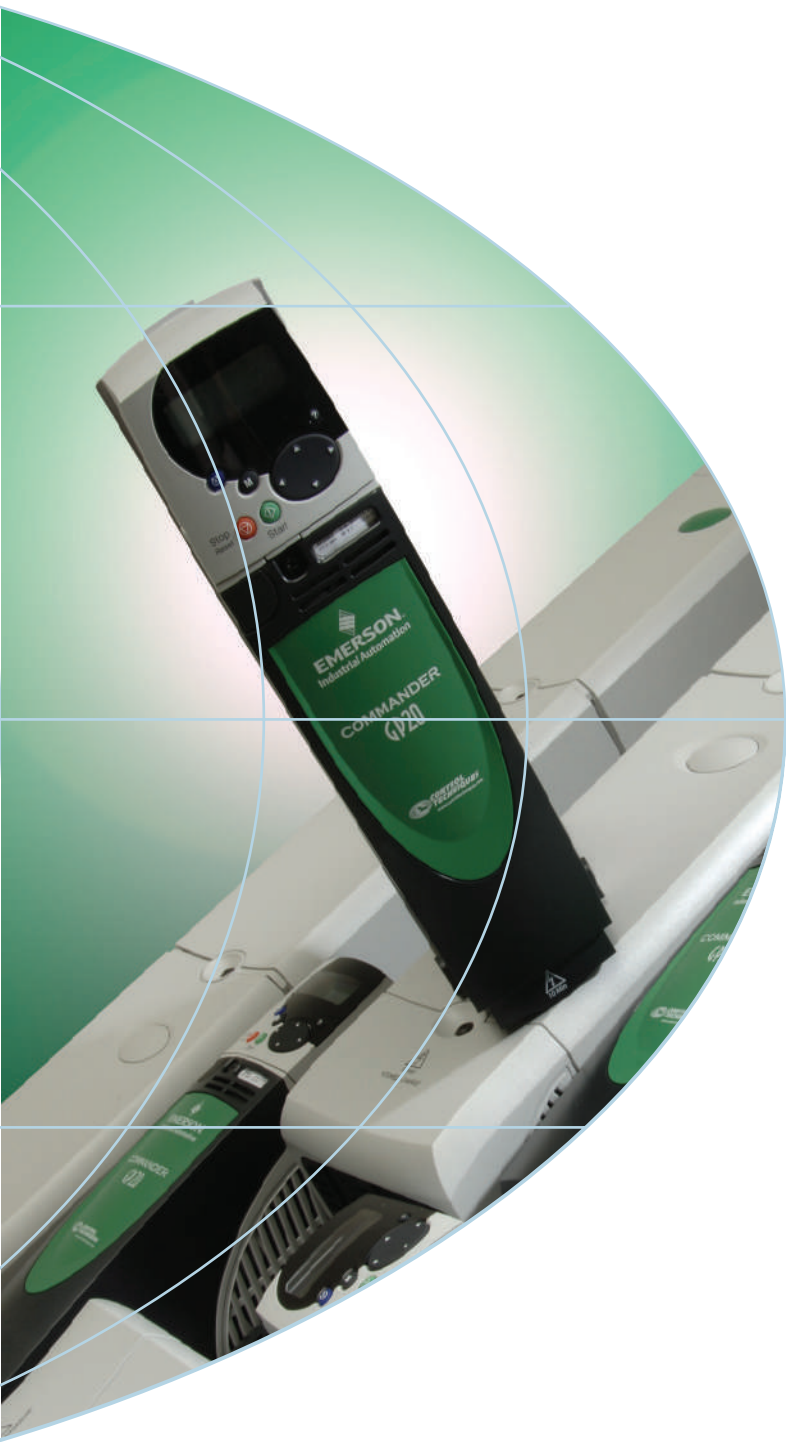




EMERSON[™]
Industrial Automation

Commander GP20

Intuitive & Powerful
General Purpose AC Drive



www.emersonct.com

Commander GP20

Intuitive & Powerful General Purpose AC Drive

The Commander GP20 is the highest performance and simplest to use General Purpose AC drive available today. Its operating modes are V/Hz (default), Open Loop Vector, or Rotor Flux Control (RFC), which provides simulated encoder feedback for outstanding motor shaft performance. Set up is intuitive using the SmartCard and selecting from its ten macros to auto configure the drive. The SmartCard also provides a safe and unique way to store and download drive settings for fast and easy cloning.



DRIVE KEY FEATURES

- Digital AC drive
- V/Hz standard default mode or can be programmed in Open Loop Vector or Rotor Flux Control mode
- Two zero-space solution module slots for fieldbus and additional I/O
- SmartCard for simple setup and cloning, includes 10 macros for rapid start-up
- External 24 VDC backup control supply connections
- PLC functionality built in with IEC 61131-3 programming language
- Modbus port for remote display and peripherals
- Plain text LCD keypad, completely configurable in multiple languages: English (default), French, German, Spanish, Italian, or can be easily customized
- PC compatible
- Built-In EMC filter
- Easy access terminals for easy wiring
- Ref: keypad, 0-10VDC, 0-20mA, 4-20mA, Presets, 7 digital inputs
- Carrier frequency 3, 6, 12, or 16 KHz
- 0 to 3,000 Hz output frequency
- IP20 or NEMA 1 mounting
- Built-in dynamic braking transistor
- Dual motor maps

Intuitive Setup and Control

The LCD plain text keypad is all that's usually needed to set up an application and monitor drive parameters. Pre-programmed macro solutions are at your finger tips for intuitive configuration for a wide range of general purpose drive applications. Simply select the application macro and you are up and running. For specialized applications, the drive can be programmed via the keypad or a laptop using free CTSOft software.

SmartCard Parameter Storage

The SmartCard is a revolution in simplicity, allowing users to store or clone parameters and download stored parameters to a drive, or dozens of drives.

V/Hz, Open Loop Vector or Rotor Flux Control

Many basic applications can be up and running in minutes in the standard V/Hz mode, but for applications with demanding speed torque requirements or using very high speed motors, Open Loop Vector and the newly developed Rotor Flux Control modes are available to boost shaft performance.

Solution Modules

To customize your GP20 with more or specialized I/O, or to install a fieldbus option there are slots beneath the cover for two Solution Modules.

CONFIGURATION AND PROGRAMMING

GP20 SmartCard

This is a standard feature that enables simple configuration of parameters in a variety of ways. The SmartCard can:

- Download pre-programmed macros for intuitive configuration of typical general purpose applications
- 'Clone' a complete set of parameters for serial production
- Save multiple complete sets of parameters
- Set up an application as parameter differences from default
- Automatically save all user parameter changes for maintenance purposes
- Load complete motor map parameters



CT Comms Cable

This standard pre-made cable is available from Control Techniques to connect a PC to AC drives, including the Commander GP20, via the RJ45/RS485 port.

FIELDBUS COMMUNICATION MODULES



INPUT / OUTPUT MODULES

SM-I/O Plus

This module provides expanded digital and analog I/O for the Commander GP20.

- 2 Analog Inputs (10-bit plus sign, $\pm 10V$)
- 1 Analog Output (10-bit plus sign, $\pm 10V$)
- 3 Digital Inputs/Outputs
- 3 Digital Inputs
- 2 Relay Contacts (2A @ 240VAC, 4A @ 30VDC)



SM-I/O Lite

This module provides expanded digital and analog I/O for the Commander GP20, in a different configuration to the SM-I/O PLUS above.

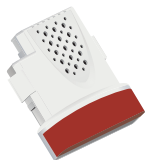
- 1 Analog Input (11-bit plus sign, $\pm 10V$, 4-20mA, or 0-20mA)
- 1 Analog Output (13-bit, 0-10V, 4-20mA, or 0-20mA)
- 3 Digital Inputs
- 2 Relay Contacts (2A @ 240VAC, 4A @ 30VDC)



SM-I/O Timer

I/O as the SM-I/O LITE above, but with the addition of a Real Time Clock and Calendar for scheduling drive events.

- Access to Year, Month, Day, Hour, Minute, Second, and Daylight Savings Mode



SM-I/O 120V

This module provides digital I/O rated for 120 or 240VAC for the Commander GP20. These I/O conform to IEC 61131-2 120VAC standard.

- 6 Digital Inputs (120VAC or 3 Digital Inputs @ 240VAC)
- 2 Relay Contacts (2A @ 240VAC, 4A @ 30VDC)



SM-I/O PELV

This module provides PELV (Protective Extra Low Voltage) double insulated digital and analog I/O to meet IEC 61131-2, Clause 3.3.1 Type as well as NAMUR NE37 specifications for chemical industry applications.

- 2 Analog Inputs (4-20mA or 0-20mA)
- 1 Analog Output (4-20mA or 0-20mA)
- 1 Digital Input
- 4 Digital Inputs/Outputs
- 2 Relay Contacts (2A @ 240VAC, 4A @ 30VDC)



COMMANDER GP20 DRIVES RATINGS

Commander GP20		Motor HP	Continuous Output Current	Peak Output Current	Motor HP	Continuous Output Current	Peak Output Current	Peak Output Current
208/230VAC		Normal Duty			Heavy Duty			
Order Code	Frame	HP @ 230V	I _N (A)	(A)	HP @ 230V	I _H (A)	Open loop (A)	RFC (A)
CGP1201	1	1.5	5.2	5.7	1	4.3	6.4	7.5
CGP1202		2	6.8	7.5	1.5	5.8	8.7	10.1
CGP1203		3	9.6	10.5	2	7.5	11.2	13.1
CGP1204		3	11	12.1	3	10.6	15.9	18.5
CGP2201	2	5	15.5	17.0	3	12.6	18.9	22
CGP2202		7.5	22	24.2	5	17	25.5	29.7
CGP2203		10	28	30.8	7.5	25	37.5	43.7
CGP3201	3	15	42	46	10	31	46.5	54.2
CGP3202		20	54	59	15	42	63	73.5
CGP4201	4	25	68	74	20	56	84	98
CGP4202		30	80	88	25	68	102	119
CGP4203		40	104	114.4	30	80	120	140

380/480VAC		Normal Duty			Heavy Duty			
Order Code	Frame	HP @ 460V	I _N (A)	(A)	HP @ 460V	I _N (A)	Open loop (A)	RFC (A)
CGP1401	1	1.5	2.8	3.0	1	2.1	3.1	3.6
CGP1402		2	3.8	4.1	2	3	4.5	8.2
CGP1403		3	5	5.5	3	4.2	6.3	7.3
CGP1404		5	6.9	7.5	3	5.8	8.7	10.1
CGP1405		5	8.8	9.6	5	7.6	11.4	13.3
CGP1406		7.5	11	12.1	5	9.5	14.2	16.6
CGP2401	2	10	15.3	16.8	10	13	19.5	22.7
CGP2402		15	21	23	10	16.5	24.7	28.8
CGP2403		20	29	31	15	25	34.5	40.2
CGP2404		20	29	31	20	29	43.5	50.7
CGP3401	3	25	35	38	25	32	48	56
CGP3402		30	43	47	30	40	60	70
CGP3403		40	56	61	30	46	69	80.5
CGP4401	4	50	68	74	50	60	90	105
CGP4402		60	83	91	60	74	111	129.5
CGP4403		75	104	114	75	96	144	168
CGP5401	5	100	138	151	100	124	186	217
CGP5402		150	168	184	125	156	234	273
CGP6401	6	150	202	225	150	180	231	269
CGP6402		200	236	259	150	210	270	315

575VAC		Normal Duty			Heavy Duty			
Order Code	Frame	HP @ 575V	I _N (A)	(A)	HP @ 575V	I _H (A)	Open loop (A)	
CGP3501	3	5	5.4	5.9	3	4.1	6.1	7.1
CGP3502		5	6.1	6.7	5	5.4	8.1	9.4
CGP3503		7.5	8.4	9.2	5	6.1	9.1	10.6
CGP3504		10	11	12.1	7.5	9.5	14.2	16.6
CGP3505		15	16	17.6	10	12	18	21
CGP3506		20	22	24.2	15	18	27	31.5
CGP3507		25	27	29.7	20	22	33	36.5
CGP4603	4	30	36	39.6	25	27	40.5	47.2
CGP4604		40	43	47.3	30	36	54	63
CGP4605		50	52	57.2	40	43	64.5	75.2
CGP4606		60	62	68	50	52	78	91
CGP5601	5	75	84	92	60	63	93	108.5
CGP5602		100	99	108	75	85	126	147
CGP6601	6	125	125	137	100	100	128	149
CGP6602		150	144	158	125	125	160	187

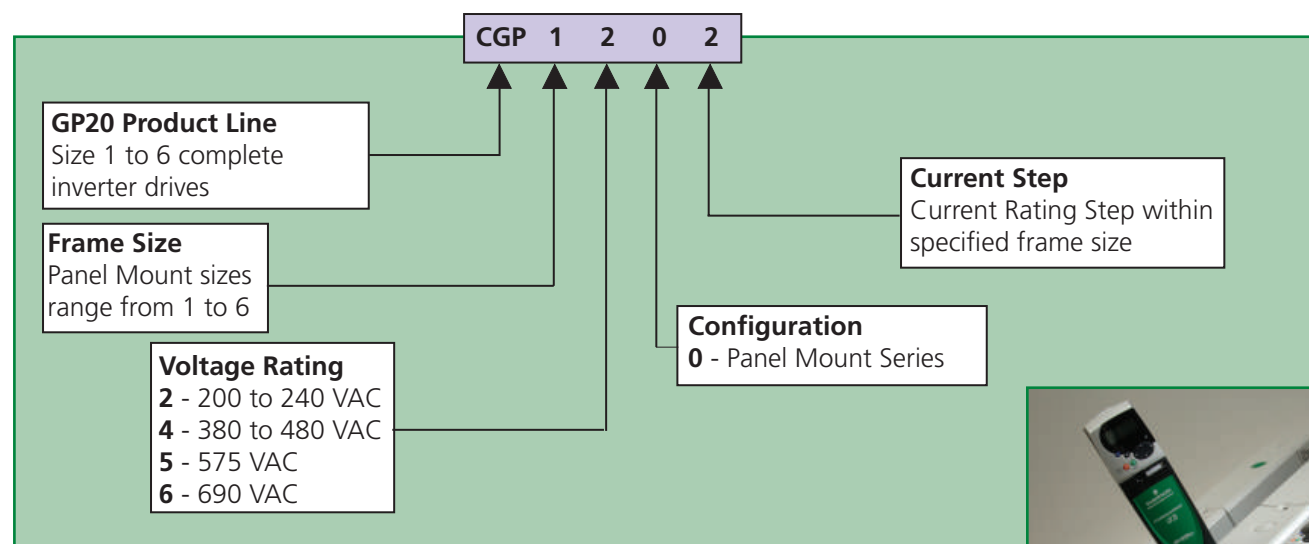
Note: Motor horsepower ratings are based on typical motor current ratings. Actual motor currents should be checked before selecting a particular drive. For some high efficiency motors, the required full load motor current may allow the selection of a smaller drive than is indicated in the chart. The same consideration would also apply for motors with less common power or voltage ratings.

COMMANDER GP20 DRIVES RATINGS (continued)

Commander GP20		Motor HP	Continuous Output Current	Peak Output Current	Motor HP	Continuous Output Current	Peak Output Current	Peak Output Current
690VAC		Normal Duty			Heavy Duty			
Order Code	Frame	HP @ 690V	I _N (A)	(A)	HP @ 690V	I _H (A)	Open loop (A)	RFC (A)
CGP4601	4	25	22	24.2	20	19	27	31.5
CGP4602		30	27	29.7	25	22	33	38.5
CGP4603		40	36	39.6	30	27	40.5	47.2
CGP4604		50	43	47.3	40	36	54	63
CGP4605		60	52	57.2	50	43	64.5	75.2
CGP4606		75	62	68.2	60	52	78	91
CGP5601	5	100	84	92	75	63	93	108.5
CGP5602		125	99	108	100	85	126	147
CGP6601	6	150	125	137	125	100	128	149
CGP6602		175	144	158	150	125	160	187

Normal Duty	Suitable for most applications, current overload is set at 110% for 60 seconds. Where motor rated current is less than the drive rated continuous current, higher over loads are achieved.	Heavy Duty	Suitable for demanding applications, current overload is set at up to 175% for 40 seconds (150% on size 6). Where motor rated current is less than the drive rated continuous current, higher overloads (200% or greater) are achieved.
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COMMANDER GP20 ORDER STRING



A part of Emerson Industrial Automation, Control Techniques is the industry leader in the design and manufacture of intelligent variable speed drives. Our drives are used to control motors in a wide range of applications, from precision machines to high performance elevators and from cranes to fans. Whatever the application, Control Techniques drives deliver an effective solution to increase productivity and reduce energy consumption.

Business without borders

Control Techniques is a global player, with manufacturing and research and development facilities in Europe, Asia and the Americas. There are Drive & Application Centers in

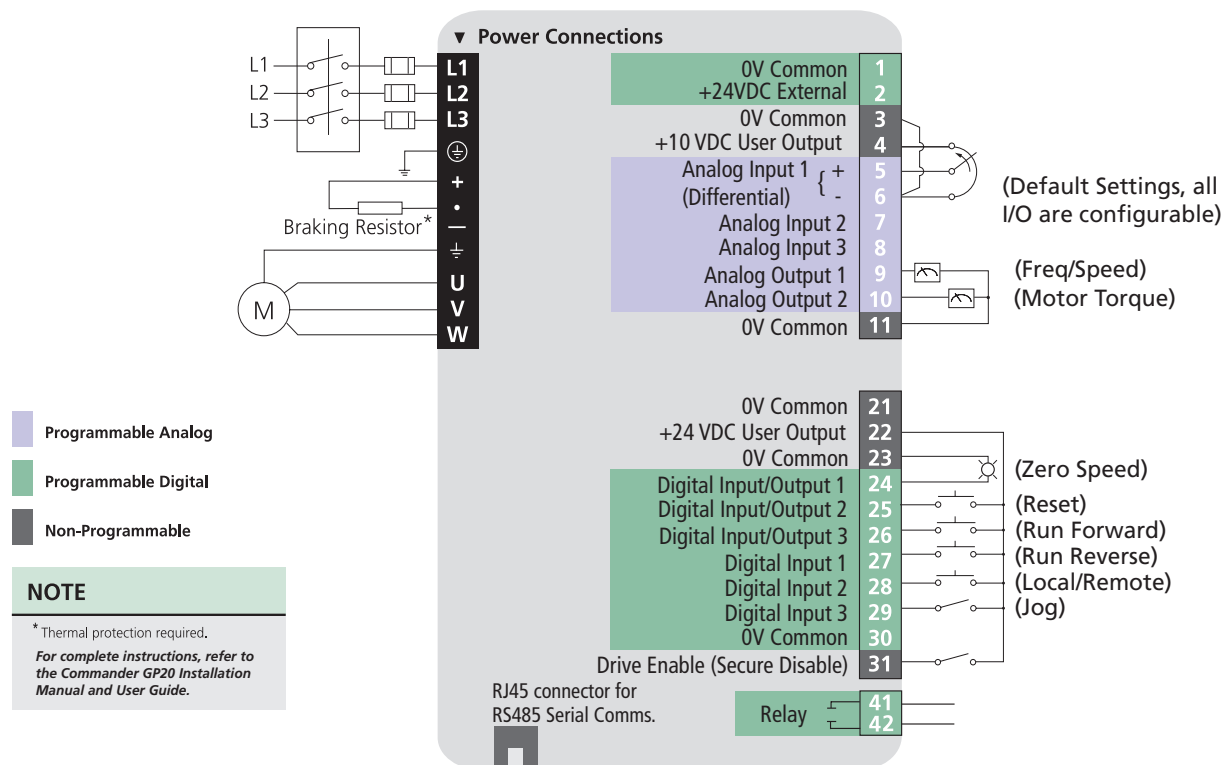
over 50 locations across 35 countries to offer customers local technical sales, service and design expertise, and many offer a comprehensive system design and build service.

Our expertise is in your industry

Our experience and expertise in a broad range of applications, allows us to work with you to maximise the performance of your machinery. Together, we can deliver the advantage that you need to stay ahead in today's competitive environment.



TERMINAL DIAGRAM



TERMINAL DESCRIPTION

Pin#	Function ①	Type/Description	Notes
1	0V Common		
2	+24VDC External Input	Back up Power Supply for Control	60W, 24 VDC
3	0V Common	Common for External Analog Devices	
4	+10VDC User Supply	Reference Supply	10 mA max
5	Analog Input 1 (Local Frequency/Speed Reference)	Differential Analog Input, Non-inverting Input, 16 bit	±10 VDC 100k Ohms
6	Analog Input 1 (Local Frequency/Speed Reference)	Differential Analog Input, Inverting Input 16 bit	±10 VDC 100k Ohms
7	Analog Input 2 (Remote Frequency/Speed Reference)	Single-ended Analog Input 10 bit	±10 VDC, 100k Ohms or 4-20 mA, 200 Ohms ②
8	Analog Input 3	Single-ended Analog Input 10 bit	±10 VDC, 100k Ohms or 4-20 mA, 200 Ohms ②
9	Analog Output 1 (Frequency/Speed Monitor)	Single-ended Analog Output, Bi-polar, 10 bit	±10 VDC or 0-20 / 4-20 mA ②
10	Analog Output 2 (Motor Torque Monitor)	Single-ended Analog Output, Bi-polar, 10 bit	±10 VDC or 0-20 / 4-20 mA ②
11	0V Common	Common External Analog Signals	

Pin#	Function ①	Type/Description	Notes
21	0V Common		
22	+24VDC User Output	User Supply	200 mA max
23	0V Common	Common for External Digital Inputs	
24	Digital I/O 1 (Zero Speed Output)	Digital Input/Output	0 to 24 VDC input, or 1 to 24 VDC, 100 mA max output
25	Digital I/O 2 (Reset Input)	Digital Input/Output	0 to 24 VDC input, or 1 to 24 VDC
26	Digital I/O 3 (Run Forward Input)	Digital Input/Output	0 to 24 VDC input, or 1 to 24 VDC, 100 mA max output
27	Digital Input (Run Reverse)	Digital Input	0 to 24 VDC, 7.5k Ohms
28	Digital Input (Local/Remote)	Digital Input	0 to 24 VDC, 7.5k Ohms
29	Digital Input (Jog)	Digital Input	0 to 24 VDC, 7.5k Ohms
30	0V Common	Common for External Digital Inputs	
31	Digital Input (Secure Disable)	Digital Input	0 to 24 VDC, 1 µsec sample
41	Status Relay (Drive Healthy)	Normally Open	240 VAC, 2A resistive
42	Status Relay (Drive Healthy)	Normally Open	240 VAC, 2A resistive

Programmable Analog Programmable Digital All Analog I/O is scalable

① Values in parenthesis designate default functions.
② 0-20, 4-20 mA modes are also available. See Commander GP20 Manual.



COMMANDER GP20

*The Intuitive & Powerful
General Purpose Drive*



SPECIFICATIONS

Environment

Ambient Operating Temperature	0° to 40°C (32° to 104°F)
Cooling method	Forced convection
Humidity	95% maximum non-condensing at 40°C (104°F)
Storage Temperature	-40° to 50°C (-40° to 122°F)
Altitude	0 to 3000m (9,900 ft). Derate 1% per 100m (328 ft) between 1000m (3280 ft) and 3000m (9,900 ft).
Vibration	Tested in accordance with IEC 68-2-34
Mechanical Shock	In accordance with IEC 68-2-27
Enclosure	NEMA 1 (IP 20), NEMA 12 (IP 54) through panel mounting
Electromagnetic Immunity	In compliance with IEC801 and EN50082-2, and complies with EN61800-3 with built-in filter
Electromagnetic Emissions	In compliance with EN50081-2 when the recommended RFI filter is used and EMC installation guidelines are followed

AC Supply Requirements

Voltage	200 to 240VAC $\pm 10\%$ 380 to 480VAC $\pm 10\%$ 500 to 575VAC $\pm 10\%$ 500 to 690VAC $\pm 10\%$
Phase	3Ø
Phase Imbalance Tolerance	2% negative phase sequence (equivalent to 3% voltage imbalance between phases)
Frequency	48 to 65Hz
Input Displacement Power Factor	0.93

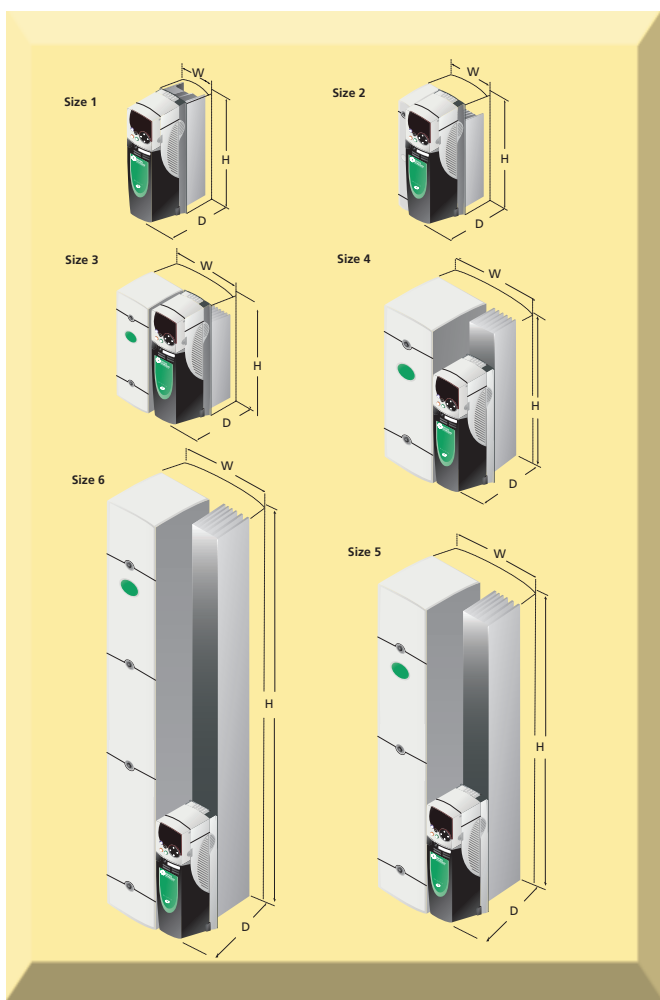
Control

Carrier Frequency	3, 4, 6, 8, 12, 16kHz
Output Frequency	0 to 3000Hz (Open loop)
Output Speed	0 to 40,000 RPM
Frequency Accuracy	$\pm 0.01\%$ of full scale
Frequency Resolution	0.001Hz
Analog Input Resolution	10 Bit + sign (Qty 2); 16 Bit + sign (Qty 1)
Serial Communications	2 or 4-wire RS232 or RS485. Protocol is ANSI x 3.28-2.5-A4, or Modbus RTU Baud rate 300 to 115,200.
Braking	DC injection braking (stopping and holding) standard. Dynamic braking transistor standard.
Control Power Ride Through	Up to 1 second depending on inertia and decel time

Protection

DC Bus Undervoltage Trip	175 / 350 / 435VDC (approximately 124 / 247 / 307VAC line voltage)
DC Bus Overvoltage Trip	415 / 830 / 990VDC (approximately 293 / 587 / 700VAC line voltage)
MOV Voltage Transient Protection	160 Joules, 1400VDC clamping (Line to line and line to ground)
Drive Overload Trip	Current overload value is exceeded. Programmable for Normal Duty or Heavy Duty, Open loop or Closed loop operation (RFC mode)
Instantaneous Overcurrent Trip	225% of drive rated current
Phase Loss Trip	DC bus ripple threshold exceeded
Overtemperature Trips	Drive heatsink, control board, and option module(s) monitoring
Short Circuit Trip	Protects against output phase to phase fault
Ground Fault Trip	Protects against output phase to ground fault
Motor Thermal Trip	Electronically protects the motor from overheating due to loading conditions

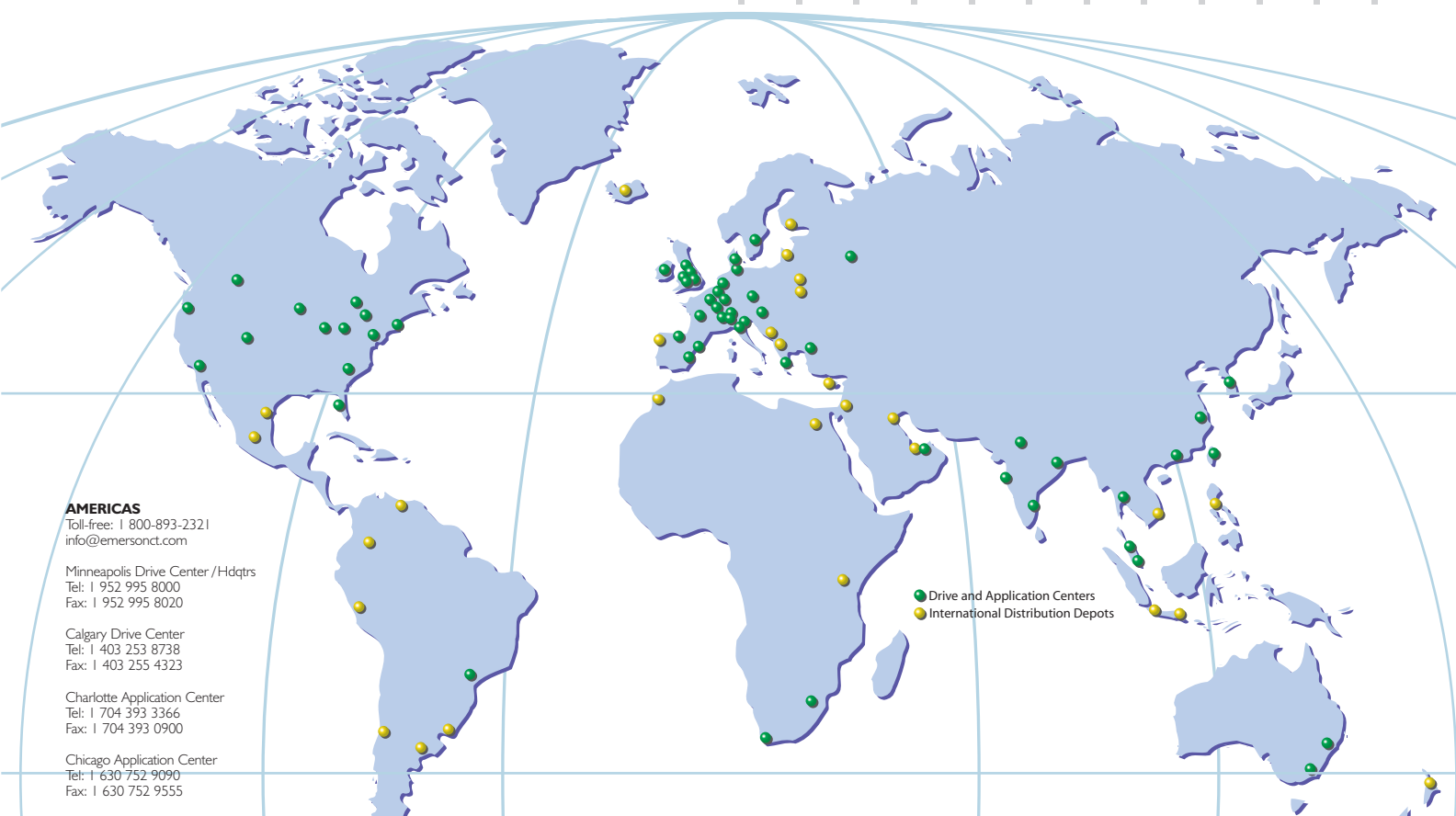
DIMENSIONS



Frame Size	H		W		D		Weight	
	in	mm	in	mm	in	mm	lb	kg
1	15.20	386	3.93	100	8.62	219	12.8	5.8
2	15.32	389	6.10	155	8.62	219	15.4	7.0
3	15.32	389	9.84	250	10.23	260	33.1	15.0
4	21.53	547	12.20	310	11.73	298	66.1	30.0
5	33.75	857	12.20	310	11.73	298	121.3	55.0
6	46.02	1169	12.20	310	11.73	298	165.3	75.0

For through-panel mounting dimensions contact your local Drive Center.

Driving Technology...



AMERICAS

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Fax: 1 403 255 4323

Charlotte Application Center
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Fax: 1 704 393 0900

Chicago Application Center
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Fax: 1 630 752 9555

Cleveland Drive / Systems Center
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Fax: 1 440 717 0133

Fort Myers Drive / Systems Center
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Fax: 1 239 693 2431

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Toronto Application Center
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Fax: 1 905 201 4694

Salt Lake City Drive Center
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Fax: 1 801 566 5673

Sao Paulo Application Center
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Fax: 55 11 9283 1778

York, Pa., Drive Center
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Fax: 1 717 751 4263

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Fax: 61 9729 3200
After Hours: 61 2 9963 5271

Sydney Drive Center
A.C.N. 003 815 281
Tel: 61 2 9838 7222
Fax: 61 2 9838 7764
After Hours: 61 2 9963 5271

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Linz Drive Center
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Fax: 43 7229 7894810
After Hours: 43 7215 3502

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Brussels Drive Center
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Fax: 32 2725 4940

CHINA

Shanghai Drive Center
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Fax: 86 21 64083282

Beijing Application Center
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Fax: 86 10 6500 3094

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Fax: 420 541 192115
After Hours: 420 541 192 119

DENMARK

Copenhagen Drive Center
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Fax: 45 4369 6101
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Fax: 33 5 4564 5400

GERMANY

Bonn Drive Center
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Fax: 49 2242 877277
After Hours: 49 1714 964777

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Dublin Drive Center
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Fax: 353 45 433622

ITALY

Milan Drive Center and
Reggio Emilia Application Center
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Fax: 39 02575 12858
After Hours: 39 02575 751

KOREA

Vicenza Drive Center
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Fax: 39 0444 341317

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Rotterdam Drive Center
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Fax: 31 1844 20721
After Hours: 31 1844 20555

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Hong Kong Application Center
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INDIA

Bombay Application Center
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Fax: 91 20 612 3771

Calcutta Application Center
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Fax: 91 33 357 3435
After Hours: 91 33 358 3622

JAPAN

Madras Drive Center
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Fax: 91 44 4961602
After Hours: 91 44 496 1083

New Delhi Application Center
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Fax: 91 11 576 4782

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After Hours: 27 11 462 1740

Cape Town Application Center
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Fax: 27 21 556 2574
After Hours: 27 11 462 1740

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Fax: 7 095 956 4862

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Singapore Drive Center
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Fax: 65 272 1302
After Hours: 65 9752 5828
or 65 9636 0323

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Fax: 34 93 680 0903
/34 93 680 2823
After Hours: 34 610 554540

Bilbao Application Center
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Fax: 34 94 681 1406

Valencia Drive Center
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Fax: 34 96 153 2906

SWEDEN

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Fax: 46 8 554 24120

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Lausanne Application Center
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Fax: 41 21 635 8596
After Hours: 41 79 357 8683

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Taipei Application Center
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Fax: 886 22705 9131

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Bangkok Drive Center
Tel: 66 2580 7644
Fax: 66 2591 4559
A/Hours Sales: 66 1443 4095
A/Hours Service: 66 1443 4098

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After Hours: 90 216 418 2420

UAE

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