

Three Phase Modifiable NEMA^{®†} Horizontal Motors

Accessories and Modifications

1. Altitude

Standard motors are designed for 3,300 feet altitude and 40°C ambient temperature. Atmospheric conditions at higher altitudes inhibit the motor's ability to dissipate heat, resulting in an increased temperature rise and a reduced motor capacity. NEMA standards state motor temperature will increase 1% for each 330-foot increment above the standard 3300-foot altitude design point. Ambient temperatures generally drop with an increase in altitude and are normally less than 40°C, even when installed indoors. Motors can be specifically designed for higher altitudes or derated, either due to lower ambient temperatures or by reducing output capacity.

A. 3,301 - 6,000 ft.

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	57	57	89	118	157	210	276	354	512	726	1150	1960

• To maintain motor service factor in altitudes of 3,301 to 6,000 feet (1,006 to 1,829 meters), make the altitude adder (percent of base list price) above for applications requiring higher altitude. Contact your Nidec Motor Corporation Technical Representative to confirm Frame Size.

B. 6,001 ft. and up

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)

• To maintain motor service factor in altitudes higher than 6,001 feet (higher than 1,830 meters), make the altitude adder (percent of base list price) above for applications requiring higher altitude. Contact your Nidec Motor Corporation Technical Representative to confirm Frame Size.

• **DERATING FACTORS** -- Standard designs may be operated at the following altitudes due to reduced ambient temperatures. Does not apply to UL^{®†} Listed Hazardous Location motors. Nameplate will not acknowledge high-altitude use.

Altitude (ft.)	Derating Factor
3300-5000	0.97
5001-6600	0.94
6601-8300	0.91
8301-9900	0.88
9901-11500	0.85

• **ADJUSTMENT DUE TO REDUCED AMBIENT TEMPERATURE** -- Standard designs may be operated at the following altitudes due to reduced ambient temperatures. Does not apply to UL^{®†} Listed Hazardous Location motors. Nameplate will not acknowledge high-altitude use.

Maximum Altitude (ft.)	Ambient (°C)
3300	40°C
6600	30°C
9900	20°C

2. Aluminum Fan Adder

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	N/A	225	300	375	450	525	600	675	750	825	900

• Replace standard plastic fan with aluminum material fan. Contact your Nidec Motor Corporation Technical Representative for availability prior to quote.

3. Ambient

Standard designs described in this catalog are suitable for operation in ambient temperatures ranging from +40°C (104°F) to -30°C (-22°F). When standard designs are consistently exposed to ambient temperatures between -5°C (23°F) and -30°C (-22°F), special lubrication practices may be required. Additional precautions such as a space heater may be required depending on such factors as starting methods and duty cycle. Clearly state low ambient requirements on inquiries to your Nidec Motor Corporation Technical Representative and order documents if product will be consistently exposed to -50°C to -30°C ambients.

NOTE: The minimum ambient temperature for standard UL^{®†} Listed Hazardous Location motors is - 25°C See ARCTIC DUTY for ambient temperatures below - 25°C.

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3. Ambient (continued)

A. Arctic Duty - Low Ambient Application

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%

- Available option for TEFC motors applied in ambients of -30°C (-22°F) to -56°C (-70°F). Add 25% to the list price to provide any required special electrical, lubrication and Mechanical features (CORRO-DUTY® features are included). Price does not include space heater for motor winding. UL® Listed Hazardous Location motors require mandatory review by your Nidec Motor Corporation Technical Representative. When High Tensile Strength Cast Iron is requested or required by inquiry, add 225% to the base list price (Not Available on 56 Frame).

Product features include:

- Cast Iron Construction
- Stainless Steel Nameplate
- Corrosion Resistant Hardware
- Internal Moisture Protection
- 1.15 Service Factor
- Class F Insulation
- Special Lead Material
- Silicon Rubber Shaft Slinger
- Low Temperature Grease
- Special Conduit Box Gasket (Non-Hazardous Location only)
- Special Lead Potting Material (Hazardous Location only)

High Ambient Application

- To provide motors suitable for installation in ambient temperatures between 41°C and 65°C, make the list price addition shown below. Motor temperature rise will change from stated price book values with ambient temperatures above 40°C. Price book stated efficiency levels, frame sizes and lubrication specifications are also subject to change. For confirmed data, refer to your Nidec Motor Corporation Technical Representative. Ambient temperature ratings over 65°C are not available.

B. 41°C to 65°C

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	57	57	89	118	157	210	276	354	512	726	1150	1960

C. 66°C to 90°C

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	114	114	178	236	314	450	552	708	1024	1452	2300	3920

D. 91°C and up

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)

Motors with 1.15 SF may be derated to 1.0 SF for use in a 50°C ambient with no reduction in nameplate H.P. (Rated output). Non-Hazardous Location motors with 1.0 SF can be derated to accommodate ambient temperatures 40°C to 50°C by applying the following correction factors. Correction factors can be used, but actual performance will differ from published values.

AMBIENT TEMPERATURE	45°C	50°C
Rated Output reduced to	95 %	90 %

4. Assembly Position

A. Standard Assembly Positions

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C	N/C

- The standard Assembly Position is considered "F1". "F2" Assembly Position is available at no charge when specified at time of Motor order.
- Floor Mounting: F1,F2
- Wall Mounting: W1,W2,W3,W4,W5,W6,W7,W8
- Ceiling Mount: C1,C2

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4. Assembly Position *(continued)*

B. "F0" Assembly Position

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	75	75	75	150	225	320	459	N/A	N/A	N/A	N/A	N/A

Assembly Position "F0" (Conduit Box on top with motor in horizontal position) is available as follows:

- ODP Motors in 140-320 Frames
- UNIMOUNT[®] Inverter Duty is 56-140 Frames
- Washdown Duty in 180-210 Frames
- Hostile Duty Inverter Duty in 56-140 Frames
- Rolled Steel TEFC (Type FS) in 140-210 Frames
- World Motor all constructions 56-449 frame

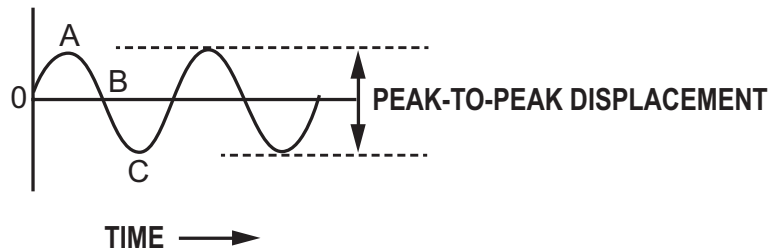
5. Balance

A. Special Balance

(Not Available With Roller Bearings)

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	192	192	192	192	221	221	251	251	317	317	606	606

NEMA^{®†} standard MG1, Part 7, requires vibration readings to be measured in terms of velocity and stated as inches per second (IPS). Velocity is defined as the maximum speed at which displacement occurs. It takes into consideration both maximum displacement and time. To illustrate velocity, think of a point moving along a typical sine wave in a rising and falling fashion. As the point rises to its peak displacement (Point A), the velocity of movement is zero since it is about to change direction and must stop to do so. Changing direction, the point accelerates towards its peak displacement in the opposite direction (Point C). Midway between the peak displacement values (Point B), velocity is at its maximum. Since the velocity of motion is changing throughout its cycle, the highest peak is selected for measurement.



Nidec Motor Corporation balances all horizontal motors to meet the standard limits shown below. For special balance, make the list adder shown above.

VIBRATION LEVEL

Frame Series	Velocity (IPS-PEAK)	Velocity (IPS-PEAK)
	Standard	Special
140	0.15	0.06
180-210	0.15	0.06
250-280	0.15	0.08
320-360	0.15	0.08
400	0.15	0.08
440	0.15	0.08

B. Precision Balance

(Not Available With Roller Bearings)

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	384	384	384	384	441	441	501	501	633	765	1212	1212

Precision Balance is 0.05 inches/second peak. (NEMA^{®†} Resilient Mount) All U.S. MOTORS[®] brand motors are dynamically balanced and the amplitude of vibration is measured on the bearing housing at no load per NEMA^{®†} MG1. Standard Balance is 0.15 inches/second peak for 2-6 pole, at 0.12 inches/second peak for 8 pole and slower (NEMA^{®†} Resilient Mount). Precision Balance is standard on 841 PLUS[®] motors.

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6. Bases

A. Adjustable Motor Base

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	N/A	N/A	N/A	N/A	210	210	273	437	700	1315	1315

Adjustable Motor Bases are kits, and are shipped loose for customer mounting. Available on 320 Frame and larger. Bases for 320-360 Frame have on adjusting screw; 400 Frame and up have two.

B. Slide Rails

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	N/A	N/A	N/A	N/A	N/A	345	443	885	1200	1440	1440

Slide Rails are kits, and are shipped loose for customer mounting. The kit includes quantity two rails and hardware. Available on 320 Frame and larger.

C. Dowel Pin Holes

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	N/A	N/A	N/A	N/A	188	188	188	188	188	188	188

Includes Dowel Pin Pilot Holes (pins supplied by others). Available on 280 Frame and larger.

D. Vertical Jacking Provisions

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	N/A	N/A	N/A	300	300	300	300	300	300	300	300

Used to assist installer in proper alignment of the motor shaft with the driven piece of equipment for shimming purposes. Will provide a tapped hole (one per foot), four per motor. A 3/8-16 UNC hole on 400-440 Frames. Customer will supply the bolts. Available on 280 Frame and larger. Not available on footless motors.

7. Bearings

A. Bearing Caps

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	225	225	225	225	300	300	375	375	N/C	N/C	N/C	N/C

Bearing Caps available on 180 Frame and larger. No charge on 400 Frame and larger. Bearing Caps are standard (no charge) on: CORRO-DUTY[®] Premium Efficiency motors, CORRO-DUTY[®] Inverter Duty motors, 841 PLUS[®] motors, and Hazardous Location motors.

B. Double Sealed Bearings

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	150	150	150	150	180	216	260	389	583	612	645	675

Double Sealed Bearings cannot be regreased. Standard (no charge) on Washdown Duty motors, and all 56-140 Frame motors. High or low temperature grease is available with increased lead time. Not available on Automotive Duty motors (violates the Auto Duty Spec).

C. Roller Bearing On Drive End

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	N/A	N/A	473	473	473	473	473	564	1073	1263	1263

Roller Bearings are only used on Belted or Chain Drive applications (not used on Direct Connected loads). Used for improved L-10 life on motors where High radial loads are present. Roller Bearings are available as open type only (no shields or seals). Belting Data for the application is required when specifying Roller Bearings. Available on 210 Frame and larger.

D. Carb^{®†} Bearing On Drive End

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	N/A	N/A	N/A	N/A	N/A	550	590	610	1150	1350	1350

CARB^{®†} bearings are only used on Belted or Chain Drive applications (not used on Direct Connected loads). Used for improved L-10 life on motors where high radial loads are present. These are only available as open type bearings. Available on 320 Frame and larger.

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7. Bearings (continued)

E. Insulated, Ball Bearing (Adder Per End)

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	300	375	750	1050	1350	1350	1350	1350	1350	1350	1350

Available on Inverter Duty motors. Double the adder for Insulated Bearings on both ends. Insulated Bearing on Short End is standard (no adder) on 400 Frame and larger Inverter Duty motors, therefore adder is \$0 for Insulated Bearing-Short End, and \$1350 for Insulated Bearing-Pulley End or Both Ends. Ceramic Bearings on 140-250 Frames.

F. SKF^{®†} Insocoat^{®†} Insulated Bearings (Adder Per End)

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	N/A	N/A	N/A	N/A	N/A	1350	2050	2145	2242	2632	2632

Available on Inverter Duty motors. Double the adder for SKF Insocoat Insulated Bearings on both ends.

G. Locked Drive End Bearing

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	N/A	225	225	300	300	375	375	375	375	375	375

Locked Short End Bearing construction axially secures the bearing inner race on the shaft as well as clamping the outer bearing race. Available on 180 Frame and larger.

H. Locked Opposite Drive End Bearing

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	N/A	225	225	300	300	375	375	375	375	375	375

Locked Short End Bearing construction axially secures the bearing inner race on the shaft as well as clamping the outer bearing race. Available on 180 Frame and larger.

I. Same Size Bearings (Both Ends)

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	225	225	225	300	300	375	375	450	525	525	525

Available on Non-Hazardous Location CORRO-DUTY[®] motors, 140 Frame and larger. On 440 Frame, available on "TS" Shaft motors only. Standard (no charge) on 841 PLUS[®] motors. Not available on motors with C-Face or D-Flange. Same size bearing is standard on TEFC Cast Iron 400 to 440 frame motors.

J. Spare Set, Ball/Roller Bearings

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%

Adder is percent of Base List Price. A Spare Set (quantity 2) of standard bearings supplied loose, shipped with the motor, when requested at the time of the motor order.

8. Brakes

A. Base Adder

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	N/A

Refer to Quick Pick Chart for pricing.

Brake Details

Disc-Type, motor mounted brakes, either Dings^{®†} or Stearns^{®†}, will be supplied at Nidec Motor Corporation's option. Brakes are single phase spring set, electrically released with automatic reset in the following voltages:

- 60Hz: 115V, 200V, 208V, 230V, 460V, 575V
- 50Hz: 110V, 200V, 220V, 380V, 440V, 500V, 550V

Standard Short-End Mounted Brakes are available, except as follows:

- Not Available on ODP 56-320 Frame
- Not Available on TEFC 360-400 Frame (see next bullet for alternate)
- Not Available on Washdown Duty Motors (except TENV)
- Not Available on Hazardous Location Motors above 286 Frame
- Not Available on 360 Frame Motors with D-Flange

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Three Phase Modifiable NEMA[†] Horizontal Motors Accessories and Modifications

8. Brakes *(continued)*

Can supply Brakes on 360-400 Frame TEFC Motors under the following conditions:

- Brake is mounted on the Pulley End of the Motor
- Must be Direct Connected Load (not belted or chain drive)
- The load is driven off of a Double-End Shaft Extension

Brake Enclosures

Standard Enclosure: for use on ODP & TEFC Motors for indoor or semi-protected outdoor installations. It is suitable for atmospheres containing chips, nonabrasive non-conductive non-explosive dusts, and coolants.

Marine/Navy Enclosure

Dust-Tight/Water-Proof Enclosure: should be selected for TEFC Motors in applications with extreme moisture, abrasive or conductive dusts, acid or alkali fumes, and for unprotected outdoor installations.

Hazardous Location Enclosure: should be chosen when the application calls for a Hazardous Location Motor. They should be selected based on NEC[†]/UL[†] listing requirements for a particular hazardous location potential for explosive reaction due to the presence of flammable liquids, explosive gases, volatile solids, or ignitable dusts in the atmosphere. U.S. MOTORS[®] brand basic offering includes Class I Group C&D, Class II Group F&G, T3C T-Code

NEMA[†] 4X Washdown Duty Enclosure: Limited offering available.

B. Breather Drain

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	345	345	345	345	345	345	345	345	345	345	345	N/A

C. Release Option, Interlock Switch

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	750	750	750	750	750	750	750	750	750	750	750	N/A

D. Stainless Steel Hardware

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	360	360	360	360	360	360	360	360	360	360	360	N/A

Standard (no charge) on NEMA[†] 4X Washdown Duty brakes.

E. Space Heaters (115V or 230V)

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	816	816	816	816	816	816	816	816	816	816	816	N/A

F. Special Discs – Carrier Ring Disc

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	N/A	1500	1500	3000	3000	3000	N/A	N/A	N/A	N/A	N/A

G. Special Elbow Location

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	75	75	75	75	75	75	75	75	75	75	75	N/A

Available on Hazardous Location brakes only.

H. Special Insulation

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	225	225	225	225	225	450	450	450	450	N/A	N/A

I. Special Paint

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	690	690	690	690	690	690	690	690	690	690	690	N/A

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8. Brakes (continued)

J. Splined Hub

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	N/A

Refer to Quick Pick Chart for pricing.

K. Thermostats

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	540	540	540	540	540	540	540	540	540	540	540	N/A

Standard on Hazardous Location brakes.

L. Through Shaft

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	N/A

Refer to Quick Pick Chart for pricing. Not available on Hazardous Location brakes.

M. Vertical Mounted

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	N/A

Refer to Quick Pick Chart for pricing.

9. Conduit Box

A. Accessory Conduit Box

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	N/A	N/A	435	435	435	435	435	435	435	435	435

Adder is per Accessory Box provided. Available on motors with Cast Iron Frames, 210 Frame and larger. Accessory Conduit Boxes are included as standard (no charge) when Thermistors, Thermocouples or Winding RTDs are provided.

B. Accessory Conduit Box with Terminal Board

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	N/A	N/A	870	870	870	870	870	870	870	870	870

Adder is per Accessory Box provided. Available on motors with Cast Iron Frames, 320 Frame and larger. Accessory Conduit Box with Terminal Board is included as standard (no charge) when Winding RTDs are provided.

C. Condulet

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	N/A	375	375	375	375	375	375	375	375	375	375

Adder is per Condulet provided.

D. Cable Glands, Arrange-To-Accommodate

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	N/A	N/A	N/A	N/A	75	75	75	75	75	75	75

E. Terminal Blocks for Main Power Leads

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	N/A	305	305	305	375	375	500	575	800	920	1050

Stud-Type Terminal Blocks for Main Power Leads are available on the following products listed below when supplied with up to 9 Leads ONLY. Standard lead connection shall be supplied. If special lead connection is required, please contact Nidec Motor Corporation for availability prior to quoting.

- CORRO-DUTY[®] motors
- Hostile Duty motors
- Unimount[®] motors
- Open Drip Proof motors
- Premium Efficient Automotive Duty (JDE)
- 841 PLUS[®] motors

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9. Conduit Box (continued)

F. Cast Iron Conduit Box

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	-	143	150	180	195	218	225	323	323	593	593	593

Cast Iron Conduit Box is available on the following products:

- CORRO-DUTY[®] motors (standard – N/C)
- Hostile Duty motors
- Premium Efficient Automotive Duty (JDE)
- Hazardous Location motors (standard – N/C)
- Open Drip Proof motors 360 Frame and larger

G. Conduit Box, Oversized

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	-	90	90	90	90	90	90	165	165	450	450	450

Main Conduit Boxes are supplied of Cast Iron, Cast Aluminum or Steel in adequate size to protect motor leads and meet or exceed NEMA^{®†} minimum requirements. All boxes must meet NEMA^{®†} Type 4 Water Resistance. Oversized Conduit Boxes come in two standard offerings:

- One size larger than U.S. MOTORS[®] brand standard (not available on 140 Frame Hazardous Location motors)
- One size larger than NEMA^{®†} standard

H. Drains/Breathers

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	-	90	90	90	90	90	90	165	165	450	450	450

The following options are available for Drains/Breathers in the Main Conduit Box or Accessory Conduit Box:

- 1/8" NPT Drain Hole in Conduit Box (Not available on Hazardous Location)
- 1/2" Drain Hole in Conduit Box (Not available on Hazardous Location)
- Breather/Drain in Conduit Box Adder is per Conduit Box. Refer to the "Conduit Box, Accessory" option for availability of Accessory Conduit Boxes.

I. Lead Positioning Gasket

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	53	53	53	53	53	53	53	53	53	53	53	53

Standard (no charge) on CORRO-DUTY[®] motors. Conduit Box Gaskets are not available on Hazardous Location motors, per UL^{®†} restrictions.

J. Pipe Coupling Plate

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	-	75	75	75	75	75	75	75	75	75	75	75

Replaces Main Conduit Box with a steel plate which has a NEMA^{®†} standard pipe threaded hole for the connection of a conduit. Not available on Hazardous Location motors. Not available on ODP motors, 56-210 Frame. Not available on UNIMOUNT[®] motors. Lead positioning gasket not available with Pipe Coupling Plate.

K. Remote Mounted

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	-	75	75	75	75	75	75	75	75	150	150	150

For locations where the Conduit Box is not mounted directly on the motor. Includes a Pipe Coupling Plate mounted on the motor and the Conduit Box shipped loose. Not available on Hazardous Location motors. Not available on ODP motors, 56-320 Frame. These applications normally require extra long leads (refer to the "Leads, Longer than Standard" option).

L. Special Connector

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)

Refer to Quick Pick Chart for pricing.

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

Three Phase Modifiable NEMA^{®†} Horizontal Motors Accessories and Modifications

9. Conduit Box (continued)

M. Oversized, TITAN[®] Size

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	N/A	N/A	N/A	N/A	N/A	N/A	(QP)	(QP)	(QP)	(QP)	(QP)

Refer to Quick Pick Chart for pricing. TITAN[®] size Conduit Boxes are available on 400-440 Frames as follows:

- Size 1.0 Cast Iron (900 cu. in.) - also fits 360 Frame
- Size 1.5 Cast Iron (3200 cu. in.) - Hazardous Location only
- Size 2.0 Cast Iron (1300 cu. in.)
- Size 2.5 Cast Iron (2000 cu. in.) - 440 Frame only
- Size 3.0 Cast Iron (3400 cu. in.) - 440 Frame only
- Size 4.5 Fabricated Steel (16,200 cu. in.) - 440 Frame only

10. Coupling, Mount Customer's Half Coupling

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	N/A	N/A	N/A	N/A	720	720	720	720	720	720	720

Nidec Motor Corporation will mount customer supplied, finished bored, key-seated and balanced half coupling on 280 frame and larger. Coupling half must be finished machined to motor shaft dimensions and sent prepaid with installation instructions to the factory prior to start of manufacture. Motors will be dynamically balanced during production and will not be rebalanced after installing half coupling.

11. Crusher Duty (TEFC Only)

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	N/A	N/A	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%

Adder is percent of Base List Price. Available on Cast Iron Frame Enclosed motors, 180 Frame and larger. Crusher Duty includes a special rotor design, increased locked rotor and breakdown torque, turn bracing and lock washers. Requires a review of load inertia and load curve for application.

12. Drains/Breathers (Price Each Bracket)

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)

Refer to Quick Pick Chart for pricing. Standard construction on Non-Hazardous Location motors includes drain holes in the bottom of the motor. The hole is provided at the lowest point of the motor, and serves as both a drain and a breather. In addition to Drain Holes, the following Drains/Breathers options are available:

- Brass T-Type Drains/Breathers (standard on 841 PLUS[®] motors)
- Stainless Steel T-Type Drains/Breathers
- Plastic Plug/Drains (standard on CORRO-DUTY[®] motors)
- Hazardous Duty (UL^{®†} Listed) Drains (standard on CORRO-DUTY[®] Hazardous Location motors)

If Drains/Breathers are selected for Hazardous Location motors, must select Hazardous Location Drains/Breathers.

Drains/Breathers not available on the following:

- Brass or Stainless Steel not available on UNIMOUNT[®] or Washdown Duty motors
- Drains/Breathers not available on Open Drip Proof (ODP) motors.

13. Drip Cover (Canopy Cap)

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	87	87	95	105	119	158	171	255	348	432	459	459

Provides protection to the motor in a Vertical Shaft Down position. Not available on Non-Vent (TENV) or Air-Over (TEAO) motors.

14. Efficiency Class

The Energy Independence and Security Act of 2007 (EISA) took effect on December 19, 2010, changing mandatory efficiency levels for 3-phase electric motors up to 600 volts, which are manufactured or imported into the USA. Under the EISA regulation, electric motors previously required to meet EPA efficiency levels must move up to NEMA Premium standards. These include general purpose motors from 1 to 200 horsepower. In addition, products not previously covered by EPA are required to meet EPA levels. These include U-frame, design C, close coupled pump, footless, vertical solid shaft normal thrust, 8-pole motors, and 201 to 400 horsepower design B motors.

Frame:	56	140	180	210	250	280	320	360	400	444-445	447	449
Adder:	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)	(QP)

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