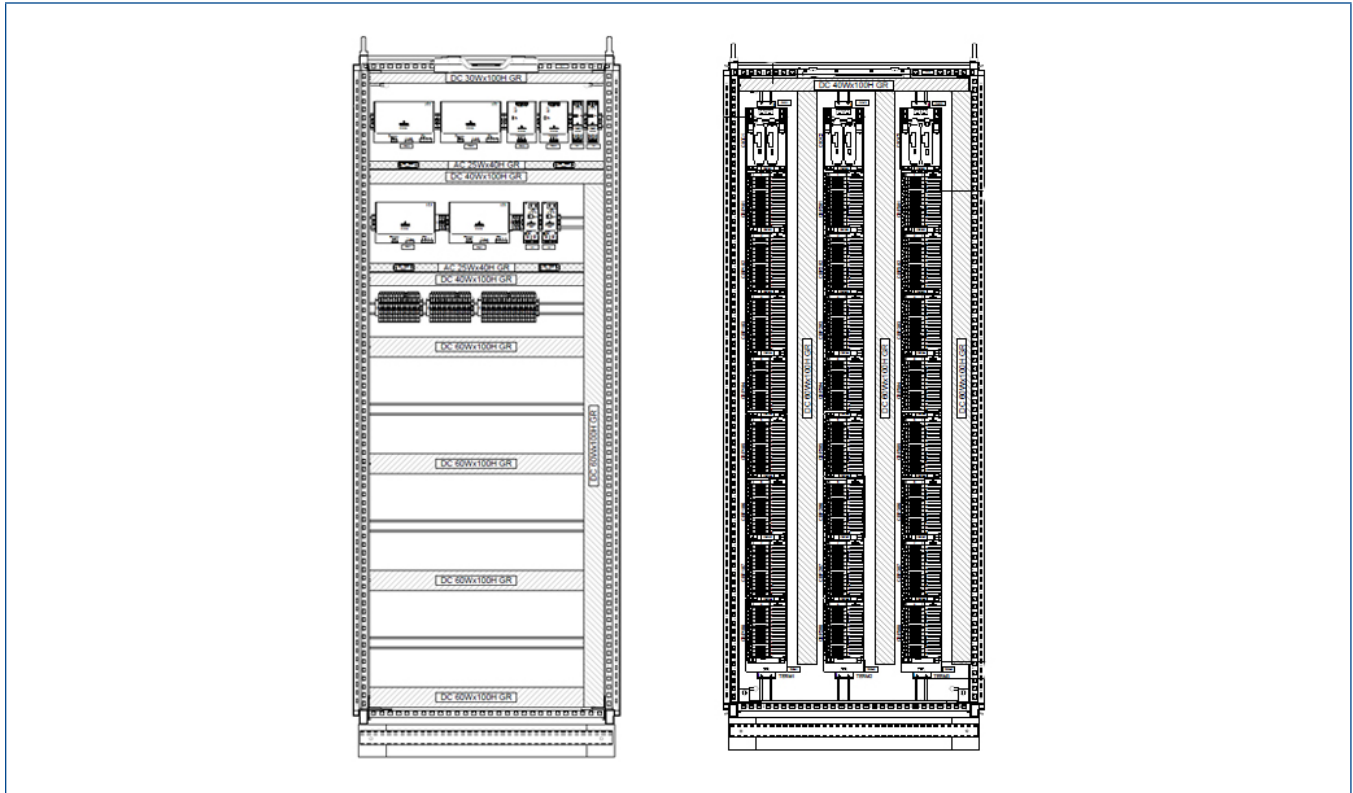


# DeltaV™ CTO CIOC CHARM Cabinets (European Standards)



- Delivers Electronic Marshalling enabled by CHARMs technology or controller cabinet for CHARM system
- Fast delivery
- Reduced system footprint
- Significantly reduce cabinet design engineering
- Fully documented package

## Introduction

The DeltaV™ Configure To Order (CTO) Cabinets provide a predesigned solution for DeltaV CHARM I/O system, assembled in industry standard cabinets, ready to be installed on-site and connected to the field I/O.

These cabinets are designed to meet CE personal safety requirements to help facilitate site installation and inspection. They seamlessly integrate into the overall hardware solution of a DeltaV project.

## Benefits

**Standardized cabinet designs:** The CTO cabinets deliver the full benefits of electronic marshalling. These cabinets meet recommended installation practices of the DeltaV system and each is tested before shipping. The flexibility of DeltaV CHARM I/O allows for 100% utilization of channels, regardless of the I/O signal mix. Late changes are easily accommodated with minimal re-engineering and no rewiring.

**Fast delivery:** Standard cabinets are available with short lead times when ordered for direct shipment to site.

**Reduced system footprint:** Equipment room footprint is reduced by eliminating the traditional marshalling cabinets with cross wiring to traditional I/O cards.

**Significantly reduce cabinet design engineering:** The CHARM I/O cabinets use DeltaV Electronic Marshalling, which allows any channel to be assigned to any one of four controllers. This eliminates the task of rationalizing I/O to specific controllers and preserves I/O flexibility to handle late changes to the system.

**Fully documented package:** Each cabinet is supplied with full documentation showing internal lay-out, bill of materials and internal wiring. Drawings can be incorporated into the project drawing package.

## Product Description

The CTO CHARM Cabinets offering comprises a range of pre-engineered solutions based on industry accepted cabinet enclosures, preinstalled with CHARM I/O or DeltaV controllers and related equipment, ready to be installed in an equipment room and connected to process field instrumentation or CHARM I/O.

The cabinets are typical, free standing enclosures intended for floor mounting in equipment room areas, where temperature and humidity are controlled within the requirements for computer/electronic equipment. They come ready to receive incoming 24 VDC power or 230 VAC power. All internal wiring to power distribution components and grounding conductors has been tested at the factory.

Before delivery, each cabinet undergoes a full in-house inspection, to assure that it is fully operational before shipping directly to site. Electronic Marshalling eliminates the need for any internal cross wiring and I/O rationalization there is typically no need for FAT at a staging facility.

The CTO controller cabinets are designed to house the controllers, DeviceNet, VIM, serial and fieldbus I/O.

The CTO CHARM cabinets support all available low voltage CHARM I/O types with 24 VDC bussed field power. The standard cabinets are designed for easy bottom cable entry.

The CTO cabinets are ordered by selecting a base enclosure model, on top of which one or more predefined options are configured to meet specific project needs.

Base enclosure models are available:

- For different cabinet sizes / Field Cable entry (top or bottom)(Front Access or Front and Rear access).
- For different power distribution needs: DC powered or AC powered.
- European electrical codes/regulations.

Configurable options examples: type of CHARMS Baseplates (I.S. or non I.S.), side panels, cabinet light and injected power.

All cabinets come with following equipment installed:

- Primary and secondary 24VDC power distribution for CHARM I/O Cards and Injected power
- Wire ducts or wire basket
- Grounding bars
- Wiring plan pocket
- Emerson Name Plate Holder and name plate insert
- DeltaV equipment based on your configuration (and priced separately): including CHARM I/O carriers, base plates, standard terminal block, address plugs/terminals, and Bulk Power supplies.

*The CHARM I/O cards and CHARMS are not included and are to be ordered separately.*

*The required number of (redundant) CHARM I/O cards and CHARM modules depends on the actual number and types of I/O that will be wired into the cabinet.*

The following sections provide a more detailed specification for the CTO CHARM Cabinets and available options.

## Overview of CIOC/Controller Cabinets – Base Models (European Standards) Assembly at Cluj iCenter

Base Model Number	Description	No. of CHARM IO	Incoming Power Requirements (Prim and Sec)	Permitted Location/ World Area
EU-CAB-800F-252-AC-CIOC	AC Powered PAS CHARMS Cabinet for 252 CHARM I/O; Front Access	252	230V AC	Safe Area/ EUR
EU-CAB-800FR-504-AC-CIOC	AC Powered PAS CHARMS Cabinet for 504 CHARM I/O; Front and Rear Access	504	230V AC	Safe Area/ EUR
EU-CAB-800F-288-DC-CIOC	DC Powered PAS CHARMS Cabinet for 288 CHARM I/O; Front Access	288	24V DC	Safe Area/ EUR
EU-CAB-800FR-AC-CNTR-288	AC Powered Controller Cabinet; Front and Rear Access; 288 CHARM I/O in Rear	288	230V AC	Safe Area/ EUR
EU-CAB-800F-AC-CNTR	AC Powered Controller Cabinet; Front Access	N/A	230V AC	Safe Area/ EUR
EU-CAB-800FR-AC-CNTR	AC Powered Controller Cabinet; Front and Rear Access	N/A	230V AC	Safe Area/ EUR

## Assembly at Nashik iCenter

Base Model Number	Description	No. of CHARM IO	Incoming Power Requirements (Prim and Sec)	Permitted Location/ World Area
EN-CAB-800F-252-AC-CIOC	AC Powered PAS CHARMS Cabinet for 252 CHARM I/O; Front Access	252	230V AC	Safe Area/ EUR
EN-CAB-800FR-504-AC-CIOC	AC Powered PAS CHARMS Cabinet for 504 CHARM I/O; Front and Rear Access	504	230V AC	Safe Area/ EUR
EN-CAB-800F-288-DC-CIOC	DC Powered PAS CHARMS Cabinet for 288 CHARM I/O; Front Access	288	24V DC	Safe Area/ EUR
EN-CAB-800FR-AC-CNTR-288	AC Powered Controller Cabinet; Front and Rear Access; 288 CHARM I/O in Rear	288	230V AC	Safe Area/ EUR
EN-CAB-800F-AC-CNTR	AC Powered Controller Cabinet; Front Access	N/A	230V AC	Safe Area/ EUR
EN-CAB-800FR-AC-CNTR	AC Powered Controller Cabinet; Front and Rear Access	N/A	230V AC	Safe Area/ EUR

### Overview of CIOC/Controller Cabinets.

The CTO base model reference for cabinets uses the following naming convention: “\*-CAB-XXXYY-ZZZ-IP-DDDD”, where:

- \* = **EU** (European standards and MFG location iCenter Cluj) **OR EN** (European standards and MFG location iCenter Nashik)
- **CAB** = Cabinet
- **XXX** = Cabinet width (mm), e.g. “800”, “1200”
- **YY** = “F” for Front only access (600 mm deep), “FR” for Front and Rear access (800 mm deep)
- **ZZZ** = Maximum I/O’s count in this CTO
- **IP** = Incoming Power AC or DC
- **DDDD** = Short description of content and purpose

## Overview of CIOC/Controller Cabinets Options for EUROPE World Area

<b>LEGENDS:</b> <ul style="list-style-type: none"> <li>● Default option setting</li> <li>○ Configure to option setting (Different from Default)</li> </ul> <b>NA</b> Option setting not possible for Base Enclosure Model			Base Model <sup>2</sup>			EU <sup>1</sup> -CAB-800F-252-AC-CIOC	EU <sup>1</sup> -CAB-800FR-504-AC-CIOC	EU <sup>1</sup> -CAB-800F-288-DC-CIOC	EU <sup>1</sup> -CAB-800FR-AC-CNTR-288	EU <sup>1</sup> -CAB-800F-AC-CNTR	EU <sup>1</sup> -CAB-800FR-AC-CNTR
						EU <sup>1</sup> -CAB-800F-252-AC-CIOC	EU <sup>1</sup> -CAB-800FR-504-AC-CIOC	EU <sup>1</sup> -CAB-800F-288-DC-CIOC	EU <sup>1</sup> -CAB-800FR-AC-CNTR-288	EU <sup>1</sup> -CAB-800F-AC-CNTR	EU <sup>1</sup> -CAB-800FR-AC-CNTR
Enclosure Options				Option Setting							
<b>Certification</b>	A	1	CE	●	●	●	●	●	●	●	
		2	None	○	○	○	○	○	○	○	
<b>Side Panels</b>	B	1	Yes	●	●	●	●	●	●	●	
		2	No	○	○	○	○	○	○	○	
<b>Cable Entry<sup>3</sup></b>	C	1	Bottom	●	●	●	●	●	●	●	
		2	Top Via Roof Plate <sup>4</sup>	○	○	○	○	○	○	○	
		3	Top Via Cable Chamber <sup>4</sup>	○	○	○	○	○	○	○	
<b>Cable Clamp Rail<sup>5</sup></b>	D	1	Yes	●	●	●	●	●	●	●	
		2	No	○	○	○	○	○	○	○	
<b>Partition plate above power supply for top entry</b>	E	1	No	●	●	●	NA				
		2	Yes	○	○	○	NA				
<b>Field Cable Routing</b>	F	1	Cable Duct	●	●	●	●	NA			
		2	Wire Basket	○	○	○	○	NA			
<b>Wiring &amp; Duct</b>	G	1	PVC	●	●	●	●	●	●	●	
		2	Halogen Free	○	○	○	○	○	○	○	
<b>Door Fans</b>	H	1	Thermostat Controlled	●	●	●	●	●	●		
<b>Temperature Monitoring</b>	I	1	Yes	●	●	●	●	●	●		
<b>Enclosure Light</b>	J	1	Yes	●	●	●	●	●	●		
		2	No	○	○	○	○	○	○		
<b>AC Surge Protection Device</b>	K	0	No	●	●	NA		●	●	●	
		1	Yes	○	○	NA		○	○	○	
<b>CIOC Network</b>	L	1	Copper	●	●	●	NA				
		2	FO Multimode	○	○	○	NA				

## Overview of CIOC/Controller Cabinets Options for EUROPE World Area

LEGENDS: <ul style="list-style-type: none"> <li>● Default option setting</li> <li>○ Configure to option setting (Different from Default)</li> </ul> <b>NA</b> Option setting not possible for Base Enclosure Model			Base Model <sup>2</sup>				EU <sup>1</sup> -CAB-800F-252-AC-CIOC	EU <sup>1</sup> -CAB-800FR-504-AC-CIOC	EU <sup>1</sup> -CAB-800F-288-DC-CIOC	EU <sup>1</sup> -CAB-800FR-AC-CNTR-288	EU <sup>1</sup> -CAB-800F-A-C-CNTR	EU <sup>1</sup> -CAB-800FR-A-C-CNTR
							Enclosure Options			Option Setting		
<b>CIOC Injected Power Distribution</b> <i>(Applicable only for NIS CHARMS)</i>	M	1	Yes	●	●	●	●	NA				
		2	No	○	○	○	○					
<b>24VDC Power for 4W or 8W Carriers</b>	N	1	Yes	NA			●	●	●			
		2	No				○	○	○			
<b>Cross wiring for traditional I/Os</b>	O	1	No	NA				●	●			
		2	Yes					○	○			
<b>Utility Socket<sup>6</sup></b>	P	1	No	●	●	NA	●	●	●			
		2	Yes	○	○		○	○	○			
<b>CBP selection For Each Column of CBP<sup>7</sup></b>	Q	1	No CIOC	○	○	○	○	NA				
		2	1 to 7 Non-IS CBP (Default 7 Non-IS CBP)	●	●	NA						
		3	1 to 7 IS CBP	○	○							
		4	1 to 8 Non-IS CBP (Default 8 Non-IS CBP)	NA		●	●					
		5	1 to 8 IS CBP			○	○					
<b>Shield Bar for CBP</b>	R	1	No	●	●	●	●	NA				
		2	Yes	○	○	○	○					
<b>High Temperature Alarm</b>	S	1	Yes	●	●	●	●	●	●			

- EU version cabinets are built at Cluj iCenter and EN version cabinets are built at Nashik iCenter.
- EU cabinets are designed with Rittal VX Series enclosures and EN cabinets are designed with Rittal TS Series enclosures.
- “Top Via Cable Chamber” cable entry option is not available for “EN” cabinets built at Nashik iCenter.
- Drilling for top cable entry to be defined during detail design.
- Cable clamps to be ordered separately in case Cable Clamps are selected for Bottom Cable entry.
- In case Utility socket selection, Country specific Utility Socket to be selected during cabinet assembly.
- Standard CHARM terminal blocks are available with NIS baseplates. Fused injected power terminal blocks need to be ordered separately during project execution as per inj. power requirements of CHARMS.

## General Specifications for CTO DCS Cabinets

General Specifications for CTO DCS Cabinets	
Dimensions	Front Only Access – 800mm (W) x 600mm (D) x 2000mm (H) + 100mm Plinth Front Rear Access – 800mm (W) x 800mm (D) x 2000mm (H) + 100mm Plinth
Access	Front Access – Single door on front side, Front Rear Access – Single door on each side, Right hand hinged, latch type lock and 2 sets of keys (Lock insert: Push-button and lock insert Lock no. 12321)
Cable Entry	Top or Bottom; Positions of components will change as per the top or bottom entry
Protection Category	IP54 – NEMA 12
Approximate Weight	Front Only Cabinet ~200 kg Front Rear Cabinet ~ 300 kg
Color	Cabinet RAL7035, Plinth RAL7022
Door Fans	With thermostat control – Set point 30°C
High Temperature Alarm	Thermostat for Cabinet High Temperature alarm (Recommended Set Point: 35°C)
Other	Louvered doors with filter, mounting plate, grounding bars, wiring plan pocket, lifting eye bolts on top, removable gland plate
Environmental Specifications	Equipment/rack room installation (HVAC controlled), recommended ambient temperature 25°C
Certifications	Installation in Safe Area locations; Default Certification: CE (Europe); Configurable: None
Input Power	Default: Primary and Secondary 230V AC Feeder Configurable: Utility feeder for Utility Socket
AC Surge Protection Device	SPD with 20 A rating for each Primary and Secondary 230V AC; Configurable
Power Supply Rating	Default: DeltaV CIOC System Bulk Power Supplies 2 X 40A Configurable: Separate Injected Power for Non IS baseplates 2 x 20A
Internal Power Distribution	AC Incoming power through lockable disconnect switch subassembly Fully redundant 24V DC distribution for CHARM I/O cards through fused terminals Injected Power 24V DC for Non IS CHARM base plates Distribution through fused terminals AC powered fan on Primary / secondary Feeder AC powered light on Primary / secondary Feeder
CIOC Control Network	Default: Copper twisted pair: 10/100BASE-TX with RJ45 connectors; Full duplex operation up to 100 m distance Daisy chained primary and secondary control network between all CIOC carriers is included (can be changed if required) Configurable: Fiberoptic: 100BASE-FX with MTRJ male connectors; Full duplex operation; Multimode – up to 2 km nominal distance

**CTO DCS Cabinets Internal General Arrangement**

Front Internal View



**EU-CAB-800F-252-AC-CIOC  
and EN-CAB-800F-252-AC-CIOC**

This CTO cabinet has space for:

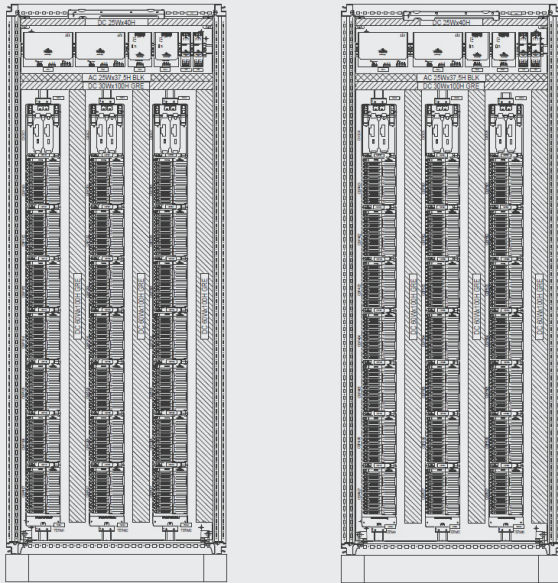
- 3 x CIOC Carrier with redundant Network connectors
- Max. 21 No. of Non-IS OR IS CHARM Base Plate as per user selection

As per the selection of CIOC carriers and CBP, the following DeltaV components are automatically added in BOM:

- CHARM Address Plug
- CHARM standard terminal blocks
- CBP Terminator
- Base Plate Identifier Labels
- Channel Identifier Labels

***No Active DeltaV equipment is included in the base model. All DeltaV equipment is to be configured separately through the Emerson quoting tools.***

Front / Rear Internal View



**EU-CAB-800FR-504-AC-CIOC  
and EN-CAB-800FR-504-AC-CIOC**

This CTO cabinet has space for:

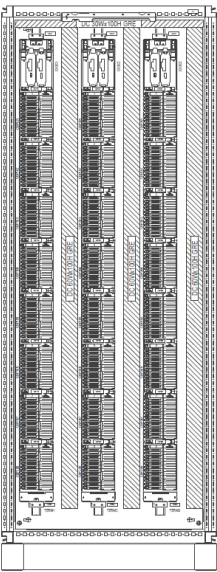
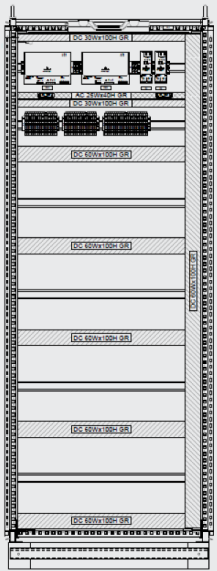
- 6 x CIOC Carrier with redundant Network connectors
- Max. 42 No. of Non-IS OR IS CHARM Base Plate as per user selection

As per the selection of CIOC carriers and CBP, the following DeltaV components are automatically added in BOM:

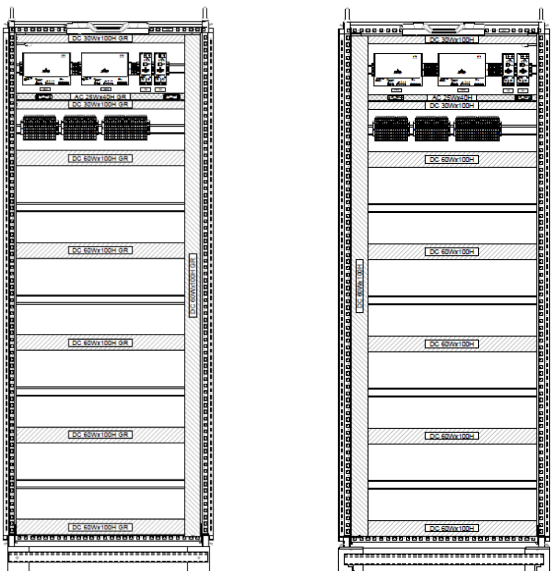
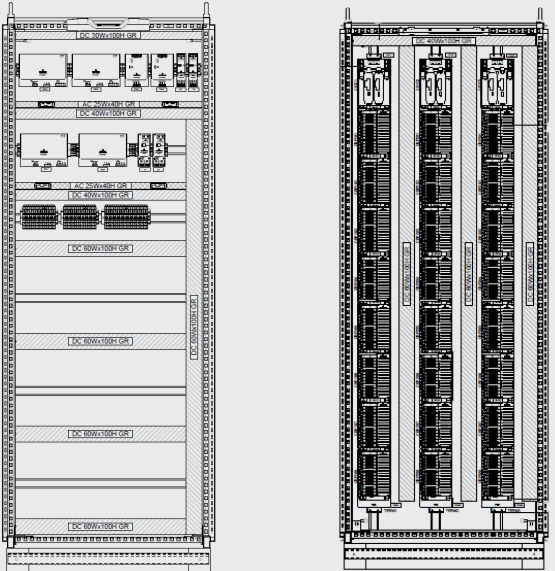
- CHARM Address Plug
- CHARM standard terminal blocks
- CBP Terminator
- Base Plate Identifier Labels
- Channel Identifier Labels

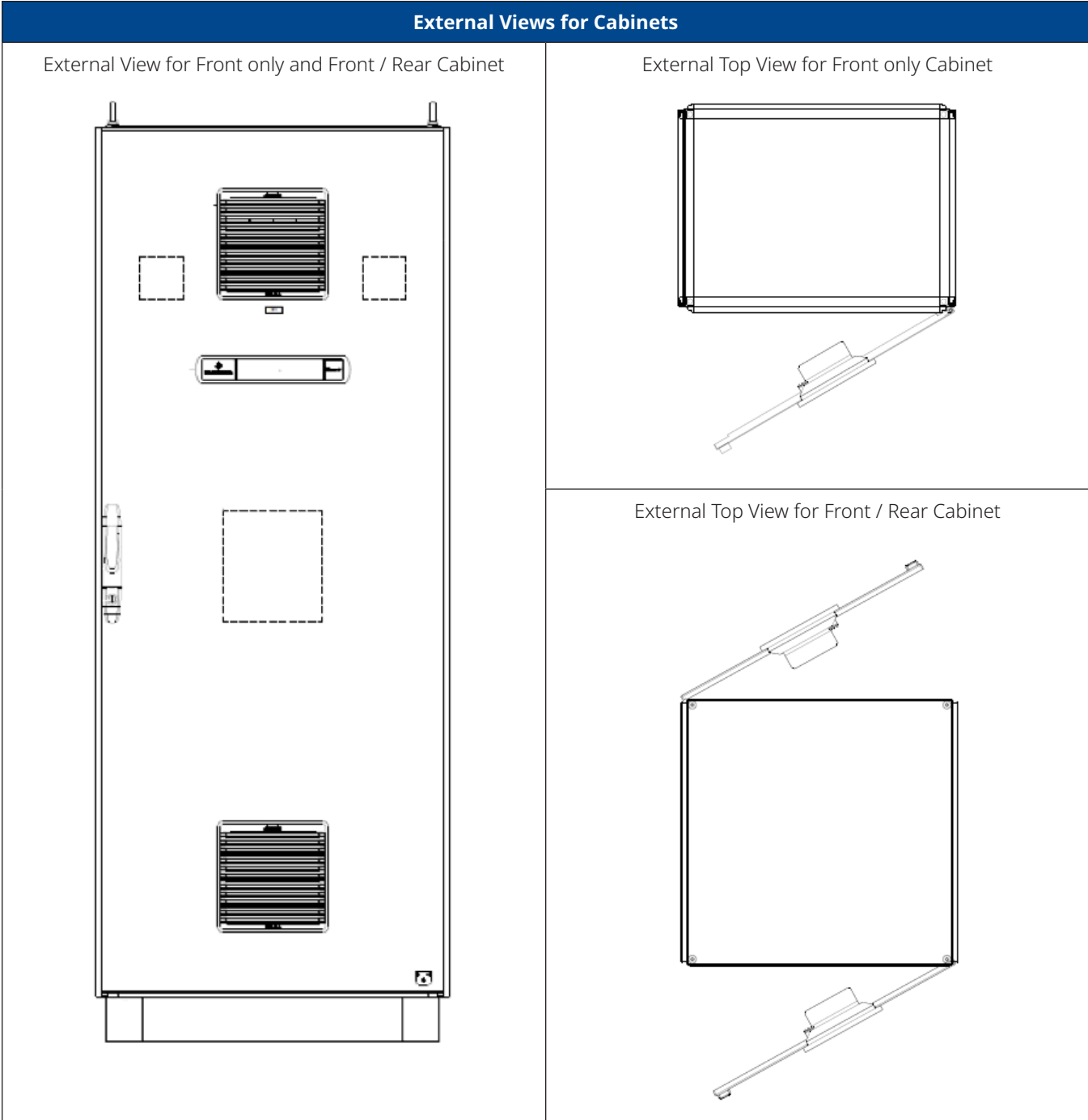
***No Active DeltaV equipment is included in the base model. All DeltaV equipment is to be configured separately through the Emerson quoting tools.***



CTO DCS Cabinets Internal General Arrangement	
<p style="text-align: center;">Front Internal View</p> 	<p style="text-align: center;"><b>EU-CAB-800F-288-DC-CIOC and EN-CAB-800F-288-DC-CIOC</b></p> <p>This CTO cabinet has space for:</p> <ul style="list-style-type: none"> <li>■ 3 x CIOC Carrier with redundant Network connectors</li> <li>■ Max. 24 No. of Non-IS OR IS CHARM Base Plate as per user selection</li> </ul> <p>As per the selection of CICO carriers and CBP, the following DeltaV components are automatically added in BOM:</p> <ul style="list-style-type: none"> <li>■ CHARM Address Plug</li> <li>■ CHARM standard terminal blocks</li> <li>■ CBP Terminator</li> <li>■ Base Plate Identifier Labels</li> <li>■ Channel Identifier Labels</li> </ul> <p><b><i>No Active DeltaV equipment is included in the base model. All DeltaV equipment is to be configured separately through the Emerson quoting tools.</i></b></p>
<p style="text-align: center;">Front Internal View</p> 	<p style="text-align: center;"><b>EU-CAB-800F-AC-CNTR and EN-CAB-800F-AC-CNTR</b></p> <p>This CTO cabinet has space for:</p> <ul style="list-style-type: none"> <li>■ Controllers</li> <li>■ 4 Wide or 8 Wide carriers</li> </ul> <p><b><i>No Active DeltaV equipment is included in the base model. All DeltaV equipment is to be configured separately through the Emerson quoting tools.</i></b></p>



CTO DCS Cabinets Internal General Arrangement	
<p style="text-align: center;">Front / Rear Internal View</p> 	<p style="text-align: center;"><b>EU-CAB-800FR-AC-CNTR and EN-CAB-800FR-AC-CNTR</b></p> <p>This CTO cabinet has space for:</p> <ul style="list-style-type: none"> <li>■ Controllers</li> <li>■ 4 Wide or 8 Wide carriers</li> </ul> <p><b><i>No Active DeltaV equipment is included in the base model. All DeltaV equipment is to be configured separately through the Emerson quoting tools.</i></b></p>
<p style="text-align: center;">Front / Rear Internal View</p> 	<p style="text-align: center;"><b>EU-CAB-800FR-AC-CNTR-288 and EN-CAB-800FR-AC-CNTR-288</b></p> <p>This CTO cabinet has space for:</p> <ul style="list-style-type: none"> <li>■ Controllers</li> <li>■ 4 Wide or 8 Wide carriers</li> <li>■ 3 x CIOC Carrier with redundant Network connectors</li> <li>■ Max. 24 No. of Non-IS OR IS CHARM Base Plate as per user selection</li> </ul> <p>As per the selection of CIOC carriers and CBP, the following DeltaV components are automatically added in BOM:</p> <ul style="list-style-type: none"> <li>■ CHARM Address Plug</li> <li>■ CHARM standard terminal blocks</li> <li>■ CBP Terminator</li> <li>■ Base Plate Identifier Labels</li> <li>■ Channel Identifier Labels</li> </ul> <p><b><i>No Active DeltaV equipment is included in the base model. All DeltaV equipment is to be configured separately through the Emerson quoting tools.</i></b></p>



## System Compatibility

The CTO CHARMs Cabinets are compatible with DeltaV v13.3.1 or later software.

CHARM I/O hardware requires:

- S-Series controllers with DeltaV v11.3.1 or later software.
- M-Series and PK controllers with DeltaV v14.3 or later software.

## Certifications

The CTO CHARMs Cabinet designs are designed to meet CE and EMC requirements.

- Conformity to the relevant EU directives

For Europe Design Standards and Regulations, the cabinet default comes with CE Certification. Optionally, "No" certification can be specified.

Refer to the **DeltaV Electronic Marshalling** or to the **DeltaV IS Electronic Marshalling** Product Data Sheet for certification information on the DeltaV system components.

## Ordering Process

CTO DCS CHARM Cabinets are pre-engineered solutions developed by Emerson iCenters.

Please follow the steps below to configure and order a CTO DCS CHARM Cabinet:

1. Specify the CTO Cabinet by selecting the base model and the options required for the project.

A configuration tool is available to aid in the selection of the right combination of optioned CTOs.

2. Generate the specification sheet from the Cabinet configuration tool (CCT) and send this to your world area contact.

3. Based on the specification, you will then receive:

- A quotation for the fully assembled Cabinet.
- The detailed specifications & Bill of Materials
- Drawing package (PDF) with default option is available for download. For any non- default option selection, drawing package to be updated by respective iCenter.

4. Approve the drawing package for construction.
5. Order the CTO Cabinet as per provided quotation and approved drawings.
6. The CTO Cabinet is assembled, factory tested and delivered to site. The delivery includes the as-built drawing package (in AutoCAD Electrical).

For questions related to specific project quotations or order processing, please contact your local Emerson Sales office or your regional Emerson assembly center:

For Europe Cluj iCenter:

**Cabinets.Quotes@Emerson.com**

For Asia Pacific, Middle East, and Africa (Nashik) iCenter:  
**rfq\_icenter.nsk@Emerson.com**

## Project Customizations

**"...What if a CTO CHARM Cabinet is 90% what I need, but I really need my Cabinet to have..."**

For any customizations as a variation or addition to the standard CTO offering can often be developed in such a way that the additional effort is incremental.

In case your project would require a customer witnessed Factory Acceptance Test, this can also be accommodated.

Please work with your local Emerson Sales office or regional Emerson assembly center to evaluate any impacts of requested customizations to cost, delivery time and certifications.

## Related Products

- CHARM I/O Cards must be ordered separately.
- CHARMs must be ordered separately.
- CHARMs requiring other than standard terminal blocks must be ordered separately.

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