

# Modifiable TITAN® Horizontal Motors Accessories and Modifications Quick Pick Chart

| ITEM                        | PG.     | NOTE | DESCRIPTION  | FRAME SIZE   |               |       |       |       |       |      |
|-----------------------------|---------|------|--|--|---------------|-------|-------|-------|-------|------|
|                             |         |      |  | 449  | 5000          | 5800  | 6800  | 8000  | 9600  |      |
| 1                           | M-10    | (1)  | Altitude - 3301-6000 Feet  | 3%   | 3%            | 3%    | 3%    | 3%    | 3%    |      |
|                             |         |      | - 6001-9900 Feet   | 6%   | 6%            | 6%    | 6%    | 6%    | 6%    |      |
|                             |         |      | - 9901 Feet & Up   | 12%  | 12%           | 12%   | 12%   | 12%   | 12%   |      |
| 2                           | M-11    | (1)  | Ambient - 41°C-50°C  | 3%   | 3%            | 3%    | 3%    | 3%    | 3%    |      |
|                             |         |      | - 51°C-60°C  | 6%   | 6%            | 6%    | 6%    | 6%    | 6%    |      |
|                             |         |      | - 61°C & Up  | 12%  | 12%           | 12%   | 12%   | 12%   | 12%   |      |
|                             |         |      | - Arctic Duty  | 25%  | 25%           | 25%   | 25%   | 25%   | 25%   |      |
| 3                           | M-12    | (7)  | Assembly Position  | N/C  | N/C           | N/C   | N/C   | N/C   | N/C   |      |
| 4                           | M-12    | (3)  | Automotive Duty  | See Page M-12  |               |       |       |       |       |      |
| 5                           | M-12    |      | Balance, Special (Not Available with Roller Bearings)                      | 2020   | 2020          | 2020  | 2020  | 2020  | 2020  |      |
| 6                           | M-12    |      | Bases - Dowel Pin Holes  | 145  | 145           | 145   | 145   | 145   | 145   |      |
|                             |         |      | - Slide Rails  | 3000   | 3700          | 4640  | 5780  | N/A   | N/A   |      |
|                             | M-13    |      | - Sole Plate   | 2540   | 3700          | 4640  | 5540  | 6480  | 6940  |      |
|                             |         |      | - Vertical Jacking Provisions  | 350  | 350           | 350   | 350   | 350   | 350   |      |
| 7                           | M-13    |      | Bearings - Roller Bearing on Drive End                                     | 1040   | 2080          | 2885  | CO    | N/A   | N/A   |      |
|                             |         |      | - Insulated, Ball Bearing (Adder Per End)                                  | 1040   | 1040          | 1040  | 1270  | 1270  | 1270  |      |
|                             |         |      | - Spare Set, Ball/Roller Bearings  | 580  | 925           | 1155  | 1445  | 1620  | 1735  |      |
|                             |         |      | - Sleeve Bearings (ODP/WPI/WPII/TEAAC/TEWAC 5800-9600)                     | N/A  | 17310         | 20195 | 25600 | 26900 | 28000 |      |
|                             |         |      | - Sleeve Bearings, DIN Style (TEFC/ODP/WPI/WPII 5008/10/12 & TEFC 5810/12) | N/A  | 17310         | 20195 | 23575 | N/A   | N/A   |      |
|                             | M-14    |      | - Insulated, Sleeve Bearings (Adder Per End)                               | N/A  | 1965          | 1965  | 2540  | 2540  | 2540  |      |
|                             |         |      | - Spare Set, Sleeve Bearings (ODP/WPI/WPII/TEAAC/TEWAC 5800-9600)          | N/A  | 15100         | 17570 | 22270 | 23405 | 24360 |      |
|                             |         |      | - Spare Set, DIN Style (TEFC 5008/10/12 & 5810/12)                         | N/A  | 15100         | 17570 | 20515 | N/A   | N/A   |      |
|                             |         |      | (7) - Oil Sump Heaters   | N/A  | 920           | 920   | 920   | 920   | 920   |      |
|                             |         |      | (7) - Oil Sump Heaters with Thermostat Control                             | N/A  | 1490          | 1490  | 1490  | 1490  | 1490  |      |
| 8                           | M-15    |      | Conduit Box – Accessory Conduit Box  | 465  | 465           | 465   | 465   | 465   | 465   |      |
|                             |         |      | - Accessory Conduit Box with Terminal Board (Triple for Stainless Steel)   | 930  | 930           | 930   | 930   | 930   | 930   |      |
|                             |         |      | (7) - Oversized Main Conduit Box   | See Page M-15  |               |       |       |       |       |      |
|                             | M-16    | (7)  |  | - NEMA <sup>®</sup> Type II Main Conduit Box                     | See Page M-16 |       |       |       |       |      |
|                             |         |      |  | - Bus Bar Connections with Standoff Insulators                   | 6710          | 6710  | 6710  | 6710  | 6710  | 6710 |
|                             | M-17    |      |  | - Terminal Blocks for Main Power Leads (Low Voltage Motors ONLY) | 1450          | 2050  | 2050  | 2900  | N/A   | N/A  |
|                             |         |      |  | - Current Transformers – Wind Type CTs (460-4800 Volts)          | 5080          | 5080  | 5080  | 5080  | 5080  | 5080 |
|                             |         |      |  | - Current Transformers – Wind Type CTs (5000-6900 Volts)         | 6595          | 6595  | 6595  | 6595  | 6595  | 6595 |
|                             |         |      |  | - Arrange To Accommodate (Adder Per CT)                          | 635           | 635   | 635   | 635   | 635   | 635  |
|                             | M-18    |      |  | - Drains/Breather In Main Conduit Box                            | 350           | 350   | 350   | 350   | 350   | 350  |
|                             |         |      |  | - Hinged Main Conduit Box  | 800           | 800   | 800   | 800   | 800   | 800  |
|                             |         |      |  | - Hinged Door with Lock & Key                                    | 1210          | 1210  | 1210  | 1210  | 1210  | 1210 |
|                             |         |      |  | - Lead Positioning Gasket  | 235           | 235   | 235   | 235   | 235   | 235  |
|                             |         |      |  | - Servit Post In Conduit Box                                     | 128           | 128   | 128   | 128   | 128   | 128  |
|                             |         |      |  | - Space Heater In Main Conduit Box (Double for Div. 2)           | 1330          | 1330  | 1330  | 1330  | 1330  | 1330 |
|                             |         |      |  | -  |               |       |       |       |       |      |
|                             | 9       | M-19 |  | Crusher Duty (TEFC & TEAAC Only)                                 | 15%           | 15%   | 15%   | 15%   | 15%   | 15%  |
| 10                          | M-19    |      | Drains And Breathers – Brass Drain   | 350  | 350           | 350   | 350   | 350   | 350   |      |
|                             |         |      | - Stainless Steel Drain  | 531  | 531           | 531   | 531   | 531   | 531   |      |
| 11                          | M-19-20 | (3)  | Efficiency Class   | See Page M-19  |               |       |       |       |       |      |
| 12                          | M-20    | (3)  | Enclosure – Open Dripproof (ODP)   | See Page M-20  |               |       |       |       |       |      |
|                             |         |      | - Dripproof Guarded  | 740  | 925           | 1155  | 1620  | 0     | 0     |      |
|                             |         |      | - Weather Protected I (WPI)  | 1198   | 2135          | 3810  | 4850  | 0     | 0     |      |
|                             | M-21    | (3)  |  | - Weather Protected II (WPII)                                    | See Page M-21 |       |       |       |       |      |
|                             |         |      |  | - Air Filters – Standard Zinc Media                              | N/A           | 785   | 1180  | 1410  | 2080  | 2540 |
|                             |         |      |  | - Air Filters – Stainless Steel Media                            | N/A           | 3130  | 4640  | 5655  | 6925  | 8080 |
|                             |         |      |  | - Air Pressure Differential Switch                               | N/A           | 925   | 925   | 925   | 925   | 925  |
|                             | M-22    |      |  | - Air Temperature Sensor (Per Sensor)                            | N/A           | 680   | 680   | 680   | 680   | 680  |
| - Sound Abatement Treatment |         |      |  | N/A  | 1745          | 2245  | 3460  | 4340  | 4710  |      |

NOTE: This is a condensed version of the complete modification section used to qualify the availability of these options.

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# Modifiable TITAN® Horizontal Motors Accessories and Modifications Quick Pick Chart

| ITEM | PG.   | NOTE                  | DESCRIPTION   | FRAME SIZE    |      |       |       |       |        |
|------|---|-----------------------|---|---------------|------|-------|-------|-------|--------|
|      |   |                       |   | 449           | 5000 | 5800  | 6800  | 8000  | 9600   |
| 12   | M-22  |                       | - Splash Proof Separately Ventilated (SPSV)                                   | N/A           | 3235 | 4500  | 5540  | 6000  | 6465   |
|      |   |                       | - Splash Proof Blower Ventilated (SPBV)                                       | N/A           | 6000 | 7850  | 9235  | 10385 | 11425  |
|      |   | (3)                   | - Totally Enclosed Fan Cooled (TEFC)  | See Page M-22 |      |       |       |       |        |
|      | M-23  |                       | - CORRO-DUTY®   | 1350          | 1735 | 2310  | 4450  | N/A   | N/A    |
|      |   |                       | - IEEE-841™ Features  | 7040          | 7445 | 8020  | 11490 | N/A   | N/A    |
|      |   |                       | - Bronze Fan  | 1475          | 1560 | 1685  | 1995  | N/A   | N/A    |
|      |   |                       | - Fabricated Steel Sound Abate Fan Cover                                      | 2195          | 2540 | 2885  | 5510  | N/A   | N/A    |
|      | M-24  |                       | - Sealant, RTV†   | 1125          | 1125 | 1775  | 2800  | N/A   | N/A    |
|      |   |                       | - Totally Enclosed Blower Cooled (TEBC)                                       | 2540          | 3645 | 4040  | 5050  | N/A   | N/A    |
|      |   | (3)                   | - Totally Enclosed Air-To-Air Cooled (TEAAC)                                  | See Page M-24 |      |       |       |       |        |
|      |   |                       | - Stainless Steel Tubes   | N/A           | N/A  | 14885 | N/A   | 23080 | 27720  |
|      |   |                       | - CORRO-DUTY®   | N/A           | N/A  | 2310  | N/A   | 2885  | 3465   |
|      |   |                       | - Totally Enclosed Separately Ventilated (TESV)                               | N/A           | 1725 | 2080  | N/A   | 5540  | 6350   |
|      | M-25  |                       | - Totally Enclosed Water-To-Air Cooled (TEWAC)                                | N/A           | N/A  | 75460 | N/A   | 96925 | 105510 |
|      |   | (3)                   | - Hazardous Location, UL® Listed Division 1 & 2 Class I                       | See Page M-25 |      |       |       |       |        |
|      |   |                       | - CORRO-DUTY®   | N/A           | 1735 | 2310  | N/A   | N/A   | N/A    |
|      |   |                       | - IEEE-841™ Features  | N/A           | 7445 | 8020  | N/A   | N/A   | N/A    |
|      |   |                       | - Hazardous Location, UL® Listed Division 1 Class II                          | N/A           | 5%   | 5%    | N/A   | N/A   | N/A    |
|      | - Division II Self Certified (Non-Listed) and CSA® Certified Division II      | 5%                    | 5%  | 5%            | 5%   | 5%    | 5%    |       |        |
| 13   | M-26  |                       | Encoders – Arrange-To-Accommodate Hollow Bore Encoder                         | 1040          | 1040 | 1040  | 1040  | 1040  | 1040   |
|      |   |                       | - Arrange-To-Accommodate Tachometer   | 1040          | 1040 | 1040  | 1040  | 1040  | 1040   |
|      |   |                       | - AVTRON® M/N HS35A (Nidec Motor Corporation Standard)                        | 1000          | 1000 | 1000  | 1000  | 1000  | 1000   |
|      |   |                       | - AVTRON® M/N HS35M   | 2765          | 2765 | 2765  | 2765  | 2765  | 2765   |
|      |   |                       | - AVTRON® M/N HS45  | 4985          | 4985 | 4985  | 4985  | 4985  | 4985   |
|      |   |                       | - AVTRON® M/N AV685   | 7825          | 7825 | 7825  | 7825  | 7825  | 7825   |
|      |   |                       | - DYNAPAR™ M/N HS35R  | 1735          | 1735 | 1735  | 1735  | 1735  | 1735   |
|      |   |                       | - Encoder Products M/N 776  | 1735          | 1735 | 1735  | 1735  | 1735  | 1735   |
|      |   |                       | - NORTHSTAR™ M/N HS56   | 4435          | 4435 | 4435  | 4435  | 4435  | 4435   |
|      |   |                       | - NORTHSTAR™ M/N HS85   | 4848          | 4848 | 4848  | 4848  | 4848  | 4848   |
| 14   | M-26  | (7)                   | Endshields, C-Face/D-Flange (Ball Bearing Motors Only)                        | 1468          | 2885 | 3808  | N/A   | N/A   | N/A    |
| 15   | M-27  |                       | Export Boxing   | 1900          | 2800 | 3365  | 5050  | 6150  | 7490   |
| 16   | M-27  |                       | UL® Listed Fire Pump Label (500HP & Less)                                     | 5%            | 5%   | N/A   | N/A   | N/A   | N/A    |
| 17   | M-27  |                       | Foot Flatness, Special  | 2885          | 2885 | 2885  | 2885  | 2885  | 2885   |
| 18   | M-27  |                       | Frequency, 50 Hertz   | 15%           | 15%  | 15%   | 15%   | 15%   | 15%    |
| 19   | M-27  |                       | Grease Fitting On Fill & Pressure Relief On Drain                             | 150           | 150  | 150   | 150   | 150   | 150    |
| 20   | M-28  |                       | Grounding – Ground On Frame   | 350           | 350  | 350   | 350   | 350   | 350    |
|      |   |                       | - Grounding Strap (Sleeve Bearing Motors Only)                                | N/A           | 810  | 810   | 810   | 810   | 810    |
|      |   |                       | - Shaft Grounding Ring Aegis® SGR® (Ball Brg. & Roller Brg. Motors Only)      | 1270          | 1270 | 1270  | 1850  | 1850  | 1850   |
|      |   |                       | - Shaft Grounding Ring Inpro/Seal® CDR® (Ball Brg. & Roller Brg. Motors Only) | 1270          | 1270 | 1270  | 1850  | 1850  | 1850   |
|      |   |                       | - Shaft Grounding Brush Helwig Carbon® (Ball Brg. & Roller Brg. Motors Only)  | 2228          | 2228 | 2228  | 2808  | 2808  | 2808   |
|      | - Shaft Grounding Ring Inpro/Seal® MGS® (Ball Brg. & Roller Brg. Motors Only) | 2540                  | 2540  | 2540          | 3700 | 3700  | 3700  |       |        |
| 21   | M-28  |                       | Hardware, Stainless Steel   | 350           | 580  | 1160  | 1825  | 2310  | 2770   |
| 22   | M-28  |                       | High Inertia Loads  | 15%           | 15%  | 15%   | 15%   | 15%   | 15%    |
| 23   | M-28  | (4)                   | Horsepower, Non-Standard  | See Page M-28 |      |       |       |       |        |
| 24   | M-29  |                       | Insulation Class – Class F  | STD           | STD  | STD   | STD   | STD   | STD    |
|      |   |                       | - Class H   | 1175          | 1745 | 2245  | 3460  | 4340  | 4710   |
| 25   | M-30  | (R)                   | Insulation System – VPI-1000  | STD           | STD  | STD   | STD   | N/A   | N/A    |
|      |   |                       | - VPI-2000  | 1155          | 1385 | 1735  | 2308  | N/A   | N/A    |
|      |   |                       | - Insulife 5000   | STD           | STD  | STD   | STD   | STD   | STD    |
|      |   | - Premium EVERSEAL®   | 1900  | 2795          | 3810 | 4825  | 5715  | 6350  |        |
|      | M-31  |                       | - Abrasion Resistant Coating  | 235           | 350  | 450   | 695   | 870   | 945    |
|      |   | - Tropical Protection | 590   | 880           | 1120 | 1735  | 2170  | 2355  |        |
| 26   | M-32  | (12)                  | Inverter Duty – 10:1 Variable Torque  | 1735          | 3235 | 4155  | 7195  | 7770  | 8350   |
|      |   | (12)                  | - 2:1 Constant Torque (10:1 Variable Torque)                                  | 1910          | 3560 | 4575  | 7915  | 8548  | 9185   |
|      |   | (10)                  | - 5:1 Constant Torque (10:1 Variable Torque)                                  | See Page M-32 |      |       |       |       |        |

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# Modifiable TITAN® Horizontal Motors Accessories and Modifications Quick Pick Chart

| ITEM | PG.     | NOTE                                | DESCRIPTION  | FRAME SIZE    |       |       |       |       |       |
|------|---------|-------------------------------------|--|---------------|-------|-------|-------|-------|-------|
|      |         |                                     |  | 449           | 5000  | 5800  | 6800  | 8000  | 9600  |
| 26   | M-32    | (15)                                | - 10:1 Constant Torque (10:1 Variable Torque) (Totally Enclosed Fan Cooled)            | See Page M-32 |       |       |       |       |       |
|      |         | (12)                                | - 10:1 Constant Torque (10:1 Variable Torque) (Totally Enclosed Blower Cooled)         | 5200          | 6120  | 8200  | 9650  | N/A   | N/A   |
|      | M-33    | (14)                                | - 10:1 Constant Torque (10:1 Variable Torque) (Totally Enclosed Separately Ventilated) | N/A           | 10735 | 13965 | 19080 | 21040 | 23350 |
|      |         | (13)                                | - 10:1 Constant Torque (10:1 Variable Torque) (Splash Proof Blower Ventilated)         | N/A           | 9235  | 12000 | 16425 | 18155 | 19770 |
|      |         | (13)                                | - 10:1 Constant Torque (10:1 Variable Torque) (Splash Proof Separately Ventilated)     | N/A           | 6465  | 8655  | 12735 | 13770 | 14810 |
|      |         |                                     | - Vector Duty  | See Page M-33 |       |       |       |       |       |
| 27   | M-33    |                                     | Leads – Longer Than Standard Leads (Adder Per Foot)                                    | 345           | 345   | 345   | 345   | 345   | 345   |
|      |         |                                     | - Sealed Leads (Potted)  | 870           | 870   | 870   | 870   | N/A   | N/A   |
|      |         |                                     | - Two-Hole Lead Lugs   | 235           | 235   | 235   | 235   | 235   | 235   |
| 28   | M-34    |                                     | Lubrication – Arrange-To-Accommodate Flood Oil Lube System (Sleeve)                    | N/A           | 1035  | 1035  | 1035  | 1035  | 1035  |
|      |         |                                     | - Constant Level Oiler (Standard Cage)(Sleeve)   | N/A           | 985   | 985   | 985   | 985   | 985   |
|      |         |                                     | - Constant Level Oiler (Stainless Steel Cage)(Sleeve)                                  | N/A           | 2370  | 2370  | 2370  | 2370  | 2370  |
|      |         |                                     | - Oil Mist Provision (Ball Bearing Motors Only)  | 1390          | 1390  | 1390  | 1390  | N/A   | N/A   |
| 29   | M-34    |                                     | Marine Duty (Ball Bearing Motors Only)   | 5%            | 5%    | 5%    | 5%    | 5%    | 5%    |
| 30   | M-35    | (+)                                 | Multi-Speed Motors – One Winding, Variable Torque                                      | 70%           | 70%   | 70%   | 70%   | 70%   | 70%   |
|      |         |                                     | - One Winding, Constant Torque   | 80%           | 80%   | 80%   | 80%   | 80%   | 80%   |
|      |         |                                     | - One Winding, Constant Horsepower   | 90%           | 90%   | 90%   | 90%   | 90%   | 90%   |
|      |         |                                     | - Two Winding, Variable Torque   | 100%          | 100%  | 100%  | 100%  | 100%  | 100%  |
|      |         |                                     | - Two Winding, Constant Torque   | 140%          | 140%  | 140%  | 140%  | 140%  | 140%  |
|      |         |                                     | - Two Winding, Constant Horsepower   | 170%          | 170%  | 170%  | 170%  | 170%  | 170%  |
| 31   | M-35    |                                     | Nameplates – Additional Duplicate Nameplate  | 60            | 60    | 60    | 60    | 60    | 60    |
|      |         |                                     | - Additional Stamping On Main Nameplate  | 100           | 100   | 100   | 100   | 100   | 100   |
|      |         |                                     | - Phase Sequencing Nameplate   | 115           | 115   | 115   | 115   | 115   | 115   |
|      |         |                                     | - Rotation Arrow Plate   | 115           | 115   | 115   | 115   | 115   | 115   |
|      |         |                                     | - Shipping Tag (#6 Paper Tag)  | N/C           | N/C   | N/C   | N/C   | N/C   | N/C   |
|      |         | - Special Features (I.D.) Nameplate | 115  | 115           | 115   | 115   | 115   | 115   |       |
|      | M-36    |                                     | - Starting Duty Nameplate  | 115           | 115   | 115   | 115   | 115   | 115   |
| 32   | M-36    |                                     | Overspeed  | See Page M-36 |       |       |       |       |       |
| 33   | M-36    |                                     | Paint – CORRO-DUTY® Paint Job  | 2%            | 2%    | 2%    | 2%    | 2%    | 2%    |
|      |         |                                     | - Special Paint  | 1000          | 1000  | 2000  | 3000  | 3000  | 3000  |
| 34   | M-36-39 |                                     | Power Factor Correction Capacitors   | See Page M-36 |       |       |       |       |       |
| 35   | M-40    |                                     | Prints And Data (NET ADDERS) – Standard Submittals                                     | N/C           | N/C   | N/C   | N/C   | N/C   | N/C   |
|      |         |                                     | - Bearing Life Calculation   | 150           | 150   | 150   | 150   | 150   | 150   |
|      |         |                                     | - Current Pulsation Analysis   | 200           | 200   | 200   | 200   | 200   | 200   |
|      |         |                                     | - Customer Data Sheet Filled Out by Nidec Motor Corp.                                  | 60            | 60    | 60    | 60    | 60    | 60    |
|      |         |                                     | - Sound Power In Watts   | 60            | 60    | 60    | 60    | 60    | 60    |
|      |         |                                     | - Sound Pressure in dBA at 3 Feet  | 30            | 30    | 30    | 30    | 30    | 30    |
|      |         |                                     | - Mass Elastic Data  | 170           | 170   | 170   | 170   | 170   | 170   |
|      |         |                                     | - Acceleration Time vs. Amps Curve   | 170           | 170   | 170   | 170   | 170   | 170   |
|      |         |                                     | - Performance Curve  | 170           | 170   | 170   | 170   | 170   | 170   |
|      |         |                                     | - Equivalent Circuit Data (X/R)  | 60            | 60    | 60    | 60    | 60    | 60    |
|      |         |                                     | - Standard Noise Data vs. Center Band  | 60            | 60    | 60    | 60    | 60    | 60    |
|      |         |                                     | - Speed vs. Torque & Amps Curve  | 60            | 60    | 60    | 60    | 60    | 60    |
|      |         |                                     | - Safe Stall Time Curve (Thermal Limit Damage Curve)                                   | 170           | 170   | 170   | 170   | 170   | 170   |
|      |         |                                     | - Shaft Stiffness  | 170           | 170   | 170   | 170   | 170   | 170   |
| 36   | M-41    |                                     | Rotor – Fabricated Copper Bar Rotor  | 15200         | 18240 | 20775 | 22300 | 25335 | 28368 |
|      |         |                                     | - Fabricated Aluminum Bar Rotor  | 1375          | 2250  | 3685  | STD   | STD   | STD   |
|      |         |                                     | - Rotor Corrosion Protection   | 1750          | 1750  | 1750  | 1750  | 1750  | 1750  |
| 37   | M-41    |                                     | Screens – Standard Material  | 741           | 925   | 1155  | 1620  | N/C   | N/C   |
|      |         |                                     | - Stainless Steel  | 1185          | 1385  | 1620  | 2080  | 2600  | 2950  |

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# Modifiable TITAN® Horizontal Motors Accessories and Modifications Quick Pick Chart

| ITEM | PG.                        | NOTE  | DESCRIPTION   | FRAME SIZE |        |        |        |        |        |
|------|----------------------------|-------|---|------------|--------|--------|--------|--------|--------|
|      |                            |       |   | 449        | 5000   | 5800   | 6800   | 8000   | 9600   |
| 38   | M-41                       |       | Seals – Shaft Slinger (Price Each)(Ball Bearing Only)                           | 235        | 235    | 235    | 235    | 235    | 235    |
|      |                            |       | - INPRO/SEAL® Seals (Price Each)(Ball Bearing Only)                             | 1270       | 1270   | 1270   | 1850   | 1850   | 1850   |
|      | M-42                       |       | - Taconite Service (Price Each)(Ball Bearing Only)                              | 1270       | 1270   | 1270   | 1850   | 1850   | 1850   |
|      |                            |       | - IP55 Seal Drive End (ODP/WPI/WPII 5008/10/12 Sleeve Bearing, DIN Style Only)  | -          | 1270   | -      | -      | -      | -      |
| 39   | M-42                       |       | Service Factor  | 5%         | 5%     | 5%     | 5%     | 5%     | 5%     |
| 40   | M-42                       |       | Shaft Extensions – Base Addition Adder  | 700        | 1045   | 1350   | 2075   | 2605   | 2825   |
|      |                            |       | - Special Shaft Material, Stainless Steel, 303 or 304                           | 2015       | 2015   | 2015   | 2900   | 2900   | 2900   |
|      |                            |       | - Special Shaft Material, Stainless Steel, 316 or 416                           | 4030       | 4030   | 4030   | 5800   | 5800   | 5800   |
|      |                            |       | - Special Shaft Material, High Tensile Steel                                    | 2885       | 2885   | 2885   | 4040   | 4040   | 4040   |
|      | M-43                       |       | - Standard Double End Shaft Extension   | 925        | 1155   | 1155   | 1385   | 1735   | 1735   |
|      |                            |       | - Locknut On End Of Shaft   | 235        | 235    | 235    | 235    | 235    | 235    |
|      |                            |       | - Special Shaft Runout  | 1735       | 1735   | 1735   | 1735   | 1735   | 1735   |
|      |                            |       | - Tapered Shaft   | 835        | 855    | 1040   | 1180   | 1250   | 1455   |
|      |                            |       | - Tapped Hole   | 580        | 695    | 750    | 870    | 985    | 1100   |
|      |                            |       | - Threaded Shaft (External Thread)  | 580        | 695    | 750    | 870    | 985    | 1100   |
| 41   | M-43-44                    |       | Space Heaters (Double Adder for Div. 1 or Div. 2) – Std. Silicone Strip Heaters | 1330       | 1330   | 1330   | 1330   | 1330   | 1330   |
|      |                            |       | - Thermostat Controlled   | 1160       | 1160   | 1160   | 1160   | 1160   | 1160   |
|      |                            |       | - Pilot (Indicator) Light   | 1310       | 1310   | 1310   | 1310   | 1310   | 1310   |
| 42   | M-44                       |       | Starting Current, Lower Than Standard – 600%-650%                               | 7.5%       | 7.5%   | 7.5%   | 7.5%   | 7.5%   | 7.5%   |
|      |                            |       | - 550%-599%   | 10%        | 10%    | 10%    | 10%    | 10%    | 10%    |
|      |                            |       | - 450%-549%   | 15%        | 15%    | 15%    | 15%    | 15%    | 15%    |
| 43   | M-45-47                    |       | Starting Method – Part Winding Start (PWS)                                      | 580        | 925    | 1155   | 1385   | 1965   | 2310   |
|      |                            |       | - Wye Delta (Star-Delta) Starting   | 1155       | 1385   | 1735   | 2080   | 2540   | 2885   |
|      |                            |       | - Reduced Voltage Starting – 69%-65% Tap  | 12%        | 12%    | 12%    | 12%    | 12%    | 12%    |
|      |                            |       | - Reduced Voltage Starting – 80%-70% Tap  | 7.5%       | 7.5%   | 7.5%   | 7.5%   | 7.5%   | 7.5%   |
| 44   | M-47                       |       | Surge Protection – Surge Capacitor & Lightning Arrestors – 600V & Below         | 4280       | 4280   | 4280   | 4280   | 4280   | 4280   |
|      |                            |       | - 601-2400V   | 10920      | 10920  | 10920  | 10920  | 10920  | 10920  |
|      |                            |       | - 2401-4800V  | 14160      | 14160  | 14160  | 14160  | 14160  | 14160  |
|      |                            |       | - 4801-6900V  | 20285      | 20285  | 20285  | 20285  | 20285  | 20285  |
| 45   | M-47-49                    |       | Temperature Rise – Class “B” Rise at 1.0 S.F.                                   | STD        | STD    | STD    | STD    | STD    | STD    |
|      |                            |       | - Class “B” Rise at 1.15 S.F.   | 12%        | 12%    | 12%    | 12%    | 12%    | 12%    |
|      |                            |       | - Class “A” Rise at 1.0 S.F.  | 25%        | 25%    | 25%    | 25%    | 25%    | 25%    |
| 46   | M-50                       |       | Tests (List Pricing)  | -          | -      | -      | -      | -      | -      |
|      |                            |       | - Short Commercial Test Un-Witnessed  | 145        | 145    | 145    | 145    | 145    | 145    |
|      |                            |       | - Short Commercial Test Witnessed   | 450        | 450    | 675    | 900    | 900    | 900    |
|      |                            | (8)   | - Complete Initial Test Un-Witnessed  | 5,575      | 5,575  | 5,575  | 7,800  | 7,800  | 7,800  |
|      |                            | (8)   | - Complete Initial Test Witnessed   | 11,250     | 11,250 | 11,250 | 15,600 | 15,600 | 15,600 |
|      |                            | (8)   | - Calibration Test Un-Witnessed   | 6,740      | 6,740  | 12,935 | 14,905 | 14,905 | 15,655 |
|      |                            | (8)   | - Calibration Test Witnessed  | 10,045     | 10,045 | 18,855 | 22,550 | 22,550 | 22,550 |
|      |                            | (8)   | - Sound Test Un-Witnessed   | 1,355      | 1,355  | 2,225  | 2,465  | 2,465  | 2,960  |
|      |                            | (8)   | - Sound Test Witnessed  | 2,035      | 2,035  | 3,698  | 3,698  | 3,698  | 4,605  |
|      |                            |       | - Vibration Test Un-Witnessed   | 2,075      | 2,075  | 2,075  | 2,075  | 2,305  | 2,305  |
|      |                            |       | - Vibration Test Witnessed  | 3,455      | 3,455  | 3,455  | 3,455  | 4,605  | 4,605  |
|      |                            |       | - Polarization Test Un-Witnessed  | 1,355      | 1,355  | 1,355  | 1,355  | 1,355  | 1,355  |
|      |                            |       | - Polarization Test Witnessed   | 2,035      | 2,035  | 2,035  | 2,035  | 2,035  | 2,035  |
|      |                            |       | - Spray Test Un-Witnessed   | 4,545      | 4,545  | 5,848  | 7,525  | 7,525  | 7,525  |
|      |                            |       | - Spray Test Witnessed  | 6,818      | 6,818  | 8,772  | 11,288 | 11,288 | 11,288 |
|      |                            |       | - Immersion Test Un-Witnessed   | 6,623      | 6,623  | 6,623  | 6,623  | 6,623  | 6,623  |
|      | - Immersion Test Witnessed | 9,935 | 9,935   | 9,935      | 9,935  | 9,935  | 9,935  |        |        |
| 47   | M-51-52                    |       | Thermal Protection, Bearings (Price Each)                                       | -          | -      | -      | -      | -      | -      |
|      | M-52                       |       | - Arrange-To-Accommodate BTDS (Not Available On Div. 1 Hazardous Location)      | 365        | 365    | 365    | 365    | 365    | 365    |
|      |                            |       | - Bearing RTDs, 10 or 120 Ohm   | 895        | 895    | 895    | 895    | 895    | 895    |
|      |                            |       | - Bearing RTDs, 100 Ohm   | 1435       | 1435   | 1435   | 1435   | 1435   | 1435   |

NOTE: This is a condensed version of the complete modification section used to qualify the availability of these options.

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# Modifiable TITAN® Horizontal Motors Accessories and Modifications Quick Pick Chart

| ITEM | PG.  | NOTE | DESCRIPTION   | FRAME SIZE |       |       |       |       |       |
|------|--|------|---|------------|-------|-------|-------|-------|-------|
|      |  |      |   | 449        | 5000  | 5800  | 6800  | 8000  | 9600  |
| 47   | M-52   |      | - Bearing RTDs, 100 Ohm Precision                                     | 1950       | 1950  | 1950  | 1950  | 1950  | 1950  |
|      |  |      | - Bearing RTDs, 10 or 120 Ohm, Dual Element                           | 1345       | 1345  | 1345  | 1345  | 1345  | 1345  |
|      |  |      | - Bearing RTDs, 100 Ohm, Dual Element                                 | 2155       | 2155  | 2155  | 2155  | 2155  | 2155  |
|      | M-53   |      | - Bearing RTDs, 100 Ohm Precision, Dual Element                       | 2920       | 2920  | 2920  | 2920  | 2920  | 2920  |
|      |  |      | - Bearing Thermocouples   | 395        | 395   | 395   | 395   | 395   | 395   |
|      |  |      | - Bearing Temperature Relay (Sleeve)                                  | 520        | 520   | 520   | 520   | 520   | 520   |
|      |  |      | - Bearing Temperature Indicator & Switch (Sleeve)                     | 1040       | 1040  | 1040  | 1040  | 1040  | 1040  |
|      |  |      | - Stem Type Thermometer (Sleeve)                                      | 1040       | 1040  | 1040  | 1040  | 1040  | 1040  |
|      |  |      | Thermal Protection, Winding   | -          | -     | -     | -     | -     | -     |
|      |  |      | - Winding Thermostats   | 320        | 320   | 320   | 320   | 320   | 320   |
|      | M-54   |      | - Winding Thermostats, Hermetically Sealed                            | 640        | 640   | 640   | 640   | 640   | 640   |
|      |  |      | - Winding Thermistors (Embedded In The Winding)                       | 865        | 865   | 865   | 865   | 865   | 865   |
|      |  |      | - THERMA SENTRY® (Separately Mounted, Separately Excited)             | 1460       | 1460  | 1460  | 1460  | 1460  | 1460  |
|      | M-55   |      | - THERMA SENTRY® (Motor Mounted, Separately Excited)                  | 2425       | 2425  | 2425  | 2425  | 2425  | 2425  |
|      |  |      | - Winding Thermocouples   | 2190       | 2190  | 2190  | 2190  | 2190  | 2190  |
|      | M-56   |      | - Winding RTDs, 10 or 120 Ohm   | 2190       | 2190  | 2190  | 2190  | 2190  | 2190  |
|      |  |      | - Winding RTDs, 100 Ohm   | 3288       | 3288  | 3288  | 3288  | 3288  | 3288  |
|      |  |      | - Winding RTDs, 100 Ohm Precision                                     | 4460       | 4460  | 4460  | 4460  | 4460  | 4460  |
|      |  |      | - Winding RTDs, 10 or 120 Ohm, Dual Element                           | 3225       | 3225  | 3225  | 3225  | 3225  | 3225  |
|      |  |      | - Winding RTDs, 100 Ohm, Dual Element                                 | 4935       | 4935  | 4935  | 4935  | 4935  | 4935  |
|      |  |      | - Winding RTDs, 100 Ohm Precision, Dual Element                       | 6690       | 6690  | 6690  | 6690  | 6690  | 6690  |
| 48   | M-57   |      | Torque, Special Locked Rotor or Breakdown Torque                      | 15%        | 15%   | 15%   | 15%   | 15%   | 15%   |
| 49   | M-57   |      | Vibration Detectors (Price Each)                                      | -          | -     | -     | -     | -     | -     |
|      |  |      | - Arrange-To-Accommodate Vibration Detectors                          | 958        | 958   | 958   | 958   | 958   | 958   |
|      |  |      | - BENTLY-NEVADA† 16699 Transducer                                     | 6398       | 6398  | 6398  | 6398  | 6398  | 6398  |
|      |  |      | - BENTLY-NEVADA† 21128 Transducer                                     | 4938       | 4938  | 4938  | 4938  | 4938  | 4938  |
|      |  |      | - BENTLY-NEVADA† 23732 Transducer                                     | 3375       | 3375  | 3375  | 3375  | 3375  | 3375  |
|      |  |      | - BENTLY-NEVADA† 330400 Accelerometer                                 | 3375       | 3375  | 3375  | 3375  | 3375  | 3375  |
|      |  |      | - BENTLY-NEVADA† 9200 Seismoprobe Transducer                          | 3465       | 3465  | 3465  | 3465  | 3465  | 3465  |
|      |  |      | - BENTLY-NEVADA† Velomitor (Prizo-Electric)                           | 2485       | 2485  | 2485  | 2485  | 2485  | 2485  |
|      |  |      | - IMI™ 685B00 Switch  | 4000       | 4000  | 4000  | 4000  | 4000  | 4000  |
|      |  |      | - IRD† 544M Transducer  | 4945       | 4945  | 4945  | 4945  | 4945  | 4945  |
|      |  |      | - METRIX™ 5484E-121 Vibration Transmitter                             | 3070       | 3070  | 3070  | 3070  | 3070  | 3070  |
|      |  |      | - METRIX™ 5484E-123 Vibration Transmitter                             | 3070       | 3070  | 3070  | 3070  | 3070  | 3070  |
|      |  |      | - METRIX™ 5491E Vibration Transmitter                                 | 2908       | 2908  | 2908  | 2908  | 2908  | 2908  |
|      |  |      | - METRIX™ 5550 Vibration Switch (USEM Std. Div. 1 Hazardous Location) | 3925       | 3925  | 3925  | 3925  | 3925  | 3925  |
|      |  |      | - METRIX™ 6000 Vibration Switch                                       | 4585       | 4585  | 4585  | 4585  | 4585  | 4585  |
|      |  |      | - METRIX™ 6300 Vibration Transmitter                                  | 2908       | 2908  | 2908  | 2908  | 2908  | 2908  |
|      |  |      | - METRIX™ 6917 Vibration Transmitter                                  | 2285       | 2285  | 2285  | 2285  | 2285  | 2285  |
|      |  |      | - METRIX™ 162VTS Vibration Transmitter                                | 3070       | 3070  | 3070  | 3070  | 3070  | 3070  |
|      |  |      | - METRIX™ 440D-R Vibration Switch                                     | 4215       | 4215  | 4215  | 4215  | 4215  | 4215  |
|      |  |      | - METRIX™ 450D-R Vibration Switch                                     | 5158       | 5158  | 5158  | 5158  | 5158  | 5158  |
|      |  |      | - ROBERTSHAW† 365A8 Vibration Switch                                  | 2875       | 2875  | 2875  | 2875  | 2875  | 2875  |
|      | - ROBERTSHAW† 366A8 Vibration Switch (USEM Std.) | 1455 | 1455  | 1455       | 1455  | 1455  | 1455  |       |       |
|      | - ROBERTSHAW† 376A Vibration Switch              | 3610 | 3610  | 3610       | 3610  | 3610  | 3610  |       |       |
|      | - ROBERTSHAW† 566 Vibration Switch               | 5475 | 5475  | 5475       | 5475  | 5475  | 5475  |       |       |
|      | - ROBERTSHAW† 570B Vibration Switch              | 2550 | 2550  | 2550       | 2550  | 2550  | 2550  |       |       |
| 50   | M-57   |      | Proximity Probes (Sleeve Bearing Motors Only)                         | -          | -     | -     | -     | -     | -     |
|      |  |      | - Arrange-To-Accommodate Proximity Probes                             | N/A        | 1735  | 1735  | 2078  | 2078  | 2078  |
|      |  |      | - BENTLY-NEVADA† 3300 Series 8mm Proximity Probes                     | N/A        | 25135 | 25135 | 25135 | 25135 | 25135 |
|      |  |      | - BENTLY-NEVADA† 3300 Series 8mm Prox. Probes w/ Keyphaser            | N/A        | 31955 | 31955 | 31955 | 31955 | 31955 |
| 51   | M-58   |      | Voltage, Special  | 5%         | 5%    | 5%    | 5%    | 5%    | 5%    |

NOTE: This is a condensed version of the complete modification section used to qualify the availability of these options.

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# Modifiable TITAN® Horizontal Motors

## Accessories and Modifications Quick Pick Chart

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(CO) CO = Contact Office for availability

(F) F = Form Wound Motors. Insulife 5000 is the standard Insulation Treatment on Form Wound Motors.

(R) R = Random Wound Motors. VPI-1000 is the standard Insulation Treatment on Random Wound Motors.

(1) Will likely change performance characteristics and/or frame size of certain product.

(3) Refer to the Base List Price Section for pricing. Refer to the Accessories And Modifications Section for descriptions.

(4) For Non-Standard Horsepower ratings, price as the next higher standard horsepower rating of the same type and speed.

(7) Refer to the Accessories And Modifications Section for description.

(8) For Multi-Speed Motors, multiply the adder by 1.5.

(10) For Inverter Duty 5:1 Constant Torque, use the Premium Efficiency Base List Price of the next higher horsepower + the Inverter Duty 10:1 VT Adder.

(11) For Vector Duty, use the 10:1 CT pricing + Encoder Adder. For Nidec Motor Corporation's Standard (Optional) Encoder, Add \$1,000.00.

(12) Use Premium Efficiency Base List Price.

(13) Use ODP Premium Efficiency Base List Price.

(14) Use WP11 Premium Efficiency Base List Price.

(15) For Inverter Duty 10:1 Constant Torque TEFC, use the Premium Efficiency Base List Price of two (2) horsepowers larger + the Inverter Duty 10:1 VT Adder. Confirm Frame Size and availability prior to quoting.

(16) Sound power level exceeds IEEE-841™ 90dBA sound power requirement.

(17) Motor includes a fabricated steel sound abate fan cover guard.

(18) Exposed surface temperature exceeds IEEE-841™ 200 deg. C maximum temperature requirement.

