Motors & Brakemotors
High Performance
4 pole • 50 & 60Hz

63-225 Frame NEMA & IEC Motors and Brakemotors
Order Preassembled or Customized to Your Requirements

PRODUCT OVERVIEW
F7000
HIGH PERFORMANCE
MOTORS & BRAKES

Voltsages
- 230/460 for 60 Hz
- 575V for 60 Hz
- 400V (380-415) for 50 Hz
- Many others

Flexible Mounting Solutions
- NEMA footed motors
- NEMA C-face flange
- IEC Footed
- IEC B14 face flange metric
- IEC B5 flange metric
- Paired with a NORD high performance speed reducer

NEMA Design & Performance
- High starting torque
- High dynamic running torque
- High breakdown torque

Inverter/Vector Duty For
- Conforms to NEMA MG-1 Section 31.4.4.2
- 5:1 constant torque 60-12Hz
- 10:1 constant torque 60-6Hz with modifications
- 20:1 constant torque 80-4Hz
- 1000+1 constant torque 60-0Hz with blower fan

International Certifications
- File numbers E19150, E 93429
- File number 189340-1293961
- European CE rating conformance

Energy Miser Designs
- Motors meet global efficiency requirements
- EISA (United States)
- NRCan regulations (Canada)
- IEC 600034-30-1 (Europe)

Protection From the Environment
- Sealed construction IP55 protection rating (minimum)
- Totally Enclosed Fan Cooled (TEFC)
- High Performance / Dynamic Motors
- Low Rotating Inertia
- High cycle rates
- Faster starts and stops
- More torque to start the load package
## HIGH PERFORMANCE MOTOR RATINGS

### High Performance Motors

<table>
<thead>
<tr>
<th>Motor Type</th>
<th>P&lt;sub&gt;f&lt;/sub&gt;</th>
<th>n&lt;sub&gt;f&lt;/sub&gt;</th>
<th>I&lt;sub&gt;n&lt;/sub&gt;</th>
<th>I&lt;sub&gt;L&lt;/sub&gt;</th>
<th>T&lt;sub&gt;L&lt;/sub&gt;</th>
<th>T&lt;sub&gt;T&lt;/sub&gt;</th>
<th>η&lt;sub&gt;f&lt;/sub&gt;</th>
<th>η&lt;sub&gt;T&lt;/sub&gt;</th>
<th>Jm</th>
<th>Duty Cycle</th>
</tr>
</thead>
<tbody>
<tr>
<td>63 S/4</td>
<td>0.16</td>
<td>1700</td>
<td>0.88</td>
<td>0.44</td>
<td>0.37</td>
<td>250%</td>
<td>5.93</td>
<td>2.7</td>
<td>3.5</td>
<td>60 min</td>
</tr>
<tr>
<td>63 L/4</td>
<td>0.25</td>
<td>1680</td>
<td>1.12</td>
<td>0.56</td>
<td>0.46</td>
<td>270%</td>
<td>9.38</td>
<td>2.3</td>
<td>2.5</td>
<td>S1 cont.</td>
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<tr>
<td>71 S/4</td>
<td>0.33</td>
<td>1710</td>
<td>1.56</td>
<td>0.78</td>
<td>0.66</td>
<td>310%</td>
<td>12.2</td>
<td>2.4</td>
<td>2.7</td>
<td>60 min</td>
</tr>
<tr>
<td>80 L/4</td>
<td>1</td>
<td>1650</td>
<td>3.66</td>
<td>1.83</td>
<td>1.46</td>
<td>390%</td>
<td>38.2</td>
<td>2.2</td>
<td>2.3</td>
<td>70%</td>
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<tr>
<td>90 L/4</td>
<td>1.5</td>
<td>1660</td>
<td>4.84</td>
<td>2.42</td>
<td>1.94</td>
<td>490%</td>
<td>57.0</td>
<td>2.5</td>
<td>2.8</td>
<td>73%</td>
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<tr>
<td>100 L/4</td>
<td>2</td>
<td>1705</td>
<td>9.00</td>
<td>4.50</td>
<td>3.63</td>
<td>490%</td>
<td>111</td>
<td>2.3</td>
<td>2.6</td>
<td>76%</td>
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<tr>
<td>100 LA/4</td>
<td>5</td>
<td>1725</td>
<td>15.2</td>
<td>7.60</td>
<td>6.10</td>
<td>510%</td>
<td>183</td>
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<td>3.1</td>
<td>81%</td>
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<tr>
<td>132 S/4</td>
<td>7.5</td>
<td>1735</td>
<td>19.8</td>
<td>9.90</td>
<td>7.92</td>
<td>540%</td>
<td>272</td>
<td>2.4</td>
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<td>85%</td>
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<tr>
<td>132 M/4</td>
<td>10</td>
<td>1735</td>
<td>25.8</td>
<td>12.9</td>
<td>10.3</td>
<td>630%</td>
<td>363</td>
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<td>3.2</td>
<td>87%</td>
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<tr>
<td>160 M/4</td>
<td>15</td>
<td>1770</td>
<td>35.8</td>
<td>17.9</td>
<td>14.5</td>
<td>820%</td>
<td>534</td>
<td>3.9</td>
<td>3.8</td>
<td>90%</td>
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<td>160 L/4</td>
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<td>1760</td>
<td>48.4</td>
<td>24.2</td>
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<td>3.9</td>
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<td>1760</td>
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<td>880%</td>
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<td>4.3</td>
<td>90%</td>
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<td>190 LX/4</td>
<td>30</td>
<td>1765</td>
<td>74.4</td>
<td>37.2</td>
<td>29.8</td>
<td>890%</td>
<td>1071</td>
<td>4.6</td>
<td>4.4</td>
<td>92%</td>
</tr>
<tr>
<td>200 LX/4</td>
<td>40</td>
<td>1770</td>
<td>98.6</td>
<td>49.3</td>
<td>39.4</td>
<td>690%</td>
<td>1071</td>
<td>4.6</td>
<td>4.4</td>
<td>92%</td>
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### Premium Efficient Motors

<table>
<thead>
<tr>
<th>Motor Type</th>
<th>P&lt;sub&gt;f&lt;/sub&gt;</th>
<th>n&lt;sub&gt;f&lt;/sub&gt;</th>
<th>I&lt;sub&gt;n&lt;/sub&gt;</th>
<th>I&lt;sub&gt;L&lt;/sub&gt;</th>
<th>T&lt;sub&gt;L&lt;/sub&gt;</th>
<th>T&lt;sub&gt;T&lt;/sub&gt;</th>
<th>η&lt;sub&gt;f&lt;/sub&gt;</th>
<th>η&lt;sub&gt;T&lt;/sub&gt;</th>
<th>Jm</th>
<th>Duty Cycle</th>
</tr>
</thead>
<tbody>
<tr>
<td>80 LP/4</td>
<td>0.16</td>
<td>1730</td>
<td>3.14</td>
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<td>1.26</td>
<td>650</td>
<td>36.4</td>
<td>3.5</td>
<td>3.8</td>
<td>60 min</td>
</tr>
<tr>
<td>90 SP/4</td>
<td>1.5</td>
<td>1740</td>
<td>4.20</td>
<td>2.10</td>
<td>1.68</td>
<td>840</td>
<td>54.3</td>
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<td>4.9</td>
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<td>1730</td>
<td>5.60</td>
<td>2.80</td>
<td>2.24</td>
<td>760</td>
<td>72.9</td>
<td>3.9</td>
<td>4.3</td>
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<tr>
<td>100 LP/4</td>
<td>3</td>
<td>1770</td>
<td>7.68</td>
<td>3.84</td>
<td>3.07</td>
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<td>107</td>
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<tr>
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<td>13.4</td>
<td>10.7</td>
<td>960</td>
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<td>91%</td>
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<tr>
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<td>1775</td>
<td>35.6</td>
<td>17.8</td>
<td>14.2</td>
<td>880</td>
<td>534</td>
<td>3.2</td>
<td>3.8</td>
<td>92%</td>
</tr>
<tr>
<td>160 LP/4</td>
<td>20</td>
<td>1775</td>
<td>47.6</td>
<td>23.8</td>
<td>19.0</td>
<td>1080</td>
<td>710</td>
<td>4.3</td>
<td>4.7</td>
<td>93%</td>
</tr>
<tr>
<td>180 MP/4</td>
<td>25</td>
<td>1850</td>
<td>60.6</td>
<td>30.3</td>
<td>24.2</td>
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<td>885</td>
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<td>4.0</td>
<td>93%</td>
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<td>69.6</td>
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<td>880</td>
<td>1062</td>
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<td>93%</td>
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<tr>
<td>225 RP/4</td>
<td>40</td>
<td>1785</td>
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<td>49.5</td>
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<td>890%</td>
<td>1420</td>
<td>3.4</td>
<td>3.8</td>
<td>94%</td>
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<tr>
<td>225 SP/4</td>
<td>50</td>
<td>1785</td>
<td>-</td>
<td>59.7</td>
<td>47.8</td>
<td>880%</td>
<td>1752</td>
<td>3.0</td>
<td>3.7</td>
<td>94%</td>
</tr>
<tr>
<td>225 MP/4</td>
<td>60</td>
<td>1785</td>
<td>-</td>
<td>72.0</td>
<td>57.6</td>
<td>910%</td>
<td>2131</td>
<td>3.3</td>
<td>3.6</td>
<td>95%</td>
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<tr>
<td>250 WP/4</td>
<td>75</td>
<td>1785</td>
<td>-</td>
<td>84.4</td>
<td>67.5</td>
<td>920%</td>
<td>2604</td>
<td>2.9</td>
<td>3.2</td>
<td>95%</td>
</tr>
</tbody>
</table>
HIGH PERFORMANCE
MOTOR DESIGN

Inverter duty winding protection, Class H magnet wire insulation, double coated wire, and voltage spike protection.

Shaft lip seal excludes speed reducer lubricant, allowing motor to be mounted in any position.

End bell to stator connections are sealed to keep out moisture.

Shaft lip seal prevents contaminants from entering.

Bearing grease has superior resistance to washout, rust and corrosion.

Corrosion-resistant, non-sparking fan.

Die cast aluminum rotor coated to prevent corrosion.

Corrosion-resistant aluminum alloy construction.

Threaded cable entry allows the power feed line to be sealed.

Standard paint has 316 stainless steel flakes with a flexible and tough resin binder. USDA incidental contact H1 approval provides excellent moisture resistance.

Conduit box connections and lid have gaskets to ensure a watertight seal.
**Designed For Inverter/Vector Duty**

- Class H magnet wire insulation is double coated for extra protection
- Magnet wire slots are lined with insulation to prevent chafing
- First turn winding construction handles line surges
- Varnish dipped stator gives added moisture protection
- 1.15 Service Factor
- Class B temperature rise
- Voltage spike resistance per NEMA MG-1 1998 Section 31.4.4.2
- Phase paper & Sleeved connecting leads

**Designed For High Start/Stop Cycle Rates**

- Low rotating inertia
- Rapid acceleration/deceleration
- Reversible rotation
- Finned aluminum alloy stator housing
- Low temperature rise
- Across the line or inverter operation
- Up to 8600 starts per hour

**Designed For High Performance Braking**

- Faster release
- Quicker stopping
- Multiple brake sizes available
- Brake voltage options
- No external wires for standard brake
- AC or DC switching
- Adjustable torque

**Designed For Protection From The Elements**

- Corrosion resistant aluminum alloy housing
- Shaft lip seals exclude contaminants from both ends
- Inorganic fungus protection
- Sealed end bell connections
- Bearing grease resists moisture
- Moisture resistant internal materials
- Gasketed and sealed terminal box
- Terminal block connector organizes power feed
- Cast metal terminal box for connection rigidity
HIGH PERFORMANCE
MOTOR OPTIONS

POWER OFF BRAKES (BRE)
- Deliver torque when power is off
- Ready-to-go wired by factory
- Long life
- Rapid cycling
- Adjustable torque
- Simple mechanical construction

BRAKE OPTIONS
- Hand release lever (HL)
- Lockable hand lever (FHL)
- Current sensing relay (IR)
- Fast release rectifier (GP)
- Corrosion protection (RG)
- Severe duty protection (NSD+)

INCREMENTAL ENCODER (IG…)
- Feedback speed/position control
- Pulse count from 100-5000
- Operating voltages from 4-6 or 10-30VDC
- Interface either RS422/TTL or HTL/push-pull type

BLOWER FANS (F, FC)
- Independent of motor speed
- Available for line power
- Use with low motor speeds

THERMAL PROTECTION
- Thermostat bi-metallic switches (TW)
- Thermistor PTC Sensors (TF)

DOUBLE FAN DRIP COVER (RDD)
- Extra protection from wind blown moisture
- Ideal option for windy outdoor duty

CANOPY DRIP COVER (RD)
- Use in wet vertical up installations
- Protects motor from falling water
- Provides umbrella protection for the motor

ENERGY EFFICIENT MOTOR
- High efficiencies
- Cost Savings
- Premium Efficiency (EISA)
- International efficiency IE1, IE2, IE3.

SEVERE DUTY PROTECTIVE PAINT COATINGS
- Stainless Steel (NSD+)
- White (NSD+W)
- Stainless Steel & Clear Coat (NSD-X3)
- White & Clear Coat (NSD-X3W)

IP66 ENCLOSURE PROTECTION
- Can handle high-pressure washdown environments

SPACE HEATER (SH)
- Anti-condensation heater installed inside motor
- Heats up windings preventing condensation
- Available voltages

POWER PLUG QUICK CONNECTOR (MS)
- Simple & fast power connections
- Modular plug wired - ready to go
- Allows rapid change out of motor
- Makes remote assembly easier

HIGH INERTIA COOLING FAN (Z)
- Adds inertia to motor
- Slows down motor starts/stops
- Mechanical soft start or soft stop
- Stores motor kinetic energy
- Smoothing for rapid load changes

SHAFT EXTENSION OUTSIDE FAN COWL (WE)
- Used to mount customer-supplied devices
- Also can be power take off

NORD offers many options not listed here. Please contact us for more information.
**HIGH PERFORMANCE**

**INVERTER / VECTOR DUTY OPERATION**

**TYPICAL INVERTER/MOTOR PERFORMANCE**

Most applications for motors and variable frequency inverters require constant torque. This means that the load torque is constant and is independent of output speed. NORD motors are well equipped to handle constant torque applications. To the left is a typical operating characteristic chart for NORD motors used on constant torque inverters. This chart demonstrates the frequency range where NORD motors deliver constant torque and constant power.

**TYPICAL TEFC MOTOR PERFORMANCE**

NORD motors are able to safely operate over a wide frequency range between 0Hz and 120Hz. The blue shaded zone below the curve on the chart indicates the safe continuous operating zone. The light blue shaded zone below 5Hz & above 90Hz indicate a cautionary performance area that may be limited by an inverter or vector controller.

**TYPICAL TEBC MOTOR PERFORMANCE (BLOWER COOLED)**

NORD motors are able to safely operate over a wide frequency range between 0Hz and 120Hz. The blue shaded zone below the curve on the chart indicates the safe continuous operating zone. The light blue shaded zone below 5Hz and above 90Hz indicate a cautionary performance area that may be limited by an inverter or vector controller.
Global Presence
Allows for short lead times and quick response times throughout the world.

Modular Design
More than 20 million totally unique product combinations guarantees that you won't need to look anywhere else.

Quality Manufacturing
NORD produces maintenance free products that have a long life in order to save you money for the long haul.

Innovative Products
Our engineers are hard at work creating solutions to everyday problems.

Dependable Service
With emergency service available 24/7 we can help you out when you need us most.

We Have you Covered
NORD provides Gear Drives, Motors & AC inverters in order to provide you with a complete Drivesystem solution.

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