

## CATEGORY SELECTION GUIDE

# Iron-Core Brushed DC Motors Category Selection Guide

Iron-core brushed DC motors provide direct voltage-responsive speed control and current-proportional torque in a conventional slotted construction. The catalog covers four frame-size Product Platforms and four SKUs from 42 mm to 80 mm. Start with the installation envelope, then compare rated torque, speed, power and current before checking stall demand, inertia, duty and integration details for the exact SKU.

## CATEGORY SELECTION GUIDE

| CATEGORY                    | CURRENT CATALOG              | REVISION / ISSUE |
|-----------------------------|------------------------------|------------------|
| Iron-Core Brushed DC Motors | 4 Product Platforms / 4 SKUs | R01   2026-09-04 |

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## 01 | Category Scope and Objective

### Product catalog and suitable use

| Item            | Current category                                                                                                                                                                                                 |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Product catalog | 4 Product Platforms / 4 SKUs                                                                                                                                                                                     |
| Suitable use    | Industrial rotary axes requiring direct voltage-responsive speed control, strong starting behavior and conventional brushed-motor integration, with optional gearbox, encoder or linear-actuator configurations. |

## 02 | Operating Principle and Typical Applications

### Voltage, current and mechanical output

Motor speed responds to applied voltage, while torque is proportional to current. The slotted iron-core construction supports conventional brushed DC drive architectures; continuous duty, starting demand and brush service must be considered together.

### Typical applications

|                                                                                                                                                              |                                                                                                                                       |                                                                                                                                                                            |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Voltage-regulated rotary motion</b><br>Rotary mechanisms that use applied voltage to regulate speed and require straightforward two-wire motor operation. | <b>High-starting-torque mechanisms</b><br>Mechanisms where starting torque and available drive current are key initial sizing inputs. | <b>Geared, encoded or linear motion</b><br>Motor-driven axes that add a gearbox, encoder or linear-actuator mechanism after the base motor operating point is established. |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## 03 | Selection Inputs

### Application record checklist

|    |                                     |                                                                                                                                                                |
|----|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 01 | <b>Installation envelope</b>        | Record Frame Size, Body Length, output shaft, mounting pattern, cable space and the complete driven assembly envelope.                                         |
| 02 | <b>Continuous operating point</b>   | Record required Rated Torque, Rated Speed, Rated Power, Rated Current and operating duration.                                                                  |
| 03 | <b>Starting and stall demand</b>    | Record starting load, acceleration and the drive current limit; use Stall Torque and Stall Current only for short-duration checks, not as a continuous rating. |
| 04 | <b>Electrical and dynamic match</b> | Record supply voltage, current capability, load inertia, direction and control behavior.                                                                       |
| 05 | <b>Duty and integration</b>         | Record Duty Cycle, thermal path, acoustic target, brush service requirements and any gearbox, encoder or brake integration.                                    |

## 04 | Product Platform Catalog

### Current Product Platforms

|                                                                                                                                                       |                                                                                                                                                       |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
|  <b>42 mm Iron-Core Brushed DC Motor Product Platform</b><br>1 SKU |  <b>50 mm Iron-Core Brushed DC Motor Product Platform</b><br>1 SKU |
|  <b>63 mm Iron-Core Brushed DC Motor Product Platform</b><br>1 SKU |  <b>80 mm Iron-Core Brushed DC Motor Product Platform</b><br>1 SKU |

## 05 | Product Platform Selection Path and Comparison

### 01 Filter by frame size and length

Retain every Product Platform that fits the radial and axial installation envelope.

**02 Match the continuous operating point**

Compare Rated Torque, Rated Speed, Rated Power and Rated Current together.

**03 Check starting and transient demand**

Check Stall Torque, Stall Current, Torque Constant and Rotor Inertia against the drive and motion profile.

**04 Confirm duty and interfaces**

Confirm Rated Voltage, Duty Cycle, shaft, mounting, wiring, thermal path and any gearbox or encoder configuration.

**05 Confirm the SKU**

Each Product Platform currently contains one SKU; retain the SKU only when all required mechanical, electrical and operating conditions remain compatible.

**Primary Product Platform comparison**

| Standard parameter | 42 mm | 50 mm  | 63 mm | 80 mm |
|--------------------|-------|--------|-------|-------|
| Frame Size         | 42    | 50     | 63    | 80    |
| Body Length        | 85    | 60     | 125   | 102   |
| Rated Voltage      | 24    | 24     | 24    | 24    |
| Rated Power        | 19    | 4      | 90    | 65    |
| Rated Speed        | 3150  | 1700   | 3200  | 2500  |
| Rated Torque       | 0.057 | 0.0225 | 0.27  | 0.25  |
| Rated Current      | 1.45  | 0.5    | 6     | 4.5   |
| Stall Torque       | 0.256 | 0.08   | 1.6   | 1.2   |
| Stall Current      | 5.5   | 1.1    | 29    | 19    |
| Rotor Inertia      | 0.11  | 0.13   | 0.8   | 1.6   |

## 06 | SKU Refinement

**SKU-level differences**

| SKU             | Product Platform | Continuous operating point | Starting and dynamic checks                               |
|-----------------|------------------|----------------------------|-----------------------------------------------------------|
| ES-DC-IC01-M001 | 42 mm            | 24; 0.057; 3150; 19; 1.45  | Stall Torque 0.256; Stall Current 5.5; Rotor Inertia 0.11 |
| ES-DC-IC02-M001 | 50 mm            | 24; 0.0225; 1700; 4; 0.5   | Stall Torque 0.08; Stall Current 1.1; Rotor Inertia 0.13  |
| ES-DC-IC03-M001 | 63 mm            | 24; 0.27; 3200; 90; 6      | Stall Torque 1.6; Stall Current 29; Rotor Inertia 0.8     |
| ES-DC-IC04-M001 | 80 mm            | 24; 0.25; 2500; 65; 4.5    | Stall Torque 1.2; Stall Current 19; Rotor Inertia 1.6     |

**Final SKU checks**

- 01** Confirm Frame Size, Body Length, shaft, mounting and cable clearance for the exact SKU.
- 02** Confirm the complete rated operating point rather than selecting from Rated Power or Rated Torque alone.
- 03** Confirm drive current, starting behavior, Duty Cycle, thermal path and brush service requirements.
- 04** Confirm any gearbox, encoder, brake or linear-actuator interface against SKU-specific controlled documents.

## 07 | Engineering Information Checklist

## Record before RFQ or engineering evaluation

|    |                                |                                                                                                                                        |
|----|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| 01 | <b>Motion and load</b>         | Required torque, speed range, acceleration, load inertia, direction and starting condition.                                            |
| 02 | <b>Duty and power</b>          | Operating duration, Duty Cycle, supply voltage, continuous current and allowed transient current.                                      |
| 03 | <b>Mechanical interface</b>    | Frame size, body length, shaft, mounting, coupling, cable space and driven-assembly envelope.                                          |
| 04 | <b>Environment and service</b> | Thermal path, ambient conditions, acoustic target, brush service interval and expected operating profile.                              |
| 05 | <b>Options and documents</b>   | Gearbox, encoder or brake requirement, SKU Product Datasheet, Dimensional & Integration Guide, 2D drawing and controlled 3D resources. |

## 08 | Engineering Use and Verification Notice

### Controlled engineering documents

|    |                                                                                                                                   |
|----|-----------------------------------------------------------------------------------------------------------------------------------|
| 01 | Use the current SKU Product Datasheet for exact SKU parameters and configuration verification.                                    |
| 02 | Use the applicable Dimensional & Integration Guide and 2D drawing for envelope, shaft, mounting, wiring and installation details. |
| 03 | Request STEP or native CAD for the exact SKU through the controlled engineering-file process.                                     |

### Final verification statement

This guide supports preliminary Product Platform and SKU selection. Before design freeze, procurement or use, verify the exact SKU, mechanical and electrical interfaces, continuous and starting operating points, duty, thermal conditions, brush service, options and current controlled engineering documents. Do not derive missing torque, speed, compatibility or performance values from a SKU code, Product Platform name, adjacent frame size or a single rated value.