

# U.S. Motors® Brand Vertical A.C. Motors HOLLOWSHAFT®, High Thrust



**Horsepower:** 3 – 5000

**Speeds:** 3600-400rpm

**Design Voltages:** 3Phase/208-6900 Vac/50 or 60Hz

**Enclosures:** Weather Protected Type I, Weather Protected Type II, Totally Enclosed Fan Cooled, and Hazardous Location

**Efficiency Levels:** Standard Efficient, Energy Efficient, and Premium Efficient



## Product Overview and Options

The U.S. Motors® brand Vertical HOLLOWSHAFT® motor has been a standard in the pumping industry since 1922. These motors are recognized for their longevity, reliability and ease of use. Unique configurations, tailored to a customer's specific requirements, can include enclosure design to minimize the effects of adverse conditions present in turbine, mix flow and propeller pump applications.

U.S. Motors® brand Vertical HOLLOWSHAFT® motors are constructed of high quality materials and are manufactured in a state-of-the-art, ISO9000-2000 facility. Innovative, performance-focused design makes this motor the most trusted in the industry.

### Product Features:

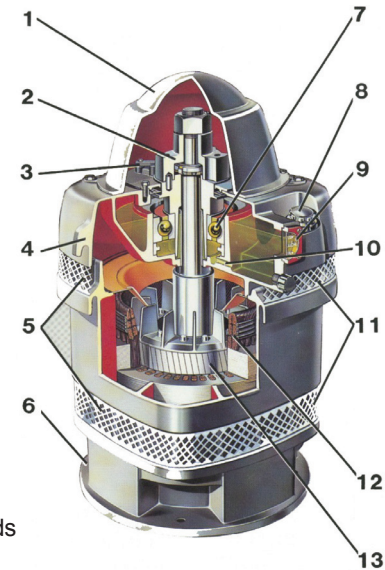
- Class F insulation, Class B rise at full load
- 1.15 Service Factor - typical for WPI and WP II enclosures
- 1.00 Service Factor - typical for TEFC and hazardous location enclosures
- Maximum 40° C ambient, 3,300 feet altitude
- Bearing capacities among highest in industry
- Multiple bearing configurations available for specific bearing life requirements.
  - Ball
  - Spherical Roller
  - Angular Contact
  - Plate Type



WPI 15-4000 HP  
and WP II 300-5008 HP

## Typical HOLLOWSHAFT® Motor Construction:

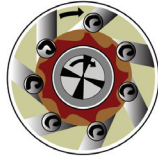
- 1. Lightweight Top Cover**
- 2. Coupling** is readily accessible
- 3. Lockbar** holds shaft during adjustments
- 4. Lifting Lugs** positioned for stability
- 5. Protected Air Openings** exceed NEMA WPI requirements
- 6. Precision Machined Mounting Base**, ample clearance for mounting bolt installation
- 7. Rugged Bearing** withstands heavy load thrusts
- 8. Large Plug** simplifies oil fills
- 9. Sight Gauge Window** for quick oil level reading
- 10. Metered Oil Flow** minimizes churning
- 11. Dual Air Flow** system for uniform cooling of motor top and bottom
- 12. Windings** Protected by new, synthetic materials
- 13. Solid Die Cast Rotor** with integral fan blades



## Enclosure Types

### Non-Reverse Backstop Ratchet Design, Ballomatic®

- First technology of its kind in the market
- Prevents reverse rotation within 4.5 degrees of rotation
- Unlimited depth setting
- Can be used in certain Hazardous Location applications



BALLOMATIC®  
Backstop Ratchet

### Weather Protected Type I (WPI)

Constructed to minimize the entrance of rain, snow and airborne particles. Enclosures exceed NEMA requirements. The ventilation system is designed to provide optimum cooling to the thrust bearing and electrical components and is available in all motor sizes.

### Weather Protected Type II (WPII)

Enclosure offers protection against hostile outdoor environments. The special ventilation system minimizes the entrance of high velocity air, moisture and airborne particles into the motor's passages.

Unique design allows the use of standard internal components. Special enclosures can be adapted with minimum delay.

### Totally Enclosed Fan Cooled (TEFC) and Hazardous Location

Non-sparking, non-reverse ratchet design. Available for severe environments where destructive dusts, vapors and other harmful substances are found. Perfect for use in hazardous locations where Underwriters Laboratories (UL®†) approval is necessary.

### CORRO-DUTY®

Cast iron CORRO-DUTY® motors are available with external corrosion-resistant paint and hardware for extremely harsh environments.



TEFC and Hazardous  
Location 3-700 HP

## 4 Zone Design

U.S. Motors® brand vertical pump motors are designed with four functional zones. This design ensures easy installation and service and provides operator protection and convenience.

### ZONE 1

Canopy cap allows easy access to the coupling, non-reverse ratchet and thrust bearing.

### ZONE 2

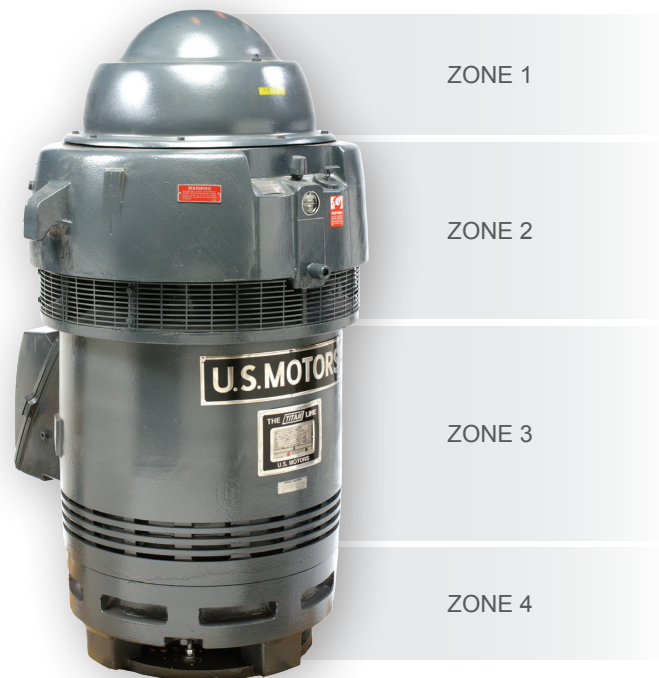
Thrust bearings, generously sized oil reservoir, and large weather-protected air intake for continuous cooling to the motor and thrust bearings.

### ZONE 3

Winding section develops the driving torque and houses the insulation systems.

### ZONE 4

Compact mounting base designed for momentary upthrusts of the pump.



WPI 15-4000 HP  
and WPII 300-5008 HP

† All marks shown within this document are properties of their respective owners.



**NIDEC MOTOR CORPORATION**

8050 W. Florissant Avenue | St. Louis, MO 63136  
Phone: 888-637-7333 | Fax: 314-553-2087

# U.S. Motors® Brand Vertical A.C. Motors Solid Shaft, High Thrust



**Horsepower:** 3 – 5000

**Speeds:** 3600-400rpm

**Design Voltages:** 3Phase/200-6900 Vac/50 or 60Hz

**Enclosures:** Weather Protected Type I, Weather Protected Type II, Totally Enclosed Fan Cooled, and Hazardous Location

**Frame Sizes:** 182-9608



## Product Overview and Options

More than 100 years of vertical motor design experience ensures U.S. Motors® brand solid shaft high-thrust motors satisfy the requirements for water/wastewater treatment industry use. These motors are constructed of high quality materials and are manufactured in a state-of-the-art, ISO9000-2000 facility.

### Product Features:

- Class F insulation, Class B rise at full load
- 1.15 Service Factor typical for WP1 and WP11 enclosures
- Service Factor typical for TEFC and hazardous location enclosures

### Options:

- Specific ambient temperatures
- Balanced to meet API 541 Fourth Edition specifications



Vertical Solid Shaft-High Thrust Motor

## Upgrades

**Inverter Duty** – Premium efficiency coupled with an Inverter Grade® insulation system provide performance and reliability on sine wave or pulse-width modified variable frequency drive inverter power. The insulation system delivers superior pulse endurance to withstand waveform stresses produced by pulse width modulated drives.

- Pulse resistant magnetic wire
- Additional lacing on end turns

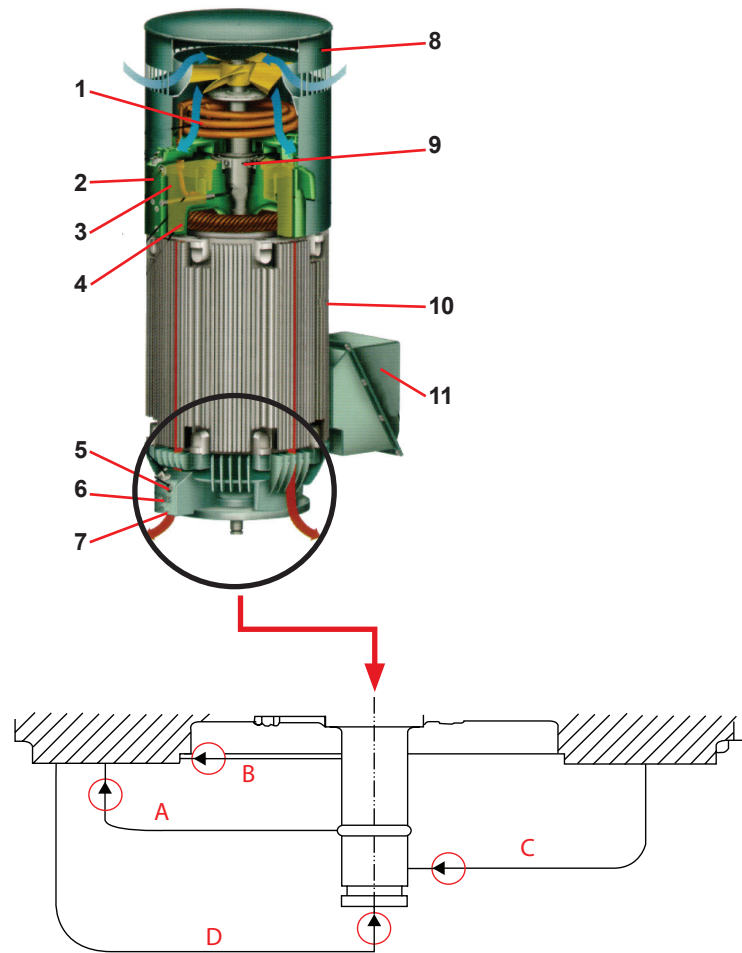
**Corro-Duty® Motors** – Additional features for harsh environments

- Cast-iron construction
- Internal and external corrosion resistant treatments

**Product Overview and Options** *continued*

**Typical Solid Shaft Motor Construction:**

1. Optional Cooling Coils
2. Bearing Temperature Probe Provision
3. Oil Sight Glass
4. Oversize Oil Sump
5. Oil Sight Glass
6. Bearing Temperature Probe Provision
7. Oil Drain
8. Heavy Steel or Cast Iron Fan Cover Guard
9. Precision Bearings (Multiple Options)
10. Rugged Cast Iron Frame, Brackets
11. Multiple Conduit Box Options



KEY	
A.	Face Runout (0.001 in max tolerance)
B.	Register Runout (0.004 in max tolerance)
C.	Shaft Runout (0.001 in max tolerance)
D.	End Play (0.005 in max tolerance)

**Enclosure and Warranty Information**

**Standard efficient** – 12 month limited warranty from the date of installation or 18 months from the date of manufacture, whichever comes first.\*

**Energy efficient** – 24 month limited warranty from the date of installation or 30 months from the date of manufacture, whichever comes first.\*

**Premium efficient** – including Inverter Duty – 36 month limited warranty from the date of installation or 42 months from the date of manufacture, whichever comes first.\*

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 \*For details, refer to: <http://www.usmotors.com/FL600/Limited Warranty.pdf>



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