

The multi-purpose Industrial AC Drive that solves 90% of all stand-alone and system variable speed motor needs



Whether your applications are simple fans or pumps, or more complex applications such as web processing systems where DC Drive performance or better is required, the GV3000/SE will meet your application needs while providing the convenience of using an AC induction motor. GV3000/SE provides simplicity and broad application flexibility with the performance features you need in a cost effective global design.

STANDARD FEATURES

3 control methods are included as standard:

- General Purpose/Scalar (V/Hz)
- Sensorless Vector Control (SVC)
- Flux Vector Control (FVC)

Each method provides a cost effective means to address the wide range of applications required by today's demanding drives customers. All methods are standard without the need for expensive or complicated option boards.

A simple, yet powerful keypad built into every GV3000/SE allows the bright 7-segment LED display to provide Output Frequency (Hz), RPM, kW, Motor Volts, Motor Current, and % Motor Torque. All of these functions are easily displayed by using the ENTER Key for scrolling.

LED's also identify the drives status: Running, Remote, Jog, Auto, Forward, Reverse, or Program. The intuitive nature of the drive's keypad makes GV3000/SE the obvious choice for users and OEMs who demand "operator friendly" products.

For added convenience, a remote mounted operator interface (OIM) with text selection in 5 languages is available as well as a CS3000 Windows® based software for those who desire a more powerful interface.

For communications, GV3000/SE networks on several industrial protocols including Reliance Electric's AutoMax®, as well as open architectures such as DeviceNet™, ControlNet™, Profibus™ and Interbus-S™.

- Input Voltages:
 - 200-230 VAC, 50/60 Hz
 - 380-460 VAC, 50/60 Hz
- HP Ratings:
 - 1 HP to 100 HP, 200-230 VAC
 - 1 HP to 400 HP, 380-460 VAC
- Enclosures:
 - 1 to 5 HP: NEMA 1, 12 & 4X/IP20, 52 & 54
 - 7.5 to 60 HP: NEMA 1 & 12/IP20 & 52
 - 30 to 200 HP: NEMA 0/IP00
 - 75 to 400 HP: NEMA 1/IP20 IEC
- Inverter Type:
 - PWM with IGBT's

- Switching Frequency:
 - Adjustable from 2, 4 or 8 kHz
- Isolated Analog Inputs (qty. 1):
 - ± 10 or 0 -10 VDC, or 4-20 mA
- Analog Output (qty. 1):
 - 0-10 VDC or 4-20 mA
- Isolated digital inputs (qty. 8 std.):
 - Start/Stop, Reset, Fwd/Rev, Run/Jog, Function Loss, Preset Speeds, MOP Speed Operation, Ramp Selection
- Programmable Digital Output Relay (qty. 1 each): Form A (N.C) and Form B (N.O.)
 - Selectable as IET Fault, drive running or network comm. active
- Dynamic Response with FVC:
 - 100 Rad/Sec (15 Hz) Speed Loop
 - 1,000 Rad/Sec (150 Hz) Torque Loop
- Operating Speed Range:
 - 20:1 V/Hz; 120:1 SVC; 1000:1 FVC
- Steady State Speed Regulation (% Base RPM):
 - V/Hz = 1.0%, 20:1 CT range
 - SVC = 0.5%, 40:1 CT range
 - FVC = 0.01%, 100:1 CT range
- Encoder PPR selection
 - SE, 512, 1024, 2048 & 4096

SPECIFICATIONS

Software Features & Functions

Operation Features
Accel & Decel Ramps w/ S-Curve
Analog I/O with ± 10 VDC, 0-10 VDC or 4-20 mA selection with gain and offset adjustments
Auto Reset with Time and Interval selection
Avoidance Frequencies with 3 Programmable setpoints
Carrier Frequency (IGBT Switching) select 2, 4 or 8 kHz
Control Method selection for V/Hz or Vector Modes
Critical Frequency Avoidance in V/Hz Mode
Current Limit with adjustable settings of 50% to 110% = V/Hz and $\leq 150\%$ = Vector
Discrete I/O Programmable and Assignable
Electronic Thermal Overload (NEC/UL approved)
Encoder PPR selection (SE, 512, 1024, 2048 & 4096) in Vector Mode
Jog Speed Programmable with assigned Accel & Decel
Line Dip Ride Through, Programmable time settings of 0.1 to 999.9 sec. = V/Hz; Fixed at 500 ms = Vector
Preset Speed selections 8 standard
Operation Control (by Keypad, Terminal Strip, Serial Port, or optional Communication Boards)
Output Frequency range of 0.5 Hz to 200 Hz in V/Hz; 0 RPM to 2 times Base Speed (SVC Mode); 0 RPM to 4 times Base Speed (FVC Mode)
Overfrequency Limit for overspeed protection
Output Relays (1 std., 3 w/ option card), Programmable and Assignable
Stop Selection for Coast or Ramp to Rest
Torque Boost Voltage, Programmable for $\leq 20\%$ of nominal input line voltage
Volts/Hz Select; Linear, Optimized & Squared Curves
Performance Features
Current Compounding for Load Sharing (SVC & FVC)
Dynamic Torque Limit (SVC & FVC)
Inertia Compensation (SVC & FVC)
Speed or Torque Regulation Reference Trim (SVC & FVC)
Slip Compensation/Adjustment (V/Hz & SVC)
Trip-Free Acceleration & Deceleration (V/Hz & Vector)
Trim Speed or Torque references w/ a 20ms update through the optional analog or frequency input
Tuning of Speed & Torque Loop PI Regulators (Vector)

Special Functions

DC Injection Braking with Programmable Time, Frequency & Current settings in V/Hz Mode
Draw Control Gain for ratio control & cascading multidrive applications
Elapsed Time Meter for days of operation
Error Log for Diagnostics maintains last 10 faults
Inverse Analog Reference
MOP (motor operated pot) Function by digital inputs with programmable rates
Motor Overload with motor cooling selection
Password Protectable "Lock-Out"
PI Setpoint Control via the standard analog input with setpoints from digital, analog settings or network speed reference sources.
Edge or Level sense detection for start command
Reverse Disable
Snubber Resistor Braking (Dynamic Braking) Enable
Trip-free Deceleration with rate adaptation for high inertia loads
Universal scaling of LED display for rates other than frequency or rpm
Zero Speed Hold for Vector Mode operation to enhance deceleration to stop and for cycling stop-start applications
"Sleep" mode with external pot.

Dimensions & Weights

For dimensions by model number, refer to list price pages D2-15 through D2-21
 Note that NEMA 1 and NEMA 12 or 4X/12 enclosed ratings from 1 HP to 60 HP are identical in dimensions and weights when both enclosure types are not shown.

SERVICE CONDITIONS

Elevation: 3300 Ft. (1000 meters)

Ambient Temp. NEMA Enclosed and IEC Bookshelf: 0°C to 40°C (32°F to 104°F)

Ambient Temp. Open Chassis (M/N's "1V" thru "60G"): 0°C to 50°C (32°F to 122°F)

Ambient Temp. Power Modules (75V4060 thru 200V4060 and 30V2060 thru 100V2060): 0°C to 55°C (32°F to 131°F)

Atmosphere: Non-Condensing
 Relative Humidity $\leq 95\%$

AC Line Voltage Variation: $\pm 10\%$

AC Line Frequency: 48 Hz to 62 Hz

INSTRUCTION MANUALS

Hardware Reference, Installation and Troubleshooting:

- 200-230 VAC Drives:
 - M/N 1V2160 - 20V2160: D2-3388
 - M/N 30V2060 - 100V2060: D2-3417
- 380-460 VAC Drives:
 - M/N 1V4160 - 60G4160: D2-3360
 - M/N 50R4160 - 125R4160: D2-3360
 - M/N 50T4160 - 75T4160: D2-3360
 - M/N 75V4060 - 200V4060: D2-3392
 - M/N 200V4160 - 400V4160: D2-3360
 - M/N 31ER4060 - 430ER4060: D2-3427
 - M/N 31ET4060 - 430ET4060: D2-3427

Software Startup and Reference Manuals:

- 200-230 VAC Drives:
 - M/N 1V2160 - 20V2160: D2-3387
 - M/N 30V2060 - 100V2060: D2-3416
- 380-460 VAC Drives:
 - M/N 1V4160 - 60G4160: D2-3359
 - M/N 50R4160 - 125R4160: D2-3359
 - M/N 50T4160 - 75T4160: D2-3359
 - M/N 75V4060 - 200V4060: D2-3391
 - M/N 200V4160 - 400V4160: D2-3359
 - M/N 31ER4060 - 430ER4060: D2-3426
 - M/N 31ET4060 - 430ET4060: D2-3426

200-230 VAC, 50/60 HZ INPUT; RATINGS 1 HP THROUGH 20 HP



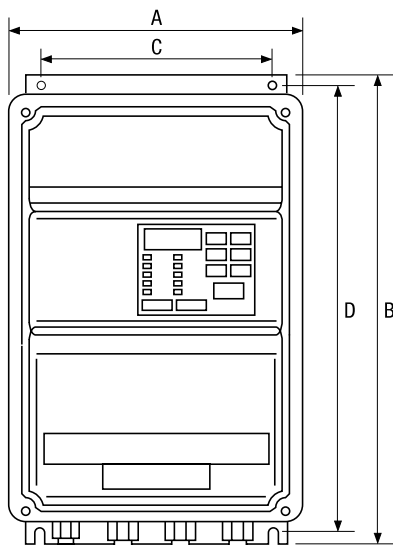
Product Features:

- NEMA 1,12 or 4X/IP20, 52 & 54 enclosures simplify stand alone applications
- In General Purpose (Scalar V/Hz) Mode, 110% Continuous Motor Overload Capacity
- In Vector (SVC or FVC) Mode, 150% Overload Capacity for 1 minute
- Full Power Rating from 2 kHz through 8 kHz Carrier Frequency Operation
- Removable cover converts to open chassis and allows 50° C ambient operation
- Local operator keypad with LED display is built-in for convenience

HP (kW) Rating ⁽¹⁾ at Parameter "P.048"		Drive Selection 200-230 VAC, 3-Phase, 50/60 Hz GV3000/SE					
P.048 = U-H	P.048 = UEC	Max. Continuous Output Amps/Motor Current		NEMA 1/IP20 Enclosed Chassis		NEMA12/IP52 Enclosed Chassis	
V/Hz Mode	Vector Mode	V/Hz Mode	Vector Mode	Model No.	List	Model No.	List
1 (1.4)	1 (1.4)	5.1	5.1	1V2160 ♦	\$1,107	1V2460 ⁽²⁾ ♦	\$1,203
2 (2.3)	2 (2.3)	8.5	8.5	2V2160 ♦	1,166	2V2460 ⁽²⁾ ♦	1,267
3 (3.4)	3 (3.4)	12.3	12.3	3V2160 ♦	1,215	3V2460 ⁽²⁾ ♦	1,321
5 (5.8)	5 (5.8)	21	21	5V2160 ♦	1,273	5V2460 ⁽²⁾ ♦	1,383
7-1/2 (7.4)	7-1/2 (7.4)	26.9	26.9	7V2160 ♦	1,618	7V2260 ♦	1,759
10 (9.7)	10 (9.7)	35	35	10V2160 ♦	1,752	10V2260 ♦	1,904
15 (14.7)	15 (14.7)	53.3	53.3	15V2160 ♦	2,987	15V2260 ♦	3,247
20 (19.2)	20 (19.2)	69.6	69.6	20V2160 ♦	3,735	20V2260 ♦	4,060

- (1) Based upon NEMA B induction motor ratings only. Application load and speed requirements must be considered to properly size the motor and drive. HP and kW ratings are based upon 230 V and 200 V inputs respectively. kW ratings are based upon an assumed motor Power Factor of 80%.
- (2) Enclosure carries NEMA 12/4X (IP52/54) rating for Dusttight and Washdown application environments.

AC Drives



230 V Dimensions: 1 HP to 20 HP

Model No.	A	B	C	D	Depth	Weight
1V2160						
1V2460						
2V2160						
2V2460	8.75	11.05	7.80	10.01	7.87	14 lb
3V2160	(222.3)	(280.7)	(198.1)	(254.3)	(199.9)	6.4 kg
3V2460						
5V2160						
5V2460						
7V2160						
7V2260	11.05	13.32	9.76	12.17	7.87	20 lb
10V2160	(280.7)	(338.3)	(247.9)	(309.1)	(199.9)	9.1 kg
10V2260						
15V2160						
15V2260	11.34	18.23	8.78	17.40	9.37	35 lb
20V2160	(288.0)	(463.0)	(223.0)	(442.0)	(238.0)	15.9 kg
20V2260						

inches (mm)

♦ Normally carried in stock

DISCOUNT VS-1AC

200-230 VAC, 50/60 HZ INPUT; RATINGS 30 HP THROUGH 100 HP

Product Features:

- NEMA 0/IP00 power module construction for panel mounting
- 55°C ambient
- Exposed line & load stabs for easy access and wiring
- Compact size
- Built-in keypad and RS-232 port

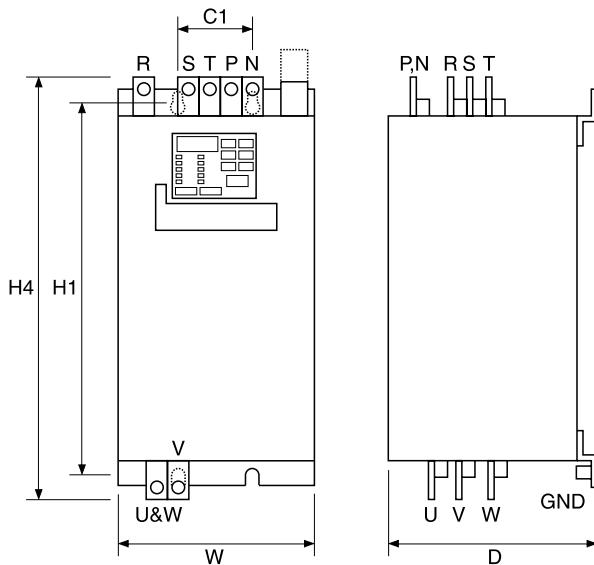


AC Drives

HP (kW) Rating ⁽¹⁾ at Parameter "P.048"						Drive Selection 200-230 VAC, 3-Phase, 50/60 Hz GV3000/SE							Model No. ⁽²⁾	List
P.048 = U-H			P.048 = UEC			Continuous Output Amps / Motor Current								
V/Hz Mode			Vector Mode			V/Hz Mode			Vector Mode					
2 kHz	4 kHz	8 kHz	2 kHz	4 kHz	8 kHz	2 kHz	4 kHz	8 kHz	2 kHz	4 kHz	8 kHz			
30 (29)	30 (29)	25 (23)	30 (29)	30 (29)	25 (23)	105	105	84	105	105	84	30V2060♦	\$7,082	
40 (37)	40 (37)	30 (29)	40 (37)	40 (37)	30 (29)	135	135	108	135	135	108	40V2060♦	7,588	
50 (41)	50 (41)	40 (33)	50 (41)	50 (41)	40 (33)	150	150	120	150	150	120	50V2060♦	9,463	
60 (53)	60 (53)	50 (43)	60 (53)	60 (53)	50 (43)	195	195	156	195	195	156	60V2060♦	11,272	
75 (67)	75 (67)	60 (54)	75 (67)	75 (67)	60 (54)	245	245	196	245	245	196	75V2060♦	12,210	
100 (76)	100 (76)	75 (60)	100 (76)	100 (76)	75 (60)	275	275	220	275	275	220	100V2060♦	14,985	

- (1) Based upon NEMA Design B induction motor ratings only. Application load and speed requirements must be considered to properly size the motor and drive. HP and kW ratings are based upon 230 V and 200 V inputs respectively. kW ratings are based upon an assumed motor Power Factor of 80%.
- (2) An input impedance of 3% is required for this full load amp rating at 2 kHz and 4 kHz. Use either an isolation transformer or a line reactor when the input impedance is less than 3%, or derate the 2 kHz and 4 kHz power rating to the 8 kHz rating shown.

230 V Dimensions: 30 HP to 100 HP



Physical Dimensions - IP00 Power Module						
HP	C1	H1	H4	W	D	Weight
30	3.9 (100)	21.4 (544)	23.9 (606)	9.3 (235)	13.6 (354)	34 kg (75 lb)
40	3.9 (100)	21.4 (544)	23.9 (606)	9.3 (235)	13.6 (354)	34 kg (75 lb)
50	3.9 (100)	21.4 (544)	23.9 (606)	9.3 (235)	13.6 (354)	34 kg (75 lb)
60	7.9 (200)	28.1 (714)	28.1 (776)	9.6 (245)	14.4 (366)	44 kg (97 lb)
75	7.9 (200)	28.1 (714)	28.1 (776)	9.6 (245)	14.4 (366)	44 kg (97 lb)
100	7.9 (200)	28.1 (714)	28.1 (776)	9.6 (245)	14.4 (366)	44 kg (97 lb)

inches (mm)

♦ Normally carried in stock

DISCOUNT VS-1AC

380-460 VAC, 50/60 HZ, INPUT; RATINGS 1 HP THROUGH 60 HP

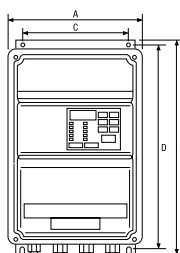
Product Features:

- NEMA 1,12 or 4X/IP20, 52 & 54 enclosures simplify stand alone applications
- In General Purpose (Scalar V/Hz) Mode, 110% Continuous Motor Overload Capacity
- In Vector (SVC or FVC) Mode, 150% Overload Capacity for 1 minute
- Full Power Rating from 2 kHz through 8 kHz Carrier Frequency Operation
- Removable cover converts to open chassis and allows 50° C ambient operation
- Local operator keypad with LED display is built-in for convenience



HP (kW) Rating ⁽¹⁾ at Parameter "P.048"		Drive Selection 380-460 VAC, 3-Phase, 50/60 Hz GV3000/SE					
P.048 = U-H	P.048 = UEC	Max. Continuous Amps/Motor Current		NEMA 1/IP20 Enclosed Chassis		NEMA 12/IP52 Enclosed Chassis	
V/Hz Mode	Vector Mode	V/Hz Mode	Vector Mode	Model No.	List	Model No.	List
1 (1.1)	1 (1.1)	2.1	2.1	1V4160♦	\$1,187	1V4460 ⁽²⁾ ♦	\$1,247
2 (1.8)	2 (1.8)	3.4	3.4	2V4160♦	1,283	2V4460 ⁽²⁾ ♦	1,346
3 (2.9)	3 (2.9)	5.3	5.3	3V4160♦	1,470	3V4460 ⁽²⁾ ♦	1,544
5 (4.5)	5 (4.5)	8.2	8.2	5V4160♦	1,859	5V4460 ⁽²⁾ ♦	1,951
7-1/2 (6.1)	7-1/2 (6.1)	11.1	11.1	7V4160♦	2,133	7V4260♦	2,239
10 (7.8)	10 (7.8)	14.2	14.2	10V4160♦	2,651	10V4260♦	2,784
15 (11.6)	15 (11.6)	21	21	15V4160♦	3,367	15V4260♦	3,535
20 (14.9)	20 (14.9)	27	27	20V4160♦	4,003	20V4260♦	4,202
25 (16.8) ⁽³⁾	20 (14.9) ⁽³⁾	30.4 ⁽³⁾	27 ⁽³⁾	25G4160 ⁽³⁾ ♦	4,345	25G4260 ⁽³⁾ ♦	4,563
25 (19.1)	25 (19.1)	34.5	34.5	25V4160♦	5,770	25V4260♦	6,059
30 (22.1)	30 (22.1)	40	40	30V4160♦	7,142	30V4260♦	7,499
40 (29.9)	40 (29.9)	54	54	40V4160♦	8,042	40V4260♦	8,444
50 (37.1)	50 (37.1)	67	67	50V4160♦	8,554	50V4260♦	8,982
60 (43.2) ⁽³⁾	50(37.1) ⁽³⁾	78 ⁽³⁾	67 ⁽³⁾	60G4160 ⁽³⁾ ♦	10,486	60G4260 ⁽³⁾ ♦	11,010

- (1) Based upon NEMA B induction motor ratings only. Application load and speed requirements must be considered to properly size the motor and drive. HP and kW ratings are based upon 460 V and 400 V inputs respectively. kW ratings are based upon an assumed motor Power Factor of 80%.
- (2) Enclosure carries NEMA 12/4X (IP52/54) rating for both Dustight and Washdown application environments.
- (3) Derate HP (kW) rating in Vector Mode configuration.



460 V Dimensions: 1 HP to 60 HP

Model No.	A	B	C	D	Depth	Weight
1V4160 1V4460						14 lb
2V4160 2V4460	8.75	11.05	7.80	10.01	7.87	14 lb
3V4160 3V4460	(222.3)	(280.7)	(198.1)	(254.3)	(199.9)	6.4 kg
5V4160 5V4460						
7V4160 7V4260	11.05	13.32	9.76	12.17	7.87	20 lb
10V4160 10V4260	(280.7)	(338.3)	(247.9)	(309.1)	(199.9)	9.1 kg
15V4160 15V4260	11.34	18.23	8.78	17.40	9.37	35 lb
20V4160 20V4260	(288.0)	(463.0)	(223.0)	(442.0)	(238.0)	15.9 kg
25G4160 25G4260						
25V4160 25V4260	14.80	23.82	12.13	22.25	13.78	52 lb
30V4160 30V4260	(376.0)	(605.0)	(308.0)	(565.2)	(350.0)	23.6 kg
40V4160 40V4260						
50V4160 50V4260	14.80	23.82	12.13	22.25	13.78	57 lb
60G4160 60G4260	(376.0)	(605.0)	(308.0)	(565.2)	(350.0)	25.8 kg

inches (mm)

♦ Normally carried in stock

DISCOUNT VS-1AC

380-460 VAC, 50/60 HZ INPUT; RATINGS 50 HP THROUGH 150 HP

Product Features:

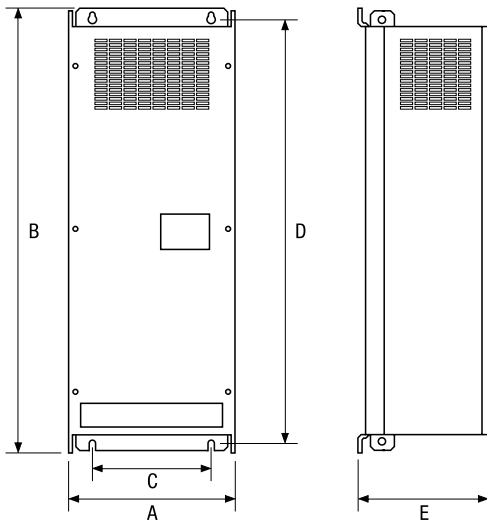
- NEMA 1/IP20 Enclosed Design
- Wall Mount Construction
- 40° C Ambient Enclosed/50° C Open
- CE Filter Options for Europe⁽²⁾⁽³⁾
- Enclosed Line & Load Terminations
- Built-in Keypad and RS-232 Port



AC Drives

HP (kW) Rating ⁽¹⁾ at Parameter "P.048"						Drive Selection 380-460 VAC, 3-Phase, 50/60 Hz GV3000/SE							Model No.	List
P.048 = U-H			P.048 = UEC			Maximum Continuous Output Amps/Motor Current								
V/Hz Mode			Vector Mode			V/Hz Mode			Vector Mode					
2 kHz	4 kHz	8 kHz	2 kHz	4 kHz	8 kHz	2 kHz	4 kHz	8 kHz	2 kHz	4 kHz	8 kHz			
75 (45)	60 (36)	45 (27)	50 (37)	40 (30)	30 (22)	90	72	54	70	56	41	50R4160 ♦	\$11,142	
75 (45)	60 (36)	45 (27)	50 (37)	40 (30)	30 (22)	90	72	54	70	56	41	50T4160 ⁽²⁾	(Discontinued) ⁽⁴⁾	
100 (55)	80 (44)	60 (33)	75 (45)	60 (36)	45 (27)	116	93	70	89	71	53	75R4160 ♦	12,726	
100 (55)	80 (44)	60 (33)	75 (45)	60 (36)	45 (27)	116	93	70	89	71	53	75T4160 ⁽²⁾ ♦	15,875	
150 (110)	120 (88)	90 (66)	125 (75)	100 (60)	75 (45)	210	168	126	152	122	91	125R4160 ⁽³⁾ ♦	24,170	

- (1) Based upon NEMA Design B induction motor ratings only. Application load and speed requirements must be considered to properly size the motor and drive. HP & kW ratings are based upon 460V and 400V inputs respectively. kW ratings are based upon an assumed motor Power Factor of 80%.
- (2) Model numbers 50T4160 and 75T4160 include a built-in RFI Filter to meet CE Component Standards.
- (3) Drive M/N 125R4160 and RFI Filter M/N 2DF4125 must both be installed into a larger, common enclosure to meet CE Component Standards.
- (4) Use 75T4160.



460 V Dimensions: M/N 50R4160 to 125R4160 and 50T4160 to 75T4160

Model No.	A	B	C	D	E	Weight
50R4160						154 lb
50T4160	16.60	34.65	14.17	33.46	12.68	154 lb
75R4160	(421)	(880.0)	(360)	(850)	(322)	70 kg
75T4160						
125R4160	18.30	57.36	12.99	55.66	13.97	211 lb
	(465)	(14.57)	(330)	(14.14)	(355)	96 kg

inches (mm)

♦ Normally carried in stock

DISCOUNT VS-1AC

380-460 VAC, 50/60 HZ INPUT; RATINGS 200 HP THROUGH 400 HP

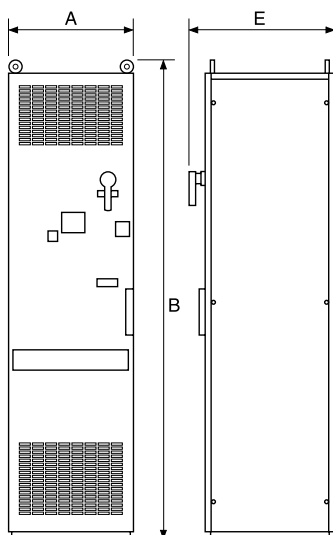
Product Features:

- NEMA 1/IP20 Floor Standing Enclosure with forced ventilation and door mounted filter
- In General Purpose (Scalar V/Hz) Mode, 110% Continuous Overload Capacity
- In Vector (SVC or FVC) Mode, 150% Overload Capacity for 1 minute
- Local operator keypad with LED display is built-in for convenience
- Input Disconnect (optional) built-in
- Input Line Fuses are built-in as standard for input short circuit protection



HP (kW) Rating ⁽¹⁾ at Parameter "P.048"				Drive Selection 380-460 VAC, 3-Phase, 50/60 Hz GV3000/SE						
P.048 = U-H		P.048 = UEC		Maximum Continuous Output Amps /Motor Current				Floor Standing NEMA 1 Encl. Force Ventilated w/ Filter		
V/Hz Mode		Vector Mode		V/Hz Mode		Vector Mode		Without Built-in Disconnect Model No.	With Built-in Disconnect Model No.	List
2 kHz	4 kHz	2 kHz	4 kHz	2 kHz	4 kHz	2 kHz	4 kHz			
200 (133)	200 (133)	200 (133)	200 (133)	240	240	240	240	200V4160♦ -	- 200V4160DS♦	\$26,321 29,146
250 (167)	250 (167)	250 (167)	250 (167)	302	302	302	302	250V4160♦ -	- 250V4160DS♦	28,711 31,536
300 (200)	300 (200)	300 (200)	300 (200)	361	361	361	361	300V4160♦ -	- 300V4160DS♦	36,668 39,493
350 (229)	350 (229)	350 (229)	350 (229)	414	414	414	414	350V4160♦ -	- 350V4160DS♦	38,561 41,386
400 (264)	400 (264)	400 (264)	400 ⁽²⁾ (264)	477	477	477	477 ⁽²⁾	400V4160♦ -	- 400V4160DS♦	42,053 44,878

- (1) Based upon NEMA Design B induction motor ratings only. Application load and speed requirements must be considered to properly size the motor and drive. HP and kW ratings are based upon 460 V and 400 V inputs respectively. kW ratings are based upon an assumed motor Power Factor of 80%.
- (2) Indicates derated operation at 4 kHz to 110% Overload Only. 200 HP to 400 HP GV3000/SE drives are selectable for either 2 or 4 kHz switching frequencies.



460 V Dimensions: 200 HP to 400 HP

Model No.	A	B	C	D	E	Weight
200V4160 200V4160DS						
250V4160 250V4160DS	23.6	86.6	-	-	23.6	850 lb
300V4160 300V4160DS	(600)	(2200)	-	-	(600)	382.5 kg
350V4160 350V4160DS						
400V4160 400V4160DS						

inches (mm)

♦ Normally carried in stock

DISCOUNT VS-1AC

380-460 VAC, 50/60 HZ INPUT; RATINGS 3.1 AMPS THROUGH 43.0 AMPS

Product Features:

- IP20 IEC Bookshelf construction for panel mounting
- 7th IGBT built-in for Snubber Resistor Braking⁽¹⁾
- 40° C ambient
- Front access control terminals for easy access and wiring
- Compact size for zero side clearance mounting
- Built-in keypad and RS-232 port

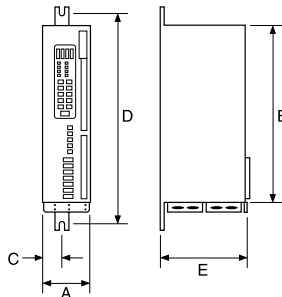


AC Drives

Drive Selection w/o Built-in CE Filters 380-460 VAC, 3-Phase, 50/60 Hz GV3000/SE									
Continuous Output Amps / Motor Current						N. American Model & Order No.	European Stock Number	Unit Type	List
V/Hz Mode			Vector Mode						
2 kHz	4 kHz	8 kHz	2 kHz	4 kHz	8 kHz				
3.1	3.1	2.8	2.1	2.1	2.1	31ER4060♦	896.01.11	AC003	\$1,237
3.8	3.8	2.8	3.1	3.1	2.8	38ER4060♦	896.02.11	AC004	1,275
5.5	5.5	5.5	3.8	3.8	3.8	55ER4060♦	896.03.11	AC005	1,322
8.5	8.5	5.5	6.7	6.7	5.0	85ER4060♦	896.05.11	AC008	1,479
12.6	12.0	8.5	9.3	9.3	8.0	126ER4060♦	896.06.11	AC012	1,832
15.0	12.0	8.5	11.0	11.0	8.0	150ER4060♦	896.07.11	AC015	2,208
24.0	16.5	12.6	16.5	15.0	11.0	240ER4060♦	896.08.11	AC024	2,720
30.0	24.0	16.5	22.0	22.0	15.0	300ER4060♦	896.09.11	AC030	3,409
43.0	31.0	22.0	32.0	22.0	15.0	430ER4060♦	896.11.12	AC044	3,705

Drive Selection w/ Built-in CE Filters ⁽²⁾ 380-460 VAC, 3-Phase, 50/60 Hz GV3000/SE									
Continuous Output Amps / Motor Current						N. American Model & Order No.	European Stock Number	Unit Type	List
V/Hz Mode			Vector Mode						
2 kHz	4 kHz	8 kHz	2 kHz	4 kHz	8 kHz				
3.1	3.1	2.8	2.1	2.1	2.1	31ET4060♦	896.01.31	AC003	\$1,522
3.8	3.8	2.8	3.1	3.1	2.8	38ET4060♦	896.02.31	AC004	1,562
5.5	5.5	5.5	3.8	3.8	3.8	55ET4060♦	896.03.31	AC005	1,619
8.5	8.5	5.5	6.7	6.7	5.0	85ET4060♦	896.05.31	AC008	1,775
12.6	12.0	8.5	9.3	9.3	8.0	126ET4060♦	896.06.31	AC012	2,198
15.0	12.0	8.5	11.0	11.0	8.0	150ET4060♦	896.07.31	AC015	2,647
24.0	16.5	12.6	16.5	15.0	11.0	240ET4060♦	896.08.31	AC024	3,264
30.0	24.0	16.5	22.0	22.0	15.0	300ET4060♦	896.09.31	AC030	4,090
43.0	31.0	22.0	32.0	22.0	15.0	430ET4060♦	896.11.32	AC044	4,448

- (1) For snubber brake resistor sizing refer to page D2-43.
 (2) Model numbers 31ET4060 thru 430ET4060 include a built-in RFI filter to meet CE Component Standard.



Bookshelf Drive Dimensions

Unit Type	Physical Dimensions in mm					Weight kg
	Width Dim. A	Height Dim. B	Mount Dim. C	Mount Dim. D	Depth Dim. E	
AC003	95	378	38	422	200	5.5
AC004	95	378	38	422	200	5.5
AC005	95	378	38	422	200	5.5
AC008	95	378	38	422	200	5.5
AC012	95	378	38	422	200	5.5
AC015	95	378	38	422	200	5.5
AC024	195	374	61	422	200	10.0
AC030	195	374	61	422	200	10.0
AC044	214	374	150	422	200	16.5

♦ Normally carried in stock

DISCOUNT VS-1AC

380-460 VAC, 50/60 HZ INPUT; RATINGS 75 HP THROUGH 200 HP*

Product Features:

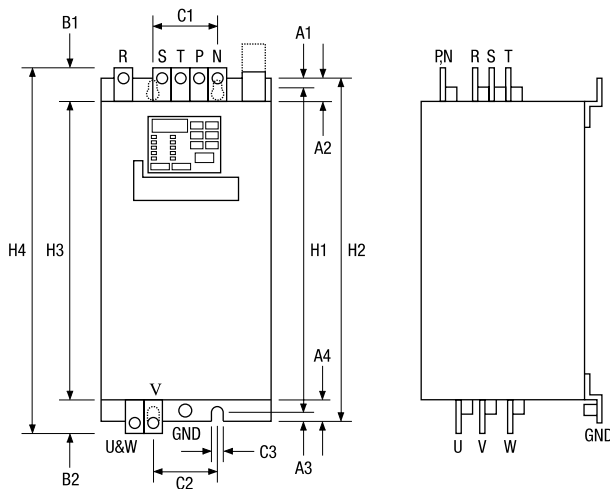
- NEMA 0/IP00 power module construction for panel mounting
- Optional NEMA 1 conversion kit ⁽³⁾
- 55° C ambient
- Exposed line & load stabs for easy access and wiring
- Compact size
- Built-in keypad and RS-232 port



HP (kW) Rating ⁽¹⁾ At Parameter "P.048"						Drive Selection 380-460 VAC, 3-Phase, 50/60 Hz GV3000/SE							Model No. ⁽²⁾	List
P.048 = U-H			P.048 = UEC			Continuous Output Amps / Motor Current								
V/Hz Mode			Vector Mode			V/Hz Mode			Vector Mode					
2 kHz	4 kHz	8 kHz	2 kHz	4 kHz	8 kHz	2 kHz	4 kHz	8 kHz	2 kHz	4 kHz	8 kHz			
75 (55)	75 (55)	60 (44)	75 (55)	75 (55)	60 (44)	100	100	80	100	100	80	75V4060♦	\$12,100	
100 (77)	100 (77)	75 (62)	100 (77)	100 (77)	75 (62)	140	140	112	140	140	112	100V4060♦	12,481	
125 (94)	125 (94)	100 (75)	125 (94)	125 (94)	100 (75)	170	170	136	170	170	136	125V4060♦	14,369	
150 (111)	150 (111)	125 (88)	150 (111)	150 (111)	125 (88)	200	200	160	200	200	160	150V4060♦	17,698	
200 (133)	200 (133)	150 (106)	200 (133)	200 (133)	150 (106)	240	240	192	240	240	192	200V4060♦	18,152	

- (1) Based upon NEMA Design B induction motor ratings only. Application load and speed requirements must be considered to properly size the motor and drive. HP and kW ratings are based upon 460 V and 400 V inputs respectively. kW ratings are based upon an assumed motor Power Factor of 80%.
- (2) An input impedance of 3% is required for this full load amp rating at 2 kHz and 4 kHz. Use either an isolation transformer or a line reactor when the input impedance is less than 3%, or derate the 2 kHz and 4 kHz power rating to the 8 kHz rating shown.
- (3) Optional NEMA 1 conversion kit available - refer to page D2-37.

AC Drives



460 V Dimensions: 75 HP to 200 HP

HP	H1	H2	H3	H4	Width	Depth	Weight
75-100	25.0 (634)	25.7 (654)	23.4 (594)	27.4 (696)	9.3 (235)	13.6 (354)	77 lb 35 kg
125	28.1 (714)	28.9 (734)	26.5 (674)	30.6 (776)	9.6 (245)	14.4 (366)	99 lb 35 kg
150-200	34.4 (875)	36.0 (914)	30.5 (774)	34.1 (866)	11.1 (28.1)	14.4 (366)	121 lb 55 kg

HP	A1	A2	A3	A4	B1	B2	C1	C2	C3	d
75-100	0.4 (10)	1.2 (30)	0.4 (10)	1.2 (30)	2.0 (51)	2.0 (51)	3.9 (100)	3.9 (100)	0.35 (9)	0.35 (9)
125	0.4 (10)	1.2 (30)	0.4 (10)	1.2 (30)	2.0 (51)	2.0 (51)	7.9 (200)	7.9 (200)	0.35 (9)	0.35 (9)
150-200	0.6 (14)	2.8 (70)	1.0 (25)	2.8 (70)	1.8 (46)	1.8 (46)	8.5 (216)	8.5 (216)	0.51 (13)	0.51 (11)

inches (mm)

♦ Normally carried in stock
*30-60 HP drives available after June 2001, contact factory.

DISCOUNT VS-1AC

POWER-MATCHING RELIANCE ELECTRIC AC MOTORS WITH GV3000/SE

For the best performance and reliability, it is recommended to match a Reliance Electric AC motor with the GV3000/SE.

Why use a Reliance Electric AC Motor with a GV3000/SE?

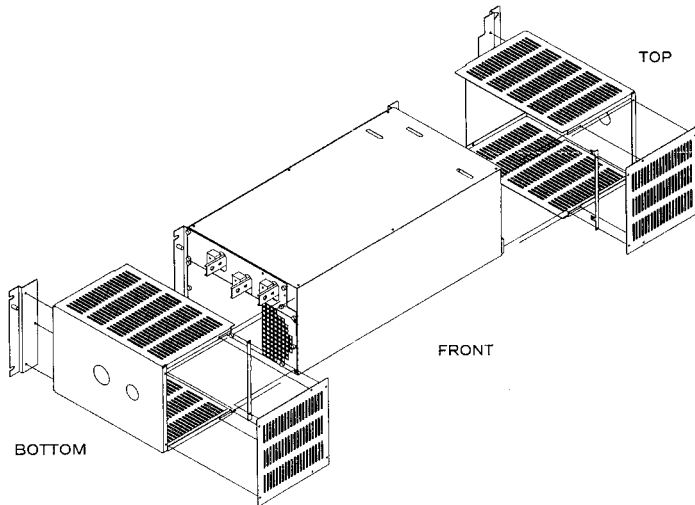
- **1600 V Insulation System.** All E-Master, Premium XE, RPM-AC, and V*S Master AC Motors are built with a 1600 V insulation system. This insulation system is specifically designed to withstand the effects of rapid dv/dt and the reflected wave phenomenon associated with IGBT based, PWM waveform AC drives.
- **AC Motors designed and built by the same company that designs and builds AC drives.** All of the AC motors listed in the Variable AC Motor section of this catalog have been evaluated and approved for variable speed operation with Reliance Electric AC drives. You can be confident that all of these motors will provide long, reliable service over the published speed range and torque rating when Power-Matched with the appropriate Reliance AC Drive.
- **One manufacturer to deal with.** Should a problem arise with either the AC drive or the AC motor, there will be only one company to contact to solve the problem. Power-matched packages make it easy to specify exactly the right drive and motor for all your applications.

Selecting and Sizing the Proper AC Motor

The table below will assist with choosing the best motor for the application. The actual motor selection can be made by referring to the Variable Speed AC Motor section of this catalog.

	RPM AC DPFV	XE, E-Master TEFC	V*S Master TENV & TEFC	RPM AC TEBC
				
HP Range	5-1000 HP	.25-350 HP	2-450 HP	.25-400 HP
Constant Torque	1000:1	2:1, 4:1, 10:1	1000:1	1000:1
Constant HP	Up to 4:1 available	1.5 x Base Speed	1.5 x Base Speed	Up to 4:1 available
Voltage Range	575 and below	575 and below	575 and below	575 and below
Construction Strengths	Laminated Frame Compact Size Low Inertia High Response Most Efficient Cooling Cooler Bearings Longer Life	Rugged Cast Iron Encl. NEMA Design B Standard T Frames Conforms to NEMA Mounting Survives Tough Environments	Cast Iron NEMA Design B Standard T Frames Conforms to NEMA Mounting Rugged Enclosure Frame and End Brackets	Extended or Laminated Frame Low Inertia High Response Compact Size Customized Rugged Enclosure Frame and End Brackets
Typical Applications	Extruders Web Process Cut-to-Length Slitters Coilers Winders Beamers	Conveyors Pumps Dryers Mixers Fans Compressors	Centrifuges Coaters Wire Drawing Roofing Lines Cranes Hoists	Runout Tables Winders Metal Forming Test Stands Beamers Crane & Hoist
Typical Industries	Plastics Film Converting Paper Metals Textile Packaging	Mixing Paper Petroleum Chemical Waste Water HVAC Pharmaceutical Packaging	Metals Paper Chemical Textile Wire & Cable Tire & Rubber	Metals Automotive Transportation Petro-Chem Textile Forest Products

NEMA 1 CONVERSION KITS FOR 75-200 HP 460V IPO GV3000/SE

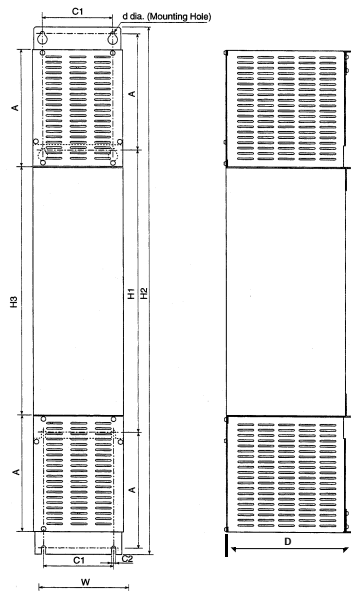


Includes top covers, bottom covers, and mounting brackets required for converting the IPO Power Module GV3000/SE to a NEMA 1, wall-mountable drive.

NEMA 1 Kit Model Number ¹	For GV3000/SE Drive Model Number(s)	List
2CK4100 ♦	75V4060 and 100V4060	\$520
2CK4125 ♦	125V4060	570
2CK4200 ♦	150V4060 and 200V4060	620

(1) Kit Installation Instruction Manual D2-3450

Note: The drive must be a mechanical rev. 0.7 or higher version to accept this kit. The outside carton and the drive (near the nameplate) will have a label showing the rev. number as well the statement “Suitable for NEMA 1 type”. NEMA 1 kits cannot be used with older rev. GV3000/SE drives.



Model No. of NEMA Type 1 Kit	Applicable GV3000/SE Drive	Dimensions millimeters (inches)									Weight (kgs)
		H1	H2	H3	W	D	A	C1	C2	d	
2CK4100	75V4060	634	1074	594	234	356	210	100	9	9	7.2
	100V4060	(24.96)	(42.28)	(23.39)	(9.21)	(14.02)	(8.27)	(3.94)	(0.35)	(0.35)	
2CK4125	125V4060	714	1204	674	244	368	235	200	9	9	8.4
		(28.11)	(47.40)	(26.54)	(9.61)	(14.49)	(9.25)	(7.87)	(0.35)	(0.35)	
2CK4200	150V4060	875	1638	774	280	370	362	216	13	13	12.8
	200V4060	(34.45)	(64.49)	(30.47)	11.02	(14.57)	(14.25)	(8.50)	(0.51)	(0.51)	

inches (mm)

♦ Normally carried in stock

DISCOUNT VS-1AC

OPTIONS - TABLE OF CONTENTS

The following options can be used with GV3000/SE:

Option	Model No.	Page No.
• 115 VAC Control Interface Board	2LB3000	D2-38
• AutoMax Network Board	2AX3000	D2-39
• CE Compliance Mains Filters.....	2DFxxxx	D2-48
• CE Compliance Cover Kit	2CK4160	D2-48
• ControlNet Network Board	2CN3000	D2-40
• DeviceNet Network Board	2DV3000	D2-39
• Encoder Feedback Cables.....	2TCxxxx	D2-41
• Interbus-S Network Board.....	2NB3000	D2-40
• Line Regeneration Modules.....	1RGxxxx	D2-47
• NEMA 1 Conversion Kit.....	2CK4xxx	D2-37
• Operators Interface Module (OIM) ...	2RK3000	D2-41
• Pre-Engineered Packages		D2-55
• Profibus Network Board	2PB3000	D2-40
• RS-232 AutoMax Adapter Cable	2CA3001	D2-42
• RS-232 Computer Cable.....	2CA3000	D2-42
• Snubber Resistor Brake Kit	2SRxxxx	D2-45
• Snubber Resistor Brake Kit	M3575Rxxxx	D2-43
• Snubber Transistor Brake Kits.....	2STxxxx	D2-46
• Snubber Transistor Brake Kits.....	M3575Txxxx	D2-44
• Software, Control & Configuration ...	2CS3000	D2-42
• Super Remote Meter Interface Board..	2SI3000	D2-38

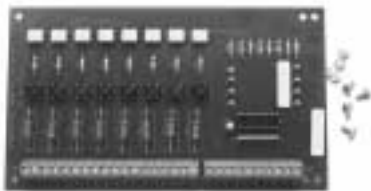
OPTIONS - I/O EXPANSION

115 VAC Control Interface Board

115 VAC control power to 24 VDC logic. Start, Stop, Jog, Forward, Reverse & Function Loss.

Available as a loose kit only. Please note that this board normally mounts inside the GV3000/SE. This board may also be remote/panel mounted when other I/O boards or network boards are used. Manual No.: D2-3376

Model No.: 2LB3000 ♦ \$630 List



115 VAC Interface Board

♦ Normally carried in stock

Super RMI Board - I/O Expansion

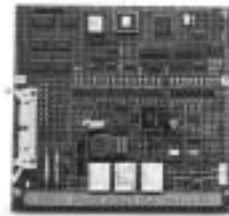
The Super RMI (Remote Meter Interface) Board provides additional Discrete and Analog Inputs & Outputs along with added functionality for application flexibility of the GV3000/SE AC Drive.

Added Inputs (Isolated): (4) Programmable Digital Inputs, (1) Programmable Analog Input - 0/4-20 mA or 0-10 VDC, and (1) Frequency Input

Added Outputs: (4) Programmable Digital Outputs, (1) Programmable Analog Output, 0/4-20 mA or 0-10 VDC, (2) Programmable Analog Outputs - 0-10 VDC, (2) Programmable N/O Relay Outputs, and (1) Form "C" Fault Relay (1 N/O, 1 N/C)

Added Functionality with Super RMI:

- Up to 8 Preset Speeds
- PI Regulator with Setpoint Control
- Speed or Torque Reference Trim
- Current Limit Adjustment
- Relay Output w/Configurable Indication of:
 - At Speed (ie: speed reach)
 - Run Condition (ie: drive enabled)
 - Torque Setpoint (ie: torque proving)



Super Remote Meter Interface (RMI) Board

This board can be mounted inside every GV3000/SE.

Hardware provided: (4 mounting screws) and a multi-pin connector.

Available as a Loose Kit only. Please note that no other I/O Cards or Network Cards will be usable with this option installed.

Instruction Manual No.: D2-3341

Super RMI Board (for NEMA and IP0 Power Modules)
Model No.: 2SI3000 ♦ \$575 List

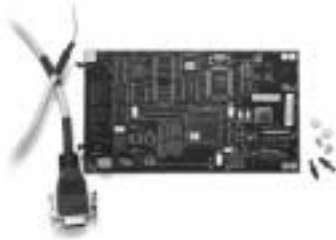
Super RMI Board (for Bookshelf drives)
Model No.: 2SI3000E ♦ \$575 List

DISCOUNT VS-1AC

OPTIONS - NETWORK COMMUNICATIONS

AutoMax™ Network Board

Provides the necessary interface when a GV3000/SE must communicate on a Reliance AutoMax DCS Network. Configurable and Tunable Parameters are accessible with 100 msec. scan times. Control and Reference Functions for speed and torque commands are accessible with 5 msec. scan times.



AutoMax Network Board

Available as a loose kit only. Please note that this card mounts inside the GV3000/SE.⁽¹⁾

Instruction Manual No.: D2-3308

Model No.: 2AX3000♦ \$530 List

DeviceNet™ Network Board

For simple and robust communications on a CAN based protocol for connection to a host device. DeviceNet provides access to Configurable and Tunable Parameters that are updated every 100 msec, and Control and Reference Functions such as speed or torque commands, are updated every 5 msec. DeviceNet also allows monitoring and data logging for operation diagnostics or trending needs.



DeviceNet Network Board

Available as a Loose Kit only. The kit contains (1) Network Option Board, (1) 3.5" Floppy Disk containing an EDS file, (1) manual and (1 set of 4) mounting screws. Please note that this card mounts inside the GV3000/SE.⁽¹⁾

Instruction Manual: HE-HGV3DN

Model No.: 2DV3000♦ \$670 List

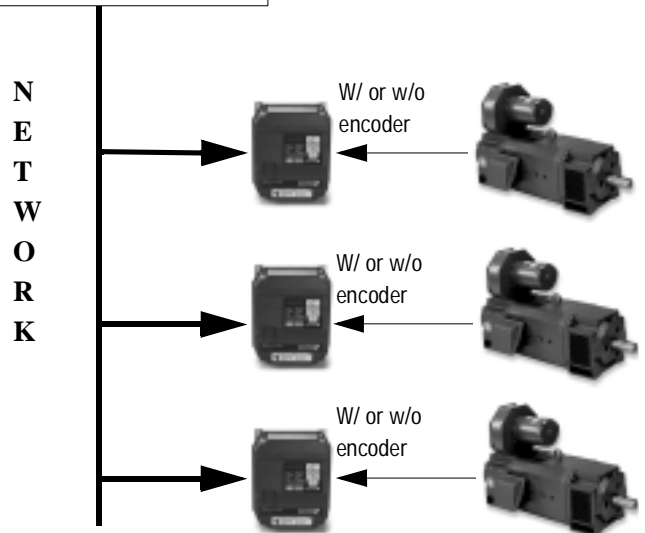
(1) No other I/O card or Network card will be usable with this option card installed.
♦ Normally carried in stock

Network Applications

- Extrusion Systems
- Material Handling
 - Conveyor sections
 - Hoist & Trolley
 - Transfer lines
- Process Control
 - Flow & Pressure
 - Metering
 - Mixing
- Web Processing
 - Cascade/Draw/Ratio
 - Dancer & Tension
 - Follower & Helper
 - Load Sharing
 - Unwind & Rewind

Host Controller

- AutoMax DCS-Net
- DeviceNet
- ControlNet
- Profibus
- Interbus-S



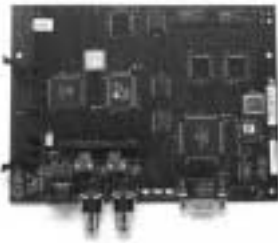
AC Drives

OPTIONS - NETWORK COMMUNICATIONS

ControlNet™ (Version 1.5) Network Board

The ControlNet Network Board mounts in a GV3000/SE drive, allowing it to communicate over the open ControlNet network. ControlNet is a highly deterministic and repeatable control layer network. It provides real-time high speed transport of time-critical I/O data and messaging data, all on one link. ControlNet is ideal for complex control systems that require synchronized and coordinated real-time performance.

ControlNet provides high speed updates to all scheduled reference and control data. It also provides access to all drive parameters through unscheduled traffic.



ControlNet Network Board

The board allows parameter configuration and tuning and has redundant A and B ports for critical applications.

Available as a loose kit only. This card mounts inside the GV3000/SE.⁽¹⁾

Instruction Manual No. D2-3390

Model No.: 2CN3000♦ \$880 List

Interbus-S™ Network Board

The Interbus-S Network Card allows the GV3000/SE to communicate over the Interbus-S network. This card allows the GV3000/SE to be controlled and monitored over the network.

Available as a loose kit only. This card mounts inside the GV3000/SE.⁽¹⁾

Instruction Manual No.: 49 1333

Model No.: 2NB3000♦ \$880 List

Profibus™ Network Board

The Profibus Network Board allows the GV3000/SE to communicate over the Profibus network. This card allows the GV3000/SE to be controlled and monitored over the network.

Available as a loose kit only. This card mounts inside the GV3000/SE.⁽¹⁾

Instruction Manual No.: 49 1355

Model No.: 2PB3000♦ \$880 List

(1) No other I/O card or Network card will be usable with this option card installed.
♦ Normally carried in stock

OPTIONS - OPERATOR INTERFACE & VECTOR DUTY ENCODER FEEDBACK CABLES

Operator Interface Module (OIM)

To allow remote keypad operation, or when parameter text display is desired, the OIM provides a user-friendly LCD display and additional features. Communication between the drive and OIM Module is performed serially over RS-232. A dedicated connector just above the 9-pin D-shell connector on the drive provides the OIM connection. Note that only one device may be connected at one time to either of these RS-232 port connections.

Operation features:

- NEMA 12 rated when installed on an enclosure door or remote station.
- 5 Languages to choose from:
English, German, Spanish, Italian & French
- Quick Start Menu for fast setup
- Monitor Mode or Program Mode Selection
 - Display 2, 4 or 6 values at one time
 - Text displays Programming Functions
- Help features simplify setup programming

Hardware included:

- OIM Display & Keypad Assembly
- 5 Meter Serial Cable
- Gasket
- 2 mounting screws and hex nuts
- Bezel



Operator Interface (OIM) Module



Operator Interface Module Display

Available as a loose kit only. Please note that local mounting onto the drive chassis is not possible except on 200 HP to 400 HP enclosures. When installed, the standard drive keypad remains on the drive, and remains operational as the LOCAL control.

Instruction Manual No.: D2-3342

Model No.: 2RK3000 ♦ \$470 List

Encoder Feedback Cables

For flux vector operation, these cable kits simplify the installation process.

Connector Type	Encoder Mfr. & Series	Cable Length Feet	Cable M/N	List
10 Pin MS	Dynapar, H20 Series	25	2TC3025 ♦	\$165
		75	2TC3075 ♦	295
16 Pin MS	Tamagawa, FA Series	25	2TC4025 ♦	165
		75	2TC4075 ♦	295
Cable only (MS connector not included)	Dynapar H20, Tamagawa FA, Lakeshore	100	2TC4100 ♦	295
		300	2TC4300 ♦	750

♦ Normally carried in stock

OPTIONS - SOFTWARE PROGRAMMING & RS-232 CABLES

CS3000 Control & Configuration Software

This is a Windows based software package which allows drive control and configuration via the standard 9-pin D-Shell RS-232 port. The user is allowed to create, store, upload, download, monitor, control and/or compare parameter values in a user-friendly environment. CS3000 runs under Windows 3.1/9x/NT/2000.

Configuration and operation of the drive from a PC provides the flexibility and power desired by today's sophisticated users and OEM's alike.

- Compare: allows quick verification of any changed parameters. Differences are displayed on the PC and may be printed.
- Edit: allows programming via PC.
- Download/Upload
- Drive Control:
 - Monitors 6 display values:
 - Speed Reference (scalable)
 - Motor Speed
 - Motor Current
 - Motor Volts
 - Motor Torque (%)
 - Output Power (kW)
- Configured Displays are:
 - Speed Reference
 - Local/Terminal/Serial/Network
 - Auto/Manual Mode
 - Fwd/Rev Direction
- Operational Keys Displayed:
 - Run, Jog, Stop and Reset
- Fault/Alarm Log: allows fault and alarm history for diagnosis of operation.
- PC Scope feature: allows monitoring and trace of two drive parameters for diagnostics and tuning of the drive. Captured data can also be saved as an ASCII text file or can be compared to previous traces.⁽¹⁾

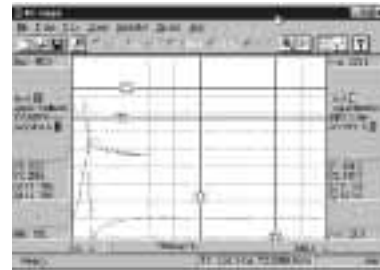
(1) Requires version 6.0 or higher regulator.

- Vector Drive Tuning: allows the user (for GV3000/SE in Vector Mode only) to fine tune the torque/flux loop gains and the speed loop gains to the application.

Provided on a 3.5" diskette with manual. Note that this software is also compatible with Reliance FlexPak 3000 DC drives and LiquiFlo AC drives.

Instruction Manual No.: D2-3348

Model No.: 2CS3000♦\$350 List



PC Scope screen from CS3000



Configuration Editor screen from CS3000

CS3000 RS-232 Computer Cable

The 9-pin to 9-pin D-shell connectors on this cable allow connection between a laptop or notebook-style PC and the GV3000/SE RS-232 port. This is a standard industrial RS-232 cable. 10 ft. length.

Model No.: 2CA3000♦\$120 List

AutoMax RS-232 Adapter Cable

The 25-pin to 9-pin D-shell connections on this cable allow adaption from the standard AutoMax cable (M/N 61C127) with a 25-pin connection to the GV3000/SE 9-pin RS-232 port.

Model No.: 2CA3001♦\$100 List

♦ Normally carried in stock

DISCOUNT VS-1AC

AC Drives

OPTIONS - BRAKING, LOOSE SNUBBER RESISTOR KITS FOR GV3000/SE BOOKSHELF

Resistor Sizing Data for GV3000/SE Bookshelf Drives with Built-in Braking Transistor

(Maximum Braking Power and Permitted Braking Resistors)

GV3000/SE Bookshelf M/N	Maximum Drive Input Voltage	Turn-on Voltage ⁽¹⁾	Turn-off Voltage ⁽¹⁾	Maximum Braking Current	Resistor Minimum Ohms	Braking Power Continuous	Braking Power @ 25% Duty Cycle
31ER/31ET4060	460	750	720	6 Amps	125	4500 W	4500 W
38ER/38ET4060	460	750	720	6 Amps	125	4500 W	4500 W
55ER/55ET4060	460	750	720	6 Amps	125	4500 W	4500 W
85ER/85ET4060	460	750	720	6 Amps	125	4500 W	4500 W
126ER/126ET4060	460	750	720	10 Amps	75	7500 W	7500 W
150ER/150ET4060	460	750	720	10 Amps	75	7500 W	7500 W
240ER/240ET4060	460	750	720	15 Amps	50	11000 W	11000 W
300ER/300ET4060	460	750	720	20 Amps	37.5	15000 W	15000 W
430ER/430ET4060	460	750	720	30 Amps	25.0	22000 W	22000 W

(1) The Turn-on and Turn-off voltages will be proportional to the incoming line power to the GV3000/SE.

Use the pre-packaged Snubber Resistor Braking Kits in the table below or contact a local snubber resistor supply house for alternate size loose resistors for panel mounting.



AC Drives

Snubber Resistor Kit Sizing for GV3000/SE Bookshelf

Snubber Resistor Kits can be connected to the GV3000/SE Bookshelf drive's built-in braking transistor for dissipation of regenerative energy as heat. By selecting the proper resistor, the user can optimize the braking performance of the drive package.

Note: Resistor maximum "on" rating is 60 seconds.

M/N M3575RH5B
Snubber Resistor Kit

GV3000/SE Bookshelf M/N	Braking HP	Braking Duty Cycle	Snubber Resistor Module M/N	Cabinet Dimen. (inches) W x H x D	Peak Braking Watts	Continuous Braking Watts	Resistor Load Ohms	Amp Rating	List
31ER/31ET4060	1	6%	M3575RH1M♦	4x12.75x8.7	746	50	780	1	\$395
	1	20%	M3575RH1MF♦	4x12.75x8.7	746	150	780	1	490
	2	6%	M3575RH2M♦	4x12.75x8.7	1492	100	390	2	425
	2	20%	M3575RH2MF♦	4x12.75x8.7	1492	300	390	2	525
	3	6%	M3575RH3M♦	4x12.75x8.7	2238	150	260	3	460
	3	20%	M3575RH3MF♦	4x12.75x8.7	2238	450	260	3	555
	4	6%	M3575RH4M♦	7x12.75x8.7	2984	200	195	4	500
	4	20%	M3575RH4MF♦	7x12.75x8.7	2984	600	195	4	615
	5	6%	M3575RH5B♦	4x17.75x8.7	4000	200	150	5	450
	5	20%	M3575RH5BF♦	4x17.75x8.7	4000	800	150	5	550
	6	6%	M3575RH6M♦	7x12.75x8.7	4476	300	130	6	570
	6	20%	M3575RH6MF♦	7x12.75x8.7	4476	900	130	6	685
126ER/126ET4060	8	6%	M3575RH8B♦	4x17.75x8.7	6000	300	90	8	495
126ET4060	8	20%	M3575RH8BF♦	4x17.75x8.7	6000	1200	90	8	590
150ER/150ET4060	9	6%	M3575RH9M♦	10x12.75x8.7	6714	450	87	9	680
150ET4060	9	20%	M3575RH9MF♦	10x12.75x8.7	6714	1350	87	9	865
240ER/240ET4060	11	6%	M3575RH11B♦	7x17.75x9.2	8000	400	60	11	550
240ET4060	11	20%	M3575RH11BF♦	7x17.75x9.2	8000	1600	60	11	705
300ER/300ET4060	16	6%	M3575RH16B♦	7x17.75x9.2	12000	600	45	16	630
300ET4060	16	20%	M3575RH16BF♦	7x17.75x9.2	12000	2400	45	16	785
430ER/430ET4060	24	6%	M3575RH24B♦	10x17.75x9.7	18000	900	30	24	770
430ET4060	24	20%	M3575RH24BF♦	10x17.75x9.7	18000	3600	30	24	980

♦ Normally carried in stock

DISCOUNT VS-1AC

OPTIONS - BRAKING, LOOSE SNUBBER TRANSISTOR KITS & SNUBBER RESISTOR KITS

Snubber Transistor Braking Kits - Transistor Only, Protected Enclosure (IP20) Type

For deceleration of high inertia loads as well as for correction of speed command overshoot, Snubber Transistor Braking Kits provide the circuitry needed to connect to the DC bus and to a matched resistor package for regulation of regenerative energy.

These snubber transistor circuits are packaged in wall mountable, protected enclosures with IP20 type connections.

Note: Maximum “on” rating is 60 seconds.

AC Line Voltage	Snubber M/N ♦	Amps DC RMS	Minimum Load Ohms	Cabinet Style	List
230	M3575TL15	15	25	M3	\$890
	M3575TL30	30	12.5	M3	1,045
	M3575TL60	60	6.25	M4	1,230
460	M3575TH15	15	50	M3	890
	M3575TH30	30	25	M3	1,045
	M3575TH75	75	10	M4	1,230
	M3575TH125	125	6	B4	1,900
	M3575TH150	150	5	B4	2,445
	M3575TH200	200	3.75	B7	2,720
	M3575TH300	300	2.5	B7	2,935



M/N M3575TH15 Snubber Transistor Kit and M/N M3575H5B Snubber Resistor Kit

Cabinet Style	Enclosed Dimensions - Inches			
	Style	Width	Height	Depth
M3	Wall	3	12.75	8.7
M4	Wall	4	12.75	8.7
M7	Wall	7	12.75	8.7
M10	Wall	10	12.75	8.7
B4	Wall	4	17.75	8.7
B7	Wall	7	17.75	9.2
B10	Wall	10	17.75	9.7
G1	Floor	25	38.00	22
G2	Floor	25	47.00	22
G3	Floor	25	56.00	22

(1) List price is for resistor module only.

♦ Normally carried in stock

Snubber Resistor Kits - Resistor Only, Protected Enclosure (IP20) Type

Snubber Transistor Kits require a resistor for dissipation of regenerative energy as heat. By selecting the proper resistor, the user can optimize the braking performance.

Note: Maximum “on” rating is 60 seconds.

230 V Snubber Resistor Kits										
Braking HP	Duty Cycle	Snubber Resistor Module M/N ♦	Use with Transistor Module M/N	Cabinet Style	Braking Watts		Load Ohms	Amp Rating	List ⁽¹⁾	
					Peak	Cont.				
1	6%	M3575RL1M	M3575TL15	M4	746	50	190	2	\$395	
1	20%	M3575RL1MF	M3575TL15	M4	746	150	190	2	490	
2	6%	M3575RL2M	M3575TL15	M4	1492	100	95	4	425	
2	20%	M3575RL2MF	M3575TL15	M4	1492	300	95	4	525	
3	6%	M3575RL3M	M3575TL15	M4	2238	150	63	6	460	
3	6%	M3575RL3B	M3575TL15	B4	1989	100	75	5	410	
3	20%	M3575RL3MF	M3575TL15	M4	2238	450	63	6	555	
3	20%	M3575RL3BF	M3575TL15	B4	1989	400	75	5	510	
4	6%	M3575RL4M	M3575TL15	M7	2984	200	48	8	500	
4	20%	M3575RL4MF	M3575TL15	M7	2984	600	48	8	615	
5	6%	M3575RL5B	M3575TL15	B4	3979	200	38	10	450	
5	20%	M3575RL5BF	M3575TL15	B4	3979	800	38	10	550	
6	6%	M3575RL6M	M3575TL15	M7	4476	300	32	12	570	
6	20%	M3575RL6MF	M3575TL15	M7	4476	900	32	12	685	
8	6%	M3575RL8B	M3575TL15	B4	5968	300	25	15	495	
8	20%	M3575RL8BF	M3575TL15	B4	5968	1200	25	15	590	
9	6%	M3575RL9M	M3575TL30	M10	6714	450	21	18	680	
9	20%	M3575RL9MF	M3575TL30	M10	6714	1350	21	18	865	
11	6%	M3575RL11B	M3575TL30	B7	7957	400	19	20	550	
11	20%	M3575RL11BF	M3575TL30	B7	7957	1600	19	20	705	
16	6%	M3575RL16B	M3575TL60	B7	11936	600	13	31	630	
16	20%	M3575RL16BF	M3575TL60	B7	11936	2400	13	31	785	
24	6%	M3575RL24B	M3575TL60	B10	17904	900	8	47	770	
24	20%	M3575RL24BF	M3575TL60	B10	17904	3600	8	47	980	

460V Snubber Resistor Kits										
Braking HP	Duty Cycle	Snubber Resistor Module M/N ♦	Use with Transistor Module M/N	Cabinet Style	Braking Watts		Load Ohms	Amp Rating	List ⁽¹⁾	
					Peak	Cont.				
1	6%	M3575RH1M	M3575TH15	M4	746	50	780	1	\$395	
1	20%	M3575RH1MF	M3575TH15	M4	746	150	780	1	490	
2	6%	M3575RH2M	M3575TH15	M4	1492	100	390	2	425	
2	20%	M3575RH2MF	M3575TH15	M4	1492	300	390	2	525	
3	6%	M3575RH3M	M3575TH15	M4	2238	150	260	3	460	
3	20%	M3575RH3MF	M3575TH15	M4	2238	450	260	3	555	
4	6%	M3575RH4M	M3575TH15	M7	2984	200	195	4	500	
4	20%	M3575RH4MF	M3575TH15	M7	2984	600	195	4	615	
5	6%	M3575RH5B	M3575TH15	B4	4000	200	150	5	450	
5	20%	M3575RH5BF	M3575TH15	B4	4000	800	150	5	550	
6	6%	M3575RH6M	M3575TH15	M7	4476	300	130	6	570	
6	6%	M3575RH6MF	M3575TH15	M7	4476	900	130	6	685	
8	6%	M3575RH8B	M3575TH15	B4	6000	300	90	8	495	
8	20%	M3575RH8BF	M3575TH15	B4	6000	1200	90	8	590	
9	6%	M3575RH9M	M3575TH15	M10	6714	450	87	9	680	
9	20%	M3575RH9MF	M3575TH15	M10	6714	1350	87	9	865	
11	6%	M3575RH11B	M3575TH15	B7	8000	400	60	11	550	
11	20%	M3575RH11BF	M3575TH15	B7	8000	1600	60	11	705	
16	6%	M3575RH16B	M3575TH30	B7	12000	600	45	16	630	
16	20%	M3575RH16BF	M3575TH30	B7	12000	2400	45	16	785	
24	6%	M3575RH24B	M3575TH30	B10	18000	900	30	24	770	
24	20%	M3575RH24BF	M3575TH30	B10	18000	3600	30	24	980	
50	20%	M3575RH50G1F	M3575TH75	G1	40000	8000	14	53	3,555	
100	20%	M3575RH100G2F	M3575TH125	G2	80000	16000	7	106	4,630	
150	20%	M3575RH150G3F	M3575TH200	G3	120000	24000	5	159	6,610	

DISCOUNT VS-1AC

OPTIONS - BRAKING, PRE-PACKAGED SNUBBER TRANSISTOR/RESISTOR KITS

Complete Snubber Transistor Resistor Brake Kits NEMA 1 Enclosed

For Deceleration of High Inertia Loads as well as for correction of speed command overshoot. Snubber Resistor Kits dissipate excess DC Bus energy into heat, thereby allowing quick step change commands in both acceleration and deceleration.

Snubber Resistor Kits include both the transistor circuitry and resistor elements in a wall mountable open ventilated enclosure.

Note: Maximum “on” rating is 60 seconds.

For sizing instructions, refer to the calculations on Page ix.



Snubber Resistor Module



Style	Enclosed Dimensions - in.(mm)		
	Height	Width	Depth
B	18.2	9.5	8.5
	(476)	(241)	(216)
C	18.2	11.5	10.5
	(476)	(292)	(267)

Drive Rating	Snubber M/N	Cabinet Style	Resistance Value	Cont. Watt Dissipation	Instant. Watt Dissipation	Continuous Duty Cycle	List
1 HP, 230V	2SR20400 ♦	B	30	400	4000	50%	\$1,680
2 HP, 230V	2SR20400 ♦	B	30	400	4000	30%	1,680
	2SR20600 ♦	B	20	600	6000	50%	1,770
3 HP, 230V	2SR20400 ♦	B	30	400	4000	20%	1,680
	2SR20600 ♦	B	20	600	6000	30%	1,770
	2SR21200 ♦	B	10	1200	12000	50%	1,965
5 HP, 230V	2SR20600 ♦	B	20	600	6000	20%	1,770
	2SR21200 ♦	B	10	1200	12000	30%	1,965
	2SR21800 ♦	C	6	1800	18000	50%	2,515
7-1/2 HP, 230V	2SR21200 ♦	B	10	1200	12000	30%	1,965
	2SR21800 ♦	C	6	1800	18000	50%	2,515
10 HP, 230V	2SR21200 ♦	B	10	1200	12000	20%	1,965
	2SR21800 ♦	C	6	1800	18000	40%	2,515
1 HP, 460V	2SR40400 ♦	B	120	400	4000	50%	1,810
2 HP, 460V	2SR40400 ♦	B	120	400	4000	30%	1,810
	2SR40600 ♦	B	75	600	6000	50%	1,895
3 HP, 460V	2SR40400 ♦	B	120	400	4000	20%	1,810
	2SR40600 ♦	B	75	600	6000	30%	1,895
	2SR41200 ♦	B	40	1200	12000	50%	2,085
5 HP, 460V	2SR40600 ♦	B	75	600	6000	20%	1,895
	2SR41200 ♦	B	40	1200	12000	30%	2,085
	2SR41800 ♦	C	25	1800	18000	50%	2,630
7-1/2 HP, 460V	2SR41200 ♦	B	40	1200	12000	30%	2,085
	2SR41800 ♦	C	25	1800	18000	50%	2,630
10 HP, 460V	2SR41200 ♦	B	40	1200	12000	20%	2,085
	2SR41800 ♦	C	25	1800	18000	40%	2,630
15 HP, 460V	2SR41800 ♦	C	25	1800	18000	20%	2,630
20 HP, 460V	2SR41800 ♦	C	25	1800	18000	20%	2,630

♦ Normally carried in stock

DISCOUNT VS-1AC

OPTIONS - BRAKING, LOOSE SNUBBER TRANSISTOR KITS & RESISTOR INFORMATION

Snubber Transistor Braking Kits - Transistor Only, Open Frame Type

For deceleration of high inertia loads as well as for correction of speed command overshoot, Snubber Transistor Braking Kits provide the circuitry needed to connect to the DC bus and to a matched resistor package for regulation of regenerative energy.



M/N 2ST40027 Snubber Transistor Kit

These snubber transistor circuits are designed to be mounted into another enclosure in engineered applications. Matching the appropriate resistor package then allows the user to optimize the braking capacity of the snubber based on peak and continuous loads. Be sure to follow the minimum resistance values provided in the table. Using resistances lower than the published data will result in excess current being allowed through the circuit and damaging the snubber transistor.

AC Line Voltage	Snubber M/N	Amps DC RMS	Min. Ohms	Max. On Time	UL Listed	List
230	2ST20019♦	19	20	120 sec.	No	\$925
	2ST20054♦	54	6	120 sec.	Yes	1,030
	2ST40009♦	9	75	Cont..	No	1,070
	2ST40027♦	27	25	120 sec.	Yes	1,450
	2ST40075♦	75	10	120 sec.	No	1,775
460	2ST40125♦	125	6	120 sec.	No	2,065
	2ST40150♦	150	5	Cont.	No	2,395
	2ST40200♦	200	3.8	Cont.	No	2,620
	2ST40300♦	300	2.5	Cont.	No	2,830

Snubber Resistor Selection Information - For use with the Snubber Transistor Kits

Snubber Transistor Kits require a resistor for dissipation of regenerative energy as heat. By selecting the proper resistor, the user can optimize the braking performance of the drive system. The following table provides resistor sizing information based on application horsepower and duty cycle. Resistors must be purchased from a local resistor supply house.

HP	Duty	Snubber Transistor M/N	Resistor Min. Ohms	Resistor Max. Ohms	Approx. Resistor KW
230 Volt Drive Snubber Resistor Sizing					
1-5	60%	2ST20019	20	58	2
	100%	2ST20019	20	35	3.75
7-1/2 - 10	60%	2ST20019	20	29	3.75
	100%	2ST20054	6	17	7.5
15-20	60%	2ST20054	6	14	9
	100%	2ST20054	6	8.5	15
460 Volt Drive Snubber Resistor Sizing					
1-5	60%	2ST40027	25	230	2.5
	100%	2ST40027	25	139	3.75
7-1/2 - 10	60%	2ST40027	25	116	5
	100%	2ST40027	25	70	7.5
15-30	20%	2ST40027	25	116	5
	60%	2ST40027	25	39	13
40-60	100%	2ST40075	10	23	20
	20%	2ST40075	10	58	9
75-100	60%	2ST40075	10	20	27
	100%	2ST40075	10	12	45
125-200	20%	2ST40075	10	35	15
	60%	2ST40075	10	12	45
250	100%	2ST40125	6	7	75
	20%	2ST40125	6	17	30
300	60%	2ST40150	5	6	90
	100%	2ST40200	3.8	4	150
350	20%	2ST40075	10	14	37
	40%	2ST40125	6	7	75
400	60%	2ST40150	5	6	112
	80%	2ST40200	3.8	4	150
460	100%	2ST40300	2.5	3	187
	20%	2ST40075	10	12	45
500	40%	2ST40125	6	6.5	90
	50%	2ST40150	5	5.5	112
550	60%	2ST40200	3.8	4	135
	100%	2ST40300	2.5	3	224
600	20%	2ST40125	10	11	52
	40%	2ST40150	5	5.5	104
650	60%	2ST40200	3.8	4	157
	80%	2ST40300	2.5	3	208
700	20%	2ST40200	3.8	9	60
	60%	2ST40300	2.5	3	179

♦ Normally carried in stock

AC Drives

OPTIONS - BRAKING, LINE REGENERATION

Line Regeneration Modules

As in snubber braking, Line Regeneration modules allow for the dissipation of high DC bus voltages to provide braking of high inertia loads at the motor. In this case however, energy is supplied back to the incoming power line. The benefit of line regeneration is the elimination of the braking resistors and the heat they develop, as well as recovering the energy to reduce power consumption. Fuses come as standard on both the 3-phase AC input connections, as well as DC connections.

Adjustments include:

- Voltage Dip
- Bus Limit
- Overload Limit

Protection features include:

- AC Line Phase Loss
- AC Line Undervoltage
- Current Limit
- DC Bus Overload
- Thermal Overload

For instructions on sizing, see Page IX.



Line Regeneration Module

	Regeneration Module Dimensions				Weight lb (kg)
	Amp Rating	Height in. (mm)	Width in. (mm)	Depth in. (mm)	
w/o Fan Option	10, 20, 30, 45	17.5 (444)	16.2 (411)	8.3 (211)	45 (99)
w/Fan Option	10, 20, 30, 45	17.5 (444)	18.5 (470)	8.3 (211)	53 (117)
	60, 90	26 (660)	23 (584)	10.4 (264)	115 (254)

AC Drives

AC Line Volts	Module M/N	RMS DC Amps	w/o Fan Option		w/Fan	List
			45 sec. kW	Cont. kW	Cont. kW	
230V	1RG22008 ♦	10	3	3	3	\$3,470
	1RG22015 ♦	20	7	4	7	3,620
	1RG22025 ♦	30	10	4	10	3,850
	1RG22045 ♦	45	15	4	12.5	4,825
460V	1RG42008 ♦	10	7	4	7	3,975
	1RG42015 ♦	20	14	4	12.5	4,365
	1RG42025 ♦	30	20	4	12.5	4,865
	1RG42045 ♦	45	30	4	12.5	6,340
	1RG42060 ♦	60	41	37.5	fan std.	8,735
	1RG42090 ♦	90	61	37.5	fan std.	12,135

Fan Kit for Regeneration Modules

Increases the continuous current ratings as shown in the "w/Fan" column above.

Model No.: 1RG10000 ♦ \$440 List

♦ Normally carried in stock

DISCOUNT VS-1AC

OPTIONS - CE COMPLIANCE

Compliance to CE Directives

Compliance to the following European Community standards can be met when the listed options are installed along with the GV3000/SE drive product, and while following installation guidelines in the instruction manual.

EN5008-1: Electromagnetic compatibility - generic standard, Part 1: residential, commercial, and light Industry.

EN5008-2: Electromagnetic compatibility - generic immunity, Part 2: Industrial Environment.

Compliance Requirements

Compliance is maintained by fitting the GV3000/SE with a Reliance Electric Mains Filter⁽¹⁾ and following installation guidelines below. Refer also to the drive instruction manual.

- Motor leads must not exceed 250 ft. from the drive.
- Motor leads must be 3 conductor plus a ground wire, screened or armored cables, or run in a rigid conductive conduit and electrically connected to both the GV3000/SE and the motor.
- Remote operator controls and signal wiring must be either screened or armored cables, or run in a rigid conductive conduit. The operator station must be electrically conductive as well.

Mains Filters

Filter selections vary between GV3000/SE models to best accommodate each frame style available. Refer to the drive model number shown in the table to identify the filter option required to comply with CE⁽¹⁾.

Incoming power is connected to the input of each Mains Filters, with output connections from the filter connected to terminals L1, L2 and L3 of the GV3000/SE.

(1) Cover Kit 2CK4160 must also be used in conjunction with the Mains Filter (For drive M/N's 25V4160 thru 60G4160 only) to comply with CE requirements.

(2) Consult factory for assistance.

◆ Normally carried in stock

GV3000/SE M/N	Mains Filter M/N	Mounting Configuration	Filter List
1V4160			
2V4160	2DF4283 ◆	mounts under drive chassis	\$340
3V4160			
5V4160			
7V4160	2DF4284 ◆	mounts under drive chassis	415
10V4160			
15V4160			
20V4160	2DF4285 ◆	mounts under drive chassis	550
25G4160			
25V4160			
30V4160			
40V4160	2DF4286 ◆ ⁽¹⁾	mounts under drive chassis ⁽¹⁾	1,600
50V4160			
60G4160			
50R4160	use 75T4160	N/A	-
75R4160			
75T4160	Standard	mounted Internal	-
75V4060			
100V4060	⁽²⁾	⁽²⁾	⁽²⁾
125R4160	2DF4125 ◆	mounts remote	6,930
125V4060			
150V4060	⁽²⁾	⁽²⁾	⁽²⁾
200V4060			
200V4160			
250V4160			
300V4160	⁽²⁾	⁽²⁾	⁽²⁾
350V4160			
400V4160			

Technical Data for GV3000/SE Mains Filter

Filter M/N	Dimensions - in (mm)			Watt Loss	Amps Cont.
	Height	Width	Depth		
2DF4283	15.2 (387)	8.5 (217)	2 (53)	45	22
2DF4284	17.3 (440)	10.7 (272)	2 (53)	45	22
2DF4285	22.6 (575)	10.7 (272)	3.6 (91.5)	45	22
2DF4286	37.7 (958)	14.4 (365.5)	3.6 (91.5)	75	100
2DF4125	26.8 (680)	12.6 (320)	6.3 (160)	27	270

Cover Kit⁽¹⁾ (For 25-60 HP GV3000/SE)

A non-ventilated cover for GV3000/SE control model numbers 25V4160 through 60G4160. This cover must be used in conjunction with a Mains Filter in order to comply with CE requirements.

Model No.: 2CK4160 ◆\$190 List

DISCOUNT VS-1AC