

ENGINEERING DOCUMENTATION

Medium-Power Servo Drive

Dimensional & Integration Guide

DOCUMENT	REVISION / ISSUE	STATUS
DIG-ES-SD-C21-S004-V002	DRAFT-08 / 26 Aug 2026	Engineering Integration Reference

Integration Overview

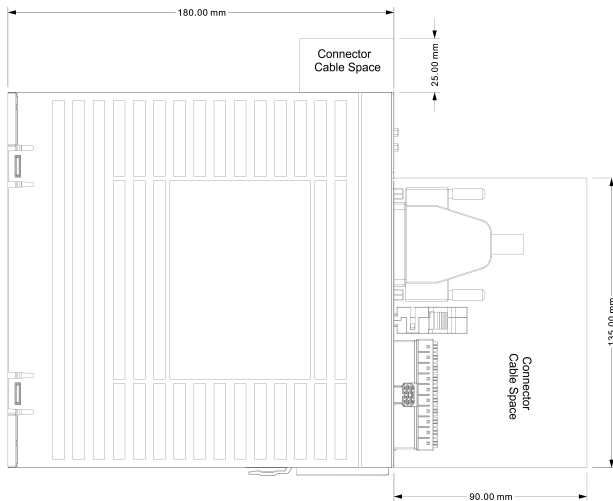
AC medium-power servo drive for cabinet-integrated motion control. This guide supports panel mounting, thermal planning, power and braking integration, signal routing, communication commissioning and enclosure boundary definition for ES-SD-C21-S004-V002.

Key Integration Facts

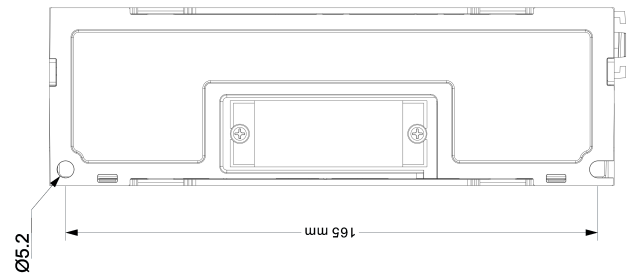
INTEGRATION ITEM	PUBLISHED VALUE
Servo Drive AC Supply Voltage	3-phase 380–415 VAC±10%, 50/60 Hz ±3 Hz
Logic Supply Voltage	No separate logic-supply input VDC
Communication Protocol	EtherCAT; CoE CiA 402

Product Structure & Views

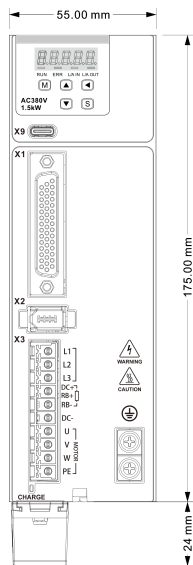
These views present product structure, mounting interfaces and relevant integration geometry for this SKU.



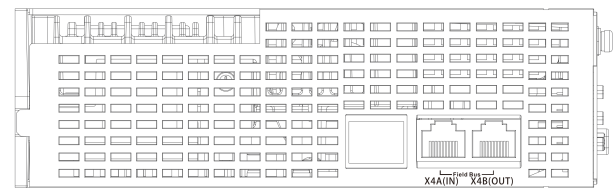
Mechanical View 1



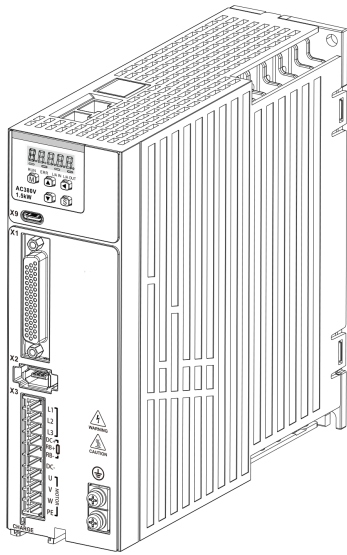
Mechanical View 2



Mechanical View 3



Mechanical View 4



Mechanical View 5

VIEW	FIELD	VALUE
Mechanical View 1	Connector cable space horizontal length	180.00 mm
	Connector cable space upper clearance height	25.00 mm
	Connector cable space label	Connector Cable Space
	Connector cable space vertical height	135.00 mm
	Side connector cable space label	Connector Cable Space
	Connector cable space horizontal projection length	90.00 mm
Mechanical View 2	Side-view length dimension	165 mm
	Mounting hole diameter	Diameter 5.2 mm
Mechanical View 3	Front panel width	Width = 55.00 mm
	Front panel main body height	Main body height = 175.00 mm
	Display and status indicator labels	Display placeholder and status labels: RUN, ERR, L/A IN, L/A OUT
	Front keypad labels	Key labels: M and S
	Input voltage and power marking	AC input marking 380 V; rated power marking 1.5 kW
	Connector labels	Connector designations: X9, X1, X2, X3
	Terminal phase labels	Power terminal labels: L1, L2, L3
	DC bus and braking terminal labels	Terminal labels: DC+ and RB+
	Safety warning labels	Safety labels: WARNING and CAUTION
	Bottom Height Dimension	24 mm
	Field bus interface label	Field Bus interface
	Field bus port designation	X4A input port and X4B output port
Mechanical View 4	Seven-segment display readout area	Seven-segment display placeholder/readout: 8.8.8.8.8.
	Run status indicator label	RUN status indicator
	Error status indicator label	ERR status indicator
	LA input/output indicator labels	LA IN and LA OUT indicator labels
	Front panel button label	M button/function label
	Rated input voltage marking	AC 380 V
	Rated power marking	1.5 kW
	X9 connector label	Connector X9
	X1 connector label	Connector X1
	X2 connector label	Connector X2
	X3 connector label	Connector X3
	Three-phase input terminal labels	Input terminals L1/L2/L3
	DC bus positive terminal label	DC+ terminal
	Regenerative braking resistor terminal labels	RB+ and RB- terminals
	Warning label	WARNING safety label
	Caution label	CAUTION safety label

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 $\pm 10\%$, 50/60 Hz ± 3 Hz	
Logic Supply Voltage	No separate logic-supply input	VDC
Braking Absorption Voltage	DC680V ± 5 V	VDC
Overvoltage Alarm Voltage	DC710V ± 5 V	VDC
Undervoltage Alarm Voltage	DC400V ± 5 V	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 $\pm 10\%$, 50/60 Hz ± 3 Hz	Coordinate the host supply, wiring and protective strategy with this exact-SKU boundary.
Braking absorption threshold	DC680V ± 5 V VDC	Coordinate the host supply, wiring and protective strategy with this exact-SKU boundary.
Overvoltage alarm threshold	DC710V ± 5 V VDC	Coordinate the host supply, wiring and protective strategy with this exact-SKU boundary.
Undervoltage alarm threshold	DC400V ± 5 V 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	EtherCAT; CoE CiA 402	

- 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-V002.
- 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-V002 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.