ENGINEERING DOCUMENTATION

Medium-Power Servo Drive

Dimensional & Integration Guide

DOCUMENT	REVISION / ISSUE	STATUS
DIG-ES-SD-C21-S004-V012	DRAFT-08 / 26 Aug 2026	Engineering Integration Reference

Integration Overview

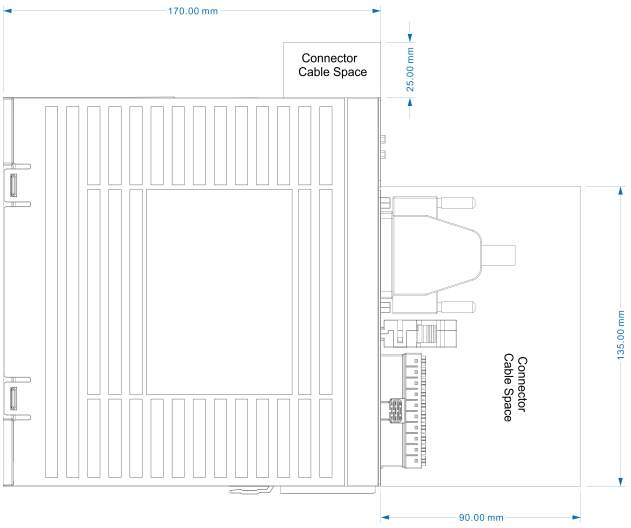
AC medium-power servo drive for cabinet-integrated motion control. This guide supports panel mounting, thermal planning, power and braking integration, signal routing, communication commissioning and enclosure boundary definition for ES-SD-C21-S004-V012.

Key Integration Facts

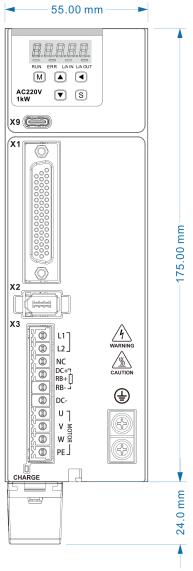
INTEGRATION ITEM	PUBLISHED VALUE
Servo Drive AC Supply Voltage	1-phase 200–240 VAC ±10%, 50/60 Hz ±3 Hz
Logic Supply Voltage	No separate logic-supply input VDC
Communication Protocol	RS485; Modbus RTU; Pulse train

Product Structure & Views

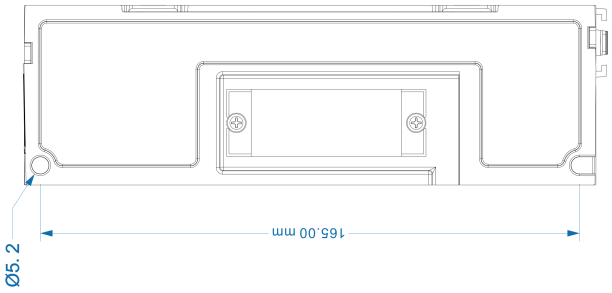
These views present product structure, mounting interfaces and relevant integration geometry for this SKU.



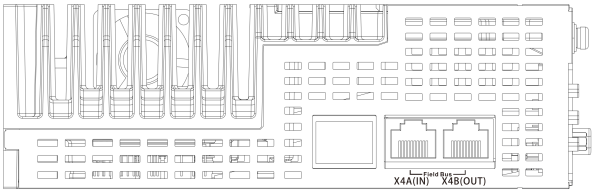
Mechanical View 1



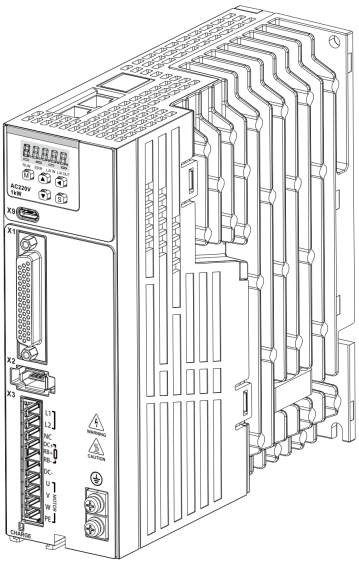
Mechanical View 2



Mechanical View 3



Mechanical View 4



Mechanical View 5

VIEW	FIELD	VALUE
Mechanical View 1	Top envelope length	170.00 mm
	Connector cable space height	25.00 mm
	Connector cable space label	Connector cable space area
	Right connector cable space height	135.00 mm
	Right connector cable space label	Connector cable space area
	Connector cable space length	90.00 mm
Mechanical View 2	Front view width	55.00 mm
	Front view main body height	175.00 mm
	X9 connector label	X9 connector
	X1 connector label	X1 connector
	X2 connector label	X2 connector
	X3 connector label	X3 connector
	Run status indicator label	RUN
	Error status indicator label	ERR
	L/A input indicator label	L/A IN
	L/A output indicator label	L/A OUT
	Rated input voltage marking	AC 220 V
	Power rating marking	1 kW
	Terminal L1 label	L1 terminal
	Warning label	WARNING
	Bottom Height Dimension	24 mm
Mechanical View 3	Overall height	Overall height = 165.00 mm
	Mounting hole diameter	Mounting hole diameter = Ø5.2 mm
Mechanical View 4	Field bus interface label	Field Bus
	X4A input connector	X4A input connector
	X4B output connector	X4B output connector
Mechanical View 5	Seven-segment display indication area	Front-panel seven-segment display placeholder/readout
	Status indicator labels	RUN, ERR, LA IN and LA OUT status indicators
	Mode key label	M front-panel key
	Input voltage and power rating label	AC 220 V, 1 kW rating
	X9 connector label	Connector X9
	X1 connector label	Connector X1
	X2 connector label	Connector X2
	X3 connector label	Connector X3
	AC input terminals	L1 and L2 AC input terminals
	DC bus and braking resistor terminals	NC, DC+, RB+ and RB- terminals

VIEW	FIELD	VALUE
Safety warning labels	WARNING and CAUTION safety labels	

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	1-phase 200–240 VAC±10%, 50/60 Hz±3 Hz	
Logic Supply Voltage	No separate logic-supply input	VDC
Braking Absorption Voltage	DC380V±5V	VDC
Overvoltage Alarm Voltage	DC400V±5V	VDC
Undervoltage Alarm Voltage	DC200V±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	1-phase 200–240 VAC ±10%, 50/60 Hz ±3 Hz	Coordinate the host supply, wiring and protective strategy with this exact-SKU boundary.
Braking absorption threshold	DC380V±5V VDC	Coordinate the host supply, wiring and protective strategy with this exact-SKU boundary.
Overvoltage alarm threshold	DC400V±5V VDC	Coordinate the host supply, wiring and protective strategy with this exact-SKU boundary.
Undervoltage alarm threshold	DC200V±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-V012.
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-V012 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.