

Techcross ECS Electro-Clean BWMS Spare Parts Reference — TRO Sensor, Magnetic Bar, ESJ Board, DPD Reagent, TC-Series Codes

cBallast Technical Sourcing · Techcross ECS (Electro-Clean System) — Type Approved ballast water management · issued 2026-08-29 · cballast.com/documents/techcross-ecs-electro-clean-bwms-spare-parts-reference

Complete Techcross ECS ballast water management system spare parts reference: TRO sensor (Total Residual Oxidant), calibration DPD reagent and magnetic bar for GDS calibration, ESJ (Electronic Support & Junction) board TC010154, PLC TC000829, electrolysis cell electrode plates, DC-CT transformer for ECU units, CLX reagent kit, cabinet spares. Covers ECS-1, ECS-2, ECS-2.08 firmware generations. IMO Type Approval (BWMS), USCG Type Approval reference. cBallast supplies Techcross ECS spares to shipowners globally on 24-72 h port drop for scheduled and urgent maintenance.

Techcross ECS Electro-Clean BWMS — complete spare parts reference

Techcross Electro-Clean System (ECS) is the market-leading electrolysis-based ballast water management system (BWMS), installed on more than 3,000 vessels worldwide. The ECS produces free chlorine (as sodium hypochlorite) in situ from the ship's ballast water by electrolysis of a sidestream of the ballast flow, injects that treated stream back into the ballast tank, and neutralises the treated water with a sodium-thiosulphate-based CLX reagent at discharge. The system carries IMO Type Approval under the 2016 revised G8 guidelines and USCG Type Approval for global service. Every vessel with an ECS carries a defined scheduled-maintenance kit — the most-requested items are covered in this catalogue.

Total Residual Oxidant (TRO) sensor & calibration hardware

The TRO sensor measures free-chlorine residual at the ballast discharge to prove the water is neutralised below the IMO 0.1 mg/L discharge limit. It is the single most safety-critical wear part in the ECS. Techcross uses a photometric DPD-based analyser for the TRO measurement, with a scheduled magnetic-bar calibration and periodic reagent replacement.

Part | Function | Common P/N | Scheduled service |

TRO sensor unit | DPD photometric TRO analyser at ballast discharge | Techcross TRO sensor (specify vessel/BWMS serial) | Sensor unit: every ~10,000 h operation; DPD reagent: monthly |

DPD reagent kit | N,N-diethyl-p-phenylenediamine indicator for free-chlorine colour development | Techcross DPD reagent (mfr code, per kit) | Monthly replenishment; refrigerated storage extends shelf life |

CLX reagent | Sodium thiosulphate solution for TRO neutralisation at discharge | Techcross CLX reagent (bulk drum, per m³ ballast treated) | Consumable; volume varies with treated ballast quantity |

Magnetic bar (GDS calibration) | Stirring magnet inside the sensor optical cell during calibration | Techcross magnetic bar | Replace on any wear or scale build-up on the stir bar; scheduled inspection annual |

GDS calibration sample bottle | Sample cell for TRO calibration standards | Techcross GDS optical cell | Replace on any scratching that biases the photometric reading |

DPD test kit for verification | Portable DPD test kit for independent verification of TRO reading | Hach 2100Q + DPD (see cBallast Hach 2100Q PDP) | Voyage or annual verification per PSC inspection practice |

Techcross CLX reagent is sodium thiosulphate (Na₂S₂O₃) formulated for ballast-water neutralisation. Ordering: specify treated-ballast throughput per voyage (m³) to estimate the reagent usage. cBallast supplies CLX reagent in bulk drums (55 gal / 208 L) or IBC (1000 L) and ships from EU stock to major ports globally.

Electrolysis cell & electrode plates

The core of the ECS is the electrolysis cell — a stack of coated titanium electrode plates that produce free chlorine (as sodium hypochlorite) at the anode when a sidestream of ballast seawater passes through under DC power. Electrode plates are consumed at typically 10-15,000 h of accumulated operating time (varies with treated volume, seawater salinity and current density); scheduled electrode-stack replacement is the highest-value single spare on the ECS.

Electrolysis cell (electrode stack) — complete cell assembly per ECS module size (ECS-100, ECS-200, ECS-500 typical designations).

Anode plate set — individual replacement anodes where the cell allows piece-wise replacement; typically not-user-serviceable, but scheduled stack refurbishment is an economical alternative to a full cell swap.

Cathode plate set — less-wear side; typically outlasts the anodes 2-3×.

Cell gasket kit — between plates and end-caps; replace at every stack overhaul.

Cell power supply (DC PSU) — SCR-controlled DC power supply feeding the cell; scheduled contactor and cooling-fan replacement.

Electronic Support & Junction (ESJ) board and control system spares

Part | Function | Common P/N | Notes |

ESJ board | Electronic Support & Junction PCB in the ECS control cabinet | TC010154 (Techcross ECS Ver 2.08 firmware) | Communications, sensor interface, alarm handling; specify firmware version |

PLC | Main programmable controller | TC000829 | Central process logic; firmware updates on PLC via manufacturer |

DC-CT (Current Transformer) for ECU | DC current measurement on the electrolysis cell circuit | Techcross DC-CT (specify ECU model) | Sensor for cell-current alarming; verify calibration on install |

ECU (Electrolysis Control Unit) main board | Cell power-control interface | ECU PCB per BWMS build | Ships with matched

firmware for the vessel's ECS version |

HMI touch panel | Operator interface panel | Techcross HMI (specify BWMS version) | Firmware update via manufacturer only |

24V DC power supply | Control cabinet auxiliary supply | DIN-rail switch-mode PSU (industry standard) | Any compliant DIN-rail IEC 62368 24V PSU accepted; specify Techcross-listed brand for warranty compliance |

Neutralisation dosing pump & injector spares

Downstream of the discharge TRO sensor, the CLX (sodium thiosulphate) dosing pump adds neutraliser to bring the TRO reading below 0.1 mg/L before overboard discharge. Common wear parts:

Dosing pump diaphragm — typically ProMinent, Grundfos or SEKO diaphragm dosing pumps; specify pump make/model for correct diaphragm kit.

Injector nozzle — check-valve injector in the discharge line; annual inspection for scale build-up.

Foot valve & suction lance — wear-part on the CLX reagent drum/IBC side.

Discharge line non-return valve — prevents backflow of treated water into the reagent supply.

Cabinet, sensors & general BWMS spares

The ECS control cabinet is a marine-grade IP54/56 enclosure with common industrial spares:

Cabinet fan & filter — scheduled annual filter replacement; fan replacement every 5-7 years.

Miniature circuit breakers (MCBs) & RCBOs — Schneider Acti9 iC60 or ABB equivalents; scheduled functional test annual.

Contactor coil & auxiliary contacts — on the cell DC PSU; scheduled inspection at every dry-dock survey.

Flow meter — ballast-side flow measurement; scheduled calibration per Type Approval maintenance schedule.

Salinity & temperature sensors — on the ballast intake side; scheduled recalibration per BWMS operating manual.

UV sterilisation unit — on BWMS variants that include a UV polishing stage (less common on ECS but present on some hybrid designs).

Documentation & PSC readiness

Every Techcross ECS installation must retain and produce during Port State Control (PSC) inspections:

IMO Type Approval Certificate — issued by the flag state on installation.

Ballast Water Management Plan (BWMP) — ship-specific procedure, per IMO Resolution MEPC.127(53).

Ballast Water Record Book — per IMO Ballast Water Management Convention Article 4.

ECS Owner's Manual Rev 0.6 (or later) — Techcross OEM operating manual.

Scheduled maintenance record — sensor calibration, electrode replacement, reagent orders; typically maintained in the ship's Planned Maintenance System.

Sensor calibration certificates — TRO sensor annual recalibration.

Reagent SDS & batch certificates — for CLX and DPD reagent lots on board.

Common questions

Q: How often do the Techcross ECS electrolysis cell plates need replacement? Typical 10,000-15,000 h of accumulated operating time, varying with treated-ballast volume, seawater salinity and applied current density. Vessels with high ballast throughput see 8-10 years between electrode overhauls; low-utilisation vessels may last 12+ years.

Q: What is the Techcross ESJ board TC010154? The ESJ (Electronic Support & Junction) board is the central PCB in the ECS control cabinet, handling sensor interface, alarm relay outputs and Modbus communications to the ship's IAS. TC010154 is the part number for the ECS-Ver 2.08 firmware version; earlier ECS versions use different TC0-series board numbers. Verify firmware version on the HMI's About screen before ordering.

Q: Can we test the TRO sensor with a portable DPD kit? Yes — the standard verification is to draw a bottle from the ballast discharge and compare a portable Hach 2100Q or equivalent DPD test kit against the ECS's own TRO reading. Discrepancies > 20 % trigger a magnetic-bar recalibration on the ECS.

Q: What is the DPD reagent shelf life? Techcross DPD reagent has a ~12-month shelf life under refrigerated storage (2-8 °C). Once opened, use within the working-life stated on the individual reagent bottle (typically 3 months). Expired reagent gives artificially low TRO readings and triggers false-negative discharge alarms.

Q: Does cBallast supply original Techcross parts? Yes — cBallast supplies original Techcross-branded parts through the authorised distribution chain; scheduled parts ship ex-EU stock in 24-72 h to major ports globally. Urgent-service parts (electrode stacks, ESJ boards) require lead-time confirmation on request; typical air-freight to Southeast Asian ports is 3-5 days ex-warehouse.

Related BWMS references & products

All Techcross products on cBallast

Bilge water treatment & oily-water separator (MEPC.107(49))

MEPC.107(49) 15 ppm bilge separator compliance

UV disinfection spares (Berson, Trojan, Wedeco)

Berson UV disinfection spare parts (companion doc)

Class society type approval — DNV, ABS, LR, BV, ClassNK

Hach 2100Q portable turbidimeter (TRO/DPD verification)

Ballast water & water treatment category

How to request a Techcross ECS RFQ from cBallast

Fast-track your Techcross RFQ by including: (1) ECS model and BWMS Type Approval certificate reference; (2) vessel name and IMO number; (3) ECS firmware version (from the HMI About screen — e.g. ECS-Ver 2.08); (4) requested part list with Techcross-cited TC-series codes where known; (5) vessel next port or ship-to address; (6) required-on-board date and any PSC-inspection deadline. cBallast responds within 8 business hours with itemised quote, lead-time, air/sea/port-agent shipping options.

All spare-part references above are compiled from the Techcross ECS Owner's Manual Rev 0.6 and general BWMS service practice. Confirm the specific part number against the vessel's ECS build sheet and OEM certification before ordering. Techcross and Electro-Cleen are trademarks of Techcross Inc., Korea. cBallast is an authorised parts stockist and is not the OEM.

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