

ICR SERIES — MINIATURE DIRECT-DRIVE ROTARY MOTOR

Compact, high-torque rotary precision in a hollow-shaft form factor.

The ICR Series miniature direct-drive rotary motor combines impressive torque output with exceptional angular positioning accuracy, all in a body starting from just 20 mm in diameter. The built-in high-resolution circular optical encoder delivers 409,600 counts per revolution, achieving repeatability of ± 2 arc-seconds and absolute positioning accuracy of 0.01° . The hollow motor core allows cables and air lines to pass through cleanly, simplifying overall system design. High-precision cross-roller bearings keep axial and radial runout within $5\ \mu\text{m}$. Both inner and outer rotor configurations are available, with custom specifications accepted.

KEY FEATURES

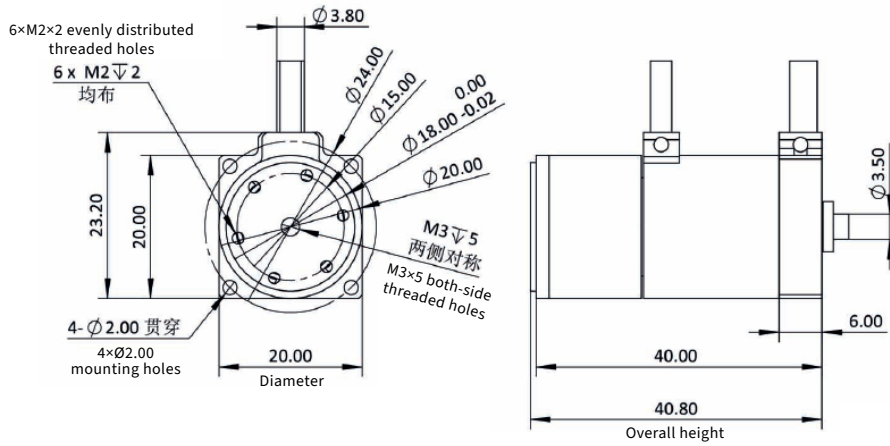
- Built-in circular optical encoder; repeatability ± 2 arc-seconds, absolute positioning accuracy 0.01°
- Compact size, high torque
- Hollow motor core allows cable and air-line routing
- High-precision cross-roller bearings; axial and radial runout both within $5\ \mu\text{m}$
- Inner rotor or outer rotor selectable; customisation accepted



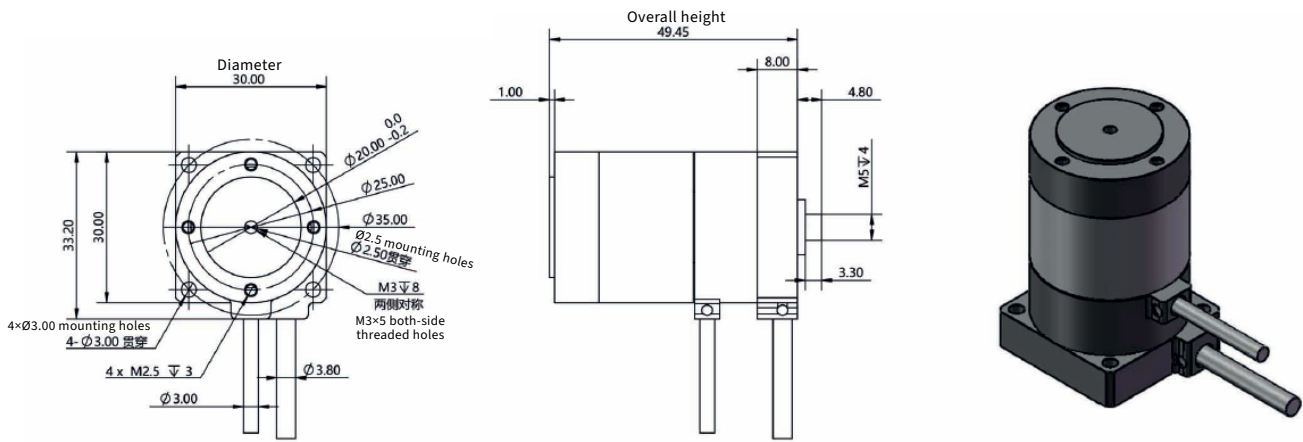
ICR20/ICR30DD SPECIFICATIONS

Parameter	Unit	ICR-20-041	ICR-30-049	ICR-30-059I
Motor Diameter	mm	20	30	30
Motor Height	mm	40.8	49.45	58.75
Peak Torque	Nm	0.09	0.24	0.36
Continuous Torque	Nm	0.03	0.08	0.12
Peak Current	Arms	1.92	1.92	1.92
Continuous Current	Arms	0.64	0.64	0.64
Torque Constant	Nm/Ams	0.047	0.125	0.188
Resistance @ 25°C	Ω	4.84	7.9	6.3
Inductance @ 1kHz	mH	0.24	1.68	1.6
Back-EMF Constant	Vp/krpm	2.4	9.8	19.7
Max Speed	rpm	1000	500	800
Single-turn Resolution	Count/rev	409 600	409 600	409 600
Axial/Radial Runout	μm	< 8	< 8	< 8
Motor Weight $\pm 15\%$	g	60	138	157
Rotational Inertia	gcm^2	50	102	153
Pole Pairs	—	7	7	7
Motor Type	—	Iron-core outer rotor	Iron-core outer rotor	Iron-core inner rotor

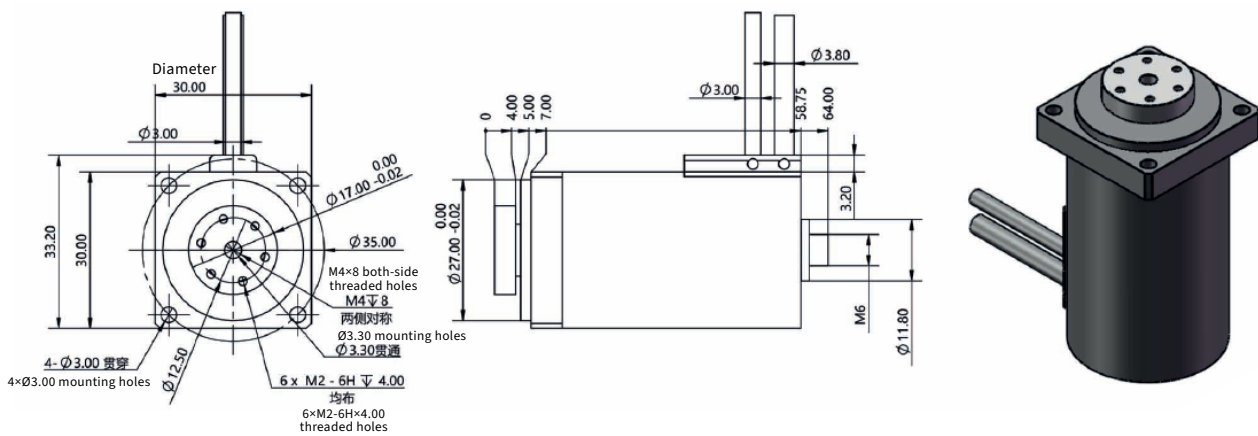
ICR-20-041 Installation Dimensions



ICR-30-049 Installation Dimensions



ICR-30-059I Installation Dimensions



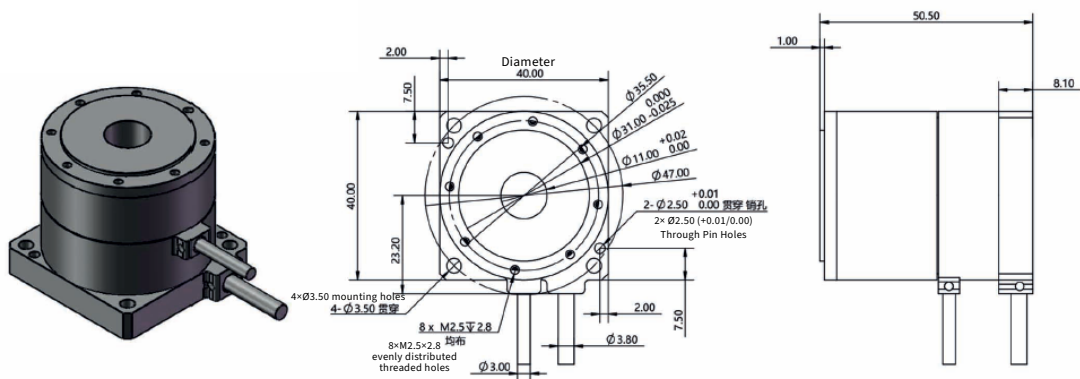
ICR40DD SPECIFICATIONS

Parameter	Unit	ICR-40-0385	ICR-40-0395-A	ICR-40-435	ICR-40-485	ICR-40-0505-A
Motor Diameter	mm	40	40	40	40	40
Motor Height	mm	38.5	38	43.5	48.5	50.5
Peak Torque	Nm	0.39	0.39	0.6	0.78	0.78
Continuous Torque	Nm	0.13	0.13	0.2	0.26	0.26
Peak Current	Arms	1.9	1.9	1.9	1.9	1.9
Continuous Current	Arms	0.63	0.63	0.63	0.63	0.63
Torque Constant	Nm/Ams	0.21	0.21	0.32	0.41	0.41
Resistance @ 25°C	Ω	9.14	9.14	10.5	13.4	13.4
Inductance @ 1kHz	mH	1.12	1.12	1.24	1.6	1.6
Back-EMF Constant	Vp/krpm	22	22	22	22	22
Max Speed	rpm	500	490	490	490	490
Encoder Resolution	Count/rev	819 200	819 200	819 200	819 200	819 200
Absolute Encoder Resolution	g	19	19	19	19	19
Axial/Radial Runout	μm	< 8	< 8	< 8	< 8	< 8
Motor Weight ±15%	g	162	162	192	230	235
Rotational Inertia	gcm ²	104	106	220	246	246
Pole Pairs	—	11	11	11	11	11
Motor Type	—	Iron-core outer rotor	Iron-core outer rotor	Iron-core outer rotor	Iron-core outer rotor	Iron-core outer rotor

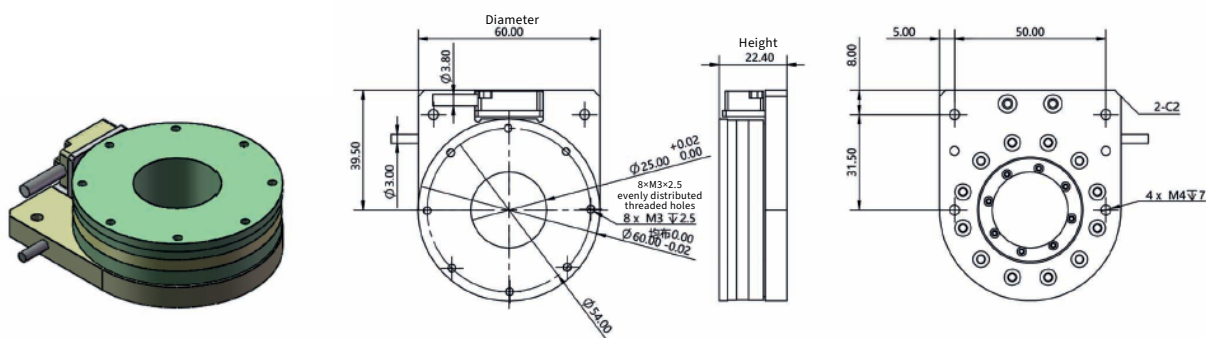
ICR60DD SPECIFICATIONS

Parameter	Unit	ICR-60-022	ICR-60-057	ICR-68-067	ICR-90-058
Motor Diameter	mm	60	60	68	90
Motor Height	mm	22.4	54.5	67.5	58.3
Peak Torque	Nm	0.6	1.1	3.6	3.6
Continuous Torque	Nm	0.2	0.36	1.2	2
Peak Current	Arms	2.5	2.7	3	5.25
Continuous Current	Arms	0.8	0.9	1	1.75
Torque Constant	Nm/Ams	0.25	0.4	1.2	1.14
Resistance @ 25°C	Ω	3.2	14	9.95	4.15
Inductance @ 1kHz	mH	0.4	9.3	8.7	2.23
Back-EMF Constant	Vp/krpm	25	41.9	125.2	119.38
Max Speed	rpm	200	490	300	300
Encoder Resolution	Count/rev	1,864,000	1,440,000	1,440,000	1,638,400
Axial/Radial Runout	μm	< 8	< 8	< 8	< 8
Motor Weight ±15%	g	375	460	990	980
Rotational Inertia	gcm ²	838	797	1780	4439
Pole Pairs	—	8	11	14	21
Motor Type	—	Coreless outer rotor	Iron-core outer rotor	Iron-core outer rotor	Iron-core outer rotor

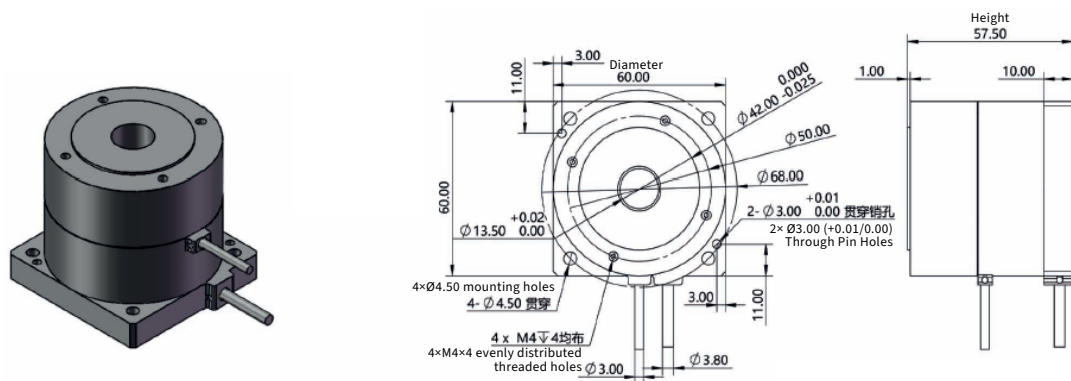
ICR-40 Series Installation Dimensions



ICR-60-022 Installation Dimensions



ICR-60-057 Installation Dimensions



ICR-68-067 Installation Dimensions

