

# VERTICAL MOTORS

---

## Vertical Solid Shaft

1 HP – 30,000 HP, 300 RPM – 3600 RPM

## Vertical Hollow Shaft

1 HP – 1500 HP, 400 RPM – 3600 RPM



# STANDARD SPECIFICATIONS FOR VERTICAL HIGH THRUST MOTORS

	ITEM	STANDARD SPECIFICATION
RATING	Kind of Motors	Squirrel Cage Induction (SCIM) or Synchronous
	Design Standards	NEMA MG-1, MG-13, IEC-34, BS4999, and various other international standards
	Voltages	230V to 13.2KV
	Frequency	50 & 60 Hz
	Output Range	1 HP to 30,000 HP
	RPM	300 RPM to 3600 RPM
	Time Duty	Continuous duty with 1.15 service factor or 1.0 service factor (S1, MCR)
	Frame Sizes	NEMA 184TP to 1250mm
	Protection Enclosures	ODP, WPI, WPPI, TEFC, TEAAC, TEWAC, IP-22 through IP-55
	Cooling Methods	IC 01, IC 0141
	Mounting	Flange mount, IM 3011
APPLICATION	Power Conditions	Voltage $\pm 10\%$ , Frequency $\pm 5\%$ , and $\pm 10\%$ maximum of combined voltage and frequency
	Application	Designed primarily for pumps
	Environment Conditions	Indoor or Outdoor Ambient temperature: $-20^{\circ}\text{C}$ to $40^{\circ}\text{C}$ Relative humidity: Less than 95% relative humidity (non-condensation) Altitude: Less than 3300 ft as standard. Other elevations available upon request.
	Coupling Method	Direct coupled
	Direction of Rotation	Counter-clockwise (when viewed from top of motor) or clockwise
CONSTRUCTION	Frame	High grade cast iron or fabricated steel plate
	Flange Bracket (Shield)	High grade cast iron or fabricated steel plate
	Upper Bracket	High grade cast iron or fabricated steel plate
	Air Cabinet	Fabricated steel plate
	Shaft	Carbon steel or alloy steel cylindrical single extension with key-way and key
	Thrust Bearing (Upper)	Oversized angular contact thrust bearing or spherical roller thrust bearing. KTB type is also an option.
	Guide Bearing (Lower)	Vacuum de-gassed, high quality, deep-groove ball bearing. Sleeve type is also an option.
	Lubrication	Thrust Bearing: Grease lubrication for motor smaller than 324TP frame size, oil lubrication for all others. Guide Bearing: Grease lubrication for anti-friction bearings, oil lubrication for sleeve lower guide bearings.
	Shaft Opening Shield	Metal flinger at flange bracket end
	Terminal Housing	Cast iron or fabricated steel plate. Cast iron boxes can be rotated at $90^{\circ}$ increments and are threaded for external conduit entrance. Fabricated boxes can have conduit entry locations at any $90^{\circ}$ increment and will consist of a blank plate for field drilling.
	Lead Terminals	3 or 6 leads with solderless lug terminals
	Iron Core	High grade, insulated, cold-rolled, electro-magnetic steel sheet, equivalent to C-5 lamination
	Stator Winding	Low voltage motors are random wound; made of heavy, heat-resistant polyester enameled copper wire. Medium voltage motors are form wound; mica insulated.
	Stator Insulation	Class F insulation system that is rated for total temperature of $155^{\circ}\text{C}$
	Varnish Treatment	Low voltage motors: Two dips and one bake in a special heat resistant, phenolic alkyd varnish. Medium voltage motors: VPI treatment of solventless epoxy varnish.
	Rotor Winding	Aluminum die cast for motors in NEMA frame size 449 and below. Copper, or copper alloy, bar rotor in 5000 frame size and larger.
	Painting	Phenolic rust proof base plus lacquer surface finish paint in blue-gray color
	Nameplate	Stainless steel
	Bolt Thread	ISO metric system
	Grounding Terminal	One available inside the primary terminal box and one on the flange
Additional Parts	Non-reversing ratchet mechanism available when ordered. Specify direction of rotation when ordering.	
PERFORMANCE	Test Procedure	IEEE-112 Method F, IEC-34, BS4999, or JEC 37
	Temperature Rise	1.0 service factor: Not to exceed $80^{\circ}\text{C}$ @ full load by resistance method 1.15 service factor: Not to exceed $105^{\circ}\text{C}$ @ service factor load by resistance method
	Over Speed	125% of synchronous speed for one minute for 2 pole and 4 pole motors and 150% of synchronous speed for one minute for all other speeds.
	Over Torque	160% rated torque for 15 seconds

