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AC Power for
Business-Critical Continuity™

Chloride CROSS Chassis/Cabinet from 160 to 1250 A

STS Catalogue

EMERSON
Network Power

Chloride CROSS Chassis/Cabinet

Complete Reliability On-line Static Switch (CROSS)

STS from 160 to 1250 A

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1 Scope

This specification describes the Chloride CROSS Chassis/Cabinet series of static switches, together with information regarding the products' electrical and mechanical features.

1.1 The system

Chloride CROSS Chassis/Cabinet ensures the supply of redundant power to critical loads through the ability to switch between two independent alternative power sources. Switching will occur whenever the line supplying the load no longer falls within the acceptable (user definable) tolerance values. The user will be able to set the operating mode of Chloride CROSS Chassis/Cabinet. When functioning in Fixed Priority Mode the user may select the preferred input line thus, the Chloride CROSS Chassis/Cabinet will transfer to the priority line whenever its parameters fall within acceptable values. When functioning in No Priority Mode, the Chloride CROSS Chassis/Cabinet will consider both lines as equally acceptable (provided their parameters are both within the set tolerance values) and will therefore select the ideal source. Chloride CROSS Chassis/Cabinet will function so that the transfer between the two sources will be break-before-make (BBM), thus, ensuring that the two sources will never be directly connected in parallel. Chloride CROSS Chassis/Cabinet will ensure switching between independent AC power sources in both synchronous and asynchronous conditions.
When the two lines are synchronous Chloride CROSS Chassis/Cabinet will transfer between the sources within 5 ms following a line failure.
In asynchronous conditions transfer will occur within 5 ms and will follow a delay time (ranging from 0 to 1000 ms) settable by the user. The acceptable phase angle difference between the two lines for sychronous transfers will be within a 30° range and selectable by the user (default value 10°).
In order to maximize reliability Chloride CROSS Chassis/Cabinet control logic is highly redundant and minimizes the use of common components. The Chloride CROSS Cabinet ranging from 160 up to 600 A will be provided with natural ventilation, while cooling of the 800 to 1250 A models will rely on redundant ventilation. Chloride CROSS Cabinet includes input/output switches and maintenance bypass switches thus ensuring safe maintenance of the system. Maintenance access is from the front of the unit.
To ensure maximum reliability the CROSS Chassis will rely on natural cooling and will therefore not require fans. Chloride CROSS Chassis is intended for complete integration with the customer's Power Distribution Units (PDU) and will therefore not include switches. Chloride CROSS Chassis will be provided with inputs for the auxiliary contacts of the external switching devices. Chloride CROSS Chassis may only operate if inserted into a PDU.

1.2 Models available

Chloride CROSS Chassis/Cabinet includes models with three-phase input and three-phase output as specified in Table 1.

MODEL	Current (A)	Input/Output phases	No. of poles
Chloride CROSS Cabinet 160	160	3/3	3 or 4
Chloride CROSS Cabinet 250	250	3/3	3 or 4
Chloride CROSS Cabinet 400	400	3/3	3 or 4
Chloride CROSS Cabinet 600	600	3/3	3 or 4
Chloride CROSS Cabinet 800	800	3/3	3 or 4
Chloride CROSS Cabinet 1250	1250	3/3	3 or 4
Chloride CROSS Chassis 160	160	3/3	4
Chloride CROSS Chassis 250	250	3/3	4
Chloride CROSS Chassis 450	450	3/3	4

Table 1. Chloride CROSS Chassis/Cabinet Models
Nominal currents are intended as continuous and may apply to any non linear load

2 System Description

The number of poles shown in Table 1 indicate if the neutral conductor is switched along with the phases (4 pole commutation) or not (3 pole commutation). In any case the neutral conductor(s) will have to be connected to Chloride CROSS Chassis/Cabinet, which is a 4-wire-in device (for each source). In 3 pole Chloride CROSS Cabinet/Chassis the neutrals of the two sources will be permanently tied together. The transfer of the phases between the two sources will always be operated without overlapping (break-before-make) in any source and load conditions (irrespective of the Power Factor). In 4 pole models the transfer mode of the neutral conductor only is User selectable: with overlapping (make-before-break) or without overlapping (break-before-make), depending on the installation conditions and on the source's neutral grounding. The ability to switch the neutral conductor means that the sources can be fully separated during normal operation.

Chloride CROSS Chassis/Cabinet is the result of an innovative Research and Development programme designed to offer the most reliable load protection.

2.1 Microprocessor control and diagnostics

Operation and control of Chloride CROSS Chassis/Cabinet is provided through the use of microprocessor controlled logic.
The coloured LEDs on the front panel of Chloride CROSS Chassis/Cabinet provide a simple and immediate indication of the operational state of the system. Indications, measurements and alarms, together with event logging are shown on an LCD display. For a more detailed and complete description of Chloride CROSS Chassis/Cabinet diagnostics, see section 4.4.

2.2 Modes of Operation

The operating mode of Chloride CROSS Chassis/Cabinet will be selected by the Priority push-button P on the control panel of the unit (see section 4.3). To ensure safe operation both push-buttons P and T (manual Transfer button) will have to be enabled from the LCD display. Chloride CROSS Chassis/Cabinet is able to operate in the following operating modes:

2.2.1 Fixed Priority Mode

When operating in Fixed Priority Mode Chloride CROSS Chassis/Cabinet will attribute a priority to one of the two sources. The priority source will be selected from the front panel by pressing push-buttons P for 2 seconds. The selected source will be indicated by the corresponding LED (S1 or S2). The selected priority source will continuously supply the load provided it remains within the tolerance windows. Failure of the priority source or an external command will initiate transfer of the load to the reserve (low priority) source. When the priority line returns within the acceptable tolerance window the load will automatically be transferred back to the priority line following a brief re-transfer time set by the user. In the event of both sources falling outside the acceptable tolerance windows, defined by the normal limit parameters, Chloride CROSS Chassis/Cabinet will transfer to the source which remains within the acceptable window defined by the critical limit parameters. In the event of both sources falling outside the critical limit parameters Chloride CROSS Chassis/Cabinet will cease supplying the load.

2.2.2 No Priority Mode

When operating in No Priority Mode Chloride CROSS Chassis/Cabinet will treat both sources as equally acceptable and will therefore supply the load from whichever source last complied with the tolerance parameters. This operating mode will be selected through push-button P and will be indicated by the simultaneous lighting of LED S1 and S2. If the load is supplied from source S1, and if this source fails to comply with the acceptable tolerance values, Chloride CROSS Chassis/Cabinet will transfer the load to source S2. The load will remain on this line and will not attempt to return to S1 even when it returns to the appropriate values. The load will transfer back to S1 only if source S2 fails.

In the event of both sources falling outside the acceptable tolerance windows defined by the normal limit parameters, Chloride CROSS Chassis/Cabinet will transfer to the source which remains within the acceptable window defined by the critical limit parameters. In the event of both sources falling outside the critical limit parameters Chloride CROSS Chassis/Cabinet will cease supplying the load.

2.3 Transfer Modes

Chloride CROSS Chassis/Cabinet will switch the supply to the load under the following conditions:

2.3.1 Line Failure Transfer

Chloride CROSS Chassis/Cabinet switching occurs if the characteristic parameters of the active power source (preferred or alternative) supplying the load fall outside defined limits.
The parameters tested are the root mean square (RMS) and instantaneous values of the voltage, which must remain within a defined acceptance window. Once the parameters of the power source have returned to normal, if the load is supplied by the source selected as the alternative, it is automatically transferred back to the priority source. Transfer time will be ≤5 ms, both for synchronous and asynchronous sources. If the sources are asynchronous the transfer delay time will define the additional delay after which transfer will occur. During this interval the load will not be supplied. Asynchronous transfer delay time will be user defined and range from 0 to 1000 ms. When the source returns to normal, Chloride CROSS Chassis/Cabinet will re-transfer back to the original source if this corresponds to the priority line and Chloride CROSS Chassis/Cabinet is operating in Fixed Priority Mode. If Chloride CROSS Chassis/Cabinet is operating in No Priority Mode there will be no transfer back to the original source.

2.3.2 User Transfer

Transfer push-button T on the front panel of Chloride CROSS Chassis/Cabinet allows the permanent transfer of the load (assuming the manual re-transfer timeout parameter is not enabled). The transfer shall occur without interrupting the output. Chloride CROSS Chassis/Cabinet will allow a transfer upon pressing push-button T only if the alternative source is within the acceptable tolerance levels and in phase with the line supplying the load. If the alternative source does not have the acceptable voltage and frequency values the transfer command will be cancelled. If the two sources are asynchronous, transfer will be delayed until the phase difference falls within the phase error limit parameter set by the user. While the two sources are asynchronous and the transfer command is pending, the LEDs indicating priority will both be flashing. If the transfer has not occurred after a time interval defined by the user (pending command timeout parameter) the command will be cancelled. Following transfer, provided Chloride CROSS Chassis/Cabinet is operating in No Priority Mode, the load will remain on the new source while its parameters stay within the acceptable tolerance values. If Chloride CROSS Chassis/Cabinet is operating in Fixed Priority Mode and the load switches to reserve line, this will be highlighted by an alarm (load on reserve line). However there will be no transfer back to the priority line unless the user enables a timeout function (manual re-transfer timeout parameter enable) which is possible only when operating in Fixed Priority Mode. If the function is activated, the load will be transferred back to the priority line upon the end of the time setting.

If the operating mode is changed from Fixed Priority Mode to No Priority Mode while the load is supplied by the reserve line, the active alarm signal will stop. If the operating mode is changed from No Priority Mode to Fixed Priority Mode while the load is supplied by the reserve line, the alarm signal will be activated.

It will be possible to transfer the load to a line outside the normal limits but within the critical limits, provided the override function is activated. This function is found in the menu present on the display.

2.3.3 External Command Transfer

It will be possible, through the optional customer interface board, to activate four (4) input failure signals referred to either of the two sources. Depending on the priority mode selected, the signals will be interpreted differently by the control logic of Chloride CROSS Chassis/Cabinet. If Chloride CROSS Chassis/Cabinet is operating in Fixed Priority Mode the possible signals will be: Preferred Source Failure, Reserve Source Failure, Transfer Inhibited and Source Supply selection.

If Chloride CROSS Chassis/Cabinet is operating in No Priority Mode the possible signals will be: S1 Source Failure, S2 Source Failure, Transfer Inhibited and Source Supply selection.

Preferred or S1 source failure, Reserve or S2 source failure
If the signal refers to the line supplying the load, the Chloride CROSS Chassis/Cabinet will activate a line failure transfer to the alternative source. If the signal refers to the line not supplying the load, Chloride CROSS Chassis/Cabinet will not allow the transfer to this source. When the signal ends the load will transfer back to the priority source if Chloride CROSS Chassis/Cabinet is operating in Fixed Priority Mode; if Chloride CROSS Chassis/Cabinet is operating in No Priority Mode there will be no re-transfer.

Source supply selection
Depending on which one of the two modes is selected the command will react as follows:

- If Fixed Priority Mode is selected, the command will change the existing priority mode. As soon as the command is disabled the previous priority mode will be restored.
- If No Priority Mode is selected Chloride CROSS Chassis/Cabinet will according to for the manual transfer command (see 2.3.2).

Transfer inhibited
Chloride CROSS Chassis/Cabinet will inhibit the transfer between source 1 and 2 and vice versa and will supply the load from the existing source.

2.3.4 Operation Under Output Short Circuit

Chloride CROSS Chassis/Cabinet will inhibit transfer whenever an output short circuit is detected, thus avoiding the transfer of the short circuit to the alternative source. The instant short circuit threshold level is user definable. The default setting is 3In. When the current falls below the threshold value and the voltage value is acceptable, Chloride CROSS Chassis/Cabinet automatically resets and enables transfer. Chloride CROSS Chassis/Cabinet internal logic will recognize a short circuit condition at the output and inhibit transfers also in the case that an upstream protection device trips and the current goes to zero.

2.3.5 Operation Under Overload

An overload condition will be recognized whenever the load is above 105% of nominal and an overload alarm appears on the display. Depending on the overload level a timeout will be activated showing the remaining thermal autonomy. The timeout will be related to the overload levels shown to the right.Once the timeout has expired, an “overload timeout expired” alarm message will be displayed. Power nevertheless continues to be supplied to the load. If the overload transfer inhibition enable parameter is set as YES, Chloride CROSS Chassis/Cabinet will inhibit the transfer between the sources. This parameter needs to be set accordingly in order to obtain the desired operation.

Chloride CROSS Chassis/Cabinet will reset the overload condition as well as the timeout expired condition whenever the output current drops below 100%.

105%<Iout<125%	timeout	10 min.	(overload level 1 timeout)
125%<Iout<150%	timeout	1 min.	(overload level 2 timeout)
150%<Iout<200%	timeout	10 sec.	(overload level 3 timeout)
200%<Iout	timeout	1 sec.	(overload level 4 timeout)

Table 2. Chloride CROSS Chassis/Cabinet Overload Capability

2.3.6 Maintenance bypass

Chloride CROSS Cabinet:
Chloride CROSS Cabinet is fitted with internal maintenance bypass switches, which enable a load transfer to the supply sources without causing a power interruption to the critical load.
Bypass isolation is complete, allowing all serviceable components to be maintained safely. Mechanical interlocks will ensure that the two bypass switches (one for each line) cannot be simultaneously closed, thus avoiding the direct connection of the two sources. The control logic will ensure that in the event of an accidental closure of the bypass on the passive line, the Chloride CROSS Cabinet will transfer the load so as to avoid a permanent paralleling of the two sources.

Chloride CROSS Chassis:
Chloride CROSS Chassis will be fitted with external bypass switches which enable a load transfer to the supply sources without causing a power interruption to the critical load.
The external switching devices (not included with Chloride CROSS Chassis) should be equipped with mechanical interlocks to ensure that the two bypass switches (one for each line) cannot be simultaneously closed, thus avoiding the direct connection of the two sources.
The control logic will ensure that in the event of an accidental closure of the bypass on the passive line, Chloride CROSS Chassis will transfer the load so as to avoid a permanent paralleling of the two sources. In the 4 pole version, the external breakers must also guarantee the complete isolation of the neutral of the two sources when in bypass mode.

2.3.7 Neutral Switching (4 pole versions only)
The switching of the neutral can be programmed to be either make-before-break (short neutral overlapping during transfer) or break-before-make (no neutral overlapping).
It is also possible to monitor the voltage difference between the two neutral conductors. For correct operation and setup of the installation it is important to be aware of how the neutral lines of the two input sources are configured.

3 Protection and Control Functions

3.1 Static Switch Fault detector

Chloride CROSS Chassis/Cabinet will be able to diagnose the following Silicon Controlled Rectifier (SCR) fault conditions:

1. Short Circuit SCRs active line
2. Short Circuit SCRs passive line
3. Open Circuit SCRs active line
4. Open Circuit SCR passive line

Depending on the presence of the external tripping coil input switch, the system will react differently.

Behaviour with SCR in open circuit on passive line

Condition four (4) will inhibit the transfer to the passive line. If the external tripping coils are present, condition four (4) also activates the auxiliary contact to open the passive line.

Behaviour with SCR in short circuit

a) If the tripping coils are present, condition 1 (Short Circuit SCRs active line) and 2 (Short Circuit SCRs passive line) activate the auxiliary contacts to open the passive line and then inhibit the transfer.

b) If the tripping coils are not present, condition 1 (Short Circuit SCRs active line) will only inhibit the transfer. Condition 2 (Short Circuit SCRs passive line) will transfer the load on the faulty SCR and then inhibit the transfer.

Behaviour with SCR in open circuit on active line

a) If the tripping coils are present, condition 3 (Open Circuit SCRs active line) will cause a transfer to the passive line, inhibit the transfer and activate the auxiliary contact to open the active line.

b) If the tripping coils are not present, the system behaviour will be the same as that detailed above in in point a) except for the auxiliary contacts that will not be tripped.

4 Monitoring, Control and Communication

4.1 General

Chloride CROSS Chassis/Cabinet incorporates the necessary controls, instruments and indicators to allow the operator to monitor the system status and performance, as well as take appropriate action.

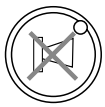
4.2 Mimic panel

The Chloride CROSS Chassis/Cabinet has a mimic panel with Light Emitting Diodes (LEDs) to indicate the condition of the subassemblies (see Table 3).
It will be possible to test the LEDs by entering the Test LED page from the LCD display menu.

Source 1	normal operation	green
Source 2	normal operation	green
Input switch 1	normal operation (closed)	green
Input switch 2	normal operation (closed)	green
By pass switch 1	normal operation (closed)	green
By pass switch 2	normal operation (closed)	green
Output	normal operation (closed)	green
Source 1	alarm	off/green-flashing
Source 2	alarm	off/green-flashing
Output	alarm/warning	off/green-flashing

Table 3. Chloride CROSS Chassis/Cabinet LED Status

4.3 Control and command push-buttons



Audible Alarm Cancel:
This button stops the acoustic alarm. When this button is pressed the red LED will flash.

Priority Selection:
Selects operating mode- Fixed Priority Mode or No Priority Mode.
The push-button must be pressed for at least 2 sec.

Transfer:
This button enables the load to be switched from one source to the other.
The push-button must be pressed for at least 2sec.

In normal conditions the Priority (P) and Transfer (T) push-buttons are inhibited and may be activated only from the 'manual commands' page using the LCD display. Following the 'manual mode timeout' period the push-buttons will again be inhibited.

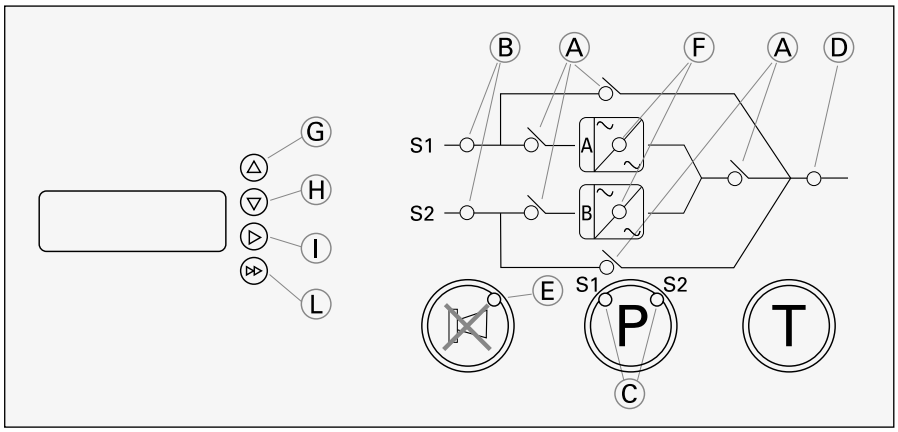


Figure 1. Chloride CROSS Chassis/Cabinet Control and Command Push-buttons

4.4 Display

The integrated LCD display enables access to over 50 operating parameters of the Chloride CROSS Chassis/Cabinet. The messages may be accessed via push-buttons. The text is available in 6 languages: English, French, German, Italian, Portuguese and Spanish.

By using the appropriate push-buttons it will be possible to browse the menu (see Figure 2):

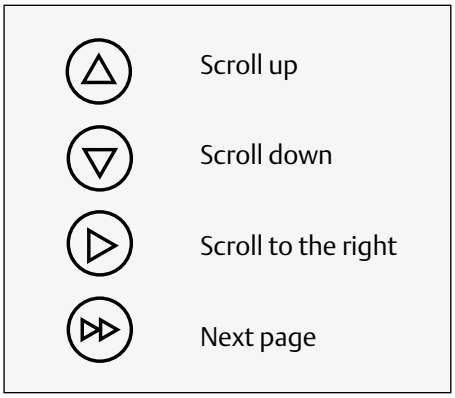


Figure 2. Chloride CROSS Chassis/Cabinet Navigation Buttons

4.4.1 Analogue measurements

- Load power	- Frequency source 1
- Phase difference	- Frequency source 2
- Input voltage source 1 (U, V, W)	- Output voltage (U, V, W)
- Input voltage source 2 (U, V, W)	- Output current (U, V, W)
- Voltage difference across the neutrals[1]	- Output frequency
- Output neutral current[1]	

(1) Only for 4 Pole Versions

4.4.2 Main Chloride CROSS Chassis/Cabinet Display messages

Display Pages and related messages

- **System Status**
  - LIFE™.net data
  - Preferred source S1
  - Preferred source S2
  - Serial number
- **S1 / S2 Status**
  - Normal running
  - Out of limit
  - Inhibited
- **S1 / S2 Measurements**
  - Voltage (U, V, W)
  - Frequency
- **Output Measurements**
  - Voltage (U,V,W)
  - Current (U,V,W)
  - Frequency
  - Power
- **System Alarms***
- **S1 Alarms***
- **S2 Alarms***
- **Output Alarms***

*See Chloride Cross Cabinet/Chassis user manual for details

4.4.3 Events Logging

The events logging function will provide access to the history of Chloride CROSS Chassis/Cabinet from the LCD display. This function will memorize and record the timing of status events and alarms. Samples will be taken every 100 ms and the last 64 events will be recorded.
It will be possible to download the event log file through the local serial port (see section 4.5) using a dedicated software interface running on a PC. Please contact Technical Support to obtain the software.

4.5 RS232C

Chloride CROSS Chassis/Cabinet will be equipped with two D type 9 pin male connectors for connection to computers with RS232C serial communications port. The connector # 1 shall be wired as follows:

Pin 1 (DCD)	Pin 4 (DTR)	Pin 7 (RTS)
Pin 2 (RXD)	Pin 5 (GND)	Pin 8 (CTS)
Pin 2 (RXD)	Pin 6 (DSR)	Pin 8 (CTS)

The connector # 2 shall be wired as follows:

Pin 1 (DCD)	Pin 3 (TXD)	Pin 5 (GND)
Pin 2 (RXD)	Pin 4 (DTR)	

4.6 Volt Free Contacts

Chloride CROSS Chassis/Cabinet shall be equipped with a D type 9 pin female connector with the following volt free contacts:

1 Preferred Source Failure (S1 source failure in No Priority Mode)
2 Reserve Source Failure (S2 source failure in No Priority Mode)
3 Sources out of Synchronism
4 Overload

4.7 Summary Alarm

A summary alarm contact will be available from a terminal connection.

5 Technical Data Chloride CROSS Cabinet from 160 to 1250 A

STS Unit		160 A	250 A	400 A	600 A	800 A	1250 A
5.1 Chloride CROSS Cabinet Units [1]							
Nominal voltage Default	(V) (V)	380 - 415 400					
Input voltage tolerance	(%)	+30, -40					
Input phases		3 +N					
Number of poles		3-4					
Nominal frequency (Hz) [selectable]	(Hz)	50/60					
Frequency tolerance (%) (user definable)	(Hz)	±5%					
Nominal Current	(A)	160	250	400	600	800	1250
Efficiency at Pn	(%)	≥99					
Overload capacity -For 10 minutes -For 1 minute -For 10 seconds -For 1 second	 (%) (%) (%) (A)	 125 150 200 5300	 125 150 200 5300	 125 150 200 5300	 125 150 200 5300	 125 150 200 5300	 125 150 200 9200
SCR Characteristics I^2T @ Tvj = 125°C I_{TSM} @ Tvj = 125°C; 8,3...10msec I^2T @ Tvj = 130°C I_{TSM} @ Tvj = 130°C; 8,3...10msec	 (A^2s) (A) (A^2s) (A)	 - - $1125x10^3$ 15000	 - - $1125x10^3$ 15000	 - - $1125x10^3$ 15000	 - - $1125x10^3$ 15000	 - - $1125x10^3$ 15000	 $6480x10^3$ 36000 - -
Transfer Mode		Break-Before-Make Switching (No source overlap)					
Transfer Time -Worst condition zero voltage source failure -Typical zero voltage source failure	 (ms) (ms)	CBEMA – ITIC compliant[2] ≤5 ≤4					
Static Switch Fault detector (Open and Closed SCR)		Yes					
Ventilation		Neutral				Forced	
Neutral sized		2 In	2 In	1.7 In	1.3 In	1 In	1.28 In
Cable entry		Bottom[3]					
Dimensions -Width -Depth -Height	 (mm) (mm) (mm)	 620 830 1780	 620 830 1780	 820 830 1780	 1220 830 1780	 1220 830 1780	 1620 830 1780
Weight	(kg)	450	450	570	590	700	880
Operating temperature	(°C)	0 - 40					
Acustic noise	(dBA)	<45				<73	<76
EMC Compatibility		IEC /EN 62310-2 Class C3					
Safety		IEC/EN 62310-1					
Frame color	(RAL scale)	7035					
Protection degree		IP20					

(1) Chloride CROSS Cabinet 1600 A 3P/4P available on demand.
(2) For CBEMA-ITIC curve please consult www.itic.org.
(3) Top cable entry available as option.

5 Technical Data Chloride CROSS Chassis 160 to 450 A

STS Unit		160 A	250 A	450 A
5.2 Chloride CROSS Chassis Units [1]				
Nominal voltage Default	(V) (V)	380 - 415 400		
Input voltage tolerance	(%)	+30, -40		
Input phases		3 +N		
Number of poles		4		
Nominal frequency (Hz) [selectable]	(Hz)	50/60		
Frequency tolerance (%) (user definable)	(Hz)	±5%		
Nominal Current	(A)	160	250	450
Efficiency at In	(%)	≥99		
Overload capacity -For 10 minutes -For 1 minute -For 10 seconds -For 1 second	 (%) (%) (%) (A)	 125 150 200 5300		
SCR Characteristics I^2T @ Tvj = 130°C I_{TSM} @ Tvj = 130°C; 8,3...10msec	 (A^2s) (A)	 1125x10³ 15000		
Transfer Mode (for Phases)		Break-Before- Make Switching (No source overlap)		
Transfer Time -Worst condition zero voltage source failure -Typical zero voltage source failure	 (ms) (ms)	CBEMA – ITIC compliant(2) ≤5 ≤4		
Static Switch Fault detector (Open and Closed SCR)		Yes		
Ventilation		Natural		
Neutral sized		2 In	2 In	1.7 In
Cable entry		Bottom(3)		
Dimensions -Width -Depth -Height	 (mm) (mm) (mm)	 700 600 1200		
Weight	(kg)	135	150	160
Operating temperature	(°C)	0 - 40		
Acustic noise	(dBA)	<45		
EMC Compatibility		IEC /EN 62310-2 Class C3		
Protection degree		IP00(4)		
Safety(5)		IEC /EN 62310-1		

(1) Chloride CROSS Chassis 630 A 4P available on demand.
(2) For CBEMA-ITIC curve please consult www.itic.org.
(3) Top cable entry available as option.
(4) IP20 available on demand, simply with the addition of dedicated side panels.
(5) Guaranteed if used inside a cubicle compliant to safety standard IEC/EN 62310-1.

Chloride CROSS Units		Chloride CROSS Cabinet (160 to 1250 A) and Chassis (160 to 450 A)
5.3 User Settings		
Nominal voltage Default	(V) (V)	380-415 400
Phase difference Default		±30° ±10°
Over Voltage Critical Limit (RMS) Default	(%) (%)	+5,+20 +13
Over Voltage Fatal Limit (RMS) Default	(%) (%)	+20,+30 +20
Under Voltage Critical Limit (RMS) Default	(%) (%)	-5,-35 -13
Under Voltage Fatal Limit (RMS) Default	(%) (%)	-35,-40 -35
Instant Short Circuit Overload Threshold Default		1 - 5In 3In
Asynchronous transfer delay time Default	(ms) (ms)	0 – 1000 10
Re-Transfer Time Default	(sec) (sec)	5 - 36000 30
Manual Transfer Timeout Enable Default		On/Off Off
Manual Transfer Timeout Default	(min) (min)	1 - 600 30
Neutral transfer mode Default		MBB or BBM (configurable) MBB

6 Options

6.1 Remote display

Chloride CROSS Chassis/Cabinet comes complete with a remote LCD enabling access to operating state information. See section 4.4 for details of notifications displayed via the LCD. A 30 metre cable fitted with appropriate connectors shall be supplied for connection to the remote display.

6.2 Galvanic isolation (special option)

This option shall include an isolation transformer housed in a separate cabinet and connected to the output or input of Chloride CROSS Chassis/Cabinet.
The transformer shall include an electrostatic screen as standard.
When this option is included, the efficiencies reported in section 5 will alter accordingly. The transformer cabinets will have top cable entry and will not include switches.
Galvanic isolation downstream of the Chloride CROSS can also be provided by third parties during installation. In this case the inrush currents resulting from the transformers must be carefully evaluated and must be compatible with the SCRs. In particular the following items must be given particular attention:

- The coordination of the transformer
  inrush currents with the SCRs or with the optional fuses if installed within Chloride CROSS Chassis/Cabinet (see also 6.7) must be guaranteed
- The magnitude of the inrush currents must be evaluated in extreme operating conditions of the transformer (i.e. asynchronous Chloride CROSS transfer with maximum residual magnetization flux in the transformer etc.)
- Standard Chloride CROSS transfers may result in transformer inrush currents also exceeding the initial inrush current value (i.e. with residual magnetization flux equal to zero)

Please contact Technical Support whenever transformers are used downstream of Chloride CROSS Chassis/Cabinet.

6.3 Top Cable Entry for 160 A, 250 A, 400 A, 600 A, 800 A and 1250 A CROSS Cabinet

This factory fitted option will allow cable access from the top involving a side extension to the main cabinet.

6.4 Customer Interface Board

It shall be possible to add four volt-free digital input/outputs to the UPS by adding an additional board.

6.5 LIFE™.net

In order to increase the overall availability of the system, Chloride CROSS Chassis/Cabinet will be delivered with the LIFE™.net communication kit, providing connection to LIFE™.net diagnostic service.
LIFE™.net will allow the remote diagnosis of the STS through the IP connection (Internet connection), telephone lines or GSM link in order to ensure maximum availability of the STS throughout its operational life. The monitoring will be a real 24-hour, 365 day service as a result of a unique feature that allows trained Customer Engineers to remain in constant electronic contact with the service center, and therefore the STS. The Chloride CROSS Chassis/Cabinet will automatically dial up the service center at defined intervals to provide detailed information that will be analyzed in order to predict near term problems. In addition, it will be possible to control the STS remotely. The communication of STS data to the LIFE Command Center will be transmitted in the following conditions :

- **ROUTINE:** settable at intervals of between five minutes and two days (typically once a day)
- **EMERGENCY:** when a problem occurs or parameters are beyond tolerance limits
- **MANUAL:** ollowing a request from the command center

During the call the command center will:

- Identify the unit connected
- Request the data stored in the STS memory since the last connection
- Request the data stored in the memory of Chloride CROSS Chassis/Cabinet during the time interval since the last connection
- Request real-time information from the STS (selectable)

The service center will analyze historical data and issue a regular detailed report to the customer informing him of the Chloride CROSS operational condition and any critical states.

6.6 J-Bus Protocol

A special J-Bus kit will ensure compatibility of Chloride CROSS Chassis/Cabinet with J-Bus protocol on RS485

6.7 Special additional fuses on phases

Chloride CROSS Chassis/Cabinet is designed to provide the maximum current carrying capability under any condition, nevertheless additional fuses can be provided on request for phase SCR protection. In this case the characteristics of the fuses will also have to be taken into consideration for the correct design of protection selectivity in the installation, along with the SCR data shown in section 5.

Notes

Ensuring The High Availability Of Mission-Critical Data And Applications.

About Emerson Network Power

Emerson Network Power, a business of Emerson (NYSE:EMR), protects and optimizes critical infrastructure for data centers, communications networks, healthcare and industrial facilities. The company provides new-to-the-world solutions, as well as established expertise and smart innovation in areas including AC and DC power and renewable energy, precision cooling systems, infrastructure management, embedded computing and power, integrated racks and enclosures, power switching and controls, and connectivity. Our solutions are supported globally by local Emerson Network Power service technicians.
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