ENGINEERING DOCUMENTATION

Medium-Power Servo Drive

Dimensional & Integration Guide

DOCUMENT	REVISION / ISSUE	STATUS
DIG-ES-SD-C21-S004-V009	DRAFT-08 / 26 Aug 2026	Engineering Integration Reference

Integration Overview

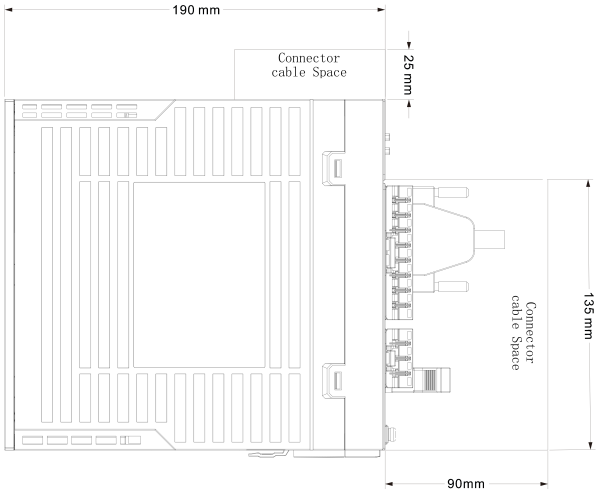
AC medium-power servo drive for cabinet-integrated motion control. This guide supports panel mounting, thermal planning, power and braking integration, signal routing, communication commissioning and enclosure boundary definition for ES-SD-C21-S004-V009.

Key Integration Facts

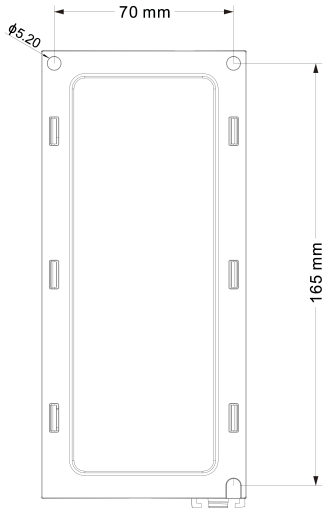
INTEGRATION ITEM	PUBLISHED VALUE
Servo Drive AC Supply Voltage	3-phase 380–415 VAC ±10%, 50/60 Hz ±3 Hz
Logic Supply Voltage	No separate logic-supply input VDC
Communication Protocol	RS485; Modbus RTU; Pulse train

Product Structure & Views

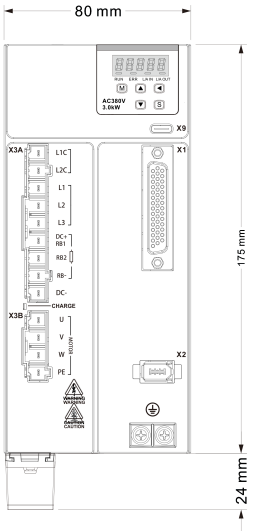
These views present product structure, mounting interfaces and relevant integration geometry for this SKU.



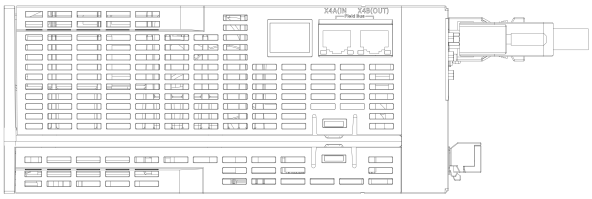
Mechanical View 1



Mechanical View 2



Mechanical View 3



Mechanical View 4

VIEW	FIELD	VALUE
Mechanical View 1	Main body horizontal dimension	190 mm
	Connector cable space label	Connector cable space
	Connector cable space vertical clearance	25 mm
	Connector cable space vertical dimension	135 mm
	Connector cable space horizontal depth	90 mm
Mechanical View 2	Upper mounting hole center distance	70 mm
	Mounting hole diameter	Diameter 5.20 mm
	Right-side mounting hole center distance	165 mm
Mechanical View 3	Device width	Width = 80 mm
	Run status indicator	RUN indicator label
	Error status indicator	ERR indicator label
	Link/activity input and output indicators	L/A IN and L/A OUT indicator labels
	Input voltage label	AC 380 V
	Power rating label	3.0 kW
	X9 connector	Connector X9
	X1 connector	Connector X1
	X3A connector	Connector X3A
	X3A control terminal labels	X3A terminal labels: L1C, L2C, L1, L2
	Main body height	Main body height = 175 mm
	Bottom Height Dimension	24 mm
Mechanical View 4	Field bus input connector label	X4A input field bus connector
	Field bus output connector label	X4B output field bus connector
	Field bus interface label	Field Bus interface

Overall Dimensions and Panel Mounting

- Mount the drive to a rigid, flat panel so the housing is not twisted and the thermal path remains repeatable.
- Use only a published installation orientation and confirm connector access, conductor bend radius and service removal space before releasing the panel layout.
- Keep terminal and connector approach zones accessible without forcing cables against adjacent devices or the enclosure.

Thermal Management and Clearance

- Preserve natural or forced airflow around the drive and do not obstruct heat-transfer surfaces with cable bundles, covers or adjacent heat sources.
- Validate continuous current, auxiliary heat sinking, enclosure temperature, altitude and duty cycle together; use applicable derating data when any boundary is approached.
- Separate the drive from braking resistors, power supplies and other concentrated heat sources unless the complete thermal design has been verified.

Power, Braking and Protective Integration

PARAMETER	PUBLISHED VALUE	UNIT
Servo Drive AC Supply Voltage	3-phase 380–415 VAC ±10%, 50/60 Hz ±3 Hz	
Logic Supply Voltage	No separate logic-supply input	VDC
Braking Absorption Voltage	DC680V±5V	VDC
Overvoltage Alarm Voltage	DC710V±5V	VDC
Undervoltage Alarm Voltage	DC400V±5V	VDC

- Before energization, verify power and logic supply ranges, polarity, protective devices, conductor ratings and discharge state against applicable terminal documentation.
- Size and locate any external braking element for the actual regenerative energy, duty cycle and enclosure thermal conditions; keep hot components clear of wiring and heat-sensitive devices.

Published Electrical Boundaries

BOUNDARY	PUBLISHED VALUE	INTEGRATION REQUIREMENT
Power input	3-phase 380–415 VAC ±10%, 50/60 Hz ±3 Hz	Coordinate the host supply, wiring and protective strategy with this exact-SKU boundary.
Braking absorption threshold	DC680V±5V VDC	Coordinate the host supply, wiring and protective strategy with this exact-SKU boundary.
Overvoltage alarm threshold	DC710V±5V VDC	Coordinate the host supply, wiring and protective strategy with this exact-SKU boundary.
Undervoltage alarm threshold	DC400V±5V VDC	Coordinate the host supply, wiring and protective strategy with this exact-SKU boundary.

I/O, Feedback and Communication Interfaces

PARAMETER	PUBLISHED VALUE	UNIT
Communication Protocol	RS485; Modbus RTU; Pulse train	

- Do not infer terminal or connector pin assignments from this guide. Use the applicable wiring and communication documentation for the exact SKU.
- Confirm voltage levels, input type, output loading, pulse frequency, feedback protocol and communication termination against the connected controller and motor.
- Commission one command and feedback path at a time, then verify direction, scaling, status handling and fault response before enabling coordinated motion.

Grounding, EMC and Cable Routing

- Bond the drive, mounting panel and enclosure through a low-impedance protective and functional grounding architecture sized for the installation.
- Route power and motor conductors separately from encoder, analog, pulse and communication wiring; cross dissimilar cable groups only where necessary.
- Terminate shields and cable clamps using the qualified EMC architecture, with short low-impedance connections and defined cabinet entry.

Operating and Enclosure Conditions

- Treat the published component and terminal ratings as local boundaries. The host enclosure must provide the required access control, ingress protection, contamination control and thermal environment.

Ingress and Enclosure Boundaries

BOUNDARY	PUBLISHED CONDITION	INTEGRATION REQUIREMENT
Drive housing	Verify against applicable product documentation	Do not treat the component rating as the protection rating of the completed control assembly.
Power terminal zone	Verify terminal-zone protection	Contain access within the host enclosure and maintain required electrical clearances and service controls.
Host electrical enclosure	Select the host enclosure for the application environment	Validate enclosure ingress protection, contamination control, thermal management and cable entry for the installed environment.

Commissioning and Safety Functions

- Before power-up, inspect mounting, protective bonding, terminal torque, conductor routing, polarity, motor and feedback compatibility, and enclosure clearances.
- Commission with the mechanism unloaded or restrained as appropriate, conservative current and motion limits, and a verified stop path before normal operation.
- Any safety input or safe-torque function used by the selected configuration must be integrated and validated as part of the machine safety design; this guide does not define safety performance or terminal assignments.

Integration Checklist

01	Confirm that the 2D drawing, published parameter set and applicable wiring data all identify ES-SD-C21-S004-V009.
02	Verify housing dimensions, mounting points, orientation, connector approach and service removal space.
03	Confirm enclosure protection, contamination control, ambient temperature, altitude and thermal derating requirements.
04	Verify power and logic supply ranges, polarity, protective devices, conductor ratings and discharge controls.
05	Validate continuous and peak current requirements together with auxiliary heat sinking and the machine duty cycle.
06	Confirm braking-energy handling, resistor rating, placement, guarding and thermal separation where applicable.
07	Verify motor, brake and feedback compatibility before connecting the load.
08	Confirm digital, analog, pulse and communication interface levels, loading, addressing and termination.
09	Complete protective bonding, shield termination and power-versus-signal cable segregation.
10	Validate safe-state behavior, stop path and any safety function within the complete machine safety design.
11	Commission under defined motion limits and verify direction, scaling, feedback, status and fault response.
12	Request current 2D, STEP, terminal, wiring and communication data before integration planning.

View SKU Product Datasheet **Request controlled 2D drawing** **Request controlled STEP review** **Request a Quote**

Engineering Use and Verification Notice

01. This Dimensional & Integration Guide applies only to EmbodyStack SKU ES-SD-C21-S004-V009 and is intended for dimensional evaluation and preliminary integration. It is not a specified installation manual, wiring diagram, terminal assignment, safety manual or manufacturing drawing and must not be used as the sole basis for panel fabrication, conductor sizing, protective-device selection, braking-resistor design, safety validation or integration planning. Before design freeze or energization, verify dimensions, mounting orientation, ventilation and derating requirements, power and logic supply limits, terminal assignments, conductor and protective bonding requirements, motor and feedback compatibility, braking-energy management, communication settings, safe-state behavior, enclosure protection and environmental limits against the applicable EmbodyStack engineering data for this exact SKU. Where this guide and applicable product documentation differ, the applicable product documentation governs. Validate the complete machine under its intended supply conditions, load cycle, fault cases, environment and applicable regulatory requirements.