

## ENGINEERING DOCUMENTATION

# Medium-Power Servo Drive

## Dimensional & Integration Guide

| DOCUMENT                | REVISION / ISSUE       | STATUS                            |
|-------------------------|------------------------|-----------------------------------|
| DIG-ES-SD-C21-S004-V013 | DRAFT-08 / 26 Aug 2026 | Engineering Integration Reference |

### Integration Overview

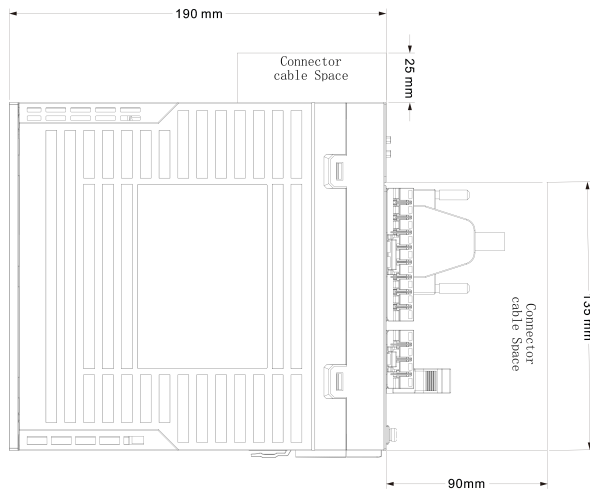
AC medium-power servo drive for cabinet-integrated motion control. This guide supports panel mounting, thermal planning, power and braking integration, signal routing, communication commissioning and enclosure boundary definition for ES-SD-C21-S004-V013.

### Key Integration Facts

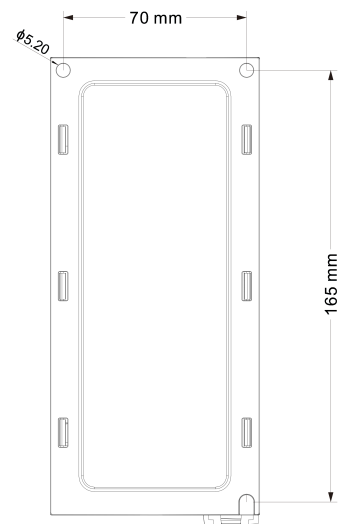
| INTEGRATION ITEM              | PUBLISHED VALUE                              |
|-------------------------------|----------------------------------------------|
| Servo Drive AC Supply Voltage | 3-phase 380–415 VAC±10%, 50/60 Hz ±3 Hz      |
| Logic Supply Voltage          | No separate logic-supply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

## Product Structure & Views

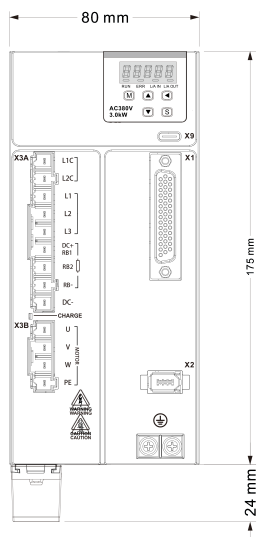
These views present product structure, mounting interfaces and relevant integration geometry for this SKU.



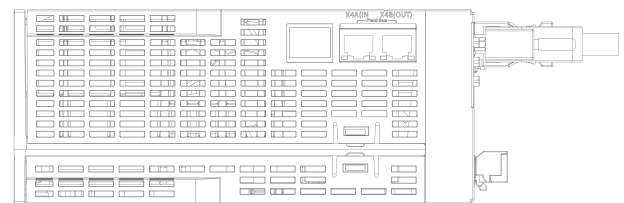
Mechanical View 1



Mechanical View 2



Mechanical View 3



Mechanical View 4

| VIEW              | FIELD                                             | VALUE                                        |
|-------------------|---------------------------------------------------|----------------------------------------------|
| Mechanical View 1 | Main body length                                  | Length = 190 mm                              |
|                   | Top connector cable space label                   | Connector cable space area                   |
|                   | Top connector cable space height                  | Height = 25 mm                               |
|                   | Side connector cable space height                 | Height = 135 mm                              |
|                   | Side connector cable space label                  | Connector cable space area                   |
|                   | Connector cable space extension length            | Extension length = 90 mm                     |
| Mechanical View 2 | Horizontal center distance between mounting holes | 70 mm                                        |
|                   | Mounting hole diameter                            | Diameter 5.20 mm                             |
|                   | Vertical center distance between mounting holes   | 165 mm                                       |
| Mechanical View 3 | Front panel width                                 | Width = 80 mm                                |
|                   | Status indicator labels                           | Status indicators: RUN, ERR, L/A IN, L/A OUT |
|                   | Keypad button labels                              | Keypad buttons: M, S                         |
|                   | Input voltage marking                             | AC input voltage marking = 380 V             |
|                   | Power rating marking                              | Power rating marking = 3.0 kW                |
|                   | X9 connector identifier                           | Connector identifier: X9                     |
|                   | X1 connector identifier                           | Connector identifier: X1                     |
|                   | X3A connector identifier                          | Connector identifier: X3A                    |
|                   | X3A control power terminals                       | X3A terminals: L1C, L2C                      |
|                   | Main body height                                  | Main body height = 175 mm                    |
|                   | Bottom Height Dimension                           | 24 mm                                        |
|                   | Field bus input connector label                   | X4A input connector                          |
| Mechanical View 4 | Field bus output connector label                  | X4B output connector                         |
|                   | Field bus interface description                   | 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 $\pm 10\%$ , 50/60 Hz $\pm 3$ Hz |      |
| Logic Supply Voltage          | No separate logic-supply input                       | VDC  |
| Braking Absorption Voltage    | DC680V $\pm 5$ V                                     | VDC  |
| Overvoltage Alarm Voltage     | DC710V $\pm 5$ V                                     | VDC  |
| Undervoltage Alarm Voltage    | DC400V $\pm 5$ 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 $\pm 3$ Hz | Coordinate the host supply, wiring and protective strategy with this exact-SKU boundary. |
| Braking absorption threshold | DC680V $\pm 5$ V VDC                                 | Coordinate the host supply, wiring and protective strategy with this exact-SKU boundary. |
| Overvoltage alarm threshold  | DC710V $\pm 5$ V VDC                                 | Coordinate the host supply, wiring and protective strategy with this exact-SKU boundary. |
| Undervoltage alarm threshold | DC400V $\pm 5$ 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 | RS485; Modbus RTU; Pulse train; Analog input |      |

- 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-V013.
- 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-V013 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.