

CP24

CP Measuring System

pmac

The PMAC CP24 is a user operated subsea Cathodic Potential (CP) measuring system that does not require the presence of a dedicated CP engineer and can be used by data recorders, ROV pilots or any other survey/inspection personnel.

Based on the use of the Silver/Silver Chloride (Ag/AgCl) Half-Cells, the system gives real time data measurement for subsea pipelines, offshore platforms or other structures such as offshore wind turbines that have a submerged steel element.

Continuous proximity CP and electrical Field Gradient (FG) readings can be read simultaneously coupled with contact measurement when required without having to change setting or probes.

The system may be used for multiple CP survey types including;

- Direct Contact CP readings – for absolute potential spot readings
- Proximity CP readings – using either a direct (earth wire) link to the asset under inspection or by use of a remote half-cell for free flying.
- Field Gradient readings – when the twin cell probe is fitted the system will display field gradient readings in both proximity form and during direct contact allowing for prevailing anode activity to be confirmed as it cannot be established visually, only evidence of past activity may be visually estimated.

The base package contains all the items unique to the system required for use that wouldn't be expected to be freely available elsewhere, including;

*Single Cell Type Contact/Proximity CP probe complete with Ag/AgCl half cells,
Ag/AgCl remote reference cell on a 10m marinised cable, for proximity readings without direct connection to the asset,
Subsea electronics pod,
Copy of the display software for installation on the user's own computer along with full manual & procedures,
US Mil Spec 18001K 99.7% purity zinc test block
Saturated calomel reference electrodes
Whip ends for connecting the electronics pod to the ROV
Spare Inconel Stab tip
Rs485-RS232 Converter/Bench power supply*



Data is measured by the subsea digitiser at a rate of .3Hz allowing for fast movement of the probe whilst capturing changes in fields and a maximum theoretical survey speed of 5 knots.

System electronics are calibrated with a confidence level of 95% to record at a resolution of;

Contact and Proximity CP - 0.1mV
Contact and Proximity FG - 0.1µV/cm

The system is supplied with all necessary parts to perform tolerance checks and calibrations when in use.



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Software

The system is controlled by a proprietary software package to display the generated data topside. This simple software may be installed on any computer removing the need for a dedicated PC. The user interface is simple with only three function buttons during use for removal of background noise, offsetting the proximity CP and taking a contact reading.

Proximity and last contact readings are displayed on screen in real time for the operator to view.

The software outputs an RS232 serial data string of the continuous proximity CP, as well as selectable options to output the proximity FG values and the last contact CP & FG values as well, that may be used for video overlay or logged by another method if required.

Contact readings are logged in a .txt file against date and time for later reference.



Probes

The system can be fitted with either a single half-cell probe for contact and proximity CP only inspections or with a twin half cell probe when Field Gradient readings are also required to determine anode activity and current output in addition to the CP readings. Both types of probe use PMAC Ag/AgCl half cells (matched for use with twin cell probe) which may be replaced if necessary should the cells become polarised outside of tolerances or otherwise contaminated. Both probe types use the same connection to the subsea electronics pod and have replaceable stab tips made from Inconel for its galvanic and hardness properties.

Both probe types are Ø60mm

Single cell probe 315mm Length, weight 0.9kg

Twin cell 612mm Length, weight 1.8kg



Subsea Electronics Pod

Based on the existing and proven PMAC CPROS system, The PMAC CP24 Subsea Digitiser utilises the latest technology increasing reliability and decreasing the potential for interference from external sources as is often found with topside or inbuilt ROV CP systems. The digitiser has simultaneous outputs in RS232 and a proprietary boosted RS485 to transmit over longer distances than standard, allowing transmission of the data either by twisted pair or via ROV data multiplexer.

Dimensions: Ø78mm, 318mm length

Weight: 2.6kg (approx 1.3kg in water)

Power Requirements: 24 Vdc rated at 200mA.

Power and comms are through a single connector at one end with the probe and a remote cell connection at the other end. The remote may be connected via its dedicated connection or via a pin in the power/comms connector depending on terminations of conductors in

ROV umbilical for 'over the side' positioning or mounting on TMS/ROV.

RS485-RS232 Converter Unit

Combined unit for RS 485 to RS 232 conversion where the signal from the ROV is coming up in RS485 mode and as 24v power supply for when the Electronics Pod is being used topside on a desk rather than installed on an ROV. Normally required for use with the proprietary boosted voltage RS485 comms.

