Produktbereich
Mobile Leuchten

ecom instruments
mobile experts

SHL 350-Ex

Operating Instructions

Table of Contents

Note:
The latest version of the operating instructions, the EC declaration of Conformity and the Ex certificate are available for download from the relevant product page at www.ecom-ex.com; alternatively they can be requested directly from the manufacturer.

1. Application
The SHL 350-Ex is a robust Handlamp with LED technology designed for industrial and fire-fighting applications in potentially explosive areas of Zones 0 and 1 or 20 and 21 in accordance with Directive 1999/92/EC (ATEX 137).

2. Safety instructions
These operating instructions contain information and safety regulations that must be followed to ensure safe and reliable operation of the unit under the described conditions. Non-observance of these information and instructions may have dangerous consequences or may contravene applicable regulations.

Please carefully read through these operating instructions before using this unit. In cases of doubt (for example, due to translation or printing errors), the German version of these operating instructions shall prevail.

3. Errors and impermissible loading
If there is any risk that the safety of the unit has been compromised, the unit must be taken out of operation and immediately removed from the Ex area.
Action must be taken to prevent the torch from being accidentally put into operation again. We recommend sending the unit to the manufacturer for inspection.

The safety of the unit may be at risk if, for example:
- Damage is visible on the housing
- The unit has been subjected to excessive loads for which it is not designed
- The unit has been improperly stored
- The unit has been damaged in transit
- Inscriptions or letterings on the unit are illegible or labels are damaged
- Malfunctions occur

We recommend that the unit is returned to ecom instruments GmbH for repair, as only original ecom spare parts should be used! The use of third party spare parts will invalidate the warranty!

4. Safety regulations

Any person using the unit must observe the standard safety regulations to prevent incorrect operation or abuse of the unit.

The following additional safety regulations must also be observed:

- The unit must only be opened outside the Ex area by ecom instruments GmbH, Assamstadt. The diffusing filter fixture may be removed for cleaning purposes (the LED housings must not be opened). Without the diffusing filter fixture installed, the Handlamp must not be taken to the Ex area.
- The unit must only be charged outside the Ex area with the corresponding chargers supplied by ecom.
- If the emergency operating light has to be activated due to an insufficient battery power or other torch malfunctions, the unit should be removed from the Ex area as soon as is possible.
- Protect the unit against contact with aggressive acids or alkalines.
- Only accessories, such as the corresponding diffusing and colour filters, approved by ecom instruments GmbH must be used.

4.1 Special requirements for use in Ex areas of Zone 0 or 20

- Storage of the lamp in this area is prohibited.
- The carrying strap should be used when operating in Zone 0 or 20.

4.2 Special requirements for use in dust Ex areas

- If the Handlamp head becomes contaminated after its use in a dust Ex areas, use a suitable device to carefully blow or clean away the dust.
- Any dust deposits on the housing, particularly below the pivoting head, need to be removed.

5. Safety instructions

When switched on do not point or direct the beam into eyes or face of either yourself or other persons. Caution! Strong light may blind other people.

6. Accessories

Chargers:

Charging station LG-300 HVC	(100-240 V AC / 50-60Hz)
Car charging station LG-300 LVC	(12 V DC or 24 V DC)

Wall bracket for charging station
Diffusing filter set (uncoloured, green, yellow, red, blue)
Diffusing filter, red
Diffusing filter, green
Diffusing filter, yellow
Diffusing filter, blue
Diffusing filter, uncoloured

7. Ex data

EC-type examination certificate no.:	ZELM 12 ATEX 0479 X
Ex designation:	II 1G Ex ia op is IIC T4 Ga
	II 1D Ex ia IIIC T130°C Da

Approved for Zones 2, 1 and 0, device group II, potentially explosive gases of gas group C, vapours or mist, temperature class T4.
Approved for Zones 22, 21 and 20, device group II, potentially explosive dusts, T 130 °C. The maximum fault surface temperature of 80% of temperature class T4 (or 135°C) that is required for use in Zone 0 and 20 has been taken into account during the approval process (in accordance with EN 1127-1) and therefore does not need to be observed separately by the user!

8. Technical data SHL 350-Ex

8.1 Technical data

Ambient temperature Ta:	-20 ... +50 °C (observe specific instructions for use in Zone 0 and 20)
Storage temperature:	-30 ... +60 °C
Charging temperature range:	0 ... +40 °C
Operating time:	approx. 6hrs (with charged battery)
Charging time:	approx. 7hrs
Light output:	10,000 lx (at a distance of 1m)
Luminous flux:	211 lumes
Dimensions (W x D x H):	approx. 140 x 190 x 300 mm
Weight:	approx. 2.4 kg
IP protection class:	IP65
Solvent resistance:	Acetone
ESD protection:	Anti-static housing
Power supply:	internal ecom-Ex-battery pack 3,7V; 7,0 Ah; 25,9 Wh (can only be replaced by the manufacturer)
Lamp:	3 power LEDs
CE designation:	CE 0102

8.2 Technical data charging station

Power supply type 300 HVC

Input voltage stationary version:	100 V – 240 V AC / 50-60Hz
Maximum current input:	0.7 A

Power supply type 300 LVC

Input voltage car version:	12 – 24 V DC
Maximum current input car version:	1.2 A (12V) – 0.6 A (24V)
CE designation:	CE

9. Functional description / operating instructions

Please carefully read through these operating instructions to ensure that you are familiar with all functions of your SHL 350-Ex and know how to use them. For your own safety and information please read through the information on the following pages.

9.1 Commissioning and general information

The lamp is to be charged prior to initial use (see point 9.2: Charging).

In order to be able to use the lamp in the Ex-area it must be ensured that all of the housing components and the main switch are intact. The lamp can then be switched on via the main switch (see point 9.3.1)

Important:

In order to ensure maximum battery life the lamp must be charged as soon as possible after the battery reaches a capacity of 0% (0% capacity LED flashes).
The built-in explosion protection measures mean that a zero current shutdown is not possible and that the lamp is discharged over a prolonged period.
If the lamp can no longer be switched on and the 0% capacity LED stops flashing, the lamp must be charged **within 3 days**. If the battery voltage has dropped below a certain value, it is possible to activate the lamp to display the error, however, it can no longer be operated. To ensure trouble-free operation we recommend placing the lamp in the charging station directly after use. The head of the Handlamp has a series of vent slots, these serve to provide optimum cooling of the LED housings and as such should never be covered or blocked. These vent slots should be periodically cleaned with an implement such as a soft brush. In providing optimum heat dissipation, the vents help ensure a long service life of the power LEDs and all of the safety-related parameters.
Be assured that moisture, water or potentially explosive atmospheres, in the form of either mists or dusts entering into the vents, neither impairs the function nor the Ex protection of the unit. The LED housing itself is air tight and also complies with the IP65 rating. Note: if the head of the Handlamp is exposed to dusts, it must be cleaned after operation (please refer to Section 10 – Cleaning, Maintenance and Storage).

9.2 Charging

The battery should be completely charged before the Handlamp is used. The charging process must only be done outside of the Ex area. Depending on the charge status of the battery, the charging process can take up to 7 hours. The maximum battery power is only achieved after approx. 5-6 charging and discharging cycles have been carried out.

High-quality lithium-ion batteries are used in the SHL 350-Ex. Whilst these batteries have minimal power limiting memory effects, the battery power may still diminish over the course of time. To help avoid this it is advised to periodically completely discharge the batteries to maintain their full capacity. To carry out this procedure, leave the unit ON until it switches automatically OFF. Then completely charge the battery outside the Ex area.

Please note: Charging temperature range: 0 ...+40°C

9.2.1 Stationary charging
The LG-300 HVC charging station is designed for the voltage range from 100-240 V AC at 50-60Hz and can be used both as freestanding and wall-mounted unit. A manual switch-over of the input voltage is not required. Alternatively, the LG-300 LVC in-vehicle charging station with an input voltage of 12 or 24V DC is available.
As soon as the charging station is connected to the power supply, the yellow LED located on the left of the charging station illuminates. If the SHL 350-Ex is switched off, it can now be inserted into the charger cradle by applying gentle pressure. The lamp can only be charged if the emergency switch is deactivated (see 8.4.2). If an emergency switch is still activated, it will cause the fault LED and the 0% capacity LED to flash simultaneously.

The lamp is correctly seated in the charger when it noticeably engages and the power indicator illuminates (or flashes). The charging progress is indicated via the capacity display on the lamp. The right-hand orange LED illuminates together with the red LED, which illuminates during the charging process. There are two ways of inserting the lamp into the charger. You do not need to observe the polarity of the charging contacts. Depending on the charge status of the battery, the charging process can take up to 7 hours. The lamp can also be charged in both the stationary and the vehicle charging station.
The charging process is monitored by the charging electronics. It is started automatically and stops automatically when the maximum charging capacity has been reached or it switches to the trickle charge mode. The progress of the charging cycle is indicated by the capacity LEDs (see Table 1). The charging process is complete when all of the capacity LEDs illuminate and the right-hand LED on the charging station is green. The charging station now switches to the trickle charge mode. The charging process can be interrupted at any time by simply removing the lamp from the charger.

When it has been removed from the charger, the SHL 350-Ex can only be switched on after a delay of approx. 10 seconds, which is a safety precaution.
To remove the lamp from the charging station turn the handle slightly and then extract it by lifting gently. In the event of an emergency, the lamp can also be removed from the charging station without turning it - providing the charging station is fixed in position. This requires considerable force, as the charging contacts simultaneously secure the lamp in the charger cradle (see Fig. 1).

Fig. 1

Slightly twist the lamp by the handle…

...and then pull gently from the charger.

9.2.2 Fixed installation of the charging station

The charging station can be used both as table and wall-mounted unit. The torch is firmly secured in the charger. A permanent installation at the wall or other suitable objects is therefore recommended.

The station can be mounted horizontally on the wall by using the optional mounting bracket. When fixing the bracket to the wall, make sure it is securely seated. The charger is then plugged onto the installed bracket from the top. The correct fit of the charger is important for the stability of the wall assembly.

When installing the charging station vertically at the wall or on horizontal, level surfaces, the charger is screwed to the surface. For installation, the charger has four fixing points.

Fig. 2 (Wall installation)

Fig. 3 (Table installation)

9.2.3 Vehicle charging station

The special vehicle charging station is adjusted to the conventional on-board voltage of approx. 12 V or 24V DC. Installation should be carried out by a competent company and if used in vehicles, only the horizontal plane is permissible. The attachment points on the vehicle must be approved by the vehicle manufacturer. **When installing the charging station it is imperative to observe the passenger safety systems.** The charger should only be connected to the vehicle's electrical system by an expert or specialist company. The ratings and connection values of the charging station can be inferred from the technical specifications (see 8.2 Technical specifications for the charging station).
Depending on the charge status of the battery, the charging process can take up to 7 hours. The lamp can be charged in both the vehicle charging station and the stationary charging station.

9.3 Handlamp operation

The SHL 350-Ex is an extremely powerful, rugged Handlamp for industrial applications in Ex areas and the fire-fighting services. The Handlamp features a number of innovative functions facilitating a maximum range of applications and easy operation.

9.3.1 Switching-on / operation

The SHL 350-Ex is switched on via the main switch. If it is dark and the lamp is switched off, the main switch is illuminated by two green, dimly lit LEDs.
The switching process is confirmed by releasing the switch.

If the battery reaches 25% of its capacity (the 25% capacity LED illuminates), the energy saving mode is activated automatically. The lamp is then illuminated with reduced luminosity. If the battery reaches 0% capacity, the 0% capacity LED flashes and the lamp switches off automatically. The main switch is now locked. The lamp can only be switched on again for a limited period by actuating the emergency switch.

9.3.2 Background lighting

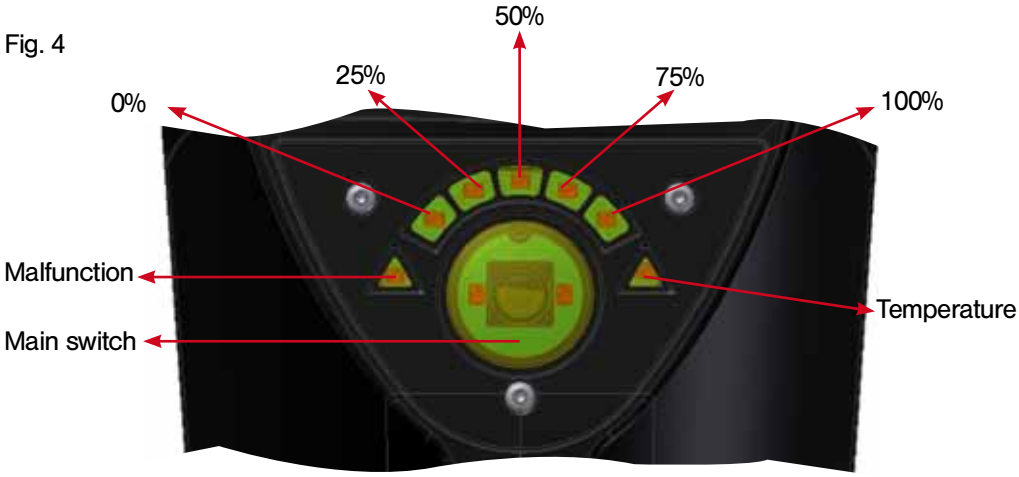
The main switch is illuminated by two green, dimly lit LEDs, which are automatically activated in the dark to make it easier to locate the lamp.
This function has been deactivated as default in order to extend battery usage.

Activation:
Press the main switch for around ten seconds while the lamp is switched off. The two capacity LEDs 25% and 75% will then simultaneously light up briefly. Background lighting is now activated.
The activated background lighting will be noticeable when the lamp is switched off by the fact that the two capacity LEDs 25% and 75% will briefly light up again.

Deactivation:
Press the main switch for around ten seconds while the lamp is switched off. The capacity LED 50% will then briefly light up.
Background lighting is now deactivated. The deactivated background lighting will be noticeable when the lamp is switched off by the fact that the two capacity LEDs 25% and 75% will **no longer** briefly light up.

9.3.3 Battery power indicator

Fig. 4



The current battery capacity level is indicated by the corresponding capacity LEDs illuminating and/or flashing.
Because of the chemical reactions that occur in a Li-ion battery when discharging over a temperature range of -20°C to 50°C, the capacity display of the SHL 350-Ex has been fully temperature compensated.
I.e. the correct capacity is always displayed over the entire temperature range.

The capacity of the battery is displayed between 0% and 100% in 25% increments.
The intermediate battery capacity stages are also displayed.
For example, if the battery's capacity is between 100% and 75%, the 100% capacity LED illuminates and the 75% capacity LED flashes (see table below).

Battery capacity and status display table

red	orange	yellow	green	green			
0%	25%	50%	75%	100%	Battery capacity	Light intensity	Dimming possible
flashes	--	--	--	--	0%	Off	no
flashes	on	--	--	--	< 25%	Energy saving mode	no
--	on	--	--	--	0,25	Energy saving mode	no
--	flashes	on	--	--	< 50%	max. 100%	yes
--	--	on	--	--	0,5	max. 100%	yes
--	--	flashes	on	--	< 75%	max. 100%	yes
--	--	--	on	--	0,75	max. 100%	yes
--	--	--	flashes	on	< 100%	max. 100%	yes
--	--	--	--	on	100%	max. 100%	yes

(Table 1)

9.3.4 Pivoting the lamp head

Thanks to its -10° to 90° pivoting head, the lamp can be operated horizontally and vertically at various degrees. This allows adjustment to compensate for sloping surfaces. Angles exceeding 15°, however, will impair the stability of the lamp.
The centre of gravity of the lamp is directly underneath the handle. When the 350-Ex is being carried, the lamp head should be rotated to the 90° position.

9.3.5 Full capacity and dimmer function

The dimmer function can only be activated if the battery capacity is between 50% and 100%. If the battery capacity reaches 25%, the lamp will automatically switch to the energy saving mode and deactivate the dimmer function.

Briefly pressing the main switch (see Fig. 4) initially switches the lamp to 100% operation. If the main switch is then pressed and held after 2 seconds, the lamp switches to the dimmer function, i.e. the output of the power LEDs can be dimmed from 100% to 25% in 25% increments, and from 25% back up to 100% output.
Info: The 25% brightness levels are increments of 10,000 Lux/1m.

The dimmed light does not have a strobe effect!

The current brightness level is indicated by the capacity – LEDs, which flash in 25% increments (depending on the light output) and remain illuminated for approx. 1second. This provides sufficient time to decide on a brightness level.

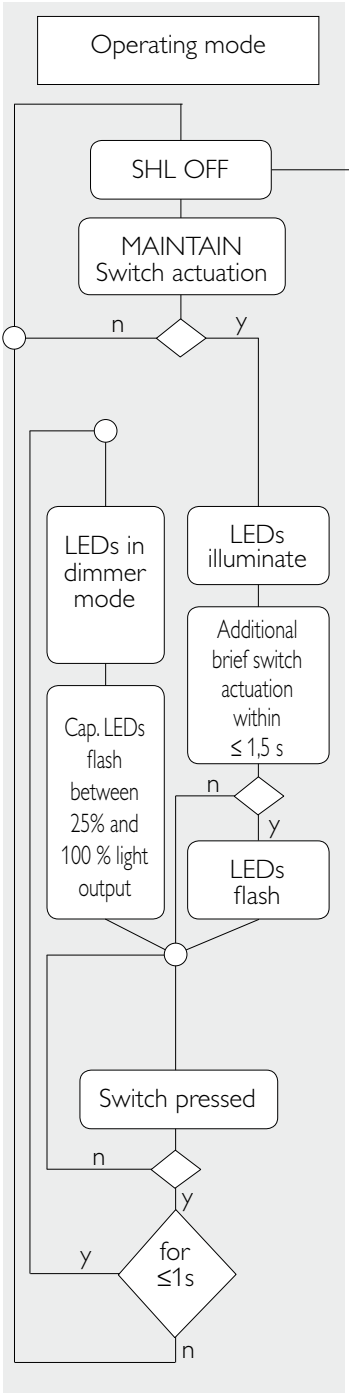
If the dimmer mode is selected again, the last setting is maintained.

Briefly pressing the main switch switches off the SHL 350-Ex again and deactivates the dimmer function; the next time the lamp is switched on again, it does so with 100% light output. The lamp‘s operating time can be increased by using the dimmer mode. If the lamp is dimmed to 25%, for example, it can produce a lighting time of approx. 30 hours.

9.3.6 Flashing light

The flashing light is activated by briefly pressing the main switch twice (within 1.5 seconds). The flashing light can also be dimmed.
Deviation: The lamp must be set to the flashing mode, then the light can be dimmed by pressing and holding the switch (for the dimmer function please refer to point 9.3.5).

9.3.7 Flow chart of functions



Lamp functions

Capacity display
Levels: 0/25/50/75/100%

Light output

off

LEDs off

Battery capacity between 50% and 100%

Power LEDs ILLUMINATE or FLASH.
When the lamp is switched on it is always at maximum brightness.
With repeated, prolonged switch actuation → dimmer operation, dimmer direction is maintained.
Light output can be dimmed in 25%, 50%, 75% & 100% brightness levels.

Battery capacity 25%

Power LEDs illuminate or flash.
Reduced light output.
Dimmer operation not possible.

Battery capacity 0 %

Power-LEDs OFF

Emergency switch operation:Battery capacity is not relevant for this function; however, if an undervoltage limit is reached, the lamp is switched off automatically (deep discharge protection)

The power LEDs can be activated at any time via the emergency switch.
When activated, the processor is reset and the main switch is locked.
The LED brightness level is determined by the battery voltage.

9.3.8 Use of colour and diffusing filters

The optional diffusing and colour filters can be used for either wide, scattered light cone or signalling tasks. The compartment for the diffusing filters is located below the Handlamp head (Refer to Fig. 5). The diffusing filters can be removed by opening the filter compartment. To install the diffusing filters at the Handlamp head, simply insert the filters into the provided fixture (Refer to Fig. 5). To engage the filters, apply gentle pressure. To remove them, proceed in reverse order. After use, replace the filters into the filter compartment (Refer to Fig. 5). This compartment can take up three filters. – which must only be diffusing and colour filters approved by ecom instruments.

Fig. 5

9.4 Safety functions

9.4.1 Battery capacity test

A battery capacity inspection is required:

- after a period of 2 years (LEDs fault & 75% flash)
- after 300 charging cycles (LEDs fault & 75% flash)
- if a loss of capacity is ascertained (LEDs fault & 50% & 75% flash)

the test must then be repeated every 6 months.

A requirement to check the battery capacity is indicated by the left fault LED and the 75% capacity LED flashing when the lamp is switched off.

The lamp can then be switched on and operated 5 times with max. brightness. The 6th time the lamp is switched on it can only be operated with a 50% brightness level until the battery capacity test has been conducted.
Important: When this fault is indicated for the first time, the capacity test will be started automatically when the lamp is inserted into the charging station; a „normal“ charging process is then no longer possible.

To start the test, insert the lamp into the appropriate charging station. It must be ensured that the power LEDs are aligned in such a way that they cannot dazzle anyone, as the lamp switches on automatically during the test.
When the lamp has been inserted all of the capacity LEDs flash to signal the start of the test.

Important: The lamp should not be removed from the charging station until all of the capacity LEDs have stopped flashing, otherwise the test will be aborted and must be started again. The test can take up to 24 hours depending on the residual capacity and charging status of the battery.

Battery capacity test passed:
The left fault LED is OFF, the lamp reverts to the normal charging mode and the capacity LEDs indicate the current battery capacity.
The lamp is approved for use and it can now be operated again at a 100% brightness level.

Battery capacity test failed:
When the test has been concluded the lamp indicates a requirement to change the battery by the left triangular fault LED and the 50% capacity LED flashing.
The lamp can now only be operated at a 50% brightness level and it should be returned to ecom instruments GmbH to have the battery replaced.

9.4.2 Emergency switch

The SHL 350-Ex is also equipped with an emergency lighting function. Use of the emergency light does not impair the Ex-protection of the 350-Ex. The emergency lighting function can also be activated at 0% battery capacity and in the event of a malfunction of the control electronics. This ensures sufficient lighting even in critical situations. The emergency switch is positioned below the Handlamp head and therefore protected against accidental switch-on. To operate the emergency switch, the diffusing filter compartment must be opened (Refer to Fig.5).

To protect the battery pack from deep discharge the power LEDs are switched off automatically before the deep discharge level is reached, even when the emergency switch has been actuated. An activated emergency switch should then be deactivated.

The lamp also switches off automatically if there are problems with the electronics. In this case the left, red triangular fault LED illuminates continuously. The lamp can also be switched on again in this status by pressing the emergency switch. If the malfunction remains in effect after actuating the emergency switch, the lamp should be sent to ecom instruments GmbH for inspection.

If the emergency light is activated, the control electronics are bypassed and all functions are reset. The brightness level of the power LEDs during emergency operation is determined by the capacity of the battery and it diminishes accordingly.

If the emergency switch has been actuated as a result of a malfunction, you should vacate the Ex-area immediately.

If the emergency switch has been actuated as a result of insufficient battery capacity, please recharge the lamp outside the Ex-area immediately. Deactivate the emergency switch beforehand!

9.4.3 Emergency lighting functions in the charge mode

The lamp has a special emergency lighting function in connection with the charging station.
Caution! If the emergency light is operated together with the vehicle charging station, there is a risk of the light activating if the lamp falls below the vehicle‘s nominal voltage, thereby resulting in accidental battery discharge.

The emergency lighting functions can be activated as soon as the lamp has been inserted into the charging cradle and power is present.
The emergency light can now be activated by pressing the main switch.

The first time the main switch is actuated the „25%, 50%, 75%“ capacity LEDs illuminate or flash for approx. 5 seconds to indicate the selected function.
If the main switch is not actuated again within this period, the function is selected and the switch is illuminated with the backlight (selection dependent).

The following functions are available:

1. Lamp illuminates in the event of a power failure → Main switch pressed once
   - The activation of this function is indicated
   - by the backlight of the main switch illuminating.
   - If there is a power failure, the emergency light is activated within 10 seconds.

2. Lamp flashes in the event of a power failure → Main switch pressed twice
   - The activation of this function is indicated
   - by the backlight of the main switch flashing.
   - If there is a power failure, the emergency light is activated within 10 seconds.

3. Lamp on permanently (reduced light output) → Main switch pressed three times
   (If this function is selected, the charging time increases)

4. Lamp flashes permanently (reduced light output) → Main switch pressed four times
   (if this function is selected, the charging time increases)

An emergency lighting function can be deactivated or reselected at any time by pressing the main switch again.
If points 3 or 4 are selected, the power LEDs illuminate with reduced luminosity. This ensures continuous emergency lighting over a prolonged period.
The charging time increases if the emergency light is switched on permanently.
The SHL 350-Ex can be positioned freely in the charger to enable optimum alignment of the emergency light.
If the battery capacity reaches 0% during a selected function, the power LEDs are switched off.

9.4.4 LED failure
The SHL 350-Ex is equipped with three high-performance, durable power LEDs. If one of the power LEDs should happen to fail during continuous or flashing operation, the lamp will automatically attempt to maintain the previously selected brightness level with the remaining power LEDs. The left red fault LED flashes to indicate the malfunction. The SHL 350-Ex thereby guarantees sufficient light in the event of a failure of an LED to ensure the operator is able to vacate the Ex-area or area of application safely.

If the lamp is switched off, a defective power LED is indicated by the fault LED and the 25% capacity LED flashing (Refer to Error messages under point 9.4.6.1).

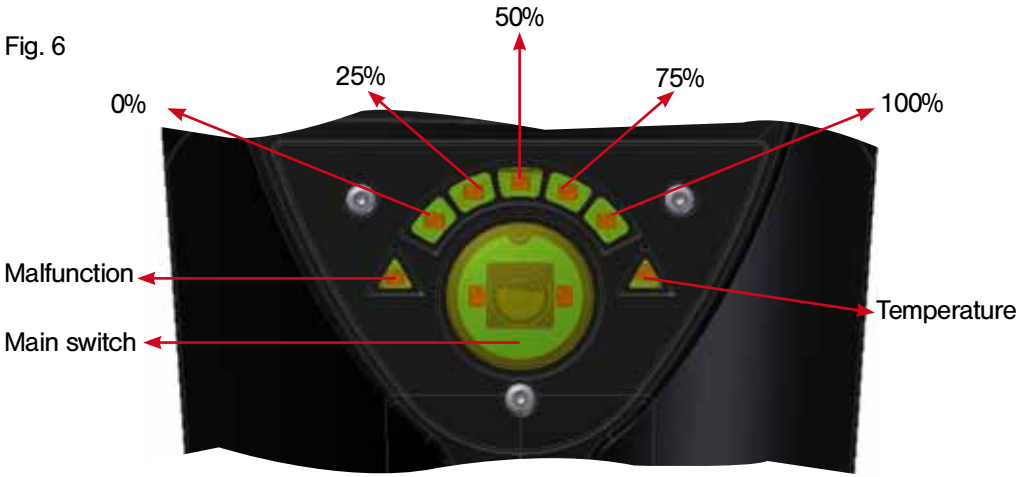
In order to guarantee the high degree of safety of the lamp, the power LEDs should only be replaced by ecom instruments GmbH. The LED housings should not be opened.

9.4.5 Exceeding the permissible operating temperature

The SHL 350-Ex is designed for an ambient temperature of -20° to +50°C. Depending on the current operating conditions and ambient temperature, it is possible for the maximum operating temperature of the lamp to be exceeded. If this occurs, the SHL 350-Ex automatically reduces its light output. If the lamp detects that the operating temperature has been exceeded, the red fault LED on the right-hand side flashes. If this occurs, the Ex-area should be vacated immediately. This ensures maximum safety in critical situations without the lamp switching off. When the standard values are reached again the lamp reverts back to the brightness level last selected.

9.4.6 Troubleshooting & messages

Fig. 6



9.4.6.1 Messages during operation

<table>
<tr><td rowspan="2">(X = Capacity LED)
The display depends on the operating status and/or error status</td><td>Malfunction</td><td colspan="5">Capacity – LEDs</td><td>Malfunction</td></tr>
<tr><td>ERROR !</td><td>0%</td><td>25%</td><td>50%</td><td>75%</td><td>100%</td><td>Temperature °C</td></tr>
<tr><td>„Temperature“ LED flashes
Cause: Operating temperature range exceeded
Lamp: The SHL can only be operated with reduced light output and dimming is not possible.
Measure: vacate the Ex-area as soon as possible
Action: The lamp is fully operational again after reaching the permitted operating temperature. If the SHL was switched on previously, it is activated with the last light setting.</td><td>X</td><td colspan="5">If the SHL is switched on,
the corresponding LEDs illuminate and/or flash depending on the battery capacity</td><td>flashes</td></tr>
<tr><td>Capacity LEDs flash depending on the battery capacity
Cause: Emergency switch is depressed
Lamp: Light output reduced
Measure: Deactivate emergency switch</td><td></td><td colspan="5">The corresponding LEDs flash
depending on the battery capacity</td><td>X</td></tr>
<tr><td rowspan="2">SHL = OFF: „ERROR“ and „25%“ LEDs flash
SHL = ON: „ERROR“ LED flashes
Cause: One or more power LEDs have failed.
Lamp: Except for reduced brightness, operation is not restricted
Action: LED must be replaced by ecom instruments GmbH.</td><td>SHL
ON
flashes</td><td colspan="5">The corresponding LED illuminates and/or flashes
depending on the battery capacity</td><td rowspan="2">X</td></tr>
<tr><td>SHL
OFF
flashes</td><td>X</td><td>flashes</td><td>X</td><td>X</td><td>X</td></tr>
<tr><td rowspan="2">SHL = OFF: „ERROR“ and „50%“ LEDs flash
SHL = ON: „ERROR“ LED flashes
Cause: Capacity fluctuations have been detected by the battery.
Lamp: Capacity-related reduction of the lighting time. Max. luminosity is 50% and dimming is not possible.
Action: Battery pack must be replaced by ecom instruments GmbH.
Caution!
If the „75%“ capacity LED flashes as well, then proceed as described under9.4.1.</td><td>SHL
ON
flashes</td><td colspan="5">The corresponding LED illuminates and/or flashes
depending on the battery capacity</td><td>X</td></tr>
<tr><td>SHL
OFF
flashes</td><td>X</td><td>X</td><td>flashes</td><td>X</td><td>X</td><td>X</td></tr>
<tr><td rowspan="2">SHL = OFF: „ERROR“ and „75%“ LEDs flash
SHL = ON: „ERROR“ LED flashes
Cause: The battery pack has been subjected to its maximum number of charging cycles or a service life of 2 years has lapsed. (For further information refer to point 9.4.1 Battery capacity test)
Lamp: Max. luminosity is 50% and dimming is not possible (after switching on 5x).
Action: Conduct battery capacity test.</td><td>SHL
OFF
flashes</td><td colspan="5">The corresponding LED illuminates and/or flashes
depending on the battery capacity</td><td>X</td></tr>
<tr><td>SHL
OFF
flashes</td><td>X</td><td>X</td><td>X</td><td>flashes</td><td>X</td><td>X</td></tr>
</table>

9.4.6.2 Other error messages

An error has been ascertained that no longer guarantees, or severely restricts, the functionality of the device. Remove the device from the Ex-area, stop using it and return it to ecom instruments GmbH as soon as possible for repair.

Warning: Do not open the Handlamp in the Ex area!

<table>
<tr><td rowspan="2">(X = capacity LED)
The display depends on the operating status and/or error status</td><td>Malfunction</td><td colspan="5">Capacity – LEDs</td><td>Malfunction</td></tr>
<tr><td>ERROR !</td><td>0%</td><td>25%</td><td>50%</td><td>75%</td><td>100%</td><td>Temperature °C</td></tr>
<tr><td rowspan="2">„ERROR“ LED illuminates and „0%“ or/and „100%“ capacity LED flashes

Cause: An error has been ascertained that no longer guarantees, or severely restricts, the functionality of the device.
Lamp: Use of the device is restricted depending on the fault that has occurred.
Vacate the Ex-area, stop using the device and return it to ecom instruments GmbH as soon as possible for repair. „Temperature“ LED flashes
Measure: vacate the Ex-area as quickly as possible
Action: Remove the device from the Ex-area, stop using it and return it to ecom as soon as possible for repair.</td><td>SHL = ON

illuminates</td><td colspan="5">A display appears depending on the error that has occurred</td><td rowspan="2">X</td></tr>
<tr><td>SHL = OFF

illuminates</td><td>operational fault

flashes</td><td>X</td><td>X</td><td>X</td><td>Battery deep discharge

flashes</td></tr>
<tr><td rowspan="5">All LEDs are OFF, activation is not possible.

Cause: The operating parameters of the battery pack have been exceeded

Lamp: The lamp is OFF and cannot be switched on via the main switch or the emergency switch.

Measure:
a) Leave the Ex-area
b) Connect the SHL to the charging station to ascertain the error.

Comment: The battery is charged to the extent that the cause of the error can be displayed.

c) Proceed in accordance with the error indicated.

Comment: If the SHL 350-Ex illuminates after charging, it may mean that the emergency switch has been activated; switch this off.</td><td>Not inserted in the charging station:
aus</td><td colspan="5">OFF</td><td>X</td></tr>
<tr><td>Inserted in the charging station:
illuminates</td><td>flashes</td><td>X</td><td>X</td><td>X</td><td>X</td><td>Stop using the device and return it to ecom as soon as possible for repair</td></tr>
<tr><td>Inserted in the charging station
flashes</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>Proceed in accordance with the display, see „Messages during operation“</td></tr>
<tr><td>Inserted in the charging station and still no display after 2 hours

off</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>Stop using the device and return it to ecom as soon as possible for repair.</td></tr>
<tr><td>Inserted in the charging station and activation of the charging mode
off</td><td colspan="5">Charging mode

The corresponding LEDs flash depending on the battery capacity</td><td>X</td></tr>
</table>

9.4.6.3 Messages during the charging process

(X = Capacity LED) The display depends on the operating status and/or error status	SHL 350-Ex							Charging station	
	Malfunction	Capacity – LEDs					Malfunction	Mains	Charge status
	ERROR !	0%	25%	50%	75%	100%	Temperature °C	Right orange	Left red/green/ orange
„Temperature“ LED flashes **Cause**: Operating temperature range exceeded **Lamp**: Charging process interrupted Measure: none **Action**: After reaching the permissible operating temperature the charging process is resumed.	X	OFF					**flashes**	illuminates	flashes orange
ERROR – LED and „0%“ capacity LED flash **Cause**: Emergency switch is depressed **Lamp**: Charging process interrupted **Measure**: Deactivate the emergency switch; the charging process is resumed.	**flashes**	flashes	X	X	X	X	X	illuminates	flashes orange
No displays on the SHL after inserting it into the charging station **Cause**: no mains or vehicle voltage present. **Lamp**: charging is not possible **Measure**: Check the supply voltage for the charger.	X	X	X	X	X	X	X	off	off
„ERROR“ LED illuminates or flashes (capacity LEDs depend on the error that has occurred) **Cause**: an error is present. **Lamp**: whether or not a charging process can be conducted depends on the error that has occurred **Action**: To display the error the lamp must be removed from the charging station. Cause of error: refer to point 9.4.6.1 Error messages „Lamp in operation“	flashes or illuminates	X	X	X	X	X	X	X	X

9.5 Opening and closing the handlamp

Warning: The lamp should not be opened!

Only the diffusing filter fixture should be removed from the lamp head.
See Cleaning / maintenance.

Fig. 7

Diffusion filter fitting

9.6 LED replacement

The lamp is equipped with three durable power LEDs. Replacement is usually not required. If one of the power LEDs becomes defective or the illuminating power decreases, the lamp should be returned to the manufacturer for inspection or to replace the power LEDs. Any repair work conducted on the lighting unit or the LED housings by the user can jeopardise the safety of the lamp and is therefore not permitted.

9.7 Battery replacement

It may be necessary to replace the battery after several years due to a loss of battery power. Thanks to the lamp‘s high degree of protection, the housing and the battery are particularly well protected. The battery must therefore only be replaced by ecom instruments GmbH. When the battery is replaced all of the seals, components and electrical values are also checked.

10. Repairs

Repairs are subject to the nationally valid regulations and directives. We therefore recommend that such work be performed by ecom instruments GmbH, Germany, as all repairs must be examined to ensure functional safety.

11. Disposal

Waste of electrical and electronic equipment (WEEE) and „historic“ WEEE by ecom instruments GmbH is disposed free of charge at our costs and in accordance with the European Directive 2002/96/EC and the German Electrical and Electronic Equipment Law of 16 March 2005. The costs of transporting the equipment to ecom instruments GmbH are to be borne by the sender.

In accordance with EU directive 2006/66/EC „Directive on batteries and accumulators“, we are obligated to provide the following information. Implementation of the directive into national legislation must be observed.

Your device contains a rechargeable lithium battery.

Depleted batteries or rechargeable batteries that can no longer be recharged should never be disposed of along with normal or household waste. Old batteries can contain harmful substances that are hazardous to health and damaging to the environment. Please return the batteries/rechargeable batteries. Return is free of charge and required by law. Please only dispose of discharged batteries in the designated containers and tape the terminals of lithium batteries.

Note: The battery used in this unit poses a fire hazard and can cause chemical injuries if it is used improperly. Neither the battery nor the battery cells should be opened or disassembled and they should not be burned or exposed to temperatures exceeding 100 °C. If the battery needs to be disposed of, it can be removed as described under point (9.7). The disposal regulations specified above are also applicable for old devices.
All batteries and rechargeable batteries can be recycled. Precious raw materials such as iron, zinc and nickel can therefore be reused.

The symbol  has the following meaning: Batteries and rechargeable batteries should not be disposed of along with normal or household waste.

The IATA regulations must be observed when sending batteries.
These regulations should always be applied for integrated and removable batteries!

12. Cleaning, maintenance and storage

- Only clean the lamp when it is switched off.
- Only clean the unit with a suitable cloth or sponge. Do not use solvents or abrasives.
- If the Handlamp is used in dust Ex areas, use a suitable device to blow clean the Handlamp head after each use. For this purpose carefully blow air into the vent slots, working from the top to the bottom ones. In the case of dust deposits, the Handlamp head should be regularly cleaned to prevent a build up of deposits.
- In the event of coarse contamination it may be necessary to open the lamp head to clean the housing. To open it remove the front screen on the lamp head by loosening the screw in the centre of the diffusing filter fixture. The screen can now be removed carefully. **The LED housings of the power LEDs should not be opened! Do not dismantle the lighting unit!** After removing the front screen the lamp head can be cleaned carefully. When doing this please make sure that the lighting unit is not damaged. The screen must be reinstalled before using the SHL 350-Ex again, otherwise the mechanical safety of the lamp is not guaranteed.
- We recommend having the torch checked for proper functioning by the manufacturer every two years.
- Do not allow storage temperatures to exceed or fall below the permitted range of -30 °C to +60 °C
- If the battery is going to be stored for over 1 moth, it should be 100% charged.

13. Warranty and liability

Under the general terms and conditions of business, ecom instruments GmbH offers a two-year warranty for functioning and materials for this product when used under the specified operating and maintenance conditions. This does not apply to wearing parts (such as rechargeable batteries and LEDs).

This warranty does not extend to products that have been used improperly, altered, neglected, damaged by accident or subjected to abnormal operating conditions or improper handling.In the event of a warranty claim, the faulty device should be returned. We reserve the right to re-calibrate, repair or replace the device.

The above warranty terms represent the sole rights of the purchaser to compensation and apply exclusively and in place of all other contractual or statutory warranty obligations. ecom instruments GmbH does not accept liability for specific, direct, indirect, incidental or consequential damages or losses, regardless of whether they are caused by breach of warranty, lawful or unlawful actions, actions in good faith or other actions.

If in certain countries the restriction of statutory warranty and the exclusion or restriction of incidental or consequential damages is unlawful, then it may be possible that the above restrictions and exclusions do not apply for all purchasers. If any clause in these warranty terms is found to be invalid or unenforceable by a competent court, then such a judgement shall not affect the validity or enforceability of any other clause contained in these warranty terms.

14. EC Declaration of Conformity and Certificate

The EC declaration and the certificate of conformity is enclosed with the sales packaging as a separate document.

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900001AL02A00 04/2012 Änderungen vorbehalten! Subject to change without notice!

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