

# **Obelux H100 series manual**

**High intensity 100 000cd aviation obstruction light**



ICAO High-Intensity Type B 100 000cd  
NVG Compliant Infrared 850nm

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# 1 ABOUT THIS PRODUCT

Obelux high-intensity H100 lights are designed for marking tall structures such as wind turbines, chimneys, masts, and towers. Obelux H100 series obstruction lights provide 100 000cd (High Intensity Type B) WHITE light. The models also feature Night Vision Goggle (NVG) compliant infrared light (850nm).

The product offers unique features such as fault monitoring, photocell and switcher incorporated in the light. Obelux uses a unique environmentally friendly optical solution which minimizes light pollution to the neighbourhood.

The lights support Stand-alone operation. In Stand-alone mode, no external controllers are required to run the product. In most use cases, mounting the standalone aviation obstruction light and connecting power supply cable are the only actions needed to operate. Some models support Modbus. In Modbus operation, the light is controlled with an Obelux controller as a part of an aviation light system.

## 1.1 Product codes

| Order code            | Output     | ICAO      | Operating voltage | IR  | Heater | Modbus | GPS | Photocell | Alarm relay |
|-----------------------|------------|-----------|-------------------|-----|--------|--------|-----|-----------|-------------|
| <b>H100IR230I</b>     | 100 000 cd | HI Type B | 230VAC            | Yes | No     | Yes    | No  | Yes       | Yes         |
| <b>H100IR230A</b>     | 100 000 cd | HI Type B | 230VAC            | Yes | No     | No     | No  | Yes       | Yes         |
| <b>H100IR230GI</b>    | 100 000 cd | HI Type B | 230VAC            | Yes | No     | Yes    | Yes | Yes       | Yes         |
| <b>H100IR230GA</b>    | 100 000 cd | HI Type B | 230VAC            | Yes | No     | No     | Yes | Yes       | Yes         |
| <b>H100IRCCV230I</b>  | 100 000 cd | HI Type B | 230VAC            | Yes | Yes    | Yes    | No  | Yes       | Yes         |
| <b>H100IRCCV230A</b>  | 100 000 cd | HI Type B | 230VAC            | Yes | Yes    | No     | No  | Yes       | Yes         |
| <b>H100IRCCV230GI</b> | 100 000 cd | HI Type B | 230VAC            | Yes | Yes    | Yes    | Yes | Yes       | Yes         |
| <b>H100IRCCV230GA</b> | 100 000 cd | HI Type B | 230VAC            | Yes | Yes    | No     | Yes | Yes       | Yes         |

A = Stand-alone operation

I = Stand-alone operation Modbus operation with Obelux Control Panel, Local controller, or similar

IR = infrared

CCV = cold climate version (heater)

HI = high intensity aviation obstacle light

Option: Angle of the peak of the beam above the horizontal (+0°, +1°, +2° and +3°) (aiming angle)

Examples: append B, C or D at the end of product code

H100IRCCV230GI (aiming angle +0°) H100IRCCV230GIC (aiming angle +2°)

H100IRCCV230GIB (aiming angle +1°) H100IRCCV230GID (aiming angle +3°)

Packing dimensions: 600x400x400 mm

## 1.2 Order codes

Syntax for order code: [Product code] - [Cable length]

For "Alarm Relay" wiring: Choose stand-alone model (=A)

For "Modbus" wiring: Choose Modbus model (=I)

Example: H100IRCCV230GAB-5.0M (Stand-alone, Heater, GPS, aiming angle +1°, 5,0m cable)

Example: H100IRCCV230GIB-5.0M (Modbus, Heater, GPS, aiming angle +1°, 5,0m cable)

## 1.3 Specifications

Obelux H100 series lights fulfill the following standards:

- ICAO International Standards and Recommended Practices: Aerodromes Annex 14 Volume 1, 8th Edition, July 2018, Chapter 6: High-intensity Type B.

Fulfills the Recommendations Section in Table 6-3.

- Transport Styrelsen TSFS 2020:88
- Luftfartstilsynet FOR-2014-07-15-980

### 1.3.1 Optical characteristics

- 100 000 cd Flashing @ Day
- 20 000 cd Flashing @ Twilight
- 2 000 cd Flashing @ Night
- Flash rates 20fpm, 40fpm (fpm = flashes per minute)
- Color aviation WHITE
- Infrared 850nm
- Horizontal radiation pattern 360°
- Vertical beam 3°

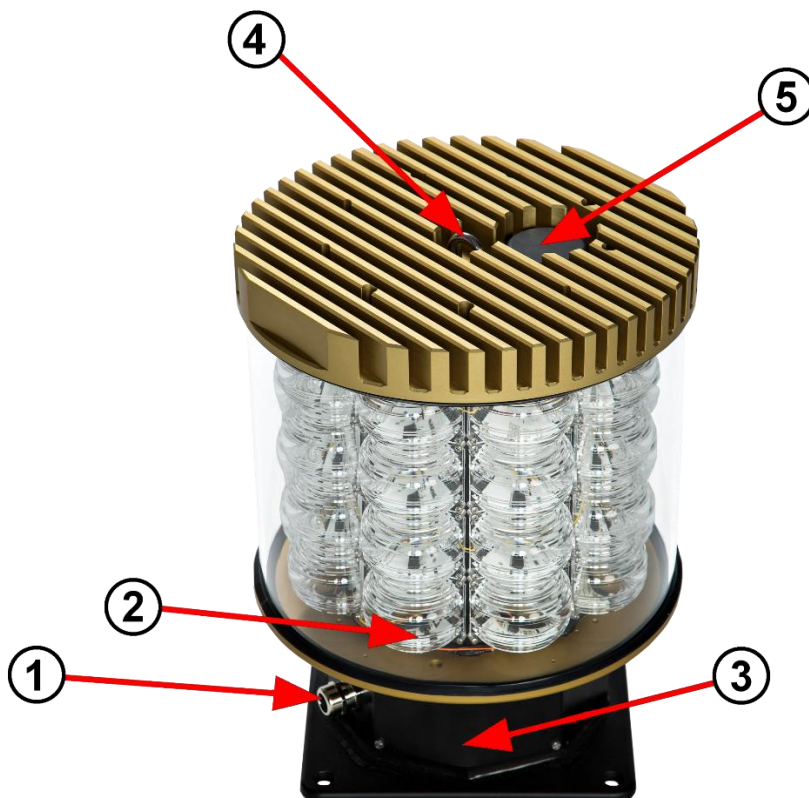
### 1.3.2 Electrical characteristics

- Operating voltage 230 V<sub>AC</sub>
- Constant power input by active PFC
- Meets standards
  - EMC (Emissions): EN 61000-6-4
  - EMC (Immunity): EN 61000-6-2
- Power consumption (@ 40 fpm)
  - 200W @ Day (with heating max. 240W)
  - 50W @ Twilight
  - 20W @ Night

### 1.3.3 Mechanical characteristics

- Anodised marine grade aluminium body
- Glass cover
- EMC cable glands M16 and M25
- Ingress protection IP65
- Two ventilation caps IP44
- Operating temperature range -40...+55 °C
- Mounting pattern 240x240 mm, Ø17 holes
- Height 455 mm, diameter 364 mm
- Weight 27 kg

## 1.4 Main functional parts



1. Cable glands (2 M25 for 11-16 mm cable diameter)
2. Location of photocell, behind lense
3. Service access door
4. Lug (for lifting the light)
5. Location of GPS antenna

## 2 INSTALLATION

### 2.1 Safety instructions

In this section are general safety instructions for the device. Please read the instructions carefully before installing or using the device to avoid any personal, environmental or material damages.

#### General considerations

Install device observing manufactures installation guide.

Use only cables and connectors specified by the manufacturer and in compliance with local electrical code. Keep your device away from heat sources, dust, smoke or other harmful substances.

Do not modify the device unless otherwise approved by the manufacturer.

If you have any error situation with the device, do not try to fix it by yourself, contact your reseller.

#### Environmental considerations

The European Parliament and the Council of European Union issued directive 2012/19/EU to contribute to sustainable production and consumption by, as a first priority, the prevention of WEEE and, in addition, by the re-use, recycling and other forms of recovery of such wastes so as to reduce the disposal of waste and to contribute to the efficient use of resources and the retrieval of valuable secondary raw materials.

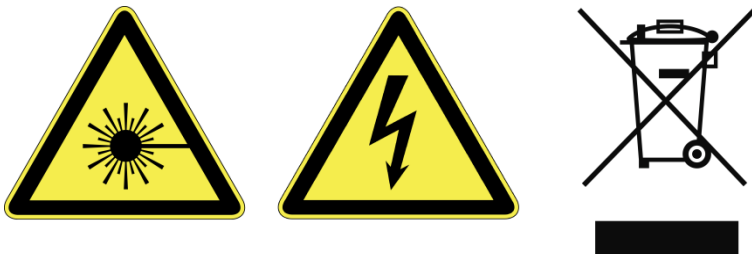
Obelux aviation obstacle light products sold inside European Union can be returned to manufacturer if no local WEEE separate collection and re-use services are available. Please contact Obelux for details.

Obelux does not refurbish returned items but forwards them to authorized WEEE treatment facility.

#### Personal considerations

HIGH VOLTAGE! Device contains high voltage; do not try to service the device when it is powered on.

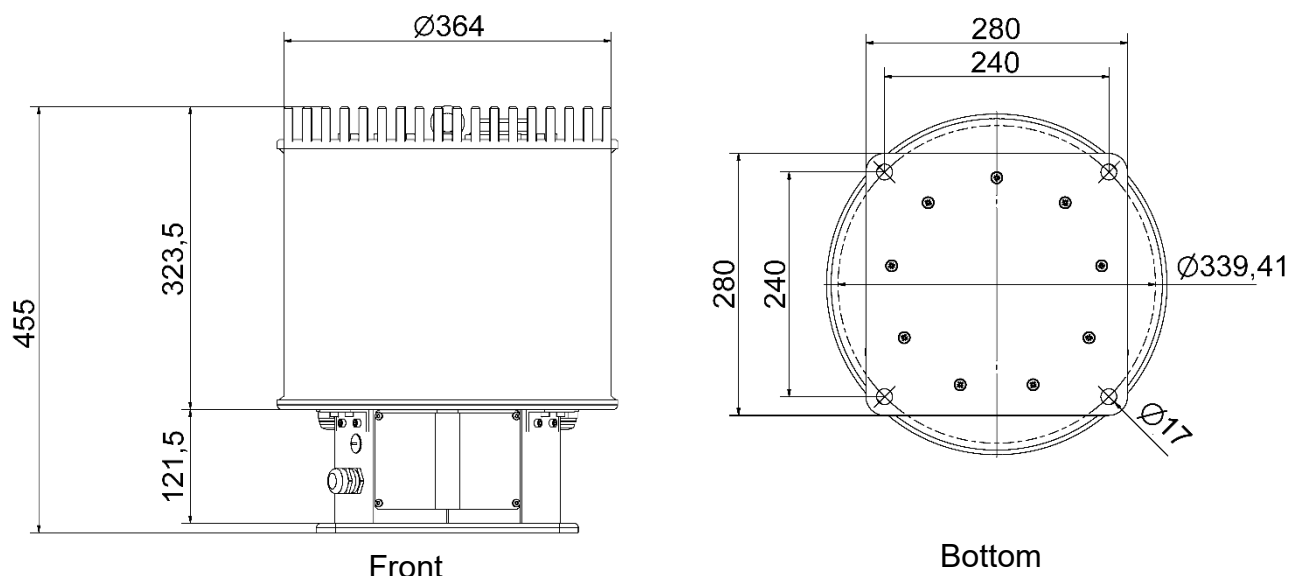
Obelux aviation obstruction lights are Class 2M LED devices. This class is safe for accidental viewing under all operating conditions. However, it may not be eye-safe for a person who deliberately stares into the LED beam by overcoming their natural aversion response to the very bright light.



## 2.2 Mechanical installation

Mount the aviation obstruction light to selected mounting point. The light comes with four M16 bolt holes for secure mounting. Level the light using spirit level (bubble level) if the mounting point is not already levelled. Tighten bolts and nuts. When the service access door is open, check that there is no inflow of water (incl. hail and snow). Photocell should have an uninterrupted view of the sky to work correctly. Make sure the photocell is pointed away from any buildings or light sources including other aviation lights. In wind turbine application it is also recommended to point the photocell away from the blades if possible.

Remove glass protecting cover after installation. Close the service access door and tighten its bolts after installation.



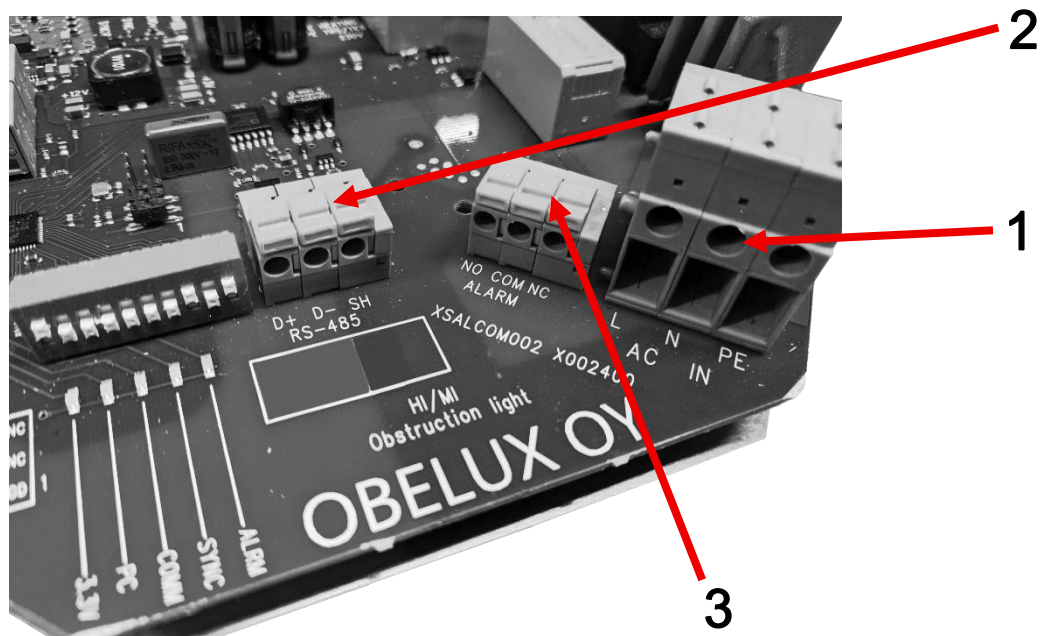
Dimensions in millimeters

## 2.3 Wiring

Open service access door to access the lights main circuit board.

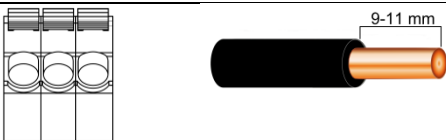
Route cables using cable glands on the side of the light. Connect the cable wires securely to appropriate terminal block connectors. The controller board has labelling for identification of connector wires. Make sure that all unused glands or gland holes are sealed.

Follow the illustration below for EMC cabling.



## 1 Power input

| Mark      | Description      | Information                                                        |
|-----------|------------------|--------------------------------------------------------------------|
| <b>L</b>  | Live terminal    | Connect the mains power supply Live (brown) wire into this pole.   |
| <b>N</b>  | Neutral terminal | Connect the mains power supply Neutral (blue) wire into this pole. |
| <b>PE</b> | Protective earth | Connect the protective earth (yellow/green) wire into this pole.   |

|                                            |                                                                                    |
|--------------------------------------------|------------------------------------------------------------------------------------|
| <b>Operating voltage</b>                   | 100-240VAC 50-60 Hz                                                                |
| <b>Conductor cross-section</b>             | 1mm <sup>2</sup> - 6mm <sup>2</sup> (18-10 AWG)                                    |
| <b>Recommended conductor size</b>          | 2.5mm <sup>2</sup> (14 AWG)                                                        |
| <b>Connector and wire stripping length</b> |  |

## 2 RS-485 / Modbus

| Mark      | Description | Information              |
|-----------|-------------|--------------------------|
| <b>D+</b> | Data +      | RS-485 non-inverting pin |
| <b>D-</b> | Data -      | RS-485 inverting pin     |
| <b>SH</b> | Shield      | Shield                   |

The RS-485 (Modbus) network input/output. Unused Modbus connectors can be left floating, i.e. no wiring there is required.

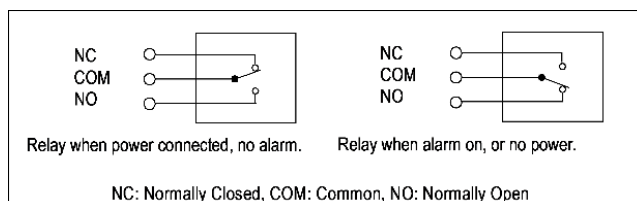
|                                   |                                                                           |
|-----------------------------------|---------------------------------------------------------------------------|
| <b>Conductor cross-section</b>    | 0.2mm <sup>2</sup> - 4mm <sup>2</sup> (24-12 AWG)                         |
| <b>Recommended conductor size</b> | 0.75mm <sup>2</sup> - 1,5mm <sup>2</sup> (20-16AWG) or shielded CAT cable |

## 3 Alarm relay

| Mark       | Description        | Information                                  |
|------------|--------------------|----------------------------------------------|
| <b>NO</b>  | Normally Open      | In alarm, connected with COM                 |
| <b>COM</b> | Common             | Common relay contact                         |
| <b>NC</b>  | Normally Connected | During normal operations, connected with COM |

Unused alarm relay connectors can be left floating, i.e. no wiring there is required.

|                                   |                                                                           |
|-----------------------------------|---------------------------------------------------------------------------|
| <b>Conductor cross-section</b>    | 0.2mm <sup>2</sup> - 4mm <sup>2</sup> (24-12 AWG)                         |
| <b>Relay maximum ratings</b>      | 250VAC, 8A                                                                |
| <b>Recommended conductor size</b> | 0.75mm <sup>2</sup> - 1,5mm <sup>2</sup> (20-16AWG) or shielded CAT cable |

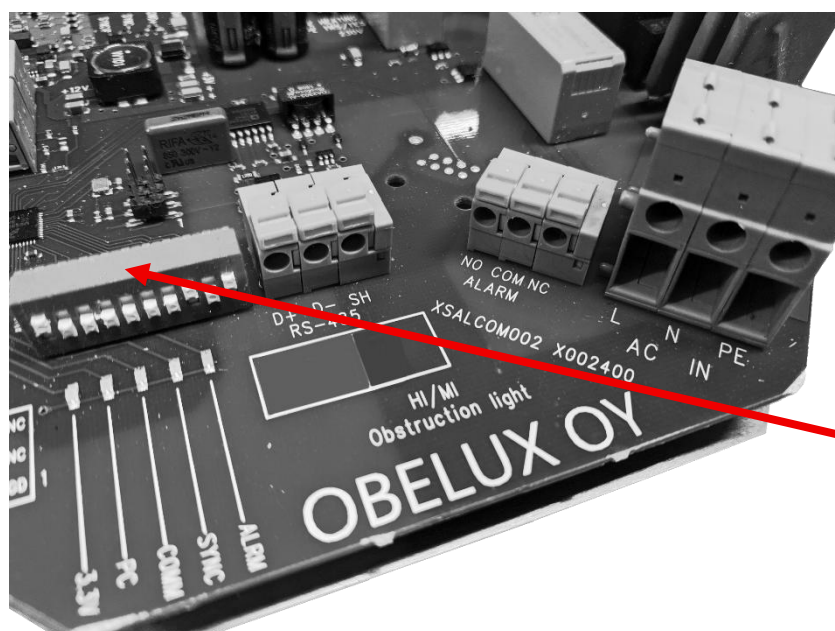


### 3 OPERATION

Open the bolts that secure the service access door to the chassis to access the lights main circuit board. Using configuration DIP switches, configure the desired parameters into the light. There are 10 configuration DIP switches. Embedded software in the obstruction light reads configuration switches regularly. Configuration change becomes effective within a few seconds. The light can be configured to different operating modes. Light reset is needed when changing between the modes. Light reset is done by power recycling (turning power off, then back on).

**Stand-alone mode:** In stand-alone mode, the light operation is configured with its DIP switches. No additional controllers are needed. Light will use its internal photocell to determine the time of day (day, twilight or night). The light will change its flashing mode based on photocell data and how the user has configured the light. Lights will synchronize their flashing with GPS module, if available. After light start-up, it will take some time for it to acquire a GPS lock.

**Modbus mode:** In Modbus mode, the light is being controlled with an Obelux controller. If Modbus connection is lost to the controller, the light will keep working on its own. It will use its internal photocell and GPS to determine the time of day and synchronize flashing. The light will return to Modbus operation when the connection is recovered.



RS-485 termination DIP switch 10

|                          |                          |                          |                          |                          |                          |                          |                          |                          |                          |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| ON                       | ON                       | ON                       | ON                       | ON                       | ON                       | ON                       | ON                       | ON                       | ON                       |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| OFF                      | OFF                      | OFF                      | OFF                      | OFF                      | OFF                      | OFF                      | OFF                      | OFF                      | OFF                      |
| 1                        | 2                        | 3                        | 4                        | 5                        | 6                        | 7                        | 8                        | 9                        | 10                       |

Configuration DIP switches

### 3.1 Stand-alone mode

In this mode, the light operation is configured with its DIP switches. No additional controllers are needed. The light is in stand-alone mode when DIP switches 7 and 8 are off.

| DIP switch | Operation mode |
|------------|----------------|
| <b>8</b>   |                |
| off        | Stand-alone    |
| on         | Modbus         |

| DIP switch | Test mode |
|------------|-----------|
| <b>7</b>   |           |
| off        | OFF       |
| on         | ON        |

| DIP switch          | Reserved |
|---------------------|----------|
| <b>3,4,5,6,9,10</b> |          |
| off                 | RESERVED |
| on                  | RESERVED |

Flashing rate (FPM) is selected with DIP switches 1-2. White and IR lights flash with same frequency.

| DIP switch |     | Flash rate (FPM) |
|------------|-----|------------------|
| 1          | 2   |                  |
| off        | off | RESERVED         |
| on         | off | 20 FPM           |
| off        | on  | 40 FPM           |
| on         | on  | RESERVED         |

## 3.2 Modbus mode

Light is in Modbus mode when the DIP switch 8 is on. The light is being controlled with an Obelux controller.

| DIP switch<br>8 | Operation mode |
|-----------------|----------------|
| off             | Stand-alone    |
| on              | Modbus         |

Test mode needs to be off.

| DIP switch<br>7 | Test mode     |
|-----------------|---------------|
| off             | Test mode off |
| on              | Test mode on  |

| DIP switch<br>5,6,9 | Reserved |
|---------------------|----------|
| off                 | RESERVED |
| on                  | RESERVED |

Configuration DIP switches 1-4 are used to give the light a Modbus address. Duplicate addresses on the same bus are not allowed. Give lights connected to the same communication bus an address starting from one.

| DIP switch |     |     |     | Modbus Address |
|------------|-----|-----|-----|----------------|
| 1          | 2   | 3   | 4   |                |
| off        | off | off | off | Address 01     |
| on         | off | off | off | Address 01     |
| off        | on  | off | off | Address 02     |
| on         | on  | off | off | Address 03     |
| off        | off | on  | off | Address 04     |
| on         | off | on  | off | Address 05     |
| off        | on  | on  | off | Address 06     |
| on         | on  | on  | off | Address 07     |
| off        | off | off | on  | Address 08     |
| on         | off | off | on  | Address 09     |
| off        | on  | off | on  | Address 10     |
| on         | on  | off | on  | Address 11     |
| off        | off | on  | on  | Address 12     |
| on         | off | on  | on  | Address 13     |
| off        | on  | on  | on  | Address 14     |
| on         | on  | on  | on  | Address 15     |

RS-485 bus should be terminated with on-board 120-ohm resistors on both ends and from every branch end of the communications bus. Turn on RS-485 termination DIP switch 10 from these lights.

| DIP switch | RS-485 termination resistor switch |
|------------|------------------------------------|
| 10         |                                    |
| off        | Termination off                    |
| on         | Termination on                     |

### 3.3 Test mode

The light is in Test mode when DIP switch 7 is on. The light will enter test mode when power is recycled. To leave test mode, turn off the power. Then set back the normal settings. When power is turned on again, the light returns to normal operation.

| DIP switch | Test mode |
|------------|-----------|
| 7          |           |
| off        | OFF       |
| on         | ON        |

| DIP switch | Reserved |
|------------|----------|
| 6,8,9,10   |          |
| off        | RESERVED |
| on         | RESERVED |

Photocell test speeds up the transition between the day and night modes to a few seconds. Normally this takes several minutes.

| DIP switch | Photocell test         |
|------------|------------------------|
| 3          |                        |
| off        | Test off               |
| on         | Photocell test mode on |

IR LED test turns on only IR light. White light is off.

| DIP switch | IR test          |
|------------|------------------|
| 4          |                  |
| off        | Test off         |
| on         | IR light on only |

White LED test turns on only White light. IR is off. The white LEDs are dimmed to 5% of full power so the LEDs can burn steadily and be visually checked.

| DIP switch | White test                   |
|------------|------------------------------|
| 5          |                              |
| off        | Test off                     |
| on         | White led Steady in 5% power |

### 3.4 Heater (CCV models)

CCV models have a 100W heater on the back side of main circuit board plate. The heater starts working when the light internal temperature drops below 10 °C. The heater reaches 100% power when temperature drops below 5 °C and stops working after the temperature rises above 10 °C.

### 3.5 Causes for alarms

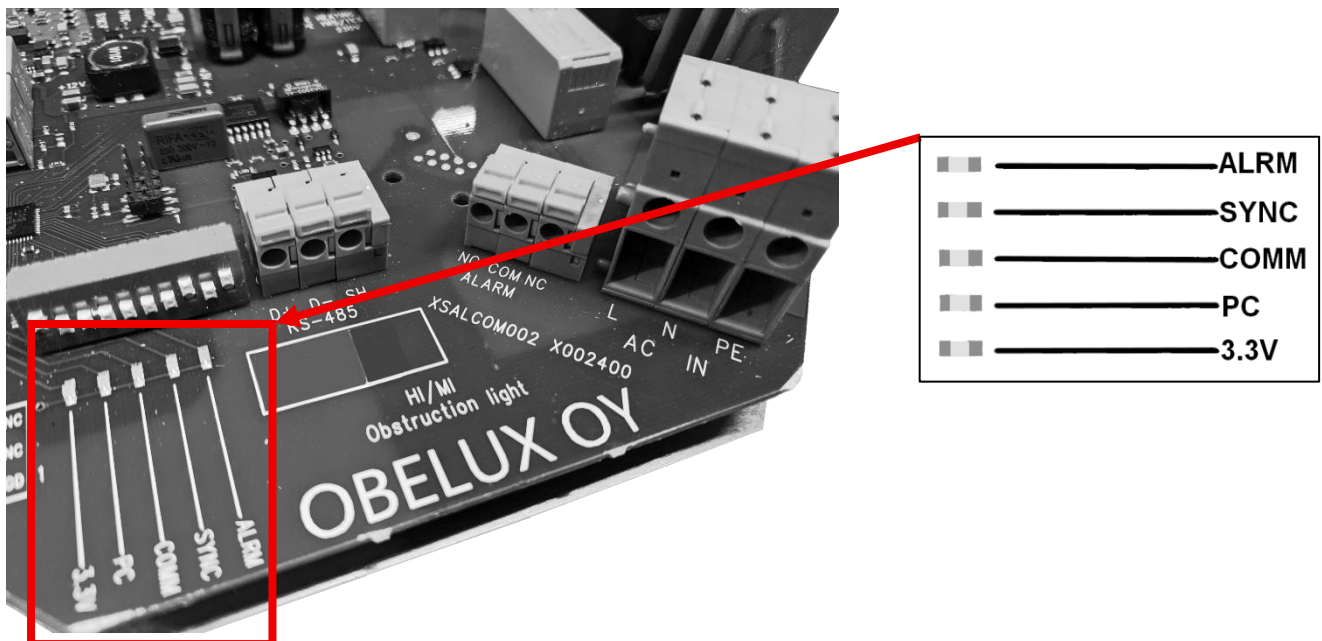
The following events can cause an ALARM:

- Internal power failure
- Light source failure, including decreased intensity level below rated level of light
- Loss of GPS synchronization signal or GPS module failure
- Incorrect photocell operation

The ALARM led will turn on and ALARM relay will activate.

### 3.6 Status LEDs

Status indication LEDs are located on the controller board.



The lights have five status LEDs on the controller board. These status LEDs are visible only when service access door is open.

| Status LED  | Description                                                                                                                                                        |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>3.3V</b> | <b>Internal operating voltage (GREEN)</b><br>OFF: Power off<br>ON: Power on                                                                                        |
| <b>COMM</b> | <b>Communication (GREEN)</b><br>OFF: Waiting for external signals<br>FLASHING: Master-slave communications occurring on the network                                |
| <b>PC</b>   | <b>Photocell (GREEN)</b><br>FLASHING: Night mode<br>FLASHING (slower): Twilight mode<br>ON: Day mode                                                               |
| <b>SYNC</b> | <b>Synchronization (GREEN)</b><br>OFF: All outputs are off<br>ON: At least one output is active. Led is flashing at same time and frequency as the aviation light. |
| <b>ALRM</b> | <b>Alarm indicator (RED)</b><br>OFF: Normal operation, no alarms<br>ON: Active alarm condition                                                                     |

## 3.7 Troubleshooting

### The light doesn't start

- No power (check that the 3.3V status LED is illuminated).
- Incorrect configuration (check DIP switches, make sure Test mode is turned off).
- Loose wires (check that all wires are properly seated in terminal block connectors).
- Do not exceed maximum operating voltage. Mains power supply input is protected with overvoltage protection circuit that is tuned to stated operating voltage range.

### No Modbus data connection to Obelux controller

- Check DIP settings. Check that light has a correct Modbus address and that there are no conflicting addresses. Make sure the light is configured to Modbus mode (DIP switch 8).
- Too many RS-485 termination resistors (120 ohm) on the same RS-485 communication bus. Only the light(s) on the bus ends should have the termination resistor in use.
- Check Modbus data wiring.

### Light does not change modes between day, twilight and night

- Check that the photocell has an uninterrupted view of the sky and has no dirt.
- Check that there are no external light sources that interfere with the photocell.
- Photocell is sampled once in a minute and read value are averaged to avoid sudden state changes. Unless test mode is enabled, it takes approx. three (3) minutes to change system state between day, twilight and night.

**Light does not flash in sync (GPS)**

- GPS antenna is mounted on top of obstruction light. Antenna needs non-blocked view to GPS satellites in orbit. After start-up, GPS receiver may take up to 30 min to obtain correct time data from GPS satellites. This operation requires data from several GPS satellites

## Annex 1: Pre-attached cable (HAN6)

### Cable specification:

#### SERVO cable FACAB EFK SERVO-CP acc. to Siemens Standard 6FX8008+

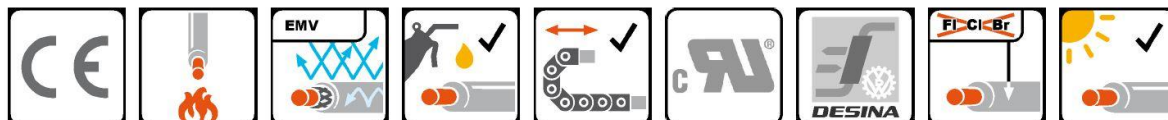
**faber**  
kabel



|                                       |                               |
|---------------------------------------|-------------------------------|
| <b>Specification/standard:</b>        | UL/CSA                        |
| <b>conductor material:</b>            | bare copper                   |
| <b>conductor construction:</b>        | fine stranded class 6         |
| <b>insulation:</b>                    | polypropylen                  |
| <b>screen:</b>                        | Cu-braid, tinned              |
| <b>screen coverage:</b>               | 85 %                          |
| <b>sheathing material:</b>            | polyurethan                   |
| <b>colour of outer sheath:</b>        | orange RAL 2003 (DESINA)      |
| <b>flame retardant:</b>               | VDE 0482-332-1-2/IEC 60332-1  |
| <b>halogen free:</b>                  | DIN EN 50267/IEC 60754        |
| <b>oil resistant:</b>                 | EN 60811-2-1                  |
| <b>max. operating temperature,</b>    | -50 - +80 °C                  |
| <b>fixed:</b>                         |                               |
| <b>temperature, moved/during</b>      | -40 - +80 °C                  |
| <b>installation:</b>                  |                               |
| <b>bending radius, fixed</b>          | 5 x DA                        |
| <b>installation:</b>                  |                               |
| <b>bending radius, moved</b>          | 7,5 x DA                      |
| <b>application:</b>                   |                               |
| <b>Bending cycles, max.:</b>          | 5 Mio.                        |
| <b>Moving distance, max.:</b>         | 100 m                         |
| <b>nominal voltage U<sub>0</sub>:</b> | 600 V                         |
| <b>nominal voltage U:</b>             | 1 kV                          |
| <b>test voltage:</b>                  | 4 kV                          |
| <b>core identification:</b>           | acc. to Siemens specification |

**Application:** Low capacity connection cable between servo controller and frequency driven motor. For application in machine tools and drag chains with medium mechanical stress. Please pay attention to our instructions for the use of drag-chain cables.

**Additional information:** Siemens part numbers (6FX...) are registered trade marks of Siemens AG and used only as reference.



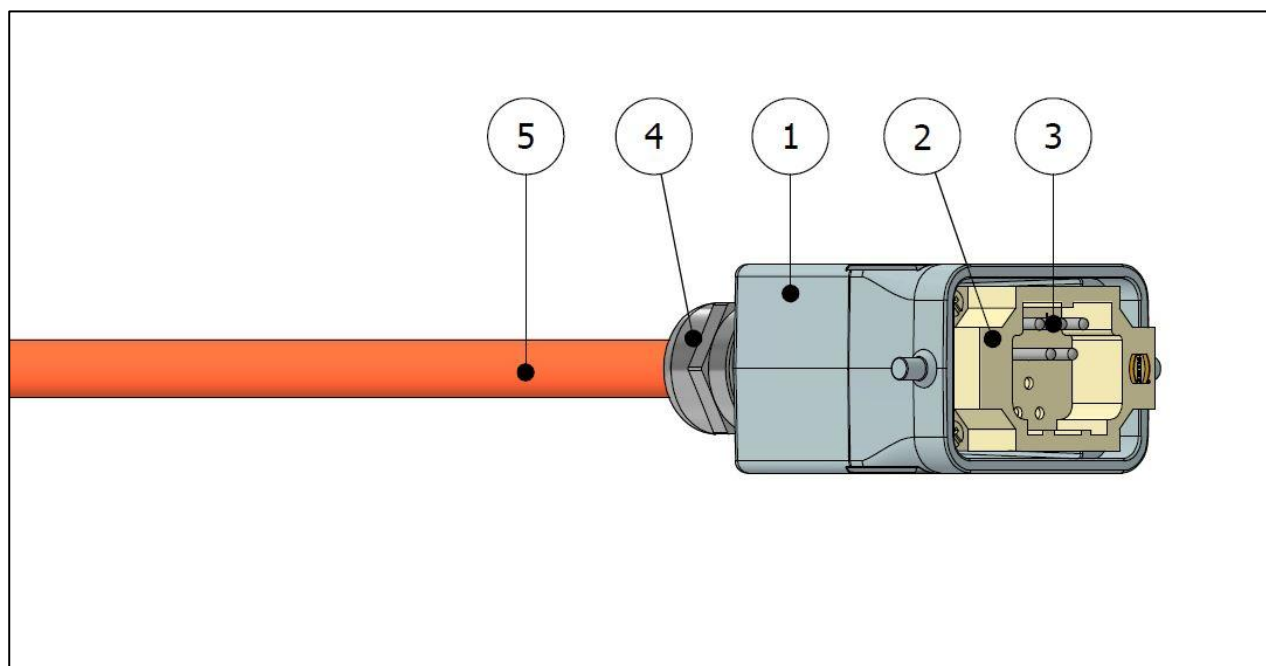
The products and information presented here are for technical calculation only. They are subject to technical progress and in no way represent the ability of shipment. Outer diameters are approximately.

| p/n    | part name                                                     | D <sub>A</sub><br>[mm] | G<br>[kg] | Cu<br>[kg/km] | p/n    | part name                                                  | D <sub>A</sub><br>[mm] | G<br>[kg] | Cu<br>[kg/km] |
|--------|---------------------------------------------------------------|------------------------|-----------|---------------|--------|------------------------------------------------------------|------------------------|-----------|---------------|
| 035291 | [4G25] 0,6/1 kV OR cUL - 6FX8008-1BB25                        | 25,4                   | 1523      | 1100          | 035298 | [4G6+(2X1,5)] 0,6/1 kV OR cUL - 6FX8008-1BA41              | 16,8                   | 540       | 365           |
| 035292 | [4G35] 0,6/1 kV OR cUL - 6FX8008-1BB35                        | 28,6                   | 2080      | 1510          | 035299 | [4G10+(2X1,5)] 0,6/1 kV OR cUL - 6FX8008-1BA516FX8008-1BA5 | 19,9                   | 782       | 560           |
| 035293 | [4G50] 0,6/1 kV OR cUL - 6FX8008-1BB50                        | 33,4                   | 2710      | 2130          | 035300 | [4G16+(2X1,5)] 0,6/1 kV OR cUL - 6FX8008-1BA616FX8008-1BA6 | 22,5                   | 1101      | 816           |
| 035294 | [4G70] 0,6/1 kV OR cUL - 6FX8008-1BB70                        | 42,5                   | 4123      | 3025          | 035301 | [4G25+(2X1,5)] 0,6/1 kV OR cUL - 6FX8008-1BA256FX8008-1BA2 | 26,2                   | 1490      | 1172          |
| 035295 | [4G1,5+(2X1,5)] 0,6/1 kV OR cUL - 6FX8008-1BA116FX8008-1BA1   | 11,6                   | 244       | 163,5         | 035302 | [4G35+(2X1,5)] 0,6/1 kV OR cUL - 6FX8008-1BA356FX8008-1BA3 | 29,8                   | 2015      | 1595          |
| 035296 | [4G2,5+(2X1,5)] 0,6/1 kV OR cUL - 6FX8008-1BA21 6FX8008-1BA21 | 13,4                   | 310       | 189           | 035303 | [4G50+(2X1,5)] 0,6/1 kV OR cUL - 6FX8008-1BA50             | 34                     | 2754      | 2214          |
| 035297 | [4G4+(2X1,5)] 0,6/1 kV OR cUL - 6FX8008-1BA316FX8008-1BA3     | 14,8                   | 408       | 260,5         |        |                                                            |                        |           |               |

|    |                |
|----|----------------|
| DA | outer diameter |
| G  | weight         |
| Cu | copper         |

### Connector parts:



- |             |                                          |                |
|-------------|------------------------------------------|----------------|
| 1. Housing: | HAN HC2 Pegs Top Entry M25               | 19 30 006 0446 |
| 2. Insert:  | HAN EE 10pos Male Crimp                  | 09 32 010 3001 |
| 3. Crimp:   | Contact HAN E Male Ag 1,5mm <sup>2</sup> | 09 33 000 6104 |
| 4. Gland:   | M25x1.5 EMC                              |                |
| 5. Cable:   | Servo 4G1,5+(2xG1,5)                     |                |

**Connector pinouts:**

| Alarm Relay |              | Modbus      |              |
|-------------|--------------|-------------|--------------|
| Pin number: | Designation: | Pin number: | Designation: |
| 1           | L            | 1           | L            |
| 2           | N            | 2           | N            |
| 3           | NO           | 3           | D+           |
| 4           | COM          | 4           | D-           |
| 5           | NC           | 5           | SH           |
| 6           | -            | 6           | -            |
| 7           | -            | 7           | -            |
| 8           | -            | 8           | -            |
| 9           | -            | 9           | -            |
| 10          | -            | 10          | -            |
| PE          | PE           | PE          | PE           |

**Order code:**

Syntax for order code: **[Light unit name] - [Cable length] - [Connector type]**  
 For "Alarm Relay" pinout: Choose stand-alone model (=A)  
 For "Modbus" pinout: Choose Modbus model (=I)

Example: H100IRCCV230GAB-2.70M-HAN6  
 (Stand-alone, Heater, GPS, aiming angle +1°, 2,7m cable with HAN6 connector)

Example: H100IRCCV230GIB-2.70M-HAN6  
 (Modbus, Heater, GPS, aiming angle +1°, 2,7m cable with HAN6 connector)

## Annex 2: Pre-attached cable (open ended)

Cable specification:

**SERVO cable FACAB EFK SERVO-CP**  
**acc. to Siemens Standard 6FX8008+**

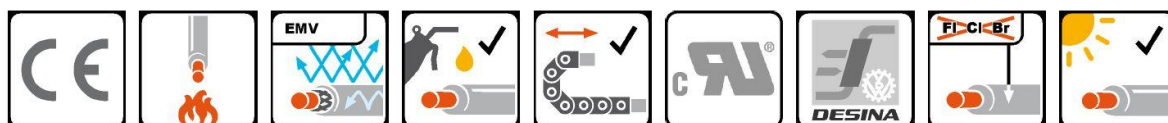
**faber**  
**kabel**



|                                                |                               |
|------------------------------------------------|-------------------------------|
| <b>Specification/standard:</b>                 | UL/CSA                        |
| <b>conductor material:</b>                     | bare copper                   |
| <b>conductor construction:</b>                 | fine stranded class 6         |
| <b>insulation:</b>                             | polypropylen                  |
| <b>screen:</b>                                 | Cu-braid, tinned              |
| <b>screen coverage:</b>                        | 85 %                          |
| <b>sheathing material:</b>                     | polyurethan                   |
| <b>colour of outer sheath:</b>                 | orange RAL 2003 (DESINA)      |
| <b>flame retardant:</b>                        | VDE 0482-332-1-2/IEC 60332-1  |
| <b>halogen free:</b>                           | DIN EN 50267/IEC 60754        |
| <b>oil resistant:</b>                          | EN 60811-2-1                  |
| <b>max. operating temperature, fixed:</b>      | -50 - +80 °C                  |
| <b>temperature, moved/during installation:</b> | -40 - +80 °C                  |
| <b>bending radius, fixed installation:</b>     | 5 x DA                        |
| <b>bending radius, moved application:</b>      | 7,5 x DA                      |
| <b>Bending cycles, max.:</b>                   | 5 Mio.                        |
| <b>Moving distance, max.:</b>                  | 100 m                         |
| <b>nominal voltage U<sub>0</sub>:</b>          | 600 V                         |
| <b>nominal voltage U:</b>                      | 1 kV                          |
| <b>test voltage:</b>                           | 4 kV                          |
| <b>core identification:</b>                    | acc. to Siemens specification |

**Application:** Low capacity connection cable between servo controller and frequency driven motor. For application in machine tools and drag chains with medium mechanical stress. Please pay attention to our instructions for the use of drag-chain cables.

**Additional information:** Siemens part numbers (6FX...) are registered trade marks of Siemens AG and used only as reference.



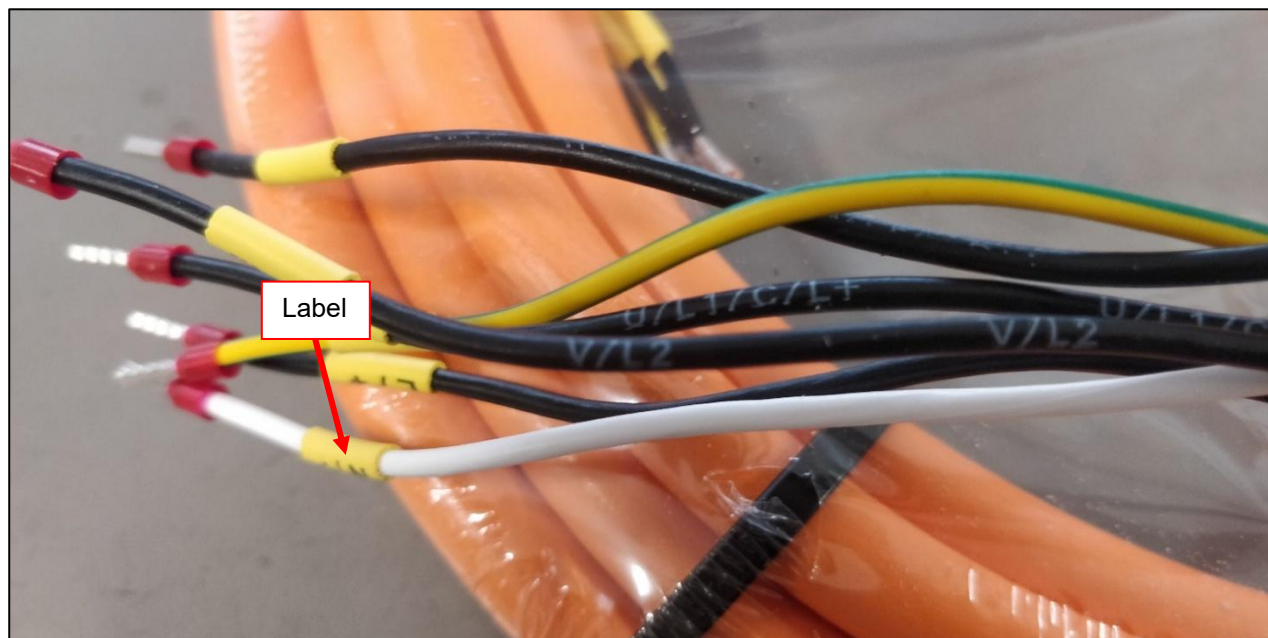
The products and information presented here are for technical calculation only. They are subject to technical progress and in no way represent the ability of shipment. Outer diameters are approximately.

| p/n    | part name                                                     | D <sub>A</sub><br>[mm] | G<br>[kg] | Cu<br>[kg/km] | p/n    | part name                                                  | D <sub>A</sub><br>[mm] | G<br>[kg] | Cu<br>[kg/km] |
|--------|---------------------------------------------------------------|------------------------|-----------|---------------|--------|------------------------------------------------------------|------------------------|-----------|---------------|
| 035291 | [4G25] 0,6/1 kV OR cUL - 6FX8008-1BB25                        | 25,4                   | 1523      | 1100          | 035298 | [4G6+(2X1,5)] 0,6/1 kV OR cUL - 6FX8008-1BA41              | 16,8                   | 540       | 365           |
| 035292 | [4G35] 0,6/1 kV OR cUL - 6FX8008-1BB35                        | 28,6                   | 2080      | 1510          | 035299 | [4G10+(2X1,5)] 0,6/1 kV OR cUL - 6FX8008-1BA516FX8008-1BA5 | 19,9                   | 782       | 560           |
| 035293 | [4G50] 0,6/1 kV OR cUL - 6FX8008-1BB50                        | 33,4                   | 2710      | 2130          | 035300 | [4G16+(2X1,5)] 0,6/1 kV OR cUL - 6FX8008-1BA616FX8008-1BA6 | 22,5                   | 1101      | 816           |
| 035294 | [4G70] 0,6/1 kV OR cUL - 6FX8008-1BB70                        | 42,5                   | 4123      | 3025          | 035301 | [4G25+(2X1,5)] 0,6/1 kV OR cUL - 6FX8008-1BA256FX8008-1BA2 | 26,2                   | 1490      | 1172          |
| 035295 | [4G1,5+(2X1,5)] 0,6/1 kV OR cUL - 6FX8008-1BA116FX8008-1BA1   | 11,6                   | 244       | 163,5         | 035302 | [4G35+(2X1,5)] 0,6/1 kV OR cUL - 6FX8008-1BA356FX8008-1BA3 | 29,8                   | 2015      | 1595          |
| 035296 | [4G2,5+(2X1,5)] 0,6/1 kV OR cUL - 6FX8008-1BA21 6FX8008-1BA21 | 13,4                   | 310       | 189           | 035303 | [4G50+(2X1,5)] 0,6/1 kV OR cUL - 6FX8008-1BA50             | 34                     | 2754      | 2214          |
| 035297 | [4G4+(2X1,5)] 0,6/1 kV OR cUL - 6FX8008-1BA316FX8008-1BA3     | 14,8                   | 408       | 260,5         |        |                                                            |                        |           |               |

|    |                |
|----|----------------|
| DA | outer diameter |
| G  | weight         |
| Cu | copper         |

### Wire designations:



| Alarm Relay |              | Modbus |              |
|-------------|--------------|--------|--------------|
| Label:      | Designation: | Label: | Designation: |
| L / +       | L            | L / +  | L            |
| N / -       | N            | N / -  | N            |
| PE          | PE           | PE     | PE           |
| NO          | NO           | D+     | D+           |
| COM         | COM          | D-     | D-           |
| NC          | NC           | SH     | SH           |

**Order code:**

Syntax for order code: **[Light unit name] - [Cable length]**  
 For "Alarm Relay" wiring: Choose stand-alone model (=A)  
 For "Modbus" wiring: Choose Modbus model (=I)

Example: H100IRCCV230GAB-5.0M (Alarm Relay, 5,0m cable)  
 Example: H100IRCCV230GIB-5.0M (Modbus, 5,0m cable)

Example: H100IRCCV230GAB-5.0M  
 (Stand-alone, Heater, GPS, aiming angle +1°, 5,0m cable)

Example: H100IRCCV230GIB-5.0M  
 (Modbus, Heater, GPS, aiming angle +1°, 5,0m cable)