

ENGLISH

1U FAN Unit

V1

Product code: D7696

Preface

Thank you for purchasing this Showgear product.

The purpose of this user manual is to provide instructions for the correct and safe use of this product.

Keep the user manual for future reference as it is an integral part of the product. The user manual shall be stored at an easily accessible location.

This user manual contains information concerning:

- Safety instructions
- Installation and operation of the device
- Intended and non-intended use of the device
- Maintenance procedures
- Troubleshooting
- Transport, storage and disposal of the device

Non-observance of the instructions in this user manual may result in serious injuries and damage of property.

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1. Introduction

1.1. Before Using the Product



Important

Read and follow the instructions in this user manual before installing, operating or servicing this product.

The manufacturer will not accept liability for any resulting damages caused by the non-observance of this manual.

After unpacking, check the contents of the box. If any parts are missing or damaged, contact your Highlite International dealer.

Your shipment includes:

- Audio 1U Fan Unit
- IEC powercable 1,5m
- Sensor cable 2m
- Mounting brackets
- User manual

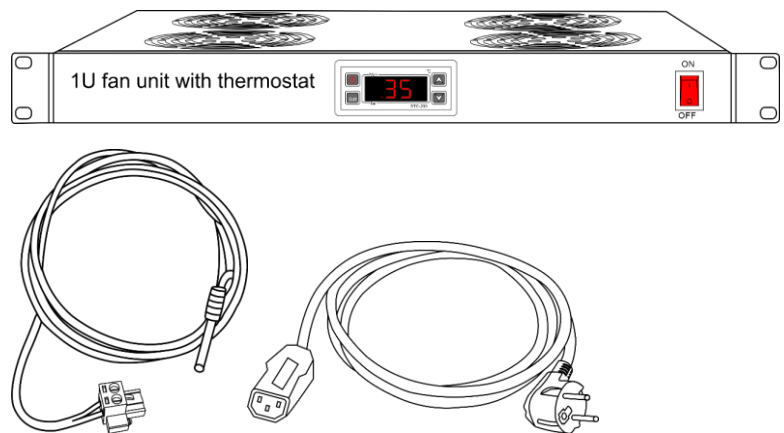


Fig. 01

1.2. Intended Use

This device is intended for professional use as a Fan Unit. It is suitable only for indoor installation. This device is not suitable for households.

Any other use, not mentioned under intended use, is regarded as non-intended and incorrect use.

1.3. Product Lifespan

This device is not designed for permanent operation. Disconnect the device from the electrical power supply when the device is not in operation. This will reduce the wear and will improve the device's lifespan.

1.4. Text Conventions

Throughout the user manual the following text conventions are used:

- Buttons: All buttons are in bold lettering, for example "Press the **UP/DOWN** buttons"
- References: References to chapters and parts of the device are in bold lettering, for example: "Refer to **2. Safety**", "turn the **adjustment screw (02)**"
- 0–255: Defines a range of values
- Notes: **Note:** (in bold lettering) is followed by useful information or tips

1.5. Symbols and Signal Words

Safety notes and warnings are indicated throughout the user manual by safety signs.

Always follow the instructions provided in this user manual.



DANGER

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.



WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION

Indicates a potentially hazardous situation, which, if not avoided, may result in minor or moderate injury.



Attention

Indicates important information for the correct operation and use of the product.



Important

Read and observe the instructions in this document.



Electrical hazard



Provides important information about the disposal of this product.

1.6. Symbols on the Information Label

This product is provided with an information label. The information label is located on the backside of the device.

The information label contains the following symbols:



This device is designed for indoor use.



This device falls under IEC protection class I.



This device shall not be treated as household waste.



Read and follow the instructions in the user manual before installing, operating or servicing the device.



Caution: Risk of electric shock. Disconnect input power before opening.
Warning: This appliance must be earthed.

2. Safety

**Important**

Read and follow the instructions in this user manual before installing, operating or servicing this product.

The manufacturer will not accept liability for any resulting damages caused by the non-observance of this manual.

2.1. Warnings and Safety Instructions

**DANGER**

Danger for children

For adult use only. The device must be installed beyond the reach of children.

- Do not leave various parts of the packaging (plastic bags, polystyrene foam, nails, etc.) within children's reach. Packaging material is a potential source of danger for children.

**DANGER**

Electric shock caused by short-circuit

This device falls under IEC protection class I.

- Do not insert objects, such as screwdrivers, wires, etc. into the connectors. Do not touch the connection terminals.
- Make sure that the device is electrically connected to ground (earth). Connect the device only to a socket-outlet with ground (earth) connection.
- Do not cover the ground (earth) connection.
- Do not bypass the thermostatic switch or fuses.
- For replacement use fuses of the same type and rating only.
- Do not let the power cable come into contact with other cables. Handle the power cable and all connections with the mains with caution.
- Do not modify, bend, mechanically strain, put pressure on, pull or heat up the power cable.
- Make sure that the power cable is not crimped or damaged. Examine the power cable periodically for any defects.
- Do not immerse the device in water or other liquids. Do not install the device in a location where flooding may occur.
- Do not use the device during thunderstorms. Disconnect the device from the electrical power supply immediately.

**DANGER**

Electric shock caused by dangerous voltage inside

There are areas within the device where dangerous touch voltage may be present.

- Do not open the device or remove any covers.
- Do not operate the device if the covers or the housing are open. Before operation, check if the housing is firmly closed and all screws are tightly fastened.
- Disconnect the device from electrical power supply before service and maintenance, and when the device is not in use.



Attention **Power supply**

- Before connecting the device to the power supply, make sure that the current, voltage and frequency match the input voltage, current and frequency specified on the information label on the device.
- Make sure that the cross-sectional area of the extension cords and power cables is sufficient for the required power consumption of the device.



Attention **General safety**

- Do not block the ventilation openings.
- To avoid possible interferences, sensor down-leads and power wires should be kept at a proper distance.
- For accurate measurement, the sensor installation should be kept away from the ventilation holes.
- Do not shake the device. Avoid brute force when installing or operating the device.
- If the device is dropped or struck, disconnect the device from the electrical power supply immediately.
- If the device is exposed to extreme temperature variations (e.g. after transportation), do not switch it on immediately. Let the device reach room temperature before switching it on, otherwise it may be damaged by the formed condensation.
- If the device fails to work properly, discontinue the use immediately.



Attention **This device shall be used only for the purposes it is designed for.**

This device is designed to be used as an end-span switch. Any incorrect use may lead to hazardous situations and result in injuries and material damage.

This device does not contain user-serviceable parts. Unauthorized modifications to the device will render the warranty void. Such modifications may result in injuries and material damage.



Attention **Before each use, examine the device visually for any defects.**

Make sure that:

- All screws used for installing the device or parts of the device are tightly fastened and are not corroded.
- The safety devices are not damaged.
- There are no deformations on housings, fixations and installation points.
- The power cables are not damaged and do not show any material fatigue.

**Attention**

Do not expose the device to conditions that exceed the rated IP class conditions.

This device is IP20 rated. IP (Ingress Protection) 20 class provides protection against solid objects greater than 12 mm, such as fingers, and no protection against harmful ingress of water.

2.2. Requirements for the User

This product may be used by ordinary persons. Maintenance may be carried by ordinary persons. Installation and service shall be carried out only by instructed or skilled persons. Contact your Highlite dealer for more information.

Instructed persons have been instructed and trained by a skilled person, or are supervised by a skilled person, for specific tasks and work activities associated with the installation, service and maintenance of this product, so that they can identify risks and take precautions to avoid them.

Skilled persons have training or experience, which enables them to recognize risks and to avoid hazards associated with the installation, service and maintenance of this product.

Ordinary persons are all persons other than instructed persons and skilled persons. Ordinary persons include not only users of the product but also any other persons that may have access to the device or who may be in the vicinity of the device.

3. Description of the Device

The Show gear 1U FAN Unit is used for controlling temperature of your rack. The device has four built-in fans which can be switched on and off by the programmable temperature settings..

3.1. Front View

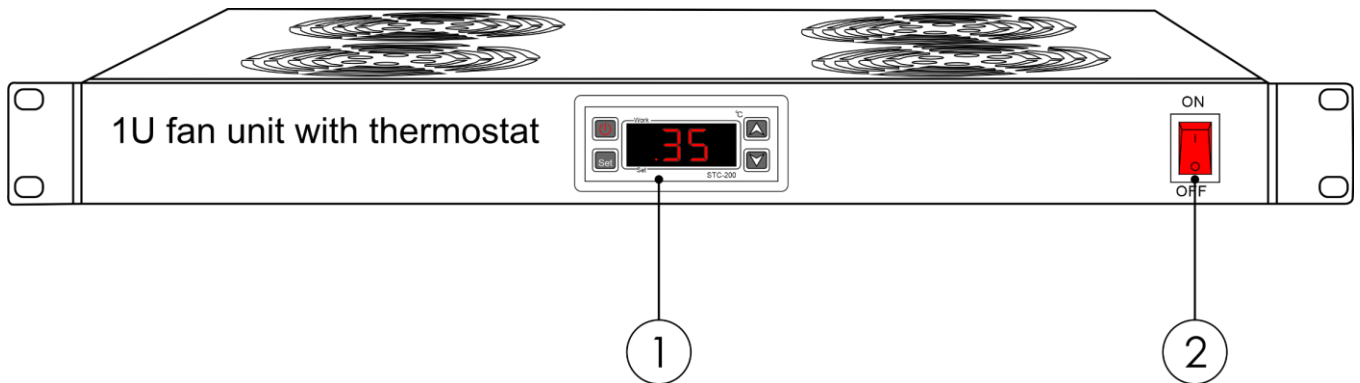


Fig. 02

- 01) Control unit/Temperature controller: press the control buttons to adjust the maximum temperature and temperature limit. For more information see page 8.
- 02) Power switch ON/OFF: Press the button to switch the device ON/OFF

3.2. Back View

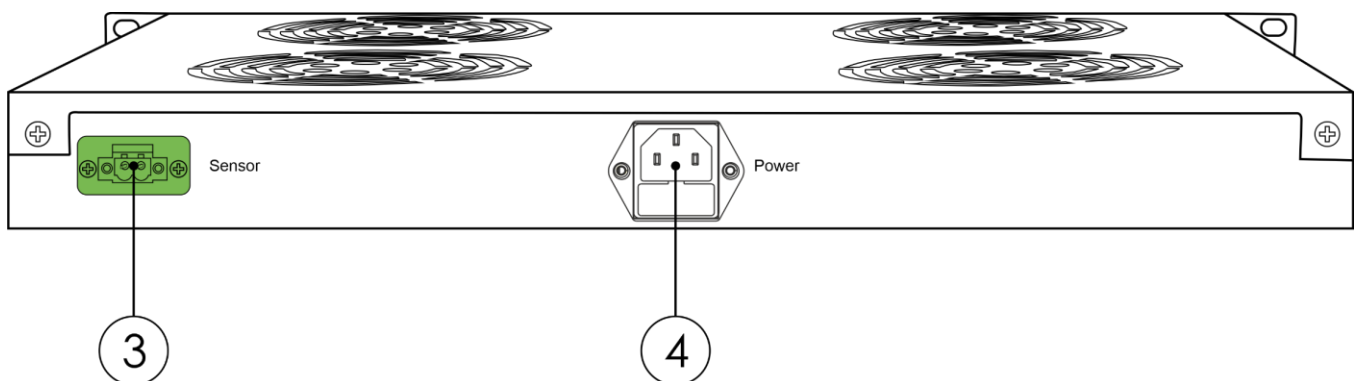


Fig. 03

- 03) Input sensor cable: Connect the included sensor cable to the input.
- 04) IEC Power connector in: Connect the device to an appropriate power supply

3.3. Product Specifications

Model:	1U FAN Unit
Electrical:	
Input voltage:	100–240 V AC, 50/60 Hz
Power consumption:	50 W
Fuse:	T1 A, 250 V
Physical:	
Dimensions:	483 x 170 x 44mm (LxWxH) 19" x 1 U (LxH)
Weight:	4,85 kg
Operation and control:	
Sensor error delay time:	1 min.
Resolution:	±1 °C
Accuracy:	± 1 °C
Relative humidity:	20-60% (no condensate)
Temperature measurement range:	-40 °C ~+ 99 °C
Temperature controlling range:	-40 °C ~+ 70 °C
Relay contact capacity:	10A/250VAC/30VDC
Temperature measurement, display and control	
Adopt differential to set temperature	
Compressor startup delay	
Alarm when error	
Switches among refrigeration, heating and alarm	
Control panel:	LED display and buttons
Connections:	
Power connections:	IEC C13 female
Data connections:	Input sensor cable for the included sensor cable Input: PTC (10kOhm)
Construction:	
Housing:	Metal
Color:	Black
IP rating:	IP20
Cooling:	Fans
Thermal:	
Maximum ambient temperature t_a :	40 °C

3.4. Dimensions

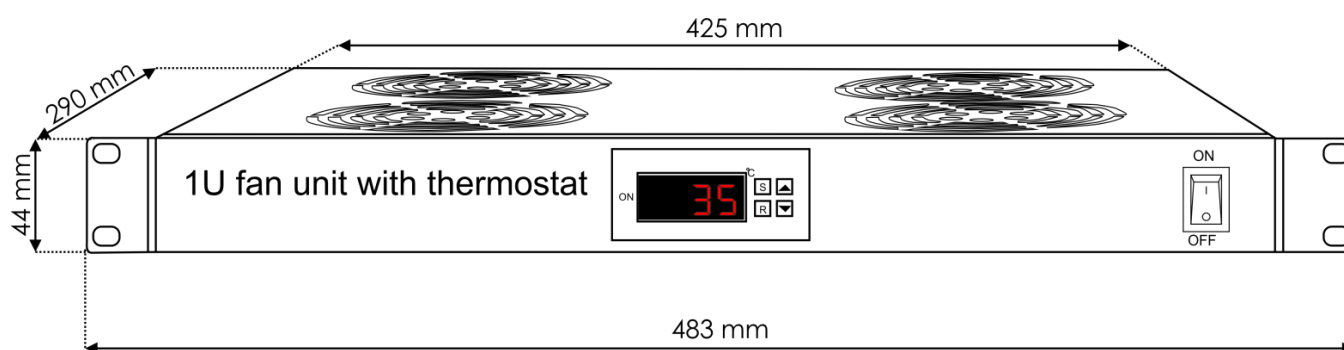


Fig. 04

4. Installation

4.1. Safety Instructions for Installation

**Attention**

Make sure there is enough space for ventilation around the device.

4.2. Installation Site Requirements

- The device must be installed only indoors.
- The device can be placed mounted in a standard 19-inch rack.
- The maximum ambient temperature $t_a = 35\text{ °C}$ must never be exceeded.
- The relative humidity must not exceed 50 % with an ambient temperature of 35 °C.

4.3. Rack Mounting

The device can be mounted in a standard 19-inch rack. The device requires 1 rack units (RU) of space. 1 rack unit is 44,45 mm high.

Make sure that the rack is sufficiently secured to prevent it from becoming unstable or falling over.

To mount the device in a two-post rack, follow the steps below:

- 01) Insert 4 cage nuts in the openings on the rack posts where you want to mount the device.
- 02) Position the device in front of the rack posts so that the 4 mounting openings on the flanges face the openings on the rack posts with cage nuts.
- 03) Using a screwdriver, mount the device to the rack posts with 4 screws.

4.4. Connecting to Power Supply

**DANGER**

Electric shock caused by short-circuit

The device accepts AC mains power at 240 V and 50/60 Hz. Do not supply power at any other voltage or frequency to the device.

This device falls under IEC protection class I. Make sure that the device is always electrically connected to the ground (earth).

Before connecting the device to the socket-outlet:

- Make sure that the power supply matches the input voltage specified on the information label on the device.
- Make sure that the socket-outlet has ground (earth) connection.

Connect the device to the socket-outlet with the power plug.

5. Setup

5.1. Warnings and Precautions



Attention

Connect all cables before supplying power.

Disconnect power supply before connecting or disconnecting cables.

6. Operation

6.1. Safety Instructions for Operation



Attention

This device must be used only for the purposes it is designed for.

This device is intended for use as a Fan Unit for cooling a server rack. It is suitable only for indoor installation. It is not suitable for households.

Any other use, not mentioned under intended use, is regarded as non-intended and incorrect use.



Attention

Power supply

Before connecting the device to the power supply, make sure that the current, voltage and frequency match the input voltage, current and frequency specified on the information label on the device.

Make sure to connect the sensor cable to the back of the device, otherwise an alarm will sound.

To avoid possible interferences, sensor down-leads and power wires should be kept at a proper distance.

For accurate measurement, the sensor installation should be kept away from the ventilation holes.

6.2. Control Panel

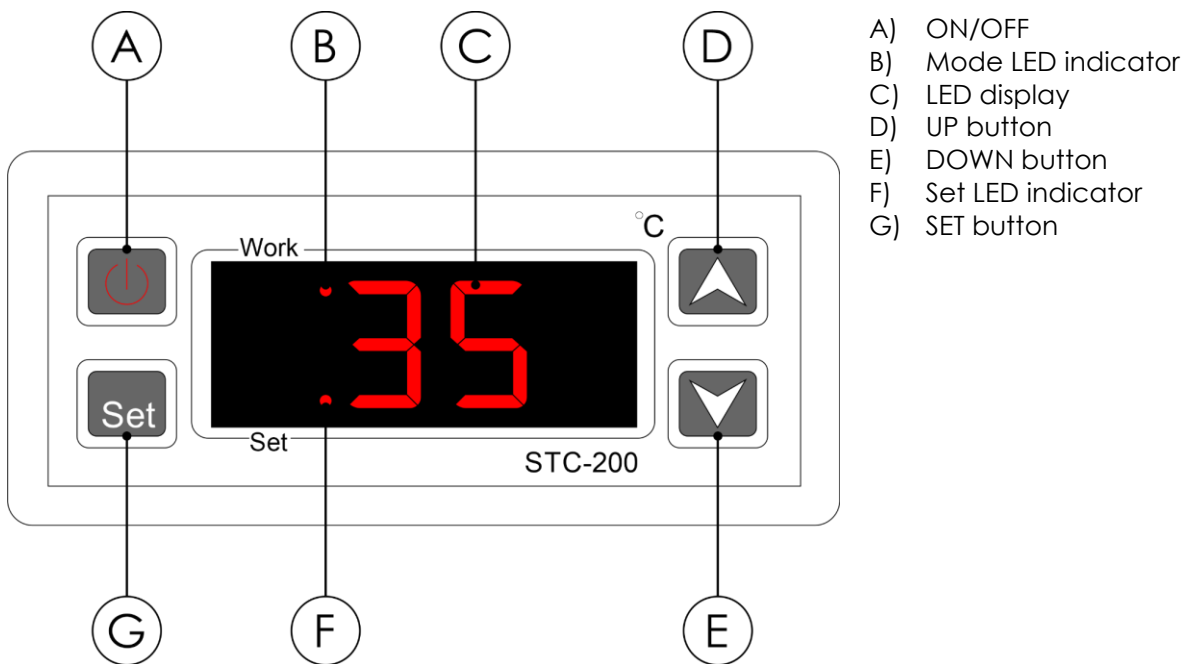


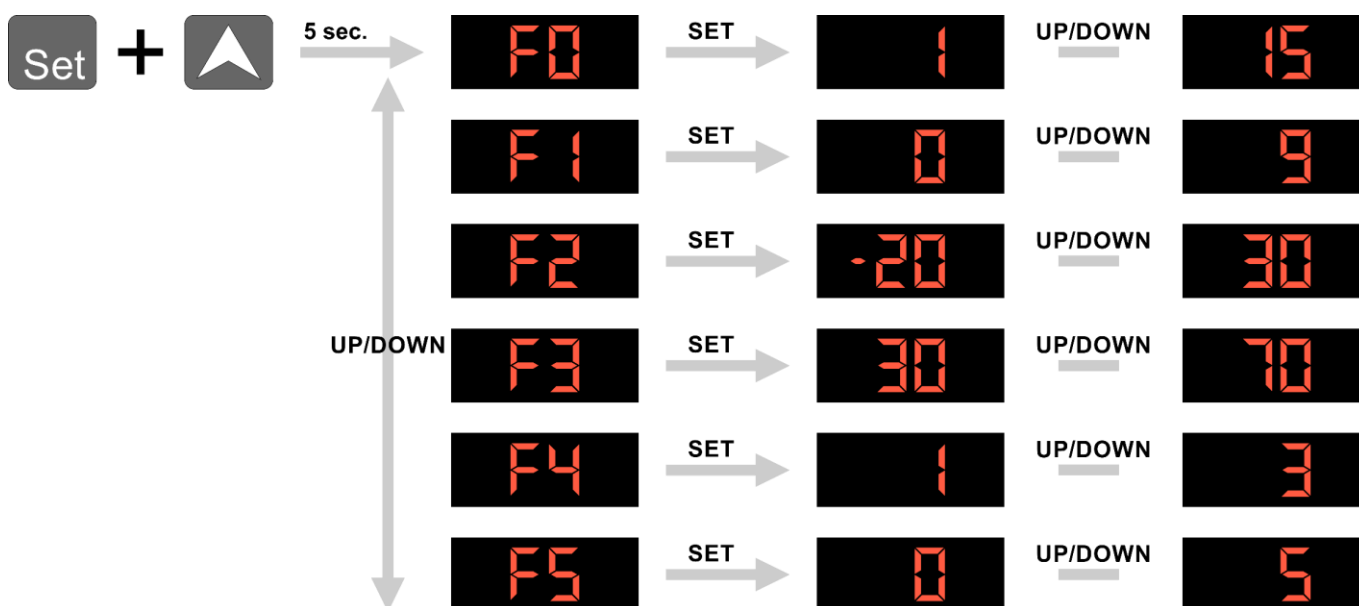
Fig. 09

- Use the **ON/OFF** button to shut the device off without losing all your settings.
- Use the **UP** button to increase the temperature limit, check the maximum temperature or scroll through the menu.
- Use the **DOWN** button to decrease the temperature limit, check the maximum temperature or scroll through the menu.
- Use the **SET** button to set the temperature limit or enter the menu.

Note:

If the fans are working properly the **Mode LED (B)** will light up.
If you set the temperature limit the **Set LED (F)** will light up.

6.3. Menu Overview



6.4. Main Menu Options

The main menu has the following options:

Temperature differential setting

Compressor delay time

Temp. lower limit setting

Temp. upper limit setting

Mode optional

Temperature calibration

6.4.1. Parameter settings

6.4.1.1. Parameter inspection (In non-setting mode)

- 01) Press the ▲ button for 2 seconds to display the set temperature value and display the current temperature.
- 02) Press the ▼ button for 2 seconds to display the temperature differential value and display the current temperature.

6.4.1.2. Parameter setting (in user-setting mode)

- 01) When you're in non-setting mode, press the SET button for at least 5 seconds to enter user setting mode, the set indicator (F) lights up on and LED displays the current temperature set value.
- 02) Press the ▲ or ▼ buttons to increase or decrease the temperature value. Press once to increase or decrease by 1 °C, press and hold down the button for at least 2 seconds rapidly change the value.

6.4.1.3. Exit user setting mode

In user setting mode, press and hold down the SET button for at least 5 seconds or do not touch any button for 30 seconds, and the system will store the displayed temperature set value and return to its normal working mode.

6.4.1.4. Administrator menu

- 01) When you're in non-setting mode, press the SET and ▲ buttons for at least 5 seconds to enter the administrator menu. The set indicator (F) lights up and LED display shows F0.
- 02) Press the ▲ or ▼ buttons to scroll through this menu. You can choose from F0-F5.
- 03) Press the SET button to enter a specific menu (parameter modification mode), The display will show the current value, set for this parameter.
- 04) When you want to modify the parameter values, press the ▲ or ▼ buttons to adjust its value.
- 05) Press the SET button to return to setting item modification mode after you've set your desired parameter. The display will show the current setting.

6.4.1.5. Exit user setting mode

In setting item or parameter mode, press the SET button for at least 5 seconds or do not touch any button for 30 seconds, and the system will store the displayed temperature set value and return to its normal working mode.

6.4.2. Output relay connection and disconnection:

- 01) Press the on/off button (**A**) to turn on the temperature controller.
- 02) In running mode, press this button for at least 3 seconds to turn off the temperature controller

6.4.2.1. Refrigeration (optional)

- 01) Relay starts refrigeration when:
 - a) compressor delay time > (is above) the set delay time
 - b) or the sensor's temperature > (is above) set temperature + temperature differential value.
- 02) The relay stops refrigeration when:
 - sensor's temperature < (is below) set temperature.

6.4.2.2. Heating (optional)

- 01) Relay starts heating when:
 - a) the actual delay time > (is above) set delay time
 - b) or the sensor's temperature < (is below) set temperature
- 02) Relay stops heating when:
 - a) The sensor's temperature > set temperature + temperature differential value.

6.4.2.3. Alarm sounds

- 01) An alarm sound will be heard when:
 - a) the sensor's temperature > (is above) set temperature + temperature differential value
 - b) or the sensor's temperature < (is below) set temperature

6.4.2.4. Alarm functions

- 01) Alarm sounds when a sensor error occurs:
 - a) The LED display shows a blinking E1 and an alarm will be heard, when the sensor has an open circuit.
 - b) The LED display shows a blinking E2 and an alarm will be heard, when the sensor has a short circuit.
- 02) Alarm sounds when **exceeding of a temperature limit** occurs:
 - a) The LED display shows:
 - HH when the sensor's temperature > +99°C.
 - LL when the sensor's temperature < -40°C.
- 03) When a sensor error occurs in refrigeration mode, the compressor will work according to a specific procedure (work for 15 minutes and stop for 15 minutes)

6.4.3. Administrator menu setting function:

Setting item	Parameter setting range	Default	Code
Temperature differential setting	1°C – 16°C	3°C	F0
Compressor delay time	0 – 9 minutes	3 minutes	F1
Temp. lower limit setting	-40°C set temperature	-20°C	F2
Temp. upper limit setting	Set temperature 70°C	20°C	F3
Mode optional	1: refrigeration, 2: heating, 3: alarm	1	F4
Temperature calibration	-5°C – +5°C	0	F5

6.4.4. Mode + Set indicator lights

Mode indicator light (B)	Light blinks	Compressor startup delay
	Light On	Compressor normally works
	Light Off	Compressor termination
Set indicator light (F)	Light On	Under setting mode
	Light Off	Normally works

7. Troubleshooting

This troubleshooting guide contains solutions to problems which can be carried out by an ordinary person. The device does not contain user-serviceable parts.

Unauthorized modifications to the device will render the warranty void. Such modifications may result in injuries and material damage.

Refer servicing to instructed or skilled persons. Contact your Highlite International dealer in case the solution is not described in the table.

Problem	Probable cause(s)	Solution
The device does not function at all	No power to the device	Check if power is switched on and cables are plugged in
	Primary fuse blown	Replace fuse
Fan (or fans) cuts out intermittently	Device is too hot	- Allow the device to cool down - Clean the fan - Make sure air vents are not blocked - Turn up the air conditioning
	The power supply settings do not match local AC voltage and frequency	Disconnect fixture. Check settings and correct if necessary

8. Maintenance

8.1. Safety Instructions for Maintenance



DANGER

Electric shock caused by dangerous voltage inside

Disconnect power supply before servicing or cleaning.

8.2. Preventive Maintenance



Attention

Before use, examine the device visually for any defects.

Make sure that:

- All screws used for installing the device or parts of the device are tightly fastened and are not corroded.
- There are no deformations on housings, fixations and installation points.
- The power cables are not damaged and do not show any material fatigue.

8.2.1. Basic Cleaning Instructions

To clean the device, follow the steps below:

- 01) Disconnect the device from the electrical power supply.
- 02) Allow the device to cool down for 5 minutes.
- 03) Clean the device with a soft, lint-free cloth.

**Attention**

- Do not immerse the device in liquid.
- Do not use alcohol or solvents.

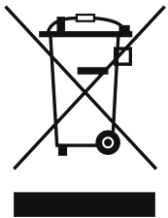
8.3. Corrective Maintenance

The device does not contain user-serviceable parts. Do not open the device and do not modify the device.

Refer repairs and servicing to instructed or skilled persons. Contact your Highlite International dealer for more information.

9. Deinstallation, Transportation and Storage

- Disconnect power supply before deinstallation.
- Use the original packaging to transport the device, if possible.
- Clean the device before storing. Follow the cleaning instructions in chapter **8.2.1. Basic Cleaning Instructions** on page 16.
- Store the device in the original packaging, if possible.

10. Disposal**Correct disposal of this product****Waste Electrical and Electronic Equipment**

This symbol on the product, its packaging or documents indicates that the product shall not be treated as household waste. Dispose of this product by handing it to the respective collection point for recycling of electrical and electronic equipment. This is to avoid environmental damage or personal injury due to uncontrolled waste disposal. For more detailed information about recycling of this product contact the local authorities or the authorized dealer.

11. Approval

Check the respective product page on the website of Highlite International (www.highlite.com) for an available declaration of conformity.

