SIMRAD

SRT LAN Radar sensor X-band up-mast

Service Manual

ENGLISH

www.navico.com/commercial

Preface

Disclaimer

As Navico is continuously improving this product, we retain the right to make changes to the product at any time which may not be reflected in this version of the manual. Please contact your nearest distributor if you require any further assistance.

It is the owner's sole responsibility to install and use the equipment in a manner that will not cause accidents, personal injury or property damage. The user of this product is solely responsible for observing maritime safety practices.

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This manual represents the product as at the time of printing. Navico Holding AS and its subsidiaries, branches and affiliates reserve the right to make changes to specifications without notice.

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Warranty

The warranty card is supplied as a separate document. In case of any queries, refer to the brand website of your unit or system:

www.navico-commercial.com

Compliance statement

Navico declare under our sole responsibility that the product conforms with the requirements of:

- European Council Directive 2014/90/EU on Marine Equipment modified by Commissioning Directive (EU) 2018/773 - Wheelmark

The relevant declaration of conformity is available in the product's section at the following website: www.navico-commercial.com

About this manual

Intended audience

This manual is written for service engineers.

The manual assumes that the reader has basic knowledge about this type of equipment in regards to:

- Maintenance work to be carried out
- Nautical terminology and practices

Important text conventions

Important text that requires special attention from the reader is emphasized as follows:

→ ***Note:*** Used to draw the reader's attention to a comment or some important information

! **Warning:** Used when it is necessary to warn personnel that they should proceed carefully to prevent risk of injury and/or damage to equipment/ personnel.

Change log

Part no	Date and description
988-12292-001	2018-10-12
	First version
988-12292-002	2018-10-18
	Second revision, Performance monitor replacement update

Safety precautions

Safety precautions described in this section are applicable to the radar system. They are general safety precautions that are not related to any specific procedure, and they might therefore not appear elsewhere in this manual. They are recommended precautions that personnel must understand and apply during operation and maintenance of the system.

You are obliged to read these operating instructions prior to operation, and to adhere to the operating instructions in order to prevent possible danger. Prevention of danger includes that operator personnel are trained and authorized for safe operation of the equipment. We assume no liability for damage due to improper operation which could have been prevented.

The system must only be operated by persons who have passed the relevant mandatory training on the respective systems and applications. Only reading these operating instructions cannot replace such training. Persons authorized to operate, maintain and troubleshoot the system are instructed and trained by Simrad. Persons operating or servicing this radar system must be familiar with the general safety regulations and specific safety systems, and they must have passed all required training. They must have read the relevant operating instructions and manuals before starting to work.

Have these operating instructions always at hand on all relevant locations, and ensure that copies are available to all operators. Operating personnel must at all times follow all safety regulations.

During normal operation, the unit can be quickly disconnected from the main power line by turning OFF the relevant circuit breaker located on the electric switchboard.

Do not replace components or make adjustments inside the unit when the voltage supply is turned ON. Always remove power and discharge to ground a circuit before touching it. Under no circumstances should any person initiate servicing or repairing the unit except in the presence of a qualified person.

Ensure unobstructed access to all operator panels, controls, and relevant switchgear cabinets in order to enable instant response to alarms.

Whenever it is necessary to disconnect the waveguide from a radar transmitter for maintenance purpose, the transmitter output should be terminated with a matched load. If this is not possible, care should be taken. Do not stand in front of an open-ended waveguide from which power is being radiated.

→ ***Note:*** Main power is always present on the terminal board unless the main break from the power distribution panel of the vessel is turned off.

! **Warning:** Never look down a waveguide from which power is being radiated.

Warnings

High voltage

Radar equipment includes high voltage that can cause injury or loss of life. Danger exists only when the units are opened, exposing internal circuits, as when servicing the equipment.

This radar has been carefully designed to protect personnel from possible injury from high voltages. Although every effort has been made to eliminate danger to personnel, no responsibility is accepted for any injury or loss of life suffered in connection with this equipment.

Radio frequency radiation

Harmful effects (particularly to the eyes) may be caused by exposure of any part of the human body to high power radio frequency radiation.

The system is however designed to always disable the microwave radiation when the antenna is not rotating.

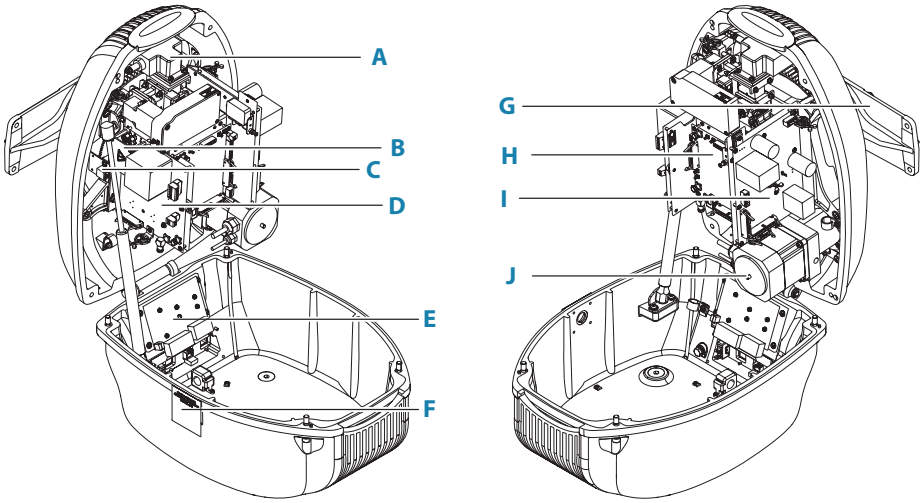
Configuration	Distance 100 W/m2 point (m)	Distance 50 W/m2 point (m)	Distance 10 W/m2 point (m)
12 KW Transceiver 6' X-band Antenna	-	0.15	0.6
12 KW Transceiver 9' X-band Antenna	-	-	0.5
12 KW Transceiver 12' X-band Antenna	0.1	0.1	1.3
25 KW Transceiver 6' X-band Antenna	0.1	0.2	1.3
25 KW Transceiver 9' X-band Antenna	-	0.1	1.0
25 KW Transceiver 12' X-band Antenna	-	0.05	0.9

X-Ray radiation

This radar system does not generate X-ray radiation.

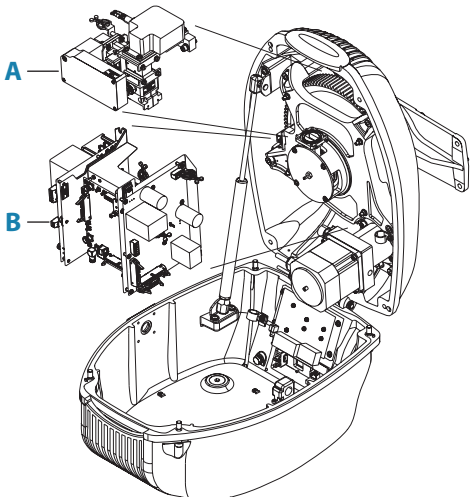
Contents

1 Component overview



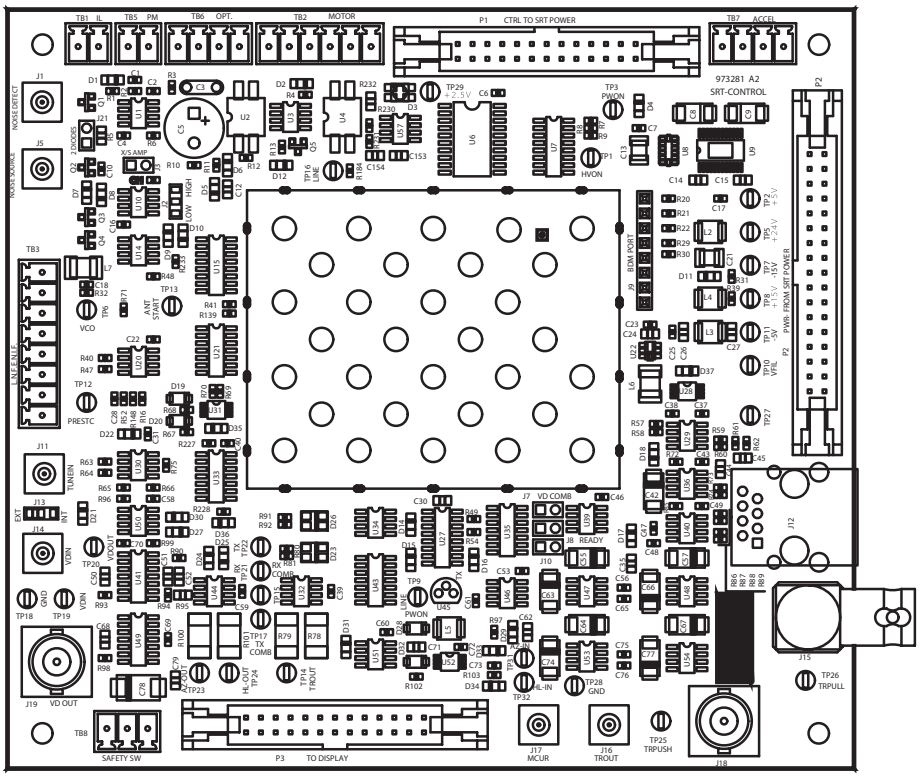
	Description
A	Magnetron
B	Magnetron HV connection
C	Bearing reader board
D	SRT MOS PCB
E	Brushless motor controller
F	Performance monitor connection point
G	Antenna platform
H	SRT Control PCB
I	SRT PWR-DC PCB
J	Motor & gearbox assembly
	SRT LAN CPU PCB
	Mini-PSU PCB

→ ***Note:*** The Mini-PSU PCB and SRT LAN CPU PCB are not shown here, as they are concealed within the electronics assembly.



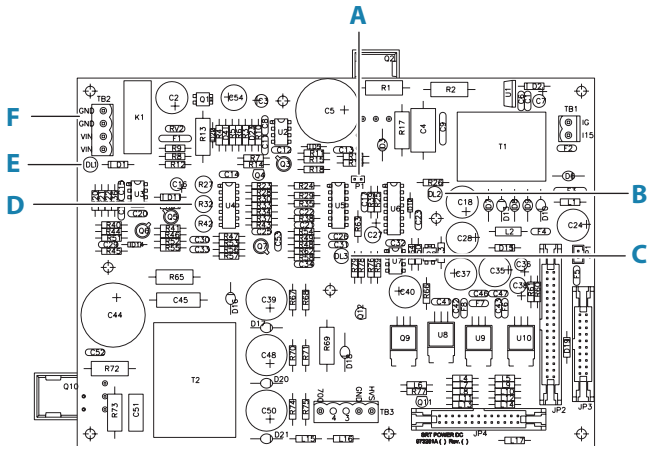
	Description
A	RF Assembly
B	Electronic assembly

SRT Control PCB



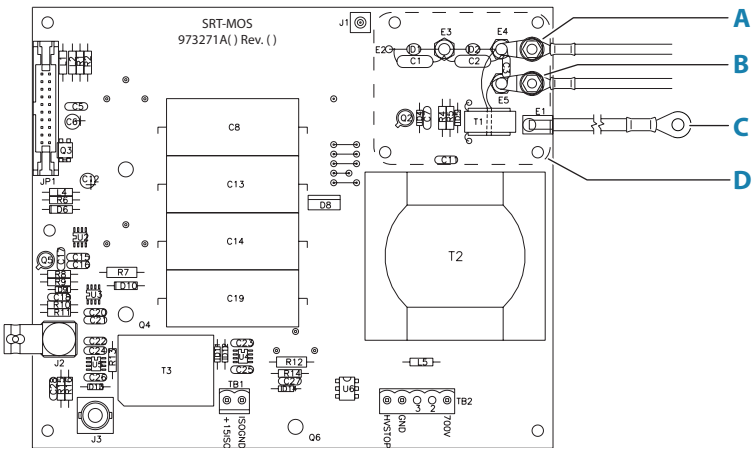
Label	Purpose
D3	LED AGB
D23	TX green
D26	Line OK
J1	Noise detect
J10	Enable boatloader programming
J11	Tune In
J12	Antenna data sensor
J14	Video In
J21	2 PM diodes (1 diode S-band, 2 diodes X-band)
J3	X/S AMP
J5	Noise source
J7	VD comb
J8	Debug
TB1	Interlock
TB2	Motor controls
TB3	RF controls
TB5	Performance monitor
TB6	OPT. motor controller/heater voltage
TB8	Safety switch

SRT PWR-DC PCB



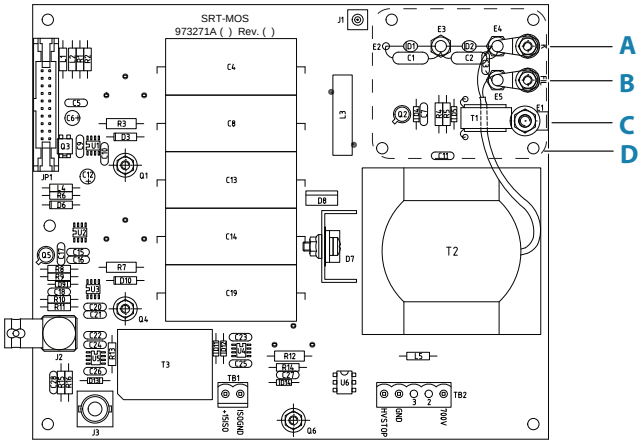
	Label	Purpose
A	P1	PW_ON (normally open, closed puts the TXRX in STBY)
B	DL2	LED ON (green): + 5,1 V DC OK
C	DL3	LED ON (red): High voltage OK (700 V DC for modulator)
D	R27, R32, R42	Modulation H .V. Adjustments factory made
E	DL1	LED ON (green): + 52 V DC input OK
F	TB2	Main Power input

SRT MOS PCB 12 Kw



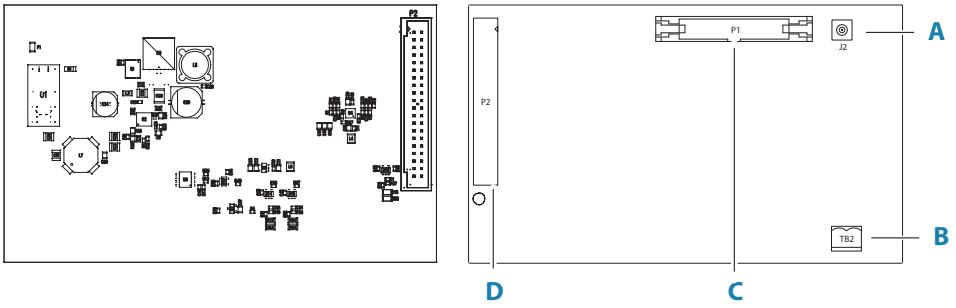
	Label	Purpose
A	K	Magnetron cathode terminal
B	FIL	Magnetron filament terminal
C	GND	Grounding wire
D		Transparent cover

SRT MOS PCB 25 Kw



	Label	Purpose
A	K	Terminal
B	FIL	Terminal
C	GND	Grounding wire
D		Transparent cover

Mini-PSU PCB

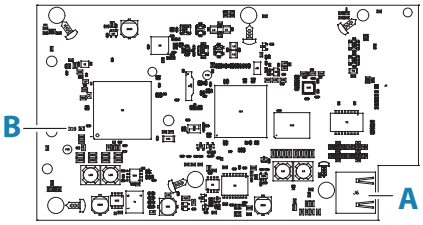


Top view

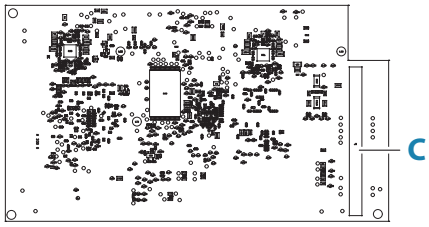
Bottom view

	Label	Purpose
A	J2	VD IN
B	TB2	Power IN (52 V)
C	P1	TXRX data
D	P2	CPU data

SRT LAN CPU PCB



Top view



Bottom view

	Label	Purpose
A	J6	Lan connector
B	D18	Red LED: - lit at start-up or halt condition - flashing bright during working conditions
C	J3	Interconnection with Mini-PSU PCB

2 Preventive maintenance

Follow the procedures that are described in this chapter to ensure the radar system operates at its optimum.

! **Warning:** High voltage is present inside the unit. Do not open the cabinet cover before the main radar breaker has been turned to the off position. Switch off the power supply before connecting measurement instruments inside the unit.

! **Warning:** Before starting any maintenance or repair work, it is mandatory that, for the safety of personnel, all high-voltage capacitors be short circuited by means of an insulated screwdriver or other suitable tool.

→ ***Note:*** All work performed on the transceiver must be recorded in the unit log book.

External inspection of the radar sensor

The operation is performed twice a year.

1. On the electric switchboard, switch OFF the radar main breaker and place a card reading WORK IN PROGRESS - DO NOT SWITCH ON
2. Switch the safety switch to the Off position
3. Place a card at the radar controls stating that the unit is being serviced
4. Check that no parts of the plastic covering the antenna have been painted
5. Check the state of the casing preservation
6. Unscrew and grease the four fastening screws of the cover to avoid corrosion and facilitate future inspections
7. If paint has been scratched off at any point
   - Degrease the part to be painted
   - Scuff lightly with emery paper
   - Dust off with a dry brush
   - Apply a rust resistance paint system suited to harsh environments. Refer to paint supplier instructions for details
8. Switch the safety switch to the ON position
9. On the electric switchboard, set the radar main breaker to ON and remove the warning card

Internal inspection of the X-band up-mast transceiver

This operation should be performed twice a year.

1. On the electric switchboard, switch OFF the radar main breaker and place a card reading WORK IN PROGRESS - DO NOT SWITCH ON
2. Switch the safety switch to the Off position
3. Position the antenna so it is facing the bow of the vessel
4. Unscrew the fourcrews securing the cover
5. Open the cover fully
6. Check for any signs of water ingress

Connectors and cables inspection

1. Check the condition of all connector contacts (pins and plugs)
2. Clean with dry brush if necessary
3. Repair or replace any corroded or defect parts

Mechanical inspection

1. Check the gear integrity
2. Add a thin coating of grease if the main gear shows lack of lubrication
3. Check that there are no loose screws inside the cover
4. Replace or tighten screws as necessary.

General cleaning

Internal cleaning is necessary only when a visible buildup of dirt is present. Use IPA alcohol if necessary.

Dry any damp surfaces by using a soft cloth.

Final steps

1. Grease the fastening screws to prevent corrosion and ease future removal
2. Apply a small amount of silicone grease to the O-ring to refresh the water sealing
3. Secure the cover in place
4. Switch the safety switch to the ON position
5. On the electric switchboard, set the radar main breaker to ON and remove the warning card

Magnetron replacement

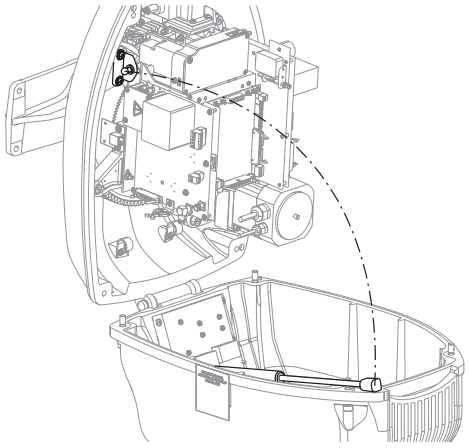
This operation should be performed as required or after 8000 hours of operation

Hardware

1. On the electric switchboard, switch OFF the radar main breaker and place a card reading WORK IN PROGRESS - DO NOT SWITCH ON
2. Switch the safety switch to the Off position
3. Position the antenna so it is facing the bow of the vessel
4. Unscrew the four screws securing the cover
5. Open the cover fully

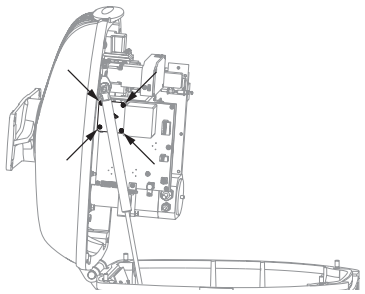
→ ***Note:*** The cover should be held open by the gas strut. The gas strut may be disconnected at one end if required for improved access to the internal parts. Hold the cover firmly with one hand, then using a small slot screwdriver, undo the metal clip securing the gas strut's upper ball joint and pull the strut outwards to disengage. The cover may be hinged backward slowly utill the hinge reaches its limit. The top cover should be secured so it cannot accidentally close.

6. Disconnect the gas strut



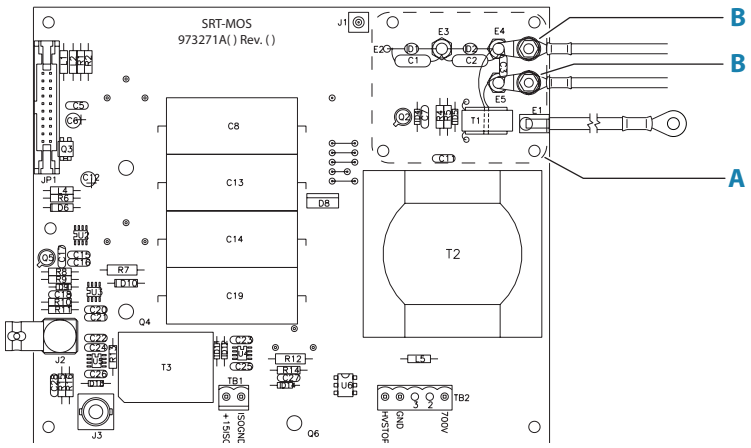
→ ***Note:*** The top cover is very heavy and if unsecured and accidentally allowed to close, it could cause serious injuries.

7 Unscrew the four screws securing the protective transparent cover (**A**) over the magnetron high voltage connections on the SRT MOS PCB



8 Remove the nuts securing the magnetron wires (**B**)

9 Remove the magnetron wires from the terminals, taking note their position

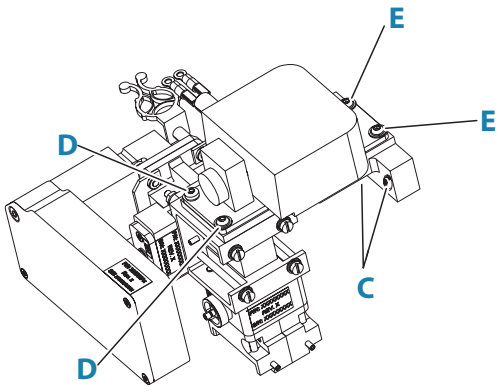


10 Reconnect the gas strut

11 Remove the two screws securing the RF assembly to the cover (**C**)

12 Remove the two screws securing the magnetron and the grounding wire (**D**)

13 Remove the magnetron from the RF assembly



14 Remove the two screws securing the magnetron to its bracket (**E**)

15 Remove the magnetron

16 Before fitting the new magnetron, spread a layer of silicone compound on the contact surface to improve the magnetron's heat dissipation

17 In order to install the new magnetron, perform the removal steps in reverse order, leaving the cover open at this stage

18 Switch the safety switch to the ON position

19 On the electric switchboard, set the radar main breaker to ON and remove the warning card

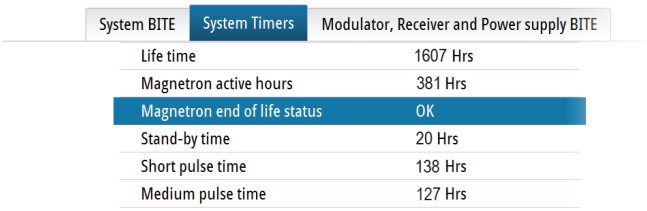
20 Warm up the radar for 30 minutes

Software

There is a timer that counts the number of hours the magnetron has been transmitting. The system gives a warning when the magnetron is close to the end of its expected lifetime.

From the radar data dialog, it is possible to view the hour count and the magnetron end of life status (which reports OK or FAIL). When the magnetron is replaced, the timer should be reset.

Access the Installation dialog, and select the magnetron timers reset option.



Tuning and performance monitor calibration

After magnetron replacement, we need to test the following:

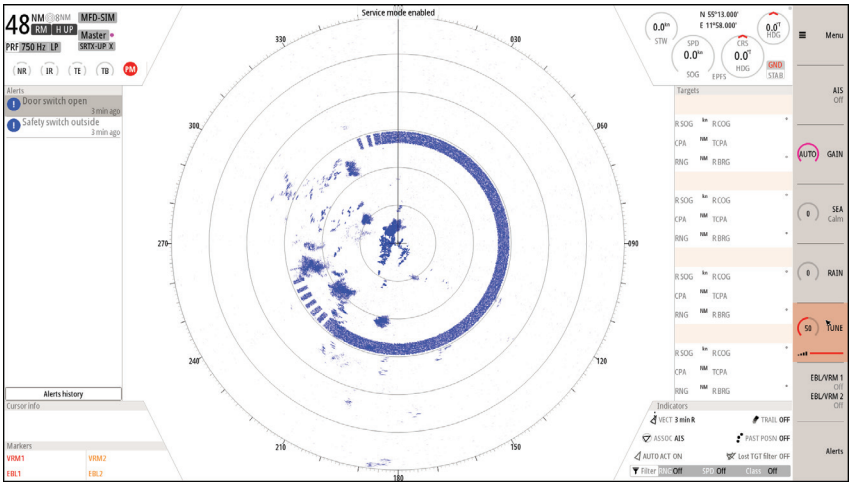
1 Tuning adjustment

2 Performance monitor adjustment (if needed).

3 Timers reset

Tuning

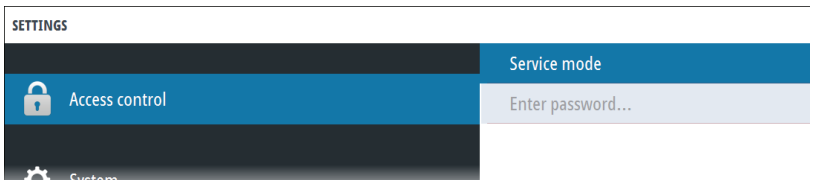
Set radar on 24Nm. Set manual tuning to 50% and verify that the radar video performance is good with the tuning indicator bar at 80%.



It is mandatory to carry out tuning adjustment following replacement of the magnetron. Please follow the procedure below.

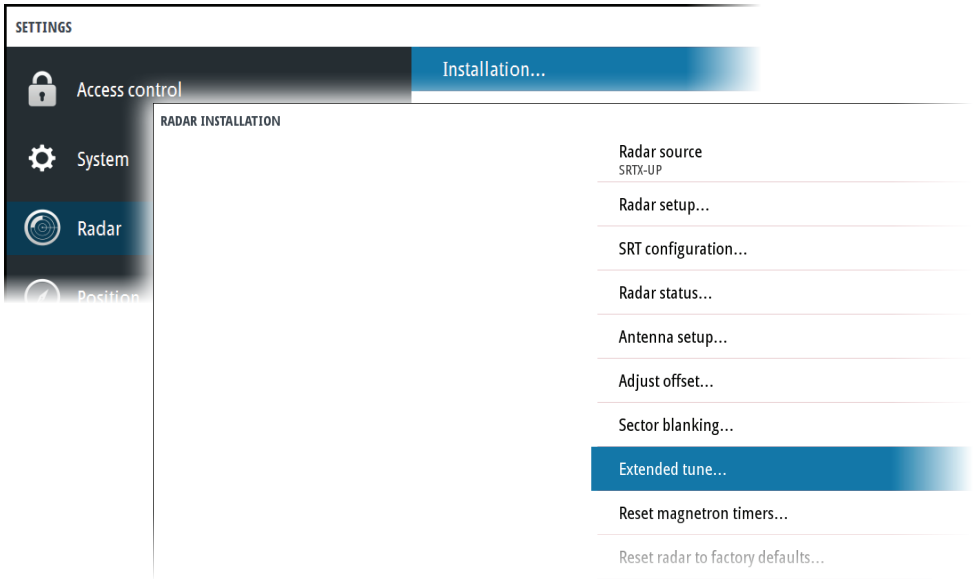
1 From the Menu, select Settings and then Access control.

2 Enter password “QWERTY” to enable the Service mode.



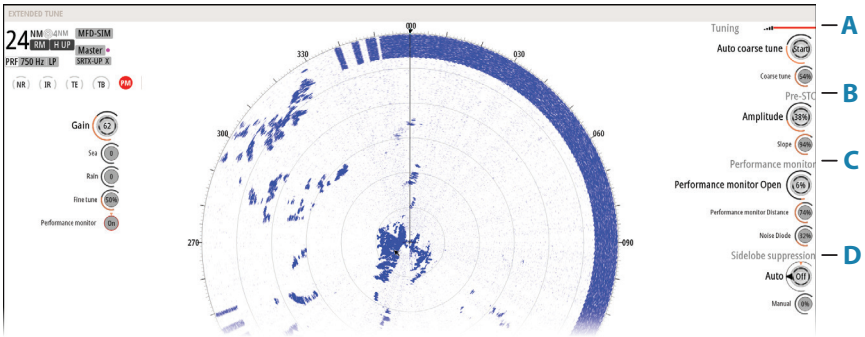
3 From the Settings dialog go to Radar and select Installation...

4 Select Extended tune



Extended tune

The extended tune allows for initial tuning and adjustment of the radar system.



	Adjustment options
A	Tuning
B	Pre-STC
C	Performance monitor
D	Sidelobe suppression

➔ ***Note:*** The status and controls icons are located on the right side of the extended tune image. The adjustment settings on the left side are to be carry out by the service engineers.

Be sure that radar is on 24 Nm range. Set the Fine Tune on manual at 50% .

STC and FTC filter at 0%. IR off. Performance monitor On.

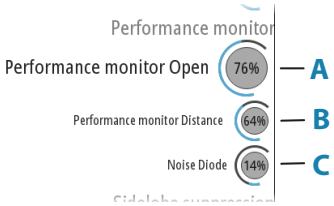
Adjust the Coarse Tune to obtain maximum echoes brightness on the screen with 80% on tune bar.

➔ ***Note:*** Adjusting the Coarse tune from 0% to 100% causes the echo brightness and target detection to increase then decrease again as the tuning is increased. Adjust the course tune to give maximum echo brightness and target detection. Some small targets that were previously hidden will appear on the panel.

The Coarse tune position will be automatically saved.

Performance monitor adjustment

Ring Thickness must be 2 Nm with radar tuned.
Consider from 21Nm to 23 Nm.



Performance monitor open (A)

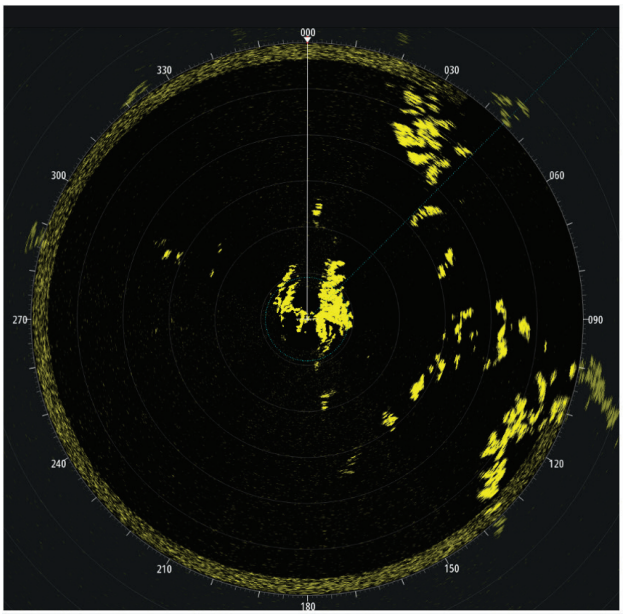
Select the Performance monitor open control and adjust to get an opening of about 50 - 100 degrees. This signal comes from the external PM lamp.

Performance monitor Distance (B)

Activate the Distance control and adjust the distance so that the ring is completely visible on 24 NM range.

Noise Diode (C)

Select the Noise Diode control and adjust so that the ring brightness is visible above the noise floor.

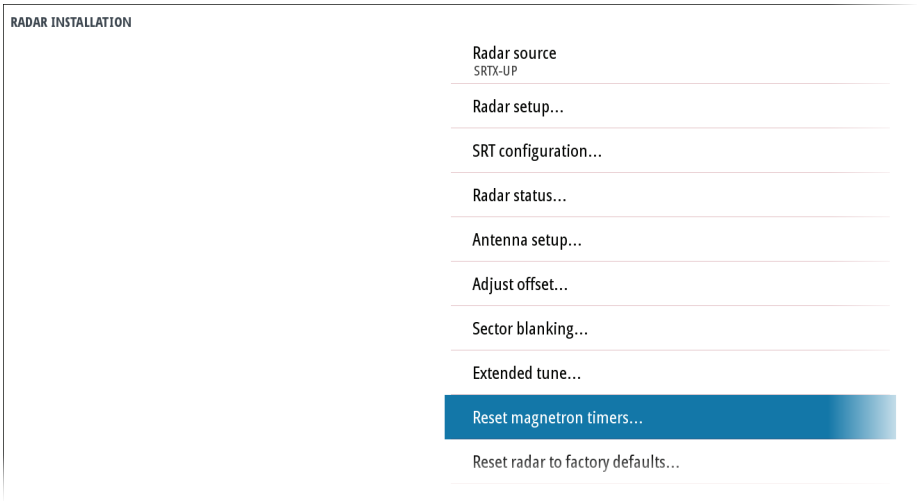


Timers reset

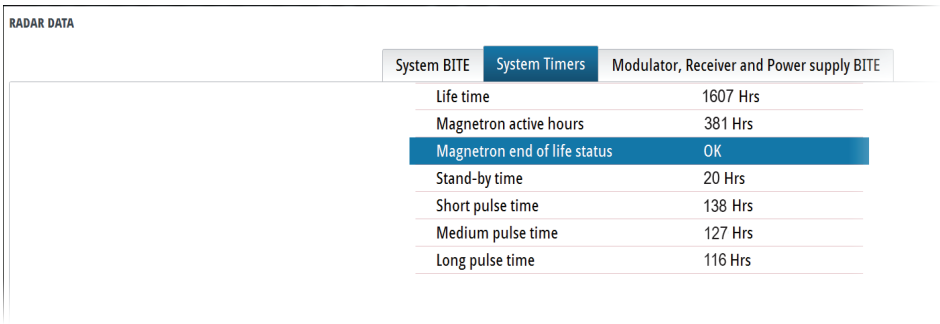
There is a timer to counts the number of hours the magnetron has been transmitting. The system gives a warning when the magnetron is close to the end of its expected lifetime.

From the radar data dialog, it is possible to view the hours count and the magnetron end of life status (which reports OK or FAIL).

When the magnetron is replaced the timer must be reset.



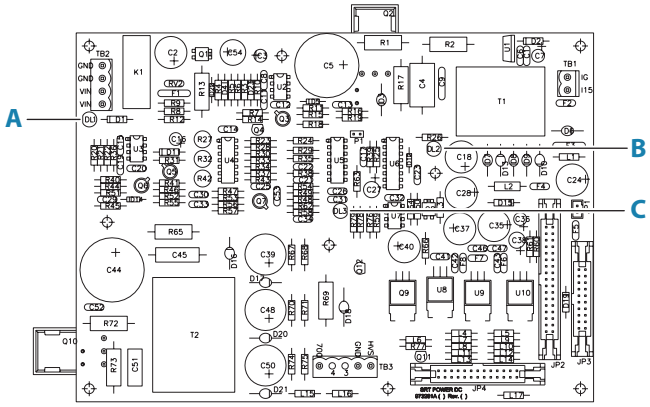
The transceiver lifetime cannot be reset, however, all the other counters will be reset.



3 Diagnostics

Power PCB LED indicators

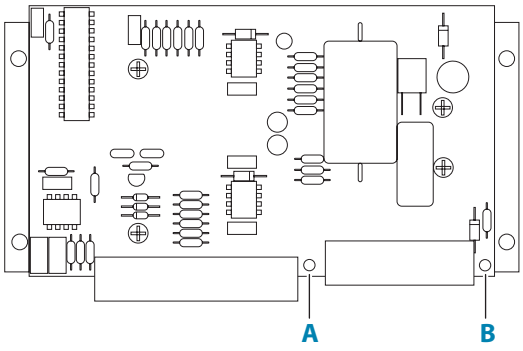
There are three LEDs on the SRT PWR-DC PCB that provide diagnostic information.



	PCB label	LED color	Indication
A	DL1	Green	LED ON: + 52 V DC input OK
B	DL2	Green	LED ON: + 5,1 V DC OK
C	DL3	Red	LED ON: High voltage OK (700 V DC for modulator)

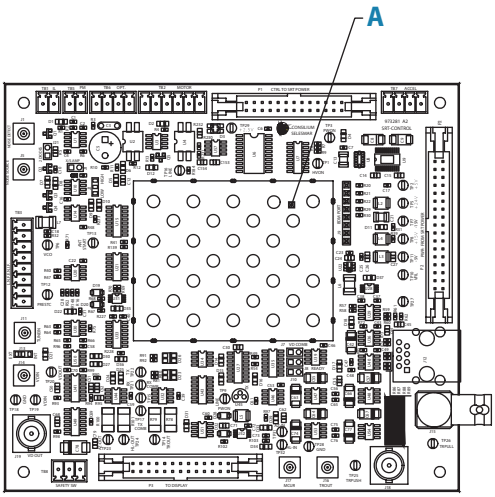
Brushless motor controller PCB LED indicators

There are two LEDs on the brushless motor controller that provide diagnostic information.



	PCB label	LED color	indication
A	DL2	Red	LED ON: motor in OFF or controller in protection LED OFF: motor in rotation
B	DL1	Green	LED ON: +52 V DC OK

SRT Control PCB

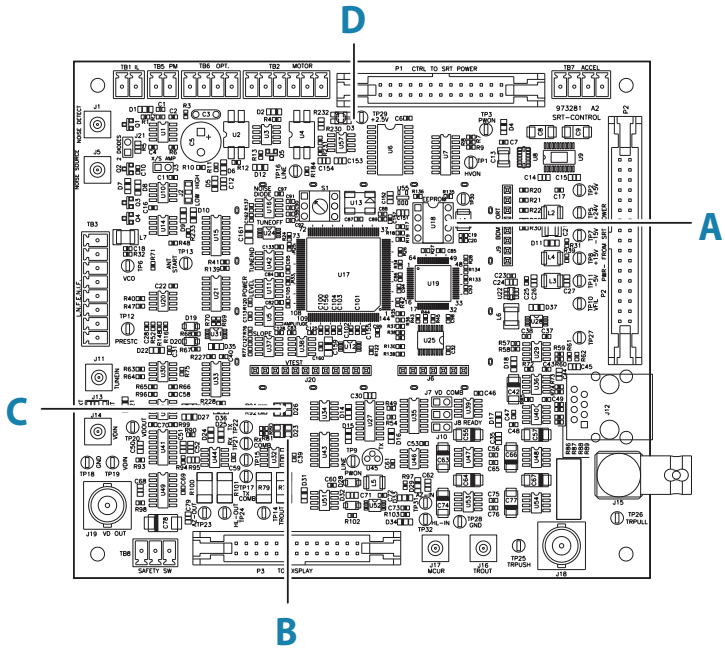


Opening the metallic cover (**A**) gives access to EEPROM U18

Magnetron life time and internal transceiver setup is resident on this device.

In case of SRT Control PCB replacement we suggest to also swap the memory to transfer the original setting to the new PCB.

➔ ***Note:*** Please use standard anti-static precautions to avoid damage to the EEPROM from electrostatic discharge.



	PCB label	LED color	Indication
A	EEPROM U18		
B	D23	Green TX / Red RX	Tx Rx Comm (RS232 or RS422)
C	D26	Green	Line ok /Power out Ok
D	D3	Red Green Blue	ST-BY Radiation and antenna in rotation

4 Troubleshooting

Symptom table

Symptom	Potential cause
Transceiver does not turn on	1, 2, 3, 4
Transceiver cannot be controlled	1, 2, 3, 4
Antenna data cannot be controlled	8, 9
Transceiver performance is low	5, 10, 12, 13
Antenna does not rotate	4, 6, 11
No magnetron current, No transmition or modulator fail alarm	5, 6, 7
Antenna rotation speed cannot be controlled	14

Potential cause and corrective action table

	Potential cause	Check	Corrective action
1	Power supply is missing or polarity is inverted	Check DL1 LED status and measure voltage on TB2 of SRT PWR-DC PCB	Connect the 52 V DC voltage from R5000 PSU properly
2	Power ON signal is missing	Close P1 link on SRT PWR-DC PCB and make sure the LED DL2 lights on properly	Replace SRT Control PCB, Mini PSU or LAN PCB
3	Voltage supply is too low	Check DL1 LED status and measure voltage on TB2 of SRT PWR-DC PCB	Connect the 52 V DC voltage from R5000 PSU properly
4	Ethernet cable is interrupted	Check electrical continuity and insulation from GND	Replace the Ethernet cable
5	Magnetron exhausted	Check magnetron transmission hours and current.	Replace magnetron
6	The safety switch is open	Check switch position and continuity	Close the safety switch or replace it
7	High voltage generator is damaged	Disconnect 700 V cable from TB3 of SRT PWR-DC PCB, disconnect motor cables, turn S1 of the SRT Control PCB on position 3 and make sure DL3 is off	Replace SRT PWR-DC PCB or SRT MOS
8	Cable between Bearing Reader and SRT Control PCBs is interrupted	Check electrical continuity of the cables	Replace the cable
9	Circuits are damaged	Check input and output azimuth signals on SRT Control PCB and bearing reader	Replace the SRT Control PCB and bearing reader PCB
10	Transceiver performance is low	Receiver faulty, check the monitor BITE on the display	Replace RF Detector & limiter
11	Motor power supply is missing	Check if 52 V DC voltage value on brushless motor controller ends is low or missing	Connect the 52 V DC voltage to the Controller properly
12	Transceiver performance is low	Visually inspect the antenna to verify the condition	Antenna dust or damage

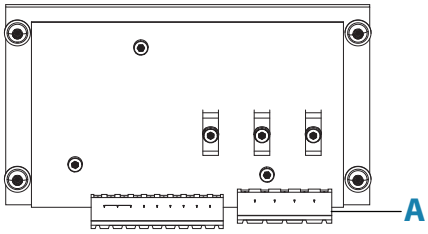
5 Fault repair

➔ ***Note:*** Maintenance must only be carried out after the equipment has been switched off. Before commencing with repair work, ensure the spare part is available, and its condition has been verified as good.

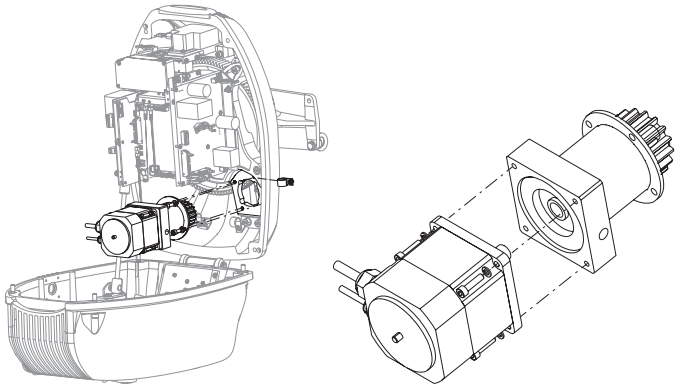
! **Warning:** The replacement operations must be carried out exclusively by skilled personnel with appropriate equipment training.

Motor or gearbox replacement

1. On the electric switchboard, switch OFF the radar main breaker and place a card reading WORK IN PROGRESS - DO NOT SWITCH ON
2. Switch safety switch to the Off position
3. Rotate the antenna by hand, as needed, so it is positioned facing the bow of the vessel
4. Unscrew the four cover screws
5. Open the cover fully
6. Remove the cabling connectors from the brushless motor controller, taking note of their position
7. Remove the three red wires and the three black wires from the CN2 connector (**A**), taking note of their position



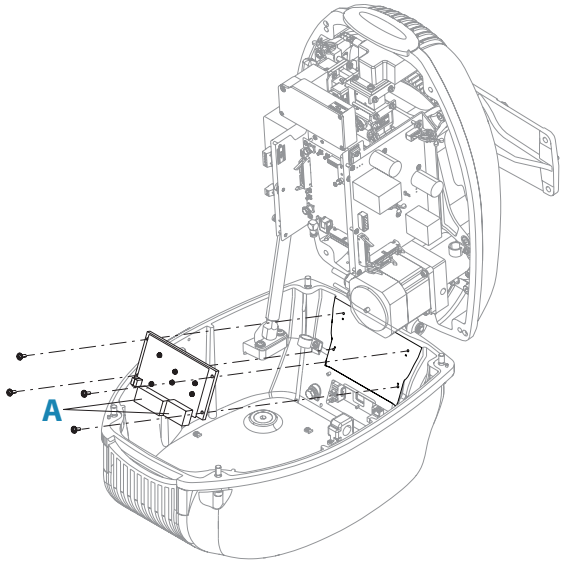
8. Remove the screw securing the grounding wire to the brushless motor controller
9. Remove the TB2 and TB6 cabling connectors from the SRT control PCB
10. Remove the motor cable from the cable clamps. Cut and remove the ties if necessary
11. Remove the four screws securing the motor and the gearbox
12. Remove the motor and the gearbox
13. Remove the four screws that attaches the motor to the gearbox



14. Replace the faulty item
15. In order to install the new motor or the new gearbox, perform the removal steps in reverse order
16. Switch the safety switch to the ON position
17. On the electric switchboard, set the radar main breaker to ON and remove the warning card

Brushless motor controller replacement

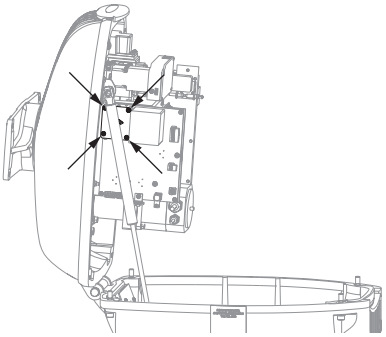
1. On the electric switchboard, switch OFF the radar main breaker and place a card reading WORK IN PROGRESS - DO NOT SWITCH ON
2. Switch safety switch to the Off position
3. Rotate the antenna by hand, as needed, so it is positioned facing the bow of the vessel. Unscrew the four cover screws
4. Open the cover fully
5. Remove the cabling connectors from the brushless motor controller, taking note of their position (**A**)
6. Remove the four screws securing the brushless motor controller
7. Remove the brushless motor controller



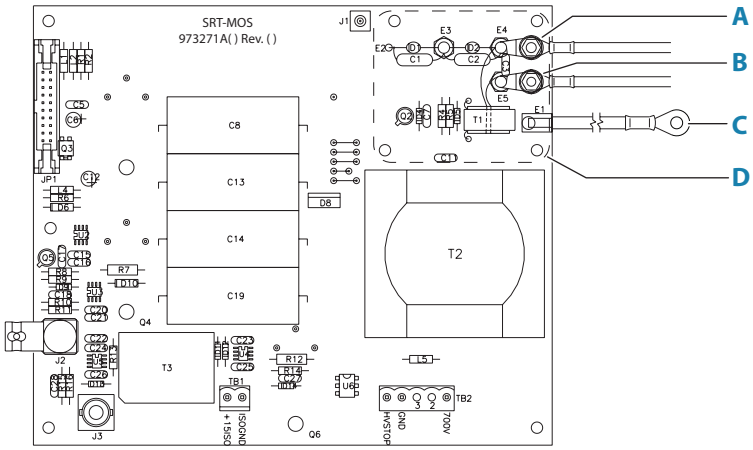
8. In order to install the new brushless motor controller, perform the removal steps in reverse order
9. Switch the safety switch to the ON position
10. On the electric switchboard, set the radar main breaker to ON and remove the warning card

Electronics assembly replacement

1. On the electric switchboard, switch OFF the radar main breaker and place a card reading WORK IN PROGRESS - DO NOT SWITCH ON
2. Switch safety switch to the Off position
3. Rotate the antenna by hand, as needed, so it is positioned facing the bow of the vessel
4. Unscrew the four cover screws
5. Open the cover fully
6. Remove the four screws securing the transparent cover over the magnetron connections on the SRT MOS PCB



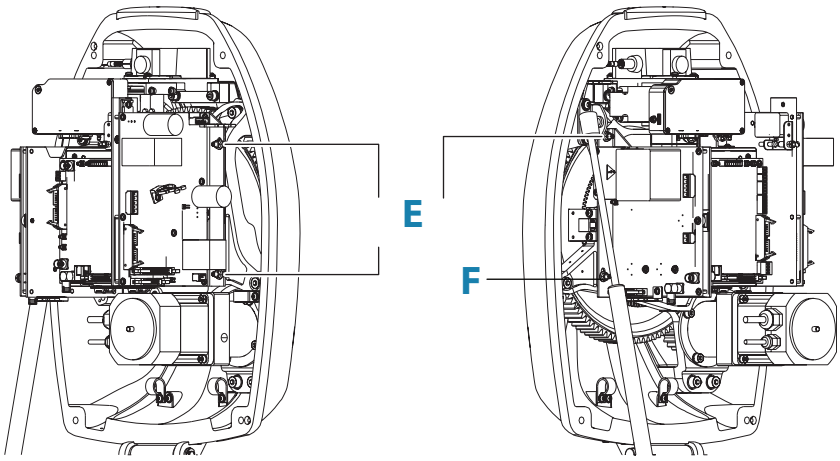
7. Remove the nuts securing the magnetron wires
8. Remove the magnetron wires from the terminals, taking note their position



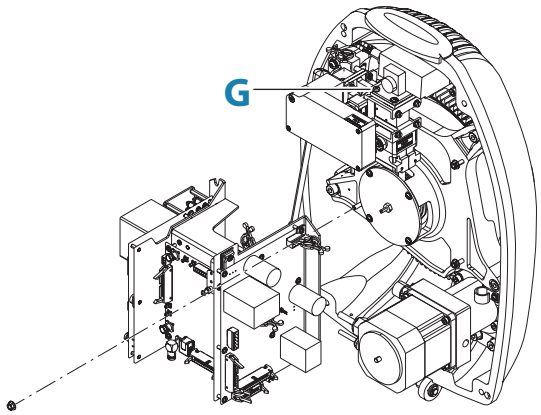
	Description
A	K terminal
B	FIL terminal
C	Grounding wire
D	Transparent cover

9. Remove the screw (**G**) securing the grounding wire to the magnetron
10. Remove the cable connector from the Bearing reader PCB, taking note of their position
11. Remove the J1, J5, J11 and J14 cable connectors from the SRT control PCB, taking note of their position
12. Remove the TB2, TB3, TB5, TB6 and TB8 cabling connectors from the SRT control PCB, taking note of their position
13. Remove the SRT LAN CPU PCB cable connector, taking note of its position
14. Remove the two wires attached to the internal contacts of the SRT PWR-DC PCB TB2 connector, taking note of their position
15. Remove the cabling from the cable clamp on the SRT PWR-DC PCB
16. Unscrew the three nuts (**E**) partially securing the Electronics assy

→ ***Note:*** Do not remove the nuts.



17. Remove the nut (**F**) securing the Electronics assembly
18. Remove the Electronics assembly. Pay close attention to the cables and the waveguide joint



19. Replace the EEPROM U18 on the new SRT control PCB with the one from the old SRT Control PCB. Failing to do so will mean the replacement must be configured, as all settings will be lost

→ ***Note:*** If this operation is not performed, then the unit must be set up manually from blank to recover values and settings stored in the old EEPROM.

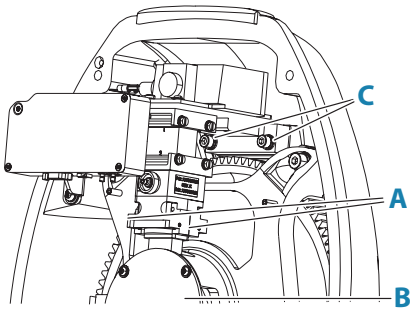
20. In order to install the Electronics assembly, perform the removal steps in reverse order
21. Switch the safety switch to the ON position
22. On the electric switchboard, set the radar main breaker to ON and remove the warning card

Magnetron replacement

Refer to "Magnetron replacement" on page 14.

RF head assembly removal

1. On the electric switchboard, switch OFF the radar main breaker and place a card reading WORK IN PROGRESS - DO NOT SWITCH ON
2. Switch safety switch to the Off position
3. Rotate the antenna by hand, as needed, so it is positioned facing the bow of the vessel
4. Unscrew the four cover screws
5. Open the cover fully
6. Remove the Electronics assembly. See "Electronics assembly replacement" on page 24



7. Unscrew the four socket screws (**A**) securing the RF head assembly to the waveguide flange (**B**) of the rotary joint

→ ***Note:*** Do not remove the socket set screws.

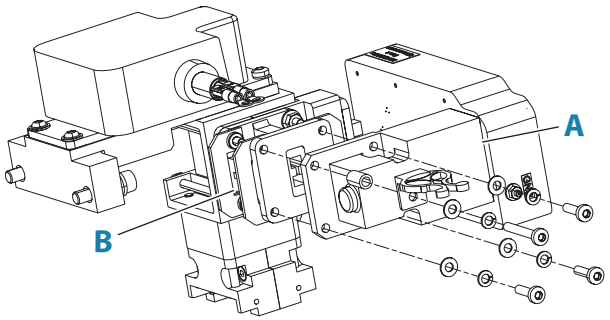
8. Holding the RF head assembly with one hand unscrew the two screws (**C**) securing the RF head assembly to the cover

→ ***Note:*** Do not remove the screws.

9. Extract the RF head assembly from the cover

RF detector and LNFE replacement

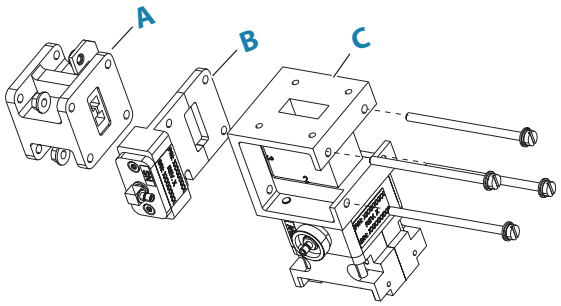
1. On the electric switchboard, switch OFF the radar main breaker and place a card reading WORK IN PROGRESS - DO NOT SWITCH ON
2. Switch safety switch to the Off position
3. Rotate the antenna by hand, as needed, so it is positioned facing the bow of the vessel
4. Unscrew the four cover screws
5. Open the cover fully
6. Remove the Electronics assembly. See "Electronics assembly replacement" on page 24
7. Remove the RF head assembly. See "RF head assembly removal" on page 26
8. Remove the cables attached to the RF detector and LNFE (**A**)
9. Holding the RF head assembly, remove the four screws., the washers, the cable clamp and the spacer securing the RF detector and LNFE to the limiter (**B**)
10. Remove the RF detector and LNFE



11. In order to install the new RF detector and LNFE, perform the removal steps in reverse order
12. Switch the safety switch to the ON position
13. On the electric switchboard, set the radar main breaker to ON and remove the warning card

Limiter or noise diode replacement

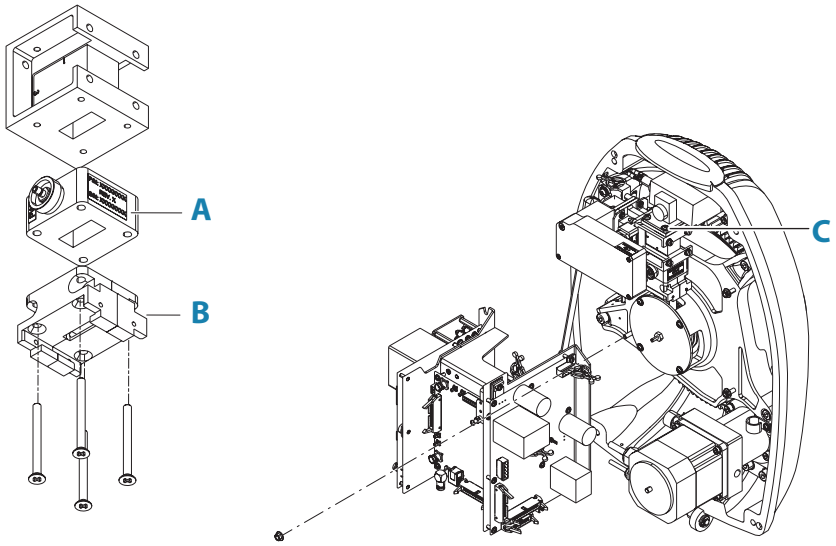
1. On the electric switchboard, switch OFF the radar main breaker and place a card reading WORK IN PROGRESS - DO NOT SWITCH ON
2. Switch safety switch to the Off position
3. Rotate the antenna by hand, as needed, so it is positioned facing the bow of the vessel
4. Unscrew the four cover screws
5. Open the cover fully
6. Remove the Electronics assembly. See "Electronics assembly replacement" on page 24
7. Remove the RF head assembly. See "RF head assembly removal" on page 26
8. Remove the cable connector from the noise diode, taking note of its position
9. Remove the four screws, the washers and the nuts securing the limiter (**A**) and noise diode (**B**) to the circulator (**C**)
10. Remove the limiter or the noise diode



11. In order to install the new limiter or the noise diode, perform the removal steps in reverse order
12. Switch the safety switch to the ON position
13. On the electric switchboard, set the radar main breaker to ON and remove the warning card

Circulator or performance monitor diode replacement

1. On the electric switchboard, switch OFF the radar main breaker and place a card reading WORK IN PROGRESS - DO NOT SWITCH ON
2. Switch safety switch to the Off position
3. Rotate the antenna by hand, as needed, so it is positioned facing the bow of the vessel
4. Unscrew the four cover screws
5. Open the cover fully
6. Remove the Electronics assembly. See "Electronics assembly replacement" on page 24
7. Remove the RF head assembly. See "RF head assembly removal" on page 26
8. Remove the limiter and the noise diode. See "Limiter or noise diode replacement" on page 27
9. Holding the circulator, remove the four screws securing the circulator and the performance monitor diode (**A**) to the adapter (**B**)
10. Remove the screw (**C**) securing the magnetron to the circulator
11. Remove the circulator or the performance monitor diode

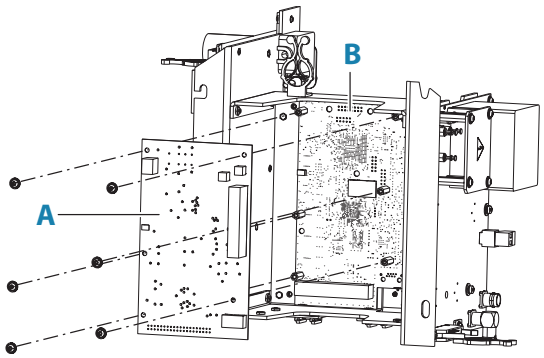


12. In order to install the new circulator or the new performance monitor diode, perform the removal steps in reverse order
13. Switch the safety switch to the ON position
14. On the electric switchboard, set the radar main breaker to ON and remove the warning card

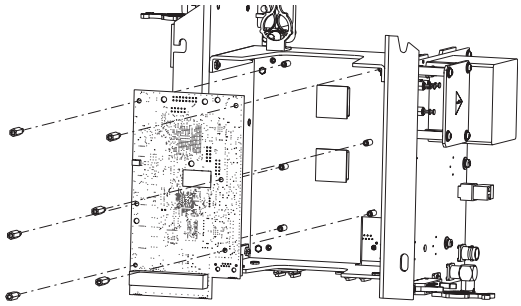
SRT LAN CPU PCB or Mini-PSU PCB replacement

1. On the electric switchboard, switch OFF the radar main breaker and place a card reading WORK IN PROGRESS - DO NOT SWITCH ON
2. Switch safety switch to the Off position
3. Rotate the antenna by hand, as needed, so it is positioned facing the bow of the vessel
4. Unscrew the four cover screws
5. Open the cover fully
6. Remove the Electronics assembly. See "Electronics assembly replacement" on page 24

7. Remove all the cables connected to the PCB's connectors
8. Remove the six screws securing the Mini-PSU PCB
9. Remove the Mini-PSU PCB (**A**)



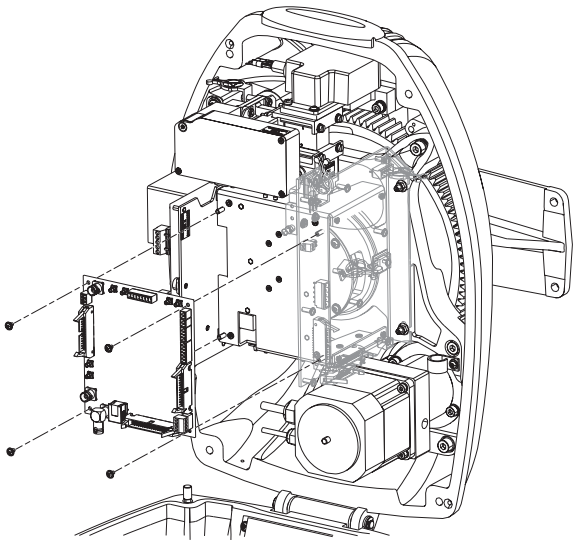
10. Remove the six spacers securing the SRT LAN CPU PCB (**B**)
11. Remove the SRT LAN CPU PCB



12. In order to install the new SRT LAN CPU PCB or the Mini-PSU PCB, perform the removal steps in reverse order
13. Switch the safety switch to the ON position
14. On the electric switchboard, set the radar main breaker to ON and remove the warning card

SRT Control PCB replacement

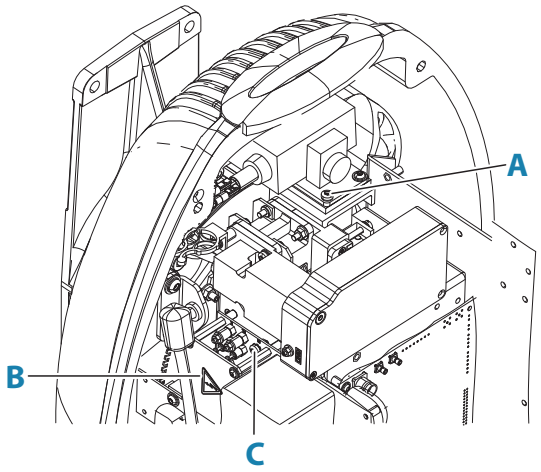
1. On the electric switchboard, switch OFF the radar main breaker and place a card reading WORK IN PROGRESS - DO NOT SWITCH ON
2. Switch safety switch to the Off position
3. Rotate the antenna by hand, as needed, so it is positioned facing the bow of the vessel
4. Unscrew the four cover screws
5. Open the cover fully
6. Remove all the cable connectors from the SRT Control PCB, taking note of their position
7. Remove the four screws securing the SRT Control PCB
8. Remove the SRT Control PCB



9. Replace the EEPROM U18 on the new SRT Control PCB with the one from the old PCB. Failing to do so will mean the replacement must be configured, as all settings will be lost
10. In order to install the new SRT Control PCB, perform the removal steps in reverse order
11. Switch the safety switch to the ON position
12. On the electric switchboard, set the radar main breaker to ON and remove the warning card

SRT MOS PCB replacement

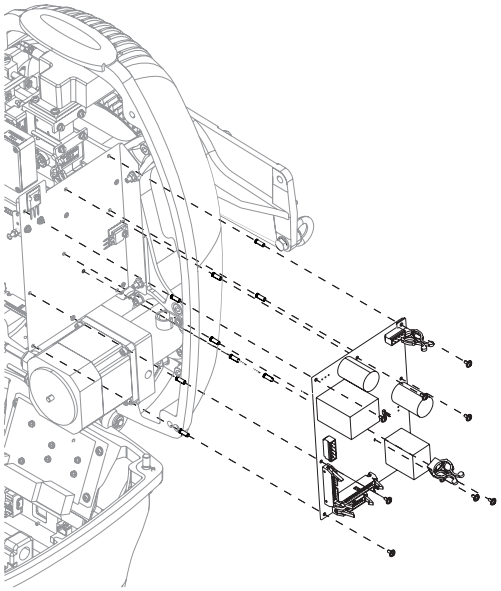
1. On the electric switchboard, switch OFF the radar main breaker and place a card reading WORK IN PROGRESS - DO NOT SWITCH ON
2. Switch safety switch to the Off position
3. Rotate the antenna by hand, as needed, so it is positioned facing the bow of the vessel
4. Unscrew and remove the four cover screws
5. Open the cover fully
6. Remove all cable connectors from the SRT MOS PCB, taking note of their position, and release any cables held in place by the cable clamps attached to the PCB
7. Remove the screw and the washer (**A**) securing the grounding wire to the magnetron (for 12 kW model only)
8. Remove the four screws securing the transparent protective cover (**B**)
9. Remove the transparent protective cover
10. Remove the screw securing the grounding wire (**C**) (for 25kW model only)
11. Remove the two nuts securing the magnetron wires, taking note of their position
12. Remove the four spacers, the screws and the washers securing the SRT MOS PCB
13. Remove the SRT MOS PCB



14. In order to install the new SRT MOS PCB, perform the removal steps in reverse order
15. Switch the safety switch to the ON position
16. On the electric switchboard, set the radar main breaker to ON and remove the warning card

SRT PWR-DC PCB replacement

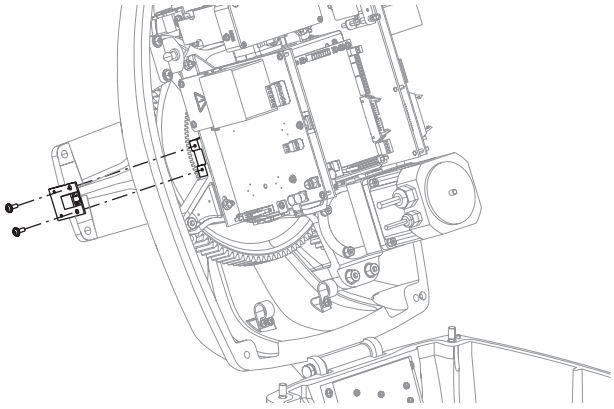
1. On the electric switchboard, switch OFF the radar main breaker and place a card reading WORK IN PROGRESS - DO NOT SWITCH ON
2. Switch safety switch to the Off position
3. Rotate the antenna by hand, as needed, so it is positioned facing to the bow of the vessel
4. Unscrew the four cover screws
5. Open the cover fully
6. Remove all the cable connectors from the SRT PWR-DC PCB and release any cables held in place by the cable clamps attached to the PCB
7. Remove the eleven screws securing the SRT PWR-DC PCB



8. In order to install the new SRT PWR-DC PCB, perform the removal steps in reverse order
9. Switch the safety switch to the ON position
10. On the electric switchboard, set the radar main breaker to ON and remove the warning card

Bearing reader PCB replacement

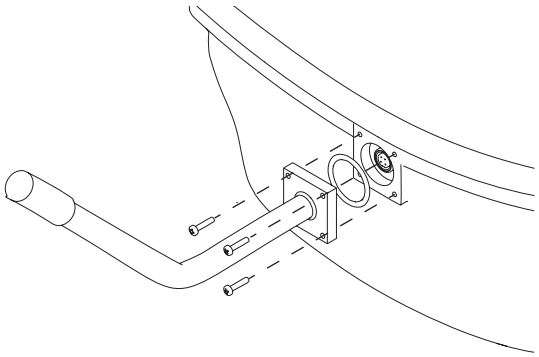
1. On the electric switchboard, switch OFF the radar main breaker and place a card reading WORK IN PROGRESS - DO NOT SWITCH ON
2. Switch safety switch to the Off position
3. Rotate the antenna by hand, as needed, so it is positioned facing the bow of the vessel
4. Unscrew the four cover screws
5. Open the cover fully
6. Remove the cable connector from the bearing reader PCB
7. Remove the two screws securing the bearing reader PCB



8. In order to install the new bearing reader PCB, perform the removal steps in reverse order
9. Switch the safety switch to the ON position
10. On the electric switchboard, set the radar main breaker to ON and remove the warning card

Performance monitor arm replacement

1. On the electric switchboard, switch OFF the radar main breaker and place a card reading WORK IN PROGRESS - DO NOT SWITCH ON
2. Switch the safety switch to the Off position
3. Remove the four screws securing the Performance monitor arm



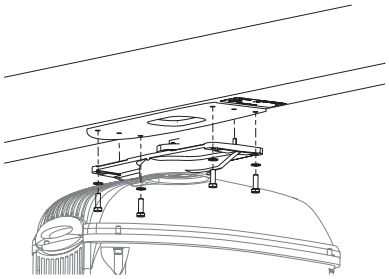
4. In order to install the new Performance monitor arm, perform the removal steps in reverse order

→ ***Note:*** Before installing the new Performance monitor arm make sure that the O-ring gasket is fitted correctly in place.

5. Switch the safety switch to the ON position
6. On the electric switchboard, set the radar main breaker to ON and remove the warning card

Antenna unit replacement

1. On the electric switchboard, switch OFF the radar main breaker and place a card reading WORK IN PROGRESS - DO NOT SWITCH ON
2. Switch safety switch to the Off position
3. Remove the four screws and washers securing the antenna



4. Remove the antenna by carefully lifting it to avoid damaging the waveguide
5. Check the integrity of the antenna
6. In order to install the new antenna, perform the removal steps in reverse order.

→ ***Note:*** Ensure the alignment pins on the antenna support engage with the holes in the antenna.

→ ***Note:*** Make sure that the waveguide connection on the up-mast transceiver is aligned with the connection in the antenna.

7. Switch the safety switch to the ON position
8. On the electric switchboard, set the radar main breaker to ON and remove the warning card

SRT LAN X-band up-mast transceiver unit replacement

1. On the electric switchboard, switch OFF the radar main breaker and place a card reading WORK IN PROGRESS - DO NOT SWITCH ON
2. Switch safety switch to the Off position
3. Remove the Antenna
4. Remove the nut securing the grounding cable to the grounding terminal on the transceiver
5. Remove the grounding cable
6. Remove the cable connectors attached to the transceiver, taking note of their position
7. Remove the four nuts and the washers securing the transceiver to the vessel
8. Check the integrity of the SRT LAN X-band up-mast transceiver
9. In order to install the new SRT LAN X-band up-mast transceiver. Perform the removal steps in reverse order
10. Switch the safety switch to the ON position
11. On the electric switchboard, set the radar main breaker to ON and remove the warning card

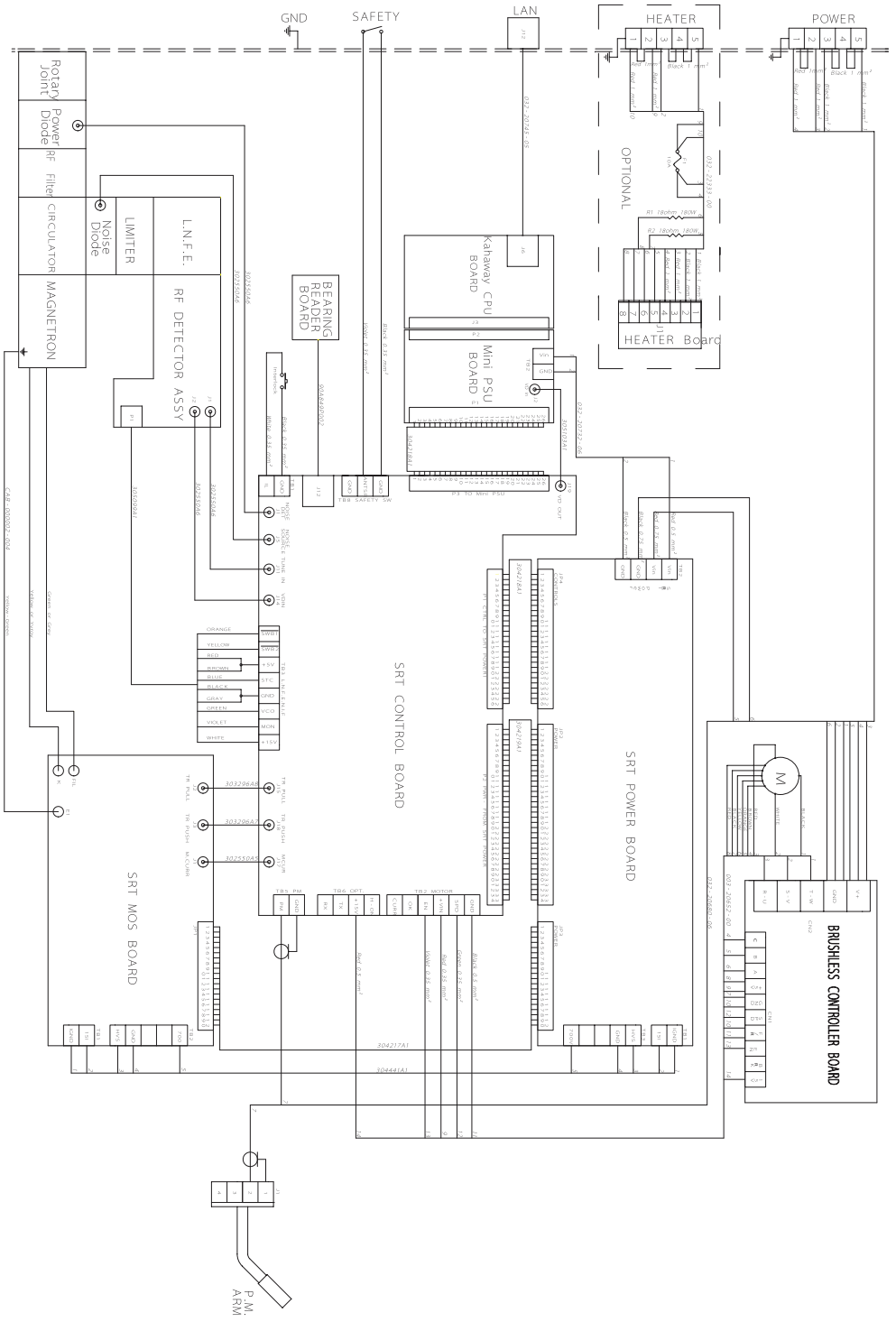
6 Spare parts

The most up-to-date spare parts list is available at:
www.navico-commercial.com

Part number	Description	Compatible
151-10616-001	SRT, 6X Antenna, replacement unit	12/25 kW transceiver
151-10617-001	SRT, 9X Antenna, replacement unit	12/25 kW transceiver
151-10618-001	SRT, 12X Antenna, replacement unit	12/25 kW transceiver for 12ft antenna
151-10619-001	SRT LAN, 12U X-Band, replacement unit	12 kW transceiver
151-10620-001	SRT LAN, 12U X-Band HSC, replacement unit	12 kW transceiver
151-10621-001	SRT LAN, 12U X-Band F/12ft, replacement unit	12 kW transceiver for 12ft antenna
151-10622-001	SRT LAN, 25U X-Band, replacement unit	25 kW transceiver
151-10623-001	SRT LAN, 25U X-Band HSC, replacement unit	25 kW transceiver
151-10624-001	SRT LAN, 25U X-Band F/12ft, replacement unit	25 kW transceiver for 12ft antenna
000-10668-001	Performance monitor arm	12/25 kW transceiver
000-13252-001	SRT LAN electronic assembly	12 kW transceiver
000-14828-001	SRT LAN electronic assembly	25 kW transceiver
000-10675-001	RF detector assembly with LNFE	12/25 kW transceiver
000-10680-001	Noise diode	12/25 kW transceiver
000-10683-001	Motor	12/25 kW transceiver
000-10682-001	SRT gear reducer	12/25 kW transceiver 6 and 9ft antenna
SP-305287A1-001	SRT gear reducer	12/25 kW 12ft antenna
SP-305274A1-001	Performance monitor diode	12/25 kW transceiver
000-10678-001	Duplexer circulator	12/25 kW transceiver
000-10679-001	Limiter	12/25 kW transceiver
000-10684-001	Brushless controller assembly	12/25 kW transceiver
000-10681-001	Bearing reader PCB	12/25/30 kW transceiver
000-10671-001	SRT PWR-DC PCB	12/25/30 kW transceiver
000-10672-001	SRT MOS PCB	12 kW transceiver
000-10673-001	SRT MOS PCB	5/30 kW transceiver
000-10674-001	SRT Control PCB	12/25/30 kW transceiver
000-13253-001	Magnetron	12 kW transceiver
SP-305078A1-001	Magnetron	25 kW transceiver
000-14826-001	Mini-PSU PCB	12/25 kW transceiver
000-14827-001	SRT LAN CPU PCB	12/25 kW transceiver

7 System diagrams

Transceiver internal interconnection diagram



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