Chloride™
Power to Protect

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Chloride® FP50R

Product Brochure





Chloride® FP50R
Industrial Rectifier - Charger

The Chloride® FP50R range of industrial rectifiers and chargers has been designed to provide a simple, fast and cost effective solution for DC power requirements. Its 100% industrialised design based on configurable sub-assemblies reduces costs and manufacturing time to meet even the most urgent requirements.

Overview of the range

The Chloride® FP50R range is available over a wide range of input voltages in single phase from 220 to 240Vac and three phase from 3x208Vac to 3x480Vac. It can supply from 10A to 250A at 24Vdc, 48Vdc, 110Vdc and 125/127Vdc.
The Chloride® FP50R rectifier-charger can be used as a battery charger or rectifier. It is equipped with a microprocessor control system that provides output voltage regulation of less than 1% and allows it to meet a variety of application requirements.
In order to guarantee the availability of the load backed up by the Chloride® FP50R rectifier-charger, it can easily operate in a dual parallel configuration. Its electronic control system has been designed to communicate easily with other Chloride® FP50R electronics via a simple CAN bus link.
The Chloride® FP50R range, with its fully industrialised options, has been specifically developed for the secondary transmission and power distribution markets, as well as for the process industries.

Power Transmission and Distribution

Motorised circuit breakers, control rooms, SCADA, automatic controllers

Energy Production

Safety systems, SCADA, automatic controllers

Process Industries

Control systems, SCADA, automatic controllers

Benefits

- **More reliable** : thanks to the proven thyristor technology that Chloride® has mastered for over 75 years.
- **More robust** : with a natural cooling design throughout the range. No risk of fan-related failures.
- **Less maintenance** : due to the use of long-life components.
- **Easier to use** : with its human-machine interface featuring a large, high-contrast display. The display shows the rectifier diagram and indicates any faults, which are also indicated by summary LEDs.
- **Faster availability** : thanks to its design in 100% industrialised configurable sub-assemblies. The Chloride® FP50R charger-rectifier can be available in only 10 weeks.

Unique Features

Intuitive human-machine interface (HMI)

The Chloride® FP50R rectifier range has an optimised and comprehensive human-machine interface to make day-to-day operation as easy as possible.

1: Its large, high contrast 75mm by 45mm display shows the system diagram and measurement parameters.

2: The diagram icons can display any faults which are also indicated by information LEDs for greater visibility when required.

3: The Chloride FP50R display has large ergonomic keys for easy navigation through the various menus.

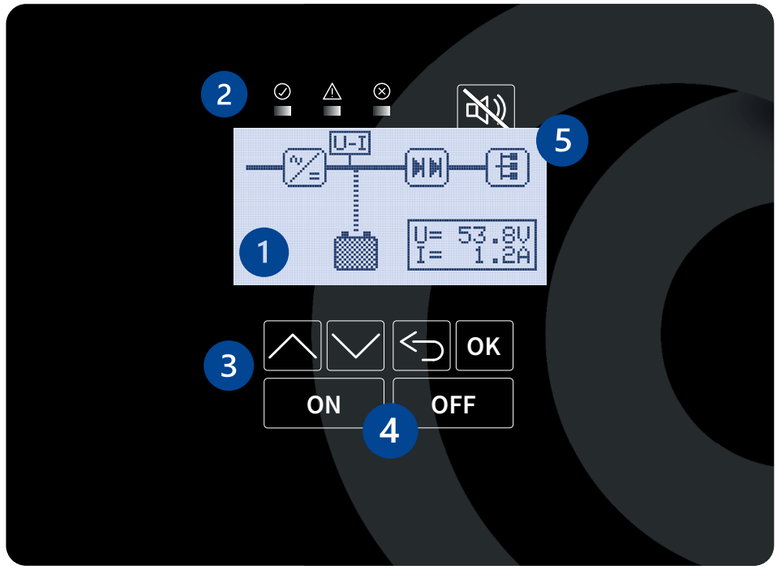
4: The rectifier can be easily switched off and on from the front panel buttons.

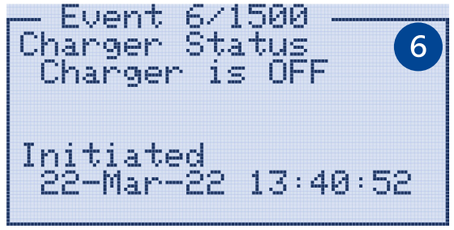
5: Key information about the status of the rectifier is displayed directly on the screen.

6: The rectifier's built-in history can record up to 1500 events. It can also be exported to a USB memory stick to facilitate exchanges with Chloride's teams during corrective or preventive maintenance.

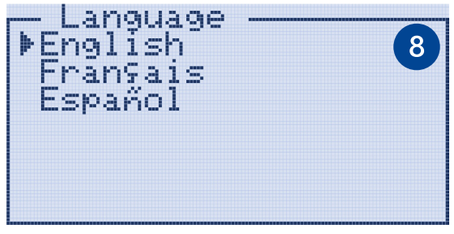
7: The Chloride FP50R rectifier parameters can be exported and imported using a USB stick to facilitate on-site parameterisation of the product. To limit access to the USB port, it is located inside the rectifier.

8: To accommodate most users, the Chloride FP50R rectifier is available in 3 languages (English, French and Spanish) as standard.







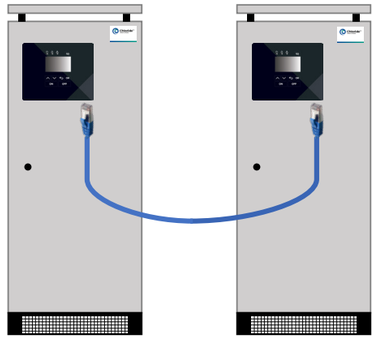


Communication

To meet the growing need for product monitoring, the Chloride FP50R range of rectifiers has been designed to incorporate multiple communication elements.

In a dual charger single battery configuration, the two units of Chloride FP50R are connected via a network cable so that the electronics communicate with each other without the need for an additional interface to synchronise their operation.

With this architecture, the rectifiers can share the load. Each rectifier knows the status of the other and can adapt its operation accordingly.



Serial fault reports

- 1. General fault
- 2. No power supply
- 3. Battery operation
- 4. End of discharge

Optional fault reports

- 1. Boost mode
- 2. DC overvoltage
- 3. DC undervoltage
- 4. Earth fault

IEC 61850

Modbus TCP/IP

In addition to the dry contacts, the Chloride® FP50R rectifiers can also have optional network communication with TCP/IP or RS485 connectivity. The RS485 protocol can be chosen for both architectures. The IEC 61850 protocol, which is standard in power transmission and distribution applications, is available in TCP/IP mode.

Footprint

The Chloride® FP50R range of rectifiers has been developed with 100% natural cooling to ensure reliability. It has also been designed to optimise its footprint. Three cabinet sizes, always 600mm deep, are available to optimise the footprint in all configurations:

Single configuration

- 1400mm x 600mm cabinet for all ratings up to 100A without option.
- 1800mm x 600mm x 600 mm cabinet for all ratings up to 100A with options.
- 1800mm x 800mm x 600mm cabinet for all ratings 160A and 250A with options.

Dual configuration (1 cabinet)

- 1800mm x 800mm x 600mm cabinet for all 25A, 40A and 60A ratings at 24V and 48V and 25A at 110V.

Technical Specifications

Range	1-Phase				3-Phase					
	25 Adc	40 Adc	60 Adc	100 Adc	25 Adc	40 Adc	60 Adc	100 Adc	160 Adc	250 Adc
Input										
Rated voltage	230VAC (220, 240)				400VAC (380, 415) / 208VAC (220, 400, 480)					
Input voltage tolerance	± 10%									
Frequency	47Hz / 63Hz									
Frequency tolerance	± 5%									
Inrush current	< 15 In				< 10 In					
Output										
Rated voltage DC	24V (17V-34V), 48V (34V-68V), 110-125V (88V-179V)									
Voltage stability (in stabilised floating mode, input within tolerances)	Single system: ± 1% (1) Dual system: ± 1% to ± 2% (1)									
Voltage ripple rate	≤ 5 % at 100 % load									

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

Battery		
Type	Lead-Acid (VLA or VRLA), Nickel-Cadmium, Sodium Metal Chloride (SMC)*	
Autonomy	From a few minutes to several hours, on request	
	Lead-Acid	NiCd
24V - Number of battery cells	12	18 - 20
48V - Number of battery cells	24	36 - 44
110V - Number of battery cells	54	82 - 92
125V - Number of battery cells	60	91 - 105

General Data	
Operating temperature	0 to 40°C (2)
Storage temperature range	-20 to 70°C (excluding battery)
Relative humidity	< 95% non-condensing at 20°C
Altitude	1000m (2) (without downgrading the system)
Rectifier technology	SCR, 2-pulses thyristors / SCR, 6-pulses thyristors
Cooling	Natural convection
External protection class	IP21 to IEC 60529 (other protection classes available: IP41 / IP42)
Internal protection	Protection against unintentional direct contact according to IEC 62477-1
Cable entry	Bottom
Cabinet colours	Grey RAL 7035 / Grey RAL 7032
Dimensions	Varies according to size and options

(2) Other values on request

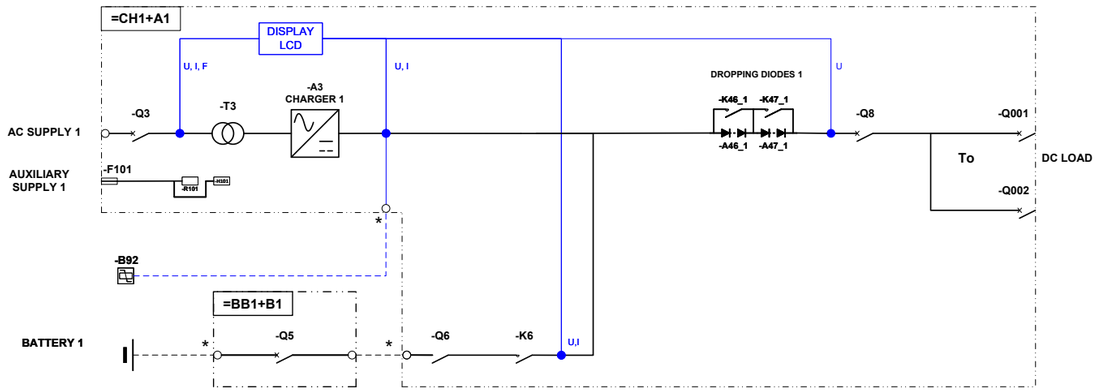
Monitoring	
Local, on the front panel	Graphic display with navigation buttons (75mm x 45mm)
List of relay alarms	Standards: general alarm, mains failure, battery charging, end of discharge Options: ground fault, boost mode, overvoltage, undervoltage
Alarm relays, contact characteristics	Changeover contact, switching capacity in accordance with DIN VDE 0660/IEC 60947: 1 A (24 V (DC13)), 0.2 A (110 V, DC13), 0.1 A (220 V, DC13) 3 A (24 V, AC15), 3 A (120 V, AC15), 3 A (230 V, AC15)
Remote control (optional)	Modbus (RS485), TCP-IP, IEC 61850**, SNMP**, PROFIBUS

Standards	
IEC 61000-6-2 : 2016	Electromagnetic compatibility (EMC) - Part 6-2: General requirements - Emission for industrial environments
IEC 61000-6-4 : 2018	Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission for industrial environments
IEC 61000-6-5 : 2015	Electromagnetic compatibility (EMC) - Part 6-5: Generic standards - Emission for equipment used in power plant and substation environments
IEC 62477-1 : 2022	Safety requirements for electronic power conversion systems and equipment - Part 1: General
IEC 60146-1-1 : 2009	Semiconductor converters - General requirements and mains switched converters - Part 1-1: Specification of basic requirements
IEC 60529 : 2013	Degrees of protection provided by the enclosures (IP Code)

**No monitoring, always out of the FP50R cabinet (rack)*

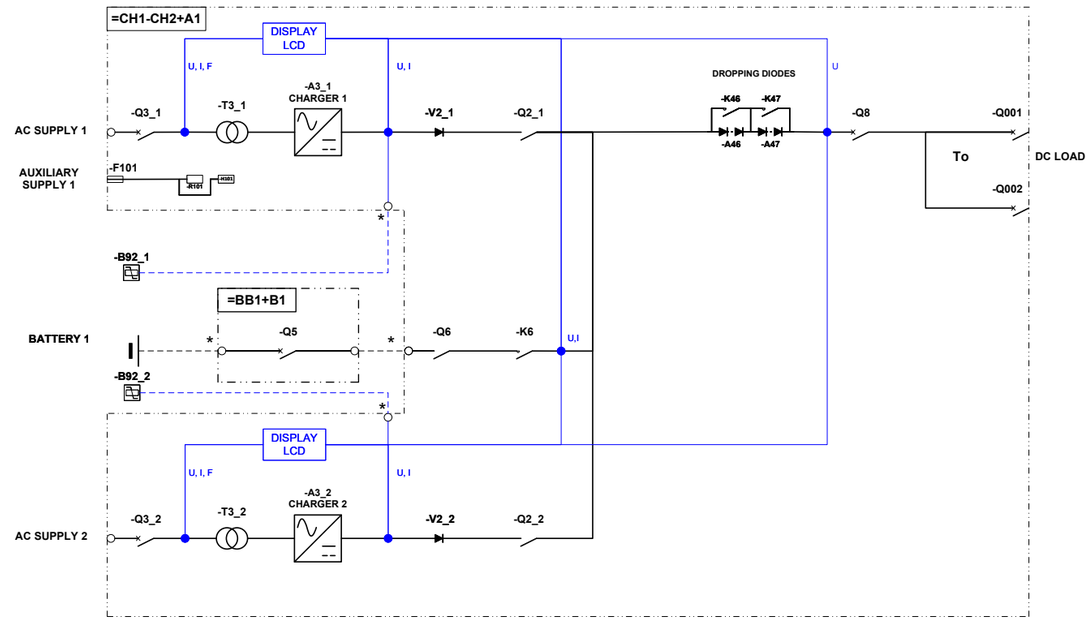
***development in progress, consult Chloride®*

Single line electrical diagram - Single Charger Configuration



*Cables not supplied

Single line electrical diagram - Dual Charger Configuration

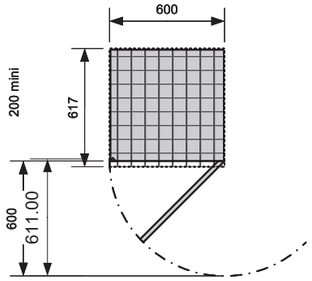


General Arrangement

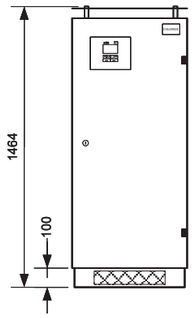
Single Charger Configuration

Cabinet 14.06.06

Top view

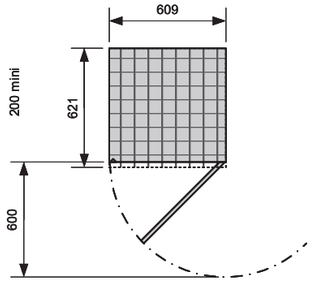


Front view

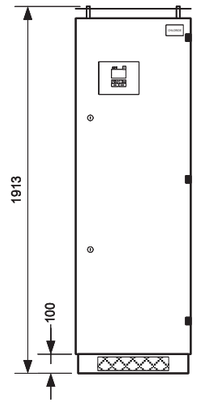


Cabinet 18.06.06

Top view



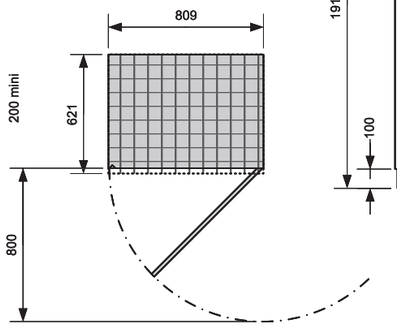
Front view



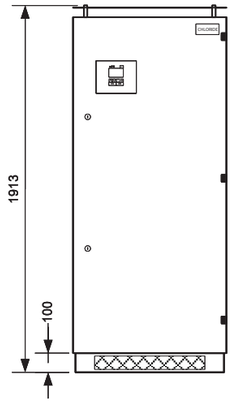
Dual Charger Configuration

Cabinet 18.08.06

Top view

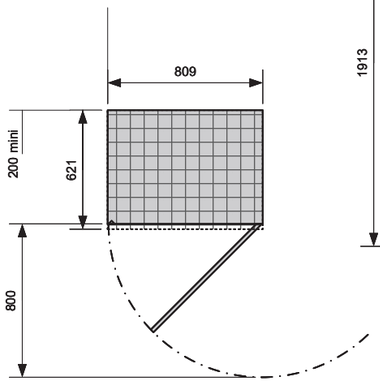


Front view

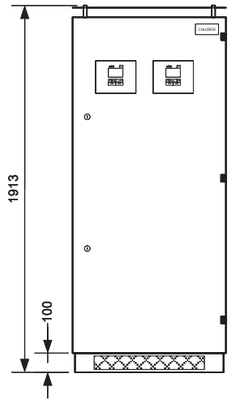


Cabinet 18.08.06

Top view



Front view



Options

AC input (Mains)

Standard	Options
U, F input measurement	I AC input measurement
Mains protection circuit breaker (Q3)	ON / OFF contact (Q3)

DC output (Load)

Standard	Options
DC output protection - Circuit breaker (Q8)	ON / OFF contact (Q8)
	Drop diodes (A46)
	Distribution - Max 16 breakers (Q001 to Q016)
	Distribution - ON / OFF contact (Q001 to Q016)

DC output (Battery)

Standard	Options
DC output protection - Circuit breaker + ON / OFF contact (Q6)	Battery protection box (external) - Circuit breaker + position contact (Q5)
	External battery current measurement
	Reverse polarity protection (V6)
	End of discharge contactor (K6)
	Battery temperature sensor (B92)
	Battery presence test
	Battery capability test
	Battery room fan failure (Floating imposed)

Other options available

Blocking diode (V2)
CPI Insulation Monitor (K100)
Internal lighting (H101)
Space heater + thermostat (R101)
Space heater + thermostat (R101) + Hygrostat (B102)
MODBUS TCP/IP communication
MODBUS RTU communication
PROFIBUS communication
SNMP communication*
IEC 61850 communication*
4 additional alarm reporting (Earth fault, Boost mode, overvoltage, undervoltage)
Customer connection to terminals
Language settings on the screen: French / English / Spanish
Packaging SEI 2B / SEI 4B / SEI 4C

**development in progress, consult Chloride®*

FP50R Charger Definition

FP50R Charger Definition

Infos	Charger	Single		Dual		Nominal curent				Peak current							
	Battery	Single		Dual		Cabinet		Rack		VRLA	x	Other		Autonomy			
	Capacity	24 Ah		40 Ah		60 Ah		100 Ah		130 Ah		150Ah		180 Ah			
		195 Ah		260 Ah		300 Ah		360 Ah		390 Ah		450 Ah		540 Ah			
	AC Voltage	230 Vac 1Ph		400 Vac 3Ph		IP 21	x	IP 41		IP 42							
	DC Voltage	24 Vdc		48 Vdc		110 Vdc		120 Vdc									
	DC Power	10 A		25 A		40 A		60 A		100 A		160 A		250 A			
	Standard default contacts			Alarm	x	Main fault	x	Battery Operation			x	End of Autonomy				x	

Input	U Measure, F Entry					x	Comments
	Input Current value, I						
	Mains protection Mcb (Q3)					x	
	Mains protection Mcb + positions contacts (Q3)						
Battery	Reverse battery polarity protection						
	Battery temperature sensor					x	
	Local ventilation fault (Floating imposed)						
	Battery presence Test		Battery Capacity Test				
	Battery Self for 0.1 %						
	End of autonomy switch (K6)						
	External battery protection cabinet						
	Battery protection + contact positions (Q5 / Q6)						
Output	Voltage range :	%	Dropping diodes (A46)				
	Ouptput Mcb Protection (Q8)						
	Output Mcb protection + contact positions (Q8)						
	Distribution, 16 Mcbs max (Q001 à Q016)						
	Distribution 16 Mcbs max + contacts positions (Q001 à Q016)						
Options	Coupling Diodes (V2)						
	Earth Fault (K100)						
	Internal Light (A101)						
	Anti-condensation Heater (R + thermostat) (R101)						
	Terminals						
	Telecom filtering (output voltage +/-0.1%)						
	Communication		RJ45		RS485		
	4 default contacts (Earth Fault, Boost, High voltage, low voltage)						
	English		French				
	Packaging : SEI 2B		SEI 4B		SEI 4C		

The FP50R charger configurator allows you to guide you and define precisely the best configuration for your installation.

How to read the table :
This table is read line by line, you must tick only one box per line.
The pre-lined boxes (X) indicate the basic configuration of an FP50R charger (cannot be modified).
The opions are additional.

If you know your requirements, the green boxes and “DC Current” are the essential information to fill in for your costing.
If you don’t know your operating current (DC voltage) and your battery capacity, you will have to fill in the “Use”, “Peak” and “Autonomy” boxes.
CHLORIDE’s technical support will then be able to calculate your battery requirements and have them validated.

“Comments”: Allows you to specify your configuration and validate the selection made.

Notes

Chloride™
Power to Protect

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Chloride®-FP50R-BR-EN-gl-rev4-0525