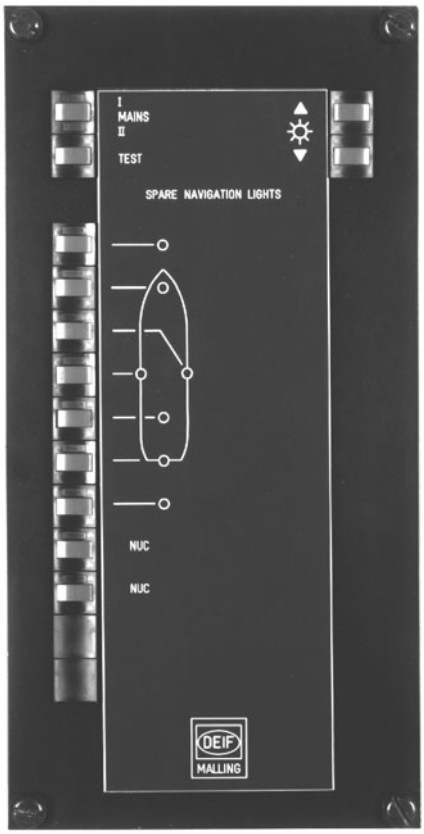
DEIF A/S

User's manual

Control panel for Navigation and Signal Lights 220V AC

MALLING Types 827.721 for 110V AC, 827.72 for 220V AC

4189330004D



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CONTENTS

1. CONSTRUCTION

1.1. APPLICATION

The lantern control panels, type 827 are intended for control and supervision of the ship's lanterns. The lanterns (navigation- and signal lights) are switched on and off either collectively or individually from the actual lantern control panel. The supervision includes the two fuses per lantern, the connections to the individual lanterns and the filaments in the lantern lamp bulbs. Furthermore, the presence of the supply voltage for the lanterns is also supervised.

The lantern control panels, type 827 are designed according to the international rules of the road at sea and their demand for control, supervision and supply of navigation lights (position lanterns) from independent panels.

Control lamps consisting of coloured LEDs (Light Emitting Diodes) indicate the condition of the lanterns. In case of failure for instance a defect filament lamp in a lantern or a blown fuse, the built-in buzzer releases an acoustic alarm signal. The defective lantern circuit is indicated with flash with full light intensity in the LED.

The same panels may also, because of their compact construction with advantage, be used for signal lights (Suez, Japanese Ocean, Panama etc.) where there are not quite as strict demands for supervision.

The control panels for navigation lights must normally be supplied from two alternative supplies, usually from the ship's main switchboard and emergency switchboard possibly battery. By failure of the normal 115V AC supply (I) the lantern control panel type 827.721 switches automatic - without the need for manual interference - to the connected alternative 115V AC supply (II).

External alarm equipment, for instance the bridge alarm system, may be activated through the relay contact for FAULT and VOLTAGE FAILURE.

Failing lantern conduction, that is lack of light (current) in the lanterns, which should be switched on, activates the FAULT relay. A built-in battery guarantees the activation of the FAULT relay at total voltage failure. Failure by only one of the supplies does not activate the FAULT relay, as long as the other one can supply the lanterns.

The VOLTAGE FAILURE relay is activated as a warning that at least one of the two supplies I or II is lacking.

1.2. DESIGN

The lantern control panel consists of:

A compact control panel - for flush mounting in desk or front panel.
Multiple cables with plugs.
One or two relay boxes for base mounting - to build in.
A power supply for base mounting - to built in.

With this construction only a minimum of area is applied in the front of the panel and it is thereby possible to connect the cables from the lanterns directly to the terminals on the relay boxes.

The main components of the lantern control panel have been accomplished in corrosion protected iron sheet.
The relay box(es) and power supply are chrome yellow.
The front of the control panel is mat black finish.

1.3. CONTENTS

1.3.1. CONTROL PANEL

See dimensional sketch 4166210001.

Type 8027.4, with one series of pushbuttons and LEDs, placed to the left, for max. 11 lanterns.

or

Type 8027.41, with two series of push buttons and LEDs for max. 22 lanterns.

The control panel includes:

1.3.1.1. Up to 11 or 22 low-power pushbuttons to switch the individual lanterns on and off.

1.3.1.2. Up to 11 or 22 LEDs for indication of the condition of the individual lanterns. The LEDs are placed outside the engraved ships or mast symbol ("mimic diagram") together with the actual low-power switch. The LEDs may be delivered in the colours: yellow, green, red and in special cases: blue. White LEDs do not exist.

Two or more buttons may be delivered electrically connected, such as the lanterns, for instance the NUC-light, are switched on and off simultaneously, but are supervised individually.

1.3.1.3. Mimic diagram.
This consists of a black resopal sign with individually engraved ships and/or mast symbols with lanterns and reference lines for the appropriate LEDs. The symbolic diagram may be supplied with engraved texts.

1.3.1.4. Two pushbuttons ("▲" and "▼") for adjustment of the light intensity for all LEDs.

1.3.1.5. Buzzer for acoustic alarm.
The sound comes through holes in the back wall of the control panel.

1.3.1.6. L1.MP TEST pushbutton for all LEDs.

1.3.1.7. 1 low-tension breaker (M1.INS), common to all lanterns.

1.3.1.8. 2 green LEDs ("I" and "II") for indication of the actual voltage supply source.

1.3.2. INTERCONNECTING CABLES

1.3.2.1. 2 or 3 low-voltage multiple cables are used between the control panel 1.C1 and the relay box(es). These cables are delivered rigidly mounted to the control panel and with plug for connection to the relay box/relay boxes. Standard length: 2 m.

1.3.2.2. 1 low-voltage multiple cable with two plugs for connection of relay box "1" and "2", provided that more than 11 lanterns are included. Standard length: 0.75 m. This extension cable is part of relay box "2", on delivery. A cover protects the cable connections for the relay boxes.

1.3.3. RELAY BOX "1" FOR MAX. 11 LANTERNS

See dimensional sketch 4166330012.

Type 8027.90: Relay box consisting of base plate, shroud and cover, inclusive motherboard but without control units, relays, fuses etc.

1.3.3.1. Connection terminals
Terminal 1..22: Output (115V AC) for the individual lanterns.
Terminal 22..24: Input (115V AC) for relay box.
Terminal 25..26: 24V auxiliary voltage input.
Terminal 27..29: Input for indication of supply (I/II).
Terminal 30..32: FAULT-relay, potential free changeover contact.
(Terminal 33..34: Only mounted in special cases).

1.3.3.2. Lantern relays
7..11 two-pole relays for activation of the lanterns. The relays are mounted in connection sockets.
Data for relay contacts: 250V AC, 51..

1.3.3.3. Lantern fuses
2 x 11 fuse holders with 2 sandfilled safety fuses for each of the 7..11 lanterns.
The lantern fuses are available from the topside of the relay boxes. The size of the fuse is indicated on a plate.

1.3.3.4. Lantern supervision units type 8027.12
7..11 plug-in printed circuit board type 8027.12 for supervision of the current in each of the 7..11 lanterns.
The current in the lanterns is supervised by a NTC resistor, which is galvanically separated from the alarm circuits with optocoupler.

1.3.3.5. Alarm logic unit type 8027.2
1 plug-in printed circuit board type 8027.2 with alarm logic for 11 lanterns and two sockets for connections from the control panel.

1.3.3.6. Internal supply unit type 8027.32
1 plug-in printed circuit board type 8027.32 with internal power supply, main breaker, alarm relay for FAILURE and drivers for indication of supply voltage (I/II).
Fuse: 1 2A T, Ø 5 x 20 mm, type 1020500001.
The fuse will be accessible when the top cover of the relay box is removed.

1.3.3.7. Dimmer-, flash-, and alarm unit type 8027.31
1 plug-in printed circuit board type 8027.31 with light dimmer and flash generator for all LEDs and transistor for control of buzzer and alarm relay.

1.3.3.8. 1 Ni-Cd battery for alarm of voltage failure.
The battery is attached with a clip and connected with two small connections to the motherboard.

1.3.3.9. The motherboard with sockets for the above-mentioned plug-in printed circuit board.

1.3.4 POWER SUPPLY

Type 827.51: 115V AC ("I" and "II")
This is the normal power supply for 115V AC (I and II).

The power supply includes:

1.3.4.1. Relay(s) for automatic selection of main supply "I" or alternative supplies "II".
Data for relay contacts: 660V AC, 25A.
The relay includes auxiliary switches to use for indication of the actual supply sources I or II on the control panel. Furthermore, the auxiliary switch for alarms of VOLTAGE FAILURE of supply I.

1.3.4.2. Transformer and rectifier for generation of internal 24V DC auxiliary voltage.

1.3.4.3. The fuse on the primary side of the transformer.
1 pc. 0.5A T, Ø 5 x 20 mm, type 1020500003.

1.3.4.4. Relay for supervision of failing alternative supply II.

1.3.4.5. Terminals for connection of:
Main supply I, typical from the main switchboard of the ship and alternative supply II for instance from a battery. Outlet for lantern voltage to the relay box(es).
Common connections, inclusive 24V auxiliary voltage for relay box "1". Alarm for VOLTAGE FAILURE.

1.3.5. RELAY BOX "2" FOR LANTERN 12 TO MAX. 22

Type 8027.90: Relay box with motherboard, without control units.

Used as supplement for relay box "1", when there is more than 11 lanterns. Includes the same printed circuit boards as 1.3.3. Relay box "1" except for the common units 1.3.3.6, 1.3.3.7 and 1.3.3.8.

Terminals 25..32 on relay box "2" do not have to be used.

ADDITIONAL ACCESSORIES

Flash relay type 2033380001.
Consists of a relay house with an 11-poled plug.

The flash relay is used for red and green flashlights in the Japanese Sea. The flash frequency may be set by means of a potentiometer.

The flash relay is used for supervision outside the relay box.

2. FUNCTION

2.1. COUPLING

The lantern control panel chooses main supply "1", provided it is intact. Otherwise, it changes automatically to "II". The choice of supply cannot be influenced from the control panel.

The lantern control panel is activated with the common pushbutton switch at the top left of the control panel "MAINS".

The control circuits are now under voltage, so that the individual lanterns may be switched on and off corresponding to the actual lantern guidance.

The LEDs indicate which lanterns are switched on by now.

During normal operation with fixed lantern guidance only the main breaker is operated.

Provided that the lantern is in working order, the LED in question shines with steady light. Certain lanterns for instance NUC-lights may be connected in order to be switched on with one button.

Flash in one of the lantern LEDs indicates that the lantern in not shining, even though it should. May be due to the fact that either the lamp or a fuse in the lantern has blown.

With the two dimmer pushbuttons to the top right of the control panel the light intensity in the LEDs may be adjusted to a suitable level.

2.1.1. TEST

One ought to always check the pilot lamps by pressing the button mrk. "TEST" immediately after the coupling.

2.1.2. FAILURE

Provided that the lantern current fails to appear due to fuse or wire breakage or defect lanterns, the LED flashes with full intensity and simultaneously the built-in buzzer gives a signal. This signal continues until the breaker of the lanterns is disconnected or the fault is remedied. Therefore, you have to connect the emergency lantern until the failure cause has been found and remedied.

External alarm may be give through built-in FAULT-relay with potential-free changeover contact and POWER-FAILURE-relay, with potential-free break contact (N/C).

2.2. INDICATION OF THE CONDITION OF THE LANTERNS

LANTERN SWITCHED OFF: The corresponding LED is dark.

LANTERN SWITCHED ON: Steady light in the LED indicated, that the lantern shines. (Current is running through the lantern).

LANTERN SWITCHED ON, BUT DEFECT: The LED flashes with full light intensity. Acoustic and external alarm activated. This alarm condition can only be terminated by switching off the lantern or by mending the fault.

2.3. VOLTAGE FAILURE

In case of failure of the normal supply "I", the main supply, the panel changes automatically to alternative supply, "II".

In case of failure of both main supply and alternative supply, acoustic and external alarm is released.

This alarm condition continues until one of the voltage supplies has been re-established or all lanterns have been switched off through the main breaker.

The actual supply voltage is indicated with light in one of the two green LEDs, marked "I" of "II". Main supply is indicated with light in "I" and switch to alternative is indicated with light in "II".

By failure of supply "I" or "II" (or both) the contact is opened for VOLTAGE FAILURE.

2.4. LIGHT DIMMER

Pressing the lowest button for decreasing the light intensity may dim the light in the LEDs in the control panel, and the light intensity may be increased with the top button.

The light intensity may be varied in 8 steps.

The dimming is only effective on steady light. Flash is indicated with full light intensity, such as any defect lantern circuits are clearly indicated.

3. CONNECTION

See connection diagram 4162330003 max. 11 lanterns and 4162330004 for 12..22 lanterns.

At first the common connections (low current) are placed between power supply unit type 827.51 and relay box "1". The internal 24V supply voltage comes from the terminals 9 (-) and 10 (+) on the power supply unit.

Thereafter 115V AC supply mains are placed between the current supply unit and relay box "I".

In case of more than 11 lanterns, relay box "2" is connected to relay box "1" by means of a multiple cable with two plugs.

Relay box "2" must have supply for lanterns directly from terminal 7 (+) and terminal 8 (-) on the power supply unit type 827.51.

The control panel may now be connected to the relay box(es) with the multiple cable(s) with plugs.

The physical position of the various plugs appears from the respective connection diagrams.

The lanterns are connected to the terminals 1-22 on the side of the relay box.

The connection between the terminal numbers on the relay boxes, the circuit breakers and the LEDs on the control panel appears from the filled-in form no. 002.11, 002.12, 002.17 or 002.18.

Note especially the terminal numbers corresponding to the positions 12-22 of the lanterns.

Finally, the supply mains to the two alternative supply sources "I" and "II" of the panel are placed.

Before the voltage is connected the following ought to be checked:

1. The supply voltage corresponds to the rated voltage of the panel.
2. The lantern connections are carried out correctly and the cables are ready-mounted by the lanterns.
3. Panel and cables are checked for earth faults.

4. DIMENSIONS

See dimensional sketches in the drawing paragraph.

5. DATA

5.1. OPERATING VOLTAGE

TYPE	VOLTAGE	LANTERN SIZE	MAX. PRIMARY FUSE
827.721/..	110V AC+,_ 10% 50..60Hz	25..120W	25A
827.72/..	220V AC+,_ 10% 50..60Hz	45..220W	25A

110V / 220V square wave or trapezium wave voltage from rectifier (for instance 24V DC/220V AC) may be used. Sinus rectifier is not necessary considering the lantern control panel.

The lantern control panel in standard version for 220V AC, type 827.72 is described in its own manual.

The voltage drop inside the control panel in the circuits for control, supervision and indication of each lantern does not exceed 3% of the rated voltage.

5.2. SECONDARY CIRCUIT

Voltage: 24V DC.
Power consumption pr. function unit: 45mA

5.3. BATTERY

1 "VARTA-DEAC" battery DK 4/60 type 1019120003.
Charging current and time by continuous switching on about 0.4mA for about 180 hours.

5.4. DIMMER

The light dimmer consists of an electronic pulse with modulator, on printed circuit board type 8027.31.

5.5. BUZZER

Type 1025220004, 6V.

5.6. WEIGHTS

TYPE	DESIGNATION	WEIGHT
UNTIL 11 LANTERNS:		
8027.4	Control panel ..... - incl. 2 fixed cables	1.70 kg
8027.90	Relay box "1" ..... Provided with common function units and individual function units, relays and fuses for 11 lanterns	3.60 kg
827.51	Power supply (I/II)	4.70 kg
TOTAL WEIGHT 827.721 OR 827.72 MAX. 11 LANTERNS		10.00 kg
MORE THAN 11 LANTERNS:		
8027.41	Control panel ..... - incl. 3 fixed cables	2.05 kg
8027.90	Relay box "1" ..... Provided with common function units and individual function units, relays and fuses for 11 lanterns (1-11)	3.60 kg
8027.90	Relay box "2" ..... - incl. individual relay, function units and fuses for 11 lanterns (12-22)	3.50 kg
	Interconnecting cable w/plugs	0.12 kg
827.51	Current supply (I, II)	4.70 kg
TOTAL WEIGHT 827.721 OR 827.72 MAX. 22 LANTERNS		14.90 kg

6. TYPE NUMBERS AND SPARE PARTS

6.1. CONTROL PANELS

NUMBER OF LANTERNS	110V AC		220V AC	
	STANDARD TYPE	SPECIAL TYPE	STANDARD TYPE	SPECIAL TYPE
7	827.721/07	827.721/07-02	827.72/07	827.72/07-02
9	827.721/09	827.721/09-02	827.72/09	827.72/09-02
11	827.721/11	827.721/11-02	827.72/11	827.72/11-02
14	827.721/14		827.72/14	
16	827.721/16		827.72/16	
18	827.721/18		827.72/18	
20	827.721/20		827.72/20	
22	827.721/22		827.72/22	

SPECIAL VERSIONS:
The panels for 7, 9 and 11 lanterns may, according to the symbol, be executed with two stripes of push buttons and LEDs. Indicated with "-02" after type number, for instance 827.721/11-02.

6.2. CONTROL UNITS (PLUG-IN PRINTED CIRCUIT BOARDS)

6.2.1. Lantern supervision unit, 220V AC, type 2045300030

6.2.2. Alarm logic for 11 lanterns, type 8027.2

6.2.3. Light dimmer, flasher, alarm, type 8027.31

6.2.4. Internal supply, type 8027.32

6.3. SPARE PARTS LIST

As a reasonable spare parts kit we can recommend the following:

FOR LANTERN CONTROL PANEL TYPE 827.721/11 - SPARE PARTS KIT 827.72S11:

QTY	DESIGNATION	TYPE
1	Lantern supervision unit	type 8027.12
1	Lantern relay	type 1023030001
10	Internal fuse 0,5A T, Ø5 x 20 mm	type 1020500003
10	Internal fuse 2A T, Ø5 x 20 mm	type 1020500001
30	Lantern fuse 1A T, Ø3 x 32 mm	type 1020510004

FOR LANTERN CONTROL PANEL TYPE 827.721/22 - SPARE PARTS KIT 927.72S22:

QTY	DESIGNATION	TYPE
2	Lantern supervision unit	type 8027.12
2	Lantern relay	type 1023030001
10	Internal fuse 0,5A T, Ø5 x 20 mm	type 1020500003
10	Internal fuse 2A T, Ø5 x 20 mm	type 1020500001
40	Lantern fuse 1A T, Ø3 x 32 mm	type 1020500004

7. LOCALIZATION OF FAULTS

7.1. FUSES

Check that all fuses (also primary fuses) are in working order.
The lantern fuses, two each lantern, are accessible from the topside of the relay box.
It is important to push the cover of the fuseholder down before it is turned. Otherwise the thread may be wrecked.
The lantern fuses must be the original sandfilled types in order to avoid that the fuseholder is wrecked in case of short circuit. The fuse in the internal supply unit in relay box "I" is accessible when the top cover of the relay box is removed.

The fuse in the power supply type 827.52 or 827.544 is placed under the upper cover.

7.2. SUPERVISION UNITS

7.2.1. Removing a fuse may perform test.

NOTE: Provided that there is no acoustic alarm, when you only remove one fuse, but alarm when you remove both fuses, there is earth failure.

7.2.2. If the points under point "3" (CONNECTION) are checked you can examine the control units by interchanging these.

7.3. If the buzzers do not give an alarm by power failure, the battery voltage must be checked.

7.4. By replacement of the battery, it must be checked that the polarity is correct.

8. DRAWINGS

DIMENSIONAL SKETCHES

CONTROL PANEL.....DRAWING NO. 4166210001
RELAY BOX.....DRAWING NO. 4166330012
POWER SUPPLY .....DRAWING NO. 4166210002

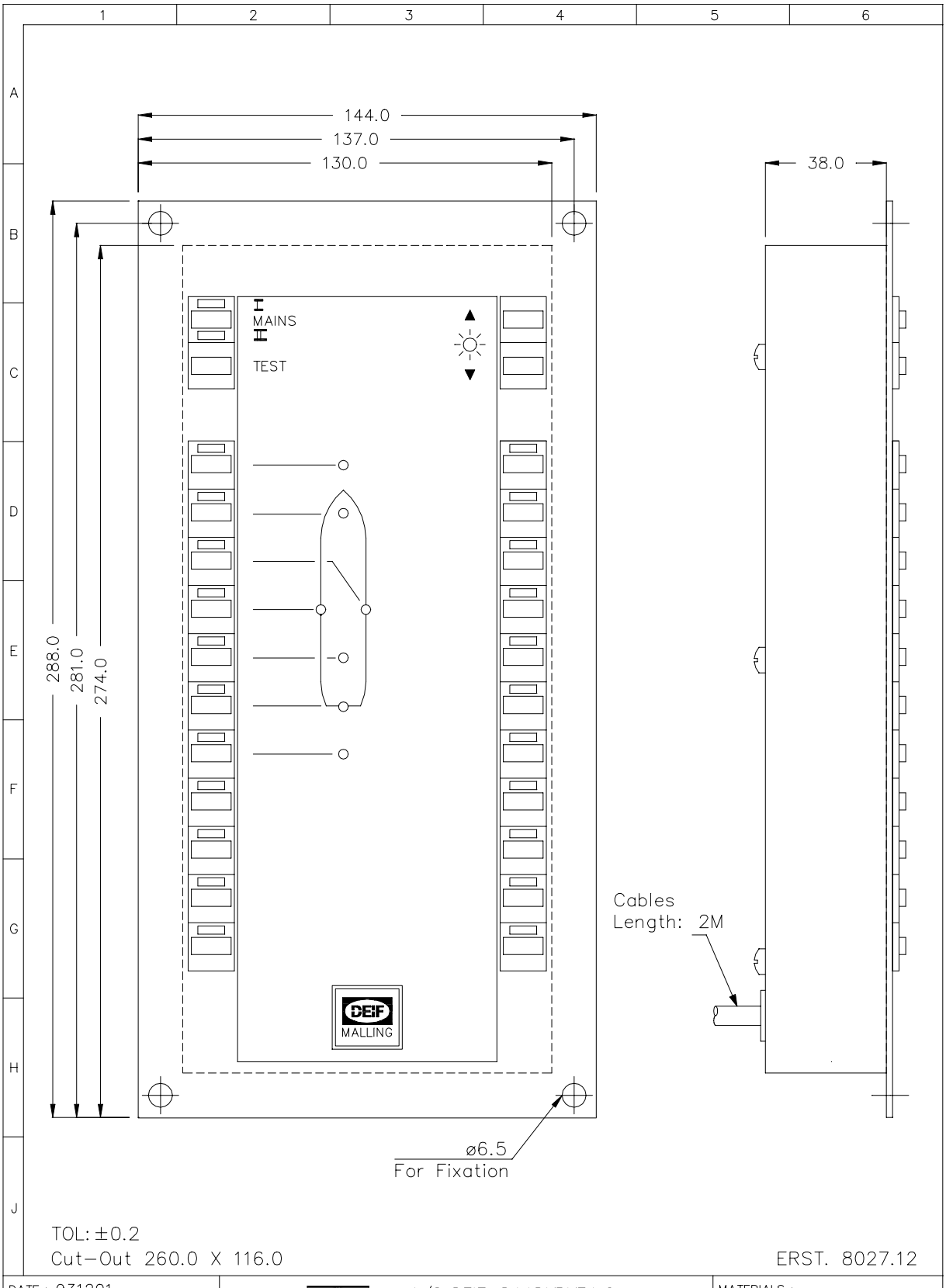
DIAGRAMS

CONNECTION DIAGRAM,
MAX. 11 LANTERNS .....DRAWING NO. 4162330003
CONNECTION DIAGRAM,
12..22 LANTERNS .....DRAWING NO. 4162330004
POWER SUPPLY, 827.51 115V AC.....DRAWING NO. 4157200130
POWER SUPPLY, 827.52 220V AC.....DRAWING NO. 4157200131

COMPONENT LAYOUT DIAGRAMS

RELAY BOX.....DRAWING NO. 4105330002

ORDER SPECIFIED DRAWINGS ETC, IF ANY



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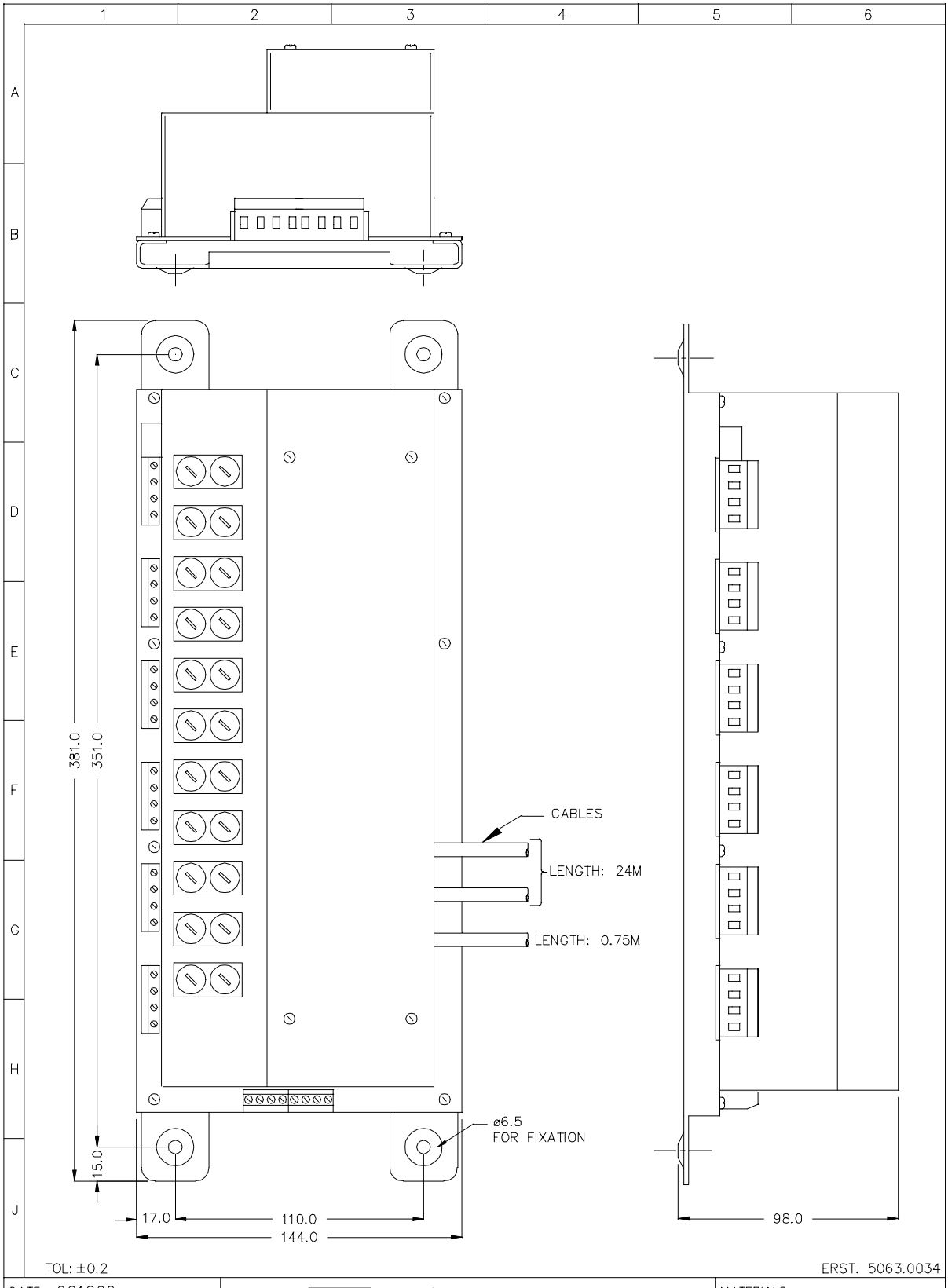
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RELAY BOX TYPE 8027.80
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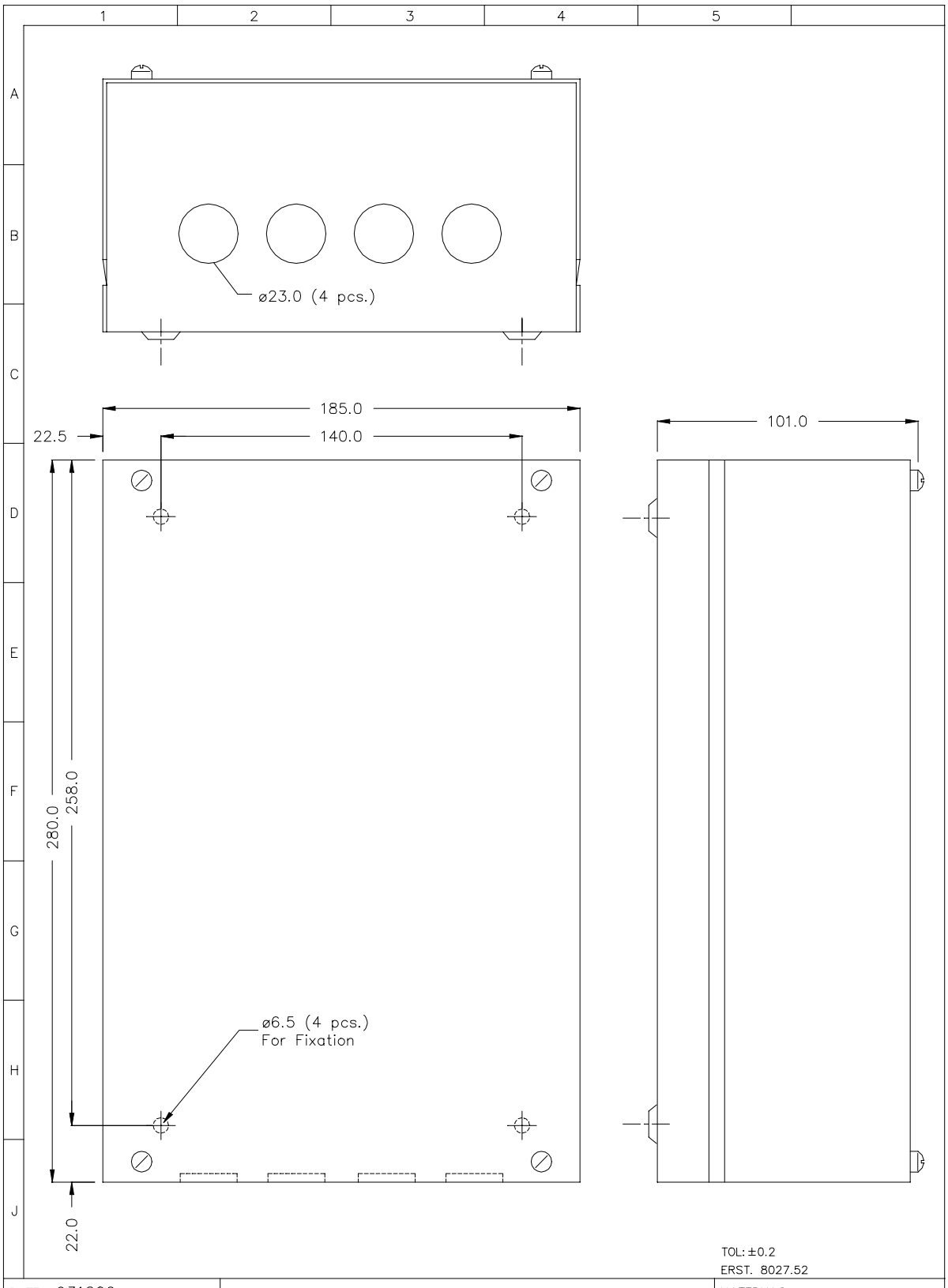
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22.0
ø6.5 (4 pcs.)
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ERST. 8027.52
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DK-7800 SKIVE, DENMARK
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CONTROL PANEL FOR
NAVIGATION AND SIGNAL LIGHT
POWER SUPPLY 827.5XX
OUTLINES
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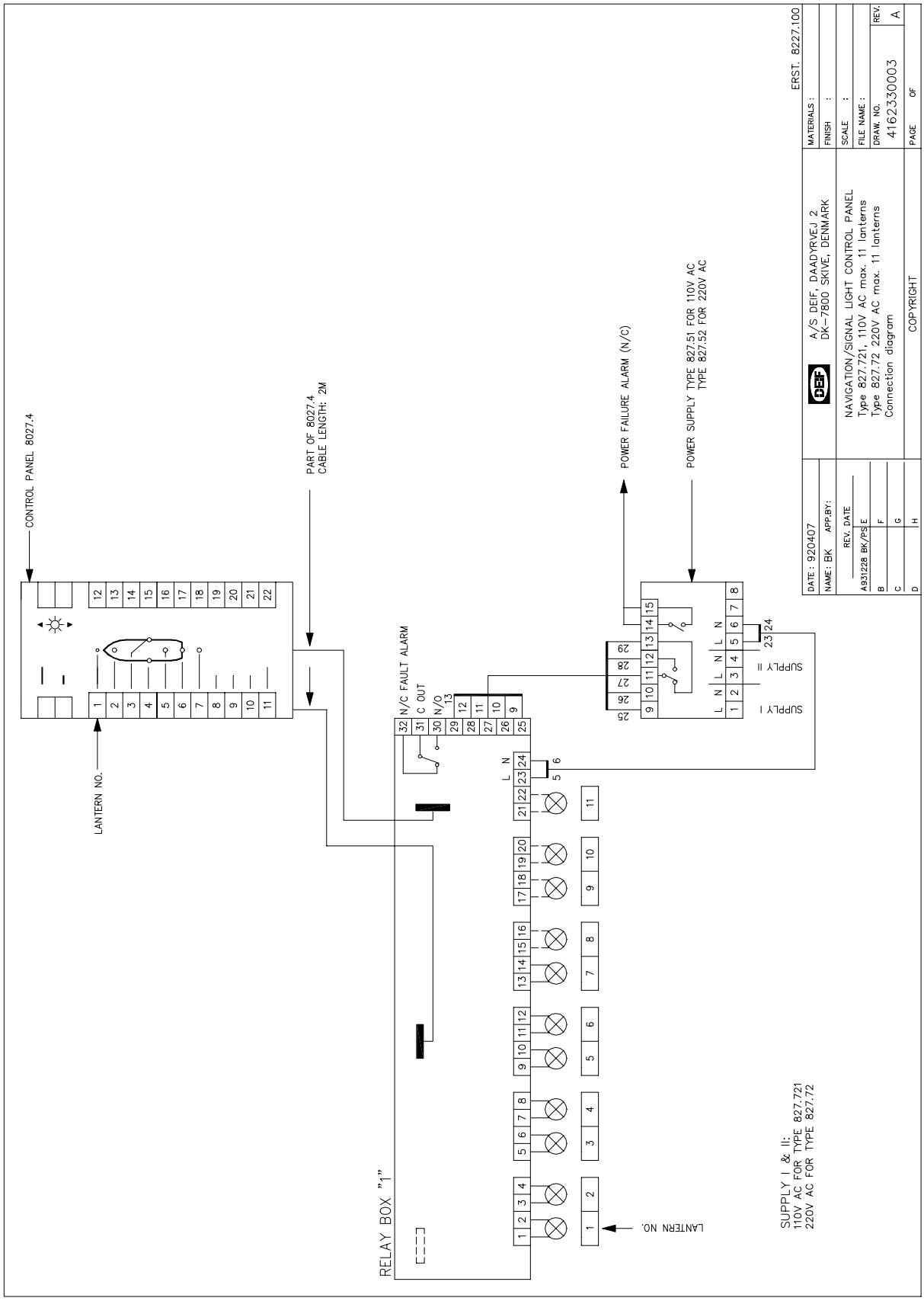
CONTROL PANEL 8027.4
PART OF 8027.4
CABLE LENGTH: 2M
POWER FAILURE ALARM (N/C)
POWER SUPPLY TYPE 827.51 FOR 110V AC
TYPE 827.52 FOR 220V AC
LANTERN NO.
N/C FAULT ALARM
C OUT
N/O
SUPPLY ~
SUPPLY =
RELAY BOX "1"
LANTERN NO.
SUPPLY I & II:
110V AC FOR TYPE 827.721
220V AC FOR TYPE 827.72
ERST. 8227.100
A/S DEIF, DAADYRVEJ 2
DK-7800 SKIVE, DENMARK
NAVIGATION/SIGNAL LIGHT CONTROL PANEL
Type 827.721, 110V AC max. 11 lanterns
Type 827.72 220V AC max. 11 lanterns
Connection diagram
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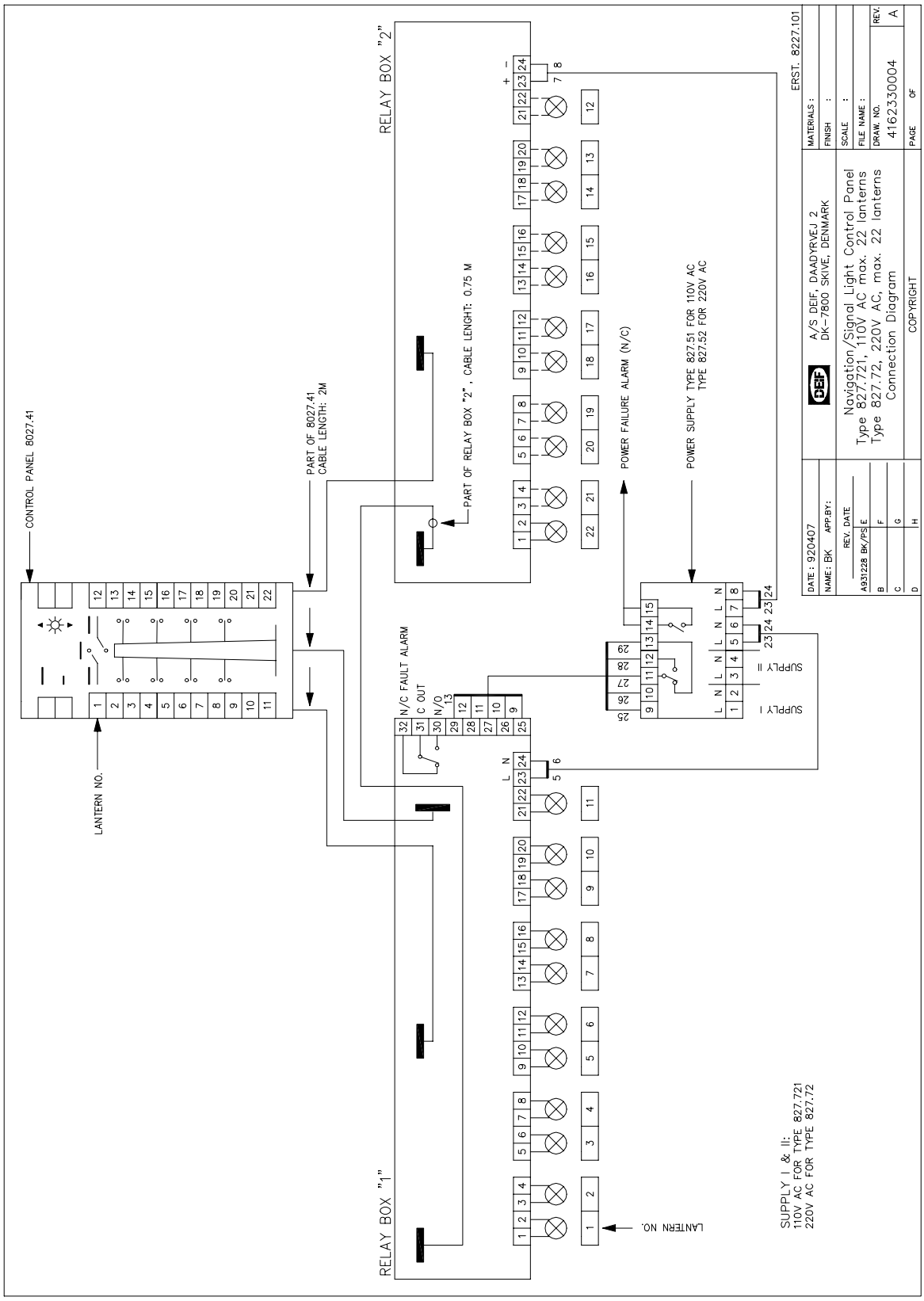
RELAY BOX "2"
RELAY BOX "1"
CONTROL PANEL 8027.41
PART OF 8027.41
CABLE LENGTH: 2M
PART OF RELAY BOX "2", CABLE LENGHT: 0.75 M
POWER FAILURE ALARM (N/C)
POWER SUPPLY TYPE 827.51 FOR 110V AC
TYPE 827.52 FOR 220V AC
N/C FAULT ALARM
C OUT
N/O
LANTERN NO.
SUPPLY I & II:
110V AC FOR TYPE 827.721
220V AC FOR TYPE 827.72
ERST. 8227.101
A/S DEIF, DAADYRVEJ 2
DK-7800 SKIVE, DENMARK
Navigation/Signal Light Control Panel
Type 827.721, 110V AC max. 22 lanterns
Type 827.72, 220V AC, max. 22 lanterns
Connection Diagram
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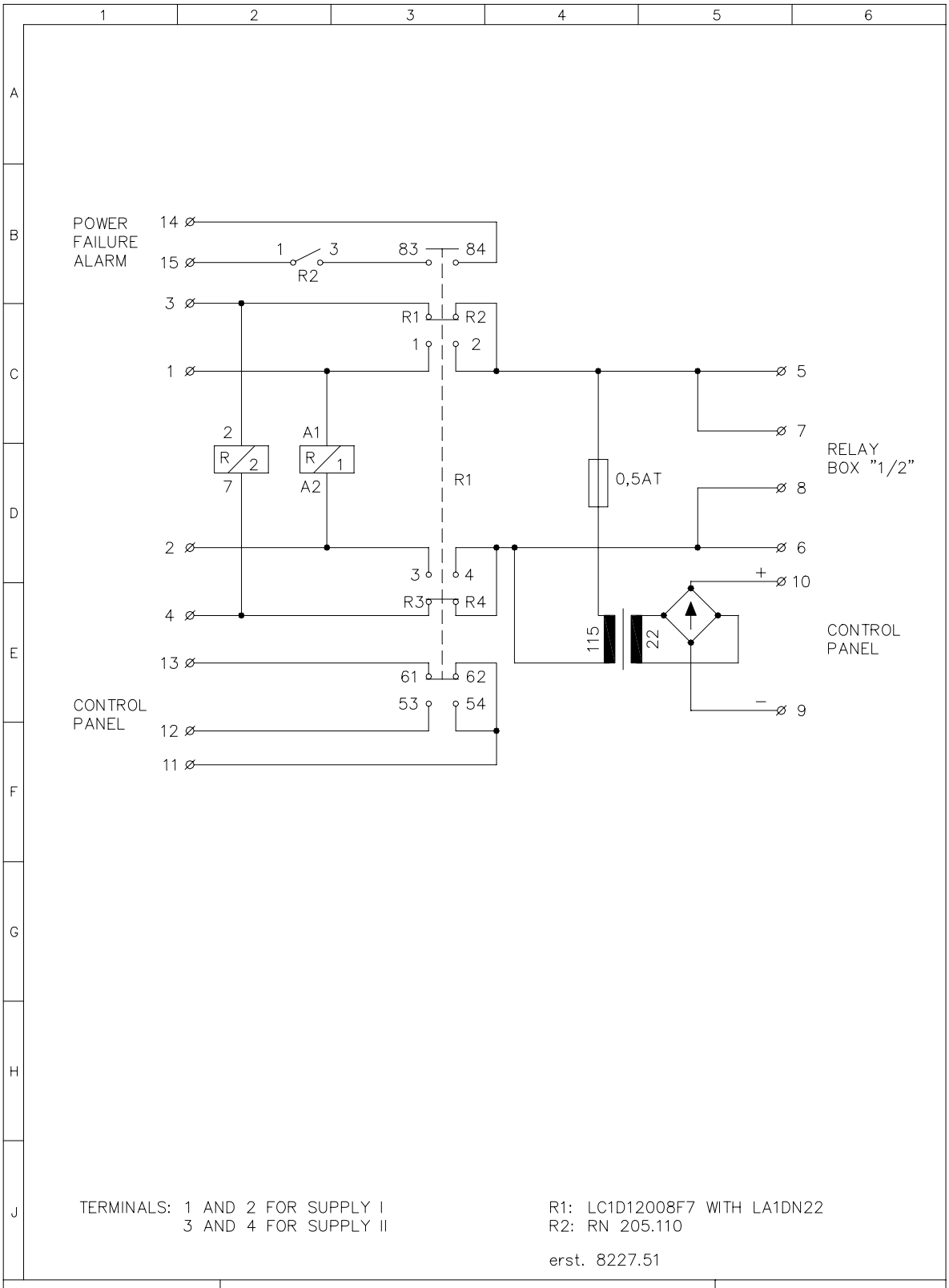
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R2
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R2
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115
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CONTROL PANEL
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62
CONTROL PANEL
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TERMINALS: 1 AND 2 FOR SUPPLY I
3 AND 4 FOR SUPPLY II
R1: LC1D12008F7 WITH LA1DN22
R2: RN 205.110
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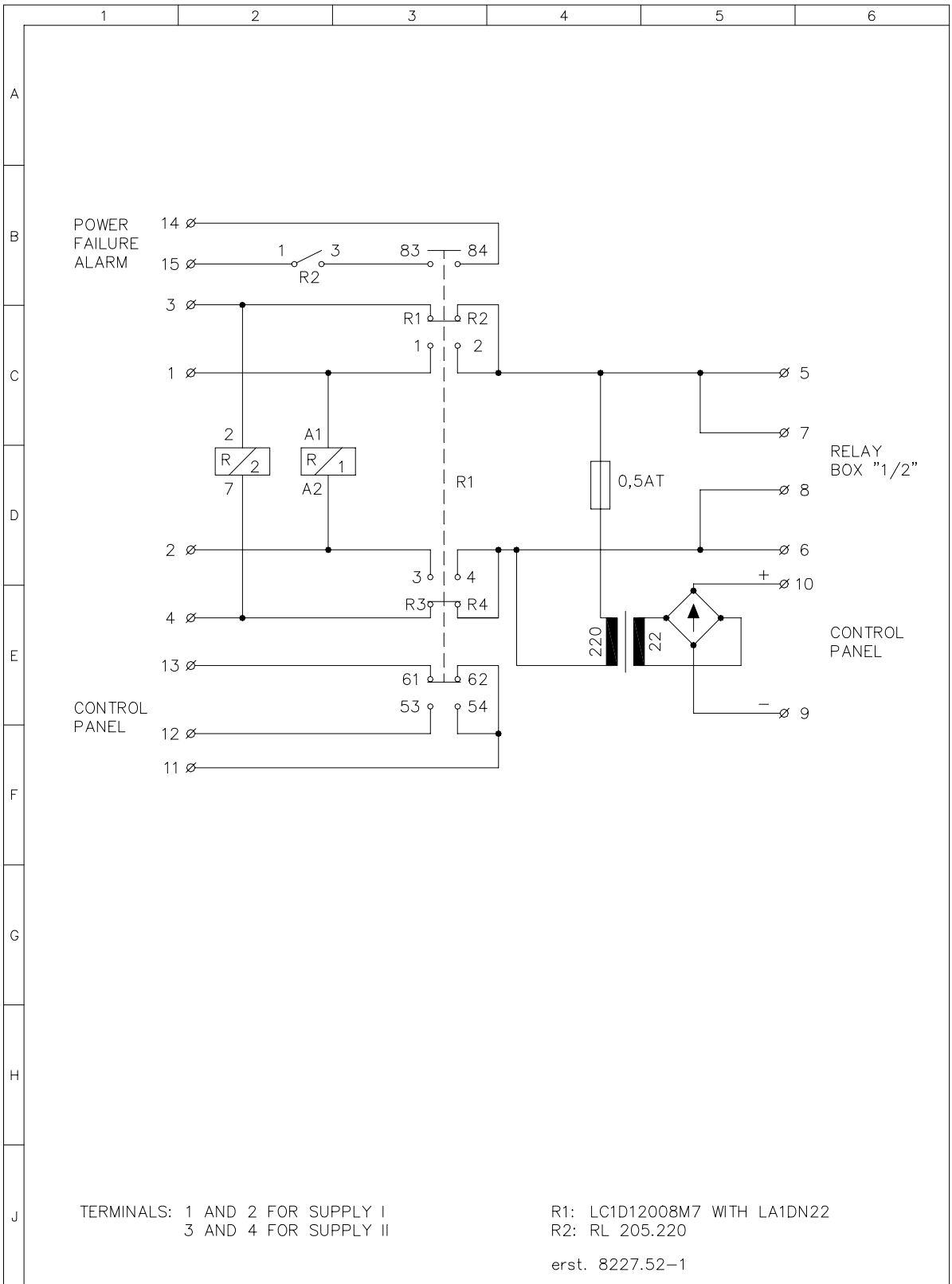
POWER FAILURE ALARM
14
15
1
3
83
84
R2
3
1
R1
R2
1
2
2
A1
R
2
R
1
7
A2
R1
0,5AT
5
7
8
6
10
9
RELAY BOX "1/2"
CONTROL PANEL
2
4
13
12
11
3
4
R3
R4
61
62
53
54
CONTROL PANEL
220
22
+
−
TERMINALS: 1 AND 2 FOR SUPPLY I
3 AND 4 FOR SUPPLY II
R1: LC1D12008M7 WITH LA1DN22
R2: RL 205.220
erst. 8227.52-1
DATE : 891006
NAME: JNJ APP.BY:
A/S DEIF, DAADYRVEJ 2
DK-7800 SKIVE, DENMARK
MATERIALS :
FINISH :
SCALE :
FILE NAME :
REV. DATE
A 940104ath
NAVIGATION/SIGNAL LIGHT CONTROLLER
POWER SUPPLY 827.52 220V AC
DIAGRAM
DRAW. NO.
4157200131
REV.
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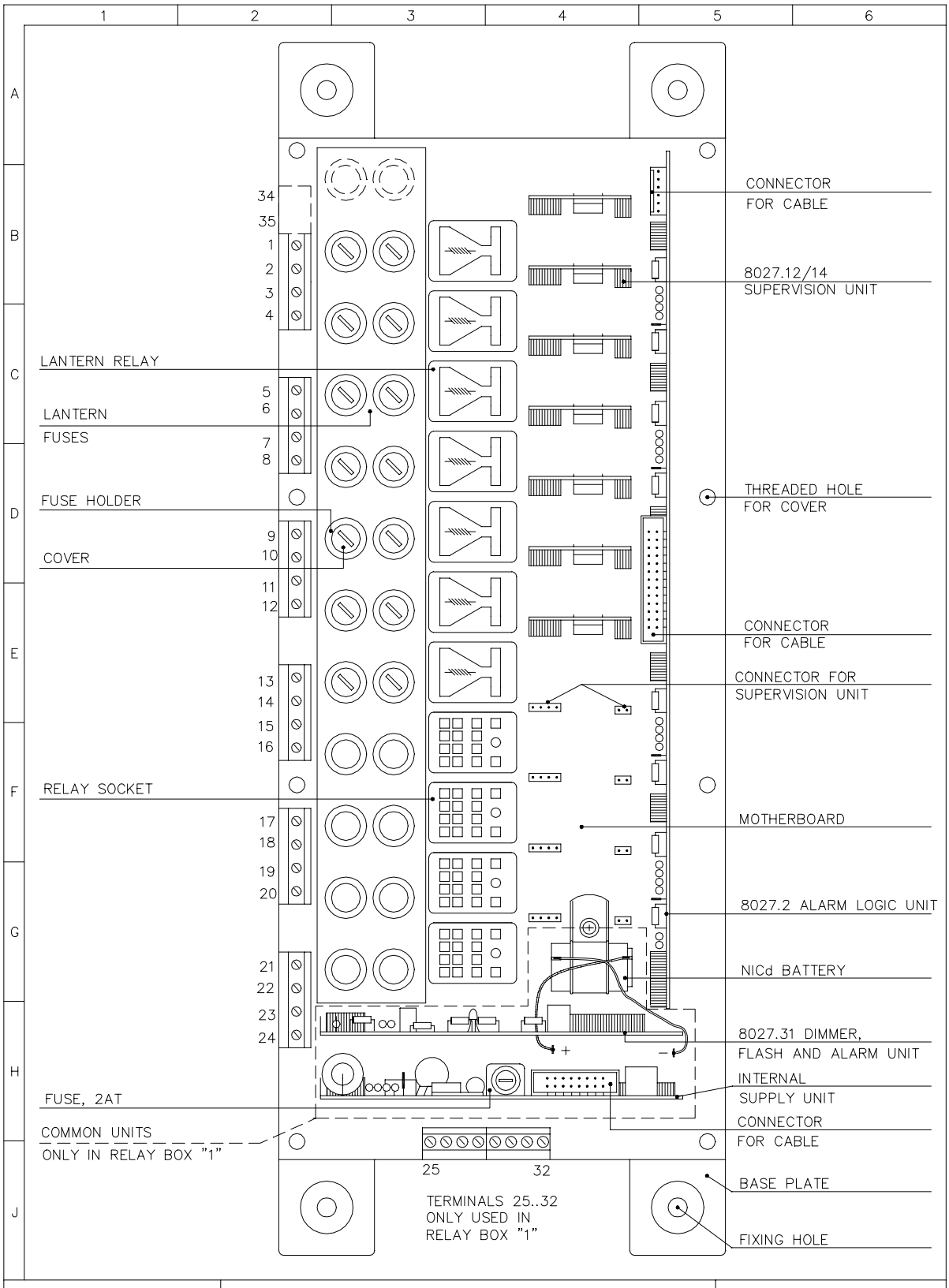

DATE : 931119	A/S DEIF, DAADYRVEJ 2 DK−7800 SKIVE, DENMARK	MATERIALS :
NAME: BK APP.BY:		FINISH :
REV. DATE A 931230 BK B C D	NAVIGATION/SIGNAL LIGHT PANEL TP. 827 RELAY BOX TYPE 8027.90 PLAC. OF COMPONENT	SCALE : PLOT 1:1.7 FILE NAME : 41053302 DRAW. NO. 4105330002 REV. A
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