Base Load Power Hub (BLPH)

NAVIGATION AID SYSTEM

INSTALLATION, OPERATING AND MAINTENANCE MANUAL

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1.0 DOCUMENT REFERENCE

For a proper use of this manual please refer to the following documents:

CUSTOMER DOC. NO.	SICE DOC. NO.	DESCRIPTION
1724000775-EL-DG-00008	DW-864-1	SYSTEM BLOCK DIAGRAM
1724000775-EL-DG-00005	DW-864-2	SINGLE LINE DIAGRAMS
1724000775-EL-DA-00003	DW-864-3	GENERAL ARRANGEMENT AND DIMENSIONAL DRAWINGS
1724000775-EL-DG-00007	DW-864-4	ELECTRICAL INTERCONNECTIONS DIAGRAMS
1724000775-EL-DG-00006	DW-864-5	SCHEMATIC WIRING DIAGRAMS
1724000775-EL-LIS-00009	DW-864-6	MATERIAL LIST AND BILL OF MATERIAL
1724000775-EL-LIS-00010	DW-864-7	BATTERY SIZING CALCULATION AND LOAD LIST
1724000775-EL-LIS-00011	DW-864-8	I/O LIST

2.0 SAFETY NOTES



This manual contains important instructions that have to be followed for proper installation and maintanance of the system. Read all of the instructions and cautions in the manual before starting the installation and use of the system to which this manual is referred to.



The equipment, described into this manual, must be used exclusively for the purpose for which it was designed.



WARNING

All actions and services on the system must be undertaken only by qualified personnel. The operations on ATEX certified equipment must be carried out in compliance with **European Rules EN 60079-01**. The works in the electrical plants must be carried out in compliance with **Rules EN 50110-1 (CEI 11-48) & CEI 11-27.**

	**WARNING: ELECTRIC SHOCK HAZARD** Always switch-off the power supply (where applicable) before carrying-out maintenance actions on the products.

	**WARNING** Do not lift heavy loads without assistance.

3.0 NAVIGATION AIDS SYSTEM DESCRIPTION

3.1 SYSTEM OVERVIEW

The system provided by SICE is a NAVIGATION AIDS SYSTEM consisting of flashing lanterns used for visually signaling the offshore structure as an obstacle to marine traffic according to IALA regulations and medium intensity obstruction lights used for visually signaling the fixed offshore platform as an obstacle to local air-born traffic according to CAP168 regulations. Furthermore, in the system is included also one boat landing status light, used as a visual warning system if a condition exists on the installation which may be hazardous for the vessel or its occupants. The lanterns, the obstruction lights and the boat landing status light are powered and driven by the NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B)*. If the working mode selected by the user is AUTOMATIC (through the selector switch on the cover of the enclosure), the marine signal lights are switched-on/off accordingly to the PHOTOCELL SYSTEM (*EPH-200-01*), the ASTRO TIMER (installed inside the NAVAIDS CENTRAL CONTROL PANEL) and the VISIBILITY METER (*EVM-200-01*) detection. The boat landing status lights are driven through the corresponding remote command and through the push-buttons placed on the cover of the enclosure (when they are activated through the corresponding remote command, they are automatically switched-off after 6 hours) . The obstruction lights are always switched-on (they can be switched-off only though the selector switch placed on the cover of the enclosure). All the loads are automatically switched-off when the low-low battery voltage alarm occurs.

The NAVAIDS BATTERY BANK (*BA-200F2*) is charged through two battery chargers installed inside the NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*) when at least one of the two 230Vac mains power supplies is available. If no 230Vac mains power supply is available, the navaids system is powered only by the NAVAIDS BATTERY BANK (*BA-200F2*) for at least 96 hours (autonomy of the NAVAIDS BATTERY BANK).

Between the NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*) and the NAVAIDS BATTERY BANK (*BA-200F2*) is installed the NAVAIDS BATTERY BREAKER (*CB-200F2*), used to manually or automatically disconnect the NAVAIDS BATTERY BANK (*BA-200F2*) from the NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*).

The BATTERY TEMPERATURE PROBE (*ETM-200-01*) is used to adjust the battery charge voltage according to the NAVAIDS BATTERY BANK (*BA-200F2*) temperature.

The NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*) receives also a remote command, used to switch-off the VISIBILITY METER (*EVM-200-01*) in case of fire and gas alarm, and provides a navaids general system alarm remote control.

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The system components and their tag names are shown in the following table.

ITEM TAG	DESCRIPTION	Q.TY
NC-200F2A/B/C/BC-200F2A/B	**NAVAIDS CENTRAL CONTROL PANEL c/w BATTERY CHARGER/RECTIFIER**	**1**
CB-200F2	**NAVAIDS BATTERY BREAKER**	**1**
BA-200F2	**NAVAIDS BATTERY BANK**	**1**
ETM-200-01	**BATTERY TEMPERATURE PROBE**	**1**
EPH-200-01	**PHOTOCELL SYSTEM**	**1**
EVM-200-01	**VISIBILITY METER**	**1**
EML-200-01	**MAIN MARINE YELLOW LIGHT 1**	**1**
EML-200-02	**MAIN MARINE YELLOW LIGHT 2**	**1**
EOL-200-01	**MEDIUM INTENSITY AOL 1 (TOP)**	**1**
EOL-200-02	**MEDIUM INTENSITY AOL 2 (TOP)**	**1**
EOL-200-03	**MEDIUM INTENSITY AOL 3 (INTERM.)**	**1**
EOL-200-04	**MEDIUM INTENSITY AOL 4 (INTERM.)**	**1**
ESL-200-01	**BOAT LANDING STATUS LIGHT**	**1**

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3.2 SYSTEM COMPONENT DESCRIPTION

3.2.1 NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*)

The NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*) is composed by three explosion-proof enclosures joined together by vertical sealing fittings and suitable to be installed indoor/outdoor in classified area (Zone 1). The panel is complete with an AISI316L stainless steel support structure suitable to be fixed to the floor and wall. The purpose of this control panel is to power and control all the navigation aids system components.

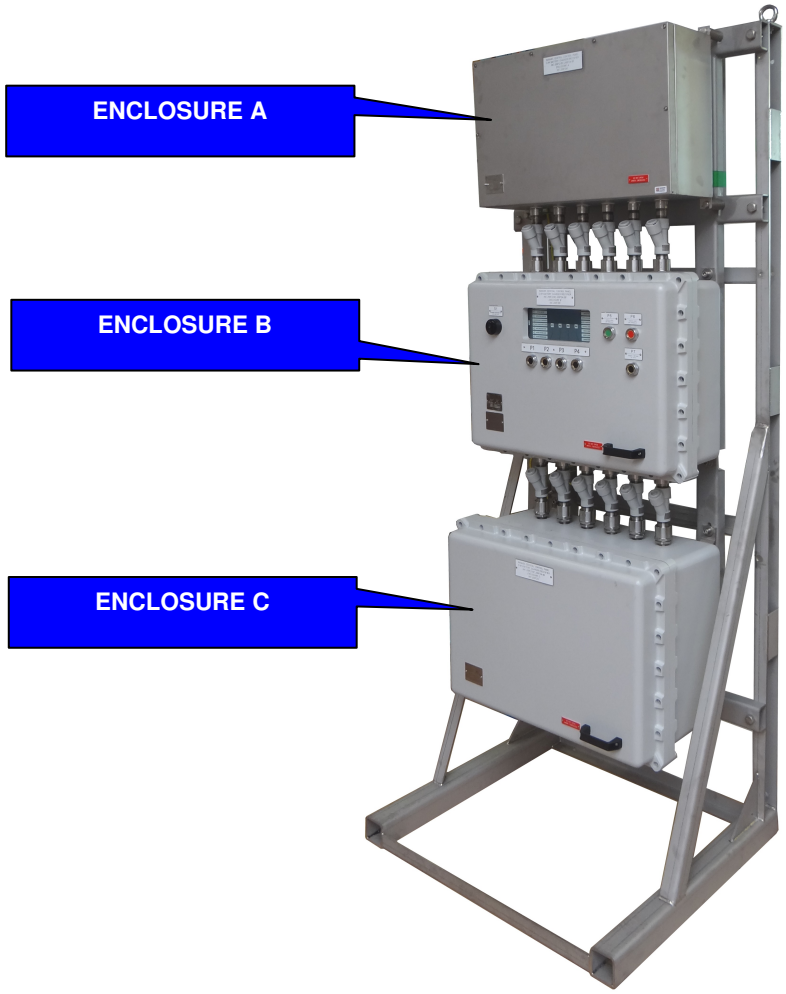


FIGURE 1: NAVAIDS CENTRAL CONTROL PANEL

The enclosures B and C are copper free aluminum enclosure (EJB-13/EJB-13A), instead the enclosures A is a AISI316L stainless steel enclosure. The enclosures A includes the terminal strip used to connect the panel.

The components installed inside the panel can be divided in the following sub-sections:

- **BATTERY CHARGERS:** it includes two battery chargers (BC-200F2A / BC-200F2B), powered by the one of the two power supplies incoming from *LV SWITCHGEAR (SG-200N1) (230Vac)*, in order to charge the NAVAIDS BATTERY BANK (*BA-200F2*) (24Vdc).

- **A.C.O.:** it includes two contactors (KM1/KM2) with electrical and mechanical interlock used to switch from one 230Vac mains power supply to the other one, in case the first one is not available.

- **CIRCUITS FOR LANTERNS AND OBSTRUCTION LIGHTS:** it includes the automatic circuit breakers, the relays, the dc/ac invertersn (INV1/INV2), the coders (CG1÷CG3) and the undercurrent monitoring relays (KU1/KU2) used to drive the MAIN MARINE YELLOW LIGHT 1/2 (*EML-200-01/02*), the BOAT LANDING STATUS LIGHT (*ESL-200-01*), the MEDIUM INTENSITY AOL 1÷4 (*EOL-200-01÷04)*.

- **NETWORK ANALYZER:** it includes two network analyzers (NA1/NA2), used to provide to the control system some analog values (voltage, current).

- **ASTRONOMICAL TIMER:** it includes the astronomical timer (KA1), used to signal day/night to the control system according to the time and location on Earth. The astronomical timer detection is used by the control system to switch-on/off the marine lights together with the PHOTOCELL SYSTEM (*EPH-200-01)* and VISIBILITY METER (*EVM-200*-01) detection (the cumulative result of the astronomical timer, the PHOTOCELL SYSTEM (*EPH-200-01)* and VISIBILITY METER (*EVM-200*-01) detection is given by a logical “OR” between them: if at least one of them is NIGHT/FOG the cumulative result is NIGHT/FOG).

- **CIRCUITS FOR VISIBILITY METER:** it includes the relay used to switch-on/off the VISIBILITY METER (*EVM-200-01*).

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- **EARTH INSULATION MONITORING SYSTEM:** it includes three earth insulation monitoring relays that are used to monitor the earth insulation with the 24Vdc battery bank poles (KE1) and with the 230Vac inverters outputs (KE2/KE3).

- **SELECTOR SWITCH & PUSH-BUTTONS:** it includes one selector switch (S1), placed on the cover of the enclosure B, used to select the working mode of the marine signal lights (ON/AUTO/OFF) and obstruction lights (OFF) and three push-buttons (P5÷P7), placed on the cover of the enclosure B, used to drive the BOAT LANDING STATUS LIGHT (*ESL-200-01*).

- **SURGE ARRESTERS:** it includes ten surge arresters (S1÷S10), used to avoid damage to the system due to the lightning.

- **DIGITAL INPUT:** it includes the digital input generated by the NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*) in order to provide the “navaids general system alarm” to the *SIS* (*B400-SIS-001)*.

- **DIGITAL OUTPUT:** it includes the digital outputs generated by the *F&G SYSTEM* (*B400-FGS-002*) in order to provide the “boat landing status light activation command” and the “visibility meter activation command” to the NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*).

- **CONTROL SYSTEM:** the above listed sub-systems and all the other system components are monitored by the control system. This system is designed by SICE and it is very useful in all cases where several sub-systems have to be integrated together, providing the user a complete local and remote control for the whole system. The local interface panel is composed of a graphic display, by which the user can monitor all the configured statuses, alarms, analogue values and thresholds and modify the settings.

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FIGURE 2: NAVAIDS CENTRAL CONTROL PANEL (INTERNAL VIEW)

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3.2.2 NAVAIDS BATTERY BANK (*BA-200F2*)

The NAVAIDS BATTERY BANK (*BA-200F2*) is composed of 12 FIAMM battery cells type SMG1680 (24Vdc) already installed and connected by the manufacturer inside a AISI316L stainless steel battery box suitable for classified area (Zone 1) indoor/outdoor installation.

It is used as back-up power supply when the mains power supplies are not available. When at least one of the 230Vac power supplies is available the battery bank is charged (FLOATING) through the battery chargers installed inside the NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*).



FIGURE 3: NAVAIDS BATTERY BANK

3.2.3 NAVAIDS BATTERY BREAKER (*CB-200F2*)

The NAVAIDS BATTERY BREAKER (*CB-200F2*) is built in an explosion-proof enclosure (EJB-5) suitable to be installed indoor/outdoor in classified area (Zone 1).

This panel is connected between the NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*) and the NAVAIDS BATTERY BANK (*BA-200F2*) and it is used to disconnect manually (through a selector switch) or automatically (through the automatic circuit breaker) the two mentioned components.

The status of the automatic circuit breaker inside the panel is monitored by the control system of the NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*). This alarm is also signaled locally on the cover of the panel through a red pilot light.



FIGURE 4: NAVAIDS BATTERY BREAKER

3.2.4 BATTERY TEMPERATURE PROBE (*ETM-200-01*)

The BATTERY TEMPERATURE PROBE (*ETM-200-01*) is suitable to be installed indoor/outdoor in a classified area (Zone 1). It is used to collect the tempearture values of the battery bank and to transmit them to the control system installed inside the NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*) in order to adjust the output voltage of the battery chargers accordingly to the temperature value detected.



FIGURE 5: BATTERY TEMPERATURE PROBE

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3.2.5 MAIN MARINE YELLOW LIGHTS (*EML-200-01/02*)

The marine signal lights (flashing yellow lights) are used to mark the off-shore obstacles on which they are installed as requested by IALA rules (yellow signal light range: 5 n.m.). Each light is driven by a U-coder installed inside the NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*). They are suitable to be installed in classified area (Zone 1).



FIGURE 6: MAIN MARINE YELLOW LIGHT

3.2.6 MEDIUM INTENSITY AOL (*EOL-200-01/02/03/04*)

These red obstacle marking lights (MIOL CAP168 – GROUP C) (red steady burning lights) are suitable to be installed in classified area (Zone 1). They are installed on obstacles that may affect the aviation safety when the top of the object to be marked is more than 45m above the level of the surrounding ground.
For the MEDIUM INTENSITY AOL 3 & 4 (*EOL-200-03/04*) SICE provides also the suitable support poles.
Each group of lights (MEDIUM INTENSITY AOL 1/2 and MEDIUM INTENSITY AOL 3/4) is driven by the inverter and undercurrent monitoring relay installed inside the NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*).



FIGURE 7: MEDIUM INTENSITY OBSTRUCTION LIGHT

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3.2.7 BOAT LANDING STATUS LIGHT (ESL-200-01)

The boat landing status light (flashing red light) is suitable to be installed in classified area (Zone 1). It is used as a visual warning system if a condition exists on the installation which may be hazardous for the vessel or its occupants.it is provided together with a suitable support pole. The light is driven by a U-coder installed inside the NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*).
When activated, they have to be visible to the vessel pilot from any direction of approach (or when landed on the boat landing).



FIGURE 8: BOAT LANDING STATUS LIGHT

3.2.8 SYSTEM PHOTOCELL (*EPH-200-01*)

The SYSTEM PHOTOCELL (*EPH-200-01*) is built in an explosion-proof enclosure (GUB-03/EMH-160) suitable to be installed in classified area (Zone 1).

It is used to detect the ambient light conditions (day/night) and to switch-on/off (together with the astronomical timer and visibility meter) the marine lanterns when the corresponding selector switch requests the mentioned groups of lights to work in AUTO mode. If it fails the marine lanterns are forced to be switched-on.



FIGURE 9: SYSTEM PHOTOCELL

3.2.9 VISIBILITY METER (*EVM-200-01*)

The visibility meter is suitable to be installed in classified area (Zone 1).

It is used to detect the ambient visibility conditions (fog/no fog) and to switch-on/off the marine lanterns (together with the photocell and astronomical timer) when corresponding selector switch requests them in AUTO mode. If it fails the marine lanterns are forced to be switched-on.

The visibility meter is provided with the suitable mechanical support pole.



FIGURE 10: VISIBILITY METER

3.3 SUB-SYSTEM REFERENCE DOCUMENTS

For any further information about the system components please see the following document:

CLIENT DOC No.	SICE DOC. No.	DESCRIPTION
1724000775-EL-DS-00004	OM-776/DE SUB	EQUIPMENT TECHNICAL DATA SHEET

4.0 MECHANICAL INSTALLATION

4.1 GENERAL RECOMMENDATIONS

	SICE recommends to follow the Constructive Manual (DOC. No. DW-864) in order to carry out properly the mechanical installation of each equipment of the system.

	SICE recommends to install the panels/enclosures considering that the frontal doors/covers need to be open after the mechanical installation in order to easily access inside and that the cable entries need to be easily accessible.

	SICE recommends to always check if it is technically possible to weld the stainless steel of the support structures to the chosen surface. Not all surface materials are suitable for welding with stainless steel materials.

	SICE recommends to always close the enclosures with bolts. During the installation/interconnection/commissioning procedure close the enclosures with at least one bolt every two on the top side of the enclosures and one bolt for each corner in order to avoid water access. Once the installation/interconnection/commissioning procedure are ended install all the bolts on the enclosures.

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4.2 COMPONENT INSTALLATION GUIDELINES

4.2.1 NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*)

The NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*) has to be installed by using all the suitable fixing holes in order to fix the panel to the floor and to the wall. To install it properly, refer to the drawing at sh. 3/5 of 44 of DOC. No. DW-864-3.

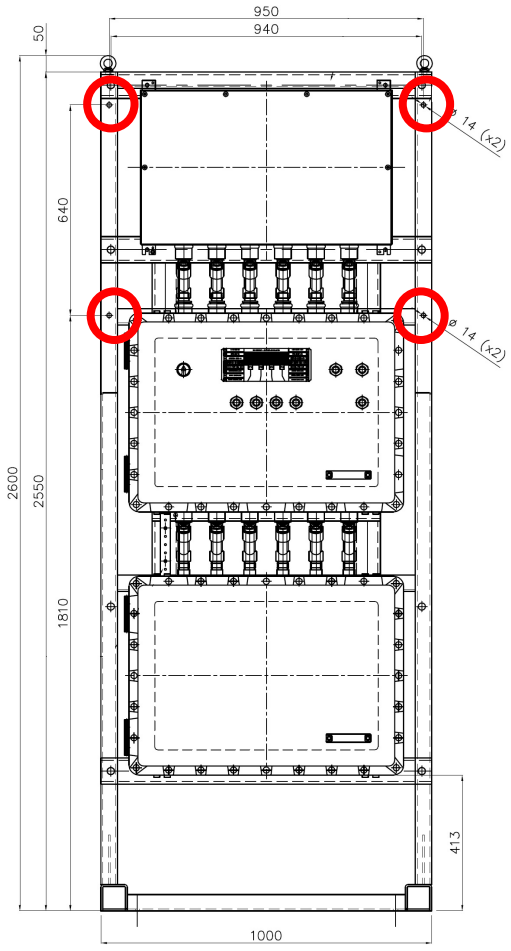


FIGURE 11: NAVAIDS CENTRAL CONTROL PANEL WALL FIXING HOLES

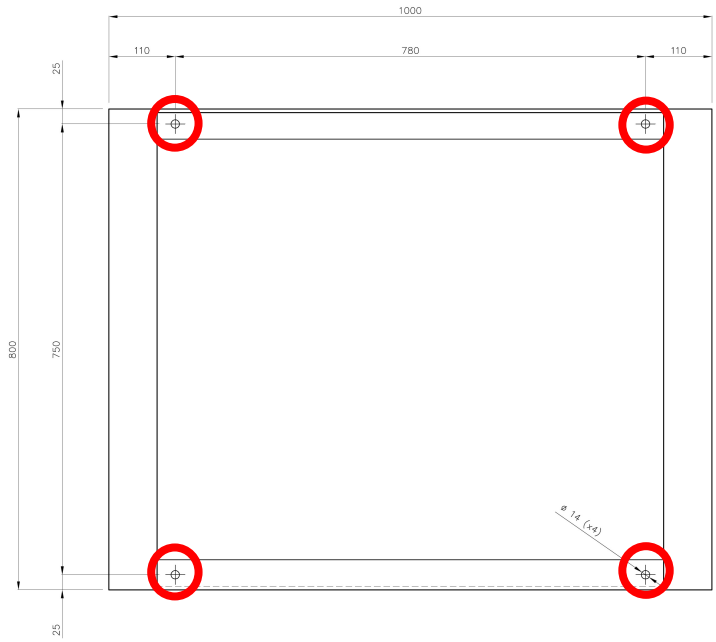


FIGURE 12: NAVAIDS CENTRAL CONTROL PANEL FLOOR FIXING HOLES (BOTTOM VIEW)

The cables enter from the top side of the panel.

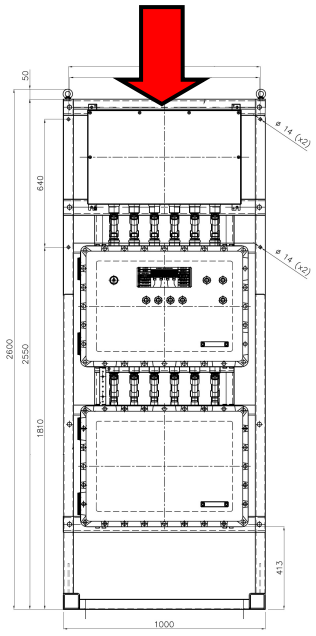


FIGURE 13: NAVAIDS CENTRAL CONTROL PANEL CABLE ENTRIES

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For any further technical information about this component, please refer to the following document:

CLIENT DOC No.	SICE DOC. No.	DESCRIPTION
1724000775-EL-DS-00004	OM-776/DE SUB	EQUIPMENT TECHNICAL DATA SHEET

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4.2.2 NAVAIDS BATTERY BANK (*BA-200F2*)

The NAVAIDS BATTERY BANK (*BA-200F2*) can be installed by using all the fixing holes available in the basement of the battery box. To install it properly, refer to the drawing at sh. 42/43 of 44 of DOC. No. DW-864-3.

SICE recommend to install the battery box considering that the lid needs to be open after the mechanical installation in order to easily access inside.

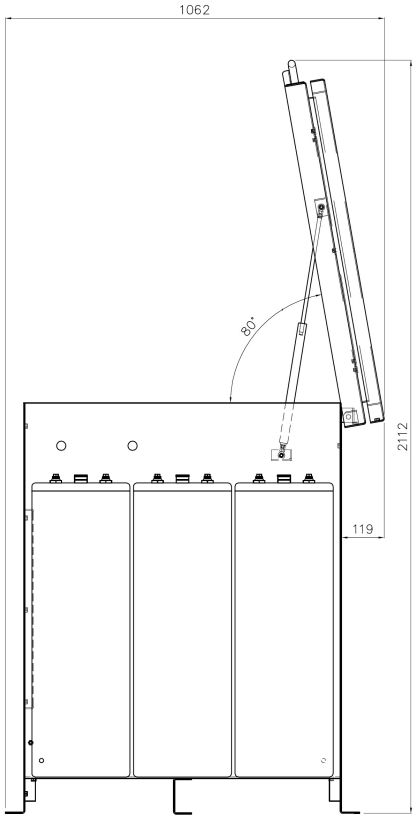


FIGURE 14: NAVAIDS BATTERY BANK (SIDE VIEW WITH LID OPEN)

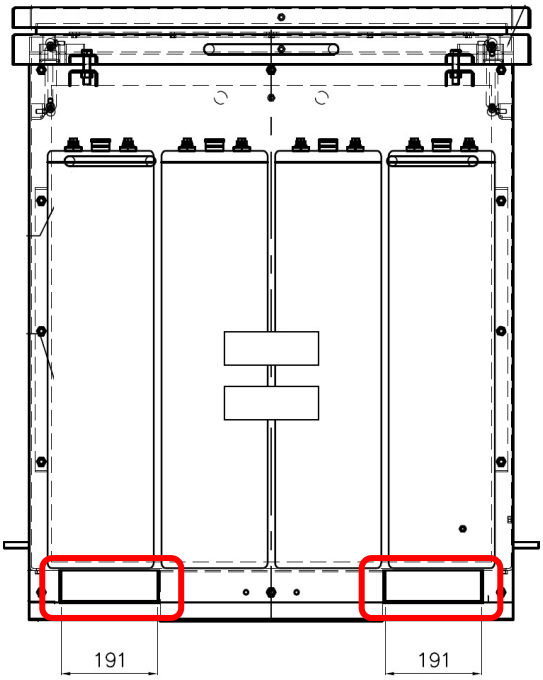


FIGURE 15: NAVAIDS BATTERY BANK LIFTING HOLES (FRONT VIEW)

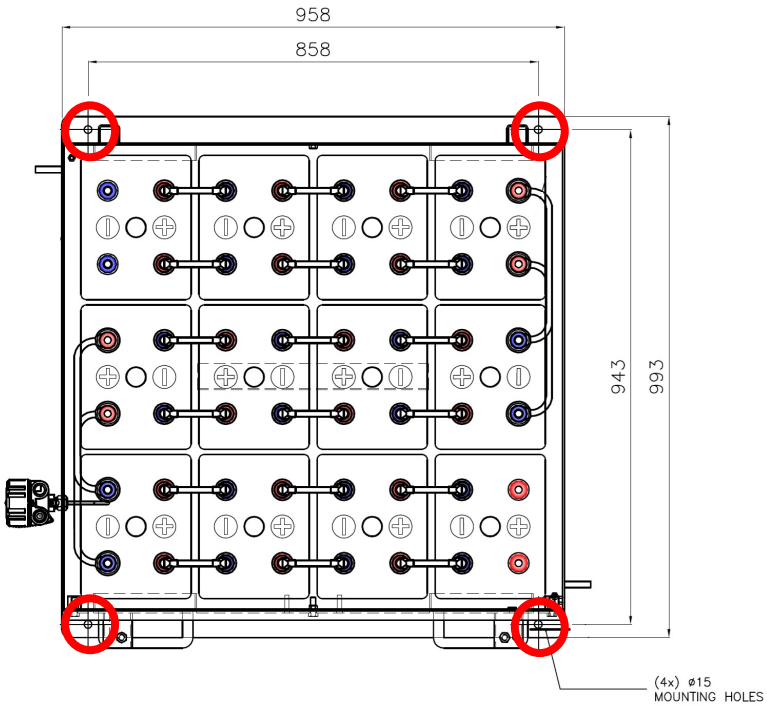


FIGURE 16: NAVAIDS BATTERY BANK FIXING HOLES (TOP VIEW)

	SICE recommends to keep the ventilation holes of the battery box free from obstacles and always cleaned in order to allow to air to flow in/out the box.

The battery cells installation and interconnections are already made by the manufacturer.

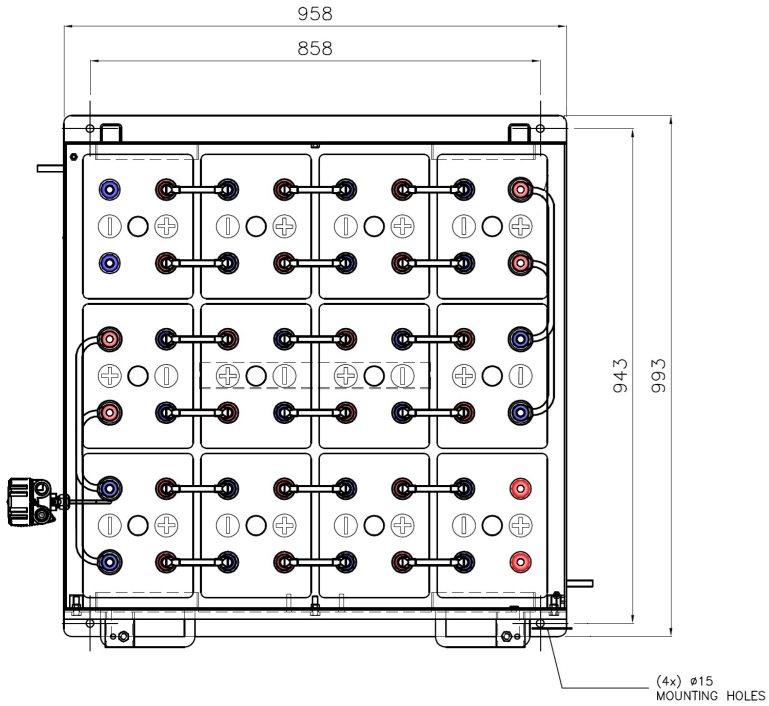


FIGURE 17: BATTERY CELLS ARRANGEMENT AND INTERCONNECTIONS (TOP VIEW WITHOUT LID)

For any further technical information about this component, please refer to the following document:

CLIENT DOC No.	SICE DOC. No.	DESCRIPTION
1724000775-EL-DS-00004	OM-776/DE SUB	EQUIPMENT TECHNICAL DATA SHEET

4.2.3 BATTERY TEMPERATURE PROBE (*ETM-200-01*)

The BATTERY TEMPERATURE PROBE (*ETM-200-01*) has to be installed in the suitable hole in the NAVAIDS BATTERY BANK (*BA-200F2*). To install it properly, refer to the drawing at sh. 41÷43 of 44 of DOC. No. DW-864-3.

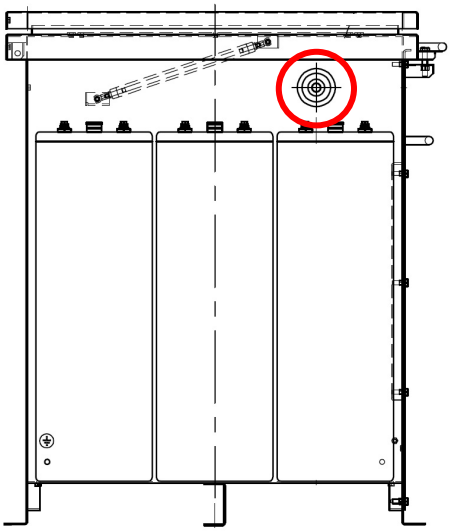


FIGURE 18: BATTERY TEMPERATURE PROBE INSTALLATION ON BATTERY BOX (SIDE VIEW)

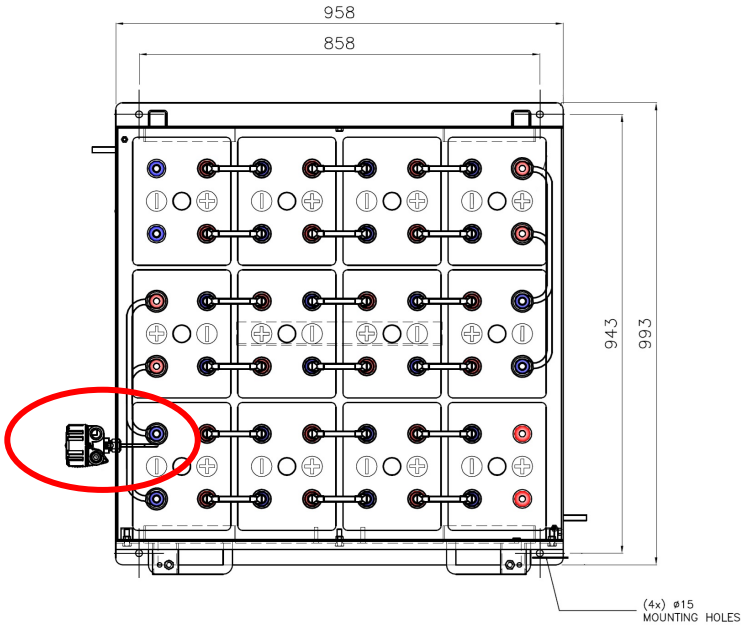


FIGURE 19: BATTERY TEMPERATURE PROBE INSTALLATION ON BATTERY BOX (TOP VIEW WITHOUT LID)

For any further technical information about this component, please refer to the following document:

CLIENT DOC No.	SICE DOC. No.	DESCRIPTION
1724000775-EL-DS-00004	OM-776/DE SUB	EQUIPMENT TECHNICAL DATA SHEET

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4.2.4 NAVAIDS BATTERY BREAKER (*CB-200F2*)

The NAVAIDS BATTERY BREAKER (*CB-200F2*) has to be fixed to the wall by using the fixing brackets. To install it properly, refer to the drawing at sh. 38 of 44 of DOC. No. DW-864-3.

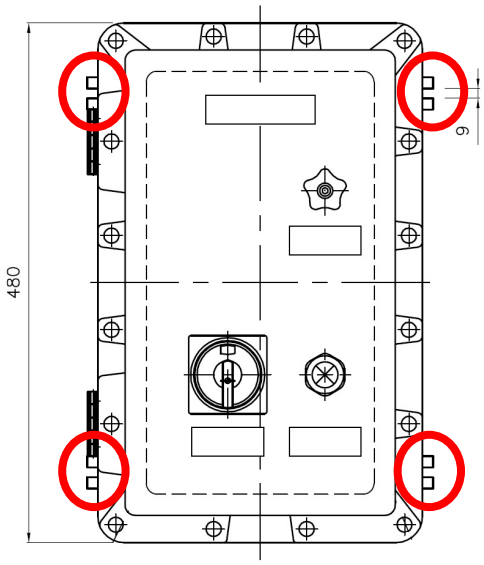


FIGURE 20: NAVAIDS BATTERY BREAKER FIXING BRACKETS

The cables enter from the top side of the enclosure.

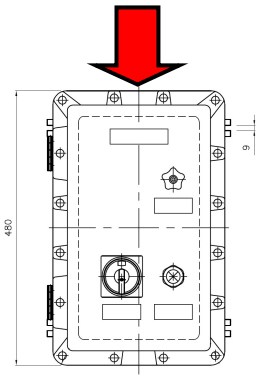


FIGURE 21: NAVAIDS BATTERY BREAKER CABLE ENTRIES

For any further technical information about this component, please refer to the following document:

CLIENT DOC No.	SICE DOC. No.	DESCRIPTION
1724000775-EL-DS-00004	OM-776/DE SUB	EQUIPMENT TECHNICAL DATA SHEET

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4.2.5 MAIN MARINE YELLOW LIGHTS (*EML-200-01/02*)

IALA recommendations request that any off-shore fixed structure has to be marked at night by one or more lights so constructed and fixed as to ensure that at least one light is visible upon approaching the structure from any direction. Furthermore the lights has to be placed not less than **6m** and not more than **30m** above **HAT** (=Highest Astronomical Tide). The vertical distribution of the projected beam shall be such that the light will be visible from the immediate vicinity of the structure to the maximum luminous range of the light (5 n.m. for the yellow light). The lights are suitable to be installed by using the sutable fixing holes. Refer to the sheet. 17 of 44 of the Doc. No. DW-864-3 for information about the signal lights and their dimensions.

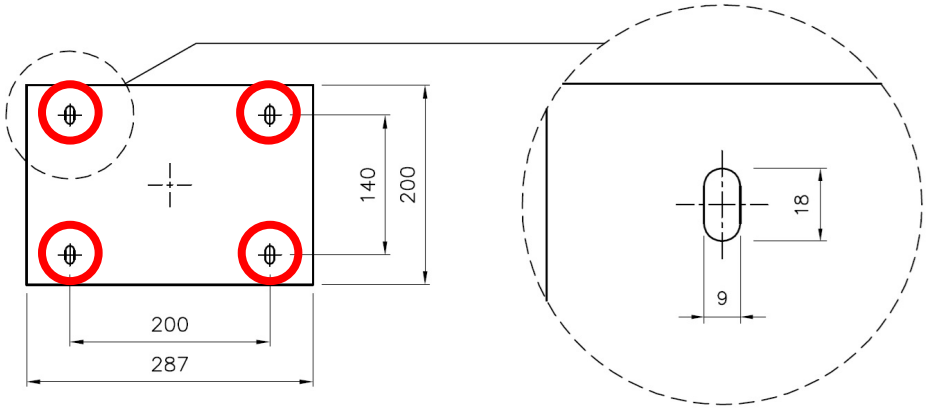


FIGURE 22: MAIN MARINE YELLOW LIGHT FIXING HOLES (BOTTOM VIEW)

	SICE recommend to install the marine lanterns avoiding obstacles that may reduce the light output of the lanterns themselves toward the sea. In this case is guaranteed the maximum visibility from any direction while approaching the structure where the lantern is installed on.

	In order to be in compliance with **IALA** rules, SICE recommend to install the marine lanterns by verifying that the air bubble installed inside the lantern is in the proper position.

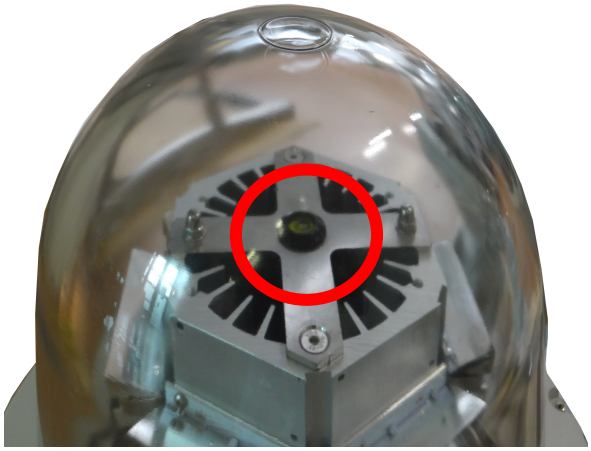


FIGURE 23: MARINE LANTERN INTERNAL AIR BUBBLE

For any further technical information about this component, please refer to the following document:

CLIENT DOC No.	SICE DOC. No.	DESCRIPTION
1724000775-EL-DS-00004	OM-776/DE SUB	EQUIPMENT TECHNICAL DATA SHEET

4.2.6 MEDIUM INTENSITY AOL (*EOL-200-01÷04*)

The red obstacle marking lights (MIOL CAP168 – GROUP C) must be installed in order to visually signal the fixed offshore platform as an obstacle to local air-born traffic as requested by the applicable rules (CAP168). These lights have to be used when the top of the object to be marked is more than 45m above the level of the surrounding ground.

Refer to CAP168 rules for any further information about the obstacle marking light arrangement on the obstacle to be signaled to the air navigation. To install these lights properly, refer to the drawing at sh. 25÷27 of 44 of DOC. No. DW-864-3. For the MEDIUM INTENSITY AOL 3/4 (EOL-200-03/04) are provided also the suitable support poles.

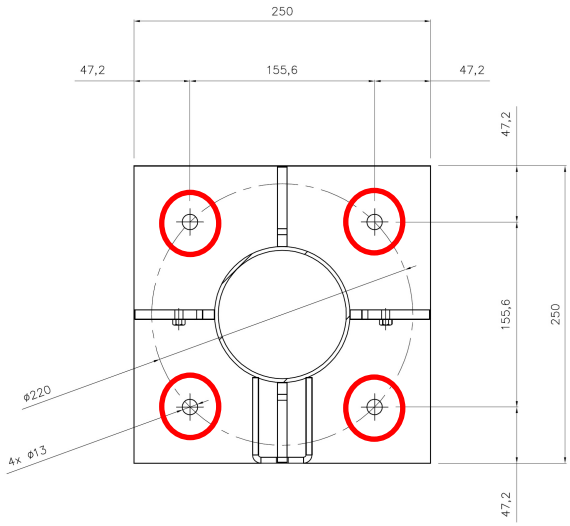


FIGURE 24: MEDIUM INTENSITY AOL SUPPORT POLE FIXING HOLES (TOP VIEW)

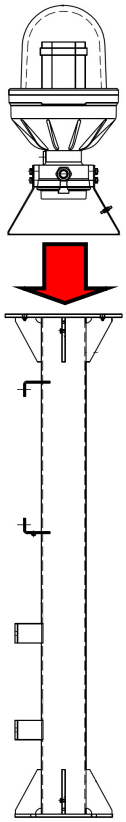


FIGURE 25: MEDIUM INTENSITY AOL INSTALLATION ON SUPPORT POLE

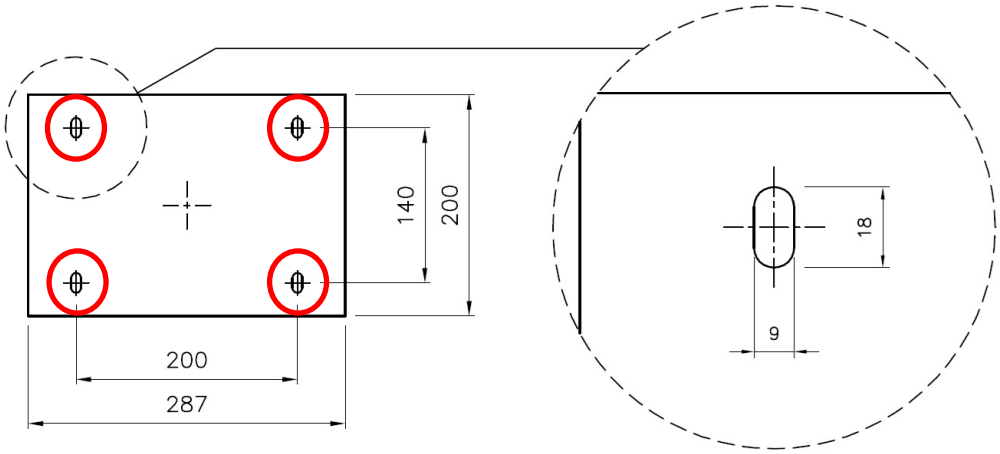


FIGURE 26: MEDIUM INTENSITY AOL FIXING HOLES (BOTTOM VIEW)

	SICE recommend to install the medium intensity obstruction lights by verifying that the air bubble installed inside the light is in the proper position.

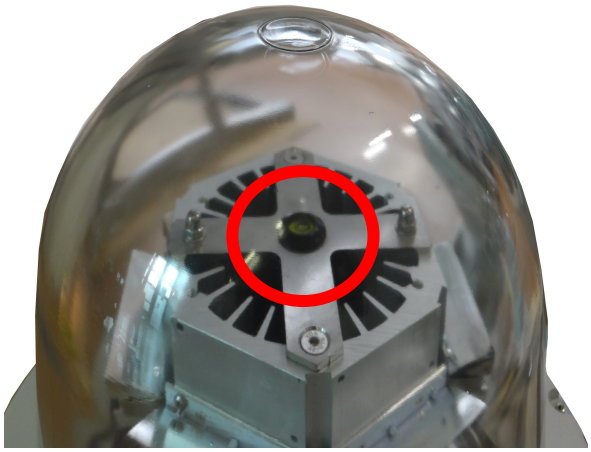


FIGURE 27: MIOL OBSTRUCTION LIGHT INTERNAL AIR BUBBLE

For any further technical information about this component, please refer to the following document:

CLIENT DOC No.	SICE DOC. No.	DESCRIPTION
1724000775-EL-DS-00004	OM-776/DE SUB	EQUIPMENT TECHNICAL DATA SHEET

4.2.7 BOAT LANDING STATUS LIGHT (*ESL-200-01*)

For maximum effectiveness and in order to avoid any potential confusion with other platform systems, it is recommended that the boat landing status lights are mounted as near as possible to the boat landing. The boat landing status light is provided by SICE ready to be installed on the supplied support pole. Refer to the sheet. 20÷22 of 44 of the Doc. No. DW-864-3 for information about the support pole and light and their dimensions.

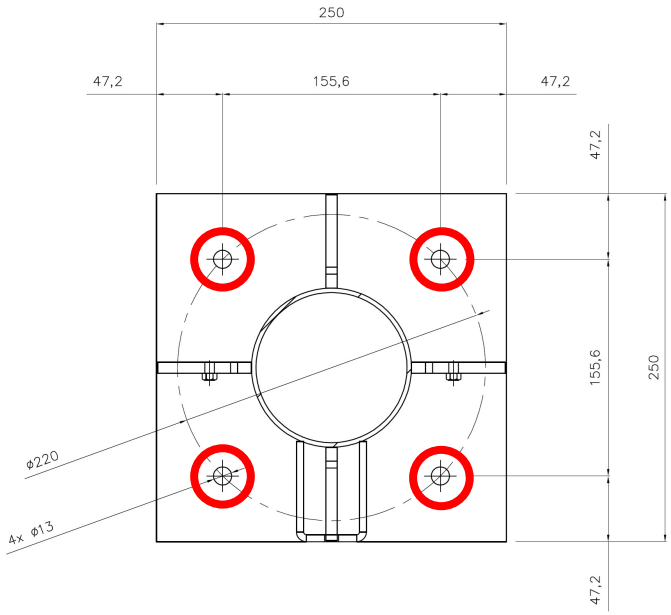


FIGURE 28: BOAT LANDING STATUS LIGHT SUPPORT POLE FIXING HOLES (TOP VIEW)

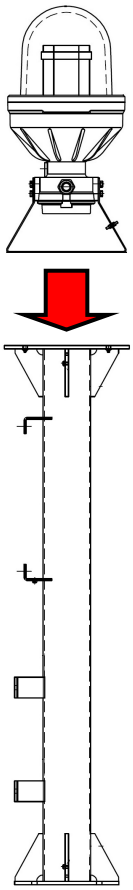


FIGURE 29: BOAT LANDING STATUS LIGHT INSTALLATION ON SUPPORT POLE

	SICE recommend to install the boat landing status light avoiding obstacles that may reduce the light output of the lantern itslef toward the sea.
	The boat landing status lights must be installed in such a way that it is visible by the pilot when the vessel approached the platform, regardless of its orientation relative to the platform.
	SICE recommend to install the lantern by verifying that the air bubble installed inside the lantern is in the proper position.

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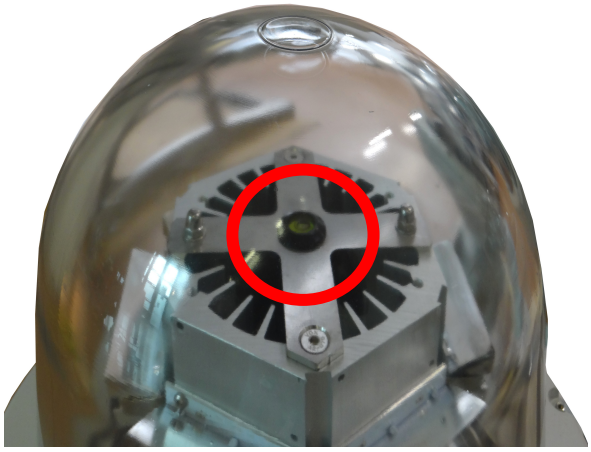


FIGURE 30: LANTERN INTERNAL AIR BUBBLE

For any further technical information about this component, please refer to the following document:

CLIENT DOC No.	SICE DOC. No.	DESCRIPTION
1724000775-EL-DS-00004	OM-776/DE SUB	EQUIPMENT TECHNICAL DATA SHEET

4.2.8 VISIBILITY METER (*EVM-200-01*)

The site selection and preparation are keys for the successful performance of the visibility meter. Simply put, if you do not choose a good location for the detector or fail to install it correctly, it will not measure data that are representative of the visibility in the area.

1. The fog detector is designed for normal base mounting in a vertical position on a suitably rigid, flat, horizontal surface. Use a sturdy pole or pedestal to reduce vibration (support piole already supplied by SICE).
2. The best location to site the sensor is at the edge of the platform deck with the optics looking over the handrail. The cable gland entry positions should be face inboard. Lights installed on the inside of the rail to illuminate the walkway for safety reasons are acceptable.
3. The fog detector requires a clear field of view over the intended operational area: any obstruction will severely restrict operating range.
4. Do not locate the sensor near artificial sources of particulates or condensation that may reduce the visibility such as: exhaust vents, water cooling towers and evaporators, smoke stacks, etc. Avoid any area subject to dripping water from deck scuppers or wash hoses from above.
5. To prevent the fog detector from being blinded by the sun at morning and evenings, it is recommended that the fog detector does not point the east or west.
6. The fog detector should be pointed aways from lights, buildings and any reflective structures.
7. The sensor shouold be mounted so that it looks horizontal and roughly north in the northern hemisphere (or south in the southern hemisphere) eliminating direct sunlight into receiver. There must not be anything in the sightline closer than 5 meters. Outside a cone of about 30 degrees angle objects can be tolerated at down to about 2 meters. See figure below.

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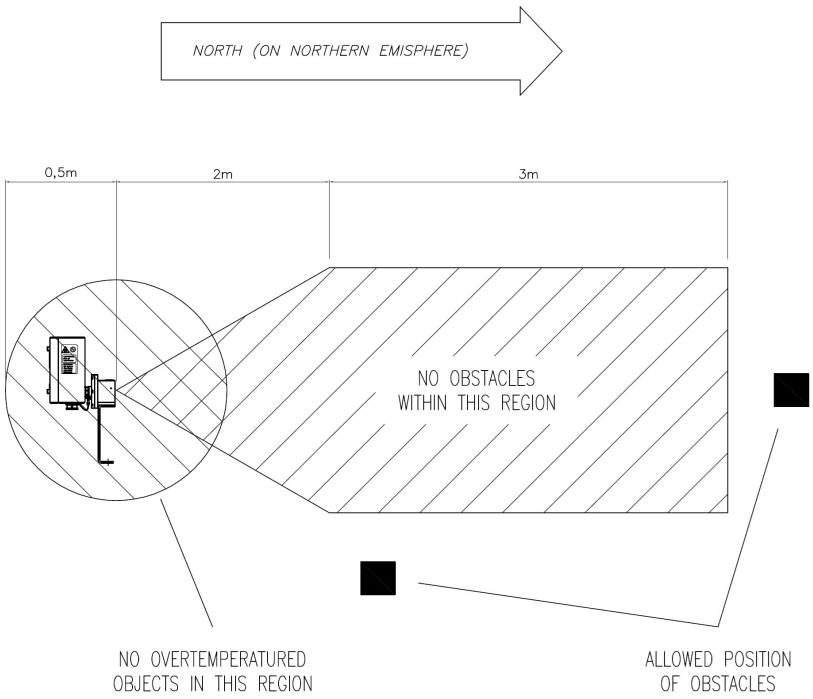


FIGURE 31: VISIBILITY METER SUGGESTED INSTALLATION

The visibility meter is supplied by SICE with a suitable AISI316L S.S. support pole that comes ready to be installed to the floor. Refer to the drawing at sh. 30÷33 of 44 of DOC. No. DW-864-3 for information about the equipment dimensions

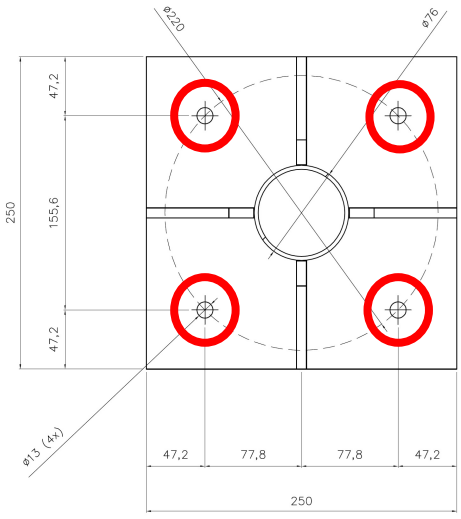


FIGURE 32: VISIBILITY METER SUPPORT POLE FIXING HOLES (TOP VIEW)

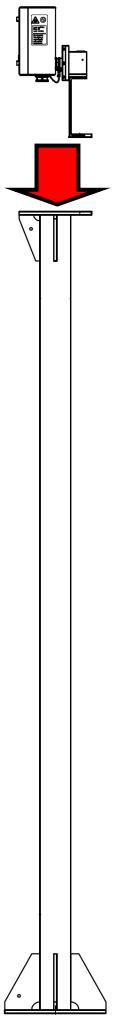


FIGURE 33: VISIBILITY METER ASSEMBLY ON SUPPORT POLE

For any further technical information about this component, please refer to the following document:

CLIENT DOC No.	SICE DOC. No.	DESCRIPTION
1724000775-EL-DS-00004	OM-776/DE SUB	EQUIPMENT TECHNICAL DATA SHEET

4.2.9 PHOTOCELL SYSTEM (*EPH-200-01*)

The site selection and preparation are keys for the successful performance of the photocell system. The position of the enclosure must be chosen in such a way that the light sensor is not affected by artificial lights or obstacles in order to detect only the ambient light (sun light). To install the enclosure properly, refer to the drawing at sh. 35 of 44 of DOC. No. DW-864-3.

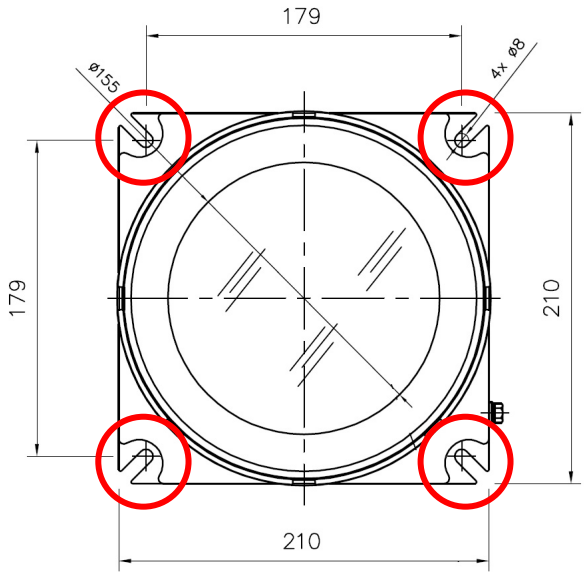


FIGURE 34: PHOTOCELL SYSTEM FIXING

	SICE recommends to install the photocell system where it is not affected by artificial lights or obstacles in order to detect only the ambient light (sun light). The correct working of the photocell system strictly depends on its proper installation.

For any further technical information about this component, please refer to the following document:

CLIENT DOC No.	SICE DOC. No.	DESCRIPTION
1724000775-EL-DS-00004	OM-776/DE SUB	EQUIPMENT TECHNICAL DATA SHEET

5.0 ELECTRICAL INTERCONNECTIONS

5.1 NOTES FOR ELECTRICAL INTERCONNECTIONS

	**Dangerous conditions of electric shock potential**. Several pieces of equipment are powered by 230 Vac voltage, for this reason, before starting the electrical interconnections it's strictly necessary to verify that the system is completely switched-off and the upstream circuit breakers are open.
	All the electrical interconnections works must be carried out only by qualified technicians, in compliance with Rules **Rules EN 50110-1 (CEI 11-48) & CEI 11-27**.
	Use the cable sizes and the cable entries specified in the construction manual **DOC. No. DW-864** to carry-out the system electrical interconnections.
	SICE recommend to strictly follow the electrical interconnection diagram (**DOC. No. DW-864-4**) while interconnecting the system components in order to avoid any mistake in the interconnections that may seriously damage the system components.
	**Please be careful to respect the polarities**, as specified in the interconnection diagrams (**DOC. No. DW-864-4**), during the equipment interconnections in order to prevent failures.
	SICE recommends to always close the enclosures with bolts. During the installation/interconnection/commissioning procedure close the enclosures with at least one bolt every two on the top side of the enclosures and one bolt for each corner in order to avoid water access. Once the installation/interconnection/sat procedure are ended install all the bolts on the enclosures.

5.2 REFERENCE DRAWINGS FOR ELECTRICAL INTERCONNECTIONS

CLIENT DOC No.	SICE DOC. No.	DESCRIPTION
1724000775-EL-DG-00007	DW-864-4	ELECTRICAL INTERCONNECTION DIAGRAMS

5.3 EQUIPMENT INTERCONNECTION NOTES

5.3.1 NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*)

- The terminal strip, to be used to interconnect this equipment, is on the baseplate of the enclosure A (see the drawing at sh. 15 of 44 of DOC. No. DW-864-3 for further details).

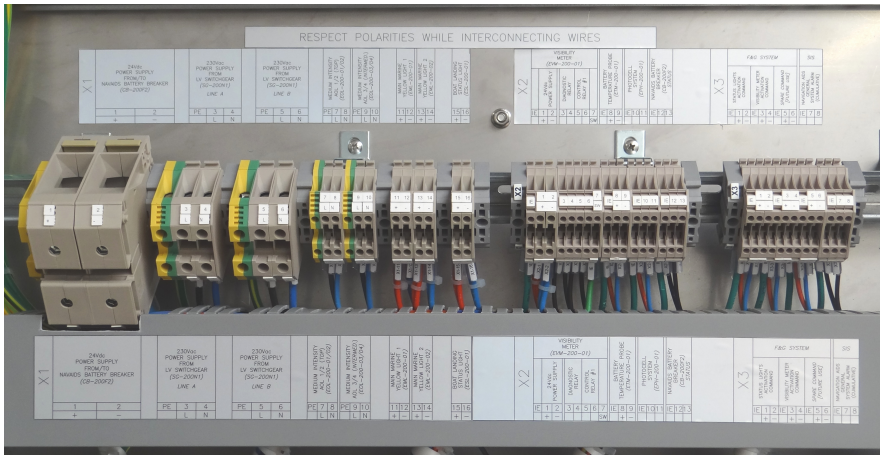


FIGURE 35: NAVAIDS CENTRAL CONTROL PANEL TERMINAL STRIP

- The cables enter from the top side of the enclosures A (see the drawing at sh. 16 of 44 of DOC. No. DW-864-3 for further details).



FIGURE 36: NAVAIDS CENTRAL CONTROL PANEL CABLE ENTRIES

- Please be careful to respect the polarities (positive and negative), specified in the interconnection diagrams, in order to prevent failures.

- Connect the protective earth busbar on the support structure to an earth point.

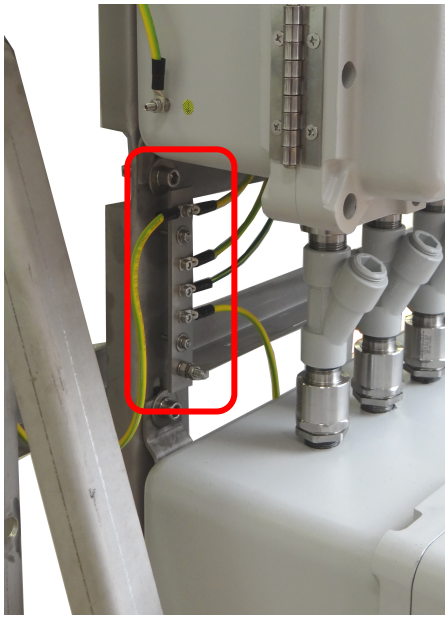


FIGURE 37: NAVAIDS CENTRAL CONTROL PANEL EARTH BUSBAR

- Connect the instrument earth busbar inside the enclosure A to the suitable dedicated earth point.

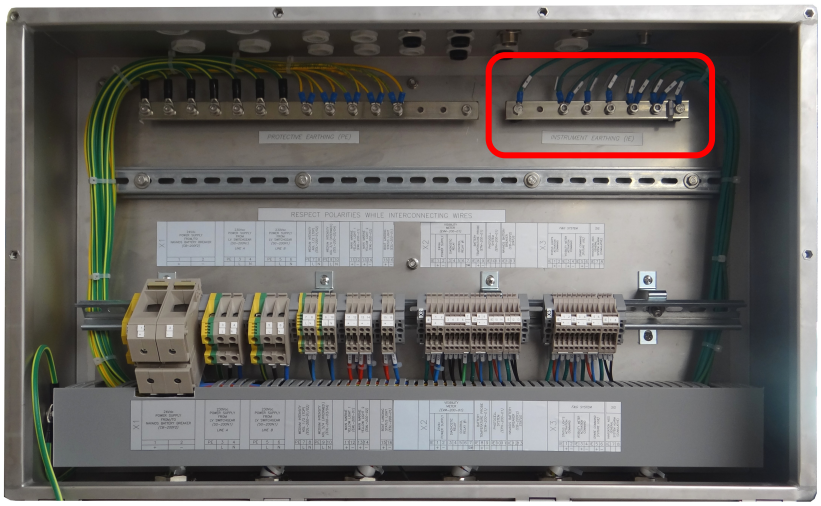


FIGURE 38: NAVAIDS CENTRAL CONTROL PANEL INSTRUMENT EARTH BUSBAR

5.3.2 NAVAIDS BATTERY BANK (*BA-200F2*)

- The interconnections of the battery cells of the NAVAIDS BATTERY BANK (*BA-200F2*) are already made by the manufacturer.

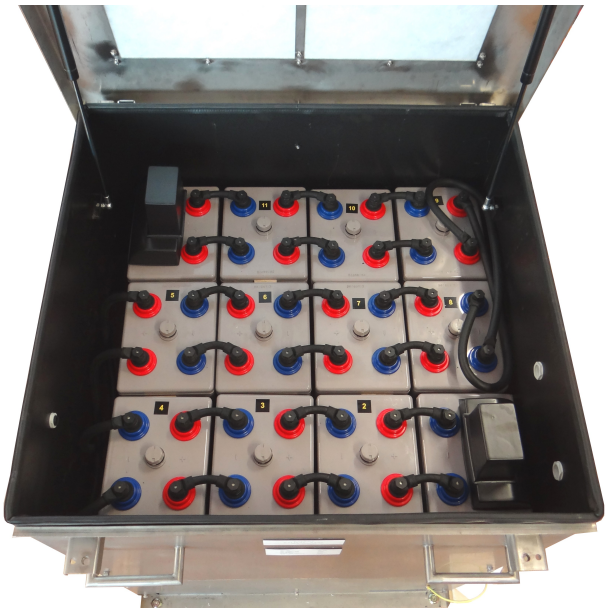


FIGURE 39: BATTERY CELLS INTERCONNECTIONS

- The cables enter from the side of the battery box (see the drawing at sh. 42 of 44 of DOC. No. DW-864-3 for further details).



FIGURE 40: NAVAIDS BATTERY BANK CABLE ENTRIES

- Please be careful to respect the polarities (positive and negative), specified in the interconnection diagrams, in order to prevent failures.

- Connect the earth bolt of the battery box to an earth point.

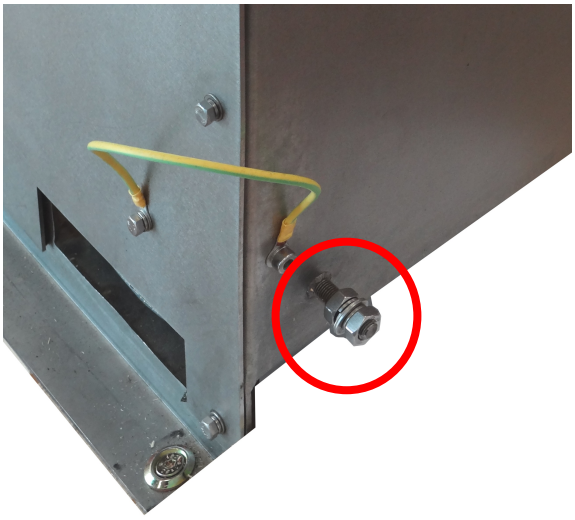


FIGURE 41: NAVAIDS BATTERY BANK EARTH BOLT

5.3.3 BATTERY TEMPERATURE PROBE (*ETM-200-01*)

- The terminal strip, to be used to interconnect this equipment, is on the baseplate of the enclosure (see the drawing at sh. 41 of 44 of DOC. No. DW-864-3 for further details).

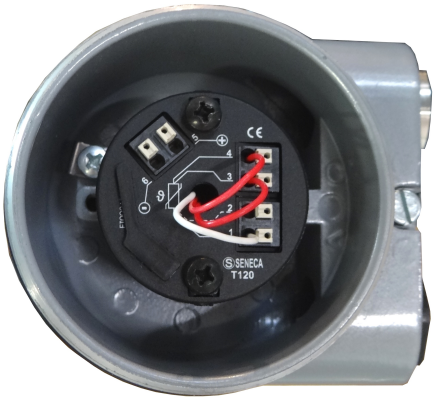


FIGURE 42: BATTERY TEMPERATURE PROBE TERMINAL STRIP

- The cable enter from a side of the enclosure (see the drawing at sh. 41 of 44 of DOC. No. DW-864-3 for further details).



FIGURE 43: BATTERY TEMPERATURE PROBE CABLE ENTRY

- Please be careful to respect the polarities (positive and negative), specified in the interconnection diagrams, in order to prevent failures.

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5.3.4 NAVAIDS BATTERY BREAKER (*CB-200F2*)

- The terminal strip, to be used to interconnect this equipment, is on the baseplate of the enclosure (see the drawing at sh. 39 of 44 of DOC. No. DW-864-3 for further details).

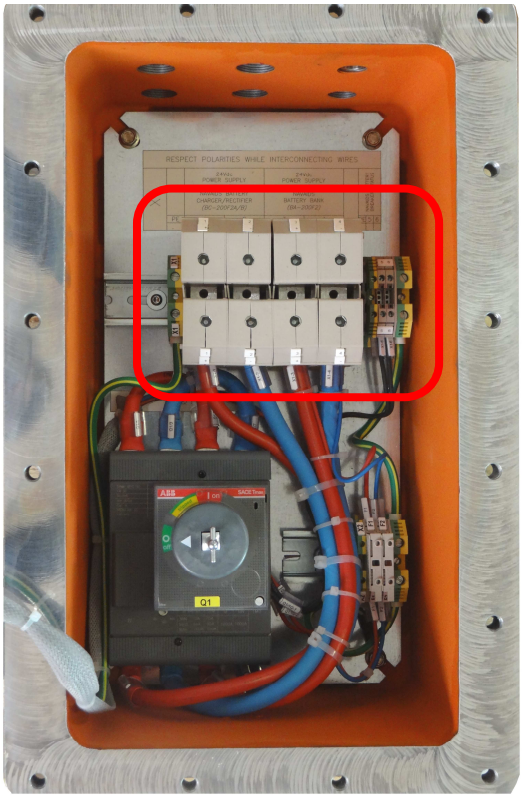


FIGURE 44: NAVAIDS BATTERY BREAKER TERMINAL STRIP

- The cables enter from the top side of the enclosure (see the drawing at sh. 40 of 44 of DOC. No. DW-864-3 for further details).

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FIGURE 45: NAVAIDS BATTERY BREAKER CABLE ENTRIES

- Please be careful to respect the polarities (positive and negative), specified in the interconnection diagrams, in order to prevent failures.
- Connect the earth bolt to an earth point.

5.3.5 MAIN MARINE YELLOW LIGHTS (*EML-200-01/02*)

- The terminal strip, to be used to interconnect this equipment, is inside the light junction box (see the drawing at sh. 18 of 44 of DOC. No. DW-864-3 for further details).

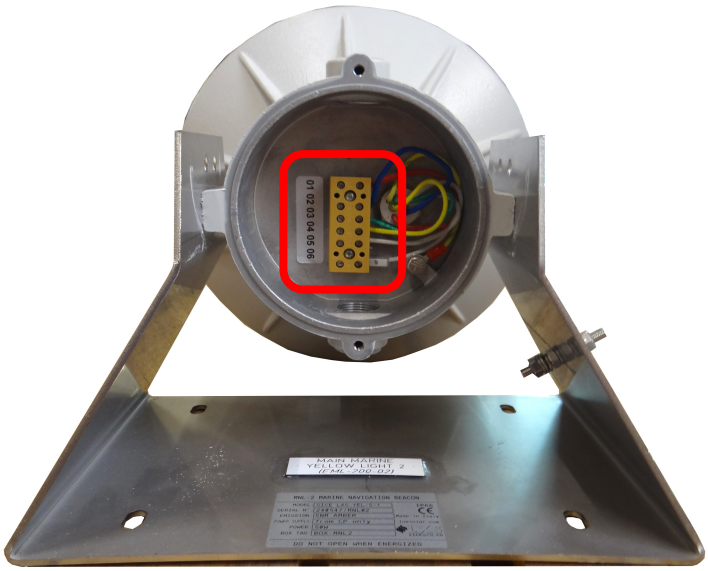


FIGURE 46: MARINE SIGNAL LIGHT TERMINAL STRIP

- The cable entry is on the side of the light junction box (see the drawing at sh. 19 of 44 of DOC. No. DW-864-3 for further details).
- Please be careful to respect the polarities (positive and negative), specified in the interconnection diagrams, in order to prevent failures.
- Connect the earth bolt of the lantern to an earth point.



FIGURE 47: MARINE SIGNAL LIGHT EARTH BOLT

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5.3.6 MEDIUM INTENSITY AOL (*EOL-200-01/02/03/04*)

- The terminal strip, to be used to interconnect this equipment, is inside the light junction box (see the drawing at sh. 28 of 44 of DOC. No. DW-864-3 for further details).

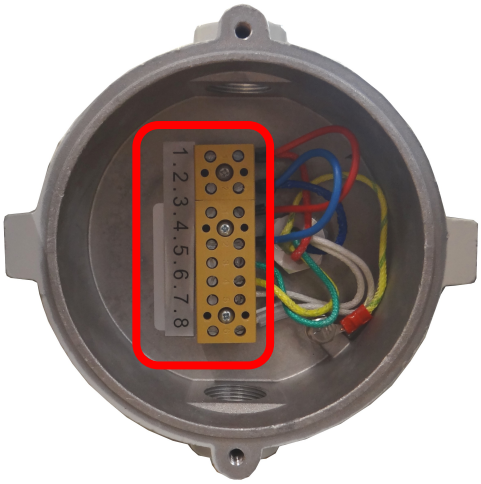


FIGURE 48: MEDIUM INTENSITY OBSTRUCTION LIGHT TERMINAL STRIP

- The cable entry is on the side of the light junction box (see the drawing at sh. 29 of 44 of DOC. No. DW-864-3 for further details).
- Please be careful to respect the polarities (positive and negative), specified in the interconnection diagrams, in order to prevent failures.
- Connect the earth bolt of the light to an earth point. In the ones supplied with the support poles, connect the earth bolt of the light to the earth bolt of the support pole and then connect the earth bolt of the support pole to an earth point.

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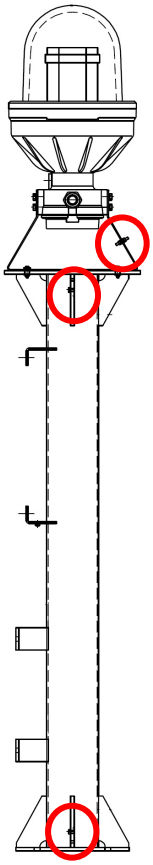


FIGURE 49: MEDIUM INTENSITY OBSTRUCTION LIGHT AND SUPPORT POLE EARTH BOLTS

	The brackets in the support pole has to be used to secure the cable tray.

5.3.7 BOAT LANDING STATUS LIGHT (*ESL-200-01*)

- The terminal strip, to be used to interconnect this equipment, is inside the light junction box (see the drawing at sh. 23 of 44 of DOC. No. DW-864-3 for further details).

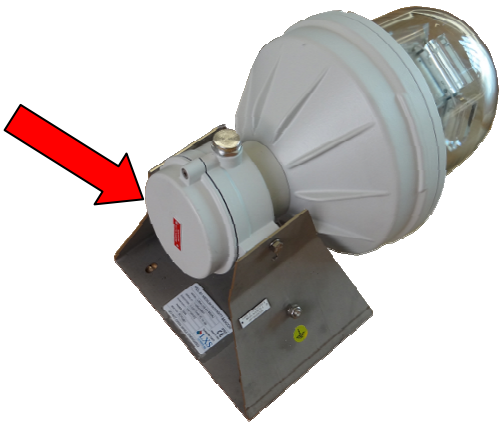


FIGURE 50: BOAT LANDING STATUS LIGHT JUNCTION BOX

- The cable entry is on the side of the light junction box (see the drawing at sh. 24 of 44 of DOC. No. DW-864-3 for further details).
- Please be careful to respect the polarities (positive and negative), specified in the interconnection diagrams, in order to prevent failures.
- Connect the earth bolt of the light to the earth bolt of the support pole. Then connect the earth bolt of the support pole to an earth point.

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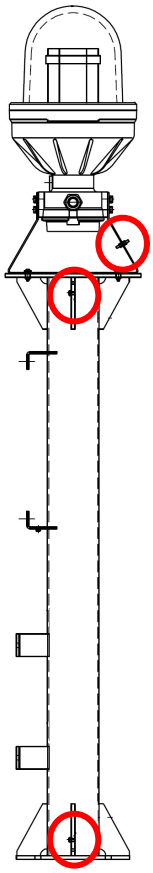


FIGURE 51: BOAT LANDING STATUS LIGHT AND SUPPORT POLE EARTH BOLTS

	The brackets in the support pole has to be used to secure the cable tray.

5.3.8 VISIBILITY METER (*EVM-200-01*)

- The terminal strip, to be used to interconnect this equipment, is inside the junction box (see the drawing at sh. 33 of 44 of DOC. No. DW-864-3 for further details).

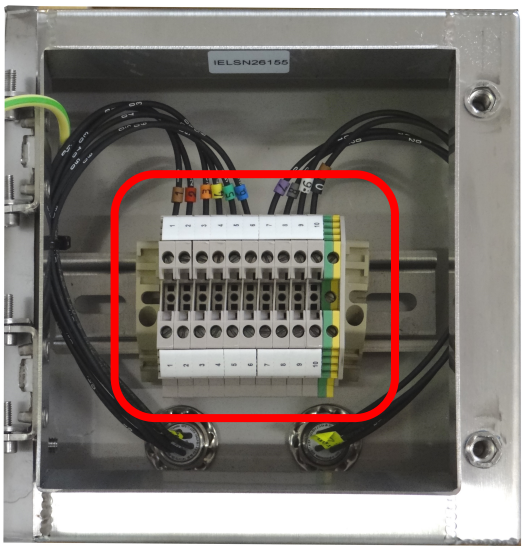


FIGURE 52: VISIBILITY METER TERMINAL STRIP

- The cable entry is on the bottom side of the enclosure (see the drawing at sh. 34 of 44 of DOC. No. DW-864-3 for further details).



FIGURE 53: VISIBILITY METER CABLE ENTRY

- Please be careful to respect the polarities (positive and negative), specified in the interconnection diagrams, in order to prevent failures.

- Conect the visibility meter earth bolt to the support pole earth bolt. Then connect the support pole earth bolt to an earth point.



FIGURE 54: VISIBILITY METER EARTH BOLT

	The brackets in the support pole has to be used to secure the cable tray.

5.3.9 PHOTOCELL SYSTEM (*EPH-200-01*)

- The terminal strip, to be used to interconnect this equipment, is inside the enclosure (see the drawing at sh. 36 of 44 of DOC. No. DW-864-3 for further details).

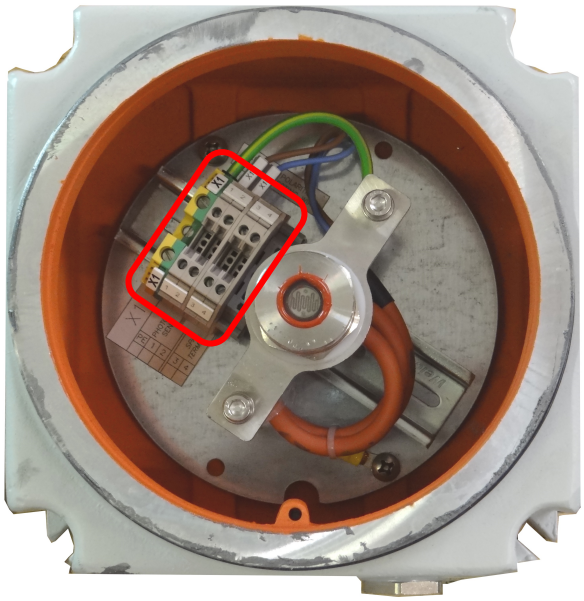


FIGURE 55: PHOTOCELL SYSTEM TERMINAL STRIP

- The cable entry is on the bottom side of the enclosure (see the drawing at sh. 37 of 44 of DOC. No. DW-864-3 for further details).



FIGURE 56: PHOTOCELL SYSTEM CABLE ENTRY

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- Connect the earth bolt to an earth point.



FIGURE 57: PHOTOCELL SYSTEM EARTH BOLT

6.0 SYSTEM ACTIVATION

6.1 CHECKS BEFORE ACTIVATING THE SYSTEM

The first system activation has to be carried-out only after the following checks are completed:

- Mechanical installation of all the system components is complete.
- Electrical interconnections of all the system components are complete and according to the interconnection diagrams.
- All the circuit breakers and terminals with fuses inside the following panels are open (OFF):
  - ✓ NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*)
  - ✓ NAVAIDS BATTERY BREAKER (*CB-200F2*)

	For more details about the “checks before activating the system” please refer to the **“PRE-COMMISSIONING / COMMISSIONING PROCEDURE” (SICE DOC No. OM-776/DE CM – CLIENT DOC No. 1724000775-QC-PRO-00014)**.

6.2 POWER SUPPLY CHECK

Before activating the system it is mandatory to check if the following power supplies are available and within the acceptable range:

- VOLTAGE AND FREQUENCY VALUES OF THE *LV SWITCHGEAR* (SG-200N1) NORMAL POWER SUPPLY (LINE A).
- VOLTAGE AND FREQUENCY VALUES OF THE *LV SWITCHGEAR* (SG-200N1) ESSENTIAL POWER SUPPLY (LINE B).
- VOLTAGE VALUE OF THE NAVAIDS BATTERY BANK (*BA-200F2*).
- VOLTAGE VALUES OF THE “BOAT LANDING STATUS LIGHTS ACTIVATION COMMAND” AND “VISIBILITY METER ACTIVATION COMMAND” FROM *F&G SYSTEM (B400-FGS-002)*.

	For more details about the “power supply check list” please refer to the **“PRE-COMMISSIONING / COMMISSIONING PROCEDURE” (SICE DOC No. OM-776/DE CM – CLIENT DOC No. 1724000775-QC-PRO-00014)**.

6.3 SYSTEM ACTIVATION PROCEDURE (BLACK START)

6.3.1 NAVAIDS BATTERY BREAKER (*CB-200F2)*

- Verify that all the terminals with fuses have the fuse installed and inserted (locked).
- Close (ON) the circuit breaker **Q1**: the NAVAIDS BATTERY BANK (*BA-200F2*) is connected to the NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*).

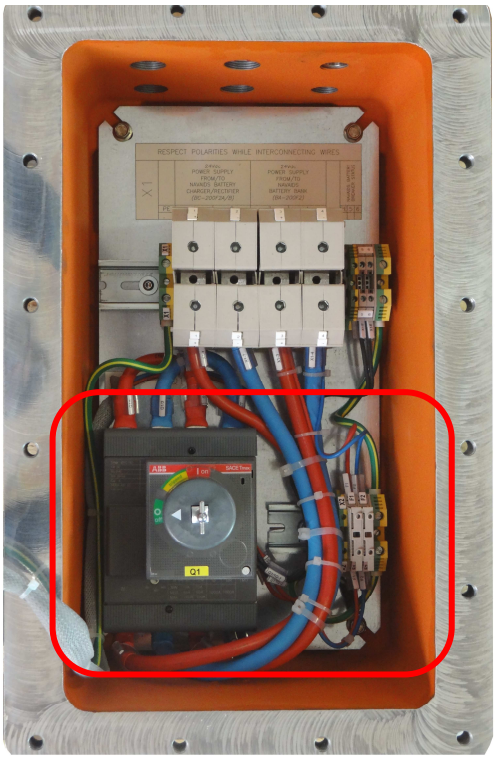


FIGURE 58: NAVAIDS BATTERY BREAKER CIRCUIT BREAKER AND TERMINALS WITH FUSES

6.3.2 NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*)

- Close (ON) the circuit breaker **Q1**: the NAVAIDS BATTERY BREAKER (*CB-200F2*) is connected to the 24Vdc battery busbar.
- Close (ON) the circuit breaker **Q2**: the NORMAL POWER SUPPLY (LINE A) from *LV SWITCHGEAR (SG-200N1)* is provided to the panel.
- Close (ON) the circuit breaker **Q3**: the ESSENTIAL POWER SUPPLY (LINE B) from *LV SWITCHGEAR (SG-200N1)* is provided to the panel.
- Close (ON) the circuit breaker **Q4**: the battery charger BC-200F2A is powered-on.
- Close (ON) the circuit breaker **Q5**: the battery charger BC-200F2B is powered-on.
- Close (ON) the circuit breaker **Q6**: the MEDIUM INTENSITY AOL 1 / 2 (EOL-200-01/02) are powered-on.
- Close (ON) the circuit breaker **Q7**: the MEDIUM INTENSITY AOL 3 / 4 (EOL-200-03/04) are powered-on.
- Close (ON) the circuit breaker **Q8**: the MAIN MARINE YELLOW LIGHT 1 (*EML-200-01*) is powered-on.
- Close (ON) the circuit breaker **Q9**: the MAIN MARINE YELLOW LIGHT 2 (*EML-200-02*) is powered-on.
- Close (ON) the circuit breaker **Q10**: the BAOT LANDING STATUS LIGHT (*ESL-200-01*) is powered-on.
- Close (ON) the circuit breaker **Q11**: the control system, the VISIBILITY METER (*EVM-200-01*), the astro timer KA1, the earth insulation monitoring relay KE1 are powered-on.

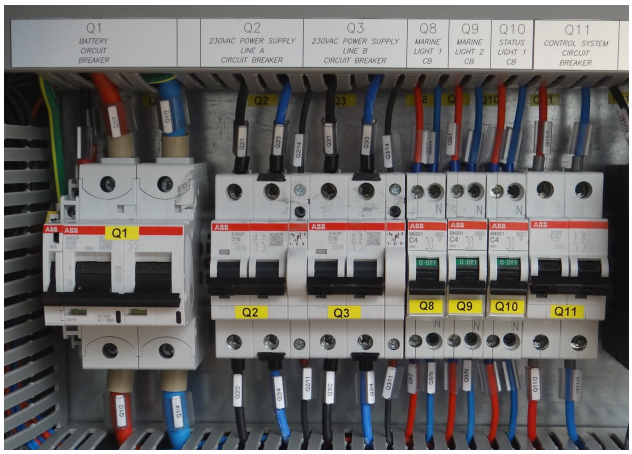


FIGURE 59: NAVAIDS CENTRAL CONTROL PANEL CIRCUIT BREAKERS 1 OF 2



FIGURE 60: NAVAIDS CENTRAL CONTROL PANEL CIRCUIT BREAKERS 2 OF 2

The local display panel installed on the cover of the enclosure B of the NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*) have its own ON/OFF switch. The user has to verify that the mentioned switch (accessible from the internal side of the enclosure) is switched-on.

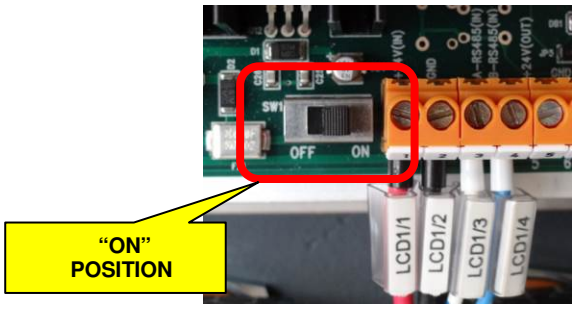


FIGURE 61: LOCAL DISPLAY PANEL ON/OFF SWITCH

The inverters INV1 / INV2 installed inside the NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*) have their own ON/OFF/ECO switch. The user has to verify that the mentioned switch is on "ON" (I) position.

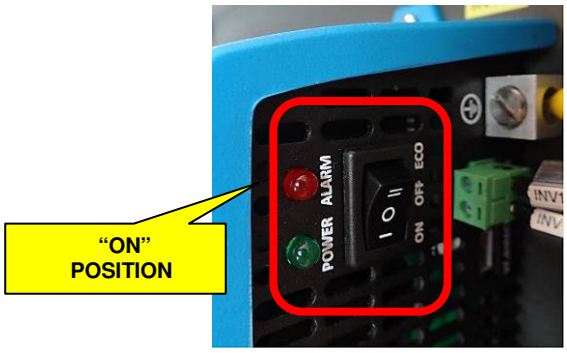


FIGURE 62: INVERTER ON/OFF/ECO SWITCH

SICE recommends to always close the enclosures with bolts. During the installation/interconnection/commissioning procedure close the enclosures with at least one bolt every two on the top side of the enclosures and one bolt for each corner in order to avoid water access. Once the installation/interconnection/commissioning procedure are ended install all the bolts on the enclosures.

7.0 SYSTEM WORKING DESCRIPTION

7.1 OVERVIEW

The aim of this system is to charge the NAVAIDS BATTERY BANK (*BA-200F2*) using the energy coming from the *LV SWITCHGEAR* (*SG-200N1*) (through an A.C.O used to switch from one 230Vac mains power supply to the other one, in case the first one is not available) through two battery chargers installed inside the NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*) and to power/control the following equipment:

- the marine lights, that are switched-on/off accordingly to the PHOTOCELL SYSTEM (*EPH-200-01*), the VISIBILITY METER (*EVM-200*-01) and the astronomical timer (installed inside the NAVAIDS CENTRAL CONTROL PANEL) detection (if the working mode selected by the user, through the selector switch is AUTO). They are automatically switched-off when the low-low battery voltage alarm occurs.
- the obstruction lights, that are always switched-on (they can be only switched-off through the selector switch S1 installed on the NAVAIDS CENTRAL CONTROL PANEL). They are automatically switched-off when the low-low battery voltage alarm occurs.
- the boat landing status light, that is switched-on/off accordingly to the remote and local commands. They are automatically switched-off when the low-low battery voltage alarm occurs or when the "REMOTE ACTIVATION COMMAND" (incoming from *F&G SYSTEM (B400-FGS-002)*) timer (6 hours) expires.

The NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B)* receives also a hard-wired remote command from *F&G SYSTEM (B400-FGS-002)* in order to switch-off the VISIBILITY METER (*EVM-200-01*) in case of fire and gas alarm because its execution is IIB (all the other equipment of the system are IIB+H2 or IIC).

The charge voltage of the battery chargers is regulated according to the battery bank temperature detected by the BATTERY TEMPERATURE PROBE (*ETM-200-01)*.

The NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*) provides also an hard-wired remote control (general system alarm) to the *SIS (B400-SIS-001)*.

	The autonomy of the NAVAIDS BATTERY BANK (*BA-200F2*) is 96 hours maximum (accordingly to the battery sizing).

7.2 NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*)

The NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*) includes a control system that is composed of the following components:

- **DIGITAL INPUTS MODULES (DI)**: they are used to collect information about the volt-free contacts (statuses and alarms) connected to the modules.
- **CENTRAL PROCESSING UNIT (CPU)**: it's used to collect periodically the information about the volt-free contacts connected to the digital inputs modules, which are provided by the system components, representing the statuses and the alarms of the monitored components. Then the CPU elaborates all the mentioned information, it sends them to the local display panel and it updates the digital outputs (to drive properly the system components), accordingly to the input statuses and the commands given by the user.
- **LOCAL DISPLAY PANEL**: it is the human-machine interface (HMI) of the control system so it's used to show the user, through the liquid crystal display, all the information, properly elaborated by the CPU, about the statuses and the alarms of the system. The following chapters explain how to use the information shown on the frontal display to understand in which condition is working each system component.

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FIGURE 63: NAVAIDS CENTRAL CONTROL PANEL LOCAL DISPLAY PANEL



FIGURE 64: NAVAIDS CENTRAL CONTROL PANEL CPU1/DI1/DI2

7.2.1 SELECTOR SWITCH

On the cover of the enclsure B of the NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*) is installed the following selector switch that is used to provide the command to the lights (marine signal lights and obstruction lights):

- **S1 MAIN MARINE & OBSTRUCTION LIGHTS ACTIVATION SELECTOR SWITCH (ON/AUTO/OFF):** 3-position selector switch used to set ON/AUTO/OFF the marine and obstruction lights depending on the chosen position:
    - **ON:** if this position is selected by the user the marine and obstruction lights are always activated regardless of the readings of the photocell, visibility meter and astronomical time switch.
    - **AUTO:** if this position is selected by the user the marine lights are switched-on/off accordingly to the photocell detection (NIGHT →lights switched-on; DAY →lights switched-off), the visibilty meter detection (FOG →lights switched-on; NO FOG → lights switched-off) and the astronomical time switch detection (15 minutes before sunset →.lights switched-on; 15 minutes after sunrise → lights switched-off). The obstruction lights are always activated regardless of the above.
    - **OFF:** if this position is selected by the user the marine and obstruction lights are always switched-off reagrdless of the readings of the photocell, visibility meter and astronomical time switch.



FIGURE 65: S1 SELECTOR SWITCH

	SICE suggest to set the "**MARINE & OBSTRUCTION LIGHTS**" working with the selector switch S1 on **"AUTO"** position.

7.2.2 PUSH-BUTTONS

On the cover of the enclsure B of the NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*) are installed the following push-buttons that are used to provide the command to the boat landing status light:

- **STATUS LIGHT ON MANUALLY (P5)**: This push-button is used to force the boat landing status light to be switched-on (flashing), even if the remote on/off command requests it switched-off, for a settable time.
- **STATUS LIGHTS OFF MANUALLY (P6)**: This push-button is used to force the boat landing status light to be switched-off, even if the remote on/off command requests it switched-on, for a settable time.
- **RESET/RETURN TO AUTO (P7)**: This push-button is used to reset the boat landing status light system.



FIGURE 66: P5, P6 AND P7 PUSH-BUTTONS

7.2.3 REMOTE CONTROL

The NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*) provides to the *SIS (B400-SIS-001)* the following digital input (volt-free) which is used to remotely monitor the general alarm of the navigation aids system (see the I/O LIST at sheets 3 of 3 of DOC. No. DW-864-8 (Client Doc. No. 1724000775-EL-LIS-00011) for further details about the digital input):

1. **NAVIGATION AIDS GENERAL SYSTEM ALARM:**

TO REMOTE VIA	STATUS		DESCRIPTION
HARD-WIRED (VOLT-FREE CONTACT)	Closed (= 1)	**OK**	No alarm is detected in the system.
	Open (= 0)	**ALARM**	At least one alarm is detcted in the system.

7.2.4 REMOTE COMMANDS

The NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*) receives the following commands, from the *F&G SYSTEM (B400-FGS-002)*, which are used to remotely command the equipment of the navigation aids system (see the I/O LIST at sh. 3 of 3 of DOC. No. DW-864-8 (Client Doc. No. 1724000775-EL-LIS-00011) for further details about the digital outputs):

1. **BOAT LANDING STATUS LIGHT ACTIVATION COMMAND:**

FROM REMOTE VIA	STATUS		DESCRIPTION
HARD-WIRED (VOLTAGE COMMAND)	24Vdc	**OFF**	The boat landing status light is switched-off.
	0Vdc	**ON**	The boat landing status light is switched-on for a settable time (SL REMOTE ON TIME in the settings pages of the display panel).

2. **VISIBILITY METER ACTIVATION COMMAND:**

FROM REMOTE VIA	STATUS		DESCRIPTION
HARD-WIRED (VOLTAGE COMMAND)	24Vdc	**ON**	The visibilty meter is switched-on.
	0Vdc	**OFF**	The visibility meter is switched-off (in case of fire and gas alarm)..

7.2.5 ASTRONOMICAL TIMER

Inside the NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*) there is an astronomical timer (KA1) used to signal day/night to the control system according to the time and location on Earth.
In order to set the right time and location on Earth (SICE already set them) refer to the user manual placed inside the DOC. No. OM-776/DE SUB (Client Doc. No. 1724000775-EL-DS-00004).
The status of the astronomical time switch is monitored by the control system of the panel.



FIGURE 67: ASTRONOMICAL TIMER

7.2.6 LOCAL DISPLAY PANEL

7.2.6.1 SYSTEM STARTING-UP PAGE



FIGURE 68: SYSTEM STARTING-UP PAGE ON LCD

The first page is shown during the start-up of the control system or after the start-up of the local display panel. As shown in the above picture, the user is requested to wait that the local display receives the communication from the CPU so that the information available on the display are the latest ones detected.

	After the power-on of the control system, the system starting-up page has to be displayed on the LCD display for few seconds. If the page persists on the LCD for more than 30 seconds it means that probably there is no communication of the local display panel with the CPU.

	If the user doesn't interact with the display panel (through the corresponding push-buttons) for few minutes, the LCD will be automatically switched-off by the control system in order to save energy from the battery bank. In order to switch it on again the user must press one of the push-buttons (P1÷P4). Instead, the signaling LEDs placed on the sides of the LCD never go in stand-by mode.

7.2.6.2 POWER SUPPLY SYSTEM 1 OF 3 PAGE (01/15))

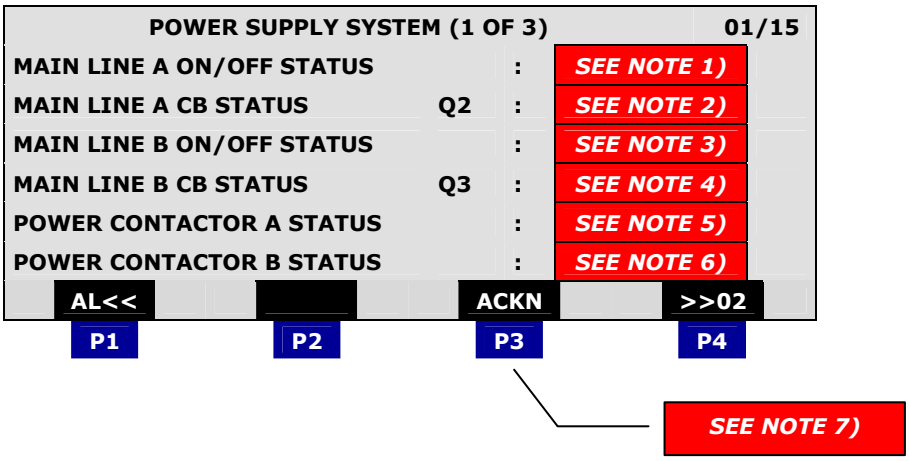


FIGURE 69: POWER SUPPLY SYSTEM (1 OF 3) PAGE ON LCD

1) **MAIN LINE A ON/OFF STATUS → the message can be one of the following:**
   - **ON** = the 230Vac main line A power supply is available.
   - **OFF <** = the 230Vac main line A power supply is not available.
   - **N/A** = the module that collects the information about this component is not communicating properly with the CPU so the information about this component is not available.

2) **MAIN LINE A CB STATUS Q2→ the message can be one of the following:**
   - **OK** = the circuit breaker Q2 inside the NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*) is closed.
   - **ALARM <** = the circuit breaker Q2 inside the NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*) is open.
   - **N/A** = the module that collects the information about this component is not communicating properly with the CPU so the information about this component is not available.

3) **MAIN LINE B ON/OFF STATUS → the message can be one of the following:**
   - **ON** = the 230Vac main line B power supply is available.
   - **OFF <** = the 230Vac main line B power supply is not available.
   - **N/A** = the module that collects the information about this component is not communicating properly with the CPU so the information about this component is not available.

4) **MAIN LINE B CB STATUS Q3→ the message can be one of the following:**
   - **OK** = the circuit breaker Q3 inside the NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*) is closed.

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- **ALARM <** = the circuit breaker Q3 inside the NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*) is open.
- **N/A** = the module that collects the information about this component is not communicating properly with the CPU so the information about this component is not available.

5) **POWER CONTACTOR A STATUS→ the message can be one of the following:**
   - **CLOSED** = the power contactor KM1 inside the NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*) is closed.
   - **OPEN** = the power contactor KM1 inside the NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B* is open.
   - **N/A** = the module that collects the information about this component is not communicating properly with the CPU so the information about this component is not available.

6) **POWER CONTACTOR B STATUS→ the message can be one of the following:**
   - **CLOSED** = the power contactor KM2 inside the NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*) is closed.
   - **OPEN** = the power contactor KM2 inside the NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*) is open.
   - **N/A** = the module that collects the information about this component is not communicating properly with the CPU so the information about this component is not available.



FIGURE 70: POWER CONTACTORS KM1 & KM2

7) **ACKN**: when a new alarm is detected by the control system, it is saved on the corresponding page until the alarm is not acknowledged. By pressing the push-button P3 on the page with one or more new alarms (blinking) all the new alarms are acknowledged.

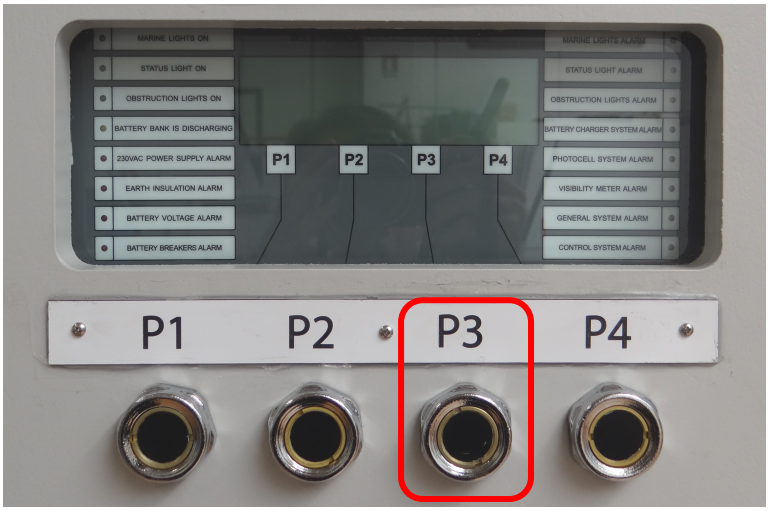


FIGURE 71: P3 PUSH-BUTTON

7.2.6.3 POWER SUPPLY SYSTEM (2 OF 3) PAGE (02/15)

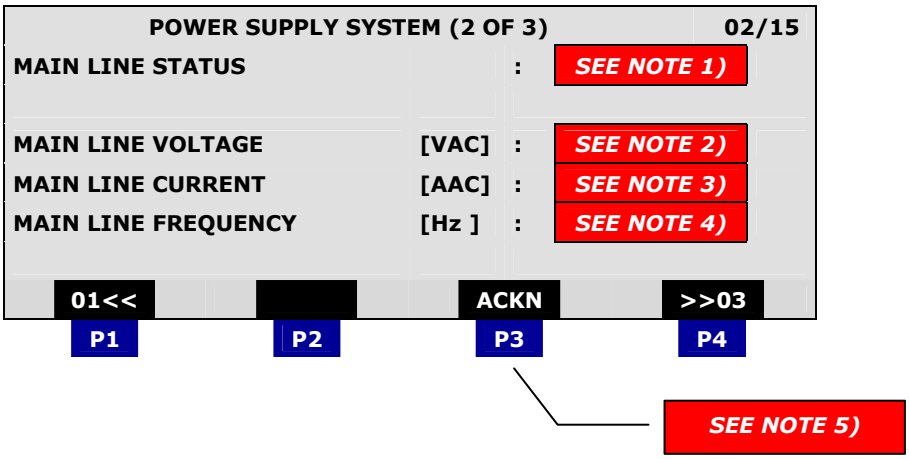


FIGURE 72: POWER SUPPLY SYSTEM (2 OF 3) PAGE ON LCD

1) **MAIN LINE STATUS → the message can be one of the following:**
   - **OK** = the main power supply is within the expected range.
   - **ALARM <** = the main power supply is not in the expected range.

2) **MAIN LINE VOLTAGE [VAC]** → the value corresponding to this message is the main line voltage value detected by the network analyzer NA1 installed inside the NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*).

3) **MAIN LINE CURRENT [AAC]** → the value corresponding to this message is the main line current value detected by the network analyzer NA1 installed inside the NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*).

4) **MAIN LINE FREQUENCY [Hz]** → the value corresponding to this message is the main line frequency value detected by the network analyzer NA1 installed inside the NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*).

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FIGURE 73: NETWORK ANALYZER NA1

5) **ACKN**: when a new alarm is detected by the control system, it is saved on the corresponding page until the alarm is not acknowledged. By pressing the push-button P3 on the page with one or more new alarms (blinking) all the new alarms are acknowledged.

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7.2.6.4 POWER SUPPLY SYSTEM (3 OF 3) PAGE (03/15)

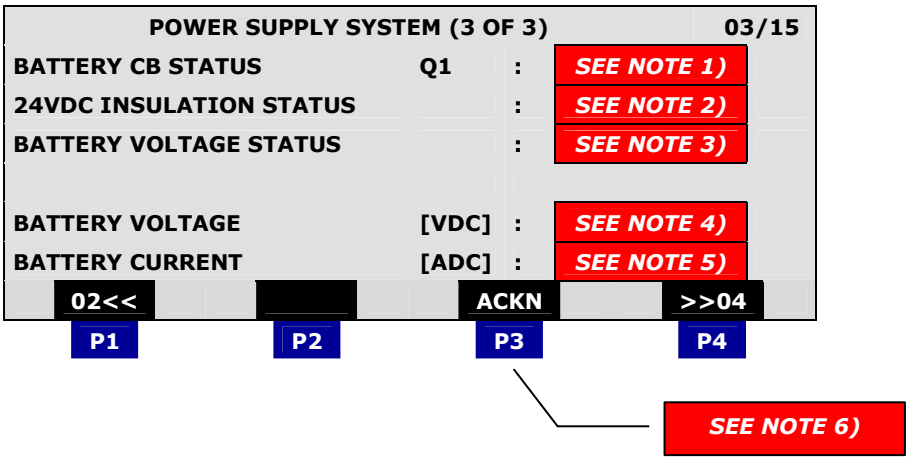
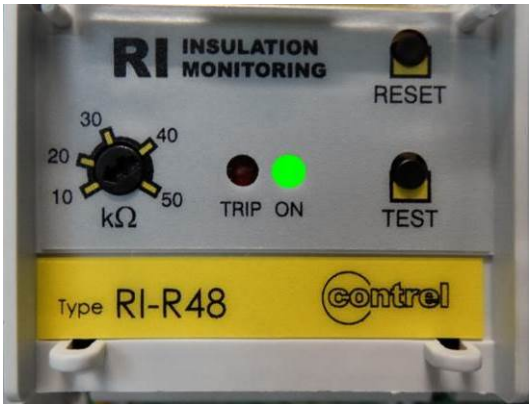


FIGURE 74: POWER SUPPLY SYSTEM (3 OF 3) PAGE ON LCD

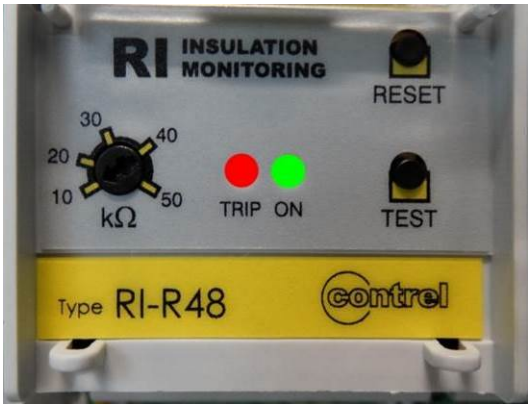
1) **BATTERY CB STATUS Q1→ the message can be one of the following:**
   - **OK** = the circuit breaker Q1 inside the NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*) is closed.
   - **ALARM <** = the circuit breaker Q1 inside the NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*) is open.
   - **N/A** = the module that collects the information about this component is not communicating properly with the CPU so the information about this component is not available.

2) **24VDC INSULATION STATUS → the message can be one of the following:**
   - **OK** = no earth fault regarding the 24Vdc battery poles is detected by the corresponding earth insulation monitoring relay (KE1).
   - **ALARM <** = an earth fault regarding the 24Vdc battery poles is detected by the corresponding earth insulation monitoring relay (KE1).
   - **N/A** = the module that collects the information about this component is not communicating properly with the CPU so the information about this component is not available.



POWERED-ON

NO ALARM



POWERED-ON

ALARM

FIGURE 75: EARTH INSULATION MONITORING RELAY KE1

3) **BATTERY VOLTAGE STATUS→ the message can be one of the following:**
   - **OK** = the battery voltage is higher than the LOW VOLTAGE ALARM threshold (defined in the SETTINGS pages) or, if the alarm was just provided, the battery voltage returned higher than the LOW VOLTAGE RESTORE threshold (defined in the SETTINGS pages) over a consecutive time of 60 seconds.
   - **LOW <** = the battery voltage is lower than the LOW VOLTAGE ALARM threshold (defined in the SETTINGS pages) over a consecutive time of 60 seconds.
   - **LOW-LOW <** = the battery voltage is lower than the LOADS DISCON. VOLT. threshold (defined in the SETTINGS pages) over a consecutive time of 60 seconds. In this case occurs the automatic disconnection of all the loads.

4) **BATTERY VOLTAGE [VDC]** → the value corresponding to this message is the battery voltage value detected by the network analyzer NA2 installed inside the NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*).

5) **BATTERY CURRENT [ADC]** → the value corresponding to this message is the battery current value detected by the network analyzer NA2 installed inside the NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*)

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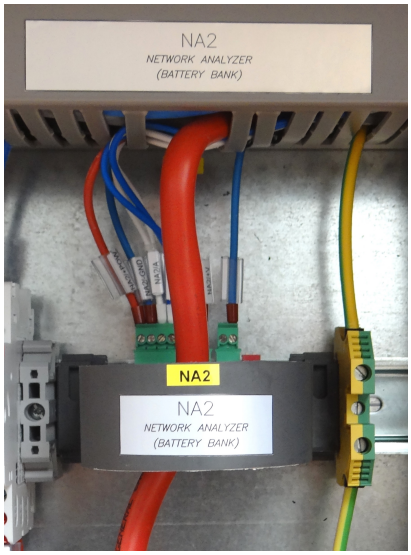


FIGURE 76: NETWORK ANALYZER NA2

6) **ACKN**: when a new alarm is detected by the control system, it is saved on the corresponding page until the alarm is not acknowledged. By pressing the push-button P3 on the page with one or more new alarms (blinking) all the new alarms are acknowledged.

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7.2.6.5 BATTERY CHARGER SYSTEM (1 OF 2) PAGE (04/15)

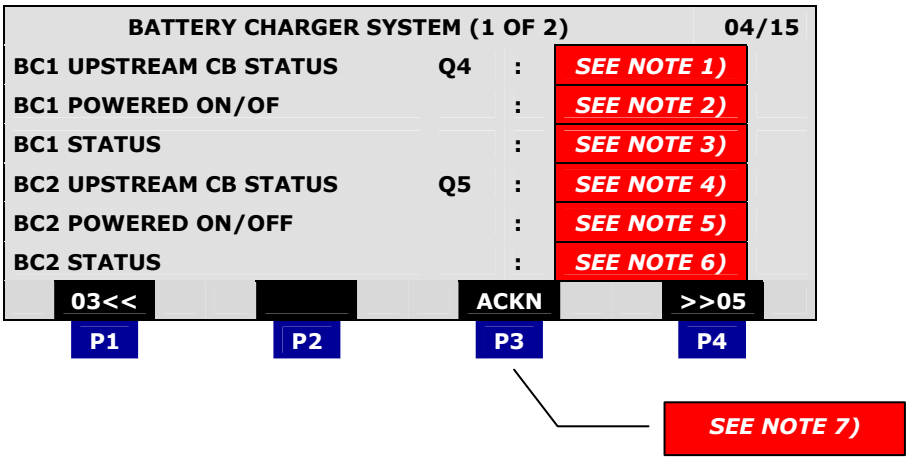


FIGURE 77: BATTERY CHARGER SYSTEM (1 OF 2) PAGE ON LCD

1) **BC1 UPSTREAM CB STATUS Q4→ the message can be one of the following:**
   - **OK** = the circuit breaker Q4 inside the NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*) is closed.
   - **ALARM <** = the circuit breaker Q4 inside the NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*) is open.
   - **N/A** = the module that collects the information about this component is not communicating properly with the CPU so the information about this component is not available.

2) **BC1 POWERED ON/OFF → the message can be one of the following:**
   - **ON** = the battery charger BC-200F2A installed inside the NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*) is powered-on.
   - **OFF** = the battery charger BC-200F2A installed inside the NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*) is powered-off.
   - **N/A** = the module that collects the information about this component is not communicating properly with the CPU so the information about this component is not available.

3) **BC1 STATUS → the message can be one of the following:**
   - **OK** = the battery charger BC-200F2A is working properly.
   - **ALARM <** = the battery charger named BC-200F2A is signaling an alarm condition.
   - **N/A** = the module that collects the information about this component is not communicating properly with the CPU so the information about this component is not available.

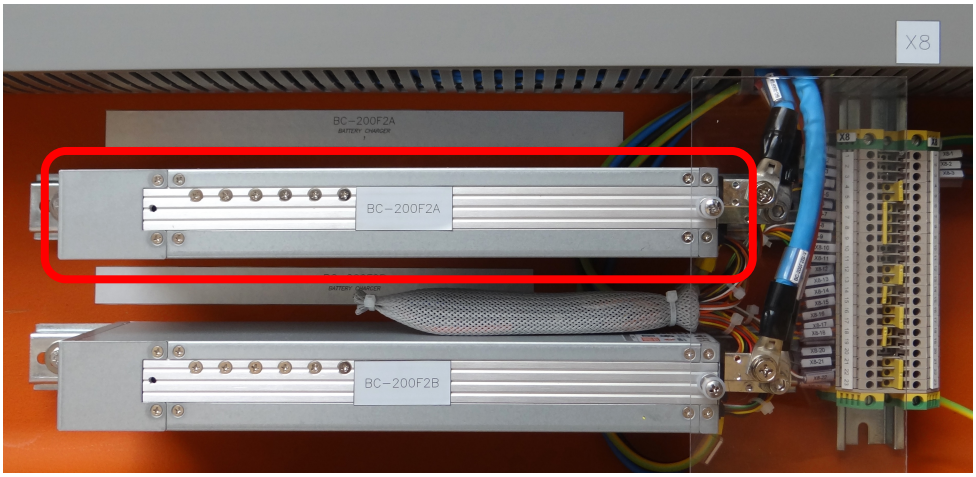


FIGURE 78: BC-200F2A BATTERY CHARGER

4) **BC2 UPSTREAM CB STATUS Q5→ the message can be one of the following:**
   - **OK** = the circuit breaker Q5 inside the NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*) is closed.
   - **ALARM <** = the circuit breaker Q5 inside the NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*) is open.
   - **N/A** = the module that collects the information about this component is not communicating properly with the CPU so the information about this component is not available.

5) **BC2 POWERED ON/OFF → the message can be one of the following:**
   - **ON** = the battery charger BC-200F2B installed inside the NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*) is powered-on.
   - **OFF** = the battery charger BC-200F2B installed inside the NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*) is powered-off.
   - **N/A** = the module that collects the information about this component is not communicating properly with the CPU so the information about this component is not available.

6) **BC2 STATUS → the message can be one of the following:**
   - **OK** = the battery charger BC-200F2B is working properly.
   - **ALARM <** = the battery charger named BC-200F2B is signaling an alarm condition.
   - **N/A** = the module that collects the information about this component is not communicating properly with the CPU so the information about this component is not available.

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FIGURE 79: BC-200F2B BATTERY CHARGER

7) **ACKN**: when a new alarm is detected by the control system, it is saved on the corresponding page until the alarm is not acknowledged. By pressing the push-button P3 on the page with one or more new alarms (blinking) all the new alarms are acknowledged.

7.2.6.6 BATTERY CHARGER SYSTEM (2 OF 2) PAGE (05/15)

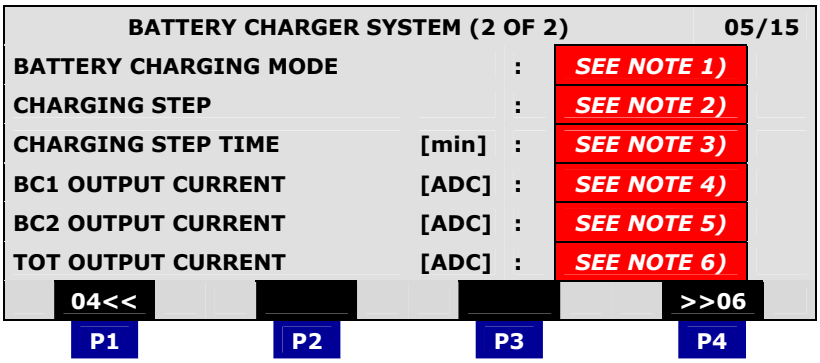


FIGURE 80: BATTERY CHARGER SYSTEM (2 OF 2) PAGE ON LCD

1) **BATTERY CHARGING MODE → the message can be one of the following:**
   - **FULL-ENAB** = the full-charge is enabled so the battery chargers can perform the full-charge of the NAVAIDS BATTERY BANK (*BA*-200F2).
   - **FULL-DIS** = the full-charge is disabled so the battery chargers cannot perform the full-charge of the NAVAIDS BATTERY BANK (*BA*-200F2) (in order to avoid the gas production). The battery chargers provide the FULL-DISAB. VOLTAGE (defined in the SETTINGS pages of the display panel).
   - **N/A** = the module that collects the information about this component is not communicating properly with the CPU so the information about this component is not available.

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The user can select the battery charging mode using the terminals X5-1/2 inside the NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*): if a jumper is installed between them, the full-charge is disabled, otherwise the full-charge is enabled. In this case the full-charge is disabled because the NAVAIDS BATTERY BANK (*BA*-200F2) is suitable to be installed in classified area (Zone 1).

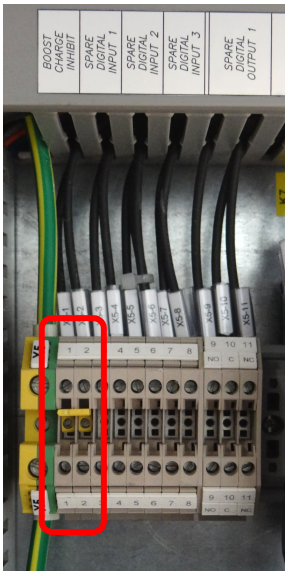


FIGURE 81: JUMPER X5-1/2

2) **CHARGING STEP → the message can be one of the following:**

- **START-UP** = during the start-up of the control system the battery chargers charge the navaids battery bank with a START-UP voltage for about 2 minutes.
- **BULK-INI** = this is the first step of the navaids battery bank charge. In this step the battery chargers charge the navaids battery bank with the maximum current value of MAX CHG CURRENT (TOT) (defined in the SETTINGS pages) till the battery voltage reaches the value of the START BULK TIMER (defined in the SETTINGS pages). If the battery voltage reaches the value of the START BULK TIMER (defined in the SETTINGS pages) the BULK-MIN step starts.
- **BULK-MIN** = in this step the timer starts counting for a time of MIN BULK TIME (defined in the SETTINGS pages).
- **BULK** = this steps starts at the end of the MIN BULK TIME (defined in the SETTINGS pages) and if the battery voltage is ≥ of the BULK VOLTAGE (defined in the SETTINGS pages) then the ABS-MIN step starts, otherwise if the battery voltage is < of the BULK VOLTAGE (defined in the SETTINGS pages) then the system remains in the BULK step for

a maximum time of MAX BULK TIME (defined in the SETTINGS pages). At the end of the MAX BULK TIME (defined in the SETTINGS pages) the ABS-MIN step starts anyway.

- **ABS-MIN** = in this step the battery chargers charge the navaids battery bank with the ABS VOLTAGE (defined in the SETTINGS pages) and the timer starts counting for a time of MIN ABS TIME (defined in the SETTINGS pages).
- **ABS** = this step starts at the end of the MIN ABS TIME(defined in the SETTINGS pages) and if the output current of the battery chargers is < of the RETURN CURRENT (TOT) (defined in the SETTINGS pages) then the FLOATING step starts, otherwise if the output current of the battery chargers is ≥ of the RETURN CURRENT (TOT) (defined in the SETTINGS pages) then the system remains in the ABS step for a maximum time of MAX ABS TIME (defined in the SETTINGS pages). At the end of the MAX ABS TIME (defined in the SETTINGS pages) the FLOATING step starts anyway.
- **FLOATING** = in this step the battery chargers charge the navaids battery bank with the FLOAT VOLTAGE (defined in the SETTINGS pages) and the system remains in this step indefinitely. Only if the *LV SWITCHGEAR (SG-200N1)* power supply goes away or if the battery voltage drops below the BULK RETURN VOLTAGE (defined in the SETTINGS pages) for a time of BULK RETURN TIME (defined in the SETTINGS pages) the system returns to the BULK-INI step and so on.
- **FULL-DIS** = in this step the battery chargers charge the navaids battery bank with the FULL-DISAB. VOLTAGE (defined in the SETTINGS pages) and the system remains in this step till the battery full-charge is disabled through the jumper installed between the termianls X5-1/2 of the NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*).
- **OFF** = this message is displayed when the *LV SWITCHGEAR (SG-200N1)* power supply is not available and then the battery chargers are powered-off.

3) **CHARGING STEP TIME [min]** → the value corresponding to this message is the timer corresponding to the above written charging step (if the charging step has no timer then the message in this line will be STOP).

4) **BC1 OUTPUT CURRENT [ADC]** → the value corresponding to this message is the current value outgoing from the battery charger BC-200F2A.

5) **BC2 OUTPUT CURRENT [ADC]** → the value corresponding to this message is the current value outgoing from the battery charger BC-200F2B.

6) **TOT OUTPUT CURRENT [ADC]** → the value corresponding to this message is the total current value outgoing from the battery chargers BC-200F2A and BC-200F2B.

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7.2.6.7 ACTIVATION SYSTEM (1 OF 2) PAGE (06/15)

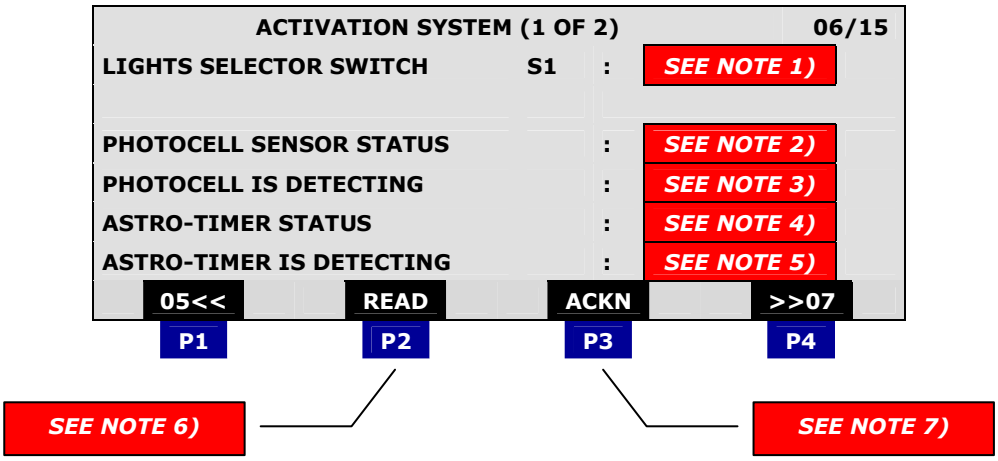


FIGURE 82: ACTIVATION SYSTEM (1 OF 2) PAGE ON LCD

1) **LIGHTS SELECTOR SWITCH S1 → the message can be one of the following:**
   - **ON** = the selector switch S1 of the NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*) is placed on "ON" position therefore the marine and obstruction lights are forced switched-on. In this case the photocell, the astronomical timer and the visibility meter are ignored.
   - **AUTO** = the selector switch S1 is placed on "AUTO" position therefore the marine signal lights are switched-on/off accordingly to the photocell, the astronomical timer and the visibility meter. The obstruction lights are always activated regardless of the above.
   - **OFF** = the selector switch S1 is placed on "OFF" position therefore the marine and obstruction lights are forced switched-off. In this case the photocell, the astronomical timer and the visibility meter are ignored.

	SICE suggest to set the **"MARINE & OBSTRUCTION LIGHTS"** working with the selector switch S1 on **"AUTO"** position.

2) **PHOTOCELL SENSOR STATUS → the message can be one of the following:**
   - **OK** = the photocell is working properly.
   - **ALARM <** = the photocell sensor detection has never changed in the last 24 hours. In this case the marine signal lights are forced switched-on if their working mode is AUTO.

3) **PHOTOCELL IS DETECTING → the message can be one of the following:**
   - **DAY** = the photocell sensor is working properly and it's detecting day.
   - **NIGHT** = the photocell sensor is working properly and it's detecting night.
   - **N/A** = the photocell sensor detection has never changed in the last 24 hours. In this case the marine signal lights are forced switched-on if their working mode is AUTO.

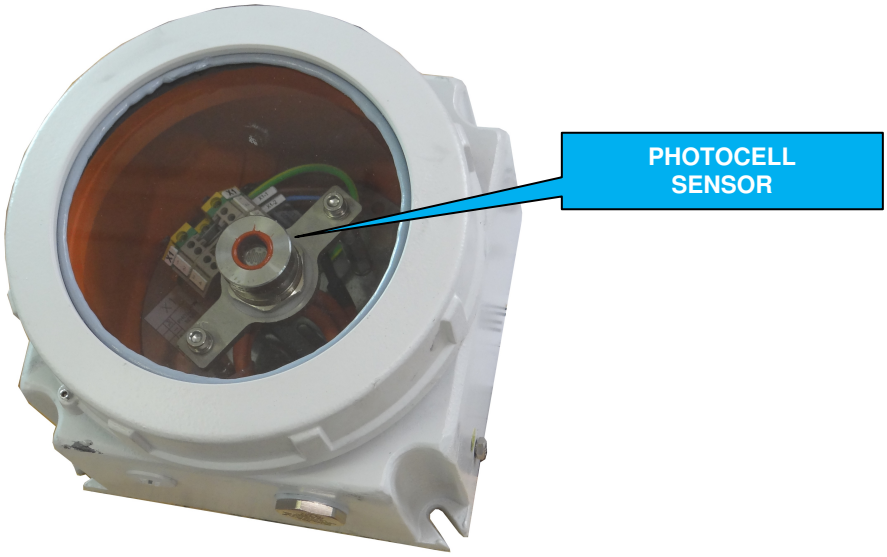


FIGURE 83: PHOTOCELL SYSTEM

4) **ASTROTIMER STATUS → the message can be one of the following:**
   - **OK** = the astronomical timer is working properly.
   - **ALARM <** = an alarm is detetected in the astronomical timer. In this case the marine signal lights are forced switched-on if their working mode is AUTO.
   - **N/A** = the module that collects the information about this component is not communicating properly with the CPU so the information about this component is not available.

5) **ASTRO-TIMER IS DETECTING → the message can be one of the following:**
   - **DAY** = the astronomical timer is working properly and it's detecting day.
   - **NIGHT** = the astro timer is working properly and it's detecting night.
   - **N/A** = an alarm is detetected in the astronomical timer. In this case the marine signal lights are forced switched-on if their working mode is AUTO.



FIGURE 84: ASTRONOMICAL TIME SWITCH

6) **READ**: by pressing the push-button P2 on this page, it is displayed the actual value of the photocell detection (the value “0” corresponds to “full darkness” while a value greater than “4000” corresponds to “full light).

7) **ACKN**: when a new alarm is detected by the control system, it is saved on the corresponding page until the alarm is not acknowledged. By pressing the push-button P3 on the page with one or more new alarms (blinking) all the new alarms are acknowledged.

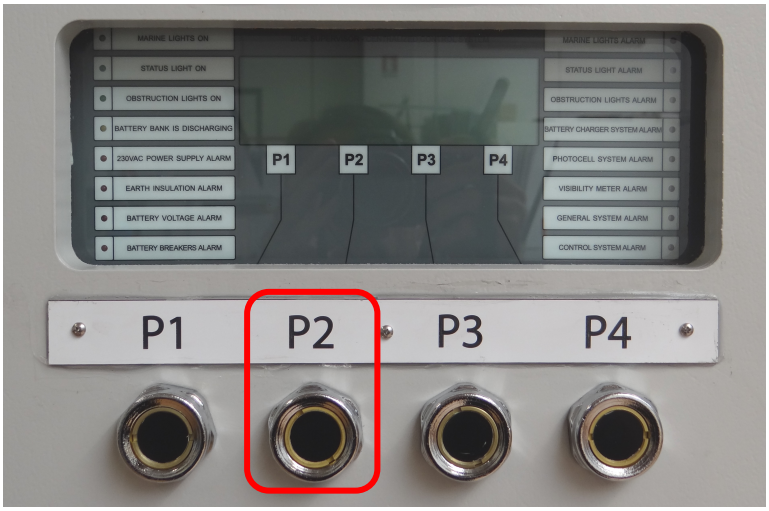


FIGURE 85: P2 PUSH-BUTTON

7.2.6.8 ACTIVATION SYSTEM (2 OF 2) PAGE (07/15)

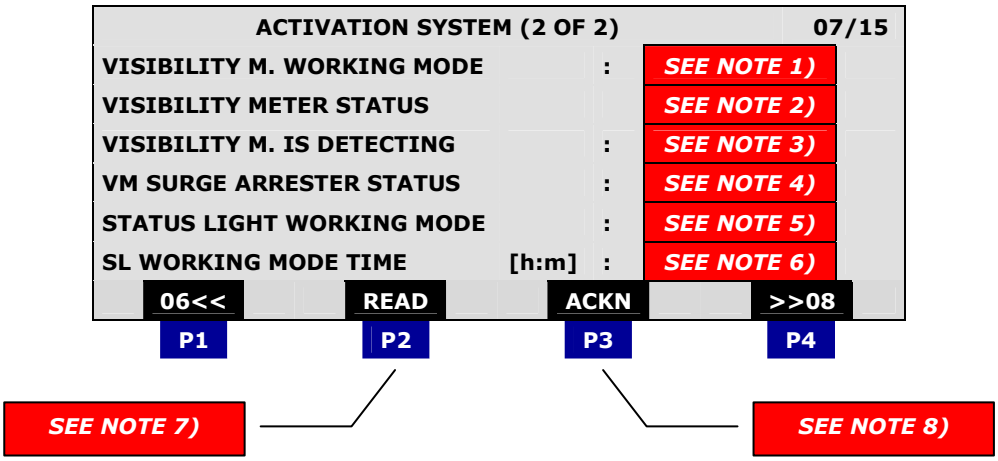


FIGURE 86: ACTIVATION SYSTEM (2 OF 2) PAGE ON LCD

1) **VISIBIL. M. WORKING MODE → the message can be one of the following:**
   - **TIMED-ON** = in case the working mode of the VISIBILITY METER (*EVM-200-01*) is set on "05/15" or "20/60" mode (it can be seen in the setting pages of the display panel), it is powered-on by the control system for 5 (or 20) minutes. During this time the control system check the visibility meter status (OK/ALARM) and the visibility meter detection (FOG/NO FOG). The control system updates the visibilty meter status continuously during the TIMED-ON phase, while it updates the visibilty meter detection only at the end of the TIMED-ON phase with the last detected visibility condition.
   - **TIMED-OFF** = in case the working mode of the VISIBILITY METER (*EVM-200-01*) is set on "05/15" or "20/60" mode (it can be seen in the setting pages of the display panel), after the TIMED-ON phase it is powered-off by the control system for 10 (or 40) minutes. During this time the visibilty meter status and the visibility meter detection are latched by the control system until the end of the TIMED-OFF phase. After the end of the TIMED-OFF phase starts another TIMED-ON phase and so on.
   - **STEADY ON** = in case the working mode of the VISIBILITY METER (*EVM-200-01*) is set on "STDY ON" mode, it is always switched-on.
   - **STEADY OFF** = the VISIBILITY METER (*EVM-200-01*) is switched-off through the "VISIBILITY METER ACTIVATION COMMAND" incoming from *F&G SYSTEM (B400-FGS-002)* in case of fire and gas alarm.

2) **VISIBIL. M. STATUS → the message can be one of the following:**
   - **OK** = the VISIBILITY METER (*EVM-200-01*)is working properly (no alarm).

- **ALARM <** = An alarm is raised by the VISIBILITY METER (*EVM-200-01*). In this case the marine signal lights are forced switched-on if their working mode is AUTO.
- **N/A** = the module that collects the information about this component is not communicating properly with the CPU so the information about this component is not available.

3) **VISIBIL. M. IS DETECTING → the message can be one of the following:**
   - **FOG** = the visibility range detected by the VISIBILITY METER (*EVM-200-01*) is lower than 2 nautical miles.
   - **NO FOG** = the visibility range detected by the VISIBILITY METER (*EVM-200-01*) is higher than 2 nautical miles.
   - **N/A** = at least one alarm is detected by the VISIBILITY METER (*EVM-200-01*). In this case the marine signal lights are forced switched-on if their working mode is AUTO.

4) **VM SURGE ARRESTER STATUS → the message can be one of the following:**
   - **OK** = no alarm is detected in the surge arresters (SA9/SA10) corresponding to the VISIBILITY METER (*EVM-200-01*) power supply.
   - **ALARM <** = at least one alarm is detected in the . the surge arresters (SA9/SA10) corresponding to the VISIBILITY METER (*EVM-200-01*) power supply
   - **N/A** = the module that collects the information about this component is not communicating properly with the CPU so the information about this component is not available.

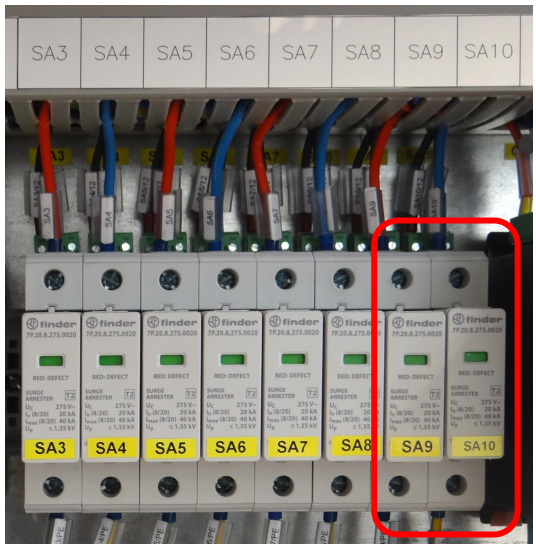


FIGURE 87: SURGE ARRESTERS SA9/SA10



FIGURE 88: SURGE ARRESTER ALARM INDICATOR

5) **STATUS LIGHT WORKING MODE → the message can be one of the following:**

- **REMOTE ON** = in this stage the status lights are required switched-on (flashing) from the "BOAT LANDING STATUS LIGHT ACTIVATION COMMAND" incoming from *F&G SYSTEM (B400-FGS-002)* and the timer (below) starts counting for the time period set in **SL REMOTE ON TIME** (defined in the SETTINGS page).
- **MANUAL ON** = in this stage the status lights are required switched-on (flashing) from the local push button (P5) and the timer (below) starts counting for the time period set in **SL MANUALLY ON TIME** (defined in the SETTINGS page).
- **MANUAL OFF** = in this stage the status lights are required switched-off (even if the remote on/off command requests them switched-on) from the local push button (P6) and the timer (below) starts counting for the time period set in **SL MANUALLY OFF TIME** (defined in the SETTINGS page).
- **STAND-BY** = in this stage the status lights are required switched-off from the "BOAT LANDING STATUS LIGHT ACTIVATION COMMAND" incoming from *F&G SYSTEM (B400-FGS-002)* and no other commands are active.

6) **SL WORKING MODE TIME [hh:mm] → the message can be one of the following:**
   - **XX:XX < YY:YY** = this message is displayed when a timer (REMOTE ACTIVATION, MANUAL-ON, MANUAL-OFF) is active: the XX:XX value represents the time of the timer already elapsed and the YY:YY value represents the total duration of the timer.
   - **OFF** = this message is displayed when no timer is active (STAND-BY).

7) **READ**: by pressing the push-button P2 on this page, it is displayed on the corresponding row if the visibilty meter detection is STABLE or if it is changing (in this case it is shown the corresponding timer, depending on the visibility meter working mode setting).

8) **ACKN**: when a new alarm is detected by the control system, it is saved on the corresponding page until the alarm is not acknowledged. By pressing the push-button P3 on the page with one or more new alarms (blinking) all the new alarms are acknowledged.

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7.2.6.9 MARINE YELLOW LIGHT 1 PAGE (08/15)

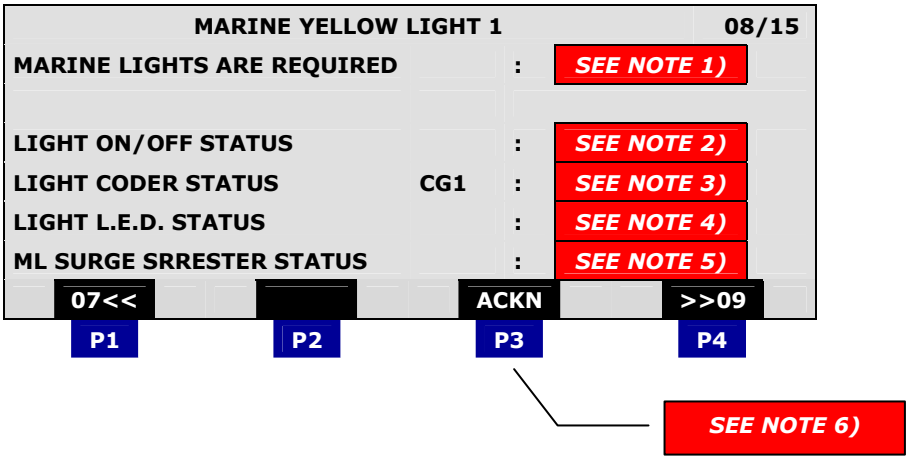


FIGURE 89: MARINE YELLOW LIGHT 1 PAGE ON LCD

1) **MARINE LIGHTS ARE REQUIRED → the message can be one of the following:**
   - **ON** = the marine signal lights are required switched-on by the control system (depending on the position of the selector switch).
   - **OFF** = the marine signal lights are required switched-off by the control system (depending on the position of the selector switch).
   - **LVD** = in case of LOWLOW battery voltage alarm, the marine signal light are required switched-off by the control system (in order to preserve the battery bank).

2) **LIGHT ON/OFF STATUS → the message can be one of the following:**
   - **ON** = the MAIN MARINE YELLOW LIGHT 1 (*EML-200-01*) is switched-on.
   - **OFF** = the MAIN MARINE YELLOW LIGHT 1 (*EML-200-01*) is switched-off.
   - **N/A** = the coder CG1, corresponding to the MAIN MARINE YELLOW LIGHT 1 (*EML-200-01*), is in alarm condition and therfore this information is not available.

3) **LIGHT CODER STATUS CG1 → the message can be one of the following:**
   - **OK** = the U-coder CG1, corresponding to the MAIN MARINE YELLOW LIGHT 1 (*EML-200-01*), doesn't signal any alarm.
   - **ALARM <** = the U-coder CG1, corresponding to the MAIN MARINE YELLOW LIGHT 1 (*EML-200-01*), is signaling at least one alarm.
   - **STAND-BY** = the U-coder CG1, corresponding to the MAIN MARINE YELLOW LIGHT 1 (*EML-200-01*), is in stand-by mode.

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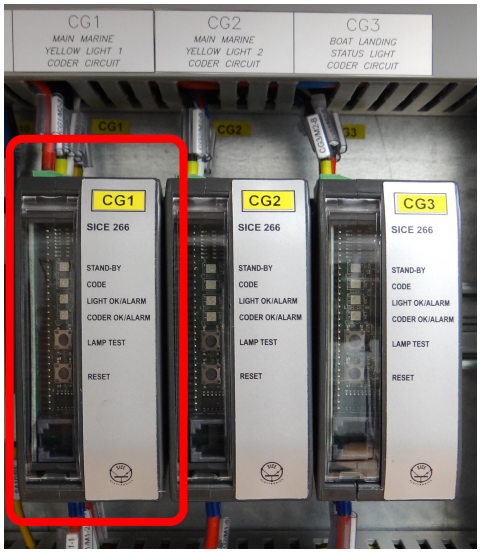


FIGURE 90: CG1 CODER CIRCUIT

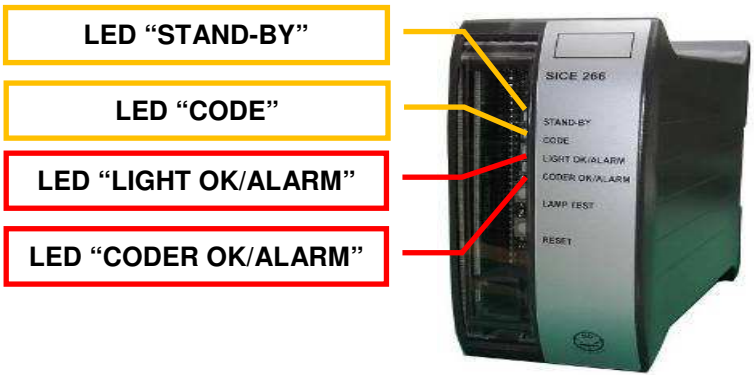


FIGURE 91: L.E.D.'S ON MARINE SIGNAL LIGHT CODER CIRCUIT

4) **LIGHT L.E.D. STATUS → the message can be one of the following:**

- **OK** = the MAIN MARINE YELLOW LIGHT 1 (*EML-200-01*) is working properly.
- **ALARM <** = the MAIN MARINE YELLOW LIGHT 1 (*EML-200-01*) is not working properly.
- **OFF** = the MAIN MARINE YELLOW LIGHT 1 (*EML-200-01*) is switched-off.
- **N/A** = the coder CG1, corresponding to the MAIN MARINE YELLOW LIGHT 1 (*EML-200-01*), is in alarm condition and therfore this information is not available.

5) **ML SURGE ARRESTER STATUS → the message can be one of the following:**

- **OK** = no alarm is detected in the surge arresters (SA3/SA4) corresponding to the MAIN MARINE YELLOW LIGHT 1 (*EML-200-01*) power supply.
- **ALARM <** = at least one alarm is detected in the surge arresters (SA3/SA4) corresponding to the MAIN MARINE YELLOW LIGHT 1 (*EML-200-01*) power supply

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- **N/A** = the module that collects the information about this component is not communicating properly with the CPU so the information about this component is not available.



FIGURE 92: SURGE ARRESTERS SA3/SA4



FIGURE 93: SURGE ARRESTER ALARM INDICATOR

6) **ACKN**: when a new alarm is detected by the control system, it is saved on the corresponding page until the alarm is not acknowledged. By pressing the push-button P3 on the page with one or more new alarms (blinking) all the new alarms are acknowledged.

	The activation of the U-coders of the marine signal lights is sequential. The sequential activation is used to minimize the total inrush current.

7.2.6.10 MARINE YELLOW LIGHT 2 PAGE (09/15)

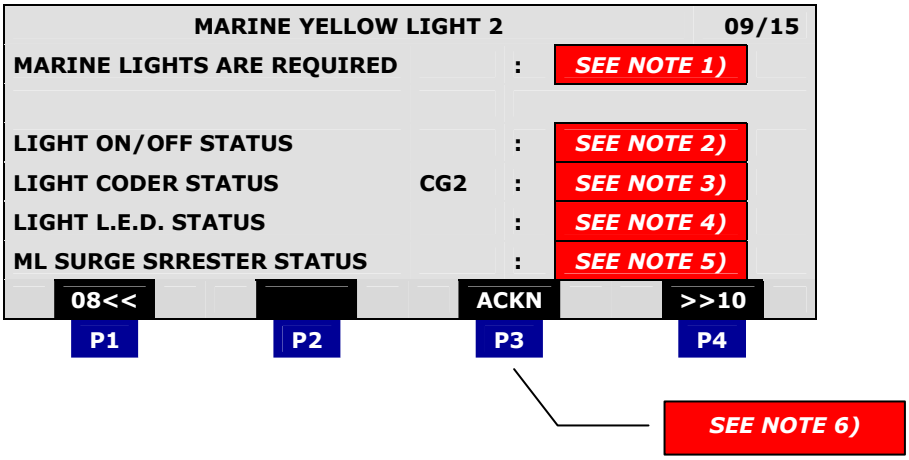


FIGURE 94: MARINE YELLOW LIGHT 2 PAGE ON LCD

1) **MARINE LIGHTS ARE REQUIRED → the message can be one of the following:**
   - **ON** = the marine signal lights are required switched-on by the control system (depending on the position of the selector switch).
   - **OFF** = the marine signal lights are required switched-off by the control system (depending on the position of the selector switch).
   - **LVD** = in case of LOWLOW battery voltage alarm, the marine signal light are required switched-off by the control system (in order to preserve the battery bank).

2) **LIGHT ON/OFF STATUS → the message can be one of the following:**
   - **ON** = the MAIN MARINE YELLOW LIGHT 2 (*EML-200-02*) is switched-on.
   - **OFF** = the MAIN MARINE YELLOW LIGHT 2 (*EML-200-02*) is switched-off.
   - **N/A** = the coder CG2, corresponding to the MAIN MARINE YELLOW LIGHT 2 (*EML-200-02*), is in alarm condition and therfore this information is not available.

3) **LIGHT CODER STATUS CG2 → the message can be one of the following:**
   - **OK** = the U-coder CG2, corresponding to the MAIN MARINE YELLOW LIGHT 2 (*EML-200-02*), doesn't signal any alarm.
   - **ALARM** < = the U-coder CG2, corresponding to the MAIN MARINE YELLOW LIGHT 2 (*EML-200-02*), is signaling at least one alarm.
   - **STAND-BY** = the U-coder CG2, corresponding to the MAIN MARINE YELLOW LIGHT 2 (*EML-200-02*), is in stand-by mode.

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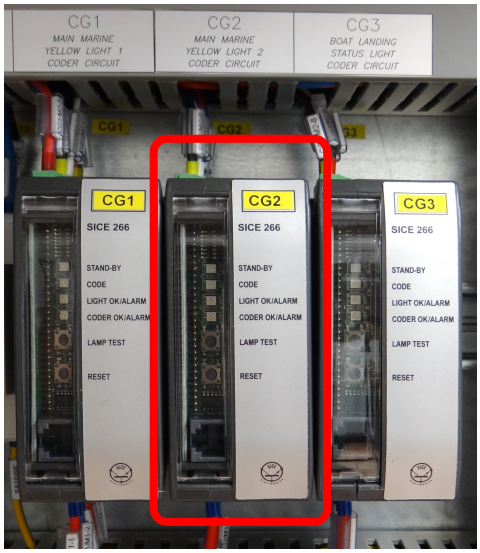


FIGURE 95: CG2 CODER CIRCUIT

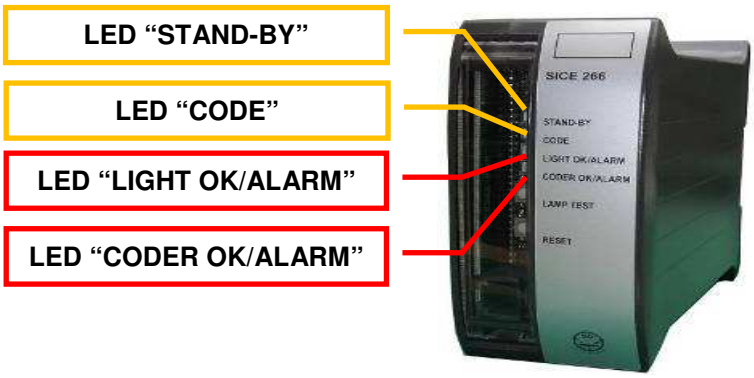


FIGURE 96: L.E.D.'S ON MARINE SIGNAL LIGHT CODER CIRCUIT

4) **LIGHT L.E.D. STATUS → the message can be one of the following:**

- **OK** = the MAIN MARINE YELLOW LIGHT 2 (*EML-200-02*) is working properly.
- **ALARM <** = the MAIN MARINE YELLOW LIGHT 2 (*EML-200-02*) is not working properly.
- **OFF** = the MAIN MARINE YELLOW LIGHT 2 (*EML-200-02*) is switched-off.
- **N/A** = the coder CG2, corresponding to the MAIN MARINE YELLOW LIGHT 2 (*EML-200-02*), is in alarm condition and therfore this information is not available.

5) **ML SURGE ARRESTER STATUS → the message can be one of the following:**

- **OK** = no alarm is detected in the surge arresters (SA5/SA6) corresponding to the MAIN MARINE YELLOW LIGHT 2 (*EML-200-02*) power supply.
- **ALARM <** = at least one alarm is detected in the surge arresters (SA5/SA6) corresponding to the MAIN MARINE YELLOW LIGHT 2 (*EML-200-02*) power supply

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- **N/A** = the module that collects the information about this component is not communicating properly with the CPU so the information about this component is not available.



FIGURE 97: SURGE ARRESTERS SA5/SA6



FIGURE 98: SURGE ARRESTER ALARM INDICATOR

6) **ACKN**: when a new alarm is detected by the control system, it is saved on the corresponding page until the alarm is not acknowledged. By pressing the push-button P3 on the page with one or more new alarms (blinking) all the new alarms are acknowledged.

	The activation of the U-coders of the marine signal lights is sequential. The sequential activation is used to minimize the total inrush current.

7.2.6.11 BOAT LANDING STATUS LIGHT PAGE (10/15)

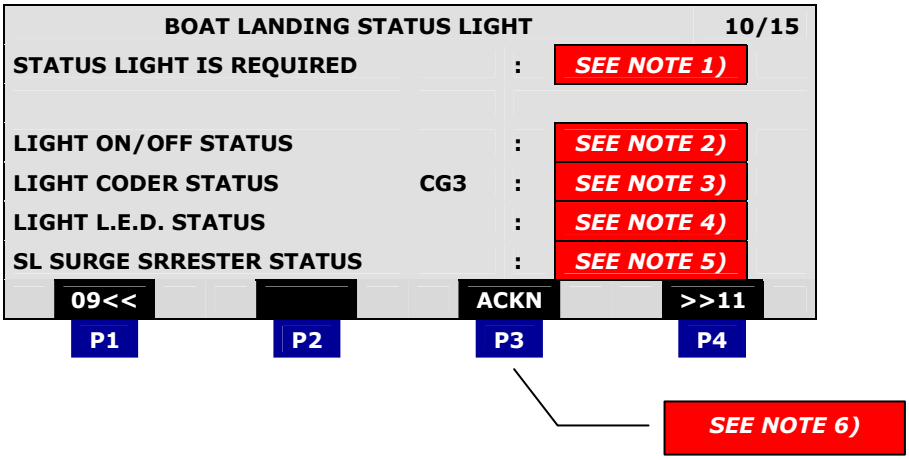


FIGURE 99: BOAT LANDING STATUS LIGHT PAGE ON LCD

1) **STATUS LIGHT IS REQUIRED → the message can be one of the following:**
   - **ON** = the boat landing status light is required switched-on by the control system (depending on the remote command and local push-buttons).
   - **OFF** = the boat landing status light is required switched-off by the control system (depending on the remote command and local push-buttons).
   - **LVD** = in case of LOWLOW battery voltage alarm, the boat landing status light is required switched-off by the control system (in order to preserve the battery bank).

2) **LIGHT ON/OFF STATUS → the message can be one of the following:**
   - **ON** = the BOAT LANDING STATUS LIGHT (*ESL-200-01*) is switched-on.
   - **OFF** = the BOAT LANDING STATUS LIGHT (*ESL-200-01*) is switched-off.
   - **N/A** = the coder CG3, corresponding to the BOAT LANDING STATUS LIGHT (*ESL-200-01*), is in alarm condition and therfore this information is not available.

3) **LIGHT CODER STATUS CG3 → the message can be one of the following:**
   - **OK** = the coder CG3, corresponding to the BOAT LANDING STATUS LIGHT (*ESL-200-01*), doesn't signal any alarm.
   - **ALARM** = the coder CG3, corresponding to the BOAT LANDING STATUS LIGHT (*ESL-200-01*), is signaling at least one alarm.
   - **STAND-BY** = the coder CG3, corresponding to the BOAT LANDING STATUS LIGHT (*ESL-200-01*), is in stand-by mode.



FIGURE 100: CG3 CODER CIRCUIT

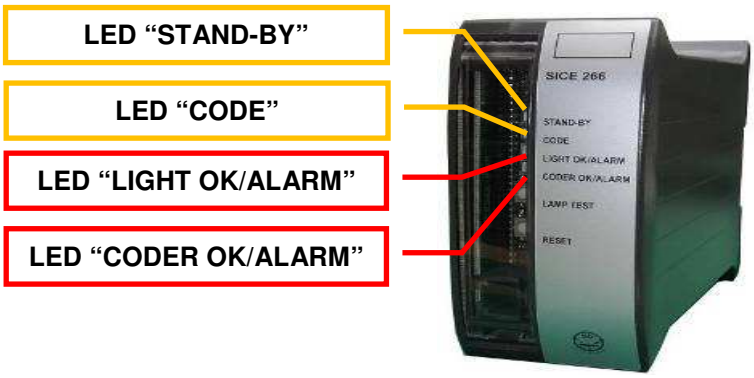


FIGURE 101: L.E.D.'S ON STATUS LIGHT CODER CIRCUIT

4) **LIGHT L.E.D. STATUS → the message can be one of the following:**

- **OK** = the BOAT LANDING STATUS LIGHT (*ESL-200-01*) is working properly.
- **ALARM <** = the BOAT LANDING STATUS LIGHT (*ESL-200-01*) is not working properly.
- **OFF** = the BOAT LANDING STATUS LIGHT (*ESL-200-01*) is switched-off.
- **N/A** = the coder CG3, corresponding to the BOAT LANDING STATUS LIGHT (*ESL-200-01*), is in alarm condition and therfore this information is not available.

5) **SL SURGE ARRESTER STATUS → the message can be one of the following:**

- **OK** = no alarm is detected in the surge arresters (SA7/SA8) corresponding to BOAT LANDING STATUS LIGHT (*ESL-200-01*) power supply.
- **ALARM <** = at least one alarm is detected in the surge arresters (SA7/SA8) corresponding to the BOAT LANDING STATUS LIGHT (*ESL-200-01*) power supply

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- **N/A** = the module that collects the information about this component is not communicating properly with the CPU so the information about this component is not available.



FIGURE 102: SURGE ARRESTERS SA7/SA8



FIGURE 103: SURGE ARRESTER ALARM INDICATOR

6) **ACKN**: when a new alarm is detected by the control system, it is saved on the corresponding page until the alarm is not acknowledged. By pressing the push-button P3 on the page with one or more new alarms (blinking) all the new alarms are acknowledged.

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7.2.6.12 OBSTRUCTION LIGHTS (1 OF 2) PAGE (11/15)

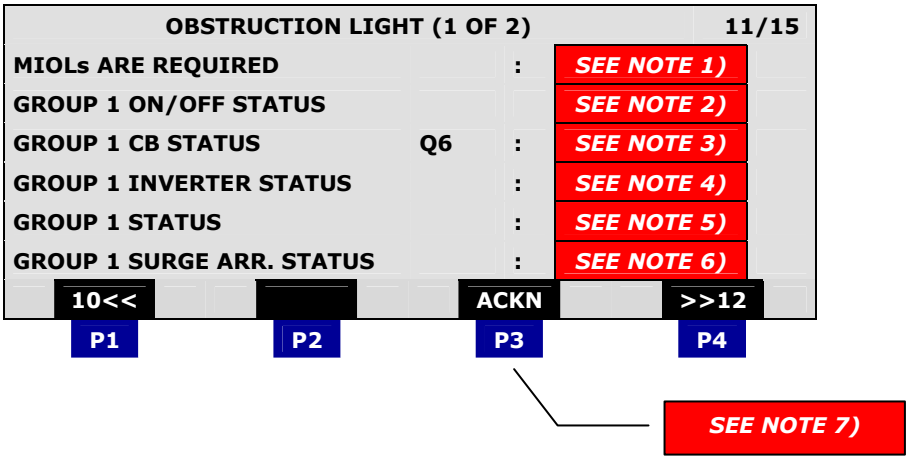


FIGURE 104: OBSTRUCTION LIGHT (1 OF 2) PAGE ON LCD

1) **MIOLs ARE REQUIRED → the message can be one of the following:**
   - **ON** = the medium intensity obstruction lights are required switched-on by the control system (depending on the position of the selector switch).
   - **OFF** = the medium intensity obstruction lights are required switched-off by the control system (depending on the position of the selector switch).
   - **LVD** = in case of LOWLOW battery voltage alarm, the medium intensity obstruction light are required switched-off by the control system (in order to preserve the battery bank).

2) **GROUP 1 ON/OFF STATUS → the message can be one of the following:**
   - **ON** = the group 1 of the medium intensity obstruction lights (*EOL-200-01/02*) is switched-on.
   - **OFF** = the group 1 of the medium intensity obstruction lights (*EOL-200-01/02*) is switched-off.

3) **GROUP 1 CB STATUS Q6 → the message can be one of the following:**
   - **OK** = the circuit breaker Q6 is closed.
   - **ALARM <** = the circuit breaker Q6 is open.
   - **N/A** = the module that collects the information about this component is not communicating properly with the CPU so the information about this component is not available.

4) **GROUP 1 INVERTER STATUS → the message can be one of the following:**
   - **OK** = the inverter INV1 is working properly.
   - **ALARM <** = at least one alarm is detected in the inverter INV1 or in the insulation monitoring relay KE2.

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- **OFF** = the inverter INV1 is switched-off.
- **N/A** = the module that collects the information about this component is not communicating properly with the CPU so the information about this component is not available.

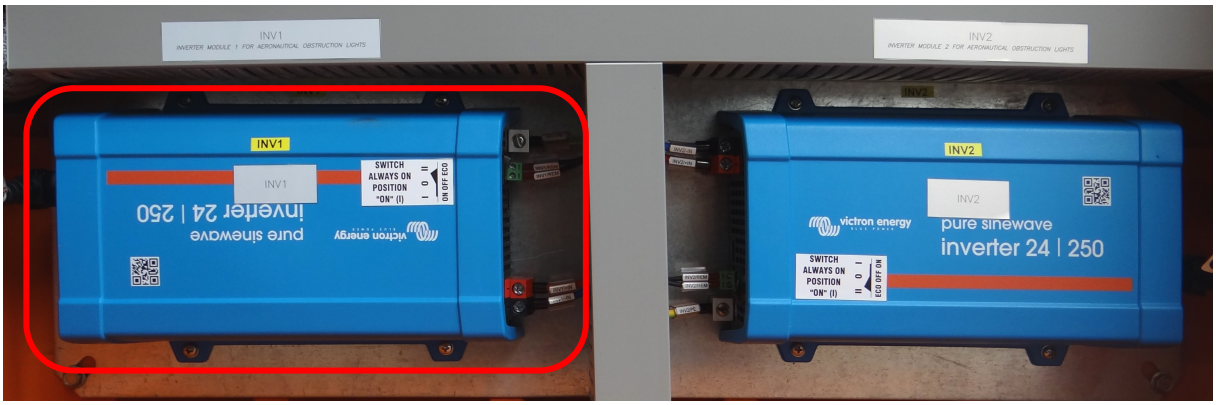


FIGURE 105: INVERTER INV1

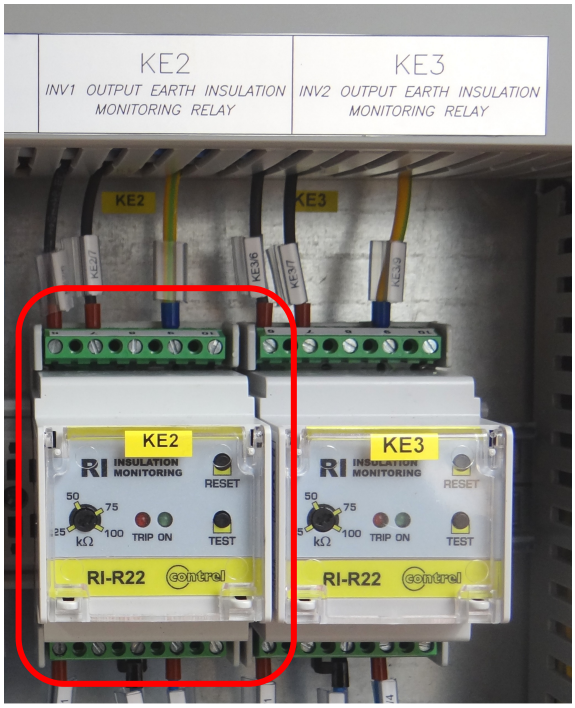
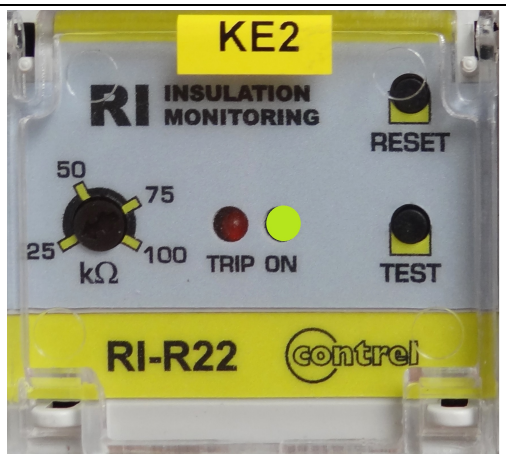
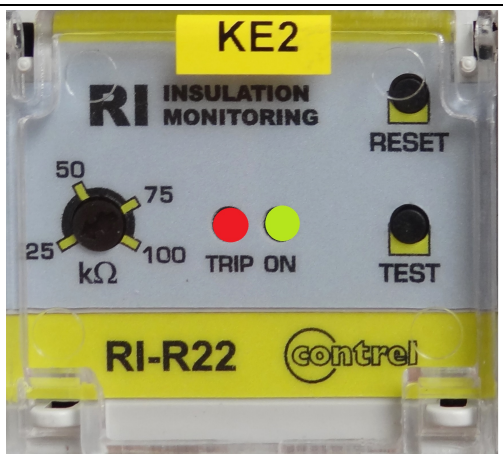


FIGURE 106: EARTH INSULATION MONITORING RELAY KE2



POWERED-ON

NO ALARM



POWERED-ON

ALARM

FIGURE 107: EARTH INSULATION MONITORING RELAY LEDs

5) **GROUP 1 STATUS → the message can be one of the following:**

- **OK** = the group 1 of the medium intensity obstruction lights (*EOL-200-01/02*) are working properly: no alarm is detected in the corresponding lights (through the corresponding current monitoring relay KU1).
- **ALARM <** = the group 1 of the medium intensity obstruction lights (*EOL-200-01/02*) are not working properly: at least one alarm is detected in the corresponding lights (through the corresponding current monitoring relay KU1).
- **OFF** = the group 1 of the medium intensity obstruction lights (*EOL-200-01/02*) are switched-off.
- **N/A** = the module that collects the information about this component is not communicating properly with the CPU so the information about this component is not available.

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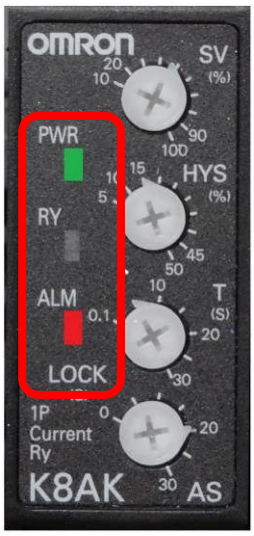


FIGURE 108: UNDERCURRENT MONITORING RELAY KU1



POWERED-ON

NO ALARM



POWERED-ON

ALARM

FIGURE 109: UNDERCURRENT MONITORING RELAY LEDs

	The LEDs on the undercurrent monitoring relays can signal alarm only when the lights are activated (obstruction lights activated) otherwise the relays are switched-off and no information can be shown by the LEDs.

6) **GROUP 1 SURGE ARR. STATUS → the message can be one of the following:**

- **OK** = no alarm is detected in the surge arrester (SA1) corresponding to group 1 of the medium intensity obstruction lights (*EOL-200-01/02*) power supply.
- **ALARM <** = at least one alarm is detected in the surge arrester (SA1) corresponding to the group 1 of the medium intensity obstruction lights (*EOL-200-01/02*) power supply
- **N/A** = the module that collects the information about this component is not communicating properly with the CPU so the information about this component is not available.

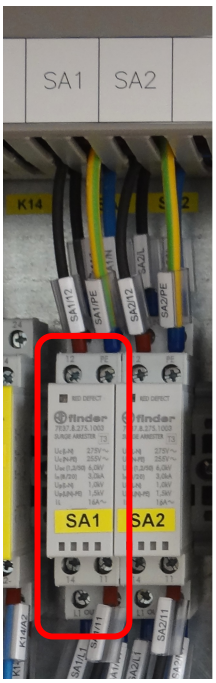


FIGURE 110: SURGE ARRESTERS SA1

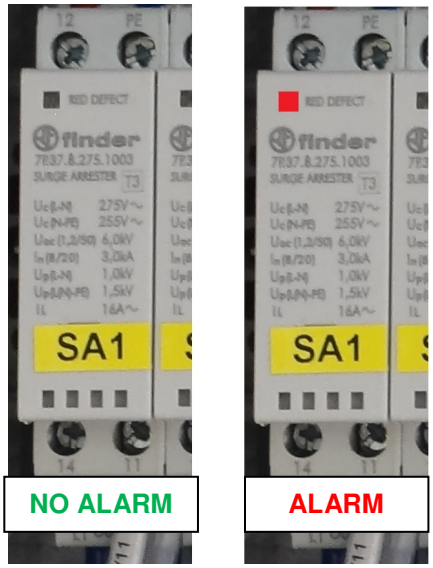


FIGURE 111: SURGE ARRESTER LED

7) **ACKN**: when a new alarm is detected by the control system, it is saved on the corresponding page until the alarm is not acknowledged. By pressing the push-button P3 on the page with one or more new alarms (blinking) all the new alarms are acknowledged.

⚠	The activation of the obstruction light groups is sequential. The sequential activation is used to minimize the total inrush current at power-on of the lights.

7.2.6.13 OBSTRUCTION LIGHTS (2 OF 2) PAGE (12/15)

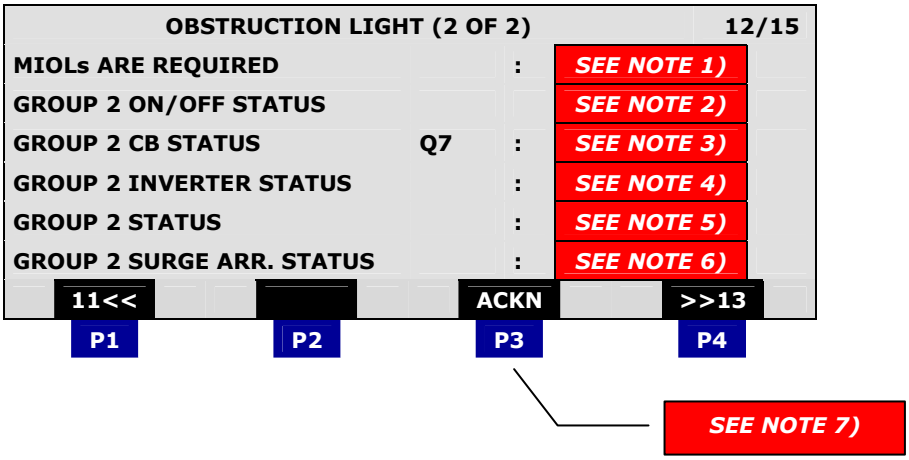


FIGURE 112: OBSTRUCTION LIGHT (2 OF 2) PAGE ON LCD

1) **MIOLs ARE REQUIRED → the message can be one of the following:**
   - **ON** = the medium intensity obstruction lights are required switched-on by the control system (depending on the position of the selector switch).
   - **OFF** = the medium intensity obstruction lights are required switched-off by the control system (depending on the position of the selector switch).
   - **LVD** = in case of LOWLOW battery voltage alarm, the medium intensity obstruction light are required switched-off by the control system (in order to preserve the battery bank).

2) **GROUP 2 ON/OFF STATUS → the message can be one of the following:**
   - **ON** = the group 2 of the medium intensity obstruction lights (*EOL-200-03/04*) is switched-on.
   - **OFF** = the group 2 of the medium intensity obstruction lights (*EOL-200-03/04*) is switched-off.

3) **GROUP 2 CB STATUS Q7 → the message can be one of the following:**
   - **OK** = the circuit breaker Q7 is closed.
   - **ALARM <** = the circuit breaker Q7 is open.
   - **N/A** = the module that collects the information about this component is not communicating properly with the CPU so the information about this component is not available.

4) **GROUP 2 INVERTER STATUS → the message can be one of the following:**
   - **OK** = the inverter INV2 is working properly.
   - **ALARM <** = at least one alarm is detected in the inverter INV2 or in the insulation monitoring relay KE3.

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- **OFF** = the inverter INV2 is switched-off.
- **N/A** = the module that collects the information about this component is not communicating properly with the CPU so the information about this component is not available.

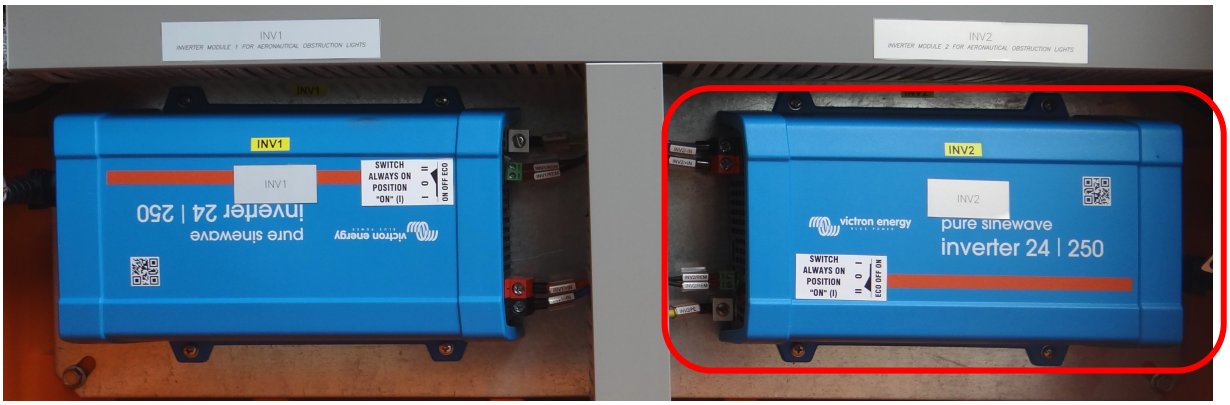


FIGURE 113: INVERTER INV2

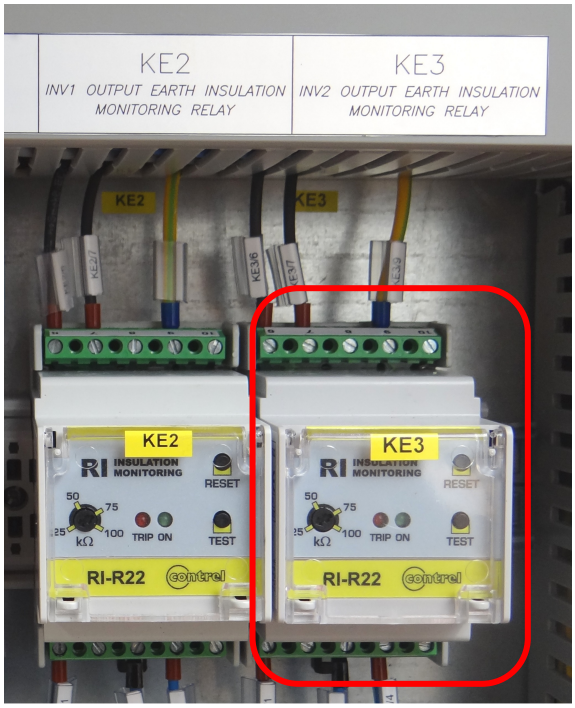
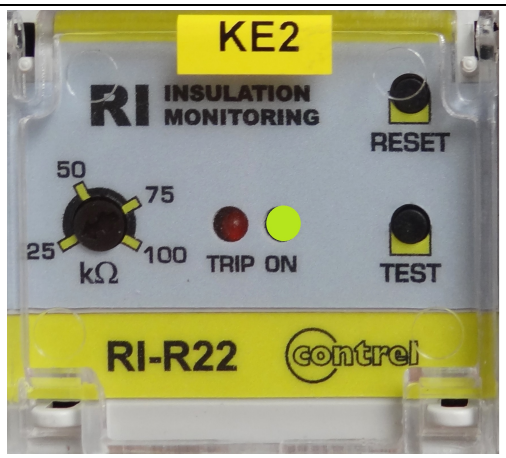
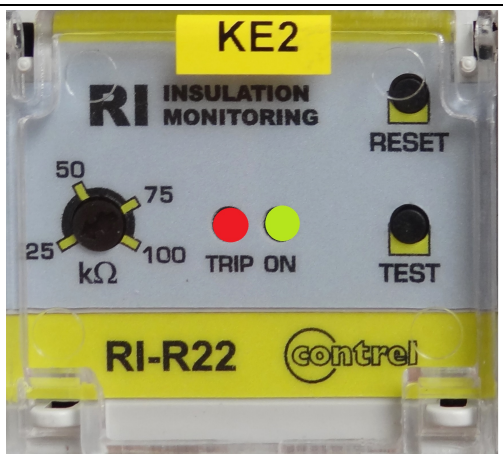


FIGURE 114: EARTH INSULATION MONITORING RELAY KE3



POWERED-ON

NO ALARM



POWERED-ON

ALARM

FIGURE 115: EARTH INSULATION MONITORING RELAY LEDs

5) **GROUP 2 STATUS → the message can be one of the following:**

- **OK** = the group 2 of the medium intensity obstruction lights (*EOL-200-03/04*) are working properly: no alarm is detected in the corresponding lights (through the corresponding current monitoring relay KU2).
- **ALARM <** = the group 2 of the medium intensity obstruction lights (*EOL-200-03/04*) are not working properly: at least one alarm is detected in the corresponding lights (through the corresponding current monitoring relay KU2).
- **OFF** = the group 2 of the medium intensity obstruction lights (*EOL-200-03/04*) are switched-off.
- **N/A** = the module that collects the information about this component is not communicating properly with the CPU so the information about this component is not available.

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FIGURE 116: UNDERCURRENT MONITORING RELAY KU1

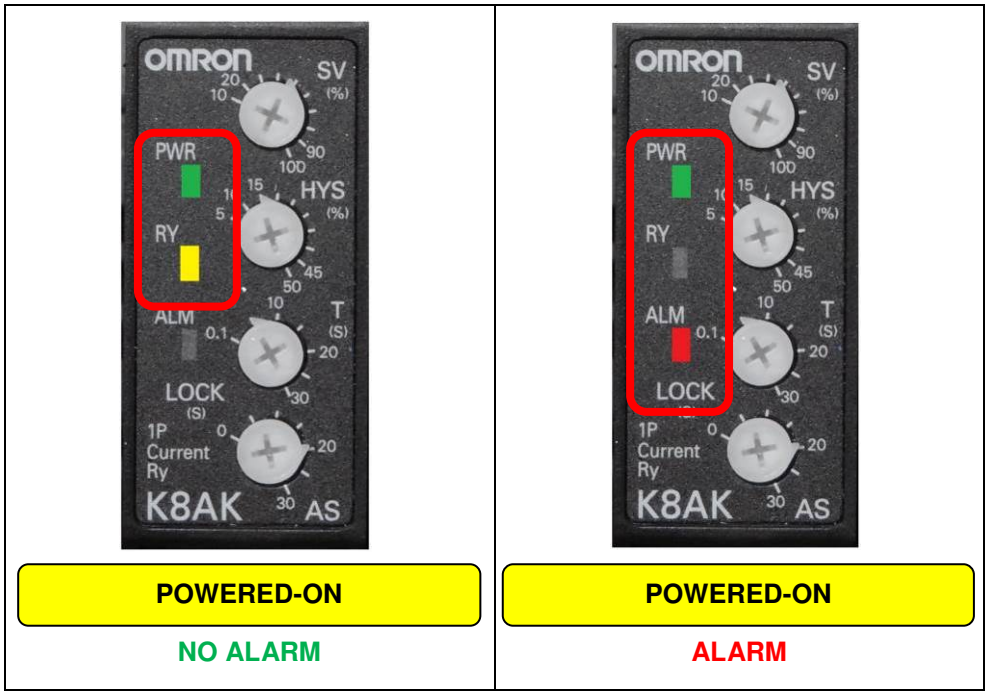


FIGURE 117: UNDERCURRENT MONITORING RELAY LEDs

	The LEDs on the undercurrent monitoring relays can signal alarm only when the lights are activated (obstruction lights activated) otherwise the relays are switched-off and no information can be shown by the LEDs.

6) **GROUP 2 SURGE ARR. STATUS → the message can be one of the following:**

- **OK** = no alarm is detected in the surge arrester (SA2) corresponding to group 2 of the medium intensity obstruction lights (*EOL-200-03/04*) power supply.
- **ALARM <** = at least one alarm is detected in the surge arrester (SA2) corresponding to the group 2 of the medium intensity obstruction lights (*EOL-200-03/04*) power supply
- **N/A** = the module that collects the information about this component is not communicating properly with the CPU so the information about this component is not available.

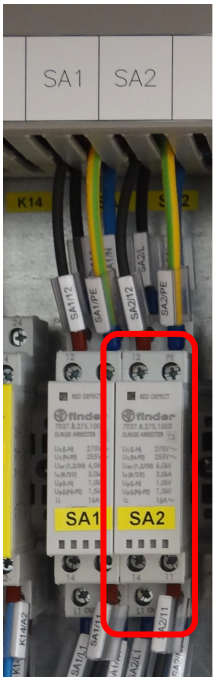


FIGURE 118: SURGE ARRESTERS SA2

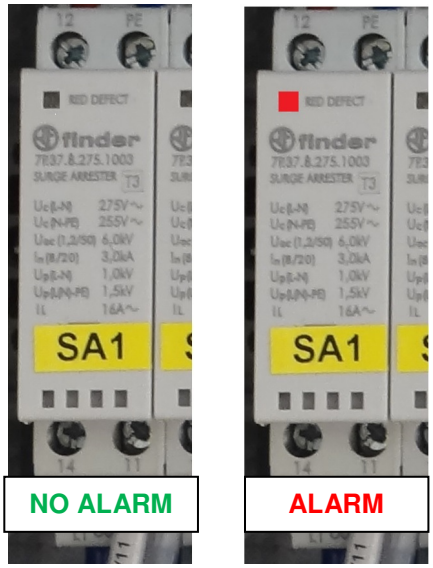


FIGURE 119: SURGE ARRESTER LED

7) **ACKN**: when a new alarm is detected by the control system, it is saved on the corresponding page until the alarm is not acknowledged. By pressing the push-button P3 on the page with one or more new alarms (blinking) all the new alarms are acknowledged.

⚠	The activation of the obstruction light groups is sequential. The sequential activation is used to minimize the total inrush current at power-on of the lights.

7.2.6.14 NAVAIDS BATTREY BANK PAGE (13/15)

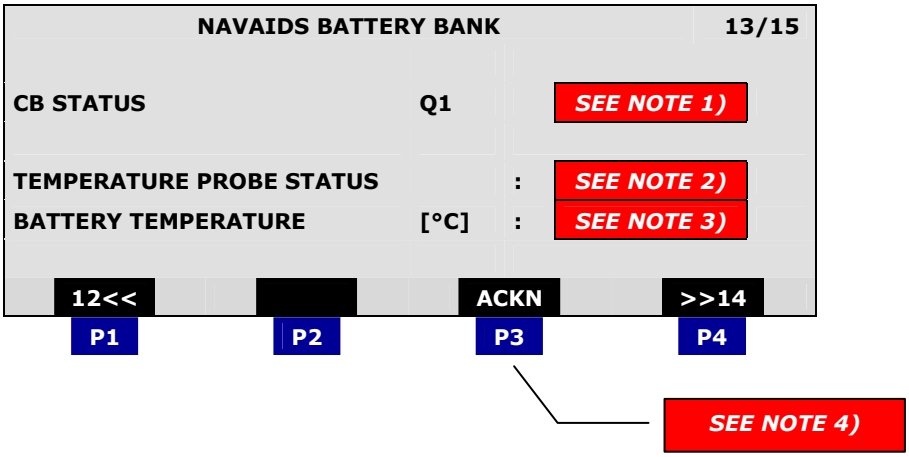


FIGURE 120: NAVAIDS BATTERY BANK PAGE ON LCD

1) **CB STATUS Q1→ the message can be one of the following:**
   - **OK** = the circuit breakers Q1 inside the NAVAIDS BATTERY BREAKER (*CB-200F2*) is closed.
   - **ALARM <** = the circuit breakers Q1 inside the NAVAIDS BATTERY BREAKER (*CB-200F2*) is open.
   - **N/A** = the module that collects the information about this component is not communicating properly with the CPU so the information about this component is not available.

2) **TEMPERATURE PROBE STATUS → the message can be one of the following:**
   - **OK** = no alarm is detected in the BATTERY TEMPERATURE PROBE (*ETM-200-01*).
   - **ALARM <** = an alarm is detected in the BATTERY TEMPERATURE PROBE (*ETM-200-01*). The defaul temperature, in this case, is 20°C.

3) **BATTERY TEMPERATURE [°C]** → the value corresponding to this message is the battery temperature value detected by the BATTERY TEMPERATURE PROBE (*ETM-200-01*)

4) **ACKN**: when a new alarm is detected by the control system, it is saved on the corresponding page until the alarm is not acknowledged. By pressing the push-button P3 on the page with one or more new alarms (blinking) all the new alarms are acknowledge

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7.2.6.15 CONTROL SYSTEM (1 OF 2) PAGE (14/15)

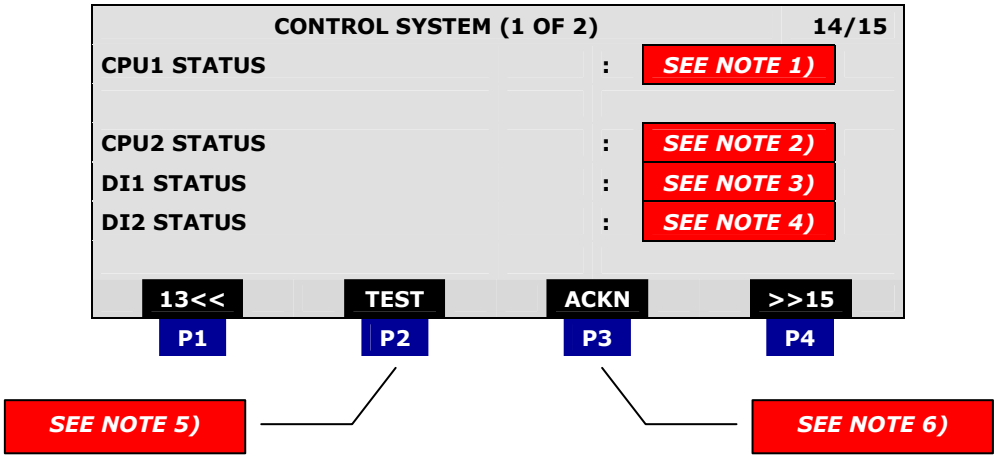


FIGURE 121: CONTROL SYSTEM (1 OF 2) PAGE ON LCD

1) **CPU1 STATUS → the message can be one of the following:**
   - **OK** = the CPU1 module is working properly: no alarm detected.
   - **ALARM <** = the CPU1 module is not working properly and/or it is not communicating with the frontal display panel (LCD1).

2) **CPU2 STATUS → the message can be one of the following:**
   - **OK** = the CPU2 module is working properly: no alarm detected.
   - **ALARM <** = the CPU2 module is not working properly and/or it is not communicating with the CPU1 module.
   - **N/A** = the CPU1 module is not communicating properly with the display panel.



FIGURE 122: CPU2 MODULE

3) **DI1 STATUS → the message can be one of the following:**
   - **OK** = the DI1 module is working properly: no alarm detected.
   - **ALARM <** = the DI1 module is not working properly and/or it is not communicating with the CPU1 module.
   - **N/A** = the CPU1 module is not communicating properly with the display panel.

4) **DI2 STATUS (BCP DI1) → the message can be one of the following:**
   - **OK** = the DI2 module is working properly: no alarm detected.
   - **ALARM <** = the DI2 module is not working properly and/or it is not communicating with the CPU1 module.
   - **N/A** = the CPU1 module is not communicating properly with the display panel.

5) **TEST**: by pressing the lamp test push-button (P2), the LEDs test is performed by the local display (all the frontal LEDs are switched-on). When the push-button is released, the lamp test ends and the LEDs take again their status depending on their meanings.

6) **ACKN**: when a new alarm is detected by the control system, it is saved on the corresponding page until the alarm is not acknowledged. By pressing the push-button P3 on the page with one or more new alarms (blinking) all the new alarms are acknowledged.

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7.2.6.16 CONTROL SYSTEM (2 OF 2) PAGE (15/15)

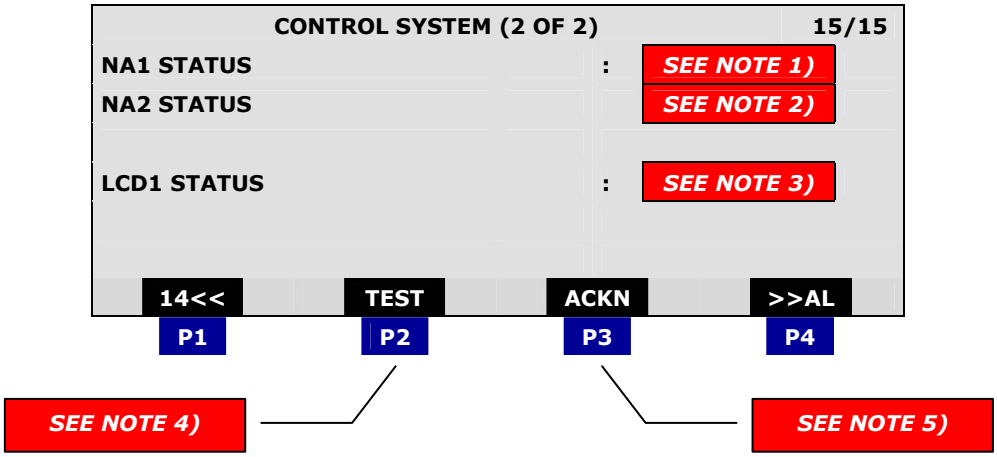


FIGURE 123: CONTROL SYSTEM (2 OF 2) PAGE ON LCD

1) **NA1 STATUS → the message can be one of the following:**
   - **OK** = the NA1 module is working properly: no alarm detected.
   - **ALARM <** = the NA1 module is not working properly and/or it is not communicating with the CPU1 module.
   - **N/A** = the CPU1 module is not communicating properly with the display panel.

2) **NA2 STATUS → the message can be one of the following:**
   - **OK** = the NA2 module is working properly: no alarm detected.
   - **ALARM <** = the NA2 module is not working properly and/or it is not communicating with the CPU1 module.
   - **N/A** = the CPU1 module is not communicating properly with the display panel.

3) **LCD1 STATUS → the message can be one of the following:**
   - **OK** = the LCD1 module is working properly: no alarm detected.
   - **ALARM <** = the LCD1 module is not working properly and/or it is not communicating with the CPU1 module.
   - **N/A** = the CPU1 module is not communicating properly with the display panel.

4) **TEST**: by pressing the lamp test push-button (P2), the LEDs test is performed by the local display (all the frontal LEDs are switched-on). When the push-button is released, the lamp test ends and the LEDs take again their status depending on their meanings.

5) **ACKN**: when a new alarm is detected by the control system, it is saved on the corresponding page until the alarm is not acknowledged. By pressing the push-button P3 on the page with one or more new alarms (blinking) all the new alarms are acknowledged.

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7.2.6.17 ALARM SUMMARY PAGE

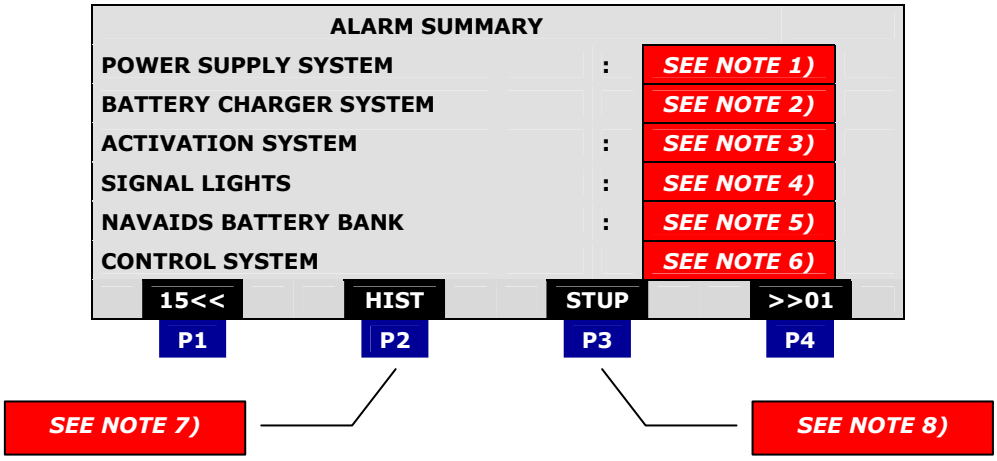


FIGURE 124: ALARM SUMMARY PAGE ON LCD

The alarm summary page contains a list complete with all the pages where may be indicated at least one alarm condition. In the line corresponding to each page indicated in this list, it is reported the message "**OK**" if there are no alarm conditions for the pages to which the line is referred to, or, on the contrary, the message "**ALARM**" if there are one or more alarm conditions in the corresponding pages. The information on the alarm summary is continuously updated depending on the presence or not of alarm conditions in each listed page. The alarm summary page is displayed automatically every time that a new alarm condition is detected by the supervisor system, and, at any new alarm condition, the red LED, called "GENERAL SYSTEM ALARM", on the local display panel, starts to flash together with the LED corresponding to the occurred alarm. The operator, drawn by these optical signaling, must check the causes of the alarms in the corresponding graphic page (by pressing the push-button P3 in the corresponding page: after this action the red LEDs stop flashing and remains in a steady 'ON' state) and take the corrective actions in order to restore the normal conditions. When no alarm conditions on the navaids system have been released any longer, the red LEDs will be automatically switched-off (only if the user has carried-out the acknowledgement of all the occurred alarms).

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1) **POWER SUPPLY SYSTEM → the message can be one of the following:**
   - **OK** = no alarm detected in the "POWER SUPPLY SYSTEM" pages.
   - **ALARM <** = at least one alarm detected in the "POWER SUPPLY SYSTEM" pages.

2) **BATTERY CHARGER SYSTEM → the message can be one of the following:**
   - **OK** = no alarm detected in the "BATTERY CHARGER SYSTEM" pages.
   - **ALARM <** = at least one alarm detected in the "BATTERY CHARGER SYSTEM" pages.

3) **ACTIVATION SYSTEM → the message can be one of the following:**
   - **OK** = no alarm detected in the "ACTIVATION SYSTEM" pages.
   - **ALARM <** = at least one alarm detected in the "ACTIVATION SYSTEM" pages.

4) **SIGNAL LIGHTS → the message can be one of the following:**
   - **OK** = no alarm detected in the "SIGNAL LIGHTS" pages.
   - **ALARM <** = at least one alarm detected in the "SIGNAL LIGHTS" pages.

5) **NAVAIDS BATTERY BANK → the message can be one of the following:**
   - **OK** = no alarm detected in the "NAVAIDS BATTERY BANK" page.
   - **ALARM <** = at least one alarm detected in the "NAVAIDS BATTERY BANK" page.

6) **CONTROL SYSTEM → the message can be one of the following:**
   - **OK** = no alarm detected in the "CONTROL SYSTEM" pages.
   - **ALARM <** = at least one alarm detected in the "CONTROL SYSTEM" pages.

7) **HIST**: by pressing the push-button P2 (HIST) when this page is shown on the display, the user can access the alarm history pages where the last 10 alarms that have occurred are listed in chronological order (see the "ALARM HISTORY" pages paragraph for further details).

8) **STUP**: by pressing the push-button P3 (STUP) when this page is shown on the display, the user can access the "STORED SETTINGS" pages where the different settable values are listed. In this page the operator can only read the settings (in order to modify these values, see the "ADJUSTABLE SETTINGS" pages paragraph).

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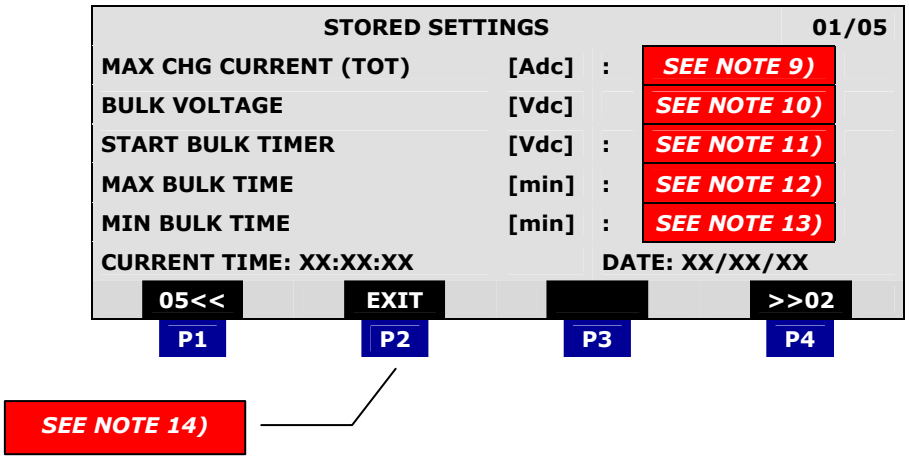


FIGURE 125: STORED SETTINGS (01/05) PAGE ON LCD

9) **MAX CHG CURRENT (TOT) [Adc]**: the message shows the maximum value of the total output current of the battery chargers.

10) **BULK VOLTAGE [Vdc]**: the message shows the battery voltage value above which occurs the transition from BULK step to ABS-MIN step.

11) **START BULK TIMER [Vdc]**: the message shows the battery voltage value above which occurs the transition from BULK-INI step to BULK-MIN step.

12) **MAX BULK TIME [min]**: the message shows the maximum duration of the BULK step.

13) **MIN BULK TIME [min]**: the message shows the duration of the BULK-MIN step.

14) **EXIT**: by pressing the push-button P2 when the “STORED SETTINGS” page is shown on the display, the operator can exit the settings pages.

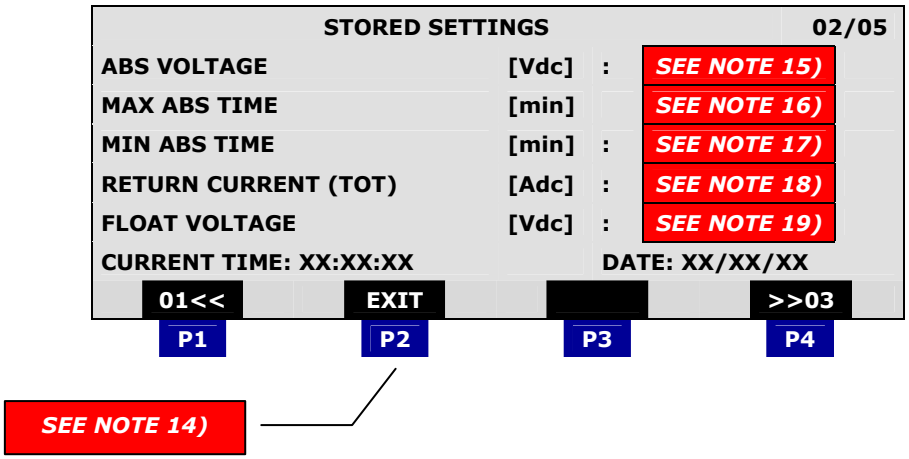


FIGURE 126: STORED SETTINGS (02/05) PAGE ON LCD

15) **ABS VOLTAGE [Vdc]**: the message shows the output voltage value of the battery chargers during the ABS-MIN and ABS step.

16) **MAX ABS TIME [min]**: the message shows the maximum duration of the ABS step.

17) **MIN ABS TIME [min]**: the message shows the duration of the ABS-MIN step.

18) **RETURN CURRENT (TOT) [Adc]**: the message shows the value of the total output current of the battery chargers below which occurs the transition from ABS step to FLOATING step.

19) **FLOAT VOLTAGE [Vdc]**: the message shows the output voltage value of the battery chargers during the FLOATING step.

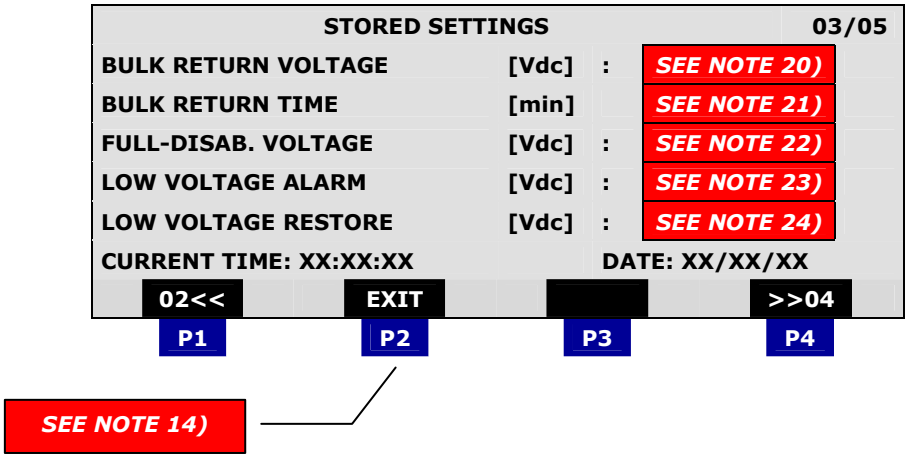


FIGURE 127: STORED SETTINGS (03/05) PAGE ON LCD

20) **BULK RETURN VOLTAGE [Vdc]**: the message shows the battery voltage value below which the system returns to the BULK-INI step (the battery voltage value must be below the BULK RETURN VOLTAGE for a time of BULK RETURN TIME).

21) **BULK RETURN TIME [min]**: the message shows the time for which the battery voltage value must be below the BULK RETURN VOLTAGE in order to return to the BULK-INI step.

22) **FULL-DISAB. VOLTAGE [Vdc]**: the message shows the output voltage value of the battery chargers when the full-charge is disabled.

23) **LOW VOLTAGE ALARM [Vdc]** → the value corresponding to this message is the LOW VOLTAGE ALARM threshold.

24) **LOW VOLTAGE RESTORE [Vdc]** → the value corresponding to this message is LOW VOLTAGE RESTORE threshold.

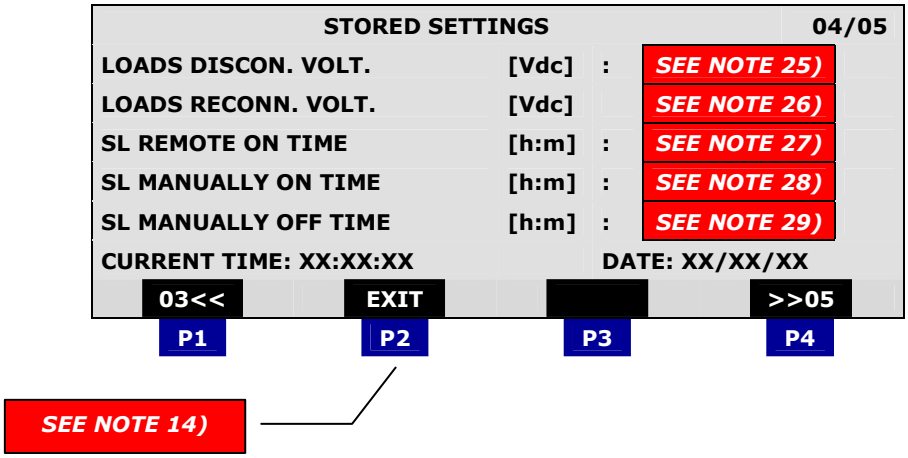


FIGURE 128: STORED SETTINGS (04/05) PAGE ON LCD

25) **LOADS DISCON. VOLT. [Vdc]** → the value corresponding to this message is LOADS DISCON. VOLTAGE threshold.

26) **LOADS RECONN. VOLT. [Vdc]** → the value corresponding to this message is the LOADS RECONN. VOLT. threshold.

27) **SL REMOTE ON TIME [h:m]** → when the status light is activated by the remote on/off command, it works at maximum for **SL REMOTE ON TIME**. If the mentioned remote command still requests the status light switched-on after this time is expired, the system forces the light to stay off. The only way to

switch-on again the status light is to provide the off remote command and then the on remote command (the timer starts again its counting in this way). While the manually-off command is given, this timer is stopped and it starts to count again when the manually-off command is expired/reset.

28) **SL MANUALLY ON TIME [h:m]** → when the manually on push button (P5) is pressed, the control system switch-on (forced-on) the status light for **SL MANUALLY ON TIME**.

29) **SL MANUALLY OFF TIME [h:m]** → when the manually off push button (P6) is pressed, the control system switch-off (forced-off) the status light for **SL MANUALLY OFF TIME**.

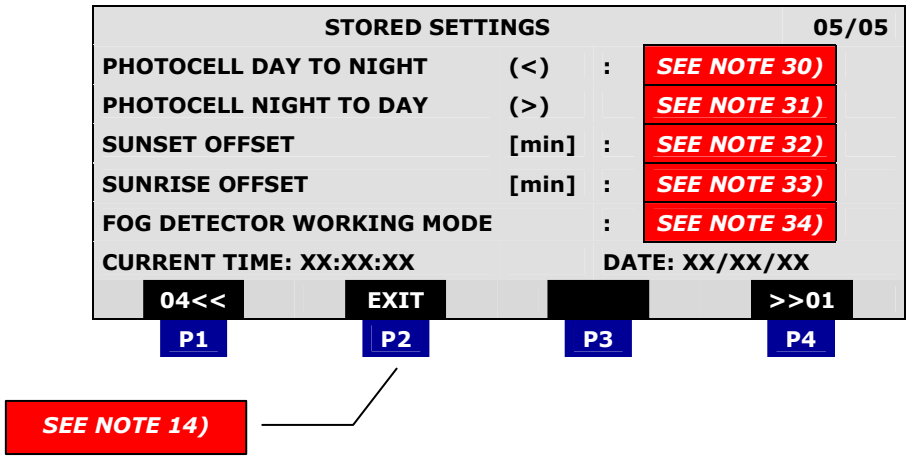


FIGURE 129: STORED SETTINGS (05/05) PAGE ON LCD

30) **PHOTOCELL DAY TO NIGHT (<)**: the message shows the photocell "day to night" threshold. When the ambient light measured by the photocell sensor drops below the set threshold (over a consecutive period of time of 60 seconds) the detection of the photocell sensor changes from DAY to NIGHT.

31) **PHOTOCELL NIGHT TO DAY (>)**: the message shows the photocell "night to day" threshold. When the ambient light measured by the photocell sensor rises above the set threshold (over a consecutive period of time of 60 seconds) the detection of the photocell sensor changes from NIGHT to DAY.

32) **SUNSET OFFSET [min]**: the message shows the sunset offset time in which the astronomical timer detection changes from DAY to NIGHT.

33) **SUNRISE OFFSET [min]**: the message shows the sunrise offset time in which the astronomical timer detection changes from NIGHT to DAY.

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34) **FOG DETECTOR WORKING MODE → the message can be one of the following:**

- **05/15m** = the visibility meter is switched-on by the control system for 5 minutes every quarter of an hour.
- **20/60m** = the visibility meter is switched-on by the control system for 20 minutes every hour.
- **STDY ON** = the visibility meter is always switched-on by the control system.

7.2.6.18 ALARM HISTORY PAGES

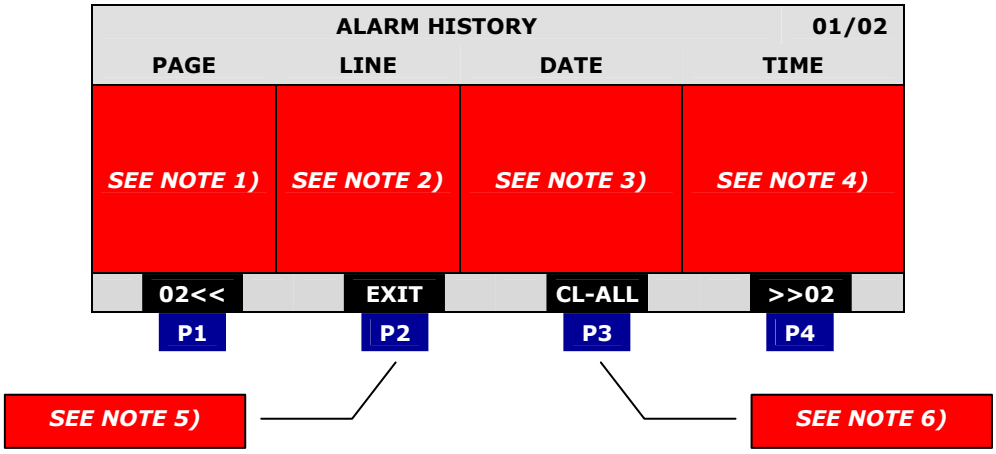


FIGURE 130: ALARM HISTORY (01/02) PAGE ON LCD

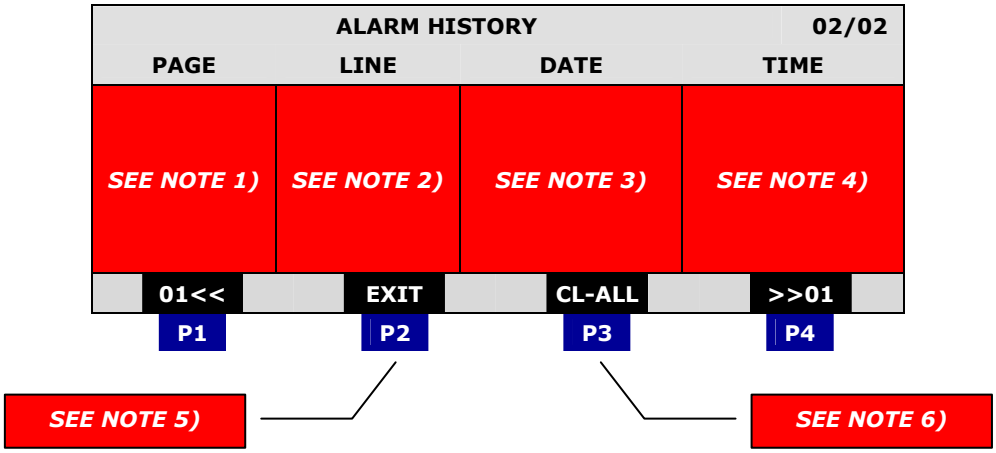


FIGURE 131: ALARM HISTORY (02/02) PAGE ON LCD

The alarm history pages contain a list complete with the last ten occurred alarms.

1) **PAGE** : the message shows the page corresponding to the occurred alarm.

2) **LINE** : the message shows the line of the page corresponding to the occurred alarm.

3) **DATE** : the message shows the date on which the alarm occurred.

4) **TIME** : the message shows the time on which the alarm occurred.

5) **EXIT**: by pressing the push-button P2 when the “ALARM HISTORY” page is shown on the display, the operator can exit the alarm history pages.

6) **CL-ALL**: by pressing the “CL-ALL” push-button (P3), the alarm history list will be cleared.

7.2.6.19 ADJUSTABLE SETTINGS PAGES

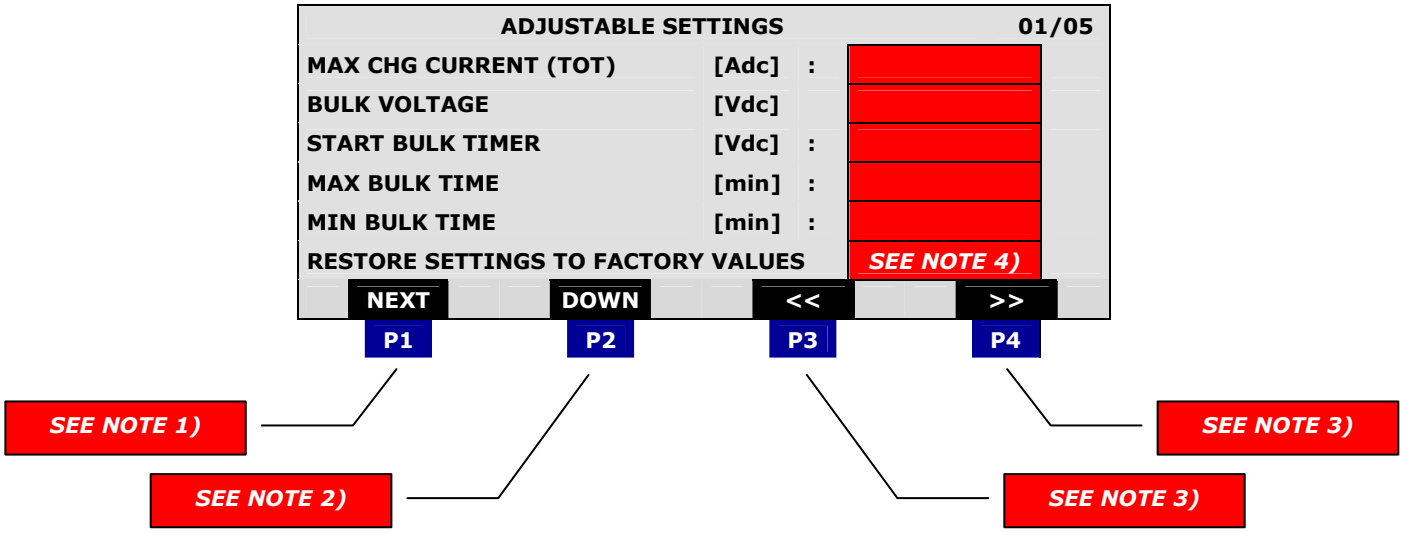


FIGURE 132: ADJUSTABLE SETTINGS (01/05) PAGE ON LCD

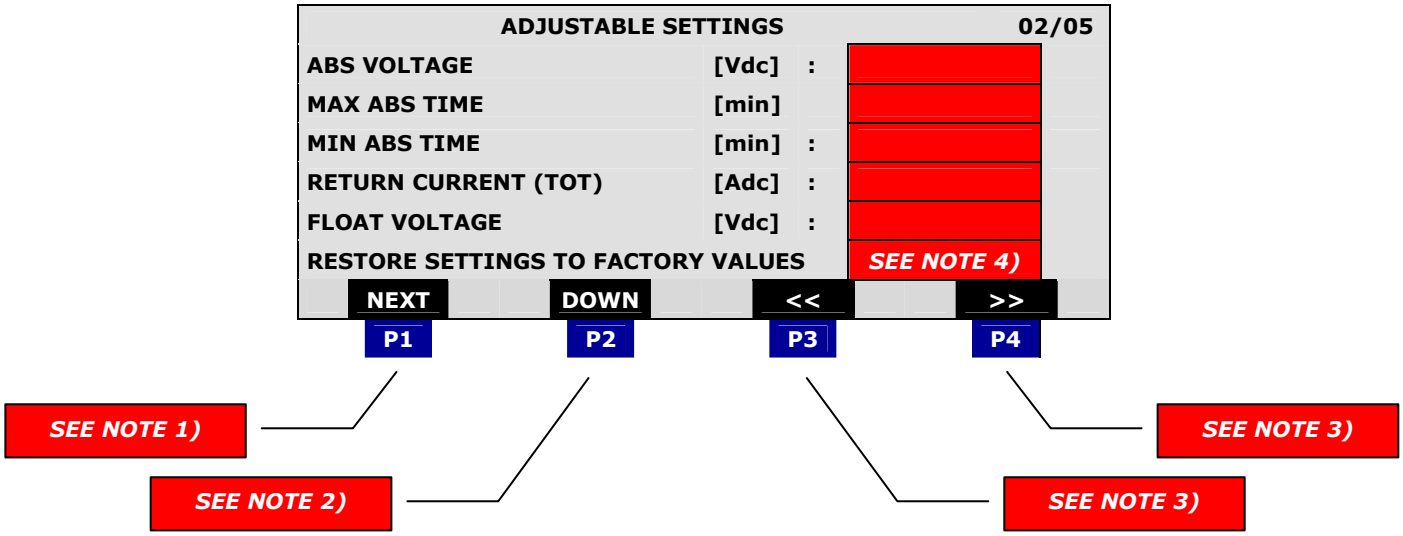


FIGURE 133: ADJUSTABLE SETTINGS (02/05) PAGE ON LCD

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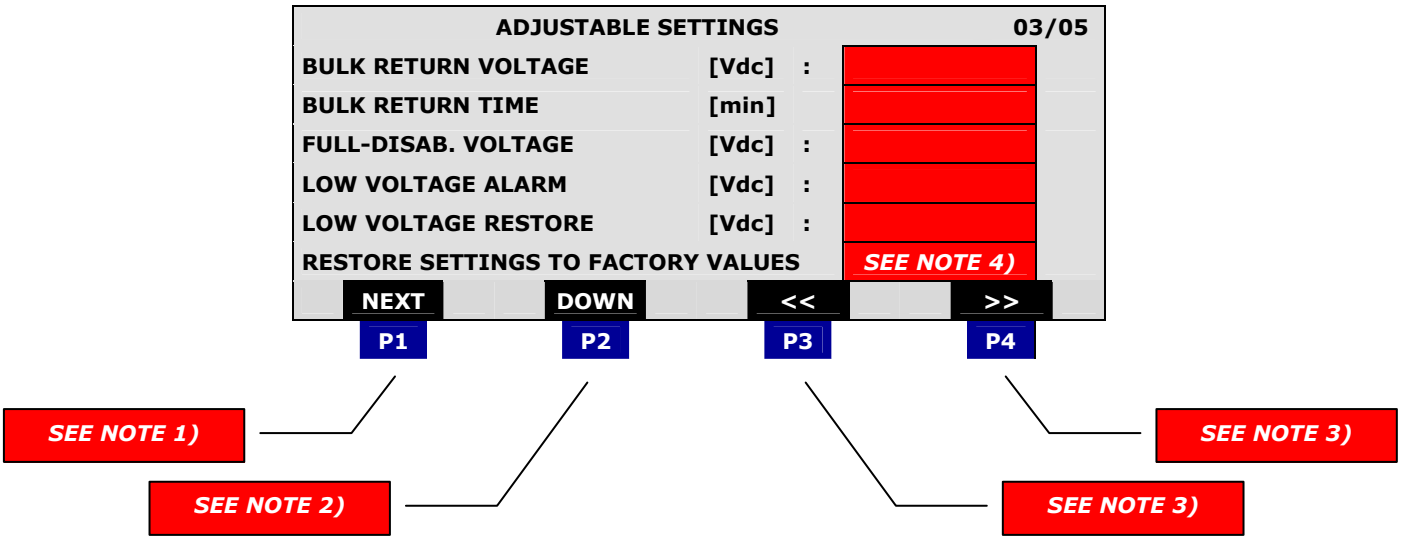


FIGURE 134: ADJUSTABLE SETTINGS (03/05) PAGE ON LCD

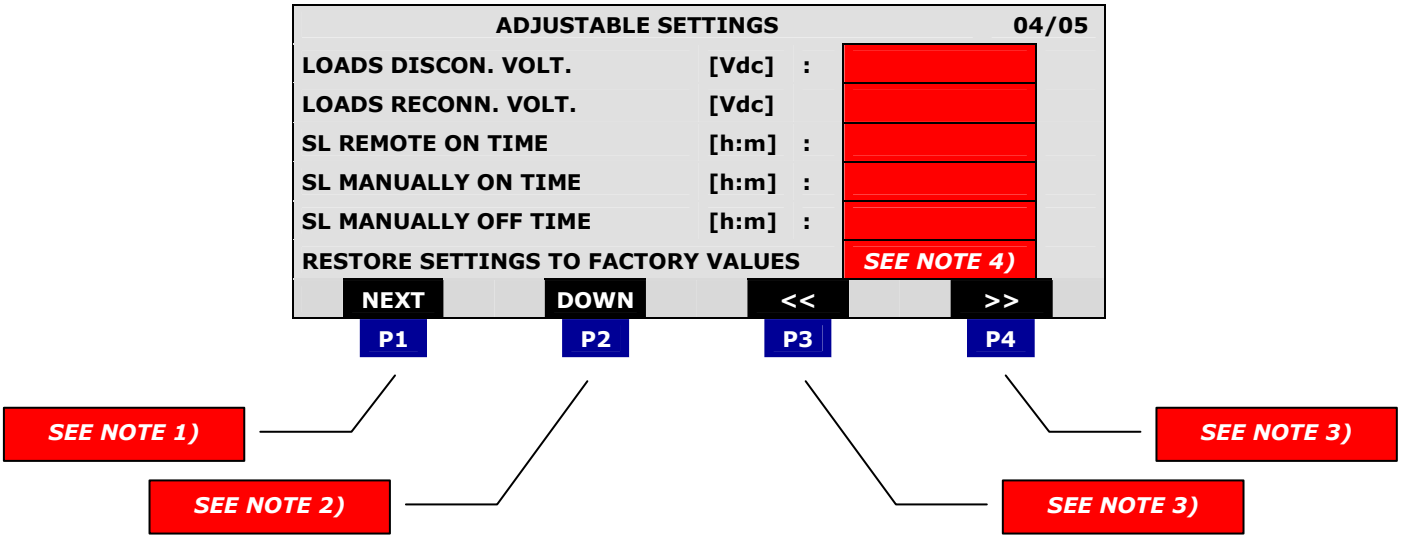


FIGURE 135: ADJUSTABLE SETTINGS (04/05) PAGE ON LCD

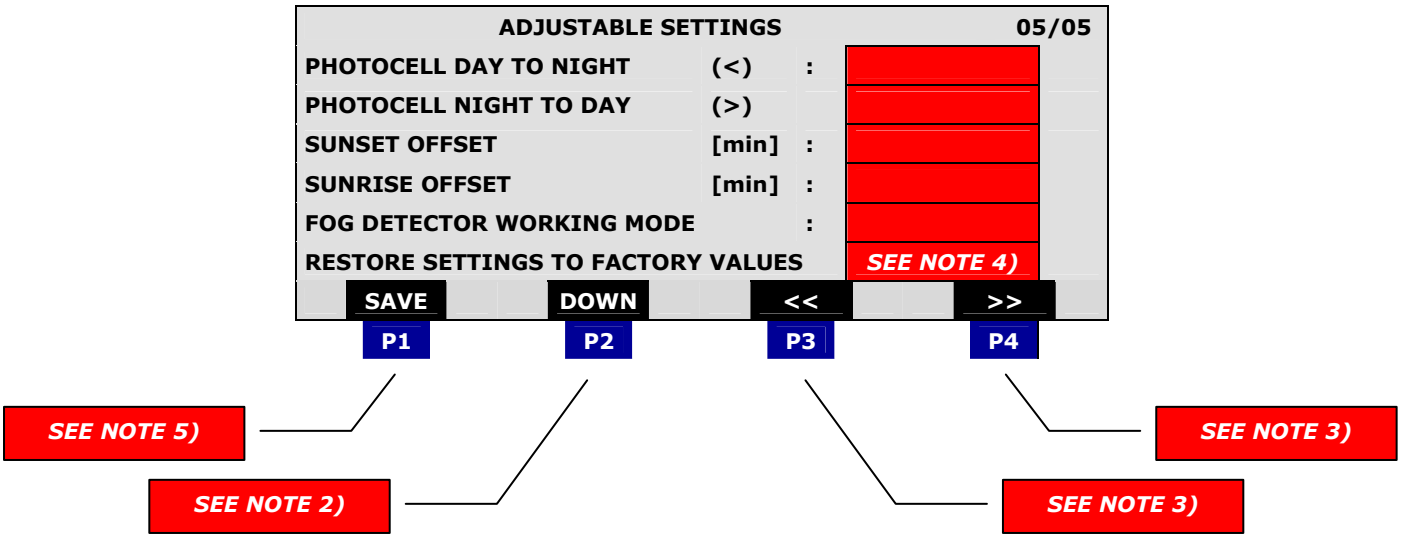


FIGURE 136: ADJUSTABLE SETTINGS (05/05) PAGE ON LCD

1) **NEXT**: by pressing the push-button P1, the operator can exit this page and enter in the next page.

2) **DOWN**: by pressing the push-button P2, the operator will be able to move the cursor across the page cyclically, from the top downwards, and in this way to scan the rows one by one.

3) << / >> : by pressing the push-button P3 (resp. P4), it is possible to decrease (resp. increase) the setting value that actually has the focus (i.e. on the row indicated by the cursor) and whose meaning is given above.

4) **RESTORE SETTINGS TO FACTORY VALUES**: by pressing the push-button P3 or P4 when this message is selected, the above listed values are restored to the "factory" default values:

- ✓ MAX CHG CURRENT (TOT) = 50.0 Adc
- ✓ BULK VOLTAGE = 28.8 Vdc
- ✓ START BULK TIMER = 28.0 Vdc
- ✓ MAX BULK TIME = 600 min
- ✓ MIN BULK TIME = 5 min
- ✓ ABS VOLTAGE = 28.8 Vdc
- ✓ MAX ABS TIME = 600 min
- ✓ MIN ABS TIME = 5 min
- ✓ RETURN CURRENT (TOT) = 10.0 Adc
- ✓ FLOAT VOLTAGE = 27.0 Vdc
- ✓ BULK RETURN VOLTAGE = 25.2 Vdc

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- ✓ BULK RETURN TIME = 5 min
- ✓ FULL-DISAB. VOLTAGE = 27.0 Vdc
- ✓ LOW VOLTAGE ALARM = 22.5 Vdc
- ✓ LOW VOLTAGE RESTORE = 25.0 Vdc
- ✓ LOADS DISCON. VOLT. = 22.0 Vdc
- ✓ LOADS RECONN. VOLT. = 24.0 Vdc
- ✓ SL REMOTE ON TIME = 6 h
- ✓ SL MANUALLY ON TIME = 30 min
- ✓ SL MANUALLY OFF TIME = 30 min
- ✓ PHOTOCELL DAY TO NIGHT = 2500
- ✓ PHOTOCELL NIGHT TO DAY = 2800
- ✓ SUNSET OFFSET = -15 min
- ✓ SUNRISE OFFSET = +15 min
- ✓ FOG DETECTOR WORKING MODE = STDY ON

5) **SAVE**: by pressing the push-button P1 on the “ADJUSTABLE SETTINGS (05/05)” page, the operator can exit this page saving/storing all the new data. Only if the operator presses the P1 push-button in the last page (“ADJUSTABLE SETTINGS (05/05)” page) all the modified data will be saved, otherwise they will be lost. Do not reset or switch-off the display before the saving, otherwise all the modified data will be lost.



WARNING!
After pressing the SAVE push-button (P1) in the last of the “ADJUSTABLE SETTINGS” pages, it is displayed on the LCD, for a while, the following warning for the user:
“DON’T SWITCH-OFF OR RESET THE DISPLAY OTHERWISE NEW DATA WILL BE LOST. PLEASE WAIT WHILE SAVING NEW DATA ON EEPROM”



WARNING!
Only authorized and qualified personnel can modify the settings values described above. The modification of these values can lead the system to malfunctioning.



The procedure to enable the user to modify the settings values is the following:

1) Reset the display panel by pushing for 2 seconds the RESET push-button located on the printed circuit board or by opening and closing the control system circuit breaker or by pushing at the same time the four push-buttons of the display panel (P1/P2/P3/P4).

2) While the “starting-up” page is shown on the display press and keep pressed the push-button P2.

3) The “ADJUSTABLE SETTINGS (01/05)” page is shown with all the functions associated to the push-button activated.

4) Modify the values by using the push-buttons P2 / P3 / P4.

5) In order to exit the page and enter in the next pages press the P1 (NEXT) push-button.

6) Modify the values by using the push-buttons P2 / P3 / P4.

7) Save all the new modified values by pressing the push-button P1 (SAVE) on the page “ADJUSTABLE SETTINGS (05/05)”. If you reset the display panel or switch it off before pressing the SAVE push-button (P1) on the page “ADJUSTABLE SETTINGS (05/05)”, all the new settings will be lost.

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7.2.6.20 DATE/TIME SETTINGS PAGE

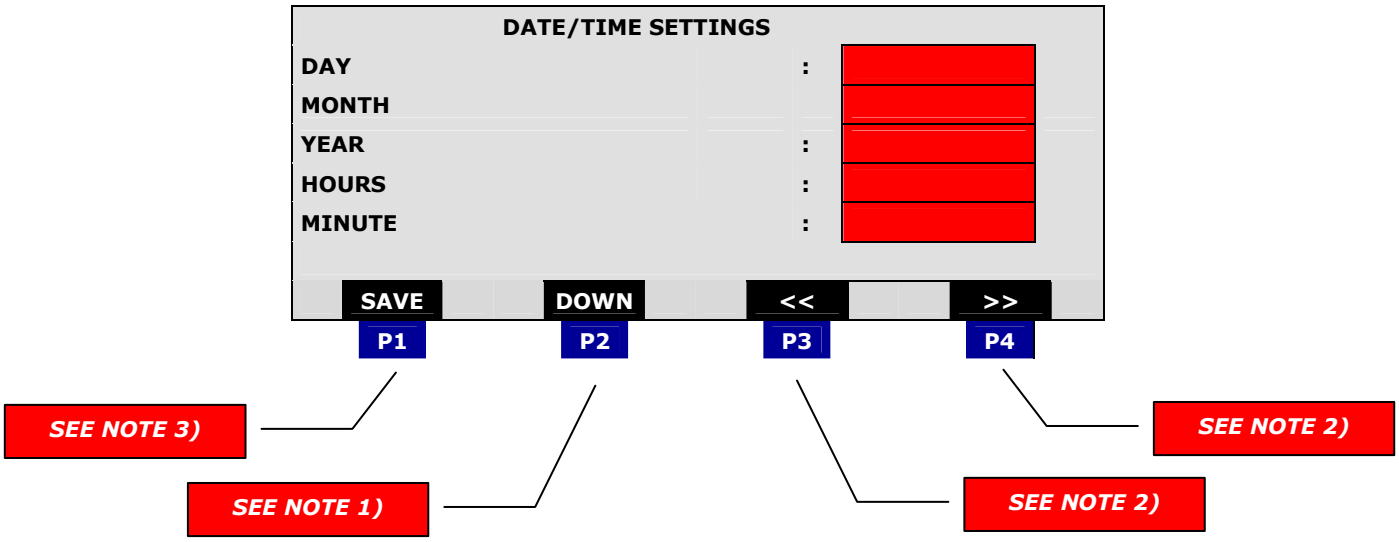


FIGURE 137: DATE/TIME SETTING PAGE ON LCD

1) **DOWN**: by pressing the push-button P2 on this page, the operator will be able to move the cursor across the page cyclically, from the top downwards, and in this way to scan the rows one by one.

2) **<</>>**: by pressing the push-button P3 (resp. P4) on this page, it is possible to increase (resp. decrease) the value that actually has the focus (i.e. on the row indicated by the cursor).

3) **SAVE**: by pressing the push-button P1 on this page, the operator can exit the data/time settings page saving the new data.

	Only authorized and qualified personnel can modify the date/time settings.



The procedure to enable the user to modify the date/time settings is the following:

1) Reset the display panel by pushing for 2 seconds the RESET push-button located on the printed circuit board or by opening and closing the control system circuit breaker or by pushing at the same time the four push-buttons of the display panel (P1/P2/P3/P4).

2) While the “starting-up” page is shown on the display press and keep pressed the push-button P1

3) The “DATE/TIME SETTINGS” page is shown with all the functions associated to the push-buttons activated.

4) Modify the values by using the push-buttons P2 / P3 / P4.

5) Save the new values by pushing the push-button P1 (SAVE). If you reset the display panel or switch it off before pushing the SAVE push-button the new settings are lost.



After the replacement of the back-up battery of the CPU1 of the control system, it is necessary to set again the date/time values.

7.2.6.21 DESCRIPTION OF L.E.D. ON LOCAL DISPLAY PANEL

The display panel contains the display 240x64 LCD, on which are shown the pages above described, and the signaling l.e.d.'s below described.

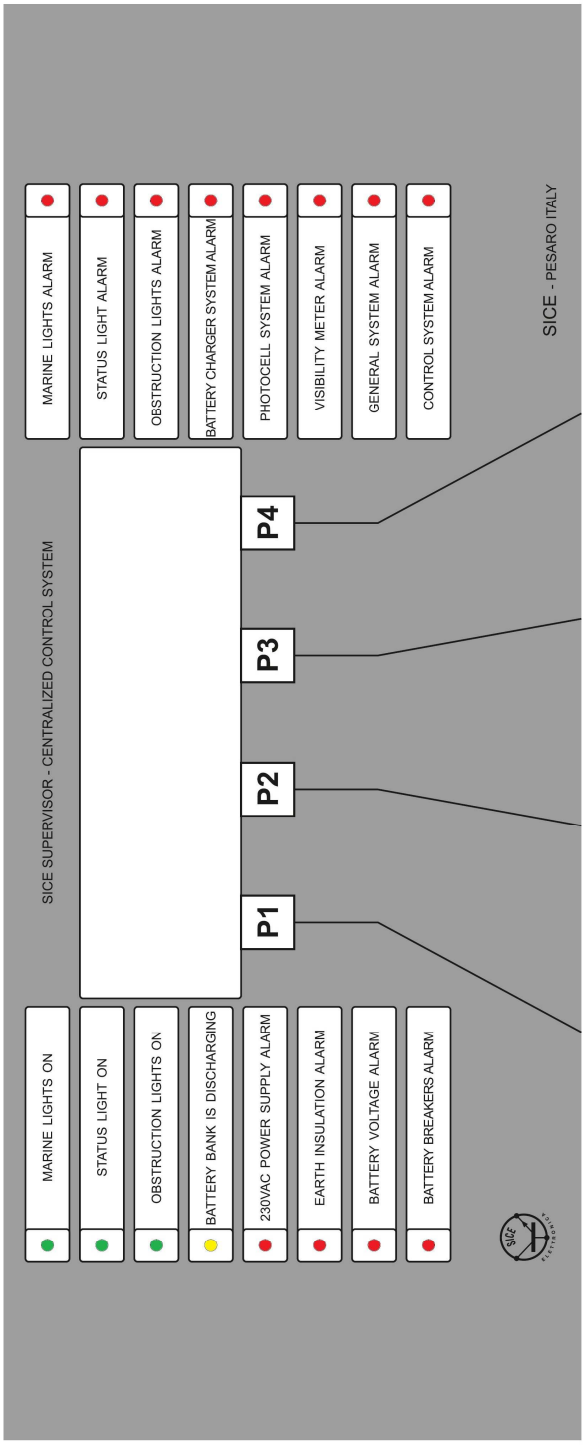


FIGURE 138: LOCAL DISPLAY PANEL

The information corresponding to the frontal l.e.d.'s is the following:

1. MARINE LIGHTS ON

- **ON**: when lit-on, this green l.e.d. informs the user that the MARINE LIGHTS are switched-on.
- **OFF**: when switched-off, this l.e.d. informs the user that the MARINE LIGHTS are switched-off.

2. STATUS LIGHT ON

- **ON**: when lit-on, this green l.e.d. informs the user that the STATUS LIGHT is switched-on.
- **OFF**: when switched-off, this l.e.d. informs the user that the STATUS LIGHT is switched-off.

3. OBSTRUCTION LIGHTS ON

- **ON**: when lit-on, this green l.e.d. informs the user that the OBSTRUCTION LIGHTS are switched-on.
- **OFF**: when switched-off, this l.e.d. informs the user that the OBSTRUCTION LIGHTS are switched-off.

4. BATTERY BANK IS DISCHARGING

- **ON**: when lit-on, this yellow l.e.d. informs the user that the BATTERY BANK is discharging.
- **OFF**: when switched-off, this l.e.d. informs the user that the BATTERY BANK is not discharging.

5. 230VAC POWER SUPPLY ALARM

- **ON**: when lit-on, this red l.e.d. informs the user that the 230VAC POWER SUPPLY ALARM is detected by the control system and this alarm condition has been already acknowledged by the user.
- **FLASHING**: when flashing, this l.e.d. informs the user that the 230VAC POWER SUPPLY ALARM has been detected by the control system and the user has still to acknowledge it.
- **OFF**: when switched-off, this l.e.d. informs the user that no 230VAC POWER SUPPLY ALARM is detected by the control system.

6. EARTH INSULATION ALARM

- **ON**: when lit-on, this red l.e.d. informs the user that the EARTH INSULATION ALARM is detected by the control system and this alarm condition has been already acknowledged by the user.

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- **FLASHING**: when flashing, this l.e.d. informs the user that the EARTH INSULATION ALARM has been detected by the control system and the user has still to acknowledge it.
- **OFF**: when switched-off, this l.e.d. informs the user that no EARTH INSULATION ALARM is detected by the control system.

7. BATTERY VOLTAGE ALARM

- **ON**: when lit-on, this red l.e.d. informs the user that the BATTERY VOLTAGE ALARM is detected by the control system and this alarm condition has been already acknowledged by the user.
- **FLASHING**: when flashing, this l.e.d. informs the user that the BATTERY VOLTAGE ALARM has been detected by the control system and the user has still to acknowledge it.
- **OFF**: when switched-off, this l.e.d. informs the user that no BATTERY VOLTAGE ALARM is detected by the control system.

8. BATTERY BREAKERS ALARM

- **ON**: when lit-on, this red l.e.d. informs the user that the BATTERY BREAKERS ALARM is detected by the control system and this alarm condition has been already acknowledged by the user.
- **FLASHING**: when flashing, this l.e.d. informs the user that the BATTERY BREAKERS ALARM has been detected by the control system and the user has still to acknowledge it.
- **OFF**: when switched-off, this l.e.d. informs the user that no BATTERY BREAKERS ALARM is detected by the control system.

9. MARINE LIGHTS ALARM

- **ON**: when lit-on, this red l.e.d. informs the user that the MARINE LIGHTS ALARM is detected by the control system and this alarm condition has been already acknowledged by the user.
- **FLASHING**: when flashing, this l.e.d. informs the user that the MARINE LIGHTS ALARM has been detected by the control system and the user has still to acknowledge it.
- **OFF**: when switched-off, this l.e.d. informs the user that no MARINE LIGHTS ALARM is detected by the control system.

10. STATUS LIGHT ALARM

- **ON**: when lit-on, this red l.e.d. informs the user that the STATUS LIGHT ALARM is detected by the control system and this alarm condition has been already acknowledged by the user.

- **FLASHING**: when flashing, this l.e.d. informs the user that the STATUS LIGHT ALARM has been detected by the control system and the user has still to acknowledge it.
- **OFF**: when switched-off, this l.e.d. informs the user that no STATUS LIGHT ALARM is detected by the control system.

11. OBSTRUCTION LIGHTS ALARM

- **ON**: when lit-on, this red l.e.d. informs the user that the OBSTRUCTION LIGHTS ALARM is detected by the control system and this alarm condition has been already acknowledged by the user.
- **FLASHING**: when flashing, this l.e.d. informs the user that the OBSTRUCTION LIGHTS ALARM has been detected by the control system and the user has still to acknowledge it.
- **OFF**: when switched-off, this l.e.d. informs the user that no OBSTRUCTION LIGHTS ALARM is detected by the control system.

12. BATTERY CHARGER SYSTEM ALARM

- **ON**: when lit-on, this red l.e.d. informs the user that the BATTERY CHARGER SYSTEM ALARM is detected by the control system and this alarm condition has been already acknowledged by the user.
- **FLASHING**: when flashing, this l.e.d. informs the user that the BATTERY CHARGER SYSTEM ALARM has been detected by the control system and the user has still to acknowledge it.
- **OFF**: when switched-off, this l.e.d. informs the user that no BATTERY CHARGER SYSTEM ALARM is detected by the control system.

13. PHOTOCELL SYSTEM ALARM

- **ON**: when lit-on, this red l.e.d. informs the user that the PHOTOCELL SYSTEM ALARM is detected by the control system and this alarm condition has been already acknowledged by the user.
- **FLASHING**: when flashing, this l.e.d. informs the user that the PHOTOCELL SYSTEM ALARM has been detected by the control system and the user has still to acknowledge it.
- **OFF**: when switched-off, this l.e.d. informs the user that no PHOTOCELL SYSTEM ALARM is detected by the control system.

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14. VISIBILITY METER ALARM

- **ON**: when lit-on, this red l.e.d. informs the user that the VISIBILITY METER ALARM is detected by the control system and this alarm condition has been already acknowledged by the user.
- **FLASHING**: when flashing, this l.e.d. informs the user that the VISIBILITY METER ALARM has been detected by the control system and the user has still to acknowledge it.
- **OFF**: when switched-off, this l.e.d. informs the user that no VISIBILITY METER ALARM is detected by the control system.

15. GENERAL SYSTEM ALARM

- **ON**: when lit-on, this red l.e.d. informs the user that at least one alarm condition is detected by the control system and this alarm condition has been already acknowledged by the user.
- **FLASHING**: when flashing, this l.e.d. informs the user that a new alarm has been detected by the control system and the user has still to acknowledge this new alarm.
- **OFF**: when switched-off, this l.e.d. informs the user that no alarm condition in the system is currently detected by the control system.

16. CONTROL SYSTEM ALARM

- **ON**: when lit-on, this red l.e.d. informs the user that the control system has at least one module that is not working properly and this alarm condition has been already acknowledged by the user.
- **FLASHING**: when flashing, this red l.e.d. informs the user that the control system has at least one module that is not working properly and the user has still to acknowledge it.
- **OFF**: when switched-off, this l.e.d. informs the user that all the modules, that compose the control system, are working properly.

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FIGURE 139: LOCAL DISPLAY PANEL ON NAVAIDS CENTRAL CONTROL PANEL

7.3 NAVAIDS BATTERY BREAKER (*CB-200F2*)

The NAVAIDS BATTERY BREAKER (*CB-200F2*) is connected between the NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*) and the NAVAIDS BATTERY BANK (*BA-200F2*) and it is used to disconnect manually (through a selector switch) or automatically (through an automatic circuit breaker) the two mentioned components.

7.3.1 PILOT LIGHT

On the cover of the enclosure are installed the following pilot lights:

- **H1 – NAVAIDS BATTERY BREAKER ALARM:** This red pilot light is switched-on when the circuit breaker Q1 (installed all inside the enclosure) is open.



FIGURE 140: PILOT LIGHT H1

7.3.2 EXTENDED ROTARY HANDLE

On the cover of the enclosure is installed the following extended rotary handle:

- **Q1 – NAVAIDS BATTERY CIRCUIT BREAKER:** it can be set on the following positions:
  - **0:** the navaids central control panel is disconnected from the navaids battery bank.
  - **1:** the navaids central control panel is connected to the navaids battery bank.

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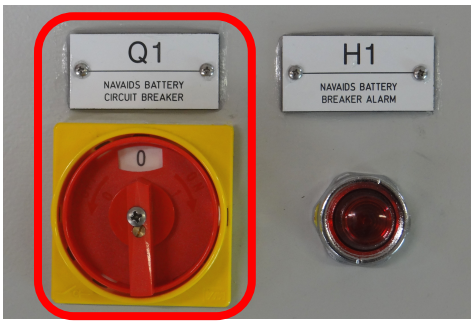


FIGURE 141: SELECTOR SWITCH S1

7.3.3 REMOTE CONTROL

The NAVAIDS BATTERY BREAKER (*CB-200F2*) provides to the NAVAIDS CENTRAL CONTROL PANEL *(NC-200F2A/B/C/BC-200F2A/B)* the following digital input (volt-free) which is used to remotely monitor the status of the NAVAIDS BATTERY BREAKER (*CB-200F2*):

1. **NAVAIDS BATTERY BREAKER SYSTEM ALARM:**

TO REMOTE VIA	STATUS		DESCRIPTION
HARD-WIRED (VOLT-FREE CONTACT)	Closed (= 1)	**OK**	No alarm is detected in the system.
	Open (= 0)	**ALARM**	At least one alarm is detcted in the system.

8.0 SETTINGS ON THE ADJUSTABLE COMPONENTS

8.1 UNDERCURRENT MONITORING RELAY SETTING

SICE provides the system with two undercurrent monitoring relays (KU1/KU2) already set according to the loads to be monitored. However, they may need to be set again, once the system is tested for the first time on site, in order to set definitively the thresholds available for each relay. The configurable parameters are the following:

1. **RELAY CONFIGURATION:** By acting on the dip-switches placed in the lower part of the component is possible to select if the relay has to signal the alarm condition in case the current is lower than a threshold ("UNDERCURRENT") or in case the current is higher than a threshold ("OVERCURRENT"). Furthermore is possible to choose if the contact has to remain in its position once the threshold is crossed ("MANUAL RESET") or if it doesn't retain any memory of its current status ("AUTOMATIC RESET"). Finally, the output contact of the relay can be normally closed or normally open. In this case, the relays are used for signaling an under-current condition through a normally closed contact without a memory so that, if any alarm condition return to a normal condition (the current is again in the expected range), then also the corresponding alarm signal is restored.
2. **CURRENT POTENTIOMETER (SV):** This potentiometer adjusts the undercurrent threshold (from 10% to 100% of the maximum settable range) under which the relay (when powered) signals an alarm condition.
3. **HYSTERESIS POTENTIOMETER (HYS):** Once the undercurrent alarm is signaled by the relay, only if the current value returns over the SV value plus the hysteresis value (from 5% to 50% of the operative value) then the alarm resets.
4. **OPERATIVE TIME POTENTIOMETER (T):** Only if the current value is lower than the set threshold (SV) for the time set with this potentiometer, then the alarm is signaled by the relay..
5. **START-UP DELAY POTENTIOMETER (LOCK):** The current relay cannot signal alarm until this time delay is expired after start-up (power-on).

	The adjustment of the undercurrent relays must be carried-out only by authorized personnel: if the current relay is not set properly, the load continues to work, when activated, but the corresponding alarm may be signaled (locally and remotely) even if the alarm is not present.

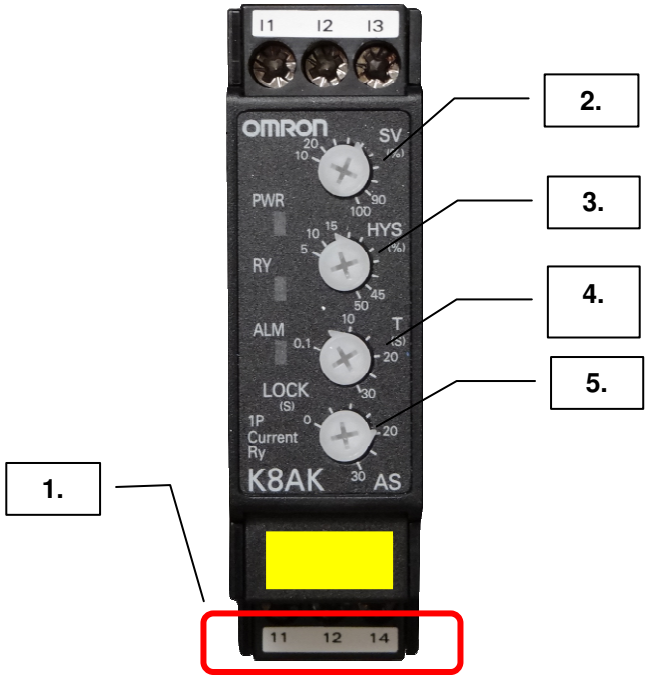


FIGURE 142: SETTAGGI DEL RELE' DI MONITORAGGIO DELLA CORRENTE

On each undercurrent monitoring relay are available three LEDs by which the user is able to understand which is the status of the current relay itself:

- **Green LED named "PWR"**: it shows the power supply status of the relay:
  - **ON** → the current relay is powered and working.
  - **OFF** → the current relay is not powered (light off).
- **Yellow LED named "RY"**: it shows the relay status:
  - **ON** → the current value is higher than the set threshold.
  - **OFF *(with the relay powered-on)*** → the current value is lower than the set threshold and the alarm is signaled through a volt-free contact.
- **Red LED named "ALM"**: it is the alarm indicator:
  - **ON** → the current value is lower than the set threshold and the alarm is signaled through a volt-free contact.
  - **OFF (*with the relay powered-on*)** → the current value is higher than the set threshold.
  - **FLASHING** → the relay is detecting a current lower than the set threshold but the delay time "T" is not expired yet.

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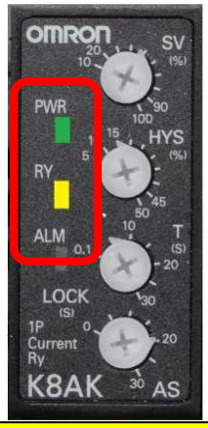
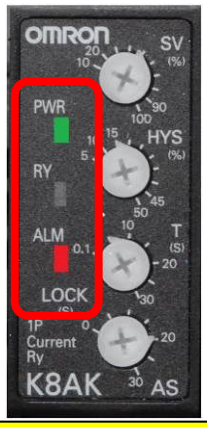
	
POWERED-ON **NO ALARM**	**POWERED-ON** **ALARM**
THE RELAY IS POWERED-ON AND IT IS DETECTING A CURRENT VALUE HIGHER THEN THE SET THRESHOLD.	**THE RELAY IS POWERED-ON AND IT IS DETECTING A CURRENT VALUE LOWER THAN THE SET THRESHOLD**

FIGURA 143: UNDERCURRENT MONITORING RELAY LEDs

⚠	SICE suggests to leave the undercurrent relay settings as set by SICE. If some adjustment is necessary please be careful. For any further information please refer to the Doc. No. DW-864-5 (Client Doc. No. 1724000775-EL-DG-00006) and the Doc. No. OM-776/DE SUB (Client Doc. No. 1724000775-EL-DS-00004).

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8.2 EARTH INSULATION MONITORING RELAY SETTING

SICE provides the system with three earth insulation monitoring relays (KE1/KE2/KE3) already set by SICE. The threshold of the each earth insulation monitoring relay can be set by rotating the black rotary knob shown in the following figure.

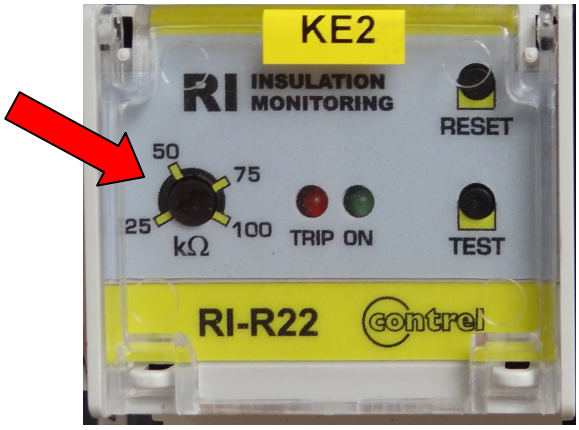


FIGURE 144: EARTH INSULATION MONITORING RELAY RI-R22 ROTARY KNOB

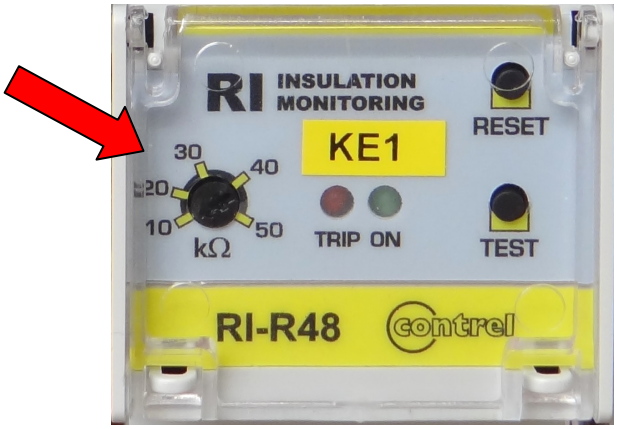


FIGURE 145: EARTH INSULATION MONITORING RELAY RI-R48 ROTARY KNOB

⚠	SICE suggest to leave the earth insulation monitoring relay settings as set by SICE: • Type RI-R22 (230Vac) = 25kΩ • Type RI-R48 (24Vdc) = 10kΩ If some adjustment is necessary please be careful. For any further information please refer to the Doc. No. DW-864-5 (Client Doc. No. 1724000775-EL-DG-00006) and the Doc. No. OM-776/DE SUB (Client Doc. No. 1724000775-EL-DS-00004).

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9.0 MAINTENANCE INSTRUCTIONS

9.1 NOTES ABOUT PROGRAMMED MAINTENANCE

	All the maintenance operations have to be carried out only by skilled personnel (system expert, electrician, electronic technician).
	All the works in the electrical plants must be carried out by qualified personnel, in compliance with Rules **EN 50110-1 (CEI 11-48) & CEI 11-27.**
	All the operations of maintenance/reparation on **ATEX** certified equipment must be carried out by authorized personnel, in conformity with European Rules **EN 60079-01.**
	For the safety of operators, and to avoid system damages, all the maintenance / repair operations have to be performed with the equipment not powered.
	For all maintenance operations see the “EQUIPMENT TECHNICAL DATA SHEET”. These documents include the maintenance sheets of the several pieces of equipment.
	During the below checks, and only where applicable, SICE suggest to switch-off the power supply of the equipment under maintenance in order to work with no voltage.



For any further information not specified here below, the user is requested to consult the sub-system manual corresponding to the equipment under maintenance.



WARNING

Use only original spare parts. If in doubt ask to SICE the information you need.

9.2 NAVAIDS CENTRAL CONTROL PANEL (*NC-200F2A/B/C/BC-200F2A/B*)

Frequency 12 months

Craft Electrical Technician

Required Men 1

Time required 60 minutes

Checks and actions:

- Verify the general status of the equipment (visual check).
- Verify the tightening of all interconnection cables (visual check).
- Verify the cable glands (visual check).
- Verify the status (visual check) of the equipment installed on the cover of the enclosures (i.e. push-buttons, selector switches, pilot lights and local display panel).
- Carry out an internal check of the enclosures (visual check).
- Check the status of all electric and electronic components (visual check).
- Check all wiring and cable connection tightening between components and terminal strips (visual check).
- Check the working of the automatic circuit breakers.
- Close again the enclosures (before closing the enclosures B and C apply a light layer of anti-seize grease to assure a better mechanical protection).



If it is necessary to replace the back-up battery of the CPU1 of the control system, after the replacement, the user has to set again the date/time values through the display panel.

In order to carry-out the maintenance or the replacement of any device of this equipment, please refer to the following document:

CLIENT DOC. NO	SICE DOC. NO	DOCUMENT DESCRIPTION
1724000775-EL-DS-00004	**OM-776/DE SUB**	**EQUIPMENT TECHNICAL DATA SHEET**

9.3 NAVAIDS BATTERY BREAKER (*CB-200F2*)

Frequency 12 months
Craft Electrical Technician
Required Men 1
Time required 30 minutes

Checks and actions:

- Verify the general status of the equipment (visual check).
- Verify the extended rotary handle and the pilot light installed on the enclosure cover (visual check).
- Verify the tightening of all interconnection cables (visual check).
- Verify the cable glands (visual check).
- Carry out an internal check of the enclosure (visual check).
- Check the status of all electric and electronic components (visual check).
- Check all wiring and cable connection tightening between components and terminal strip (visual check).
- Check the working of the automatic circuit breaker.
- Close the enclosure applying a light layer of anti-seize grease to assure a better mechanical protection.

In order to carry-out the maintenance or the replacement of any device of this equipment, please refer to the following document:

CLIENT DOC. NO	SICE DOC. NO	DOCUMENT DESCRIPTION
1724000775-EL-DS-00004	OM-776/DE SUB	EQUIPMENT TECHNICAL DATA SHEET

9.4 NAVAIDS BATTERY BANK (*BA-200F2*)

Frequency 12 months
Craft Electrical Technician
Required Men 1
Time required 30 minutes

Checks and actions:

- Verify the battery box status (visual check).
- Verify the tightening of all interconnection cables (visual check).
- Check the cable glands (visual check).
- Open the battery box and carry out an internal check (visual check).
- Verify the cleaning of the battery cells and surrounding area (visual check).
- Verify if signs of corrosion are present on the battery cells (visual check).
- Verify the cell integrity (visual check).
- Verify (visual check) that the ventilation holes of the battery box are free from obstacles that may reduce the air flow (clean if necessary).

In order to carry-out the maintenance or the replacement of any device of this equipment, please refer to the following document:

CLIENT DOC. NO	SICE DOC. NO	DOCUMENT DESCRIPTION
1724000775-EL-DS-00004	OM-776/DE SUB	EQUIPMENT TECHNICAL DATA SHEET

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9.5 BATTERY TEMPERATURE PROBE (*ETM-200-01*)

Frequency 12 months
Craft Electrical Technician
Required Men 1
Time required 10 minutes

Checks and actions:

- Verify the general status of the equipment (visual check).
- Verify the tightening of all the interconnection cables (visual check).
- Verify the cable gland (visual check).
- Carry out an internal check opening the temperature probe (visual check).
- Close the temperature probe applying a light layer of anti-seize grease to assure a better mechanical protection.
- Check the equipment working (when switched-on).

In order to carry-out the maintenance or the replacement of any device of this equipment, please refer to the following document:

CLIENT DOC. NO	SICE DOC. NO	DOCUMENT DESCRIPTION
1724000775-EL-DS-00004	OM-776/DE SUB	EQUIPMENT TECHNICAL DATA SHEET

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9.6 MAIN MARINE YELLOW LIGHTS (*EML-200-01/02*)

Frequency 12 months
Craft Electrical Technician
Required Men 1
Time required 10 minutes/each

Checks and actions:

- Verify the general status of the equipment (visual check).
- Verify the cable glands at each light junction box (visual check).
- Verify the tightening of all interconnection cables (visual check).
- Verify the interconnection cables in the light junction box (visual check).
- Carry out the external cleaning of the glass with a freshwater and a soft cloth.
- Close again the junction box by applying a light layer of anti-seize grease to assure a better mechanical protection.
- Check the equipment working (when switched-on):
  - Verify that each marine lantern is flashing the programmed Morse code and no alarm is raised by the coders (no red led lit-on).
  - Check the synchronization of the marine lanterns (the marine lanterns must flash synchronized together when activated).



WARNING
In case of presence of humidity inside the light, remove the glass dome as described in the corresponding sub-system manual, dry it and then carefully close it again. Carry out this operations with a suitable environmental conditions.

In order to carry-out the maintenance or the replacement of any device of this equipment, please refer to the following document:

CLIENT DOC. NO	SICE DOC. NO	DOCUMENT DESCRIPTION
1724000775-EL-DS-00004	OM-776/DE SUB	EQUIPMENT TECHNICAL DATA SHEET

9.7 BOAT LANDING STATUS LIGHT (*ESL-200-01*)

Frequency 12 months
Craft Electrical Technician
Required Men 1
Time required 10 minutes

Checks and actions:

- Verify the general status of the equipment (visual check).
- Verify the cable glands at each light junction box (visual check).
- Verify the tightening of all interconnection cables (visual check).
- Verify the interconnection cables in the light junction box (visual check).
- Carry out the external cleaning of the glass with a freshwater and a soft cloth.
- Close again the junction box by applying a light layer of anti-seize grease to assure a better mechanical protection.
- Check the equipment working (when switched-on):
  - Verify that the status light is flashing the programmed code and no alarm is raised by the coder (no red led lit-on).



WARNING
In case of presence of humidity inside the light, remove the glass dome as described in the corresponding sub-system manual, dry it and then carefully close it again. Carry out this operations with a suitable environmental conditions.

In order to carry-out the maintenance or the replacement of any device of this equipment, please refer to the following document:

CLIENT DOC. NO	SICE DOC. NO	DOCUMENT DESCRIPTION
1724000775-EL-DS-00004	OM-776/DE SUB	EQUIPMENT TECHNICAL DATA SHEET

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9.8 MEDIUM INTENSITY AOL (*EOL-200-01/02/03/04*)

Frequency	12 months
Craft	Electrical Technician
Required Men	1
Time required	10 minutes/each

Checks and actions:

- Verify the general status of the equipment (visual check).
- Verify the cable glands at each light junction box (visual check).
- Verify the tightening of all interconnection cables (visual check).
- Verify the interconnection cables in the light junction box (visual check).
- Carry out the external cleaning of the glass with a freshwater and a soft cloth.
- Close again the junction box by applying a light layer of anti-seize grease to assure a better mechanical protection.
- Check the equipment working (when switched-on).



WARNING

In case of presence of humidity inside the light, remove the glass dome as described in the corresponding sub-system manual, dry it and then carefully close it again. Carry out this operations with a suitable environmental conditions.

In order to carry-out the maintenance or the replacement of any device of this equipment, please refer to the following document:

CLIENT DOC. NO	SICE DOC. NO	DOCUMENT DESCRIPTION
1724000775-EL-DS-00004	**OM-776/DE SUB**	**EQUIPMENT TECHNICAL DATA SHEET**

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9.9 PHOTOCELL SYSTEM (*EPH-200-01*)

Frequency 12 months
Craft Electrical Technician
Required Men 1
Time required 10 minutes

Checks and actions:

- Verify the general status of the equipment (visual check).
- Verify the cable gland (visual check).
- Verify the tightening of all interconnection cables (visual check).
- Carry out an internal check of the enclosure (visual check).
- Check all wiring and cable connection tightening between components and terminal strip (visual check).
- Clean the glass of the photocell sensor with a freshwater and a soft cloth.
- Clean the glass of the enclosure with a freshwater and a soft cloth.
- Close again the junction box by greasing the cover thread with a light layer of anti-seize grease.
- Check the equipment working (by simulating day/night conditions).

In order to carry-out the maintenance or the replacement of any device of this equipment, please refer to the following document:

CLIENT DOC. NO	SICE DOC. NO	DOCUMENT DESCRIPTION
1724000775-EL-DS-00004	OM-776/DE SUB	EQUIPMENT TECHNICAL DATA SHEET

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9.10 VISIBILITY METER (*EVM-200-01*)

Frequency	12 months
Craft	Electrical Technician
Required Men	1
Time required	10 minutes

Checks and actions:

- Verify the general status of the equipment (visual check).
- Verify the cable gland (visual check).
- Verify the tightening of all interconnection cables (visual check).
- Open the junction box and carry out an internal check of the enclosure (visual check).
- Check all wiring and cable connection tightening between components and terminal strip (visual check).
- Verify the cleanliness of both the lenses and clean them if necessary (only the glass outside).
- Check the equipment working (by simulating fog/no-fog conditions).



WARNING
The visibility meter is ”sealed for life“ therefore don’t try to open the lenses fixture. The only object that can be open is the junction box to access to the interconnection terminals. Attempts to open the lenses fixture voids the warranty of the manufacturer.

In order to carry-out the maintenance or the replacement of any device of this equipment, please refer to the following document:

CLIENT DOC. NO	SICE DOC. NO	DOCUMENT DESCRIPTION
1724000775-EL-DS-00004	**OM-776/DE SUB**	**EQUIPMENT TECHNICAL DATA SHEET**

10.0 ENVIRONMENTAL ASPECTS

10.1 GENERAL NOTES

Since 2003 SICE S.R.L. Company has adopted an Environmental management system integrated to the Quality one in order to control and improve the environment impacts connected to its activities and products. The system made in compliance with the UNI EN ISO 14001 rule and certified respect to the same standard by RINA, consists of planning the project activities and the equipment inspection tests taking into consideration the connected environmental aspects.

10.2 ENVIRONMENTAL RULES FOR THE INSTALLATION

In phase of installation it is important to pay attention to the placing of the supplying batteries of the equipment. These batteries must be placed in specials locals equipped with suitable ventilation requirements and containment basins for the eventual loss of liquids (acid substances).
All the produced wastes during the assembling operations must be managed in compliance with the current legislation applicable in the country of installation.

10.3 FINAL WASTE DISPOSAL OF THE EQUIPMENT

The equipment waste disposal must be carried out in the total respect of the applicable rule in the country in which the equipment has to be disposed.
In the optic of re-use and recycling the equipment are above all realised with materials easily recyclable (iron and steel) reducing to the minimum the presence of dangerous substances for the environment.
The equipment contains components that at the moment of the final disposal must be removed and displaced for the separate treatment as present specific problems of disposal. These components are:

- Battery cells
- Electrolytic capacitor with diameter higher than 25 mm or height greater than 25 mm
- Printed circuits of surface higher than 10 cm^2
- LCD of surface higher than 10 cm^2

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