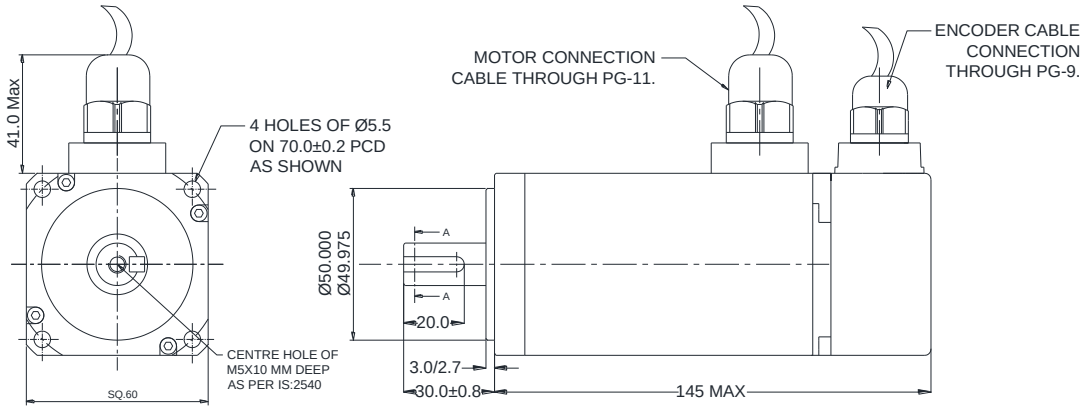
MOVEMATIC

Brushless Servo Motors

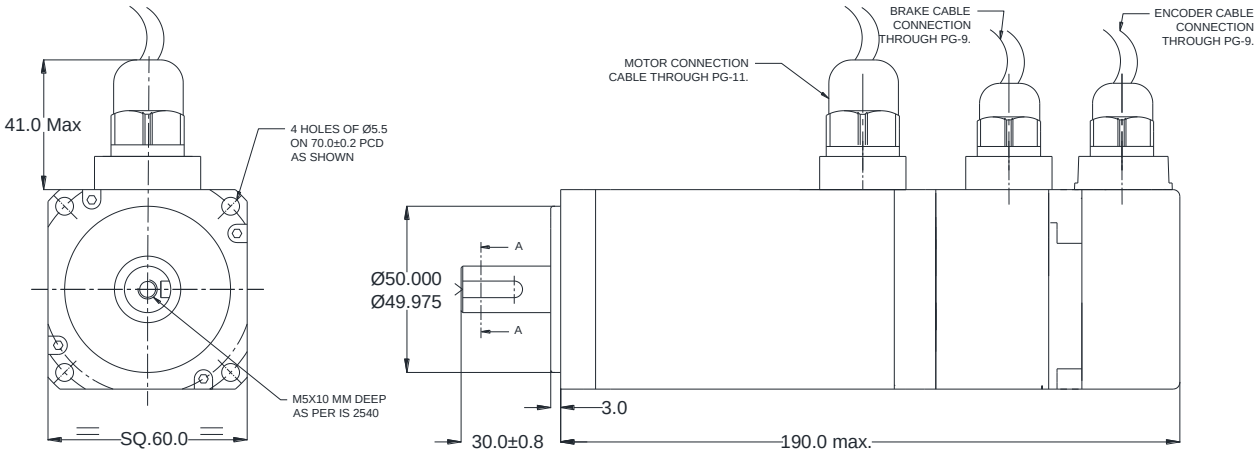
Performance Data

Motor Model	060-400-048-30-I-L-X-X	060-400-230-30-I-L-X-X
Parameters	**48 Volt**	**230 Volt**
Rated Power (kW)	0.4	0.4
Rated Voltage	48	230
Rated Torque (Nm)	1.27	1.27
Maximum Torque (Nm)	3.82	3.8
Rated Speed (rpm)	3000	3000
Maximum speed (rpm)	4000	4500
Rated Current (A)	9.6	2.5
Maximum current (A)	28.8	7.5
Torque constant KT (Nm/A)	0.1322	0.484
Voltage constant KE (mV/rpm)	7.5	29
Motor Constant (Nm/$\sqrt{W}$)	0.256	0.24
Armature resistance (ohm)	0.267	3.7
Armature Inductance (mH)	1.2	12.9
Electric constant (ms)	4.49	4.07
Mechanical constant (ms)	1.204	3.486
Rotor inertia (10^{-4} kgm^2) (w/o brake)	0.4269	0.4269
Insulation class	class F	class F
Insulation resistance	>100Mohm, 500Vdc	>100Mohm, 500Vdc
Insulation strength	1.8kVac, 1Sec	1.8kVac, 1Sec
Weight (kg) (w/o brake)	1.4	1.4
Weight (kg) (with brake)	1.9	1.9
Operating temperature (°C)	0 to 40 °C	0 to 40 °C
Storage temperature (°C)	-10 to 80 °C	-10 to 80 °C
IP rating	IP65 Except rotating portion of output shaft and lead wire end	IP65 Except rotating portion of output shaft and lead wire end

- 10 Pole Design.
- Closed aluminum housing with aluminum flanges.
- Bi-directional speed control with continuous output of 400 Watts @ 3000rpm.
- Various combination options with gears, encoders and brakes.
- Customization available as per customer's requirement.



400 Watts Motor without brake



400 Watts Motors with brake

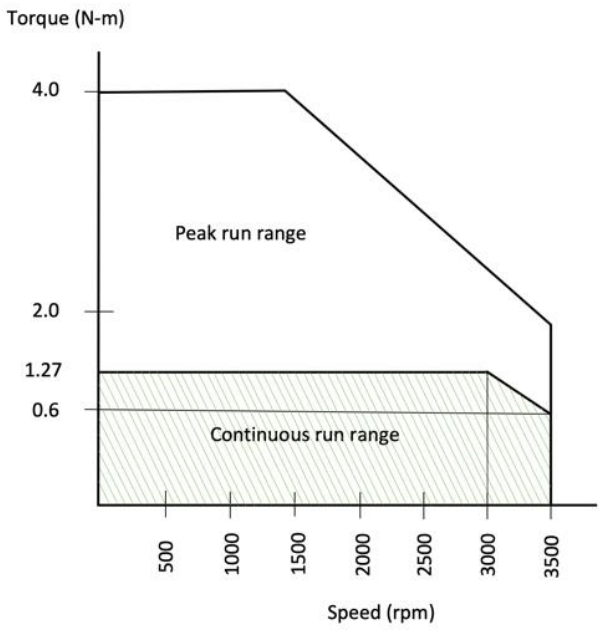
Pin Details for Encoder Signal Connector

Pin. No	Lead Color	Output Signal
1	Blue	A
2	Green	B
3	Yellow/Black	$\overline{Z}$
4	White/Black	Hall $\overline{W}$
5	Blue/Black	$\overline{A}$
6	Green/Black	$\overline{B}$
7	Red	5 V
8	Brown	Hall U
9	Grey	Hall V
10	Grey/Black	Hall $\overline{V}$
11	Black	Ground
12	Black	Ground
13	Yellow	Z
14	White	Hall W
15	Brown/Black	Hall $\overline{U}$

Pin Details for Power Connector

Pin no.	Lead Color	Phase Signal
1	Red	R-Phase
2	Yellow	Y-Phase
3	Blue	B-Phase
4	Green	Earth

Performance Curve



Continuous run range

The continuous duty zone is bordered by the maximum continuous torque line up to the intersection with the intermittent duty line. The continuous torque line is set by either the motor's maximum rated temperature, or the drives' rated continuous current output, whichever less is. The system voltage limit line is set by the voltage rating of the drives, the line voltage supplied, and the motor winding. The system can operate on a continuous basis anywhere within this area, assuming the ambient temperature is 40°C or less. See notes below for additional variables that may affect the continuous torque specification.

Intermittent (Peak) run range

The intermittent duty zone is bordered by the peak torque line and the system voltage limit line. The peak torque line is set by either the drives' peak current rating, which the drive can produce for a limited time, or the maximum rated peak current for the motor, whichever is less. Refer to the Rating Data on the pages that follow. Note: Higher torque levels may be achievable at higher power levels.

Safety Guidelines

The manufacturer of the machine must generate a hazard analysis for the machine and take appropriate measures to ensure that unforeseen movements cannot cause injury or damage to any person or property.

It is vital that you ensure that the motor housing is safely earthed to the PE (protective earth) busbar in the switch cabinet. Electrical safety is impossible without a low-resistance earth connection.

Do not unplug any connectors during operation. This creates the danger of death, severe injury, or extensive material damage.

- Power connections may be live even when the motor is not rotating. Never disconnect the power connections of the motor while the equipment is energised. This can cause flashovers with resulting injuries to persons and damage to the contacts.

- After disconnecting the servo amplifier from the supply voltage, wait several minutes before touching any components which are normally live (e.g. contacts, screw connections) or opening any connections. The capacitors in the servo amplifier can still carry a dangerous voltage several minutes after switching off the supply voltages. To be quite safe, measure the DC-link voltage and wait until the voltage has fallen below 40V.

- The surfaces of the motors can be very hot in operation, according to their protection category. The surface temperature can exceed 100°C. Measure the temperature and wait until the motor has cooled down below 40°C before touching it.

- Remove any fitted key (if present) from the shaft before letting the motor run independently, to avoid the dangerous results of the key being thrown out by centrifugal forces.
- Built-in holding brakes do not ensure personnel safety! Hanging loads (vertical axes) require an additional, external mechanical brake to ensure personnel safety.
- Only properly qualified personnel are permitted to perform such tasks as transport, assembly, setup and maintenance. Properly qualified personnel are persons who are familiar with the transport, assembly, installation, setup and operation of motors, and who have the appropriate qualifications for their jobs. The qualified personnel must know and observe the following standards and regulations:
- IEC 60364 or IEC 60664 national regulations for safety / accident prevention
- Read the available documentation before assembly and setup. Incorrect handling of the motors can result in injury and damage to persons and machinery. Keep strictly to the technical data and the information on the connection requirements (nameplate and documentation).

Designated Use

- The motors may **only** be operated under the environmental conditions defined in this document.
- The motors in this series are designed **exclusively** for the regulation of rotation speed and/or torque control by servo amplifiers.
- The motors are mounted as components in electrical assemblies or machines and may only be operated as integrated parts of the system.
- The thermal protection contact built into the motor winding must be evaluated and

Non Designated Use

The use of the motors in the following environments is prohibited:

- potentially explosive areas
- environments with corrosive and/or electrically conductive acids, alkaline solutions, oils, vapours, dusts
- directly on supply networks

Commissioning the motor is prohibited if the machine in which it was installed

- does not comply with the EMC Directive
- does not comply with the Low Voltage Directive

Built-in holding brakes without further equipment must not be used to ensure personnel safety.