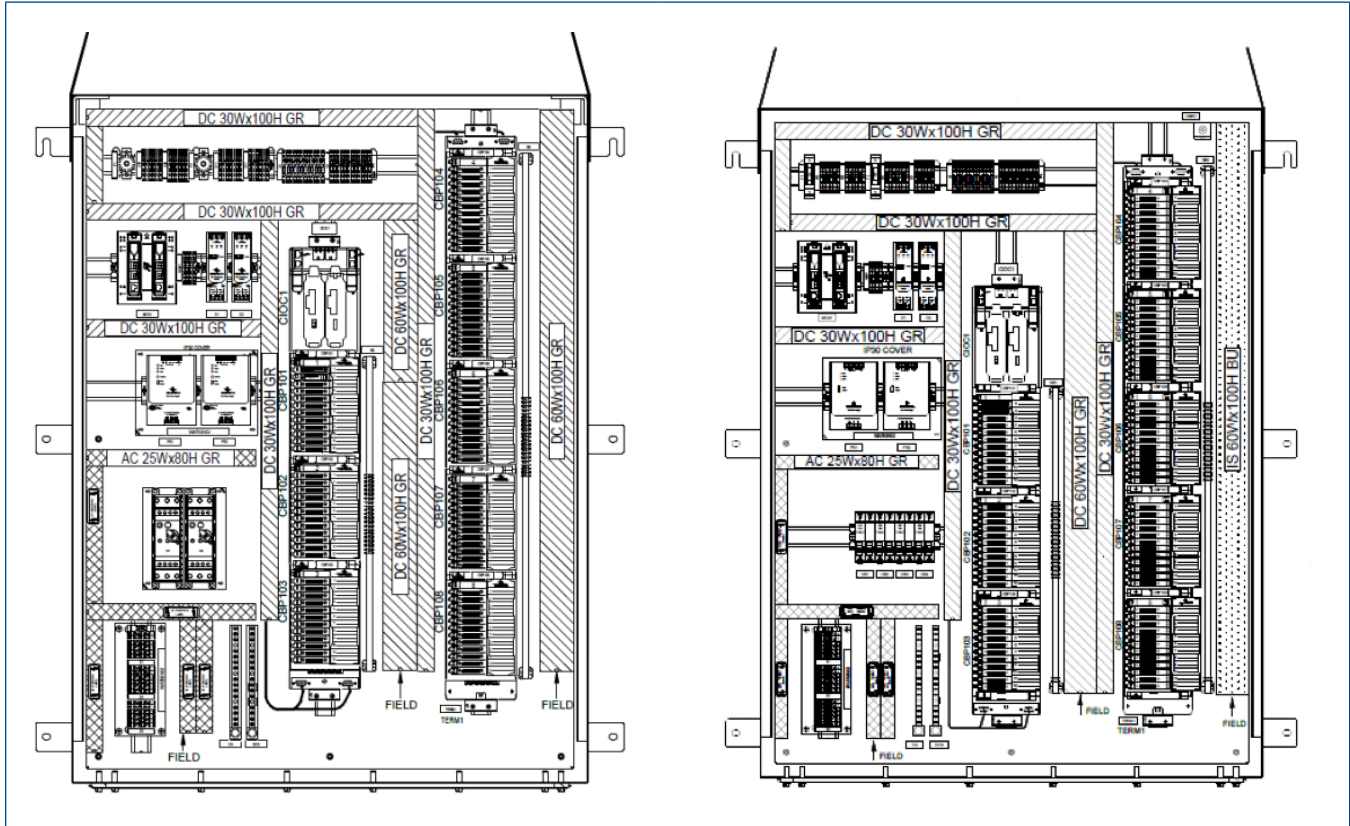


DeltaV™ CTO Smart Junction Box

(CE; ATEX; IECEx; Ordinary and Zone 2 Locations)



Configure to Order (CTO) CHARM Smart Junction Boxes.

- Delivers Electronic Marshalling enabled by CHARACTERIZATION Modules (CHARM) technology
- Reduce system footprint
- Eliminate I/O home run cables
- Significantly reduce SJB design engineering
- Fully documented package

Introduction

The DeltaV™ CTO CHARM Smart Junction Boxes provide an off-the-shelf solution for faster project execution and reduced installation costs. SJBs are factory tested products and ready for installation in the field. Electronic Marshalling eliminates traditional I/O design tasks and allows field wiring to start long before control strategies are finalized.

The SJBs are designed for safe area, hazardous areas and harsh environments, from extreme temperatures to corrosive gases.

Benefits

Delivers Electronic Marshalling enabled by CHARMs technology:

The CHARM SJBs offer the full benefits of Electronic Marshalling. The individual channels can be defined for any combination of field signal type, as required by the process equipment. This 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.

Reduce system footprint: Equipment room footprint is greatly reduced by replacing traditional marshalling cabinets with field mounted I/O cards.

Eliminate I/O home run cables: Field instrumentation wiring is reduced to the signal pair that connects the field device to the SJB save on home run multi-core cables, cable trays, associated engineering, and documentations.

Significantly reduce SJB design engineering: The CHARM SJBs are pre-engineered, and factory tested. The I/O flexibility allows the same design to serve a wide variety of I/O signals, conditioned individually by the CHARM. Field wiring design is complete at the terminal block.

Fully documented package: Each SJB is supplied with full documentation and engineering drawings showing internal lay-out, bill of materials, and internal wiring.

They are designed to meet local building code and industry best practices to deliver proven functionality with minimal costs.

Product Description

The CTO CHARM SJBs offering comprises a range of pre-engineered solutions based on industry standard, wall mounting SJBs that are available in AC-powered version with space up to 96 CHARM I/O.

The designs have considered specific requirements related to outdoor installation in the field, including environmental protection, heat dissipation, power and grounding requirements, and installation in hazardous areas.

All components are prewired and tested at the factory. Simply select the required DeltaV Electronic Marshalling equipment and the enclosure is ready to install, connect the field wiring, power, and network cables. Install needed CHARMs to commission your loops and autosense the hardware into your DeltaV system.

Before delivery, each SJB undergoes a full in-house inspection and test, to assure that it is fully operational before leaving the factory. Electronic Marshalling eliminates the need for custom designs. These SJBs can be ordered, together with the DeltaV Electronic Marshalling equipment and CHARM I/O and delivered directly to site to begin field wiring (Factory Acceptance Test (FAT) with client may be optional).

The SJBs are ordered by selecting a base enclosure model and required options to meet specific project needs.

A range of base enclosure models are available:

- I/O quantities: Up to 96 I/O's
- Distributed CHARM I/Os (combination of Max. 12 / 24 CHARMs inside SJB and external 12 CHARM I/O junction boxes - total I/O count 96).
- For ASCO Valve Solenoid outputs: 12 or 24 or 32 IOs
- For different environmental requirements: Safe Area or Hazardous Area.
- European electrical codes/regulations.

Each base model is further explained in the coming sections.

Configurable options include the type of CHARMs (IS or Non-IS), network (Fiberoptic or Copper), enclosure Material (SS304/SS316L), cable entry, nameplate engraving, injected power, heater, etc.

System planning

Electronic Marshalling changes the game with respect to control system I/O planning. The field I/O wiring can be designed independently from the control strategy design, allowing E&I engineers to determine the number and type of I/O based on the process design.

- Count the I/O requirements and determine the number of SJBs you need.
- Determine whether the SJB is for a safe area or hazardous area.
- Plan the power distribution and install the enclosures.
- Wire the field devices and commission them.
- When control strategies and associated controller hardware is finalized, simply assign the I/O signals to the controllers as needed, no wiring changes. You can change controller I/O assignments with the click of a mouse, without touching a wired connection.

DeltaV CTO DCS Smart Junction Box (SJB)

All CHARM SJBs come with the following equipment installed:

- AC power feeds with redundant AC/DC 24V DC bulk power supplies.
- Power distribution and isolation components for primary and secondary 24V DC Power to CHARM I/O Cards.
- Halogen-Free Cable ducts.
- Grounding bars for CG (Chassis Ground) and DC Reference Ground.
- Name Plate.
- Removable Gland Plate (3mm thick).

SJBs are designed for bottom entry for all cables (power, network, and I/O signals).

The CTO CHARM SJBs support all available low voltage CHARM I/O types with 24V DC busseled field power and all available CHARM terminal blocks.

CHARM I/O Cards (CIOC2), and CHARMs are not included and are to be ordered separately.

CTO Options

For a particular base enclosure model, several pre-engineered CTO options can be specified. These options include:

- No. of Non-IS Baseplates – Can be selected from 0 to 8
- Type of Non-IS Baseplate assembly – Can be selected with 4 different types of CHARM terminals
- No. of IS Baseplates – Can be selected from 0 to 8
- CHARMS I/O Gateway Assembly – can be selected from 4 diff. types of Networking topologies
- Non-IS and IS baseplates installation possible in single column

Enclosure Material: Stainless Steel SS304 or SS316L.

Stainless steel provides protection for corrosive environments (category NEMA 4X). SS316L provides superior corrosive protection and is typically applied in offshore applications (salt resistant).

- Pre-drilled bottom entry with cable glands for I/O, power, communications, and grounding cables
- With standard drill pattern (with stop plugs) or cable transit system with flexible cable gland blocks that are installed in a cable entry frame
- **Name plate engraved** with custom supplied SJB identification information

24V DC power distribution for injected power or 4-wire

transmitter power: 12 fused circuits, prewired to all Non-IS baseplates (This option includes a redundancy diode to bring primary and secondary power feeds to a common injected power distribution).

- **Heaters** for extreme low temperature installations & condensation management
- Blue marking for IS signals Field Cable ducts
- Breather: SS316L
- CIOC Network: Fiber optic / Copper
- **Warning label languages** other than standard English, French, Spanish, and German

All CTO options are implemented, tested, and shipped to site as one package, significantly reducing the required upfront design and certification effort.

The following sections provide a more detailed specification for the SJBs and available options.

Overview of DeltaV CTO DCS Smart Junction Boxes (SJB) – Base Models

CTO Base Model No.	Description	No. of CHARM I/Os	Power Requirements (Pri and Sec)	Permitted Location
EU-FE-96-AC-CIOC-HA	AC Powered Smart Junction Box for 96 CHARM I/O; CE; ATEX/ IECEx; Zone 2 Locations.	96	220 To 240V AC/ 100 To 120V AC	Hazardous Area ATEX/IECEX; Zone 2
EU-FE-96-AC-CIOC-SA	AC Powered Smart Junction Box for 96 CHARM I/O; CE; Safe Area Locations.	96	220 To 240V AC	Safe Area CE
EU-FE-96-AC-VLV-SA	AC Powered Smart Junction Box with 60 CHARM I/O and ASCO Valve Island; CE; Safe Area Locations	96	220 To 240V AC	Safe Area CE

The CTO base model reference for Smart Junction Boxes uses the following naming convention: **EU-FE-96-XX-YYYY-ZZ**, where:

- **EU** = Europe Design Standards and Regulations
- **FE** = Field Enclosure (Smart Junction Box)
- **96** = Maximum I/O's count in this CTO model
- **XX** = Incoming Power, AC: 220 To 240V AC/100 To 120V AC
- **YYYY** = Short description of content and purpose, CIOC or VLV
- **ZZ** = SA: for use in Safe Area, HA: for use in Hazardous Area (ATEX/IECEX, Zone 2)

Overview of SJB Base Models and Options

SJB Options		SJB Options Setting		SJB Base Model		
				EU-FE-96-AC-CIOC-HA	EU-FE-96-AC-CIOC-SA	EU-FE-96-AC-VLIV-SA
LEGENDS:						
• Default option setting						
o Configure to option setting (Different from Default)						
NA Option setting not possible for the SJB Base Model						
Certification	A	1	ATEX / IECEx	•	NA	NA
Ambient Temperature	B	1	-10°C to +40°C	NA		•
		2	-20°C to +50°C	•	NA	NA
		3	-40°C to +50°C	o	•	
		4	-20°C to +55°C	o	o	
Enclosure Material	C	1	Stainless Steel SS304	•	•	•
		2	Stainless Steel SS316L	o	o	o
Cable Entry	D	1	Undrilled Gland Plate	•	o	•
		2	Pre-drilled gland plate with installed cable glands	o	•	NA
		3	Pre-filled Roxtec Frame	o	o	o
Input Voltage	E	1	220 to 240V AC	•	•	•
		2	100 to 120V AC	o	NA	NA
Incoming Power Landing	F	1	Feedthrough Terminals	•	•	•
		2	Disconnect Switches	o	NA	NA
MCB Make	G	1	Eaton ¹	•	NA	NA
		2	Appleton	o	NA	NA
Heaters	H	1	No	•	•	NA
		2	Single Heater (for condensation)	o	o	
		3	Two Heaters ⁶	o	NA	
AC Surge Protection Device	I	1	No	•	•	•
		2	Yes	o	o	o
24VDC injected power (Applicable only for Non-IS baseplates)	J	1	8 Circuits	•	•	•
		2	No	o	o	o
Enclosure Light	K	1	No	•	•	•
		2	Yes ²	o	o	o
Door Opening Alarm	L	1	No	•	•	•
		2	Yes	o	NA	NA
External 12 CHARM I/O Junction BOX 24VDC Supply	M	1	No	•	•	NA
		2	Yes	o	o	

SJB Options		SJB Options Setting		SJB Base Model		
				EU-FE-96-AC-CIOC-HA	EU-FE-96-AC-CIOC-SA	EU-FE-96-AC-V1V-SA
LEGENDS: • Default option setting o Configure to option setting (Different from Default) NA Option setting not possible for the SJB Base Model						
CIOC Network	N	1	Single-mode Fiber Optic w/ Splice Cassettes	•	•	NA
		2	Multimode Fiber Optic w/ Splice Cassettes	o	o	
		3	Single-mode Fiber Optic w/ Adapter	o	o	
		4	Multimode Fiber Optic w/ Adapter	o	o	
		5	Copper	o	o	•
		6	Fiber Optic	NA	NA	o
Type of Valve	O	1	12 Coil configuration Valve Island	NA	NA	•
		2	24 Coil configuration Valve Island	NA	NA	o
		3	32 Coil configuration Valve Island	NA	NA	o
CHARMS I/O Gateway Assembly	P	1	No	•	•	NA
		2	Yes	o	o	
Type of CHARMS I/O Gateway Assembly	Q	1	No	•	•	NA
		2	Redundant CHARM I/O Gateway Assembly for Ring Topology	o	o	
		3	Simplex CHARM I/O Gateway Assembly for Ring Topology	o	o	
		4	Redundant CHARM I/O Gateway Assembly for Star Topology	o	o	
		5	Simplex CHARM I/O Gateway Assembly for Star Topology	o	o	
I/O Type Selection ³	R	1	Up to 96 I/O - Non-IS, IS or Mix	•	•	NA
		2	60 I/O - Non-IS	NA	NA	•
		3	60 I/O - IS			o
Type of Non-IS baseplates Assembly	S	1	With Standard CHARM Terminal Blocks	•	•	NA
		2	With 3-wire DI Fused Injected Power CHARM Terminal Blocks	o	o	
		3	With Fused Injected Power CHARM Terminal blocks	o	o	
		4	With Relay Output CHARM Terminal Blocks	o	o	
Enclosure Fan	T	1	Yes ⁷	NA	NA	NA
		2	No	•	•	
Warning Labels Languages	U	1	STANDARD LABEL (ENG+FRN+GER+SPN)	•	•	•
		2	ENG+FRN+GER+USER SPECIFIC LANGUAGE	o	NA	NA
		3	ENG+FRN+SPN+USER SPECIFIC LANGUAGE	o	NA	NA

1. Eaton MCB is rated for -20°C at lower side, hence 2-off heaters will be added automatically when Eaton MCB is selected for ambient temperature range -40°C To +50°C.
2. For ATEX/IECEX certified SJB, Light will be provided with “Door Switch”.
3. Selection of required CHARM Baseplate (CBP) quantity and type is possible. The Max. CBP quantity is dependent on
 - i) Ambient Temperature
 - ii) 24VDC for injected power or 4-wire transmitters
 - iii) External 12 CHARM I/O Junction BOX 24VDC Supply (Consumes space for 2 CBP)
 - iv) CHARMS I/O Gateway Assembly (Consumes space for 1 CBP)
4. Min. 1 CBP (IS/non-IS) selection is mandatory for connecting SJB’s diagnostic alarms to the CHARMS CBP.
5. In case of all Non-IS CBP or IS/Non-IS mix CBP selection, Non-IS type CHARMS will be selected for SJB’s diagnostic alarm connection. When all IS CBPs are selected, IS CHARMS will be selected for alarm connection. Total installable CHARMS qty. in SJB will be reduced by 2 as 2 CHARMS are required for diagnostic alarms for that SJB.
6. Two heater option is applicable for 50°C ambient temperature only.
7. Enclosure fan is default option and applicable for 55°C ambient temperature only.

General Specifications for SJBs

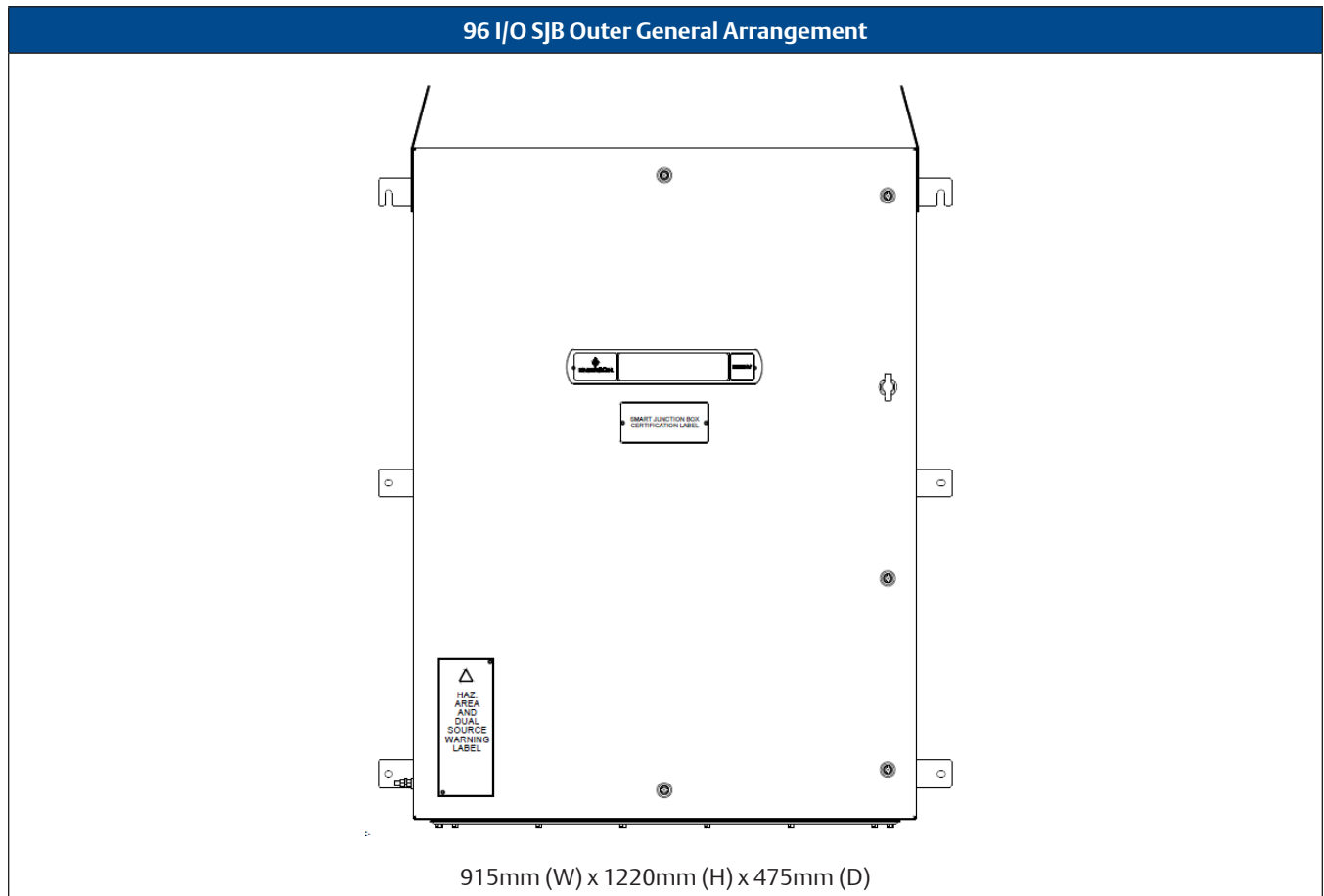
General Specifications for SJBs	
Material (*)	Stainless Steel SS304/ SS316L, Enclosure Thickness 2mm
Dimensions	915mm (W) x 1220mm (H) x 475mm (D)
Access	Single door (Thickness 2mm), left hand hinged
Protection Category	IP 66 – Type 4X (Corrosive Environment)
Cable Entry (*)	Bottom, single gland plate (Thickness 3mm)
Name Plate	Outside Door: Laser engraved plastic
Weight	~ 165 kg (may vary as per hardware added by option selection)
Control Network (*)	Options available for Control Network: Fiber Optic control network Includes: <ul style="list-style-type: none"> ■ FO to Copper Media Converter (MM or SM as per type of FO selected). Media converter has one 100 BASE-FX (SM/MM) port with LC Connector. ■ SC Splice cassettes (MM or SM as per type of FO selected). ■ SC-LC FO patch cables, Multimode 50/125-micron core/ cladding diameters (OM2) or Single mode 9/125-micron cable.
Power Requirements – Internal Power Distribution	Primary and secondary AC power supply supplied from outside the Smart Junction Box. Redundant AC power distribution through power terminals, and circuit breakers. 24 VDC bulk power supplies: 2 x 10A and full redundant (Primary and Secondary) for 55°C ambient selection. 2 x 20A and full redundant (Primary and Secondary) for 50°C ambient selection.
Diagnostic Alarm	<ul style="list-style-type: none"> ■ Bulk Power supplies failure alarm and door open alarm (if selected), connected in series ■ High Temp alarm
Provision of Power distribution for external 12 CHARM I/O Junction boxes	Input power required by external 12 CHARM I/O Junction boxes (24VDC +/- 10%) is supplied from Smart Junction Box. This can be Redundant (Redundant pair of power cable from SJB to individual external 12 CHARM I/O BOX junction Box). Maximum power cable distance from Smart Junction Box to 12 CHARM I/O Junction box is 100mtr. Maximum power cable termination possible in 12 CHARM I/O Junction box is 2.5mm ² (14AWG). <ul style="list-style-type: none"> ■ User should daisy chain Pri. and Sec. input power terminals of 12 CHARM I/O Junction box to avoid alarm for non-redundancy power in case of Simplex power option is selected.
CHARM Baseplate Flexibility (Except for Valve SJB)	<ul style="list-style-type: none"> ■ The selection is available for Non-IS CHARM Baseplates with 4 different types of CHARM Terminals blocks. ■ Even in case of 55°C ambient temp. Injected power to the CHARM Baseplate option is available with the restriction on no. of Non-IS CHARM baseplates. ■ Mix of Non-IS and IS CHARM Baseplates in 1 column is possible.
CHARMS I/O Gateway Assembly	<ul style="list-style-type: none"> ■ The selection is available for CHARM I/O Gateway Assembly with 4 different types of networking topologies. ■ On selection of CHARM I/O Gateway Assembly, the maximum no. of CHARM baseplate selection will be reduced by 1.
Supply Includes	Mounting plate, Halogen-Free wire ducts, external wall mounting brackets, door clamps, ground bars, external grounding bolt, drip edge, breather-drain.

(*) For available configurable options refer to respective base SJB model & option table.

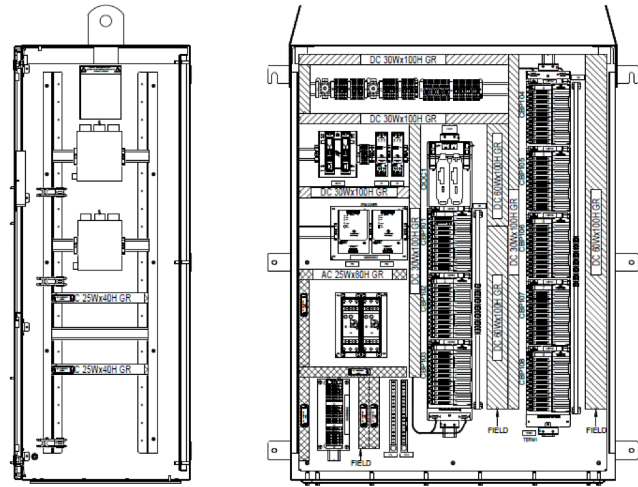
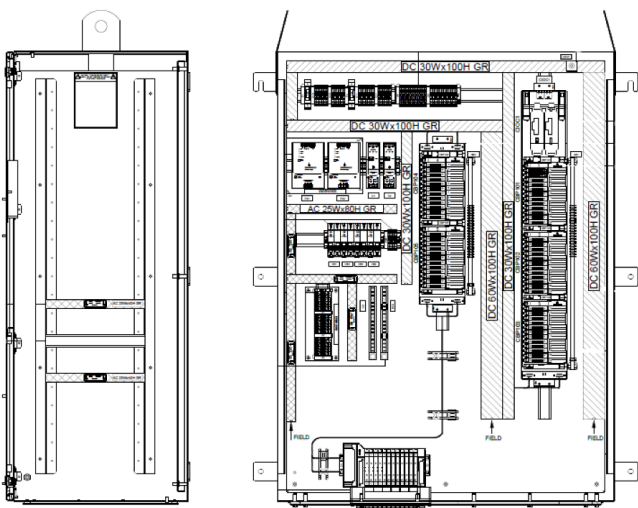
Additional General Specifications for 96 I/O CHARM Valve SJB

General Specifications for 96 I/O CHARM Valve SJB	
ASCO Valve connection	ASCO Valve will be connected to CIOC bus through top and bottom extenders using extender cables. ASCO Valve model to be selected as per project requirement. No. of channels of Valve unit will be considered in 96 I/O count of CIOC bus.

SJB General Arrangements



Internal General Arrangement of SJBs

96 I/O SJB Internal General Arrangements	
	<p style="text-align: center;">EU-FE-96-AC-CIOC-HA OR EU-FE-96-AC-CIOC-SA</p> <p>These SJBs has space for:</p> <ul style="list-style-type: none"> ■ 1 x CIOC Carrier with redundant Copper Ethernet connectors ■ Max. 8 No. of Non-IS and IS CHARM Base Plate as per user selection ■ 1 X CHARMS I/O Gateway Assembly ■ 24VDC Redundant Power distribution for up to 7 External 12 CHARM I/O Junction boxes
96 I/O CHARM Valve SJB Internal General Arrangements	
	<p style="text-align: center;">EU-FE-96-AC-VLV-SA</p> <p>These SJBs has space for:</p> <ul style="list-style-type: none"> ■ 1 x CIOC Carrier with redundant Copper Ethernet connectors ■ Max. 5 No. of Non-IS OR IS CHARM Base Plate as per user selection ■ ASCO Valve model as per selected type

Design Considerations

Environmental Specifications

The SJBs are certified for an ambient temperature range of -40 to +55°C. For ASCO valves enclosures installation, max. recommended ambient is 40°C as ASCO valves are rated for max. 50°C operating temperature.

Caution: Operating any electronics at the higher end of its temperature range for long periods of time will shorten its expected lifetime, see **Effects of Heat and Airflow Inside an Enclosure White Paper** for more information.

The humidity specification for the SJB is 5-95% relative humidity, non-condensing. SJBs are verified for typical heat load, to cover most used cases.

The Heat Load Calculation tables below specifies the impact of CTO configurable options on the heat dissipation within the CTO enclosures: assuming wall mount installation (back side not used for heat dissipation), installation in shaded area (no direct sunlight) and an internal heat dissipation not greater than the value specified in the column “Maximum allowed heat dissipation inside the SJB.”

It is advised to calculate the heat dissipation and power consumption for each individual enclosure with the actual quantity and mix of CHARM types. In high ambient temperatures the CHARM capacity of the enclosure may have to be reduced depending on the mix of CHARM types.

Heat Load Calculations for SJB for 50°C Ambient

CTO SJB Model	Maximum allowed heat dissipation for 50°C Ambient	User Configurable Heat Contributing Options			Total Dissipation	CIOC2 Heat Dissipation (W)	Maximum allowable heat load for CHARM HW
		A	B	C	(A+B+C)		
		CIOC Network	Inj. Power	Power Supply			
EU-FE-96-AC-CIOC-HA EU-FE-96-AC-CIOC-SA (With CHARM gateway)	160	FO (Converter)	NO	10Amp	29	8	123
		COPPER (IOP)			24		128
		FO (Converter)	YES	20Amp	50		102
		COPPER (IOP)			46		106
EU-FE-96-AC-CIOC-HA EU-FE-96-AC-CIOC-SA (With CHARM gateway)	160	FO (Converter)	NO	10Amp	29	18*	113
		COPPER (IOP)			24		118
		FO (Converter)	YES	20Amp	50		92
		COPPER (IOP)			46		96

*CIOC2 heat dissipation includes CHARM gateway Module heat dissipation value (STAR Gateway model considered here as it has higher dissipation).

Heat Load Calculations for SJB for 55°C Ambient

CTO SJB Model	Maximum allowed heat dissipation for 55°C Ambient	User Configurable Heat Contributing Options			Total Dissipation (A+B+C)	CIOC2 Heat Dissipation (W)	Maximum allowable heat load for CHARM HW
		A	B	C			
		CIOC Network	Inj. Power	Power Supply			
EU-FE-96-AC-CIOC-HA EU-FE-96-AC-CIOC-SA (With CHARM gateway)	90	FO (Converter)	NO	10Amp	29	8	53
		COPPER (IOP)			24		58
		FO (Converter)	YES	20Amp	50		32
		COPPER (IOP)			46		37
EU-FE-96-AC-CIOC-HA EU-FE-96-AC-CIOC-SA (With CHARM gateway)	90	FO (Converter)	NO	10Amp	29	18*	43
		COPPER (IOP)			24		48
		FO (Converter)	YES	20Amp	50		22
		COPPER (IOP)			46		27

*CIOC2 heat dissipation includes CHARM gateway Module heat dissipation value (STAR Gateway model considered here as it has higher dissipation).

Heat Load Calculations for SJB with ASCO Valve (40°C Ambient)

CTO SJB Model	Maximum allowed heat dissipation for 40°C Ambient	User Configurable Heat Contributing Options			Total Dissipation (A+B+C)	CIOC2 cards Heat Dissipation (W)	Maximum allowable heat load for CHARM HW including ASCO Valve
		A	B	C			
		CIOC Network	Inj. Power	Power Supply			
EU-FE-96-AC-VLV-SA **	150	FO (IOP)	NO	10Amp	29	5	116
		COPPER (IOP)			28		117
		FO (IOP)	YES	20Amp	51		94
		COPPER (IOP)			50		95

**Maximum allowed internal temperature for Valve SJB is 50°C.

Power Calculations

It is advised to calculate power requirements for each individual SJB with the actual quantity and mix of CHARM types.

SJB Location

The ambient temperature specification provided assumes the SJB is not exposed to direct sunlight. It is recommended to mount the SJBs in a permanently shaded area.

System Compatibility

CTO SJBs are compatible with DeltaV v11.3.1 or later software.

CHARM I/O cards require S-series, M-Series or PK Controllers.

Certifications

The CTO CHARM SJBs are designed with components that meet or exceed the following certifications. Depending on the enclosure type (see specs):

- **CE**
 - EN 61326-1, EN 61010-1
- **ATEX: Sira 16ATEX4047X**
 - EN 60079-0, EN 60079-1, EN 60079-7, EN 60079-11, EN 60079-15, EN 60079-28
- **ATEX /IECEX Marking**
 - Ⓜ II 3(3) G/ Ex db ec ic [ic] nC op is IIC T4 Gc with NON-IS CHARMS
 - Ⓜ II 3(1) G/ Ex db ec [ia Ga] ic nC op is IIC T4 Gc with IS CHARMS
- **IECEX: SIR 16.0019X**
 - IEC 60079-0, IEC 60079-1, IEC 60079-7, IEC 60079-11, IEC 60079-15, IEC 60079-28

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

Ordering Process

CTO CHARM SJBs are pre-engineered solutions developed by Emerson's Project Management Office (PMO) and made available from Emerson Supply Chain.

Basically, the following steps are followed to obtain a CHARM Smart Junction Box:

1. Specify the CHARM SJB 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 options for your CTO SJB.

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 SJB.
- The detailed specification (drawing package) matching your configuration, including the Bill of Materials.

4. Approve the drawing package for construction.

5. Order the CHARM SJB as per provided quotation and approved drawings.

6. The CHARM SJB is assembled, factory tested and delivered to site. The delivery includes the as-built drawing package (AutoCAD).

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 (iCenter Cluj):

Cabinets.Quotes@Emerson.com

For Middle East, Africa, and Asia Pacific (iCenter Nashik):

RFQ_iCenter.NSK@Emerson.com

Project Customizations

“...What if a CTO Smart Junction Box is 90% what I need, but I really need my SJB 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 FAT, 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 (CIOC2) must be ordered separately.
- Individual I/O CHARM modules must be ordered separately as per project requirement.

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