

## Chloride® CP Range

Customized to user specification  
Full portfolio of industrial options



### Benefits

#### Technical and budgetary optimization.

Battery can represent a significant part of UPS budget in greenfield or brownfield projects. That's why Chloride® CP70R is designed with a wide output DC voltage range to optimize:

- Number of battery cells
- Battery capacity and therefore the price, as per the required autonomy

#### Seamless integration with operating environment.

A made-to-order system can accommodate:

- Various solutions to operate with the differing input voltage networks (nominal value, tolerance, frequency)
- Generous internal space to adapt terminal block size to input and output cables.
- Dedicated fault and status loops for enhanced interfacing with existing DCS and SCADA systems.

**Very high reliability.** The unique design provides natural cooling of both thyristors and the enclosure on most ratings to:

Offer full power availability at the maximum design temperature.

- Enable high MTBF above 150 000 hours, with appropriate maintenance plan
- Eliminate the need to replace hard to reach internal fans on power bridges

#### Ruggedized solutions.

The system may be tailored to various environments, e.g. high temperatures, earthquakes or vibrations, dust, elevation, moisture.

The Chloride® CP70R industrial rectifier-battery charger is the flagship rectifier of the Chloride® range. It combines reliability from naturally cooled thyristor-based rectifier with proven digital control technology to offer the best performances in any electrical and environmental conditions.

### Range Overview

Combined with an industrial stand-by battery, Chloride® CP70R rectifier-charger protects DC critical industrial equipment and processes from the damaging effects of power interruptions and losses. It features a microprocessor control which offers exceptional output stability and allows adaptability to various application requirements.

Chloride® CP70R range of rectifiers-chargers is available from 25 A to 250 A with single-phase input, and from 25 A to 2500 A with three-phase input. It offers several output voltages from 24 Vdc to 240 Vdc.

Chloride® CP70R is also available with 400 Vdc output. This configuration can be combined with a CP70i inverter to design specific high ratings double conversion AC UPS systems (up to 500 kVA).

To further improve load availability and process reliability, Chloride® CP70R is able to operate in dual or trial parallel configuration, with single or dual batteries, and can include a DC bus-tie.

### Applications

- Power generation plants
- Transmission and Distribution substations
- Continuous process industries
- Oil & Gas and Petrochemical industries
- Rail transport



Example of Chloride® CP70R-48V-200A-6P

## Key Features

- Continuous operation at full load at 40 °C ambient to meet industrial-level reliability requirements
- Resistance to vertical and horizontal acceleration up to 0.5 g using robust mechanical design
- Designed for 20+ years of continuous operation with appropriate maintenance plan
- Isolation transformer included
- Full compatibility with lead-acid and nickel-cadmium batteries, sealed or vented

## Technical Data

| Input                                    |  |
|--|--|
| AC voltage                               |  |
| • Single phase                           | 1 x 220 V, 1 x 120 V <sup>(1)</sup>                                  |
| • Three phase                            | 3 x 480 V, 3 x 208 V, 3 x 400 V <sup>(1)</sup>                       |
| Voltage tolerance                        | +/- 10 %   |
| Neutral configuration                    | Any configuration, with or without neutral                           |
| Frequency                                | 60 Hz (50 Hz)  |
| Frequency tolerance                      | +/- 5 %  |
| Frequency range (temporary)              | 45 Hz to 65 Hz (with 50 Hz nominal)                                  |
| Total harmonic current distortion (THDI) | < 34 % (6-pulse version)<br>< 12 % (12-pulse version) <sup>(2)</sup> |
| Inrush current                           | < 15 x In (for 6-pulse and 12-pulse)                                 |

| Output  |  |
|---|--|
| Nominal DC voltage  | 24 V    48 V    110-127 V    220-240 V    400V           |
| Output DC voltage range   | 17-40 V    36-75 V    88-160 V    176-300 V    296-550 V |
| Voltage stability (in stabilized floating mode, input within tolerance) |  |
| • Unitary system  | +/- 1 % <sup>(3)</sup>                                   |
| • Parallel systems  | +/- 1 % to +/- 2 % <sup>(3)</sup>                        |
| Voltage ripple  | ≤ 1 % RMS, in float mode, battery disconnected           |
| Current limitation  | I nominal  |

| Battery   |   |
|---|---|
| Type  | Lead acid or nickel cadmium, vented or recombination        |
| Autonomy  | From few minutes to several hours, on request               |
| Battery current limitation (typical, float & boost modes) | 0.1 C (lead-acid battery)<br>0.2 C (nickel-cadmium battery) |

| General data                       |   |
|------------------------------------|---|
| Operating temperature              | 32 to 104 °F <sup>(4)</sup> / 0 to 40°C <sup>(1)</sup>                |
| Storage temperature                | -4 to 158 °F / -20 to +70 °C  |
| Relative humidity                  | < 95 % non condensing   |
| Operating altitude                 | 3200 feet / 1 000 m max without derating <sup>(1)</sup>               |
| Cooling                            | Natural convection on most of the range                               |
| Efficiency                         | Up to 96 % according to rating  |
| External protection                | NEMA 1 <sup>(1)</sup> (IP 20 <sup>(1)</sup> ) according to IEC 60529) |
| Internal protection                | Protection against unintentional direct contacts, as per IEC 60950-1  |
| Noise (at 1m in front of the unit) | 55 – 65 dB according to rating  |
| Cabinet color                      | Grey RAL 7032 <sup>(1)</sup>  |
| Dimensions                         | Varying according to ratings & options                                |

(1) Other value on request

(2) May vary between 10 and 14% according to operation conditions.

Option for THDI ≈ 5% (+/- 1pt) available on 12-pulse version

(3) May vary depending on DC output voltage and system configuration

(4) 6-pulse version only

(5) 12-pulse version only

## Ratings

| Single phase input : Output current (A) vs Output voltage (Vdc) |        |        |             |
|---|--------|--------|-------------|
|   | 24 Vdc | 48 Vdc | 110-127 Vdc |
|   | 25     | 25     | 25          |
|   | 60     | 60     | 60          |
|   | 100    | 100    | 100         |
|   | 160    | 160    | 160         |
|   | 250    | 250    | 250         |

| Three phase input : Output current (A) vs Output voltage (Vdc) |                     |                     |                     |                     |                     |
|--|---------------------|---------------------|---------------------|---------------------|---------------------|
|  | 24 Vdc              | 48 Vdc              | 110-127 Vdc         | 220-240 Vdc         | 400 Vdc             |
| -  | -                   | -                   | 25 <sup>(4)</sup>   | 25 <sup>(4)</sup>   | -                   |
| -  | -                   | 60 <sup>(4)</sup>   | 50                  | 50                  | -                   |
| 100 <sup>(4)</sup>   | 100 <sup>(4)</sup>  | 100 <sup>(4)</sup>  | 100 <sup>(4)</sup>  | 100 <sup>(4)</sup>  | -                   |
| -  | -                   | 125 <sup>(5)</sup>  | 125 <sup>(5)</sup>  | 125                 | -                   |
| 160 <sup>(4)</sup>   | 160 <sup>(4)</sup>  | 160 <sup>(4)</sup>  | 160 <sup>(4)</sup>  | 160 <sup>(4)</sup>  | -                   |
| 200 <sup>(5)</sup>   | 200 <sup>(5)</sup>  | 200 <sup>(5)</sup>  | 200 <sup>(5)</sup>  | 200                 | -                   |
| 250 <sup>(4)</sup>   | 250 <sup>(4)</sup>  | 250 <sup>(4)</sup>  | 250 <sup>(4)</sup>  | 250                 | -                   |
| 320 <sup>(5)</sup>   | 320 <sup>(5)</sup>  | 320                 | 320                 | 320                 | -                   |
| 400 <sup>(4)</sup>   | 400 <sup>(4)</sup>  | 400 <sup>(4)</sup>  | 400 <sup>(4)</sup>  | 400                 | 400                 |
| 500 <sup>(5)</sup>   | 500                 | 500                 | 500                 | 500                 | 500                 |
| 600 <sup>(4)</sup>   | 600 <sup>(4)</sup>  | 600                 | 600                 | 600                 | 600                 |
| 800  | 800                 | 800                 | 800                 | 800                 | 800                 |
| 1000 <sup>(4)</sup>  | 1000                | 1000                | 1000                | 1000                | 1000 <sup>(5)</sup> |
| 1200   | 1200                | 1200                | 1200                | 1200 <sup>(5)</sup> | 1200 <sup>(5)</sup> |
| 1500 <sup>(4)</sup>  | 1600 <sup>(5)</sup> | 1600 <sup>(5)</sup> | 1600 <sup>(5)</sup> | 1600 <sup>(5)</sup> | 1600 <sup>(5)</sup> |
| 2000 <sup>(4)</sup>  | 2000 <sup>(5)</sup> | 2000 <sup>(5)</sup> | 2000 <sup>(5)</sup> | 2000 <sup>(5)</sup> | -                   |
| 2500 <sup>(4)</sup>  | 2400 <sup>(5)</sup> | 2400 <sup>(5)</sup> | -                   | -                   | -                   |

## Standards

| Standards                     |  |
|-------------------------------|--|
| IEC60146-1-1:2009             | Semiconductor converters - Specification of basic requirements   |
| IEC62040-1:2008<br>+AMD1:2013 | Uninterruptible power systems (UPS) - Part 1-2: General and safety requirements for UPS in restricted access locations |
| IEC62040-2:2006               | Uninterruptible power systems (UPS) - Part 2: Electromagnetic compatibility (EMC) requirements                         |
| IEC60529:1989<br>+AMD1:1999   | Degrees of protection provided by enclosures (IP Code)   |
| IEC60076-11:2004              | Power transformers – Part 11: Dry type transformers  |

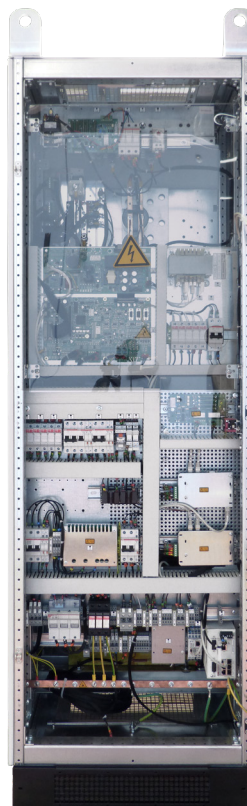
| Conformity            |                            |
|-----------------------|----------------------------|
| Low voltage directive | 2006/95/EC and 2014/35/EU  |
| EMC directive         | 2004/108/EC and 2014/30/EU |
| CE Mark               |                            |

## Options

Consult us for any other requirements, subject to feasibility

|               |   |
|---------------|---|
| Rectifier     | <ul style="list-style-type: none"> <li>• 12-pulse rectifier</li> <li>• Harmonic filter on 12P for THDi ≈5 % (+/- 1pt)</li> <li>• Voltage ripple filter (psophometric for 48 Vdc output only)</li> <li>• Blocking diode</li> <li>• Other input voltage (1 x 110 to 3 x 690 VAC)</li> <li>• Inrush current limitation to 5 x In</li> <li>• Surge and/or lightning protections</li> </ul>  |
| Battery       | <ul style="list-style-type: none"> <li>• Battery circuit protection box</li> <li>• Battery reversed polarity detection</li> <li>• Battery low-voltage disconnection contactor (LVD)</li> <li>• DC earth fault detection</li> <li>• Battery room temperature sensor</li> <li>• Battery monitoring system (Chloride® BMS)</li> <li>• Battery cabinet / rack</li> </ul>  |
| System        | <ul style="list-style-type: none"> <li>• Operation in ambient temperature up to 131°F (55°C)</li> <li>• Parallel configurations (dual, tri)</li> <li>• Hot stand-by configuration</li> <li>• Input/output isolators</li> <li>• Dropping diodes / DC/DC serial regulator</li> <li>• Isolated DC/DC converter</li> <li>• DC distribution</li> <li>• Earth fault detection or monitoring</li> <li>• Internal cabinet lighting</li> <li>• Anti-condensation heater</li> <li>• Cabinet temperature monitor</li> </ul>  |
| Mechanical    | <ul style="list-style-type: none"> <li>• External ingress protection up to IP42</li> <li>• Top cable entry</li> <li>• Specified color of panels</li> <li>• Special feet height (7.9 inches or 11.8 inches)</li> <li>• Special keylock</li> <li>• Non-magnetic gland plate (brass or aluminum)</li> <li>• Lifting eyes</li> <li>• 12 Gauge side panels thickness</li> <li>• Specified cabinet identification (tag, nameplate)</li> <li>• Anti-seismic design</li> </ul>  |
| Communication | <ul style="list-style-type: none"> <li>• Touch pad Human-Machine Interface</li> <li>• Front panel analogue meters (2.8 x 2.8 inches, class 1.5 or class 1)</li> <li>• Transducers 4-20mA</li> <li>• Additional volt-free contacts</li> <li>• Modbus RTU (RS232 or RS485)</li> <li>• Modbus / TCP</li> <li>• Profibus</li> <li>• IEC61850 protocol</li> <li>• PPVis monitoring software</li> <li>• PPVis2 monitoring software with touchpad display</li> <li>• Mimic panel:                             <ul style="list-style-type: none"> <li>- Passive mimic of the system</li> <li>- Active mimic with integrated LEDs</li> </ul> </li> <li>• Lamp indicator on front panel (22 mm diameter)</li> </ul> |

## Internal layout examples

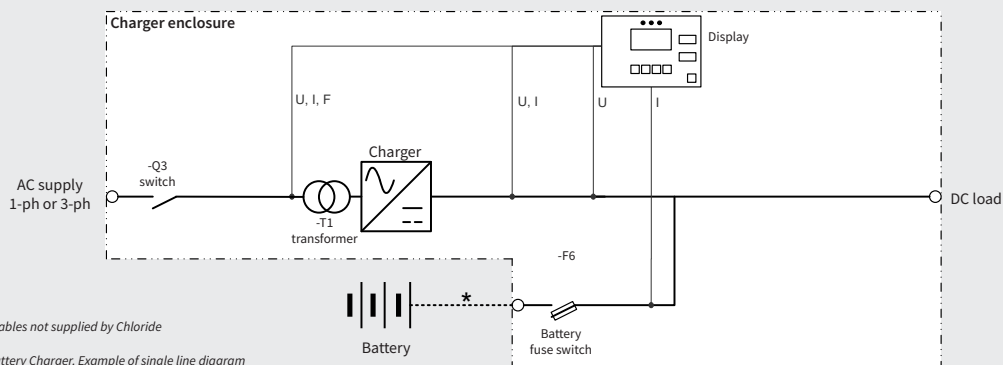


Example of Chloride® CP70R-110V-50A-6P



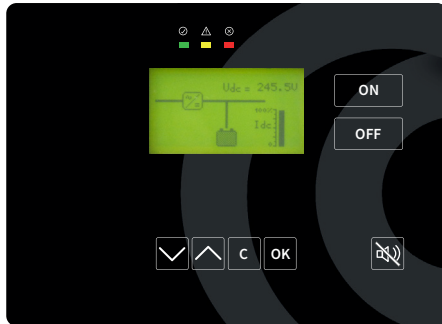
Example of Chloride® CP70R-127V-150A-6P

The above illustrations show some examples of finished systems. As each system is customized to specification, the internal layout might be different for different units.



## Ergonomic LCD display

As standard, the front panel of the system includes an ergonomic graphical interface that helps understanding the system operation.



Chloride CP70R - Standard LCD display

## System Operation

- On/off control buttons of the rectifier/charger
- 3 LEDs highlighting the operation status of the unit
- View of the power flow on a simplified single line diagram
- View of the system status via the navigation buttons
- View of the system measurements
- Control of the rectifier/charger operation mode (floating, boost, initial charge)
- Launch of a battery test
- Memorization of some critical fault messages with a mandatory fault acknowledgement
- Event logger that records up to 100 events with date and time stamp

## LYNX by Chloride® (HMI) - Optional

As an option, the front panel of the system includes a large, colour touchscreen LYNX with intuitive graphical interface that simplifies system setup, operation, and troubleshooting.



LYNX by Chloride® - Human-machine Interface (HMI)

## System Set-up

- Selection of the language
- Set-up of the date and time
- Adjustment of the brightness
- Configuration of the main screen: the user can choose between displaying the block diagram only or the block diagram with the input and/or output measurements
- Configuration of the Modbus (optional)
- Adjustment of system parameters in a password protected area (e.g. battery voltage level, number of cells)

## System Operation

- View of the single line diagram with color-coded blocks and power flow
- Check the position of the system main isolators (open/close status)
- Access to blocks information and measurements via a simple touch
- Change of the battery charging mode (float, boost, initial charge)
- Launch of a battery test

## System troubleshooting

- Color-coding of each block for immediate identification of possible alarm
- Memorization of some critical fault messages with a mandatory fault acknowledgement
- Checking of all the triggered status, warning and fault messages with detailed description via a simple touch
- Event logger that records up to 2000 events with date and time stamp
- Export of all the recorded events using USB flash drive. The extracted HTML file allows root cause analysis.