

BRUSHLESS DC MOTOR FAMILY

Series NT™ HST Brushless DC Permanent Magnet Motor



The NT™ HST is designed to provide:

- Fast dynamic response
- High power density
- Compact package size
- Long life ball bearing system


Perfect for applications in office automation, instrumentation and medical equipment:

- Robotics
- Packaging
- High speed presses
- X-Y Positioning
- Mail handling equipment

NT™ HST BLDC Motor Specifications

- Standardized Modules
 - Brings high volume pricing to low volume orders
 - Makes product performance easy to specify
 - Ensures maximum product quality
- Flexible Performance
 - Operates from 12-48Vdc power sources
 - Operates in speed or torque mode
 - 4 quadrant closed loop or 2 quadrant open loop
 - Compact integrated encoder option

Electrical

- Integral Motor Controls Matched to a Motor Winding
- 2 or 4 Quadrant Operation
- 10Vdc-48Vdc Range (depending on motor control)
- Up to 100 oz-in [706 mN-m] Torque (with no gearing)
- Ultra Smooth Precision Motion Quality
-  Approved Class B Insulation System
- 100% Final Tested
- Custom Windings Available

Mechanical

- Long Life Ball Bearing System
- NEMA 23 Mounting Flange
- Neodymium Ring Magnets (not arcs)
- Stainless Steel Shaft
- Over 20,000 Hours of Design Life @ Rated Torque
- Standard Molex[®] Connectors
- Small Package Size with Low Rotor Inertia
- Up to 6000 RPM Operation

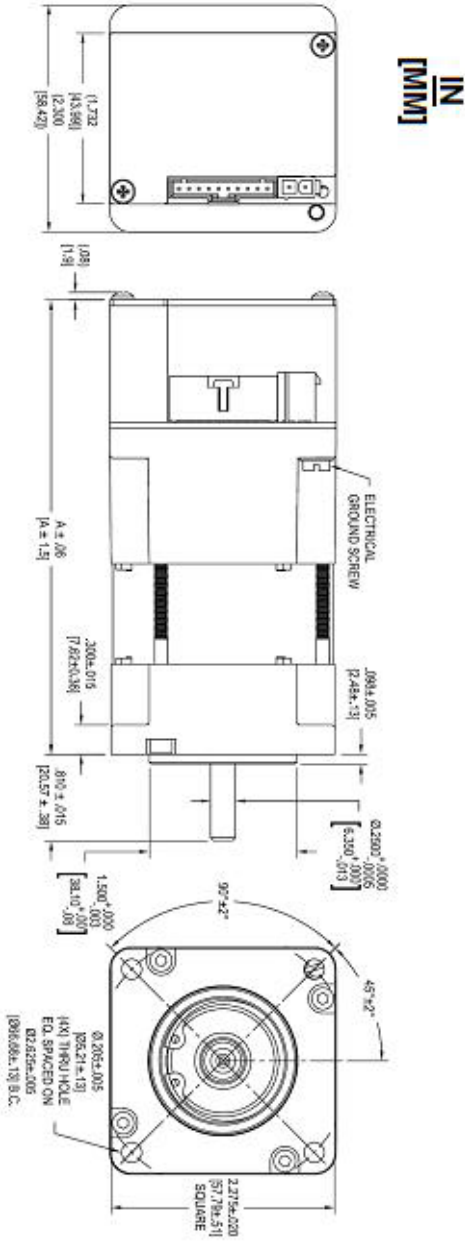
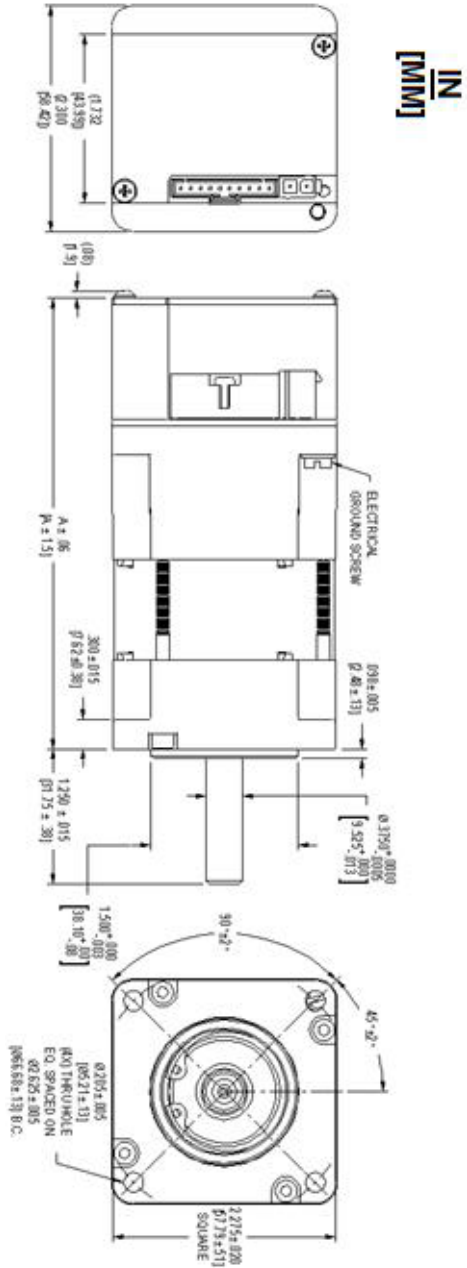
Reliability

- Over 1.5 Million Hours of Combined Life and Reliability Testing
- In Use at Major OEM's in Demanding Applications
- Our Proven Design can Help Reduce the Test Time Needed to Validate Your Design
- Contact Hurst for Detailed Life and Reliability Data

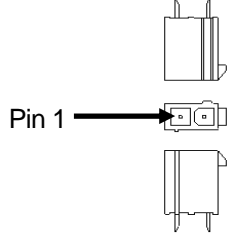
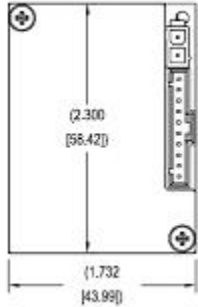
Integral Motor Control and Encoders

- External Motor Module
 - For Use with Customer Supplied Motor Control
 - Provides Hall Sensor and/or Encoder Outputs
- Analog Motor Control
 - Economical Control via a Simple Speed Pot or a 0-5Vdc Control Signal
- PWM Motor Control
 - Control via Customer Generated PWM Signal
- Encoders – 100, 250, 256 with Index Pulse, 400, or 1000 Line Resolution

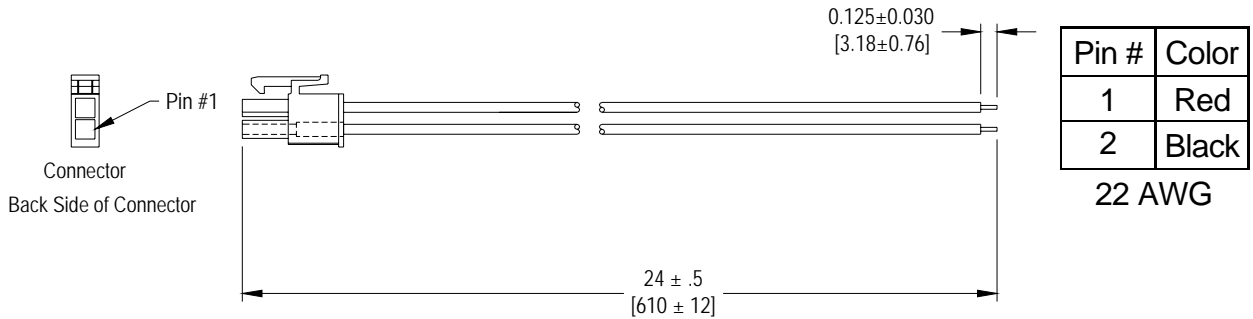
INTEGRATED CONTROL DRAWINGS



| Model | Overall Length (A) in [mm] |
|-------|----------------------------|
| 1 | 4.61 [117.1] |
| 2 | 5.61 [142.3] |

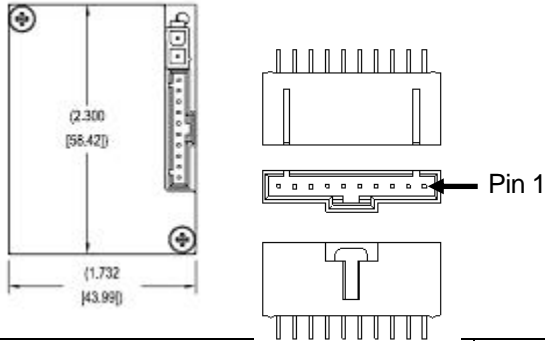


| Pin No. | Description | Input/Output | Notes |
|---------|-------------|--------------|-----------|
| 1 | +DC | Input | 12-45 Vdc |
| 2 | GND | Input | |

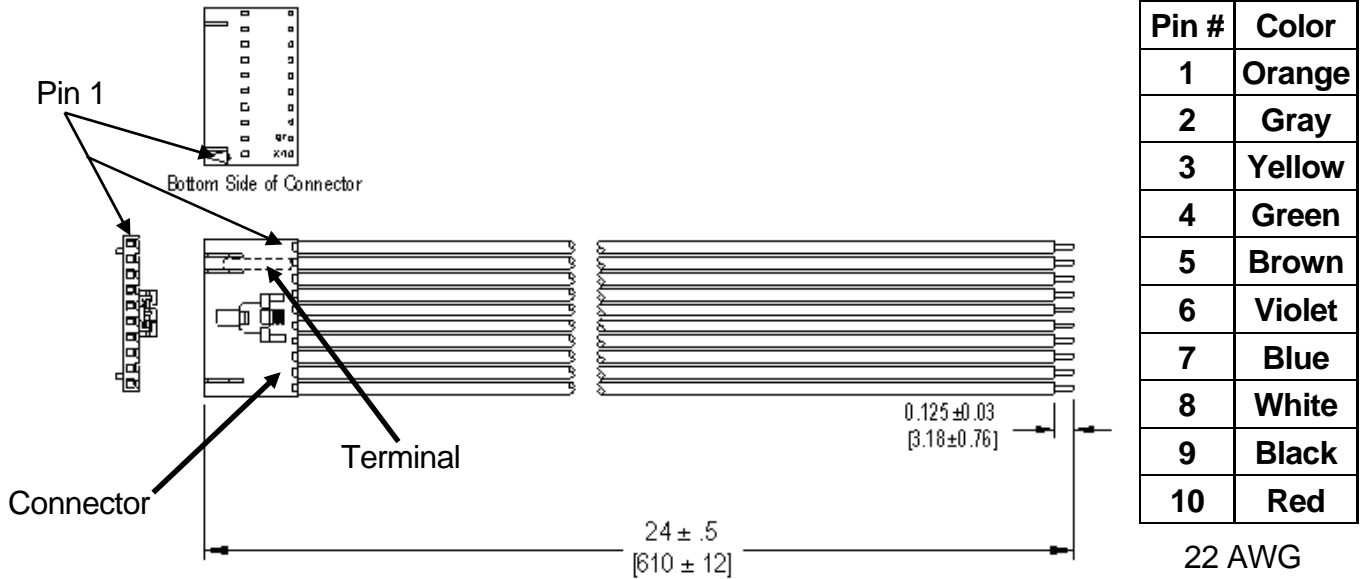


| Description | Manufacturer | Manufacturer Part # |
|-------------|--------------|---------------------|
| Connector | Molex | 39-01-2020 |
| Terminal | Molex | 39-00-0038 (chain) |
| | Molex | 39-00-0039 (loose) |

NOTICE
Minimum Gauge Size is recommended to be 22 AWG or greater.



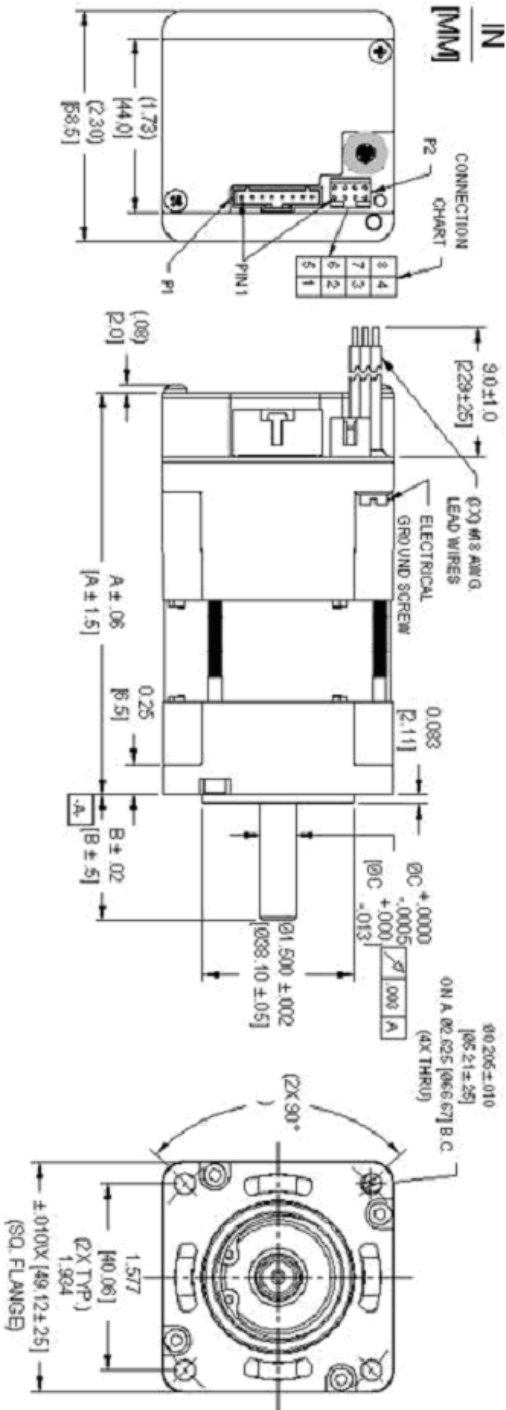
| Pin No. | Description | Input/Output | Notes |
|---------|-----------------------------|--------------|---|
| 1 | Tachometer | Output | Speed Output – 15 Pulses/Revolution (PPR) for Dynamo and 9 PPR for HST23 at TTL Level (0 to 5 Vdc) and 50% Duty Cycle |
| 2 | Speed / Torque | Input | Only used for Analog Control Method |
| 3 | PWM | Input/Output | Input - PWM Control Method <ul style="list-style-type: none"> • 0% duty cycle minimum command • 100% duty cycle maximum command • Used with Direction Input pin (Pin 7) Output - Analog Control Method <ul style="list-style-type: none"> • Outputs a PWM signal that monitors the ValuDrive® DC input current. |
| 4 | Encoder Channel B | Output | Speed and Direction Output – PPR based on customer preference at TTL level; No connection if encoder not present |
| 5 | Encoder Channel A | Output | Speed and Direction Output – PPR based on customer preference at TTL level; No connection if encoder not present |
| 6 | Direction | Output | Direction Output – 5 Vdc output = clockwise lead end 0 Vdc output = counter-clockwise lead end Can be used in conjunction with Tachometer output (Pin 1) to determine speed and direction |
| 7 | Direction / PWM & Direction | Input | Direction - <ul style="list-style-type: none"> • Clockwise Lead End = High level (5 Vdc) • Counter- Clockwise Lead End = Low level (GND) Used in conjunction with PWM (Pin 3) and Speed/Torque (Pin 2) PWM & Direction - <ul style="list-style-type: none"> • 0% duty cycle maximum command in the counterclockwise direction lead end • 50% duty cycle minimum command • 100% duty cycle maximum command in the clockwise direction lead end |
| 8 | Enable | Input | Low level signal (0 Vdc) enables drive |
| 9 | GND | -- | Return path for + 5 Vdc (Pin 10) |
| 10 | +5 Vdc | Input/Output | Input - User supplied 5 Vdc Output - Optional Integral 5 Vdc supply |



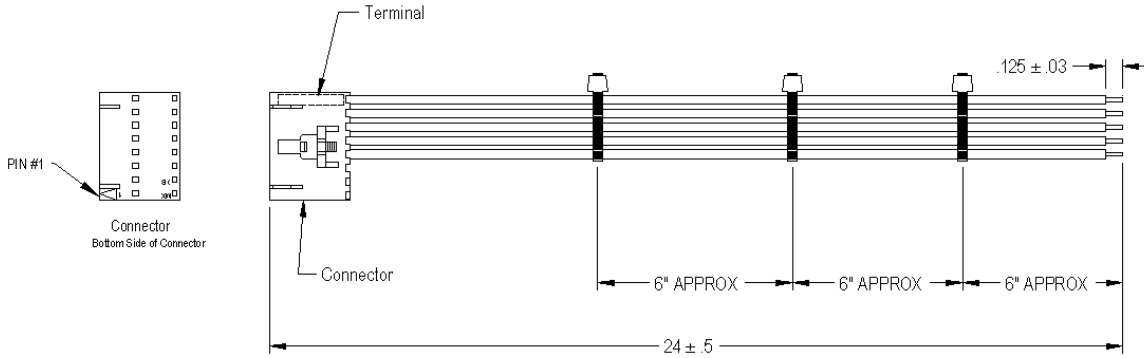
| Description | Manufacturer | Manufacturer Part # |
|-------------|--------------|---------------------|
| Connector | Molex | 50-57-9410 |
| Terminal | Molex | 16-02-0087 (chain) |
| | Molex | 16-02-0103 (loose) |

NOTICE
Minimum Gauge Size is recommended to be 22 AWG or greater.

EXTERNAL CONTROL DRAWINGS

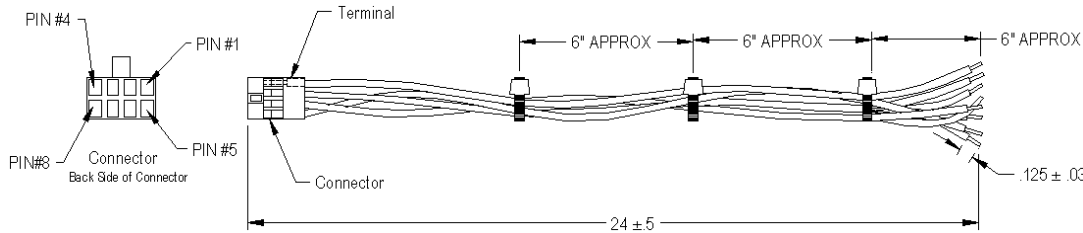


| Model | Overall Length (A) in [mm] | Shaft Extension (B) in [mm] Specific to shaft diameter | Shaft Diameter (C) in [mm] Applies to any Model |
|-------|----------------------------|--|---|
| 1 | 4.00 [101.6] | 0.81 [20.6] | .250 [6.35] |
| 2 | 5.00 [127.0] | 1.25 [31.8] | .375 [9.525] |



| Pin # | Color |
|-------|-------|
| 1 | Red |
| 2 | Black |
| 3 | Brown |
| 4 | White |
| 5 | Green |

| Description | Manufacturer | Manufacturer Part # |
|--------------------|--------------|--|
| Connector | Molex | 50-57-9408 |
| Terminal | | 16-02-0087 (chain) 16-02-0103 (loose) |
| 22 AWG Wire, Red | Belden | 32822 0025000 |
| 22 AWG Wire, Black | Belden | 32822 0105000 |
| 22 AWG Wire, Brown | Belden | 32822 0015000 |
| 22 AWG Wire, White | Belden | 32822 0095000 |
| 22 AWG Wire, Green | Belden | 32822 0055000 |
| Cable Tie | | |



| Pin # | Color |
|-------|--------|
| 1 | Red |
| 2 | White |
| 3 | Blue |
| 4 | Gray |
| 5 | Black |
| 6 | Orange |
| 7 | Brown |
| 8 | Green |

| Description | Manufacturer | Manufacturer Part # |
|---------------------|--------------|--|
| Connector | FCI | 65846-016 |
| Terminal | FCI | 48051-000 (chain) 48236-000 (loose) |
| 22 AWG Wire, Red | Belden | 32822 0025000 |
| 22 AWG Wire, White | Belden | 32822 0095000 |
| 22 AWG Wire, Blue | Belden | 32822 0135000 |
| 22 AWG Wire, Gray | Belden | 32822 0085000 |
| 22 AWG Wire, Black | Belden | 32822 0105000 |
| 22 AWG Wire, Orange | Belden | 32822 0035000 |
| 22 AWG Wire, Brown | Belden | 32822 0015000 |
| 22 AWG Wire, Green | Belden | 32822 0055000 |
| Cable Tie | | |

| HALL CONNECTIONS (P1) | | | | MOTOR LEAD CONNECTIONS | |
|---------------------------------|-------------|-------|---------------|-------------------------------|-------------|
| PIN # | DESCRIPTION | PIN # | DESCRIPTION | COLOR | DESCRIPTION |
| 1 | Vs | 5 | HALL C | BLUE | PHASE A |
| 2 | Vs (return) | 6 | BLANK | RED | PHASE B |
| 3 | HALL B | 7 | BLANK | BLACK | PHASE C |
| 4 | HALL A | 8 | BLANK | | |
| ENCODER CONNECTIONS (P2) | | | | | |
| 1 | +5Vs | 4 | N/C | 7 | /B |
| 2 | A | 5 | +5Vs (return) | 8 | N/C |
| 3 | B | 6 | /A | | |