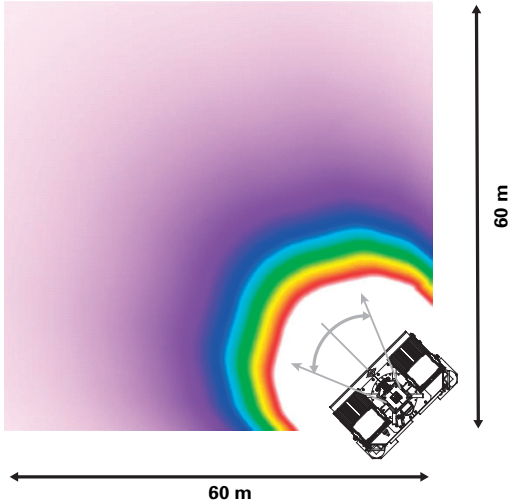


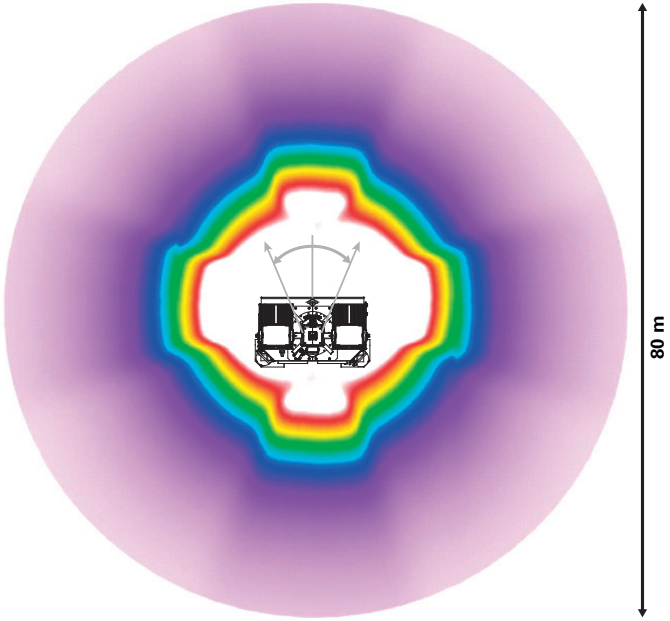
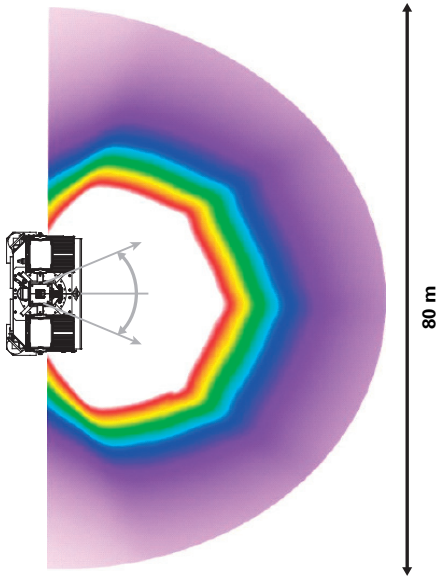
Lux	200	100	50
Job	Administrative jobs	Manual jobs	Earth moving

10.4 Floodlight lux level

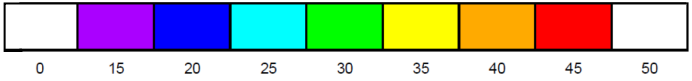
Lamps	Rotation angle	Inclination angle
		

Case	Angle	Lamp 1	Lamp 2	Lamp 3	Lamp 4
1	**Inclination**	80	80	70	70
	Rotation	0	0	-25	+25
2	**Inclination**	80	80	70	70
	Rotation	+10	-10	-20	+20
3	**Inclination**	80-70	80-70	80-70	80-70
	Rotation	0	-180	-90	+90
4	**Inclination**	80	80	70	70
	Rotation	-20	-20	-60	+60

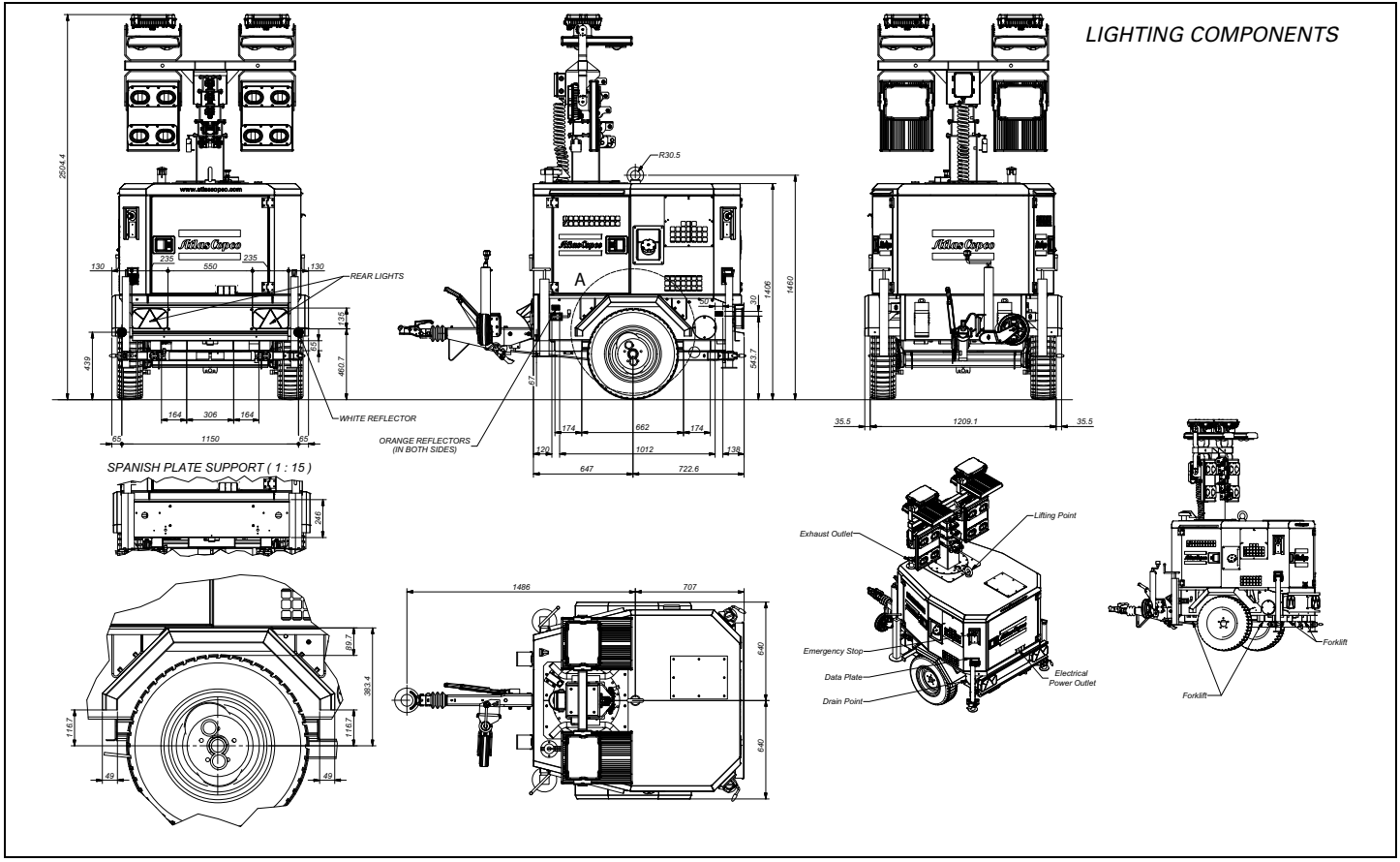
Case 1	Case 2
	
Average Lux: 23 *4000 m²*	*Average Lux: 23* *3600 m²*

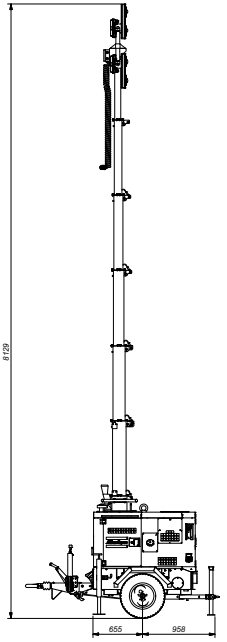
Case 3	Case 4
	
Average Lux: 20 *5000 m²*	*Average Lux: 33* *2500 m²*

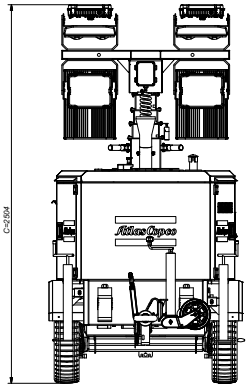
Lux level:

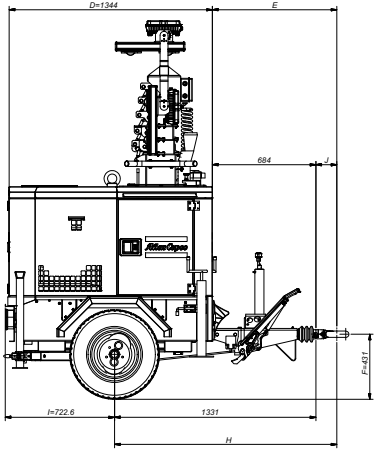


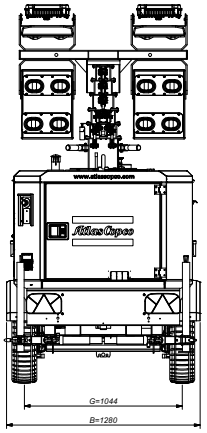
10.5 Dimensions

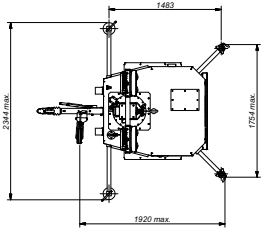










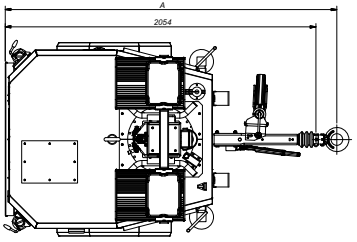


MAIN DIMENSIONS		
DIMENSION	KEY	LENGHT (mm)
A	TOTAL LENGHT	SEE COUPLING SYSTEM TABLE
B	TOTAL WIDTH	1280
C	TOTAL HEIGHT	2504
D	BASEFRAME LENGHT	1344
E	TOWBAR LENGHT	SEE COUPLING SYSTEM TABLE
F	TOWBAR HEIGHT	431
G	WHEEL TRACK WIDTH	1044
H	FRONT CANTILEVER	SEE COUPLING SYSTEM TABLE
I	REAR CANTILEVER	722.6

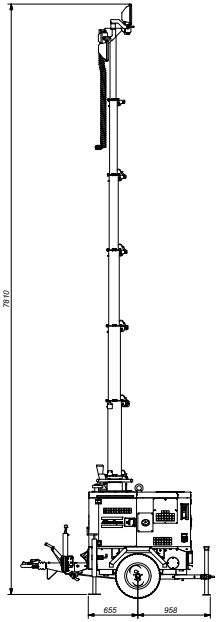
COUPLING SYSTEM				
TYPE	J	A	E	H
AK160 HEAD ϕ50	188	2242	872	1522
DIN EYE ϕ40	166.5	2220.5	850.5	1500.5
ITA EYE ϕ45	170.5	2224.5	854.5	1504.5
FRA EYE ϕ68	142.5	2196.5	826.5	1476.5
NATO EYE ϕ76	147.5	2201.5	831.5	1481.5
UK EYE ϕ40	166	2220	850	1500

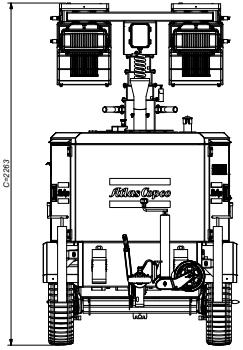
LT ON ROAD TOWBAR			
WEIGHT	TOTAL	WEIGHT ON AXLE	WEIGHT ON TOWING EYE
MAXIMUM	1121.2	1045.3	75.9
MINIMUM	988.5	945.6	42.9

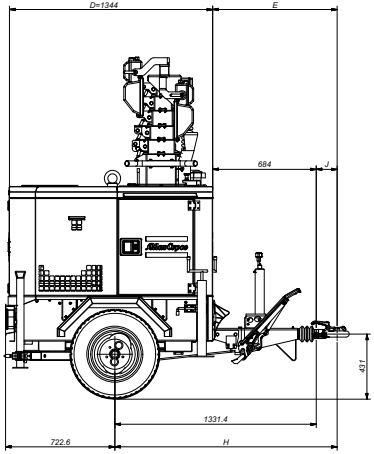
MTPLM	MASS (kg)
MAXIMUM TECHNICALLY PERMISIBLE LADEN MASS	1300

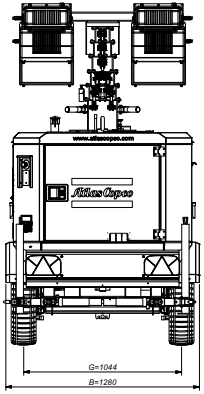


ON ROAD UNDERCARRIAGE + LED

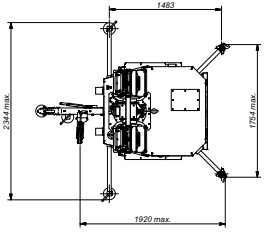








MAIN DIMENSIONS		
DIMENSION	KEY	LENGHT (mm)
A	TOTAL LENGHT	SEE COUPLING SYSTEM TABLE
B	TOTAL WIDTH	1280
C	TOTAL HEIGHT	2263
D	BASEFRAME LENGHT	1344
E	TOWBAR LENGHT	SEE COUPLING SYSTEM TABLE
F	TOWBAR HEIGHT	431
G	WHEEL TRACK WIDTH	1044
H	FRONT CANTILEVER	SEE COUPLING SYSTEM TABLE
I	REAR CANTILEVER	722.6



COUPLING SYSTEM				
TYPE	J	A	E	H
AK160 HEAD ϕ50	188	2242	872	1522
DIN EYE ϕ40	166.5	2220.5	850.5	1500.5
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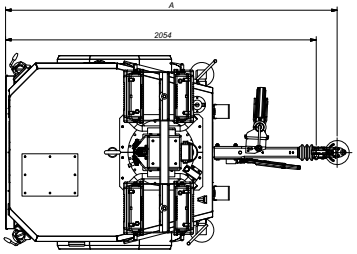
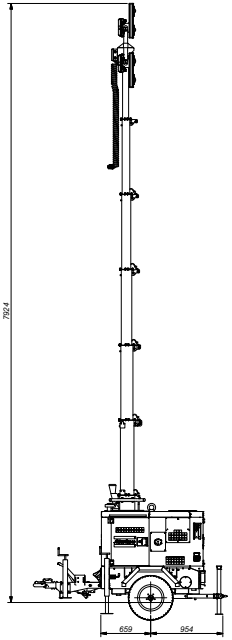
NATO EYE ϕ76	147.5	2201.5	831.5	1481.5
UK EYE ϕ40	166	2220	850	1500

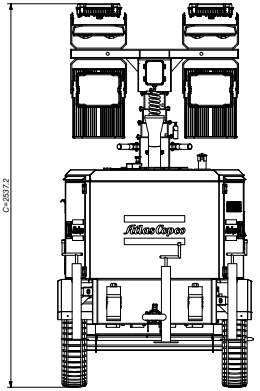


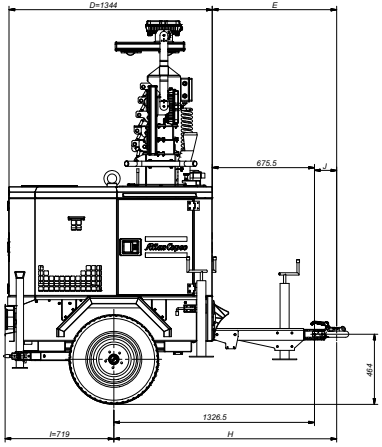
LT.ON ROAD TOWBAR			
WEIGHT	TOTAL	WEIGHT ON AXLE	WEIGHT ON TOWING EYE
MAXIMUM	1091.2	1018.3	72.9
MINIMUM	958.5	925.3	33.2

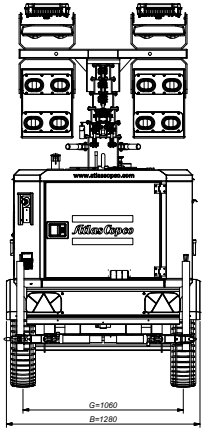
MTPLM	MASS (kg)
MAXIMUM TECHNICALLY PERMISIBLE LADEN MASS	1300

ON ROAD UNDERCARRIAGE
+ METAL HALIDE

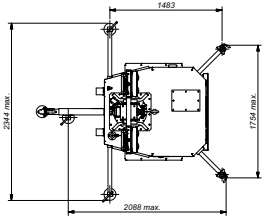




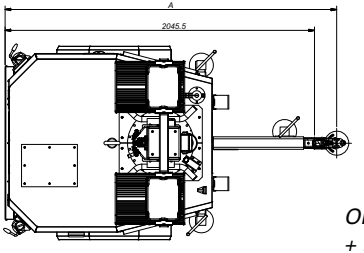




MAIN DIMENSIONS		
DIMENSION	KEY	LENGHT (mm)
A	TOTAL LENGHT	SEE COUPLING SYSTEM TABLE
B	TOTAL WIDTH	1280
C	TOTAL HEIGHT	2537.2
D	BASEFRAME LENGHT	1344
E	TOWBAR LENGHT	SEE COUPLING SYSTEM TABLE
F	TOWBAR HEIGHT	464
G	WHEEL TRACK WIDTH	1060
H	FRONT CANTILEVER	SEE COUPLING SYSTEM TABLE
I	REAR CANTILEVER	719

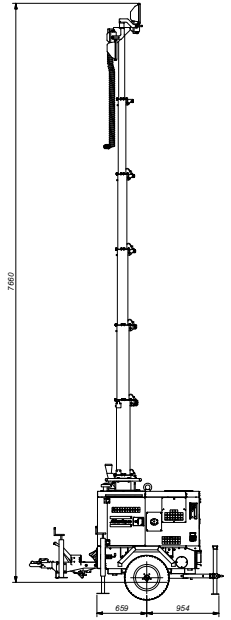


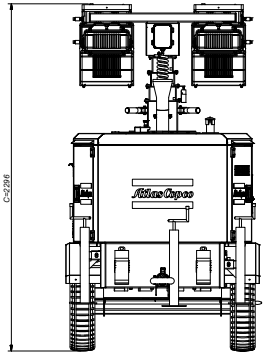
COUPLING SYSTEM				
TYPE	J	A	E	H
AK160 HEAD Φ50	188	2242	872	1522
DIN EYE Φ40	166.5	2220.5	850.5	1500.5
ITA EYE Φ45	170.5	2224.5	854.5	1504.5
FRA EYE Φ68	142.5	2196.5	826.5	1476.5
NATO EYE Φ76	147.5	2201.5	831.5	1481.5
UK EYE Φ40	166	2220	850	1500

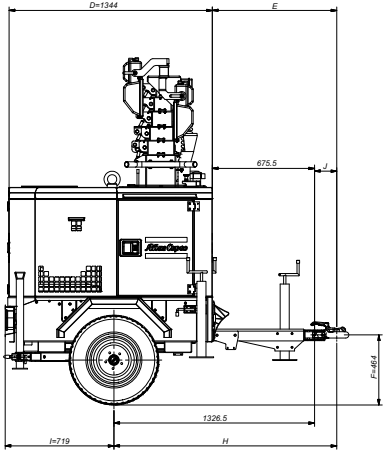


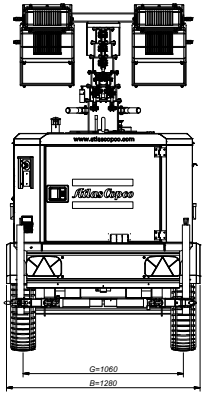
OFF ROAD UNDERCARRIAGE + LED

Atlas Copco

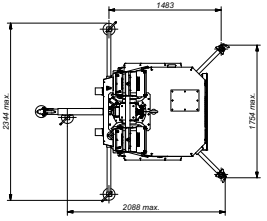








MAIN DIMENSIONS		
DIMENSION	KEY	LENGHT (mm)
A	TOTAL LENGHT	SEE COUPLING SYSTEM TABLE
B	TOTAL WIDTH	1280
C	TOTAL HEIGHT	2296
D	BASEFRAME LENGHT	1344
E	TOWBAR LENGHT	SEE COUPLING SYSTEM TABLE
F	TOWBAR HEIGHT	464
G	WHEEL TRACK WIDTH	1060
H	FRONT CANTILEVER	SEE COUPLING SYSTEM TABLE
I	REAR CANTILEVER	719



COUPLING SYSTEM				
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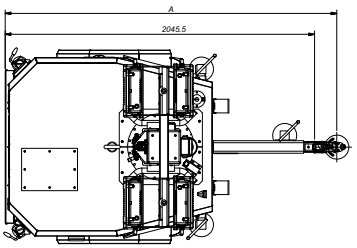
NATO EYE Φ76	147.5	2201.5	831.5	1481.5
UK EYE Φ40	166	2220	850	1500



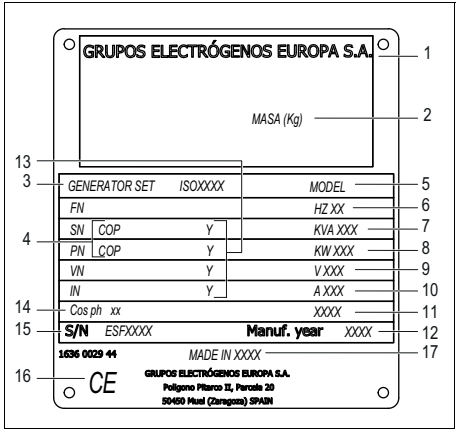
OFF ROAD UNDERCARRIAGE
+ METAL HALIDE

10.6 Conversion list of SI units into British units

1 bar	=	14.504 psi
1 g	=	0.035 oz
1 kg	=	2.205 lbs
1 km/h	=	0.621 mile/h
1 kW	=	1.341 hp (UK and US)
1 l	=	0.264 US gal
1 l	=	0.220 lmp gal (UK)
1 l	=	0.035 cu.ft
1 m	=	3.281 ft
1 mm	=	0.039 in
1 m^3/min	=	35.315 cfm
1 mbar	=	0.401 in wc
1 N	=	0.225 lbf
1 Nm	=	0.738 lbf.ft
$t_{°F}$	=	32 + (1.8 x $t_{°C}$)
$t_{°C}$	=	($t_{°F}$ - 32)/1.8

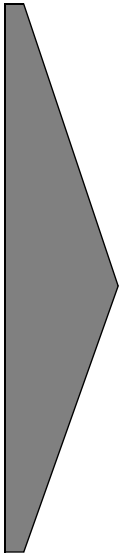
A temperature difference of 1°C = a temperature difference of 1.8°F.

10.7 Data plate

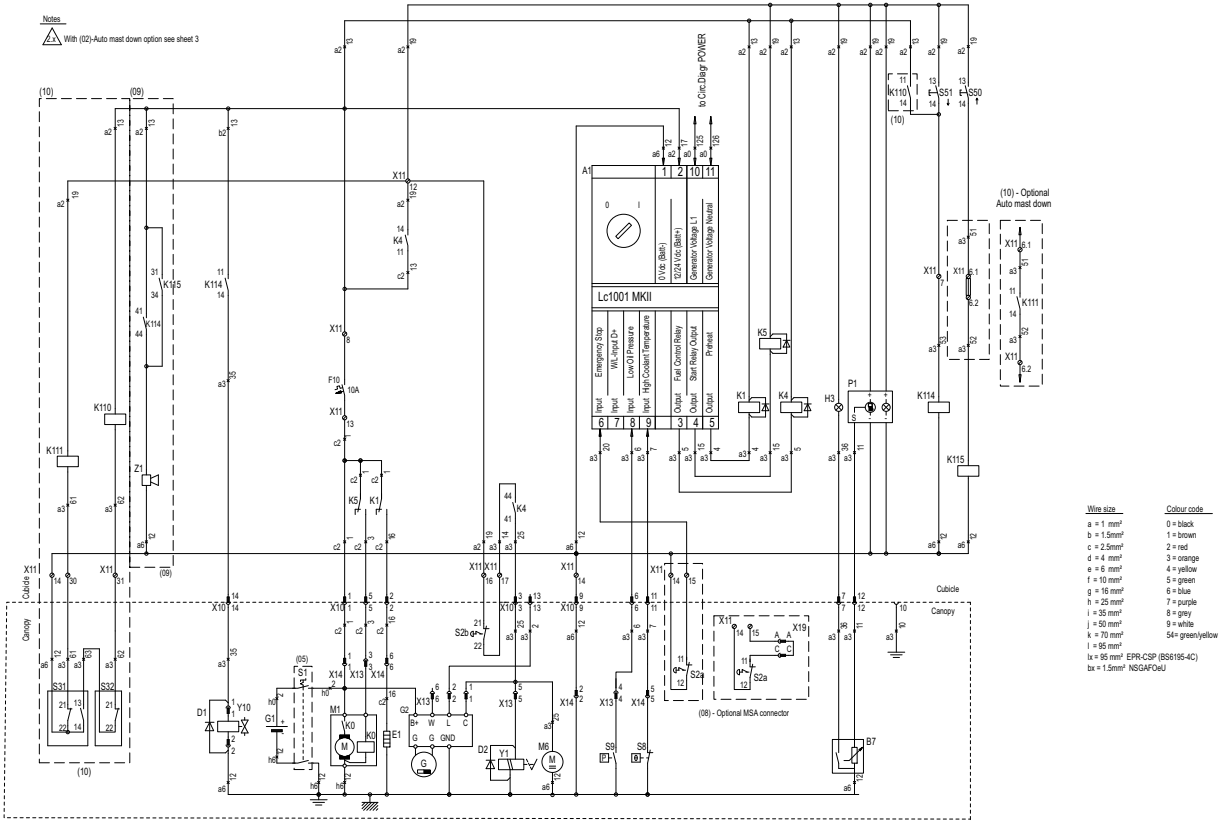


1	Name of manufacturer
2	Maximum permitted total weight of the vehicle
3	Machine type
4	Mode of operation
5	Model number
6	Frequency
7	Apparent power - PRP
8	Active power - PRP
9	Nominal rated voltage
10	Nominal rated current
11	Generator class
12	Manufacturing year
13	Winding connections
14	Power factor
15	Serial number
16	EEC mark in accordance with Machine Directive 89/392E
17	Address of manufacturer

Circuit diagrams



1636 0089 42/01_01
Applicable for HiLight H5+/H2 with Lc1001™, Controller Circuit



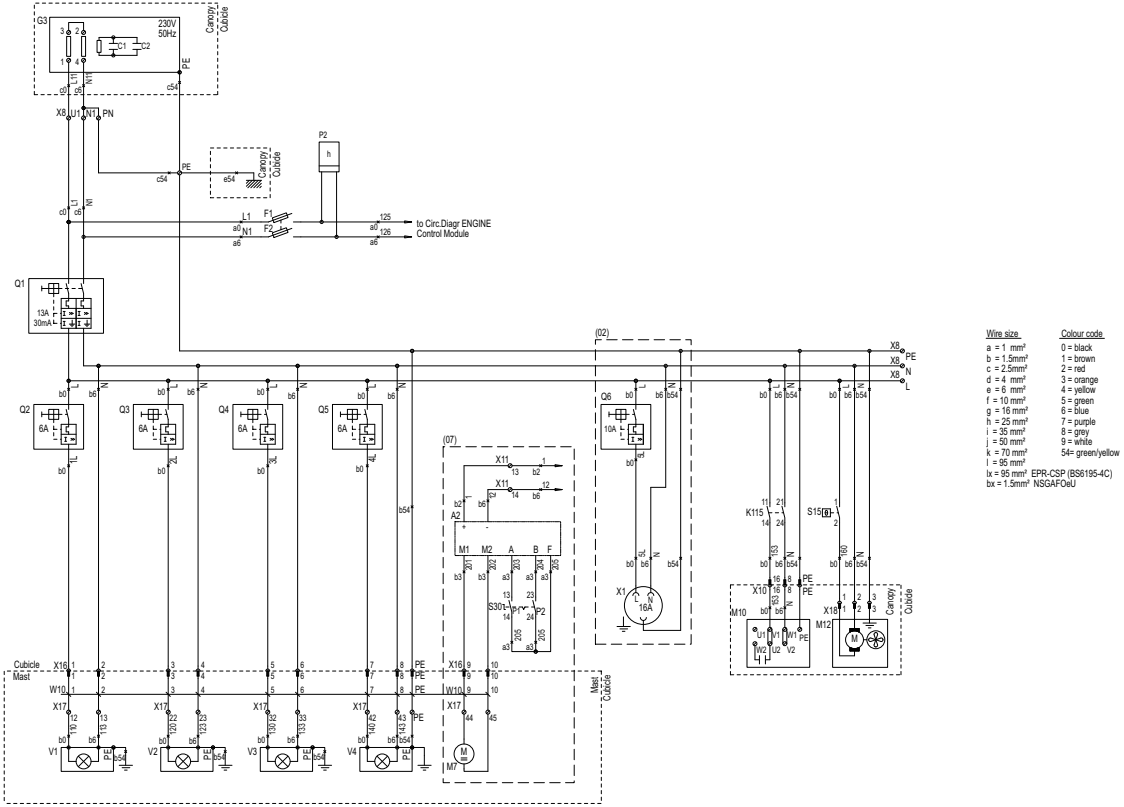
Wire size	Colour code
a = 1 mm²	0 = black
b = 1.5mm²	1 = brown
c = 2.5mm²	2 = red
d = 4 mm²	3 = orange
e = 6 mm²	4 = yellow
f = 10 mm²	5 = green
g = 16 mm²	6 = blue
h = 25 mm²	7 = purple
i = 35 mm²	8 = grey
j = 50 mm²	9 = white
k = 70 mm²	54= green/yellow
l = 95 mm²	

lx = 95 mm² EPR-CSP (BS6195-4C)
bx = 1.5mm² NSGAFOeU

A1	Generator control unit
B7	Fuel level sensor
D1-2	Diode
E1	Preheat resistor
F10	Fuse 10A DC
G1	Battery 12Vdc
G2	Charging regulator
H3	Fuel alarm lamp
K0	Starter solenoid
K1	Preheat relay
K4	Fuel control relay
K5	Starter relay
K110	Mast down aux. relay
K111	Mast up aux. relay
K114	Mast down relay
K115	Mast up relay
M1	Starter motor
M6	Fuel feed pump
P1	Fuel feed gauge
S1	Battery switch (05)
S2	Emergency stop
S8	High oil temperature switch
S9	Low oil pressure switch
S31	Brake on switch
S32	Mast down switch
S50	Mast up push button
S51	Mast down push button

X10	Connector wire harness
X11	Auxiliary terminals
X13	Connector engine - A
X14	Connector engine - B
X19	MSA 3P connector
Y1	Fuel stop solenoid
Y10	Mast down solenoid
Z1	Buzzer
(05)	Optional battery switch
(08)	Optional MSA connector
(09)	Optional buzzer
(10)	Optional Auto mast down system

1636 0089 42/01_02
Applicable for HiLight H5+/H2 with Lc1001™, Power Circuit

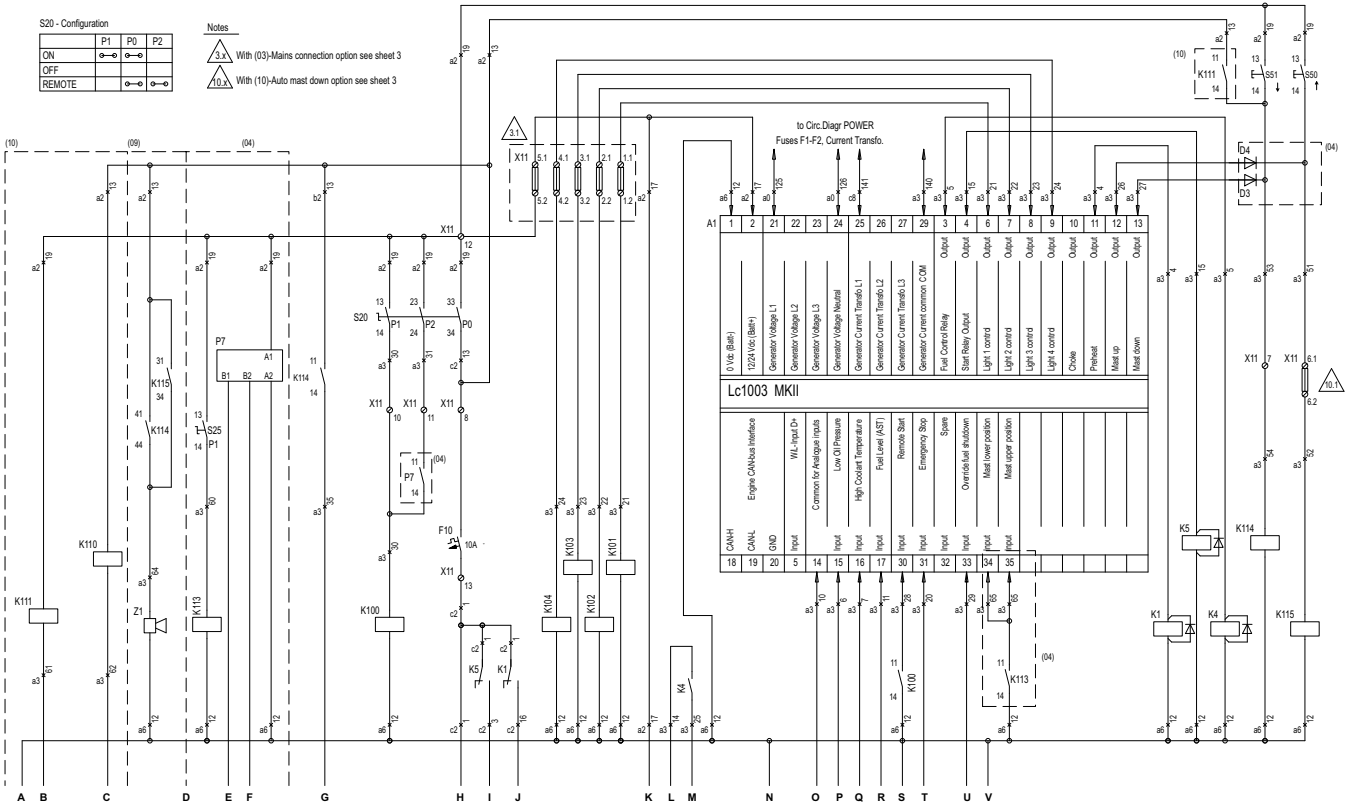


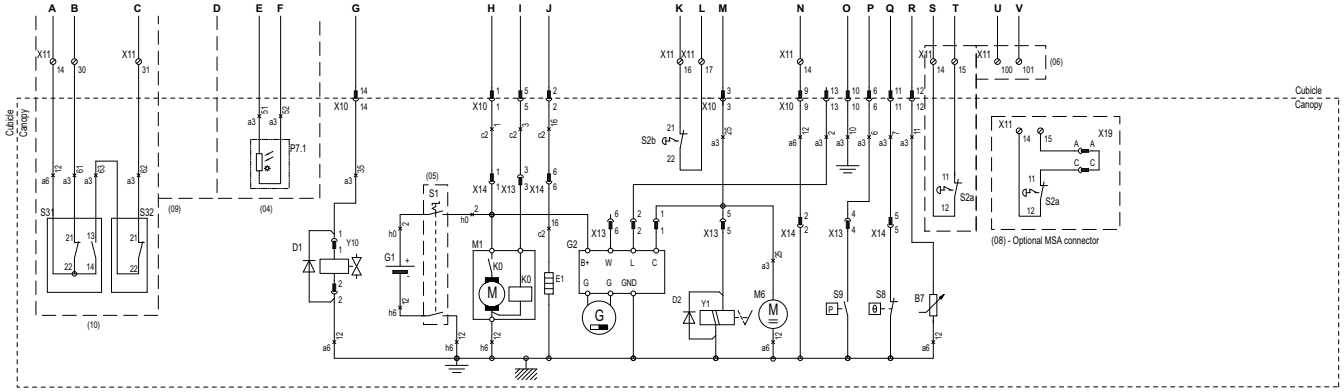
Wire size	Colour code
a = 1 mm²	0 = black
b = 1.5mm²	1 = brown
c = 2.5mm²	2 = red
d = 4 mm²	3 = orange
e = 6 mm²	4 = yellow
f = 10 mm²	5 = green
g = 16 mm²	6 = blue
h = 25 mm²	7 = purple
i = 35 mm²	8 = grey
j = 50 mm²	9 = white
k = 70 mm²	54= green/yellow
l = 95 mm²	

lx = 95 mm² EPR-CSP (BS6195-4C)
bx = 1.5mm² NSGAFOeU

A2	Actuator controller (07)
C1-C2	Capacitor (alternator)
F1-F2	Fuses 2A
G3	Alternator
K115	Mast up relay
M7	Actuator autotilt (07)
M10	Pump
M12	Electrical fan
P2	Run meter
Q1	Earth leakage 25A/30mA
Q2	Circuit breaker 6A
Q3	Circuit breaker 6A
Q4	Circuit breaker 6A
Q5	Circuit breaker 6A
Q6	Circuit breaker 10A (02)
S15	Temperature switch
S30	Autotilt switch up/down (07)
V1-V4	Floodlight
W10	Spiral cable
X1	Outlet socket (02)
X8	AC terminals
X10	Connector wire harness
X16	Connector lighting
X17	Lighting terminals
X18	Connector fan
(02)	Optional power output connections
(07)	Optional autotilt

1636 0089 43/01_01
Applicable for HiLight H5+/H2 with Lc1003™, Controller Circuit





Wire size	Colour code
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e = 6 mm²	4 = yellow
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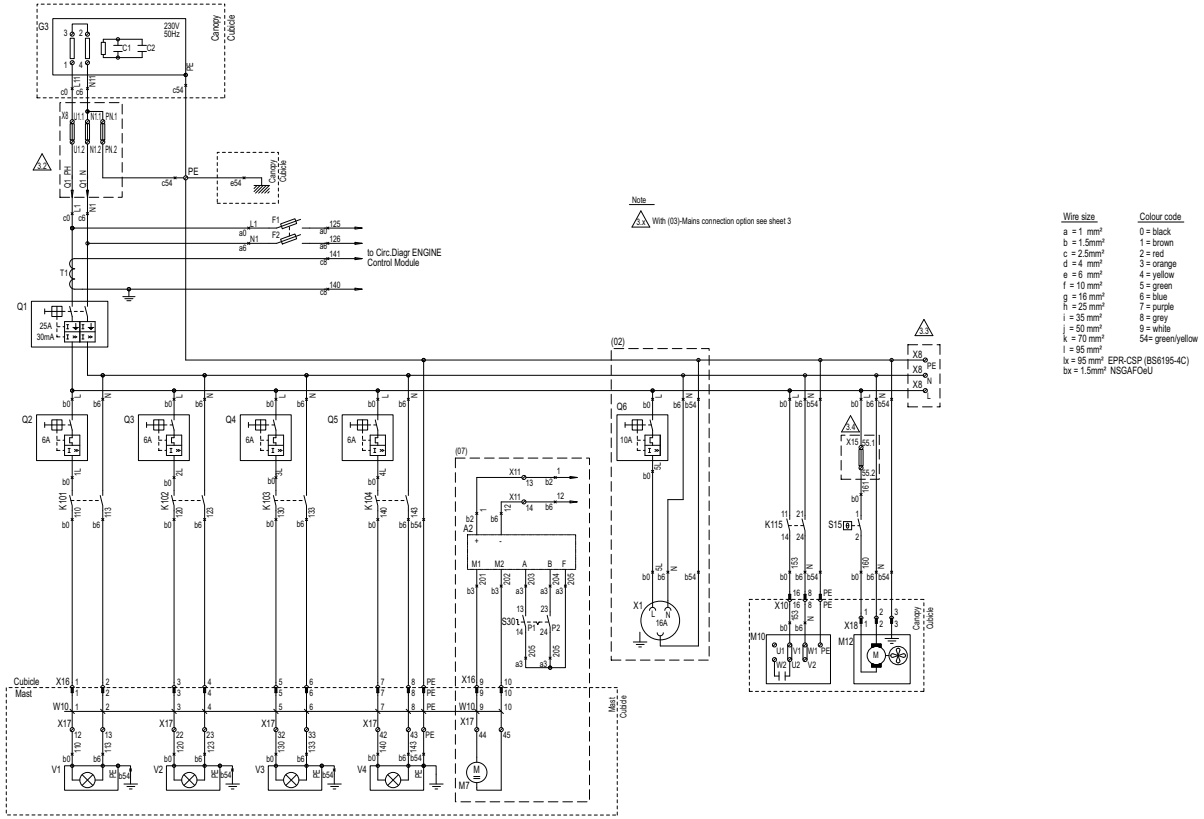
g = 16 mm²	6 = blue
h = 25 mm²	7 = purple
i = 35 mm²	8 = grey
j = 50 mm²	9 = white
k = 70 mm²	54= green/yellow
l = 95 mm²	
lx = 95 mm² EPR-CSP (BS6195-4C)	
bx = 1.5mm² NSGAFOeU	

Atlas Copco

A1	Generator control unit
B7	Fuel level sensor
D1-4	Diode
E1	Preheat resistor
F10	Fuse 10A DC
G1	Battery 12Vdc
G2	Charging regulator
H1	Buzzer
K0	Starter solenoid
K1	Preheat relay
K4	Fuel control relay
K5	Starter relay
K100	Remote start relay
K101-K104	Light control relay
K113	Mast auto positioning (04)
K114	Mast down relay (04)
K115	Mast up relay (04)
M1	Starter motor
M6	Fuel feed pump
P7	Photocell (04)
S1	Battery switch (05)
S2	Emergency stop
S8	High oil temperature switch
S9	Low oil pressure switch
S20	REMOTE/OFF/ON switch
S25	Auto positioning switch (04)
S51	Mast down push button

X10	Connector wire harness
X11	Auxiliary terminals
X13	Connector engine - A
X14	Connector engine - B
X19	MSA 3P connector
X25	Customer's terminals
Y1	Fuel stop solenoid
Y10	Mast down solenoid
(03)	Optional Mains connection (see 16360 089 43/01_03)
(04)	Optional auto start lighting level
(05)	Optional battery switch
(06)	Optional override fuel shutdown (see instruction manual)
(08)	Optional MSA connector
(09)	Optional buzzer
(10)	Optional Auto mast down system

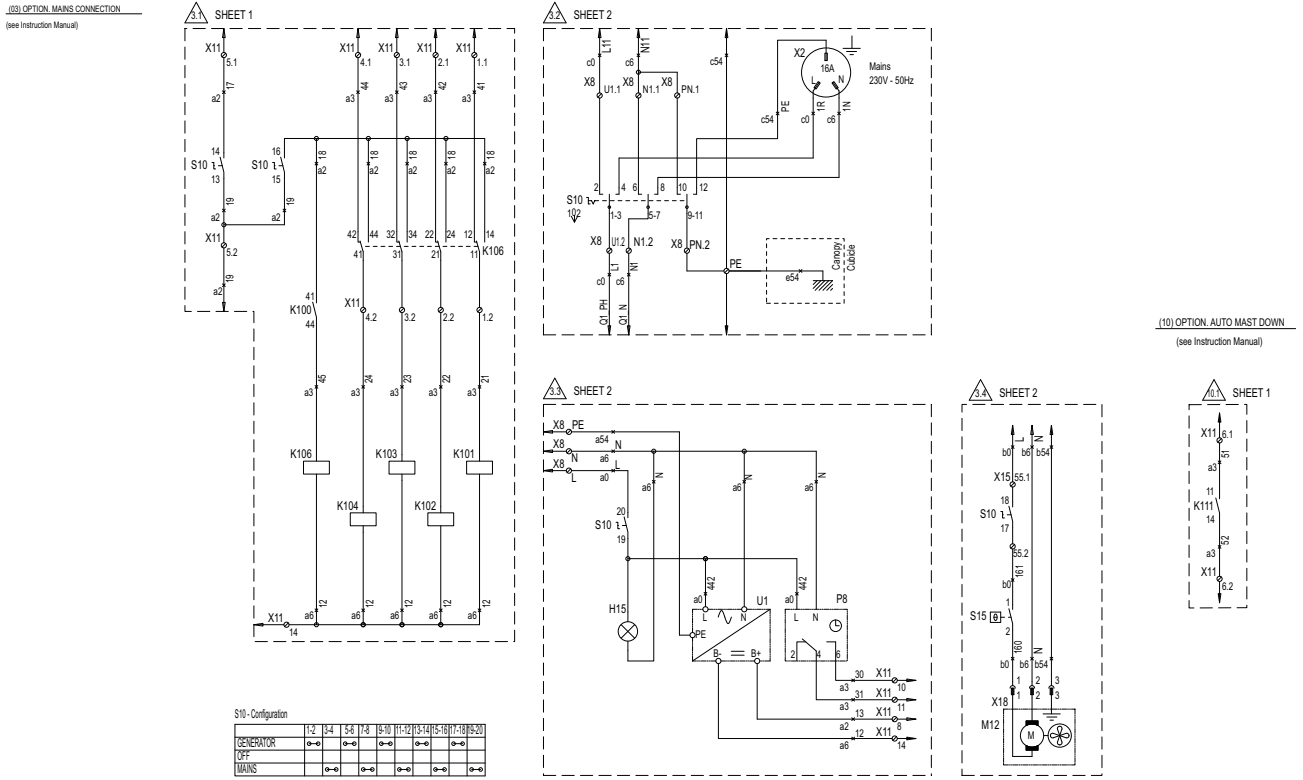
1636 0089 43/01_02
Applicable for HiLight H5+/H2 with Lc1003™, Power Circuit



A2	Actuator controller (07)
C1-C2	Capacitor (alternator)
F1-F2	Fuses 2A
G3	Alternator
K101-104	Light control relay
K115	Mast up relay
M7	Actuator autotilt (07)
M10	Pump
M12	Electrical fan
Q1	Earth leakage 25A/30mA
Q2	Circuit breaker 6A
Q3	Circuit breaker 6A
Q4	Circuit breaker 6A
Q5	Circuit breaker 6A
Q6	Circuit breaker 10A (02)
S15	Temperature switch
S30	Autotilt switch up/down (07)
S50	Mast up push button
T1	Current transformer
V1-V4	Floodlight
W10	Spiral cable
X1	Outlet socket 16A (02)
X8	AC terminals
X10	Connector wire harness
X16	Connector lighting
X17	Lighting terminals
X18	Connector fan
(02)	Optional power output connections
(03)	Optional Mains connection (see 16360 089 43/01_03)
(07)	Optional autotilt

1636 0089 43/01_03

Applicable for HiLight H5+/H2 with Lc1003™, , Mains Connection (optional)



H15	Mains light (03)
K100	Remote start relay
K101-K104	Light control relay
K106	Mains aux. relay (03)
P8	Timer (scheduler) (03)
S10	GENSET/OFF/MAINS-switch (03) (see Power circuit)
U1	Battery charger (03)
X2	Inlet socket 32A (03)
X8	Alternator power terminals
X11	Auxiliary terminals
X15	AC terminals
(03)	Optional Mains connection
(10)	Optional Auto mast down system

Following documents are provided with this unit:

– Test Certificate

– EC Declaration of Conformity:

EC DECLARATION OF CONFORMITY

We, Grupos Electrogenos Europa S.A., declare under our sole responsibility, that the product
Machine name : **Power Generator**
Commercial name :
Serial number :

Which falls under the provisions of the article 12.2 of the EC Directive 2006/42/EC on the approximation of the laws of the Member States relating to machinery, is in conformity with the relevant Essential Health and Safety Requirements of this directive.

The machinery complies also with the requirements of the following directives and their amendments as indicated.

Directive on the approximation of laws of the Member States relating to		Harmonized and/or Technical Standards used	Att° mnt
Machinery safety	2006/42/EC	EN ISO 12100-1 EN ISO 12100-2 UNE EN 12601	
Electromagnetic compatibility	2004/108/EC	EN 61000-6-2 EN 61000-6-4	
Low voltage equipment	2006/95/EC	EN 60034 EN 60204-1 EN 60439	
Outdoor noise emission	2000/14/EC	ISO 3744	

The harmonized and the technical standards used are identified in the attachments hereafter
Grupos Electrógenos Europa, S.A. is authorized to compile the technical file

	Conformity of the specification to the Directives	Conformity of the product to the specification and by implication to the directives
Issued by	Product Engineering	Manufacturing
Name		
Signature		

Place , Date *Muel (Zaragoza), Spain*

Grupos Electrógenos Europa, S.A. A company within the Atlas Copco Group

Postal address
Polígono Pitarco II, Parcela 20
50450 Muel ZARAGOZA
Spain
www.atlas copco.com

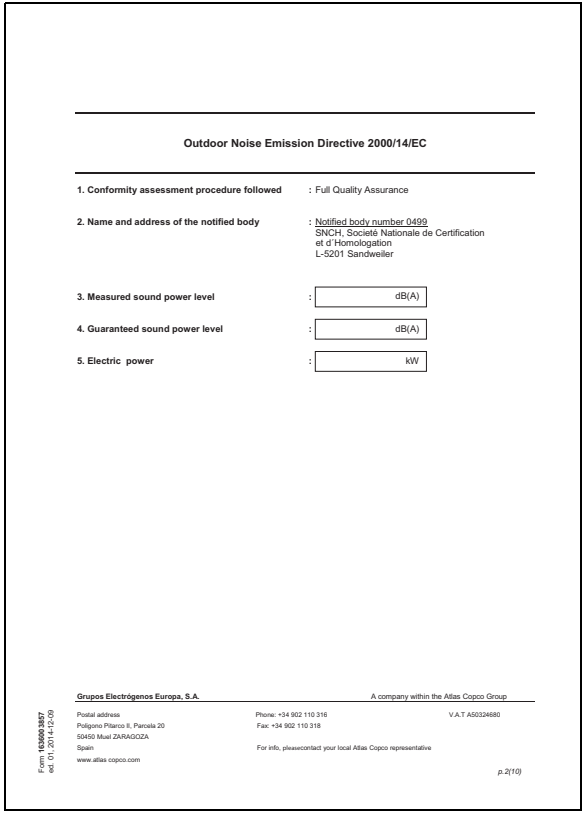
Phone: +34 902 110 316
Fax: +34 902 110 318

V.A.T A50324680

For info, pleasecontact your local Atlas Copco representative

Form **1636003857**
ed. 01, 2014-12-09

– Outdoor Noise Emission Directive 2000/14/EC:



Outdoor Noise Emission Directive 2000/14/EC

1. Conformity assessment procedure followed	:	Full Quality Assurance
2. Name and address of the notified body	:	Notified body number 0499 SNCH, Societé Nationale de Certification et d´Homologation L-5201 Sandweiler
3. Measured sound power level	:	dB(A)
4. Guaranteed sound power level	:	dB(A)
5. Electric power	:	kW

Grupos Electrógenos Europa, S.A. A company within the Atlas Copco Group

Postal address
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Spain
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