

Marine HVAC Condition Report

Riva 75 ft | Dometic Condaria chilled-water system

REPORT REFERENCE	SCI-MHVAC-CASE-001	SYSTEM	Marine HVAC / chilled water
REPORT TYPE	Inspection and corrective work scope	PHOTO RECORD	Technical close-ups included

CURRENT STATUS

Major corrective maintenance required

Executive assessment

The installation remained operational, but the evidence showed several interacting defects rather than a single failed component. Restricted heat transfer, weak circulation, degraded electrical connections, leaking plumbing and contaminated air-side equipment were collectively reducing cooling performance and raising failure risk.

Situation

A multi-zone chilled-water marine HVAC installation showed weak and unreliable cooling, uneven cabin performance and visible deterioration across the machinery and distribution systems.

Diagnostic scope

- Chiller assembly and three operating compressor circuits.
- Condenser, heat exchanger, seawater strainer, pumps and associated plumbing.
- Electrical control panel, terminals, harnesses, capacitors and protective covers.
- Representative fan-coil units, airflow, supply-air temperature, filters, coils and drain condition.
- Refrigerant identification and compatibility evidence.

Key technical outcome

The inspection did not justify immediate full-system replacement on evidence alone. It supported a staged corrective program, followed by controlled commissioning and a measured performance report.

Equipment details

Key equipment information recorded during the inspection.

Item	Specification	Field note
Yacht	Riva 75 ft motor yacht	Multi-zone marine HVAC installation.
Chiller make and model	Dometic / Condaria SLY S75/16 chilled-water chiller	Verified from the equipment nameplate; serial number excluded.
Nominal cooling capacity	108,000 BTU/h	Nameplate capacity for the central chiller.
Compressor arrangement	3 operating compressor circuits	All three circuits were measured during inspection.
Refrigerant configuration	Nameplate: R407C; field record: later R22 replacement compressors	Configuration mismatch requires compatibility confirmation before charge or commissioning.
Indoor distribution	12 FCUs reported	Supports a multi-zone diagnosis rather than a single-cabin complaint.
Supplementary equipment	1 Dometic self-contained unit, 16,000 BTU, R410A	Recorded separately in the engine-room equipment review.

Note: Specifications shown are taken from the equipment nameplate and field log.

Recorded operating evidence

The following readings were recorded during the inspection. They represent field conditions at the time and are not a substitute for manufacturer commissioning data.

Circuit	Load current	Compressor temp.	High-side pressure	Low-side pressure
1	19.2 A	43.0 deg C	245 psi	65 psi
2	18.6 A	66.8 deg C	260 psi	70 psi
3	19.2 A	43.7 deg C	240 psi	70 psi

Additional field indicators

Indicator	Recorded evidence	Interpretation
Reported maximum compressor load	20 A	Operating current was close to the reported maximum on all three circuits.
Representative outlet air	17.7 to 26.8 deg C	Wide spread confirmed inconsistent zone performance.
Representative outlet velocity	0.91 to 2.38 m/s	Large variation supported airflow restriction and blower/coil maintenance findings.
Refrigerant identification	Nameplate R407C; replacement compressors reported for R22	Nonstandard configuration required compatibility verification before charging or commissioning.

System findings

System	Evidence observed	Technical consequence
Heat rejection	Condenser scale and marine growth; advanced rust on heat exchanger.	Reduced heat transfer and increased probability of high pressure or leakage.
Water circulation	Dirty strainer, degraded hoses and clamps, plumbing leaks, pump reconditioning need.	Restricted or unstable chilled-water and seawater flow.
Electrical	Missing terminal covers, overheated harnesses, corroded capacitors and poor mounting.	High reliability risk with localized overheating and fire potential.
Air side	Dirty coils, damaged filters, weak airflow, no-cooling zones and biological odor.	Reduced capacity, poor indoor air quality and condensate/drain risk.

Selected field evidence

The image set connects the recorded readings to the physical condition observed during inspection.

Technical close-ups recorded during the inspection.



PRESSURE MEASUREMENT

Manifold evidence captured the refrigerant-side operating condition.



ELECTRICAL LOAD VERIFICATION

Clamp-meter evidence linked the recorded current to an operating circuit.



ELECTRICAL DEGRADATION

Corroded and poorly mounted capacitor terminations supported high-priority panel repair.



AIR-SIDE RESTRICTION

Heavy coil fouling and corrosion matched the recorded airflow and cooling imbalance.

Field notes

- Measured refrigerant and electrical conditions were documented rather than inferred from symptoms alone.
- The electrical and air-side photographs support separate failure mechanisms within the same system.
- Together, the evidence supports a staged corrective program followed by measured commissioning.

Supplementary performance evidence

Two additional close-ups demonstrate how field measurements were linked to heat-transfer and air-distribution performance.

Technical close-ups recorded during the inspection.



LINE-TEMPERATURE VERIFICATION

A handheld meter documented a recorded 61 deg C temperature at the chiller circuit.



AIR-DISTRIBUTION VERIFICATION

Grille measurement recorded low airflow and elevated supply-air temperature in an affected zone.

Field notes

- Temperature and airflow readings supplement the pressure and compressor-current evidence.
- The combination supports a system-level diagnosis across refrigerant, electrical, water and air-side components.

Risk prioritization

Priority	Observed risk	Required control
CRITICAL	Overheated or corroded wiring and unsecured capacitors.	Isolate unsafe circuits; replace damaged conductors, terminals, covers and mounts before extended operation.
HIGH	Advanced heat-exchanger corrosion and active plumbing leakage.	Pressure-test the affected assembly and renew degraded hoses, clamps and fittings.
HIGH	Restricted condenser and seawater flow.	Descale, clean the strainer, verify pump duty and document inlet/outlet conditions.
MEDIUM	Dirty or corroded fan-coil units and biological odor.	Clean, disinfect, restore drainage and verify airflow and supply temperature by zone.

Assessment

The weak and uneven cooling was consistent with combined heat-rejection restriction, degraded water circulation and air-side fouling, with electrical corrosion adding an independent reliability and safety risk. The refrigerant documentation mismatch was a configuration-control issue that required verification, not an assumption of correct charge.

Key observations

- Condenser fouling and marine growth reduce the system's ability to reject heat.
- Dirty strainers, leaking plumbing and degraded pump condition reduce stable flow through both water circuits.
- Air-side restrictions explain low and inconsistent outlet velocity and elevated outlet temperature in affected zones.
- Corroded electrical terminations and overheated harnesses can create faults unrelated to the cooling circuit.

Recommended work

1. Make the electrical installation safe: replace damaged wiring, terminals, covers and capacitor mounts; clean and test the panel.
2. Pressure-test the corroded heat exchanger; renew it if damage is confirmed, then flush the chilled-water circuit, repair leaks and refill with specified treated fluid.
3. Descale the condenser and seawater circuit; clean the strainer and verify pump flow after service.
4. Recondition or replace degraded pumps and renew damaged hoses, elbows, clamps and inaccessible plumbing arrangements.
5. Service fan-coil units, replace damaged filters, clean coils and blowers, clear drains and disinfect affected zones.
6. Verify refrigerant, oil and component compatibility before charging; commission the complete system under stabilized load and issue measured close-out results.

After repair

- Record compressor current, suction/discharge pressure and relevant line temperatures after stabilization.
- Record chilled-water supply/return temperature and seawater inlet/outlet temperature and flow.
- Confirm leakage status, panel temperature, protective-device operation, airflow and supply-air temperature by zone.

Report notes

This case history is based on an inspection record and selected operating readings. It does not include laboratory analysis, teardown results, refrigerant composition testing or post-repair commissioning data.