Vertical A.C. Motors

Solid Shaft, High Thrust for Oil, Gas & Refining Applications

- Horsepower: 3 – 5000
- Speeds: 3600 – 400 rpm
- Design Voltages: 3 Phase / 200 – 6900 Vac/ 50 or 60 Hz
- Enclosures: Weather Protected Type I, Weather Protected Type II, Totally Enclosed Fan Cooled, and Hazardous Location
- Frame Sizes: 182 – 9608

U.S. MOTORS® brand Vertical Solid Shaft - High Thrust Motors for reliable use in typical applications within the oil, gas, refining and other harsh process industries. These motors are carefully designed and built to the high NIDEC and U.S. MOTORS® standards utilizing innovate materials and manufacturing processes to ensure reliability and long life. U.S. MOTORS® vertical motors meet the customer's specifications for use on vertical API®† 610 Process turbine applications such as booster, transfer, pipeline, chemical process and in refinery water treatmeit facilities. U.S. MOTORS® also offers "Meet the Intent" of API 547 or IEEE -841™. These "Meet the Intent" motors include typical features required by the specs that can be applied to vertical motors.

Product Overview and Options

U.S. MOTORS®' team of engineers utilize over 100 years of vertical motor design experience and resources from our advanced Motor Technology Laboratories and our adept manufacturing facilities to ensure solid shaft high-thrust motors have the features that oil, gas and refining customers require

Standard Features

- Class F Insulation, Class B Rise At Full Load
- 1.15 Service Factor - typical for WPI & WPII enclosures
- 1.00 Service Factor - typical for TEFC & Hazardous Location enclosures

Options

- Specific Ambient Temperatures
- API®† 610 Tolerances
- "Meets the Intent" of API®† 547

Upgrades

CORRO-DUTY® Motors

- Extra features for harsh environments
- Cast-Iron Construction
- Internal and External Corrosion Resistant Treatments

Inverter Duty – Inverters use Pulse Width Modulation (PWM) to change the voltage and frequency of the power applied to the motor. The switching frequency of the PWM control system generates spikes in the voltage that can damage motor insulation. U.S. MOTORS® has a specially engineered Inverter Grade insulation system to midigate damage to the winding caused by PWM control systems. Insulation is not the only part of the motor that can be damage when run on an inverter. PWM inverters also generate common mode voltage. Shaft voltages result in bearing currents which cause the bearing to flute and eventually fail. U.S. MOTORS® installs as standard, on inverter duty products, a shaft grounding ring to allow the bearing current to travel to ground without damaging the bearing.

- Pulse Resistant Magnetic Wire
- Additional Lacing on End turns
- Additional Phase Paper between coil groups
- Shaft Grounding Ring (Except on Hazardous Location Motors)
- Insulated Bearing on 100HP and up
- Winding Thermal Protection (Thermostats standard)

"Meet the Intent" of IEEE-841™

U.S. MOTORS® offers “Meet the Intent” of IEEE-841™ for high thrust vertical solid shaft motors this feature is available on TEFC motors 180 – 5800 frame. Motors that “Meet the Intent” of IEEE-841™ will have typical features required by the IEEE-841™ specification. Some of these features are listed below.

- Premium Efficiency
- CORRO-DUTY® Construction
- INPRO\SEAL®† shaft seal on drive end
- 1.15 Service Factor
- Grounding on frame and in conduit box
- Class F insulation with 80˚C temperature rise at 1.0 Service Factor by resistance
- Special Balance
- Special Shaft Run-Out
- NEMA®† Design B
- Non-Witnessed IEEE-841™ Enhanced No Load Test

API Options

API®† 610

U.S. MOTORS® is proud to offer products that meet the stringent requirements for motors used with API pumps in Petrochemical Industries.

The API®† 610 option is available on 400 frame sizes and larger on both open and enclosed motor types.

API®† 610 Requirements Include Specific:

- Thrust Bearing Location
- Shaft Runout
- Face Runout
- Register Runout
- End Play with Minimum L-10 Bearing life of at least 25,000 hours

API®† 547

API®† 547 "Meet the Intent" is available on motors 449 frame and larger

- EVERSEAL®† Insulation, which meets sealed winding per NEMA®† MG1
- CORRO-DUTY® (Only Corro-Duty treatment on WPII)
- Stainless Steel Hardware
- 650% Current Inrush Limit
- INPRO/SEAL®† type seal on drive end to prevent ingress of contamnates
- 3.5 per unit surge withstand per IEEE-522™
- Qty. 6 winding RTDs
- Special Balance
- Oversized Conduit Box
- U.S. MOTORS®' API®† routine test

Enclosures

Weather Protected Type I (WPI) – enclosures are constructed to minimize the entrance of rain, snow and airborne contaminants found in outdoor applications while providing cooling to the thrust bearing and electrical components.

Weather Protected Type II (WPII) – enclosures are constructed for hostile outdoor atmospheres. The WPII ventilation circuit is arranged with a minimum of three abrupt changes in airflow direction of at least 90° each. This results in an area of reduced velocity in the air intake that reduces the chances of high velocity air, moisture and airborne particles reaching the cooling passages of the motor.

Totally Enclosed Fan Cooled (TEFC) – enclosures prevent the free exchange of air between the outside and inside of the motor, but are not airtight. Each TEFC motor is cooled by a fan that is integral with the motor, but external to the enclosing parts. Suitable to be installed in Division 2 areas.

TEFC Hazardous Location – enclosures are built to contain explosions inside the motor casing as well as to prevent ignition outside the motor by containing sparks, flashing and explosions. Suitable to be installed in Division 2 areas.

For additional information, please refer to our Modified Vertical Motors Catalog (PB500) or contact your Nidec Motor Corporation representative.

† 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: 866-422-7758