# Seco

## AC/DC Drives

SERVO & STEPPER MOTORS • CONTROLS • AC / DC DRIVES • LINEAR ACTUATORS

## SV3000 Flux Vector Drives


Danaher MOTION
Engineered Systems Center

*We Design Solutions*

MADE IN USA

# SV Flux Vector Drive Series

## Leader In Technology

Danaher Motion Engineered Systems Center puts you ahead of the game by developing products and systems to help the performance of your machinery. Our motor controllers, adjustable speed drives, voltage control and conditioning, AC synchronous and DC step motors, servo motors, and engineered systems are designed to provide next generation solutions to today's applications.

Danaher Motion Engineered Systems Center of Danaher Corporation boasts a reputation for quality and service. With unparalleled engineering capabilities, we can help you develop product lines for both new and existing high-technology markets.

## SV3000 AC Adjustable Speed Flux Vector Drives

The AC drive that performs like a DC drive at no additional cost. SECO's SV3000 Series flux vector drives can achieve the same performance as DC drives but are equally at home in machines usually driven by conventional AC drives. By using a motor-mounted encoder and encoder interface card, the SV3000's performance surpasses that of most DC drives and approaches that of Servo.

Its versatility makes it ideal for many drive applications including wire and cable, packaging / converting machinery, material handling, metal forming, plastics, textiles, food processing equipment, spindles, cut-offs, winders, and unwinders.

## Simple and User Friendly

Start-up is as simple as pressing a button, yet security codes limit access to authorized persons. Read-out in plain language; select French, German, or Spanish if you are exporting your machine. The SV3000 is easy to program and gets you up-and-running faster. It also offers a Help feature to simplify parameter adjustment. If a fault should develop, the plain language read-out will help you diagnose the problem.

## Communication

Serial communication, via fully isolated industry-standard RS485 high-noise immunity circuitry, and ANSI protocol make it easy to monitor and control the SV3000 from a process control computer or PLC. Optional high-speed serial communications are available (e.g., DeviceNet®, Modbus).

## Design Concept Power Electronics

- Insulated-gate bi-polar transistors (IGBTs) form the inverter bridge power circuit and give high power / high speed switching but require only low drive energy.
- Auto-protecting IGBT gate drive circuits give fast phase to-phase and phase-to-ground short circuit protection.
- A fast-responding, flux-balancing current transducer provides for current control and protection within the adjustable speed drive.
- A switch mode power supply (SMPS) provides auxiliary voltage for the control circuits and allows the inverter to operate over a wide input voltage range. The SMPS provides isolated supplies to drive the IGBTs.

*Please refer to SECO's SV3000 Installation and Operation manual 400030-098 or 400030-110 for proper installation and usage instructions.*

# Features and Benefits

## SECO® SV – Direct Integration into Factory Automation Systems

Each SV3000 can be programmed to fill a particular role in today's sophisticated process control or manufacturing system.

SV3000 provides a high degree of compatibility for linking into complex supervisory and control packages. In processes such as food manufacturing or line packaging, each drive in a multi-drive system has its own line address and can be programmed for a specific role in precise time relation to other data bus components.

SV3000 can also accept feedback directly as part of a coordinated drive system, thereby eliminating costly and time-consuming customer engineering—in a digital or analog follower configuration, for example.

Whatever the complexity of the control strategy, the SV3000 is an ideal building block in the computer integrated manufacturing (CIM) system.

## Standard Features

- Micro-processor control using a digital signal processor for higher performance
- Constant torque over 70:1 speed range without encoder
- Full torque at zero speed available with encoder feedback
- New PWM carrier modulation reduces harmonics and acoustic noise
- Output short circuit / ground fault protection
- Electronic inverse time overload
- Adjustable current limiting up to 150% for 60 seconds
- Instantaneous overcurrent protection
- AC line transient voltage protection
- Fuses included for additional protection
- Over- and undervoltage protection
- Electronic reversing
- 0 to 10 VDC, 0 to 20mA, 4 to 20mA speed command inputs
- Isolated low voltage electronics
- Analog and digital frequency signal output
- Analog load signal output
- Encoder feedback available
- Speed or torque control with speed override
- Status relay
- Output frequency selectable to 120 Hz
- Dynamic braking (standard on 1-100 HP 460VAC and 1-20 HP 230VAC)
- DC injection braking
- Start a spinning motor feature
- Three skip frequencies with adjustable windows to avoid mechanical resonances
- Current limit alarm output
- Parameter and diagnostic data saved during power loss
- Key pad with two-line, 16-character alphanumeric LCD display read-out in simple English, French, German, and Spanish
- Menu-driven programming and "Help" key for easy parameter set-up
- Multi-level security codes to prevent unauthorized parameter changes
- Serial communication standard on all units (RS485)
- Automatically tunes control to motor and system to application
- Chassis, NEMA 4/12 (1-10 HP 460VAC, 1-5 HP 230VAC), NEMA 12 (7.5-20 HP 230VAC, 15-60 HP 460VAC), NEMA 1 (75-350 HP 460VAC)
- Full monitoring of drive parameters with last three faults indication and fault log
- User-programmable analog and digital inputs and outputs
- Seven preset speeds and jog with independent accelerate and decelerate
- Coast-to-rest or decelerate-to-rest stop modes
- Four-quadrant torque control
- Master-follower operation with either analog inputs or new, fully automatic high-speed follower using serial communication link
- Compact size
- Designed and built to highest quality standards
- Five-year warranty
- Designed, built, and serviced in the USA
- UL®-listed or recognized
- CE compliance available

# SV3000 Control Keypad

## Readout

Programmable in English, French, German, and Spanish

## Control Functions

- Run Fwd
- Stop
- Run Rev
- Jog

## Programming Controls

- Status / Menu
- Prog
- Edit
- Help
- Scroll Up – Fast, Slow
- Scroll Down – Fast, Slow

## Status Information

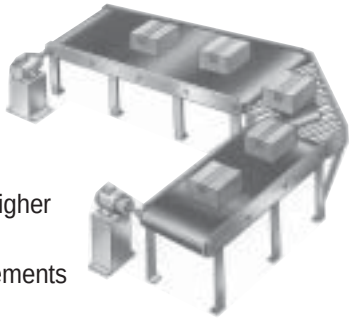
- Speed
- Motor Amp
- Torque
- Speed Error
- Motor Frequency
- DB Accumulator
- Motor HP
- DC Bus Voltage
- $I^2t$ Accumulator
- Term. Inputs
- Last 3 Faults
- Status During Fault
- Reference Input


## Fault Diagnostics

- Ext. Trip
- Overcurrent, Instantaneous
- Overcurrent, Timed
- Temperature
- Power Supply
- Undervoltage
- IGBT Fault
- Loss of 4-20mA Input
- Feedback Loss
- Input Phase Loss
- Motor Not Connected

# Optimal Solutions For Your Difficult Applications

## AC Line Regeneration

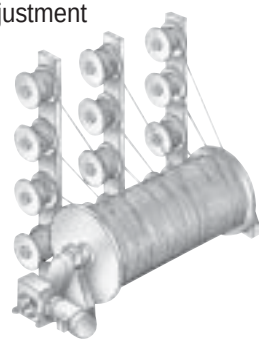


- Energy savings $$$
- No resistors
- Continuous braking without high energy losses
- Reduces AC power line harmonic distortion with higher power factor
- Complies with your local power company's requirements
- Controls overhauling high inertial loads
- Driven unwind applications (a friction brake alternative; see CTCW below)
- Crane and hoist
- Dynamometers – Test stands for motors, engines, transmissions, axles, etc.

## Electronic Line Shaft - Shaft Lock

- Load sharing for multi-motor applications
- Tension for non-extensible webs – No web distortion or errors in registration
- Mechanical line shaft replacement – Reduced downtime for mechanical adjustments
- Variable pitch pulley replacement – Digital ratio / position adjustment
- Rotor position control with advance / retard inputs

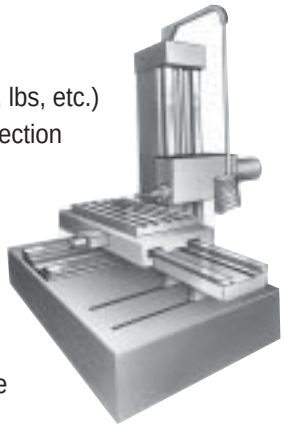
## PID Loop Control



- Closed loop process control for unwind, intermediate zone, and rewind applications
- "Slack Loop" control – "tensionless" web processing
- Digital zero-position dancer control with line speed input

## Constant Tension Centerwind Control (CTCW)

- 1-5% tension regulation without load cell feedback (machine-dependent)
- Maintains indefinite stall tension
- Maintains constant power / tension or taper tension (machine dependent)
- Uses a standard or inverter / vector-duty AC motor
- Compensates for friction and inertia losses
- Programs in real engineering units (FPM, RPM, inches, lbs, etc.)
- Roll inertia ($Wk^2$) recipe control (large and small roll selection via digital input)
- Over- and under-wind selection via digital input
- Web break detection



## Digital Motor-Operated Pot Control

- Easy retrofit to existing operator devices
- Provides inputs for speed increase and speed decrease push-buttons
- Allows speed control from multiple remote locations

## Serial Communications

- Modbus and other popular protocols available

### Applications

- Textiles
- Chemical Processing
- Food Processing
- Robotics
- Steel Products
- Coating & Laminating
- Automotive
- Machine Tool
- Plastics
- Rubber Products
- Printing
- Packaging
- Converting
- Material Handling
- Dynamometers
- Winders
- Unwinds
- Infeeds
- Test Stands
- Balancing Machines
- Wire Manufacturing

# Specifications

## Service Conditions

| | |
|---|---|
| AC Line Input: | • 380 to 460 volts ±10%, three phase<br>• 200 to 240 volts ±10%, three phase<br>• 575 volts ±10%, three phase |
| AC Line Input Frequency: | 48 to 62 Hz |
| Ambient Temperature: | • 0°C to +40°C (enclosed units)<br>• 0°C to +55°C (chassis units) |
| Humidity: | 5 to 95% non–condensing |
| Altitude: | To 3300 ft without derating |

## Operating Conditions

| | |
|---|---|
| Output Voltage: | 0 to input voltage |
| Output Frequency: | 0 to 120 Hz |
| Maximum Load Capacity: | 150% for one minute |
| Line Protection: | Fuses, M.O.V.s, and capacitors |

## Performance

| | |
|---|---|
| Speed Holding: | ±.5% of base speed over 70:1 motor speed range with no feedback device (.01% of base speed down to zero speed with encoder feedback) |
| Resolution: | .025% with analog input<br>-11 bits (.01% with digital input) |

## Basic Adjustments

| | |
|---|---|
| Max Speed: | 0 to 120 Hz |
| Min Speed: | 0 to max speed |
| Accel Time: | 0.1 to 3200 seconds |
| Decel Time: | 0.1 to 3200 seconds |
| Jog Speed: | 0 to 100% of base speed (separate decel) |
| Max Torque Motoring: | 10 to 150% |
| Max Torque Braking: | 10 to 150% |
| Read-out: | Engineering units (RPM, etc.) |

## Other Adjustments

- Seven preset speeds
- Three skip frequencies and windows

## Selection Modes

- DC injection braking selection
- S-ramp accel and decel selection
- Catch a spinning motor selection
- Communication set-up
- Master-slave selection
- Slave signal source selection

## Analog Inputs

| | |
|---|---|
| Local Analog Input: | Controls speed or torque scalable 0-10 VDC maximum, unipolar or bi-polar |
| User Analog Input: | Controls other parameters scalable 0-10 VDC maximum, slave input source |
| Remote Analog Input: | Controls speed or torque scalable 0-20 mA (4-20 mA default value) |

## Analog Outputs

| | |
|---|---|
| Meter Output: | 0-10 VDC speed or torque (12 bit) |
| User Output: | Scalable 0-10 VDC maximum (12 bit) selectable to indicate status parameter value |

## Digital Inputs

| | |
|---|---|
| User Input: | • Selects speed or torque<br>• Selects master or slave<br>• Selects zero torque<br>• Digital inputs are 5 to 24 VDC |

# Specifications

## Digital Output

| | |
|---|---|
| User Relay: | Program to indicate status parameters, Form C contacts |
| Ready Relay: | Indicates AC power and no faults, Form A contacts, relay contacts rated at 250 VAC, 5 Amps |
| User Output: | Open collector programmable to indicate status parameters |

## Diagnostics

Status Display:

- Motor Speed Reference
- Inputs
- Load Torque
- Motor Amps
- Motor Frequency
- DC Bus Volts
- Speed Error
- DB Accumulator
- Status of Input
- Signals
- Last Three Faults
- Type
- Drive Conditions at Last Fault
- Status Parameters at Time of Fault
- $1^2t$ Accumulator
- Hours Run

## Motor Requirements

| | |
|---|---|
| Type: | AC induction motor 2, 4, 6, 8, 10 pole 200-230, 380-460, 575 volts |

## Encoder Requirements (when needed for application)

| | |
|---|---|
| Type: | Incremental 1024 pulses per revolution preferred, programmable for 60 to 2048 pulses per revolution, two-channel, quadrature, 5VDC, differential. Power supply +5V, 200 mA max. Max frequency 200 kHz |

## Stopping Modes

- Coast-to-rest
- Ramp-to-rest

## Braking Modes

- Integral dynamic braking (1-5 @ HP 230V, 1-15 HP @ 460V)
- Optional dynamic braking (20-350 HP @ 460V) (7.5-20 HP @230V)
- DC injection braking
- Regenerative to common DC bus system

## Communications

| | |
|---|---|
| Serial Port #1: | RS485, isolated, ANSI 3.28X protocol |
| Serial Port #2: | Synchronous serial RS485 port for high-speed multi-motor master / slave operation |

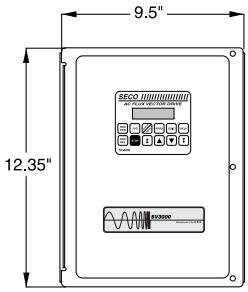
## Start Modes

| | |
|---|---|
| Manual: | By operator controls |
| Automatic: | • At power-up or after fault (if selected)<br>• By serial communications |

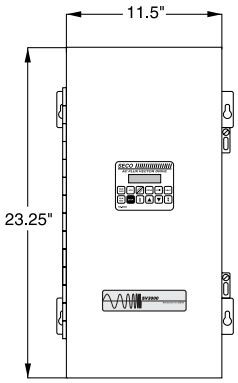
## Other Features

| | |
|---|---|
| Auto Tune: | Control to motor, and control system PID gains |
| Security: | Multi-level programmable security codes |
| Read-Out: | Two-line, 16-character back-lit LCD display in English, French, German, and Spanish |

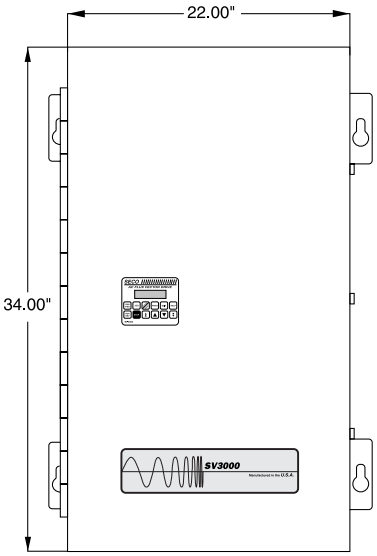
# SV3000 1-20 HP 230VAC, 1-125 HP 460VAC




1-10 HP 460V
1-5 HP 230V




15-40 HP 460V
7.5-20 HP 230V




50-125 HP 460V

## SV3200 Series – 230VAC, Three-Phase Input

| Ratings | | | | | | Model Numbers | | | |
|---|---|---|---|---|---|---|---|---|---|
| | AC Line Input | | AC Motor Output | | Input Power | Standard Performance SV3000 | | Enhanced Performance[3] SV3000 | |
| HP | AMPS | KVA | AMPS | KVA | Factor | Chassis | Enclosed[1] | Chassis | Enclosed[1] |
| 1 | 5.6 | 2.4 | 4.1 | 1.6 | 0.95 | SV3201-00000 | SV3201-01000 | SV3201-10000 | SV3201-11000 |
| 2 | 11.2 | 4.5 | 7.8 | 3.1 | 0.95 | SV3202-00000 | SV3202-01000 | SV3202-10000 | SV3202-11000 |
| 3 | 15.8 | 6.4 | 11.0 | 4.4 | 0.86 | SV3203-00000 | SV3203-01000 | SV3203-10000 | SV3203-11000 |
| 5 | 23.3 | 9.7 | 17.5 | 7.0 | 0.86 | SV3205-00000 | SV3205-01000 | SV3205-10000 | SV3205-11000 |
| 7.5 | 25.5 | 10.2 | 24.0 | 9.6 | 0.88 | SV3207-00000 | SV3207-01000 | SV3207-10000 | SV3207-11000 |
| 10 | 38.1 | 15.2 | 36.0 | 14.3 | 0.87 | SV3210-00000 | SV3210-01000 | SV3210-10000 | SV3210-11000 |
| 15 | 46.0 | 18.3 | 48.0 | 19.1 | 0.82 | SV3215-00000 | SV3215-01000 | SV3215-10000 | SV3215-11000 |
| 20 | 58.8 | 23.4 | 60.0 | 23.9 | 0.88 | SV3220-00000 | SV3220-01000 | SV3220-10000 | SV3220-11000 |

## SV3400 Series – 460VAC, Three-Phase Input

| Ratings | | | | | | Model Numbers | | | |
|---|---|---|---|---|---|---|---|---|---|
| | AC Line Input | | AC Motor Output | | Input Power | Standard Performance SV3000 | | Enhanced Performance [3] SV3000 | |
| HP | AMPS | KVA | AMPS | KVA | Factor | Chassis | Enclosed[2] | Chassis | Enclosed[2] |
| 1 | 2.6 | 2.1 | 1.8 | 1.4 | 0.95 | SV3401-00000 | SV3401-01000 | SV3401-10000 | SV3401-11000 |
| 2 | 4.9 | 3.9 | 3.4 | 2.7 | 0.95 | SV3402-00000 | SV3402-01000 | SV3402-10000 | SV3402-11000 |
| 3 | 6.9 | 5.5 | 4.8 | 3.8 | 0.95 | SV3403-00000 | SV3403-01000 | SV3403-10000 | SV3403-11000 |
| 5 | 10.4 | 8.3 | 7.6 | 6.0 | 0.95 | SV3405-00000 | SV3405-01000 | SV3405-10000 | SV3405-11000 |
| 7.5 | 11.0 | 8.8 | 11.0 | 8.8 | 0.86 | SV3407-00000 | SV3407-01000 | SV3407-10000 | SV3407-11000 |
| 10 | 13.1 | 10.4 | 14.0 | 11.1 | 0.86 | SV3410-00000 | SV3410-01000 | SV3410-10000 | SV3410-11000 |
| 15 | 22.3 | 17.8 | 21.0 | 16.7 | 0.88 | SV3415-00000 | SV3415-01000 | SV3415-10000 | SV3415-11000 |
| 20 | 28.6 | 22.8 | 27.0 | 21.5 | 0.87 | SV3420-00000 | SV3420-01000 | SV3420-10000 | SV3420-11000 |
| 25 | 32.4 | 25.8 | 34.0 | 27.1 | 0.92 | SV3425-00000 | SV3425-01000 | SV3425-10000 | SV3425-11000 |
| 30 | 38.3 | 30.5 | 40.0 | 31.8 | 0.82 | SV3430-00000 | SV3430-01000 | SV3430-10000 | SV3430-11000 |
| 40 | 51.0 | 40.6 | 52.0 | 41.4 | 0.88 | SV3440-00000 | SV3440-01000 | SV3440-10000 | SV3440-11000 |
| 50 | 62.2 | 49.6 | 65.0 | 51.8 | 0.92 | SV3450-00000 | SV3450-01000 | SV3450-10000 | SV3450-11000 |
| 60 | 73.7 | 58.7 | 77.0 | 61.4 | 0.92 | SV3460-00000 | SV3460-01000 | SV3460-10000 | SV3460-11000 |
| 75 | 95.1 | 75.8 | 96.0 | 76.5 | 0.91 | SV3475-00000 | SV3475-01000 | SV3475-10000 | SV3475-11000 |
| 100 | 119.0 | 94.8 | 124.0 | 98.8 | 0.92 | SV341A-00000 | SV341A-01000 | SV341A-10000 | SV341A-11000 |
| 125 | 151.0 | 120.3 | 156.0 | 124.3 | 0.92 | SV341B-00000 | SV341B-01000 | SV341B-10000 | SV341B-11000 |

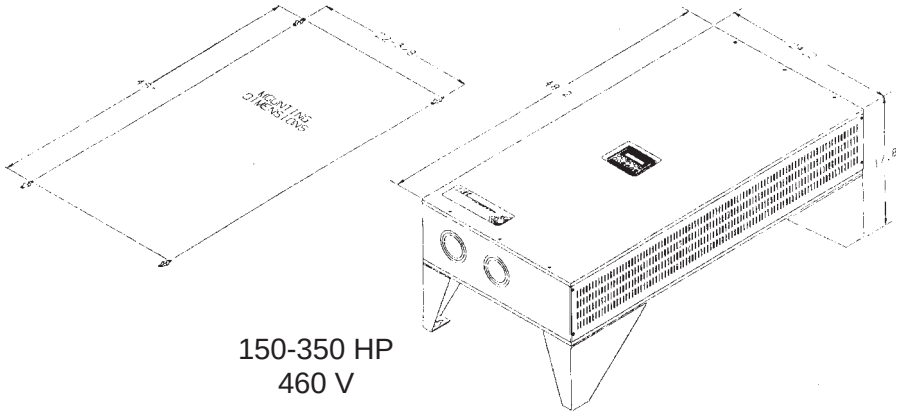
(cont.)

# SV3000 150-350 HP 460VAC

## SV3400 Series – 460VAC, Three-Phase Input (cont.)

| Ratings | | | | | | Model Numbers | | | |
|---|---|---|---|---|---|---|---|---|---|
| | AC Line Input | | AC Motor Output | | Input Power | Standard Performance SV3000 | | Enhanced Performance [3] SV3000 | |
| HP | AMPS | KVA | AMPS | KVA | Factor | Chassis | Enclosed[2] | Chassis | Enclosed[2] |
| 150 | 180.0 | 143.4 | 180.0 | 143.4 | 0.93 | SV341C-00000 | SV341C-01000 | SV341C-10000 | SV341C-11000 |
| 200 | 240.0 | 191.2 | 240.0 | 191.2 | 0.93 | SV341D-00000 | SV341D-01000 | SV341D-10000 | SV341D-11000 |
| 250 | 300.0 | 239.0 | 300.0 | 239.0 | 0.93 | SV341E-00000 | SV341E-01000 | SV341E-10000 | SV341E-11000 |
| 300 | 360 | 286.5 | 360 | 286.1 | .93 | SV341F-00000 | SV341F-01000 | SV341F-10000 | SV341F-11000 |
| 350 | 420 | 334.2 | 420 | 334.2 | .93 | SV341G-00000 | SV341G--01000 | SV341G-10000 | SV341G-11000 |

(1) 1–5 HP enclosures are NEMA 4/12. 7.5–20 HP enclosures are NEMA 12.
(2) 1–10 HP enclosures are NEMA 4/12. 15–60 HP enclosures are NEMA 12. 75-350 HP enclosures are NEMA 1.
(3) For enhanced performance, a motor-mounted encoder is required.
(4) 1-50 HP enclosures are NEMA 12. 65-350 HP enclosures are NEMA 1.




150-350 HP
460 V

# Isolation Transformers

While the AC inverter normally does not need to be used with a drive isolation transformer or line reactor, in some applications or installations the addition of a drive isolation transformer or line reactor will increase the reliability, performance, and lifetime of the drive system. Drive KVA ratings and the Danaher Motion Engineered Systems Center transformer part numbers can be found in the following table:

## Three-Phase NEMA 1 Enclosed, Dry Type, ±5% Primary Taps, 60 Hz

| Secondary Voltage | | 230VAC | | 460VAC | |
|---|---|---|---|---|---|
| Primary Voltage | | 230 | 460 | 230 | 460 |
| Model Number | | TRT22- | TRT42- | TRT24- | TRT44- |
| HP | KVA | | | | |
| 1 | 3 | 003 | 003 | 003 | 003 |
| 3 | 6 | 006 | 006 | 006 | 006 |
| 5 | 7.5 | 007 | 007 | 007 | 007 |
| 7.5 | 11 | 011 | 011 | 011 | 011 |
| 10 | 15 | 015 | 015 | 015 | 015 |
| 15 | 20 | 020 | 020 | 020 | 020 |
| 20 | 27 | 027 | 027 | 027 | 027 |
| 25 | 34 | 034 | 034 | 034 | 034 |
| 30 | 40 | 040 | 040 | 040 | 040 |
| 40 | 51 | 051 | 051 | 051 | 051 |
| 50 | 63 | 063 | 063 | 063 | 063 |
| 60 | 75 | 075 | 075 | 075 | 075 |
| 75 | 93 | 093 | 093 | 093 | 093 |
| 100 | 118 | 118 | 118 | 118 | 118 |
| 125 | 145 | 145 | 145 | 145 | 145 |
| 150 | 175 | 175 | 175 | 175 | 175 |
| 200 | 220 | 220 | 220 | 220 | 220 |
| 250 | 275 | 275 | 275 | 275 | 275 |
| 300 | 330 | 330 | 330 | 330 | 330 |
| 350 | 440 | 440 | 440 | 440 | 440 |


*Danaher Motion precision motors and controls, electronic adjustable speed drives, variable voltage controls, and power conditioning equipment used in today's automation applications.*

# SV3000 Inverter Duty / Vector Duty – (Constant torque-to-zero speed) AC Motors

## 230 / 460VAC

| HP | Frame Size | Base Speed/ Top Speed[4] | Enclosure [1], [3] | Inverter Duty 20:1 Constant Torque Speed Range Model No. | Vector Duty[2] Constant Torque-to-Zero Speed Model No. | Motor Inertia (lb ft²) | Est. Weight (lbs) |
|---|---|---|---|---|---|---|---|
| 1/2 | 56C* | 1800/3600 | TENV | MVM005 | MVM005-01 | .06 | 25 |
| 1 | 56C* | 1800/3600 | TENV | MVM01 | MVM01-01 | 0.11 | 60 |
| 2 | 145TC* | 1800/3600 | TENV | MVM02 | MVM02-01 | 0.32 | 71 |
| 3 | 182TC* | 1800/3600 | TENV | MVM03 | MVM03-01 | 0.42 | 92 |
| 5 | 184TC* | 1800/3600 | TENV | MVM05 | MVM05-01 | 0.65 | 125 |
| 7.5 | 213TC* | 1800/3600 | TENV | MVM07 | MVM07-01 | 0.85 | 135 |
| 10 | 215TC* | 1800/3600 | TENV | MVM10 | MVM10-01 | 1.3 | 185 |
| 15 | 256TC * | 1800/3600 | TENV | MVM15 | MVM15-01 | 1.6 | 210 |
| 20 | 256TC* | 1800/3600 | TENV | MVM20 | MVM20-01 | 3.0 | 360 |
| 25 | 284TC* | 1800/3600 | TENV | MVM25 | MVM25-01 | 3.0 | 540 |
| 30 | 286T | 1800/3600 | TEBC | MVM30 | MVM30-01 | 2.6 | 560 |
| 40 | 324T | 1800/3600 | TEBC | MVM40 | MVM40-01 | 5.1 | 620 |
| 50 | 326T | 1800/3600 | TEBC | MVM50 | MVM50-01 | 6.1 | 700 |
| 60 | 364T | 1800/2700 | TEBC | MVM60 | MVM60-01 | 6.5 | 1039 |
| 75 | 365T | 1800/2700 | TEBC | MVM75 | MVM75-01 | 7.5 | 1091 |
| 100 | 405T | 1800/2700 | TEBC | MVM100 | MVM100-01 | 12.0 | 1423 |
| 125 | 444T | 1800/2700 | TEBC | MVM125 | MVM125-01 | 21.0 | 1735 |
| 150 | 445T | 1800/2700 | TEBC | MVM150 | MVM150-01 | 58.0 | 2241 |
| 200 | 445T | 1800/2700 | TEBC | MVM200 | MVM200-01 | 58.0 | 2318 |
| 250 | 449T | 1800/2700 | TEBC | MVM250 | MVM250-01 | 74.5 | 2880 |
| 300 | 449T | 1800/2700 | TEBC | MVM300 | MVM300-01 | 86.5 | 2950 |
| 350 | 449T | 1800/2700 | TEBC | MVM350 | MVM350-01 | 87.5 | 3075 |

(1) Totally-enclosed blower-cooled (TEBC) motors require a motor blower starter to operate the motor-mounted blower. This is available as an option to be supplied with the Danaher Motion Engineered Systems Center AC drive. Motor blower voltage is 220/380/460 VAC, three-phase for 7.5-350 HP.

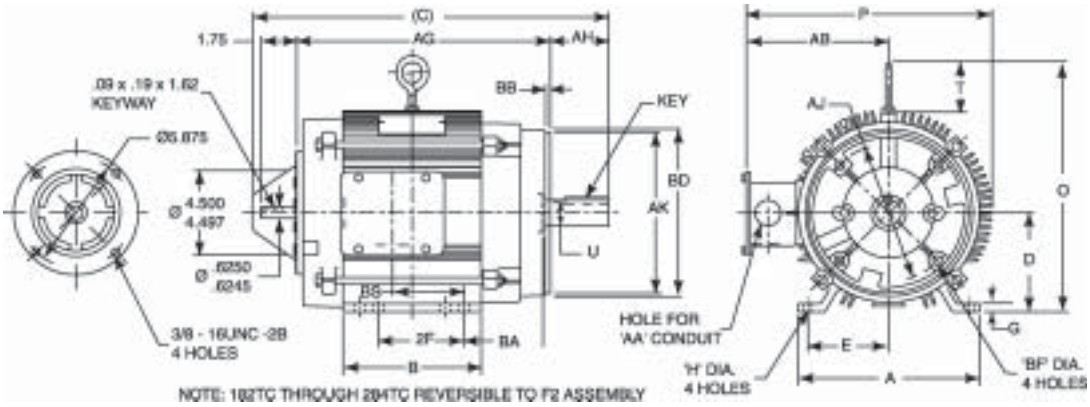
(2) The vector duty AC motors (-01 suffix at the end of the model number) are supplied with a motor-mounted 1024 p.p.r., dual-channel quadrature encoder.

(3) The vector duty AC motors are supplied with a junction box for motor connections and an MS connector for the encoder connections. The mating connector is supplied with the motor. As an option, a pre-wired MS connector with mating plug is available. MNVM-MS10.

(4) Top speeds refer to direct-coupled applications. For belt drive applications over base speed, consult factory. For other base and top speeds, contact Danaher Motion Engineered Systems Center for product and pricing information.

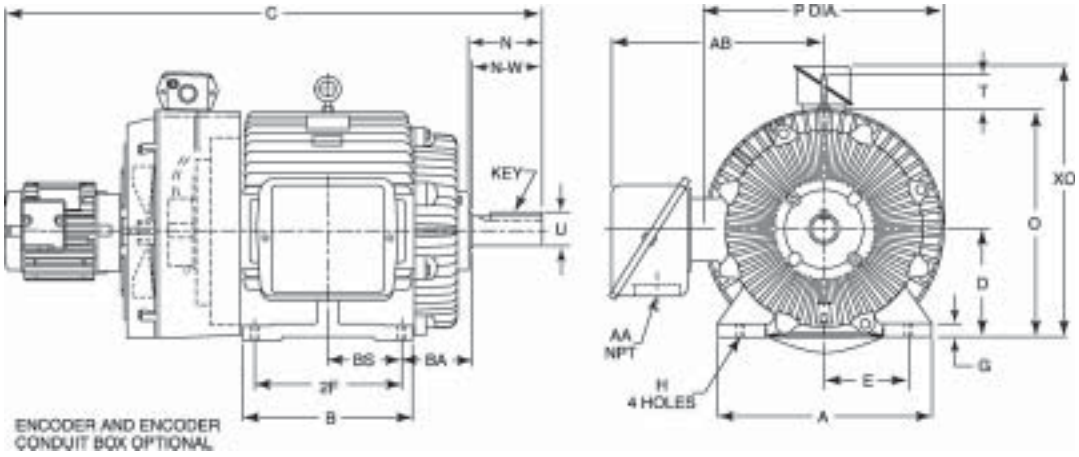
* NEMA design A optimized for use with IGBT inverter. All other motors are NEMA Design B.

# AC Motor Dimensions




| FRAME | A | B MAX | C MAX | AG MAX | D | E | 2F | BS | G | H | AH | O | P | AB | BA | T | U | BD | AK | AJ | BF | AA | BB | KEY |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 56C | 6.50 | 4.00 | 14.98 | 10.61 | 3.50 | 2.44 | 3.00 | 5.25 | .12 | .35 | 2.06 | 6.71 | 8.52 | 5.56 | 2.75 | - | .625 | 6.48 | 4.500 | 5.875 | 3/8-16 | - | .13 | .19X.19X1.38 |
| 143TC | 6.50 | 6.50 | 15.04 | 10.61 | 3.50 | 2.75 | 4.00 | 4.93 | .12 | .35 | 2.12 | 6.71 | 8.52 | 5.56 | 2.75 | - | .875 | 6.48 | 4.500 | 5.875 | 3/8-16 | - | .13 | .19X.19X1.38 |
| 145TC | 6.50 | 6.50 | 16.04 | 11.61 | 3.50 | 2.75 | 5.00 | 5.93 | .12 | .35 | 2.12 | 6.71 | 8.52 | 5.56 | 2.75 | - | .875 | 6.48 | 4.500 | 5.875 | 3/8-16 | - | .13 | .19X.19X1.38 |
| 182TC | 8.50 | 7.75 | 17.94 | 13.00 | 4.50 | 3.75 | 4.50 | 3.25 | .40 | .44 | 2.62 | 11.87 | 12.02 | 7.02 | 3.50 | 2.62 | 1.125 | 8.88 | 8.50 | 7.250 | 1/2-13 | 1.09 | .27 | .25X.25X1.75 |
| 184TC | 8.50 | 7.25 | 19.94 | 15.00 | 4.50 | 3.75 | 5.50 | 4.25 | .40 | .44 | 2.62 | 11.87 | 12.02 | 7.02 | 3.50 | 2.62 | 1.125 | 8.88 | 8.50 | 7.250 | 1/2-13 | 1.09 | .27 | .25X.25X1.75 |
| 213TC | 9.50 | 8.75 | 20.24 | 14.81 | 5.25 | 4.25 | 5.50 | 3.75 | .50 | .44 | 3.12 | 13.12 | 13.00 | 7.50 | 4.25 | 2.50 | 1.375 | 8.76 | 8.500 | 7.250 | 1/2-13 | 1.34 | .28 | .31X.31X2.38 |
| 215TC | 9.50 | 11.75 | 23.24 | 17.81 | 5.25 | 4.25 | 7.00 | 5.25 | .50 | .44 | 3.12 | 13.12 | 13.00 | 7.50 | 4.25 | 2.50 | 1.375 | 8.76 | 8.500 | 7.250 | 1/2/13 | 1/34 | .28 | .31X.31X2.38 |
| 254TC | 11.50 | 14.50 | 26.87 | 20.81 | 6.25 | 5.00 | 8.25 | 10.40 | .55 | .56 | 3.75 | 14.12 | 13.77 | 8.10 | 4.75 | 2.62 | 1.625 | 8.76 | 8.500 | 7.250 | 1/2-13 | 1.75 | .27 | .38X.38X2.88 |
| 256TC | 11.50 | 16.25 | 26.87 | 20.81 | 6.25 | 5.00 | 10.00 | 10.40 | .55 | .56 | 3.75 | 14.12 | 13.77 | 8.10 | 4.75 | 2.62 | 1.625 | 8.76 | 8.500 | 7.250 | 1/2-13 | 1.75 | .27 | .38X.38X2.88 |
| 284TC | 13.00 | 13.00 | 27.23 | 20.57 | 7.00 | 5.50 | 9.50 | 5.50 | .62 | .56 | 4.38 | 17.27 | 19.47 | 12.31 | 4.75 | 3.12 | 1.875 | 10.25 | 10.500 | 9.00 | 1/2-13 | 1.50 | .27 | .50X.50X3.25 |

These motors are NEMA Design A optimized for use with IGBT inverter.




| FRAME | A (MAX) | B (MAX) | C | D | E | 2F | G | H | 0 (MAX) | P (MAX) | T | U | N | AA | AB (MAX) | BA | BS | N-W | XC | KEY |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 286T | 13.00 | 13.00 | 28.20 | 7.00 | 5.50 | 11.00 | .62 | .53 | 14.19 | 14.32 | 3.12 | 1.875 | 4.81 | 1.50 | 12.50 | 4.75 | 5.50 | 4.38 | 10.88 | .50X.50X3.25 |
| 324T | 15.75 | 13.00 | 39,84 | 8.00 | 6.25 | 10.50 | .86 | .66 | 15.94 | 15.88 | 3.12 | 2.125 | 5.50 | 2.00 | 15.44 | 5.25 | 5.25 | 5.00 | 20.25 | .50X.50X3.88 |
| 326T | 15.75 | 14.50 | 41.34 | 8.00 | 6.25 | 12.00 | .86 | .66 | 15.94 | 15.88 | 3.12 | 2.125 | 5.50 | 2.00 | 15.44 | 5.25 | 6.00 | 5.00 | 20.25 | .50X.50.3.88 |
| 364T | 17.75 | 13.25 | 41.84 | 9.00 | 7.00 | 11.25 | 1.12 | .66 | 19.00 | 20.00 | 3.62 | 2.375 | 6.12 | 3.00 | 17.88 | 5.88 | 5.62 | 5.62 | 22.62 | .62X.62X4.25 |
| 365T | 17.75 | 14.25 | 42.84 | 9.00 | 7.00 | 12.25 | 1.12 | .66 | 19.00 | 20.00 | 3.62 | 2.375 | 6.12 | 3.00 | 17.88 | 5.88 | 6.12 | 5.62 | 22.62 | .62X.62X4.25 |
| 404T | 19.25 | 14.75 | 45.89 | 10.00 | 8.00 | 12.25 | 1.12 | .81 | 20.88 | 21.75 | 3.62 | 2.875 | 7.50 | 3.00 | 18.75 | 6.62 | 6.12 | 7.00 | 24.06 | .75X.75X5.62 |
| 405T | 19.25 | 16.25 | 47.39 | 10.00 | 8.00 | 13.75 | 1.12 | .81 | 20.88 | 21.75 | 3.62 | 2.875 | 7.50 | 3.00 | 18.75 | 6.62 | 6.88 | 7.00 | 24.06 | .75X.75X5.62 |
| 444T | 21.50 | 17.75 | 53.78 | 11.00 | 9.00 | 14.50 | 1.25 | .81 | 24.19 | 26.31 | 4.19 | 3.375 | 8.75 | 3.00 | 20.74 | 7.50 | 7.25 | 8.25 | 26.95 | .88X.88X6.88 |
| 445T | 21.50 | 19.75 | 55.78 | 11.00 | 9.00 | 16.50 | 1.25 | .81 | 24.19 | 26.31 | 4.19 | 3.375 | 8.75 | 3.00 | 20.74 | 7.50 | 8.25 | 8.25 | 26.95 | .88X.88X6.88 |
| 449T | 21.50 | 28.25 | 63.32 | 11.00 | 9.00 | 25.00 | 1.25 | .81 | 24.19 | 26.31 | N/A | 3.375 | 8.75 | 4.00 | 25.90 | 7.50 | 1.78 | 8.25 | 27.03 | .88X.88X6.88 |

These motors are NEMA Design B.

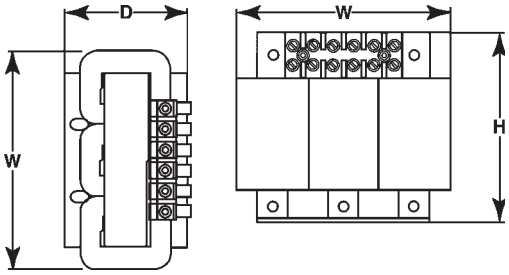
# Open Frame Line Reactor Dimensions

## 230VAC, Three-Phase, 3% Line Impedance

| HP | Inductor Value (mH) | Max. Current Ratings (A) | Watts Loss/ Weight[1] | Dim. Figure | Part# (open) | Dim. Figure | Part# (NEMA 1) |
|---|---|---|---|---|---|---|---|
| 1 | 6.50 | 4 | 19/9 | 1A | PTR5013-300 | 2 | PTR5013-400 |
| 2 | 2.50 | 6 | 16/6 | 1A | PTR5013-302 | 2 | PTR5013-402 |
| 3 | 1.50 | 10 | 25/6 | 1A | PTR5013-303 | 2 | PTR5013-403 |
| 5 | 0.80 | 15 | 32/6 | 1B | PTR5013-304 | 2 | PTR5013-404 |
| 7.5 | 0.45 | 25 | 40/11 | 1C | PTR5013-305 | 3 | PTR5013-405 |
| 10 | 0.40 | 35 | 70/13 | 1D | PTR5013-306 | 3 | PTR5013-406 |
| 15 | 0.25 | 50 | 82/22 | 1E | PTR5013-307 | 3 | PTR5013-407 |
| 20 | 0.25 | 50 | 82/22 | 1F | PTR5013-308 | 3 | PTR5013-408 |

[1] For enclosed units, add 7 lbs for PTR5013-203 to -403, 22 lbs for PTR5013-404 to -408.

Open Frame, Fig. 1A – 1I




### Open Frame

| Fig. No. | H | W | D |
|---|---|---|---|
| 1A | 4.00 | 4.25 | 3.00 |
| 1B | 5.00 | 5.81 | 3.25 |
| 1C | 5.60 | 6.62 | 3.12 |
| 1D | 5.60 | 6.75 | 3.12 |
| 1E | 5.60 | 6.88 | 3.12 |
| 1F | 5.60 | 6.88 | 3.44 |

### NEMA 1 Enclosure

| Dimensions (inches) | | | |
|---|---|---|---|
| Fig. No. | H | W | D |
| 2 | 6.50 | 8.00 | 6.00 |
| 3 | 7.50 | 10.00 | 7.00 |

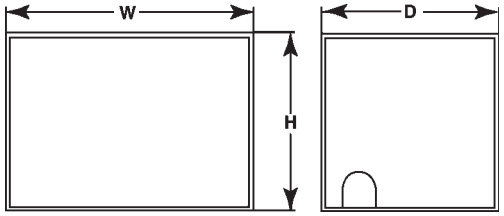
## 460VAC, Three-Phase, 3% Line Impedance

| HP | Inductor Value (mH) | Max. Current Ratings (A) | Watts Loss/ Weight[1] | Dim. Figure | Part# (open) | Dim. Figure | Part# (NEMA 1) |
|---|---|---|---|---|---|---|---|
| 1 | 11.026 | 2 | 8 | 1A | PTR5013-00 | 2 | PTR4013-200 |
| 2 | 5.513 | 4 | 15 | 1A | PTR5013-02 | 2 | PTR5013-202 |
| 3 | 3.675 | 6 | 17 | 1A | PTR5013-03 | 2 | PTR5013-203 |
| 5 | 2.75 | 8 | 27 | 1B | PTR5013-04 | 2 | PTR5013-204 |
| 7.5 | 1.838 | 12 | 31 | 1B | PTR5013-05 | 2 | PTR5013-205 |
| 10 | 1.376 | 16 | 38 | 1B | PTR5013-06 | 2 | PTR5013-206 |
| 15 | .882 | 25 | 48 | 1C | PTR5013-07 | 3A | PTR5013-207 |
| 20 | .87 | 27 | 58 | 1C | PTR5013-08 | 3A | PTR5013-208 |
| 25 | .630 | 35 | 70 | 1D | PTR5013-09 | 3A | PTR5013-209 |
| 30 | .490 | 45 | 74 | 1E | PTR5013-10 | 3A | PTR5013-210 |
| 40 | .401 | 55 | 113 | 1F | PTR5013-11 | 3B | PTR5013-211 |
| 50/60 | .276 | 80 | 129 | 1G | PTR5013-12 | 3C | PTR5013-212 |
| 75* | .200 | 110 | 338 | 1H | PTR5013-14 | 3C | PTR5013-214 |
| 100 | .170 | 130 | 362 | 1I | PTR5013-15 | 3C | PTR5013-215 |

[1] For enclosed units, add 7 lbs for PTR5013-200 to -206, 22 lbs for PTR5013-07 to -213, and 31 lbs for PTR5013-214 to -215.

* Lifting lugs provided on 75 HP and above.

NEMA 1 Enclosure, Fig. 2



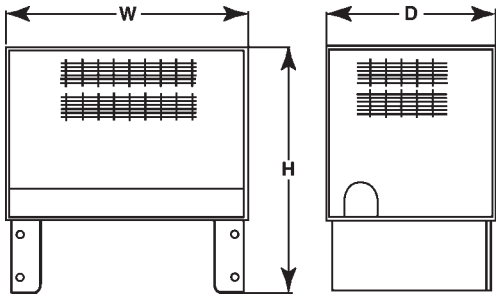

### Open Frame

| Fig. No. | H | W | D |
|---|---|---|---|
| 1A | 4.00 | 4.25 | 3.00 |
| 1B | 5.00 | 5.81 | 3.25 |
| 1C | 5.60 | 6.94 | 3.44 |
| 1D | 5.60 | 6.75 | 3.86 |
| 1E | 5.60 | 6.88 | 3.86 |
| 1F | 6.89 | 8.44 | 4.25 |
| 1G | 8.50 | 10.25 | 4.75 |
| 1H | 9.50 | 10.56 | 8.25 |
| 1I | 8.50 | 9.88 | 5.75 |

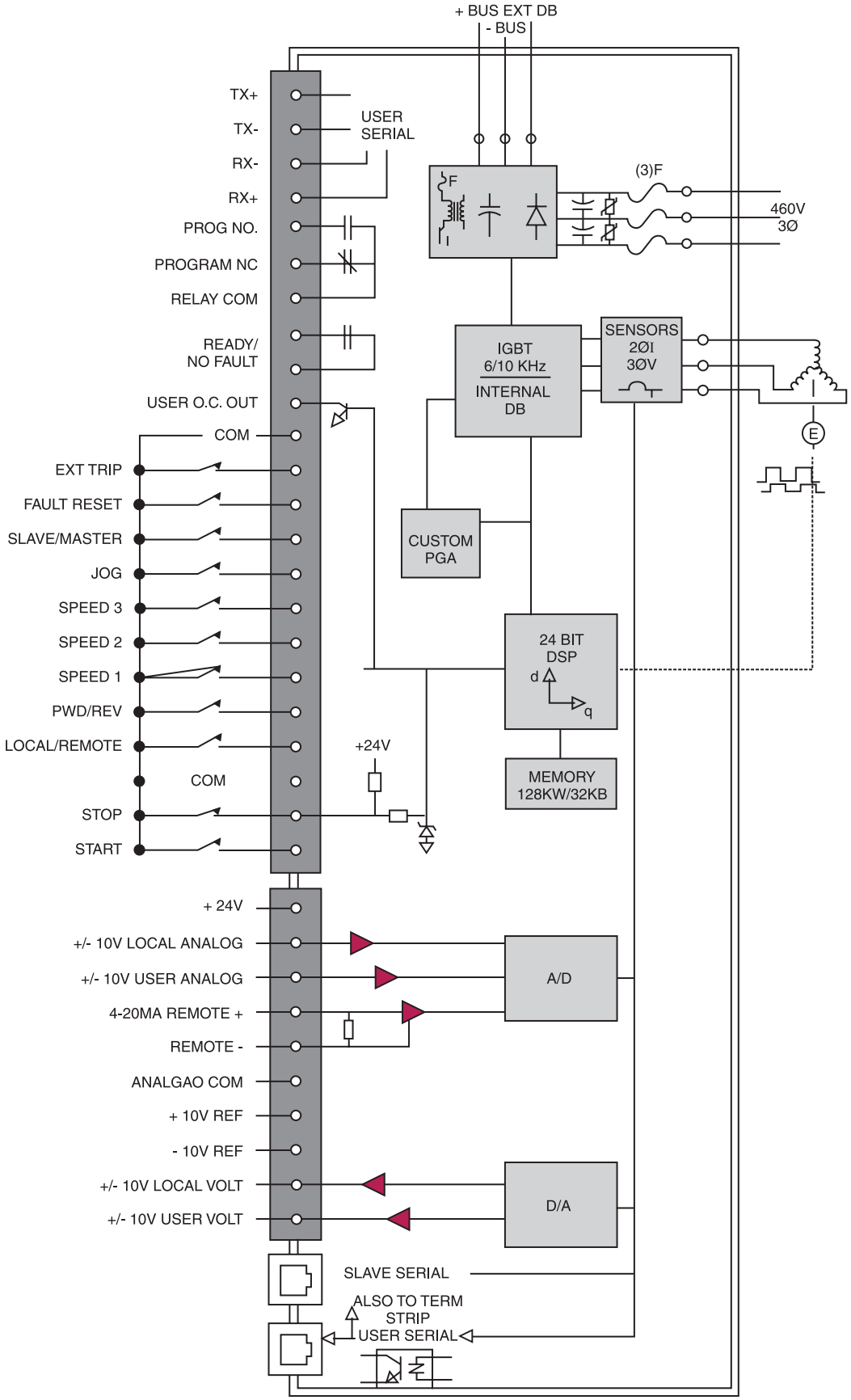
### NEMA 1 Enclosure

| Dimensions (inches) | | | |
|---|---|---|---|
| Fig. No. | H | W | D |
| 2 | 6.50 | 8.00 | 6.00 |
| 3A | 7.50 | 10.00 | 7.00 |
| 3B | 9.00 | 12.00 | 8.00 |
| 3C | 16.00 | 15.00 | 13.00 |

NEMA 1 Enclosure, Fig. 3, 3A – 3C



# Terminal Location Diagram



# How to Order

In determining the components that comprise a drive system, the following selections must be made for features and options.

## SV3000 Series AC Motor Drive

- Select horsepower and ranges
- AC input voltage – 460VAC/3Ø
- Motor voltage – 460V

Now select drive configuration, chassis, or enclosure, and standard or enhanced performance models. The enhanced performance model was designed for applications requiring very accurate speed holding or high dynamic response. Determine which operators are required and which remote operator station meets this need. From the list of standard options, select those required for your application.

## AC Motor

With the motor voltage specified by the AC input voltage (460VAC), now determine the AC motor required. For standard performance drives, select from the table on page 11 for standard performance AC motors. For enhanced performance drives, select from the enhanced performance AC motors with the -01 suffix (motor supplied with encoder).

## Isolation Transformer

Select KVA of transformer by adding the total KVA ratings of all drives to be connected to the transformer. Then select model number by primary input voltage and secondary output voltage.

## Line Reactors

If the distance between the drive and motor exceeds 50 feet, a 3Ø line reactor should be included between the drive and motor to prevent fault trips due to cable capacitances selected by the HP of the drive.

## Options / Accessories

- Determine which options are required for your application. This could include speed and/or load meters.
- Options will be factory installed where applicable, and shipped loose otherwise.

**Example**

An application requires a 5 HP AC motor, 1800 RPM, base speed, C-face, TENV frame, and thermostat. The AC adjustable speed drive specifications require an enclosed NEMA 4/12, 1% of base speed regulation, dynamic braking, 5 HP, 460VAC three-phase input, and to be operated from a customer-supplied PLC. Isolation transformer will be 460V Pri/460V secondary, 7.5 KVA, and NEMA 1 enclosed.

| Item | Qty | Part No. |
|---|---|---|
| 1 | 1 | SV3405-01000* |
| 2 | 1 | MVM05 |
| 3 | 1 | TRT44-007 |
| 4 | 1 | Specify as required |

*The standard performance SV3405-01000 was selected because it meets all the requirements of the application. For applications requiring greater DB capability, an external DB kit would be used instead of the internal DB resistor.

## Service

It is intended that the SECO SV digital AC inverter be serviced by replacing the unit.

**For additional assistance, please call Danaher Motion Engineered Systems Center at 704-588-5693.**

# About Danaher

### The core of our business

The Danaher Corporation designs, manufactures, and markets industrial and consumer products in three principal businesses — Process/Environmental Controls, Tools/ Components and Automation. We focus on the advantages of strong brand names, proprietary technology, and leading market positions.

### What sets us apart

Danaher distinguishes itself from other companies by looking beyond the immediate competition. We set our expectations, quality, customer service, and cost at stretch levels — world-class standards. Striving toward these benchmarks keeps us well ahead of our competition.

Our 23,000 associates, located in Danaher facilities around the world, are active participants in the powerful management process we call the Danaher Business System (DBS). This cohesive and pervasive philosophy begins with outstanding people and superior market-driven and customer-driven plans. The Danaher Business System provides the tools and methodology to advance quality, improve customer service, and reduce cost.

The Engineered Systems Center provides a highly customized, engineered solution to your motion control problems using Danaher motion products.
We also integrate a wide range of other technologies and products into our designs.

All of these services and products are available worldwide through an extensive authorized distributor network.
These distributors provide technical support, replacement parts, and literature, as well as an extensive inventory of replacement models off-the-shelf for the fastest possible delivery and service. Call your nearest distributor for ordering and application information.

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