

DC Motor & Encoder - Datasheet

Product Description

The JGA25-370 is a compact brushed DC gear motor featuring a 25 mm all-metal gearbox and an integrated incremental quadrature encoder.

This motor is designed for applications requiring low speed, moderate torque, and closed-loop feedback, such as robotics, automation systems, smart devices, and motion control projects.

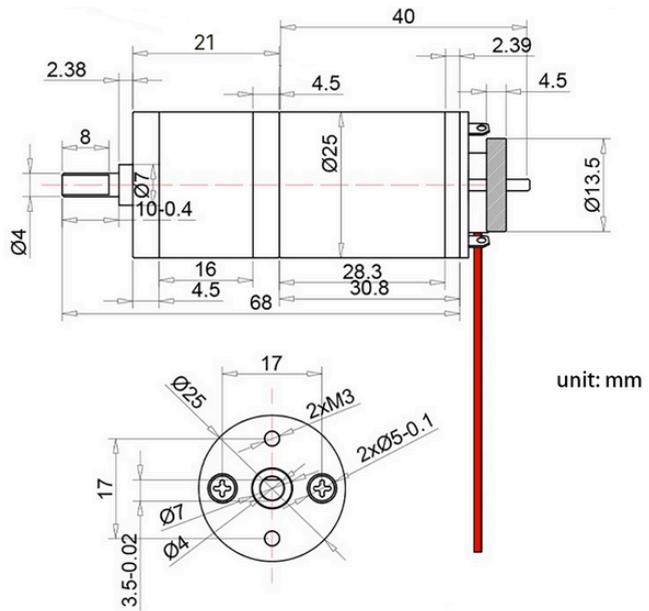


This datasheet covers the 12V, ~150 RPM version of the motor as it comes as standard. Info about other configurations can be found at the end of the datasheet in the Annex A.

Mechanical Specifications

The 150 RPM version of the gearbox has a reduction ratio of:

- Reduction Ratio:** 35:1
- Gearbox Length:** 21 mm
- Weight:** 110 g
- Output Power:** 2.7 - 4.8 W

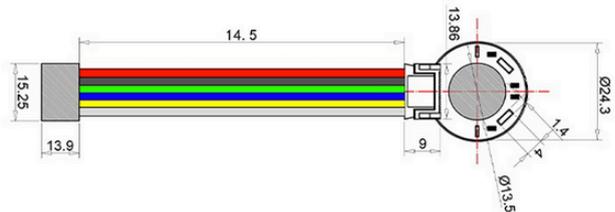


Torque Characteristics

The following values represent realistic, engineering-grade estimates for the 12V ~150 RPM motor:

- Continuous Torque:** ~0.8 - 1 kg·cm
- Stall Torque:** ~2.8 kg·cm

Design systems such that continuous torque remains within the rated range. Peak torque values must not be sustained as the motor will heat up and burn out.



Reduction ratio	Rated Volt V	No Load		AT Load			STALL		Gearbox Length mm
		SPEED RPM	CURRENT mA	Torque KG.cm	SPEED RPM	Current A	TOGQCE KG..CM	CURRENT A	
35	12	170	60	0.8	130	0.45	2.8	1.3	21

Electrical Specifications

- **Motor Type:** Brushed DC motor with metal reduction gearbox
- **Rated Voltage:** 12 V DC
- **Functional voltage:** 3V - 24 V DC (do not overload past 12V)
- **No-Load Speed:** ~170 RPM ($\pm 5\%$)
- **Speed Tolerance:** $\pm 5\%$
- **No-Load Current:** ~60 mA (typical)
- **Rated Load Current:** ~0.4–0.6 A (typical)
- **Stall Current:** ~1.3 A (typical)

Warning - Continuous operation at stall is not permitted, motor will burn out!

Encoder Specifications

Encoder Type:	Quadrature incremental hall
Signal Type:	Square wave AB phase
Bus Resistor:	Built in pullup resistor
Interface:	PH2.0 connector
Response frequ.	100 kHz
Supply Voltage:	3.3 - 5.0 V DC
Resolution:	11 pulses / motor rev
Magnetic ring:	22 poles (11 pairs)



Quadrature decoding of the encoder pulses gives up to 44 counts per motor revolution. This must be multiplied by the gearbox reduction ratio to find the output encoder resolution:

$$44 \text{ counts (per motor rev)} \times 35:1 = 1540 \text{ counts (per gearbox rev) or 10 bits of resolution}$$

System	Wire Color	Function
Motor +	Red	Reversing polarity changes motor's direction of rotation
GND supply -	Black	Encoder ground (GND). Polarity must not be reversed
Encoder B	Yellow	Encoder signal B (11 pulses per motor revolution)
Encoder A	Green	Encoder signal A (11 pulses per motor revolution)
VCC supply +	Blue	Encoder power supply + (3.3–5 V). Polarity must not be reversed
Motor -	White	Reversing polarity changes motor's direction of rotation

Annex A - Various Configurations of JGA25-370 Motors

Parameter Overview

Reduction ratio	Rated Volt	No Load		AT Load			STALL		Gearbox Length mm
		SPEED	CURRENT	Torque	SPEED	Current	TOGQCE	CURRENT	
		V	RPM	mA	KG.cm	RPM	A	KG..CM	
4.4	6	1360	100	0.1	1000	0.45	0.35	1.8	17
9.6	6	620	100	0.22	450	0.45	0.75	1.8	17
21.3	6	280	100	0.5	220	0.45	1.7	1.8	19
35	6	170	100	0.8	130	0.45	2.8	1.8	21
46	6	130	100	1	100	0.45	3.6	1.8	21
78	6	77	100	1.8	60	0.45	6.2	1.8	23
103	6	60	100	2.4	46	0.45	8.2	1.8	23
171	6	35	100	4	27	0.45	9	1.8	25
226	6	26	100	5.2	20	0.45	9	1.8	25
377	6	16	100	8.4	12	0.45	9	1.8	27
500	6	12	100	9	9	0.45	9	1.8	27
4.4	12	1360	60	0.1	1000	0.45	0.35	1.3	17
9.6	12	620	60	0.22	450	0.45	0.75	1.3	17
21.3	12	280	60	0.5	220	0.45	1.7	1.3	19
35	12	170	60	0.8	130	0.45	2.8	1.3	21
46	12	130	60	1	100	0.45	3.6	1.3	21
78	12	77	60	1.8	60	0.45	6.2	1.3	23
103	12	60	60	2.4	46	0.45	8.2	1.3	23
171	12	35	60	4	27	0.45	9	1.3	25
226	12	26	60	5.2	20	0.45	9	1.3	25
377	12	16	60	8.4	12	0.45	9	1.3	27
500	12	12	60	9	9	0.45	9	1.3	27
4.4	24	1360	40	0.1	1000	0.25	0.35	0.7	17
9.6	24	620	40	0.22	450	0.25	0.75	0.7	17
21.3	24	280	40	0.5	220	0.25	1.7	0.7	19
35	24	170	40	0.8	130	0.25	2.8	0.7	21
46	24	130	40	1	100	0.25	3.6	0.7	21
78	24	77	40	1.8	60	0.25	6.2	0.7	23
103	24	60	40	2.4	46	0.25	8.2	0.7	23
171	24	35	40	4	27	0.25	9	0.7	25
226	24	26	40	5.2	20	0.25	9	0.7	25
377	24	16	40	8.4	12	0.25	9	0.7	27
500	24	12	40	9	9	0.25	9	0.7	27

