



V-MI-0190 (ed.8)



For your information

This mounting and assembly instruction must be included the delivery of the Polar Liferrafts. It must be kept on board, and it must at all times be available to the crew for maintenance purposes.



Mounting instructions

VIKING Polar Liferaft heating system

Mounting instruction for **VIKING POLAR heating system** V-MI- 0190



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This VMI requires an authorized electrician!



Warning

LIVE TENSION ON INLET TERMINALS OF THE MAIN SWITCH WHEN THE MAIN SWITCH IS IN POSITION OFF.

THE SWITCHBOARD MUST BE OPENED BY AUTHORIZED PERSONEL ONLY.

THE DOORS MUST BE KEPT LOCKED WHEN THE SWITCHBOARD IS UNDER TENSION.

THE SWITCHBOARD MUST BE KEPT CLEAN AND DRY.

BY REPAIR USE ONLY ORIGINAL SPARE PARTS AS STATED IN COMPONENT LIST.

SAFETY CIRCUIT MUST BE TESTED EVERY 6. MONTH



Attention

ELECTRICAL CONECTIONS MUST BE TIGHTENED BEFORE CONNECTING LIVE TENSION TO THE BOARD

INSTALLATION **MUST BE** ACCORDING TO APPLICABLE REGULATIONS AND REQUIRES AUTHORIZED TECHNICIAN / CERTIFIED ELECTRICIAN.

PLEASE OBSERVE NATIONAL OR OTHER APPLICABLE REGULATIONS REGARDING THE ELECTRICAL INSTALLATIONS IN GENERAL.

Mounting instruction for

VIKING POLAR heating system V-MI- 0190



Mounting instructions

Always mount and install VIKING liferafts in cradles, racks or ramps according to VIKING Mounting Instructions (VMI).

The **VIKING POLAR heating system** is a supplement to the standard VIKING liferafts - which means that this VMI is an appendix (regarding the heating system) to the mounting instruction for the cradle / rack / ramp.

Very important !

VIKING recommends that the supply box is supported by the vessels main and emergency electrical power.

VIKING recommends that all cables are protected in pipes or closed cable trays.

Technical requirements

Rated voltage.....230VAC (216-244V)

Rated insulation voltage.....500 V

Frequency.....50-60 Hz

Rated current for two liferafts.....10 A

Rated power for two liferafts.....2300 W

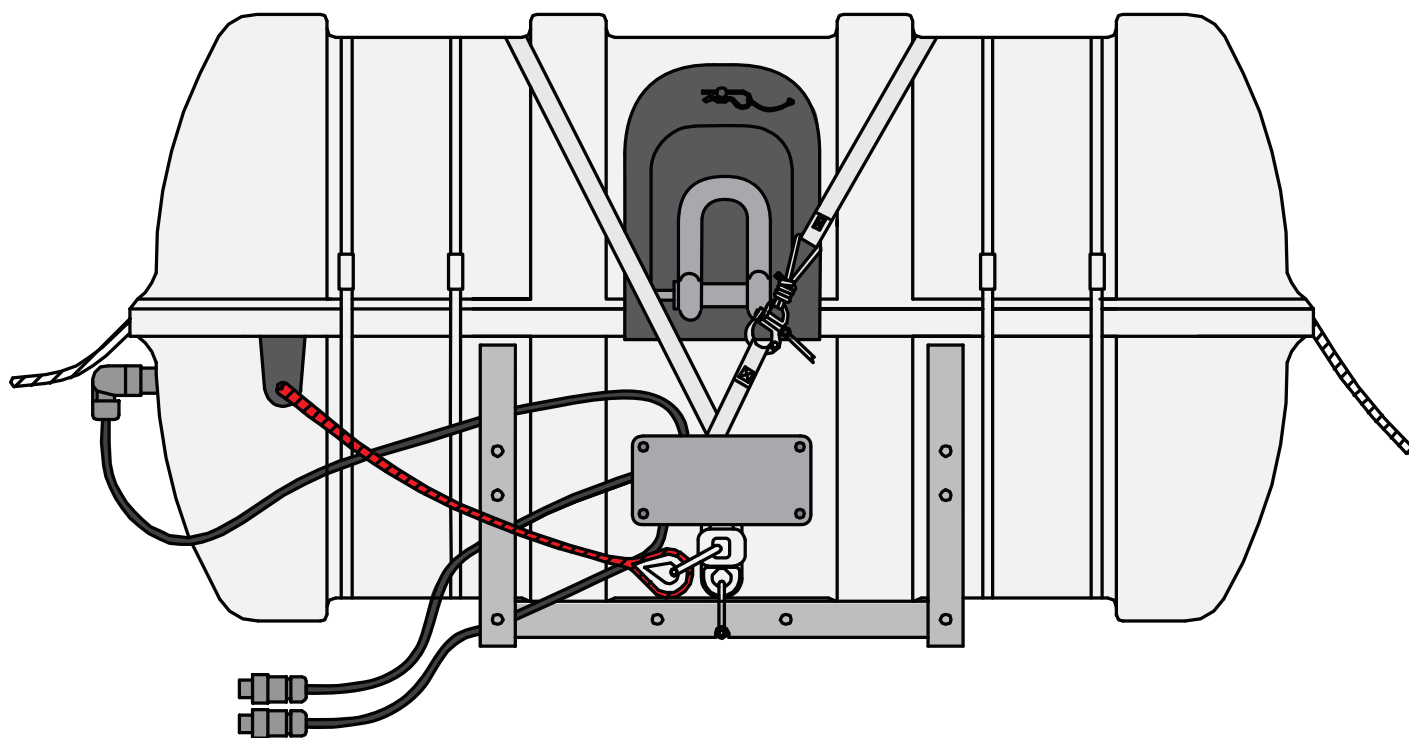
Rated current for three liferafts.....15 A

Rated power for three liferafts.....3450 W

Main power protection max.....25 A

Degree of protection.....IP 67

Impact protection enclosure.....IK 10




Mounting instruction for VIKING POLAR heating system V-MI- 0190




The system comprises

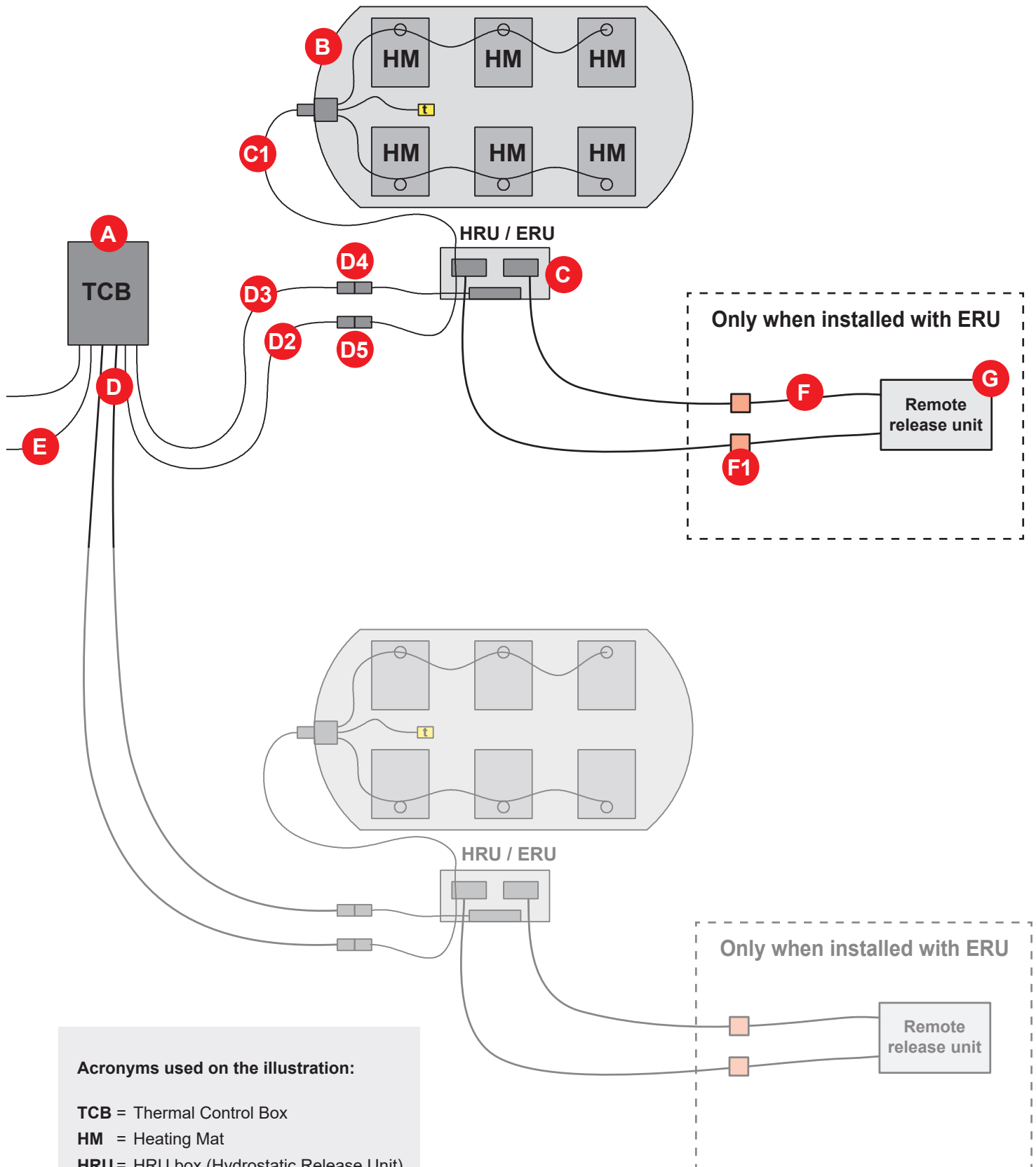
- A** A "VIKING Thermal Control Box" to supply up to two or three liferaft containers.
- B** A "Liferaft container" with built-in heating elements on the inside of upper and lower container part.
- C** A "HRU box" with built-in heating element and two HRUs or ERUs.
- D** A "Connection kit" containing cables and connectors between the Thermal Control Box and the liferaft container.
- E** Independent "Failure alarm signal" which can and must be connected to the alarm system on the vessel. For a remote alarm system - see the "Wiring diagram" for the electrician page 8.

- F** Electrical cables or pneumatic line remote release.
- F1** Junction box or U-console for cables or lines.
- G** Remote release unit.

 Only when installed with ERU

 The POLAR heating system can be installed with either HRU or ERU.
Only ERU comprises from F to G





Acronyms used on the illustration:

TCB = Thermal Control Box
HM = Heating Mat
HRU = HRU box (Hydrostatic Release Unit)
ERU = ERU box (Electrical Release Unit)
t = Thermo sensor.

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A VIKING Thermal Control Box

Install the power supply box at a suitable place near by the liferaft container.
The power supply box **must** be visible for inspection and be protected from any damage by other equipment.

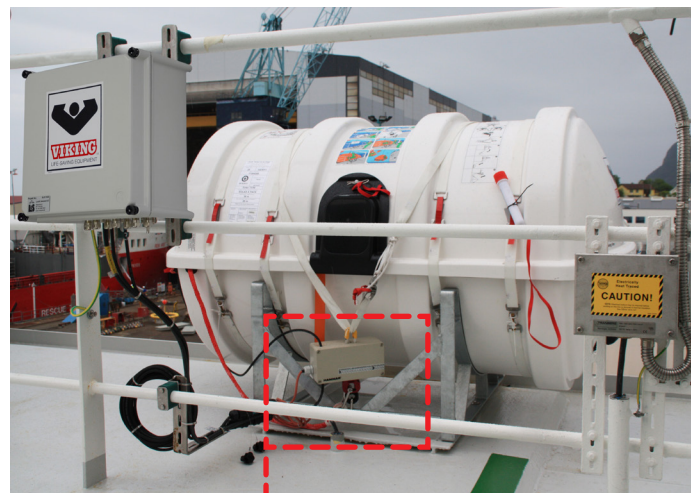


B The liferaft container

The container with built-in heating elements on the inside of upper and lower container shell part.



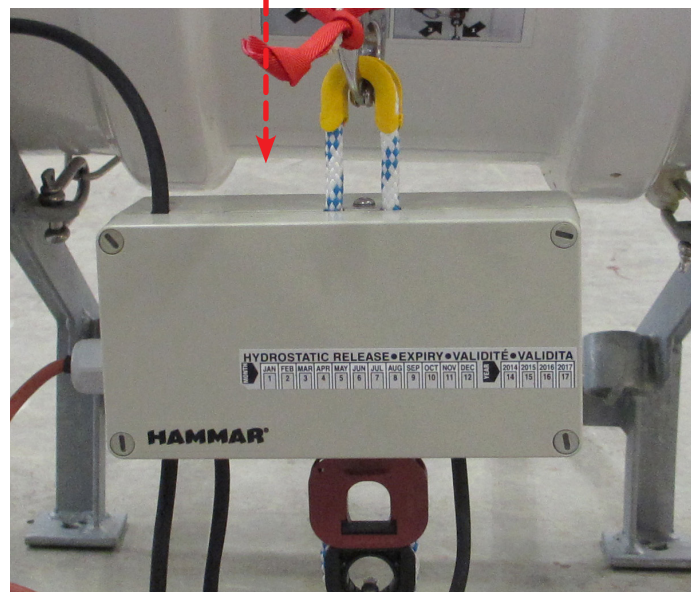
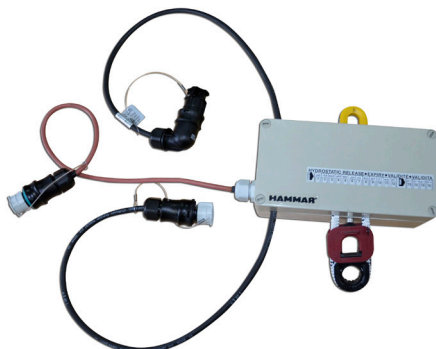
Example photo in this VMI shows a 25 DKF+ liferaft mounted in a cradle.



C The HRU box

The box with built-in heating element and two HRUs (Hydrostatic Release Unit) for polar use. Can also be fitted with ERUs (Electrical Release Unit).

- C1 Extension cable for the HRU box with male and female connector, to connect supply cable to liferaft.



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D Connection kit (per liferaft)

► Connection kit with the supply cables from the Thermal Control Box:

- D1** Wiring instruction.
- D2** 5 m supply cable with female connector, for heating in the liferaft container.
- D3** 5 m supply cable with female connector, for the electrical heated HRU box. The connector is coded turquoise to avoid mix-up with the connector for the liferaft container.



Connect the cables to Thermal Control Box according to wiring instruction.

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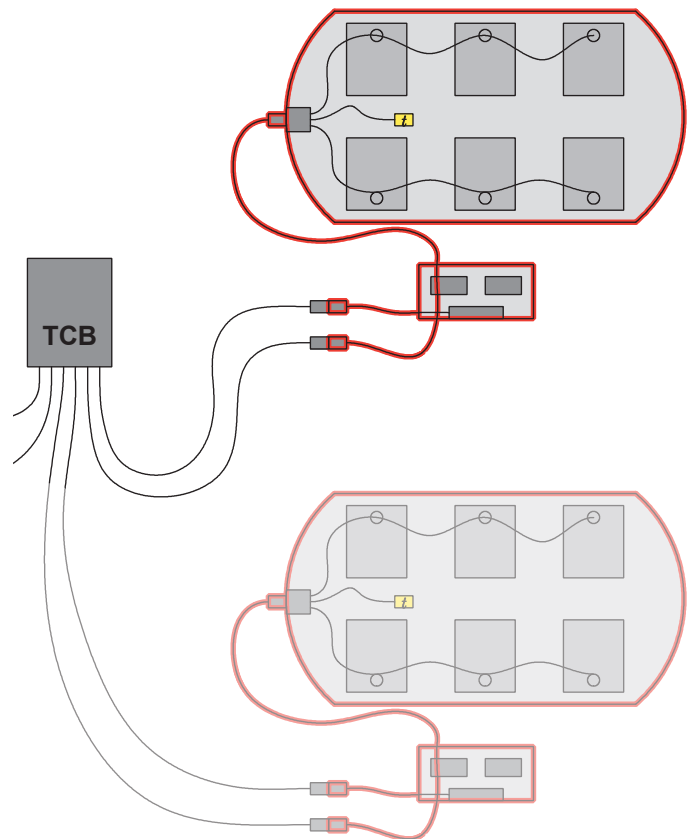
Description of the functions

The thermal control box is equipped with a temperature controlled relay to power the liferaft(s) and HRU-heater when the outside air temperature goes below +5°C.

Each heating element in the liferaft is equipped with overheating thermo-limiter which turns off the power when the temperature gets too high.

The liferaft container has a built-in thermo sensor to supply the vessel with an alarm signal if the temperature inside the container goes below -20°C.

The HRU box has a built-in thermo sensor alarm to monitor the temperature and supply the vessel with an alarm signal if any malfunction occurs.



Service

When liferafts are due for service the parts marked with a red stroke must be dismantled and handed in for service.

Connecting plug

The connecting plug for the heating mats inside the liferaft container is located at the left end of the container.

This connecting plug is for the extension cable for the HRU box **D5**.



This connecting plug **MUST** be accessible at all times after installation!



Mounting instruction for VIKING POLAR heating system

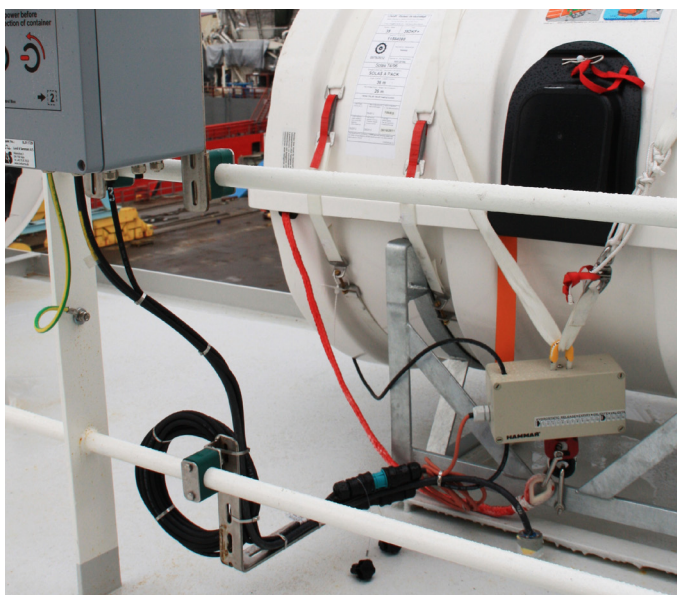
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Installation of the heating system

Connecting plug

Put the male connector which is mounted on the extension cable for the HRU box **D5** into the socket located at the left end of the container.



HRU box

Unscrew the lid on the HRU box.

Mark the expiry date on HRU

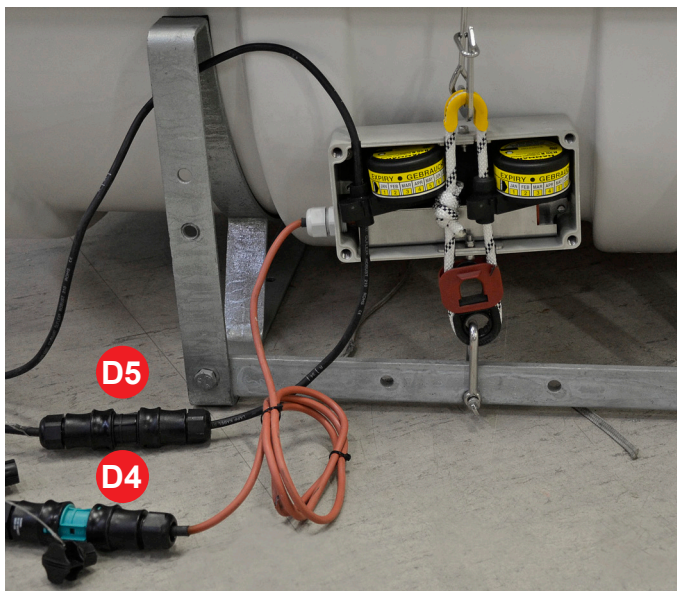
The HRU unit is labelled with fields to state month and year.

Remove the fields which state expiry month and year (expiry date on standard HRU is 2 years from mounting month).

Example:

Mounting month and year: **FEB. 2012**
 Expiry month and year: **FEB. 2014**

A HRU unit not properly marked with expiry date **MUST** be replaced.



Place the cable within the two premade holes in the HRU box.



Mounting instruction for VIKING POLAR heating system V-MI- 0190



Screw the lid back on the HRU box.

Installation of cables

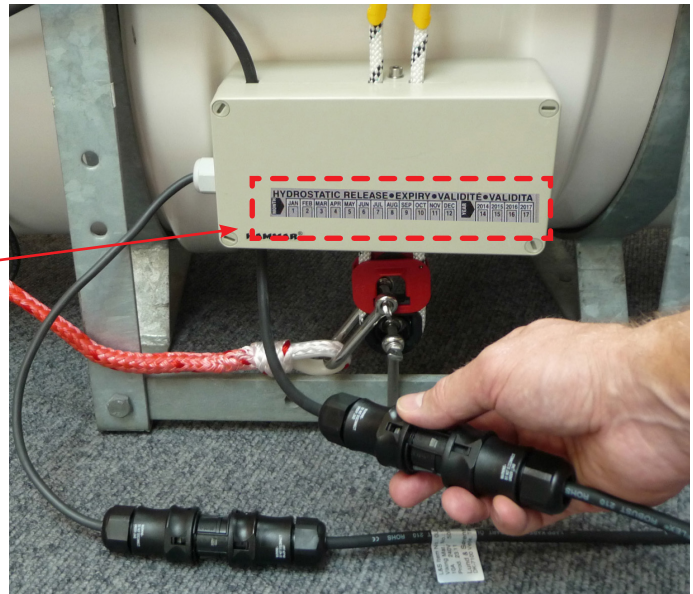
Connect the cables **C1** + **D2**.

Connect **D3** to the HRU heater.

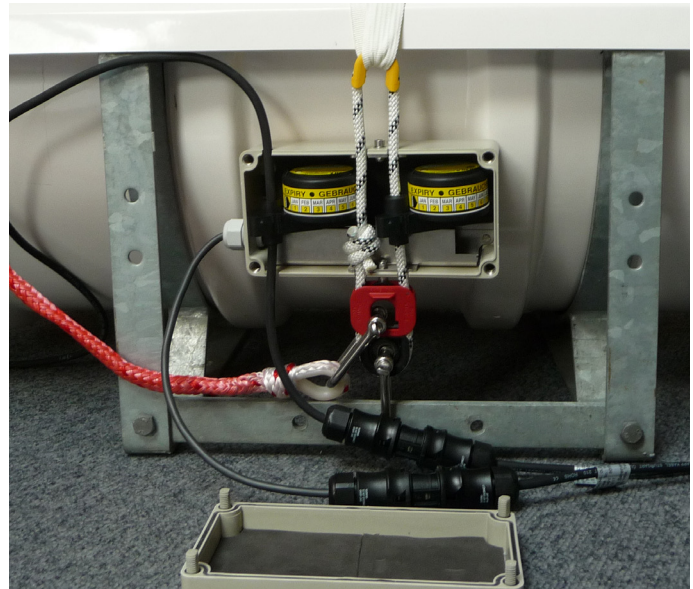
Place the enclosed expiry date label on the front.

Mark the expiry date on the label.

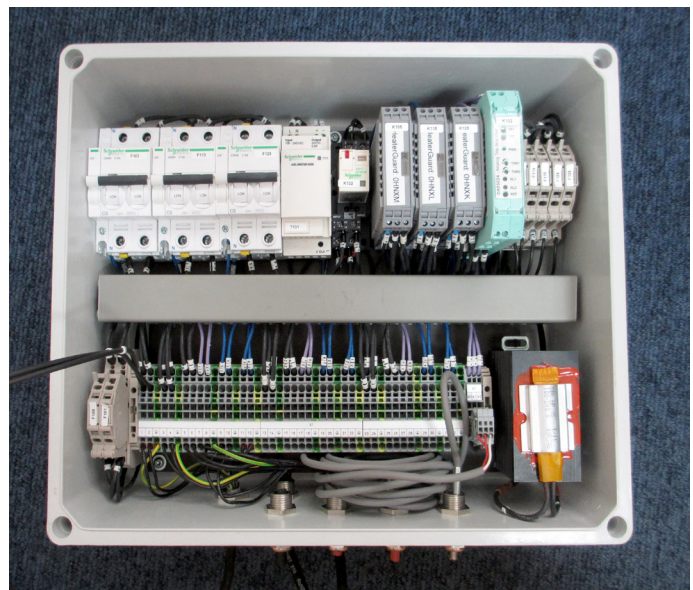
Ensure that all cables are securely installed between the Thermal Control Box and the liferaft container according to the regulation for high voltage (see page3).



To secure float free the cable C1 between HRU heater and the liferaft may NOT be fixed to the cradle or ship.



Shorten the cables if necessary.
Pull the cables through the cable glands.
Mount the wires according to the "Mounting scheme for cables" (page12) or the wiring instruction **D1** and according to the information on page4.

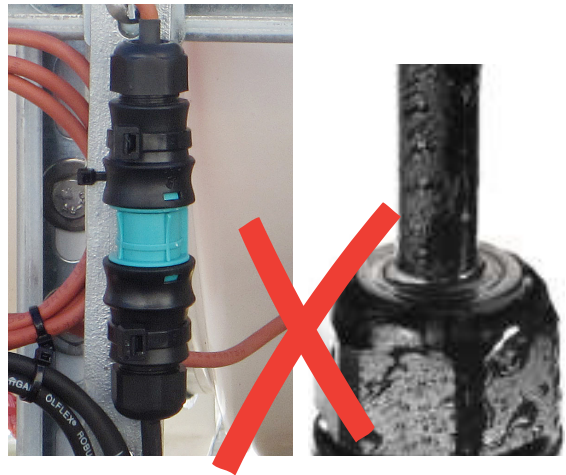


Mounting instruction for VIKING POLAR heating system V-MI- 0190



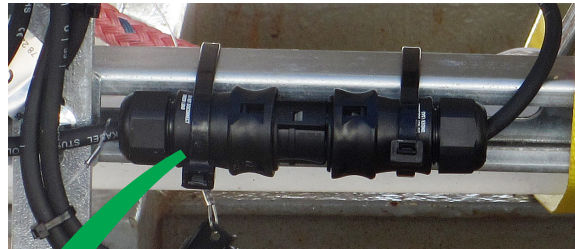
Guide for mounting of connector

Do not place connector vertical. It shall not be possible for water to stay around the cable gland.



Place connector horizontal in a way that leads draining water away from cable gland.

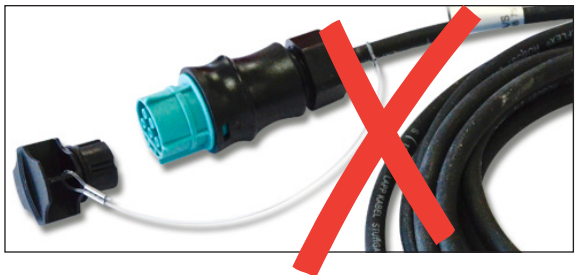
Cable must be laid in such a way that any draining water is not routed to cable gland, but drops off beforehand.



Cables may not dangle in the wind as they can be pulled out of the cable inlet, and open for water ingress.



Use the protection cap when connectors is not assembled. Never let connector stay open when placed on open deck.



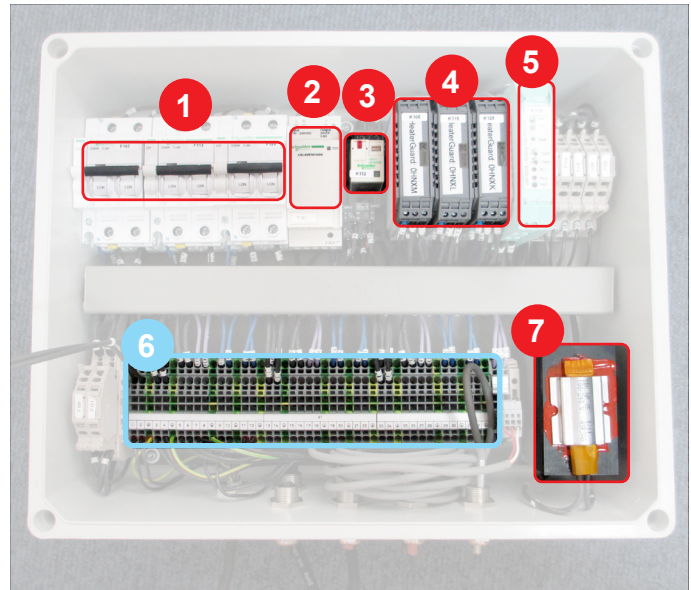
Mounting instruction for VIKING POLAR heating system V-MI- 0190



Thermal Control Box Overview

Before March 2023

- 1 Circuit breaker relay
- 2 Power Supply 24 VDC
- 3 Auxiliary relay
- 4 HRU Heater Guard
- 6 Temperature control relay
- 5 Terminal block
- 7 Anti condense heating element

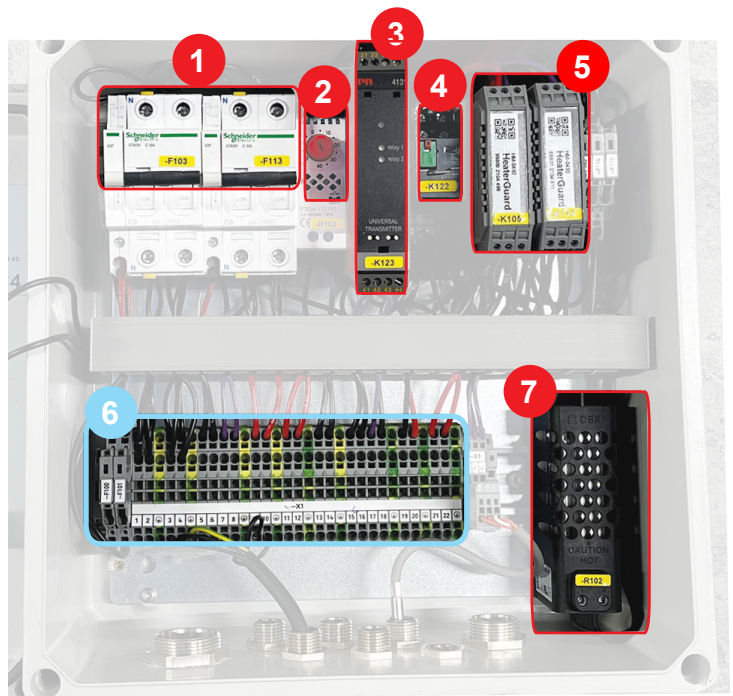


After installation
 Inspect all connections visually and manually and check that the installation is correctly installed.

Thermal Control Box Overview

From March 2023

- 1 Circuit breaker relay
- 2 TCB thermostat
- 3 Temperature control relay
- 4 Auxiliary relay
- 5 HRU Heater Guard
- 6 Terminal block
- 7 Anti condense heating element



After installation
 Inspect all connections visually and manually and check that the installation is correctly installed.

Mounting instruction for

VIKING POLAR heating system

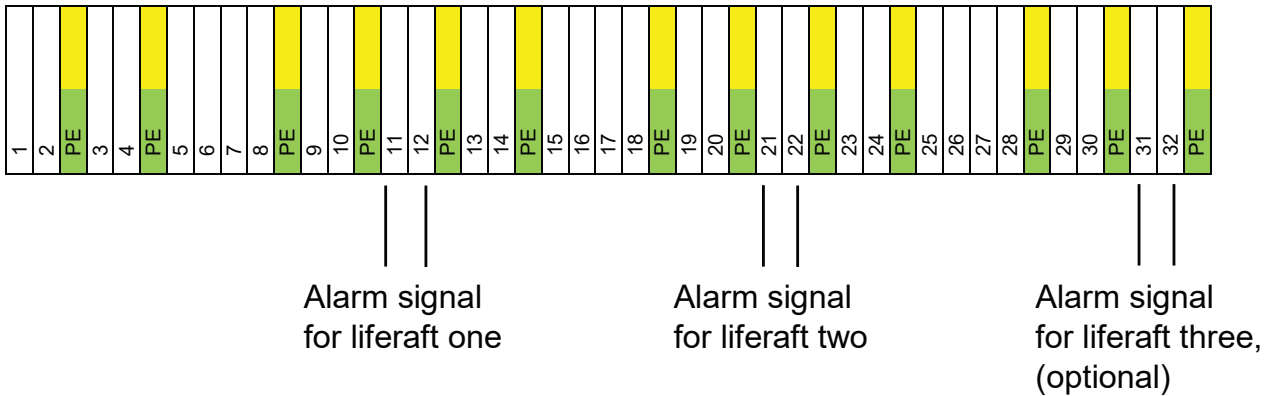
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Connecting the “Failure alarm signal”

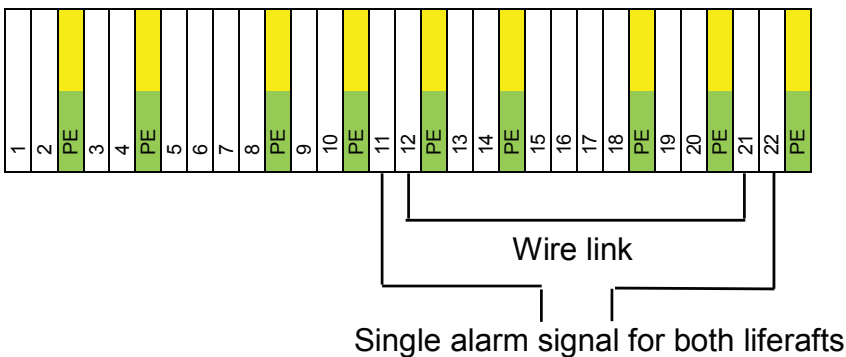
The failure alarm system is made of a dry contact circuit for each liferaft. The circuit must be connected to the alarm system of the vessel using the alarm cable E (see page 2) The connections can be carried out as individual alarm for each liferaft, or a single alarm for all liferafts connected to the thermal control box.

Connections for individual alarms.

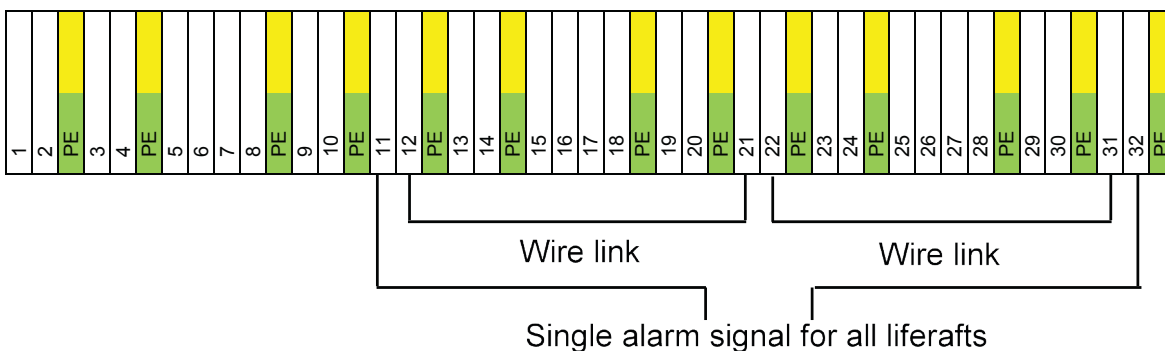


Connections for single alarm signal

To obtain a single alarm, each alarm output for the vessel must be connected in serial with a wire link. Example is for Thermal Control Box for two liferafts.



Example is for Thermal Control Box for three liferafts.





Mounting scheme for cables

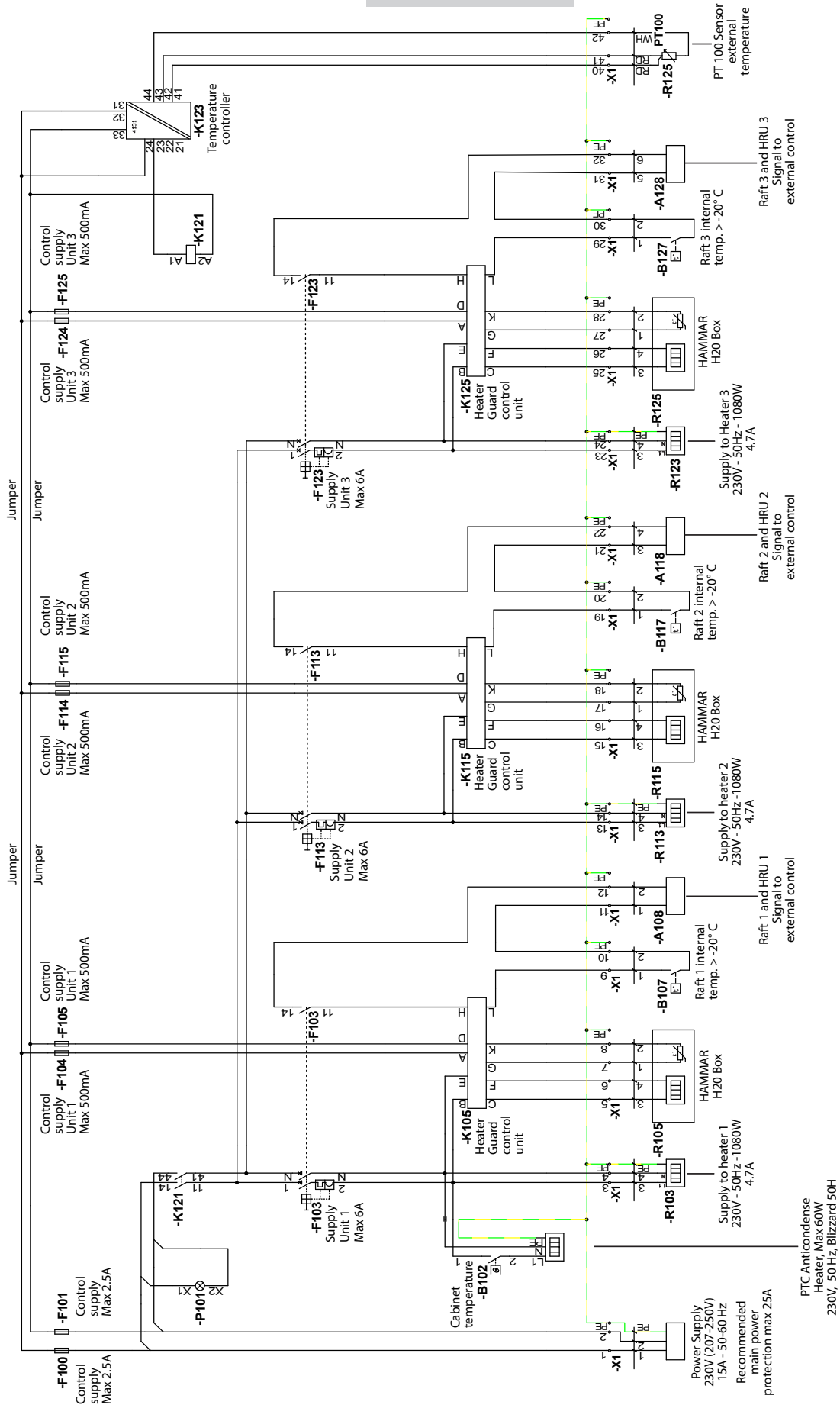
CABLE	WIRE	TERMINAL	Terminal group
Power supply from the vessel	L1	1	Power supply
	L2/n	2	
	PE	PE	
E Alarm cable to the alarm system on the vessel	Fill in:	11	Alarm signal 1
	Fill in:	12	Alarm signal 2
	Fill in:	21	
	Fill in:	22	Alarm signal 3
		31	
	32		
D2 Liferaft no.1	3	3	Heating
	4	4	
	1	9	Alarm signal
	2	10	
	Earth	PE	
D3 HRU no.1 (connector coded turquoise)	3	5	Heating
	4	6	
	1	7	Alarm sensor
	2	8	
	Earth	PE	
D2 Liferaft no.2	3	13	Heating
	4	14	
	1	19	Alarm signal
	2	20	
	Earth	PE	
D3 HRU no.2 (connector coded turquoise)	3	15	Heating
	4	16	
	1	17	Alarm sensor
	2	18	
	Earth	PE	
D2 Raft no. 3 Optional	3	23	Heating
	4	24	
	1	29	Alarm signal
	2	30	
	Earth	PE	
D3 HRU no. 3 Optional Connector coded turquoise	3	25	Heating
	4	26	
	1	27	Alarm sensor
	2	28	
	Earth	PE	

Mounting instruction for VIKING POLAR heating system

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Wiring diagram for three liferafts – From March 2023

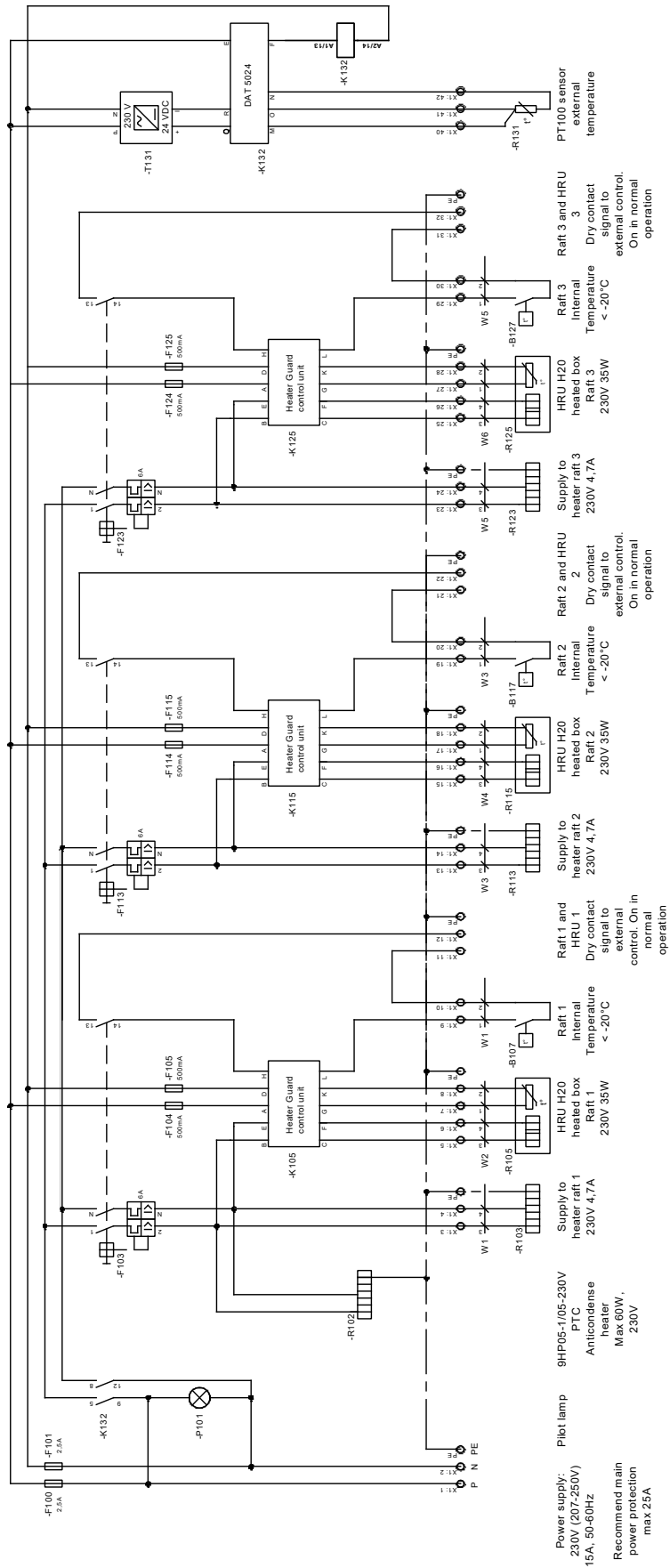


Mounting instruction for

VIKING POLAR heating system V-MI- 0190



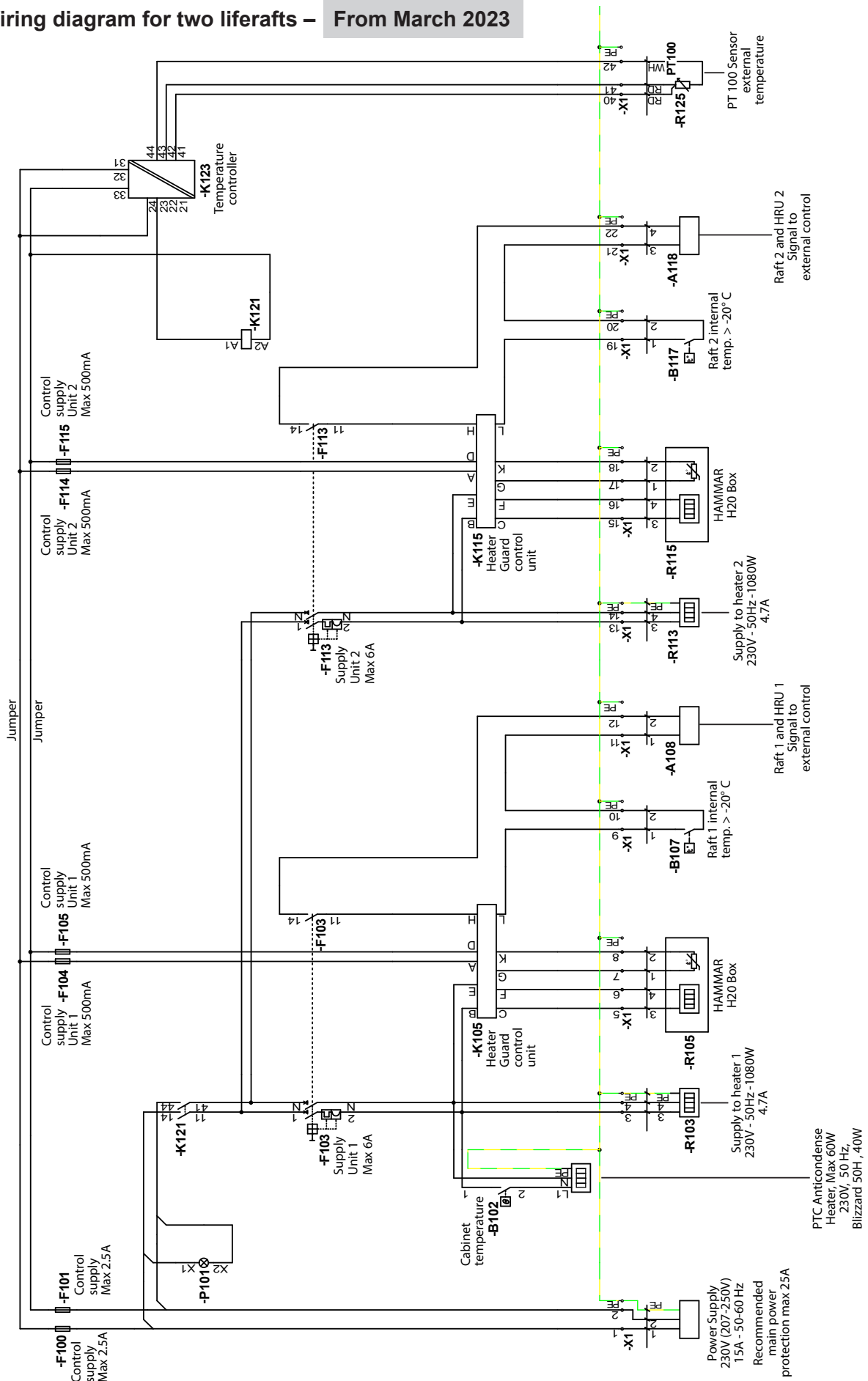
Wiring diagram for three liferafts – Before March 2023



Mounting instruction for VIKING POLAR heating system V-MI- 0190



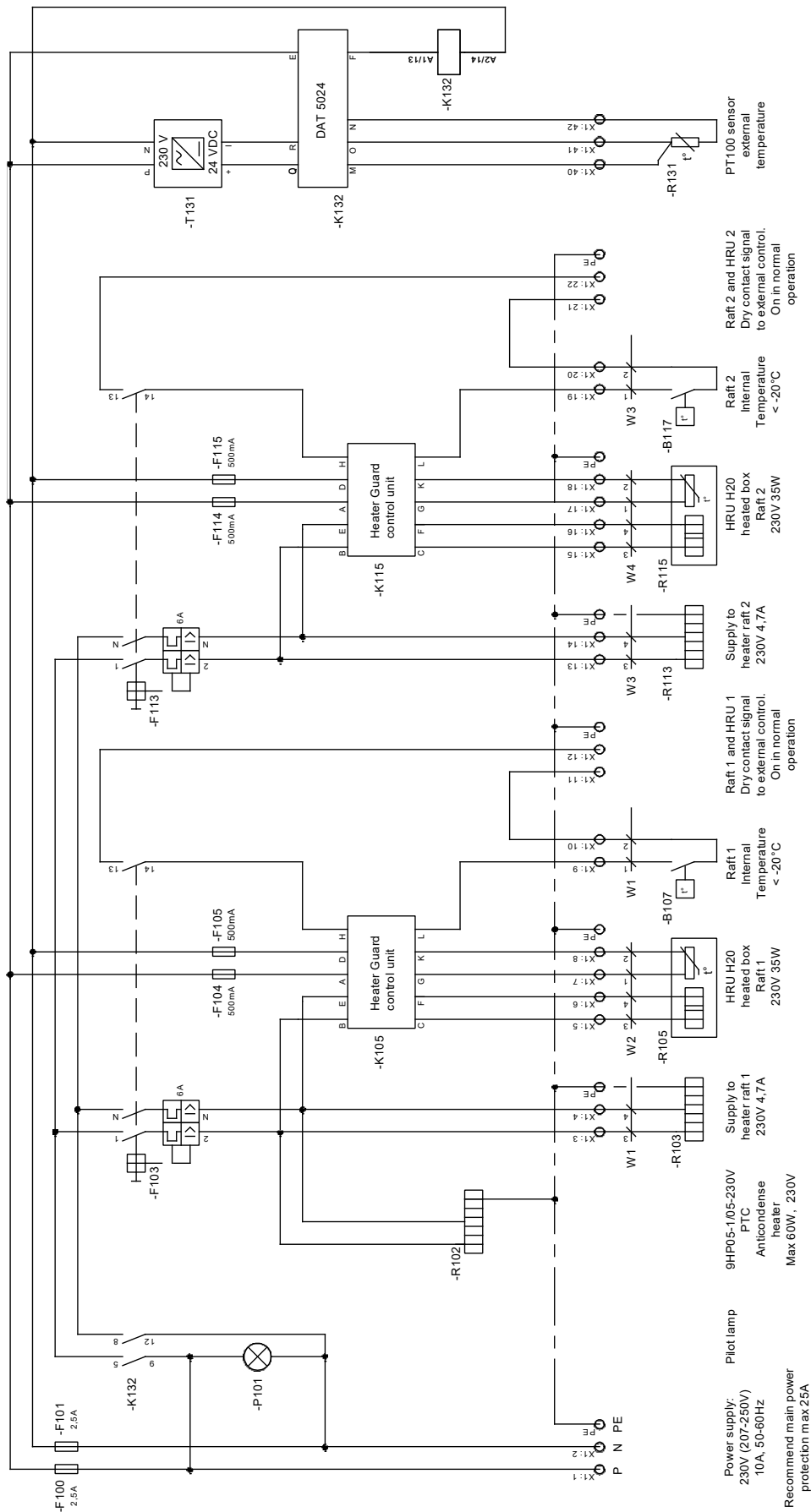
Wiring diagram for two liferafts – From March 2023



Mounting instruction for VIKING POLAR heating system V-MI-0190



Wiring diagram for two liferafts – Before March 2023

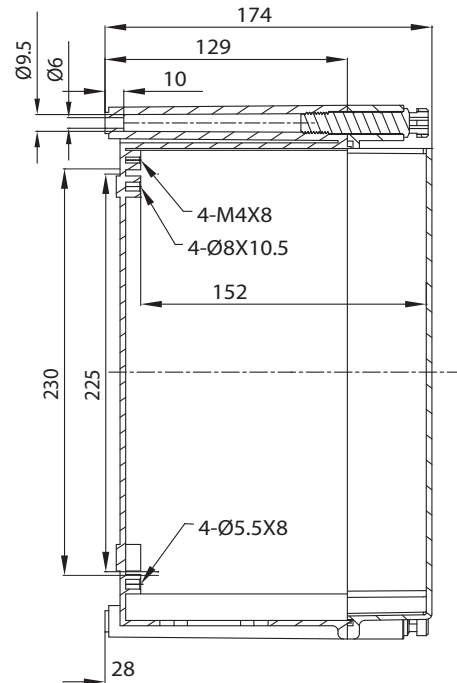
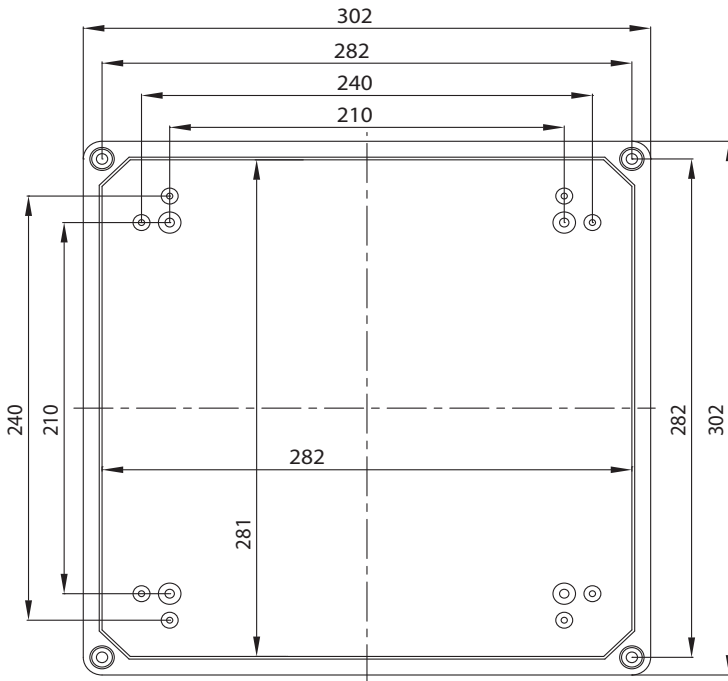


Mounting instruction for VIKING POLAR heating system

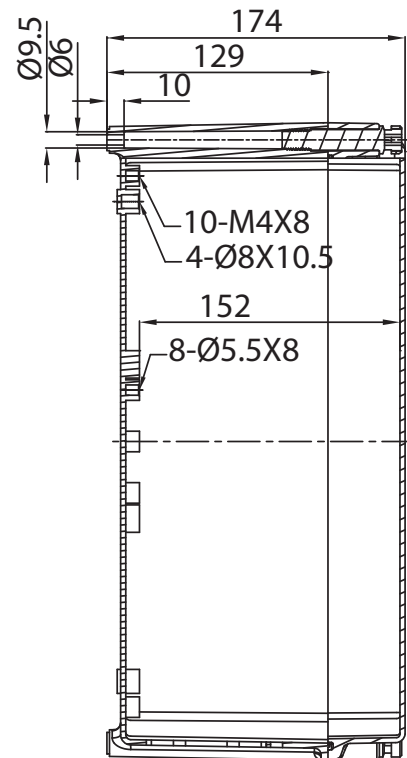
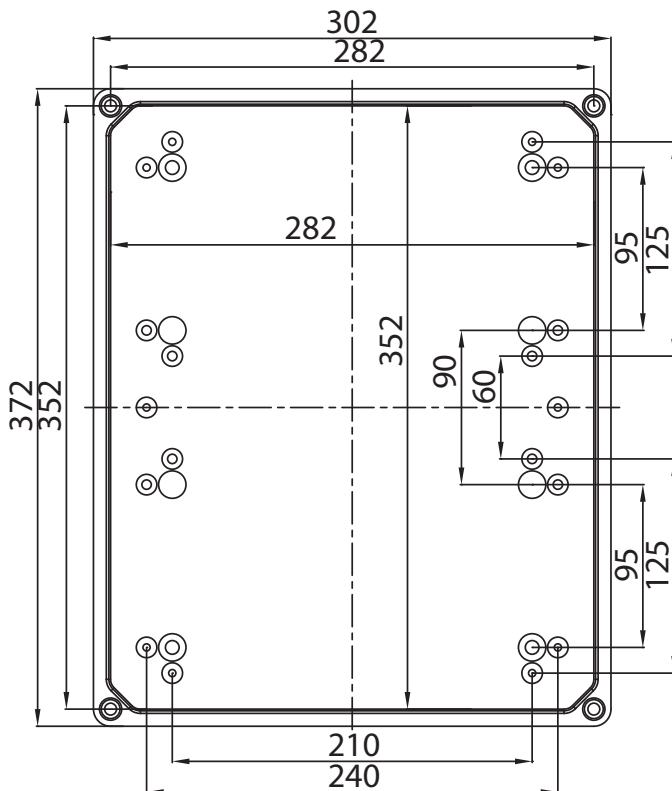
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Mounting layout Box for two liferafts



Box for three liferafts





Check form for Polar liferaft heating system
Print and fill in.

Type:		Serial No.:			Date:		
Before powering							
Check:	Terminals -X1 – Liferaft number:			Measure with multi-meter:	Measured value – Liferaft number		
	1	2	3		1	2	3
1	Resistance Liferaft heater elements	3 - 4	13 - 14	23 - 24	46.5-51.5 Ω (<20°C)		
2	Resistance HRU heater elements	5 - 6	15 - 16	25 - 26	800-1100 Ω		
3	Resistance HRU NTC	7 - 8	17 - 18	27 - 28	55-10000 Ω		
4	Alarm sensor	9 - 10	19 - 20	29 - 30	0-10 Ω		
5	Insulation	Liferaft connector pin - liferaft container			>1 MΩ		
6	Installation check	Connector and glands must be tightened to avoid water ingress. Connector may not dangle Cable from HRU heater to liferaft must be free to secure float free.					
After powering							
7	Power check	1 - 2			230 V		
8	Thermostat function	Heater in liferaft must warm when sensor is cooled down.					
9	Limiter function	Surface on liferaft may not exceed approx. +50°C					
10	Alarm signal	11 - 12	21 - 22	31 - 31	0 V if no alarm	Ship voltage supply for Alarm	
11	Alarm function	Disconnect the plugs Turn of circuit breaker					

Signature:

Mounting instruction for VIKING POLAR heating system V-MI- 0190



Helping guide for the check form For fault finding

Check heating mats on upper pins.

Check alarm sensor on lower pins.



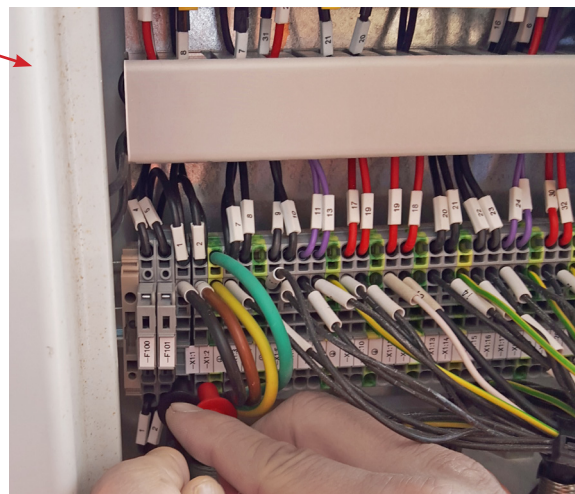
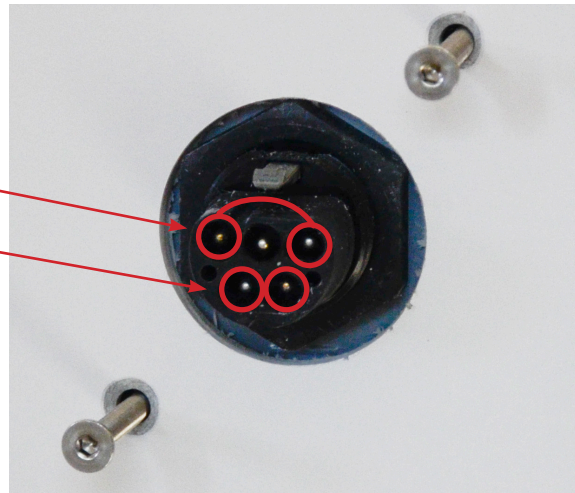
Resistance must be measured when all thermo-limiters are turned **OFF**.

Measuring at terminals



For liferafts manufactured from **April 2019**, the thermo-limiters are turned **ON** at limiter temperatures above +50°C and turned **OFF** at temperatures below +30°C"

For liferaft manufactured before **April 2019**, the thermo-limiters are turned **ON** at limiter temperatures above +30°C and OFF below temperatures +10°C



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Maintenance performed by certified electrician

Cables and plugs must be inspected regularly for damages according to applicable regulations and considering voyage conditions.

The Thermal Control Box contains a temperature sensitive thermo sensor for control of the temperature. When the sensor temperature is below the temperature set, the relay activate and the heat turns on. The temperature is default set to +5°C.

To control the heating elements

- Cool down the thermo-sensor using ice cubes.
- Wait a short time and place a hand on the container to check if the container is warm.

Each heating element in the liferaft container is fitted with an overheating thermo limiter.



Resistance must be measured when all thermo-limiters are turned **OFF**.



For liferafts manufactured from April 2019, the thermo-limiters are turned **ON** at limiter temperatures above +50°C and turned **OFF** at temperatures below +30°C"

For liferaft manufactured before April 2019, the thermo-limiters are turned **ON** at limiter temperatures above +30°C and OFF below temperatures +10°C

Regular inspections performed by crew

The liferaft container has a built in thermo sensor alarm to supply the vessel with an alarm signal if the temperature inside the container get below -20°C.

Check that the alarm signal is working properly by disconnecting any of the cable connections. If no alarm is achieved, then there is an installation error.

The alarm can activate by different failures for example

- Power failure on power supply
- Circuit breaker activate due to short circuit
- Open circuit failure in the cables
- Cables are disconnected
- Low temperature alarm in container or HRU due to failure in heating elements or missing power supply.

Service

The HRU (Hydrostatic Release Unit) must be inspected as manufactures recommendations.

A HRU unit **NOT** properly marked with expiry date must be replaced.

Service of liferaft. See page 4.

Fault isolation and detection performed by certified electrician

Fault isolation and detection is necessary in order to get the malfunctional components reimbursed by VIKING Life-saving Equipment.

The electrician performs a stepwise fault detection and should be able to isolate the specific malfunctional component listed in the Spare part list, page 19.

If the TCB is located as the failure, further detection is needed. The failure should be isolated componentwise with reference to the wiring diagram.

VIKING Life-saving Equipment shall be informed:

- What is the failed spare part? For the TCB, what is the specific failed component?
- How has the fault isolation and detection been performed and what is the measured failure value?

Mounting instruction for VIKING POLAR heating system

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Spare part list

1056182 VIKING Mounting Instruction for POLAR (VMI-0190).

For external connections

- D** 1039973 Set of 2 x 5m cable with female connectors and protection caps:
 - D2** 1050678 Cable with female connector (Black marking)
 - D3** 1050681 Cable with female connector (Turquoise marking)
- 1050685 Protection cap for Female connector
- 1074490 Protection cap for male connector
- D4** 1053194 Connector set male and female black
- D5** 1053193 Connector set male and female turquoise

For liferaft container (Only to be replaced at service station)

- B** 1037060 Heating mats, Universal
 - 1050660 Splitter Box POLAR
 - 1050677 Safety Thermo Sensor for heating mats

For Thermal Control Box

- A** 1056143 Thermal Control Box for two liferafts
- A** 1056183 Thermal Control Box for three liferafts
 - 2** 1061425 ANALOG TRIP AMPLIFIER DAT 5024
 - 1061426 RTD PT100 SENSOR
 - 7** 1061427 POWER SUPPLY 24 VDC 0,5A
 - 3** 1061424 POWER RELAY 15 A 230 VAC
 - 4** 1050696 Heat guard
 - 1050697 Glass fuse - 0.5A
 - 1050698 Glass fuse - 2.5A
 - 1084749 TCP Indicator lamp

HRU HAMMAR H20 POLAR Box and Spare Parts S30:

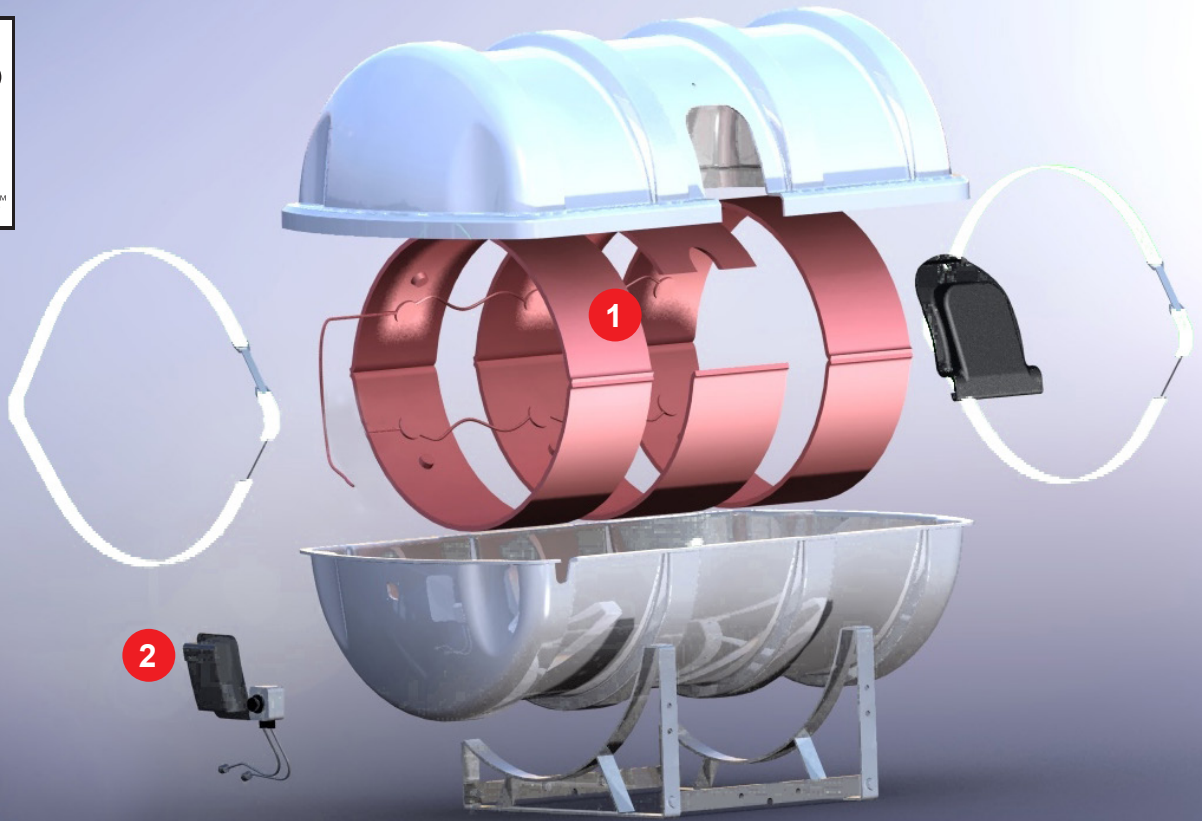
- C** 1141106 HAMMAR HRU heater Box with HRU
 - 1052011 Service kit for HAMMAR H20 POLAR Box:
 - 1051053 HRU H20 with line
 - C1** 1039977 Cable 1.5m with plugs and HRU
 - 1052112 Expiry date label

ERU (Electric Release Unit) HAMMAR POLAR Box and Spare Parts S30:

- 1158100 HAMMAR ERU BOX with ERU
- 1158388 Service kit for HAMMAR ERU Box

Recommended spare parts for ship

- 1053194 Connector set male and female black
- 1053193 Connector set male and female turquoise
- 1061425 ANALOG TRIP AMPLIFIER DAT 5024
- 1061426 RTD PT100 SENSOR
- 1061427 POWER SUPPLY 24 VDC 0.5A
- 1061424 POWER RELAY 15 A 230 VAC
- 1050696 Heat guard
- 1050697 Glass fuses - 0.5A
- 1050698 Glass fuses - 2.5A
- 1040482 HAMMAR HRU heater Box with HRU
- 1158100 HAMMAR ERU BOX with ERU (S30)



VIKING Polar Liferaft heating system

Always ready for use - even at -52°C temperatures

- VIKING Liferrafts are approved according to SOLAS, IMO Res. A1024(26) Guidelines for ships operating in polar waters and Russian Winterization of Liferrafts -52°C regulations
- Certified for use down to -52°C by DNV, USCG, TC Canada and RMRS
- Hammar[®] HRU stored in heated container
- A-Pack with extra food rations
- Available for 6-39 person throw-overboard and davit launched liferafts

VIKING Polar liferafts are certified for use down to -52°C . However, the Polar Code Resolution MSC.385(94) requires that vessels specify the type of equipment and functional requirements necessary for the route planned. Therefore liferafts and other safety equipment must be specified individually according to weather conditions in the area to obtain approval. Please refer to the code.

Standard GRP containers equipped with heating mats mounted on the inside of the containers

1. Built-in heating mats inside the container prevent over-icing
2. Waterproof connectors join the heating mats to the thermal control box

VIKING LIFE-SAVING EQUIPMENT A/S

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