# CPS SR6-20 Power Supply Remote

**6th generation power and monitoring unit for use in Cathodic Protection of concrete using impressed current.**

## General

The CPS SR Power Supply Remote is a standalone CP power and monitoring unit with the ability to read and control remotely. Housed in a glass fiber reinforced polycarbonate enclosure are a transformer, modem, and specially developed CP power supply. The adjustable power and measurement unit has a maximum useful output power of 20 W and has connections for up to six reference electrodes from the zone.

CPS SR Power Supply Remote is used as a power and monitoring system for a cathodic protection zone of reinforcement in concrete that fully complies with EN-ISO 12696:2022. The output power is controlled by automatic limits on voltage and current (adjustable limits up to 10 V and 10 A), a so-called 'envelope' of range.

The control of the protective current has a step size of 0.15 mV/mA. The measurement of the imposed voltage and delivered protective current is done with a resolution of 0.3 mV/mA. The reference electrodes can be measured with a response time of approximately 0.26 ms with a resolution of 0.075 mV at an input impedance of 1 GΩ. Data communication is via LTE-M to an IoT platform where the measurement results are processed, clearly displayed and commands for the CP installation can be sent.

## Key Features

- High-efficiency power system
- Stable accurate output voltage (low noise/ripple)
- Control on voltage and current limit (envelope)
- Complies with EN-ISO 12696:2022
- Communication to IoT platform
- Compact housing
- Plug-in connection




Adresgegevens
Cathodic Protection Supplies BV
Dalkruidbaan 142
2908 KC Capelle aan den IJssel

Contactgegevens
Email: info@cp-supplies.nl
Internet: www.cp-supplies.nl
Telefoon: +31 (0)10-8208 704

Administratief
IBAN: NL23RABO0151297428
BTW nr.: NL850885206B01
KvK nr.: 53450833

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The power and monitoring capabilities include:

- Status measurements: voltage (cathode-anode), delivered current, steel (cathode) potential value relative to 6 reference electrodes.
- Adjustable voltage and current to be delivered (envelope: 10 V / 10 A, maximum 20 W).
- Switchable bipolar relay for turning the zone on and off.
- Instant-off measurement: with automatic measurement of 'on' potential, and immediately after switching off the relay 10x the measurements of the 'off' potential with a 100 ms interval. All values are reported for further analysis.
- Depolarization measurement: the 'on' potential of the reference electrodes is measured; then the 'instant-off' value (see previous point); then with a continuously switched off relay 60x the 'off' potential is determined; and finally, the relay is switched on again and the 'on' potential is measured. When reading, all values are reported so that the depolarization per reference electrode can be determined and also the uniformity of the depolarization can be assessed. The measurement interval between the 60 measurements during depolarization (and the one measurement after switching on again) is an adjustable interval. Typically, this interval is set to 24 minutes for a 24-hour depolarization measurement.
- Measurements of temperature and relative humidity (ambient and optionally also internally inside the concrete).
- Communication via LTE-M to an IoT platform where the results of all measurements are stored, processed and clearly displayed. From the platform, both automatic and manual commands can be scheduled.



## Applications

CPS SR Power Supply Remote is suitable for all indoor and outdoor exposed reinforced concrete structures that are subject to corrosion of the reinforcement due to mixed or penetrated chlorides and/or carbonation. Examples of applications are:

- Gallery and balcony slabs
- Consoles and cantilever beams
- Columns and beams
- Bridge decks
- Parking garages

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## Properties

| | |
|---|---|
| **Dimensions** | |
| Housing without connectors (lxbxh) | 21 x 25 x 17 cm |
| **Input** | |
| AC range | 85 ~ 264 VAC |
| Design power requirement | 28 W |
| **Output adjustable power supply** | |
| Maximum output power | 20 W |
| Voltage control range | 0-10 VDC |
| Resolution voltage control range | 0.15 mV |
| Current control range | 0-10 A |
| Resolution current control range | 0.15 mA |
| **Measurement connections** | |
| Reference electrode inputs | 6 simultaneously readable |
| Response time | 0.26 ms |
| Measurement resolution | 0.075 mV |
| Input impedance | 1 GΩ |
| Depolarization measurement | Power is digitally switched off by a relay and galvanically disconnected on both poles |
| Operational range | -20 ºC to 65 °C without derating |
| **Connections** | |
| Input | single 3 x 1.5 mm² QPD connector |
| Output | 3-fold 4 x 2.5 mm² QPD connector Cathode, anode, and 2 reference electrodes per connector |

## Design Criteria

CPS SR Power Supply Remote can be used for corrosion prevention, corrosion control, or cathodic protection applications. The anode design varies according to project specifications. For assistance in system design, please contact CPS.

## Installation Instructions

*Installation*

Terminate cables from the fields at designated positions for cathode, anode, and reference electrodes. Termination should only be carried out after completion of installation work and after approval of the necessary control measurements of all connections.

Terminate the supply voltage within the intended and permitted range. Start up the CP system by performing start-up tests as described in EN-ISO 12696:2022.

All work related to termination, checking, and starting should be carried out by a CP specialist of at least level 3 according to EN-ISO 15257:2017 (or equivalent).

## Use

*Control*

The CPS SR Power Supply Remote can operate within an envelope of a maximum of 10 V and 10 A with a maximum load of 20 W. In practice, it is often controlled by voltage with a sufficiently high chosen current limit as a safety.

*Status measurement*

Typically, this measurement is performed daily from the platform, which also serves as a check whether the system is switched on and operational. The values for voltage (cathode-anode), delivered current, value 6 reference electrodes relative to cathode are retrieved.

*Instant-off measurement*

Typically, this measurement is performed weekly from the platform. The 'instant-off' value is free to choose from 0.1 – 1 second after switching off according to the standard EN-ISO 12696:2022. Typically, the value after 0.5 s is reported as the 'instant-off' value. The behavior of the reference electrode when switching off can be used to assess the functioning of the reference electrode.

*Depolarization measurement*

Typically, this measurement is performed monthly from the platform. The interval is usually set to 24 minutes for a 24-hour depolarization measurement, but values from 1 to 255 minutes are possible, allowing for example a 1 hour, 4 hours, or 7 days (set at 168 minutes measurement interval) period for depolarization.

*Precautions*

CPS SR Power Supply Remote is not intended to address or repair structural damage to structures. If structural damage has occurred, consult a structural engineer.

*Data Line and Communication*

Units with a modem are fully tested upon delivery and connected to the IoT platform, making them immediately operational. Monthly charges for the data line and platform start from the first full month after delivery.

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