

PowerXL Series

DG1 general purpose drives

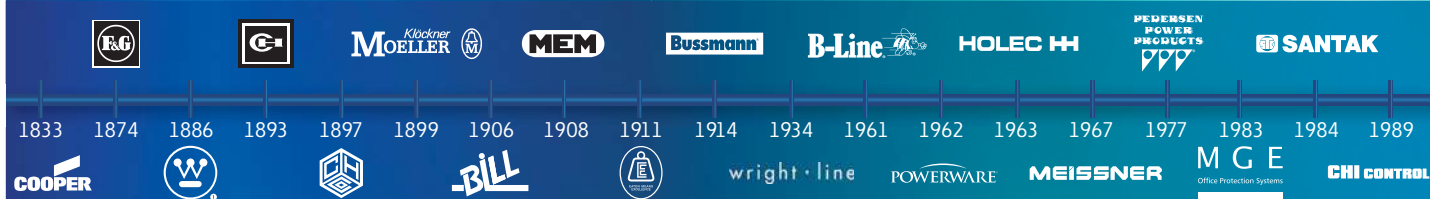
High efficiency The new generation VFD



Powering Business Worldwide



The power of fusion.



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Powering Business Worldwide

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DG1 General Purpose Drive



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PowerXL Series—DG1 General Purpose Drive

Product Description

The DG1 general purpose drives are part of Eaton’s next generation PowerXL Series of adjustable frequency drives specifically engineered for today’s more demanding commercial and industrial applications. The power unit makes use of the most sophisticated semiconductor technology and a highly modular construction that can be flexibly adapted to meet the customer’s needs.

The control module was designed to include today’s standard communication protocols and I/O while still having the modularity to add additional option cards.

Eaton’s patented Active Energy Control is also a standard feature on DG1 drives, offering customers increased efficiency, safety and reliability.

These drives continue the tradition of robust performance and raise the bar on features and functionality, ensuring the best solution at the right price.

Product Range

- 0.75-90kW, 208-240V
- 1.5-160kW, 380V-500V

Features and Benefits

Hardware

- Brake chopper standard on Frames 1, 2, 3
- Dual overload ratings
 - 110% variable torque (I_L)
 - 150% constant torque (I_H)
- IP21 and IP54 enclosures available
- Integrated common mode reduction 5% DC link choke with input surge protection
- EMI/RFI filters standard on all drives—meets EMC Category C2
- Real-time clock—supports calendaring and PLC functionality
- Graphic LCD display and keypad—supports simple menu navigation as well as on-screen diagnostics and troubleshooting
- LOCAL/REMOTE operation from keypad and two configurable soft keys

- Control logic can be powered from an external auxiliary control panel—internal drive functions and fieldbus if necessary
- Standard I/O:
 - 8DI, 1DO
 - 2AI, 2AO
 - Three relays
 - Meets needs of most communication requirements
- Standard communications:
 - Ethernet IP, Modbus TCP
 - RS-485: Modbus RTU BACnet MS/TP
 - Meets the needs of most communication requirements
- Two expansion slots—intended to support additional I/O or communication protocols as necessary
- Quick disconnect terminals for I/O connections—supports fast easy installation

Software

- Active energy control—minimizes energy losses in your motor, resulting in industry-leading energy efficiency for your application
- Quick Start Wizard upon initial power-up supports fast, easy installation
- Standard applications:
 - Standard
 - Multi-pump and fan Control
 - Multi-PID
 - Multi-purpose
- Copy/paste functionality on drive keypad—allows for fast setup of multiple drives
- Pre-programmed I/O—supports fast, easy installation for most applications
- Dynamic motor regenerative energy management
- Advanced PC Tool with diagnostic capabilities
- Two configurable keypad soft keys

Adjustable Frequency Drives

PowerXL Series—DG1 General Purpose Drive

Standards and Certifications

Product

- IEC/EN 61800-5-1
- IEC/EN 61800-5-2
- UL 508C
- IEC 61508
- EN 62061
- EN ISO 13849-1

EMC

- Immunity: IEC/EN 61800-3
- Category C2

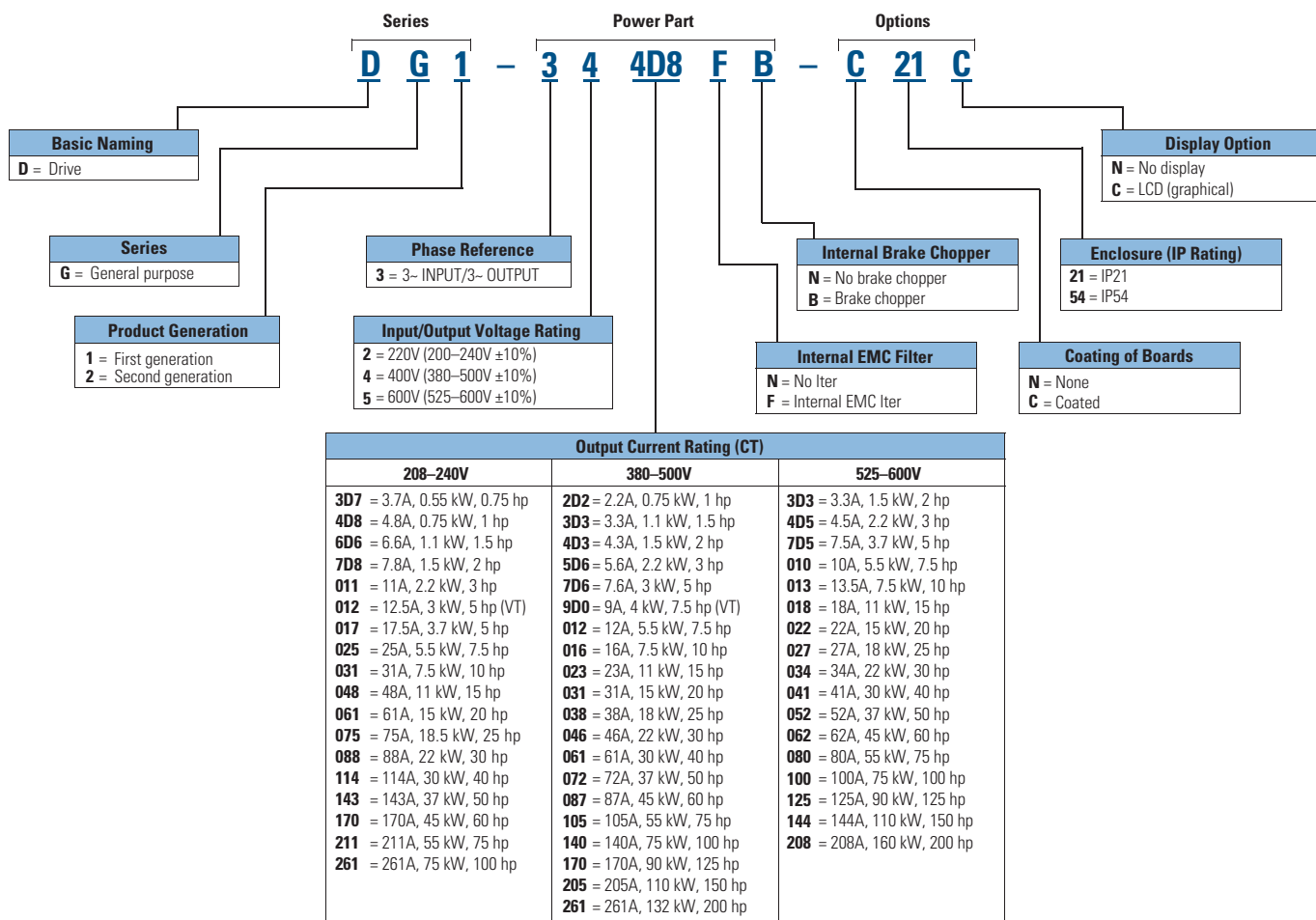
Certification

- UL
- CUL
- CE
- C-Tick
- GOST
- RoHS

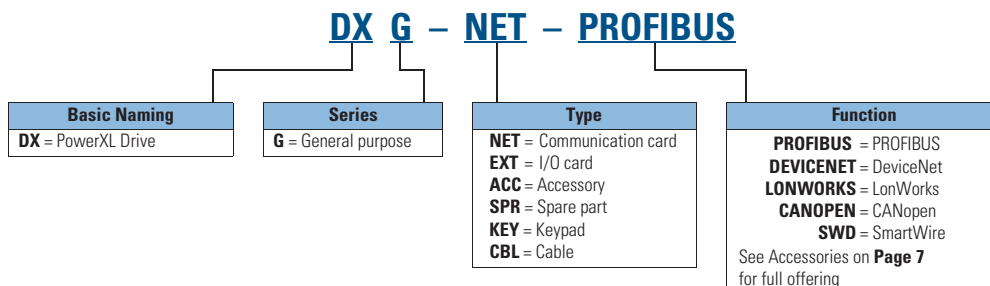


Catalog Number Selection

PowerXL Series—DG1 General Purpose Drive



PowerXL Series—DG1 General Purpose Drive Option Boards



Product Selection

208–240V

PowerXL Series—DG1

IP21



Frame Size	220V 50 Hz Rated power kW (CT/Heavy load)	230V 60 Hz hp(CT/I _N)	Current (CT/I _N)	220V 50 Hz Rated power kW (VT/Light load)	230V 60 Hz hp(VT/I _L)	Current (VT/I _L)	Catalog Number
FR1	0.55	0.75	3.7	0.75	1	4.8	DG1-323D7FB-C21C
	0.75	1	4.8	1.1	1.5	6.6	DG1-324D8FB-C21C
	1.1	1.5	6.6	1.5	2	7.8	DG1-326D6FB-C21C
	1.5	2	7.8	2.2	3	11	DG1-327D8FB-C21C
	2.2	3	11	3	—	12.5	DG1-32011FB-C21C
FR2	3	—	12.5	3.7	5	17.5	DG1-32012FB-C21C
	3.7	5	17.5	5.5	7.5	25	DG1-32017FB-C21C
	5.5	7.5	25	7.5	10	31	DG1-32025FB-C21C
FR3	7.5	10	31	11	15	48	DG1-32031FB-C21C
	11	15	48	15	20	61	DG1-32048FB-C21C
FR4	15	20	61	18.5	25	75	DG1-32061FN-C21C
	18.5	25	75	22	30	88	DG1-32075FN-C21C
	22	30	88	30	40	114	DG1-32088FN-C21C
FR5	30	40	114	37	50	143	DG1-32114FN-C21C
	37	50	143	45	60	170	DG1-32143FN-C21C
	45	60	170	55	75	211	DG1-32170FN-C21C
FR6 ①	55	75	211	75	100	261	DG1-32211FN-C21C
	75	100	261	90	125	312	DG1-32261FN-C21C

PowerXL Series—DG1

IP54



Frame Size	220V 50 Hz Rated power kW (CT/Heavy load)	230V 60 Hz hp(CT/I _N)	Current (CT/I _N)	220V 50 Hz Rated power kW (VT/Light load)	230V 60 Hz hp(VT/I _L)	Current (VT/I _L)	Catalog Number
FR1	0.55	0.75	3.7	0.75	1	4.8	DG1-323D7FB-C54C
	0.75	1	4.8	1.1	1.5	6.6	DG1-324D8FB-C54C
	1.1	1.5	6.6	1.5	2	7.8	DG1-326D6FB-C54C
	1.5	2	7.8	2.2	3	11	DG1-327D8FB-C54C
	2.2	3	11	3	—	12.5	DG1-32011FB-C54C
FR2	3	—	12.5	3.7	5	17.5	DG1-32012FB-C54C
	3.7	5	17.5	5.5	7.5	25	DG1-32017FB-C54C
	5.5	7.5	25	7.5	10	31	DG1-32025FB-C54C
FR3	7.5	10	31	11	15	48	DG1-32031FB-C54C
	11	15	48	15	20	61	DG1-32048FB-C54C
FR4	15	20	61	18.5	25	75	DG1-32061FN-C54C
	18.5	25	75	22	30	88	DG1-32075FN-C54C
	22	30	88	30	40	114	DG1-32088FN-C54C
FR5	30	40	114	37	50	143	DG1-32114FN-C54C
	37	50	143	45	60	170	DG1-32143FN-C54C
	45	60	170	55	75	211	DG1-32170FN-C54C
FR6 ①	55	75	211	75	100	261	DG1-32211FN-C54C
	75	100	261	90	125	312	DG1-32261FN-C54C

Note:

① FR6 will be released in 2015.

Adjustable Frequency Drives

PowerXL Series—DG1 General Purpose Drive

380–500V

PowerXL Series—DG1

IP21



Frame Size	400V 50 Hz Rated power kW (CT/Heavy load)	460V 60 Hz hp(CT/I _N)	Current (CT/I _N)	400V 50 Hz Rated power kW (VT/Light load)	460V 60 Hz hp(VT/I _L)	Current (VT/I _L)	Catalog Number
FR1	0.75	1	2.2	1.1	1.5	3.3	DG1-342D2FB-C21C
	1.1	1.5	3.3	1.5	2	4.3	DG1-343D3FB-C21C
	1.5	2	4.3	2.2	3	5.6	DG1-344D3FB-C21C
	2.2	3	5.6	3	5	7.6	DG1-345D6FB-C21C
	3	5	7.6	4	-	12	DG1-347D6FB-C21C
	4	-	9	5.5	7.5	12	DG1-349D0FB-C21C
FR2	5.5	7.5	12	7.5	10	16	DG1-34012FB-C21C
	7.5	10	16	11	15	23	DG1-34016FB-C21C
	11	15	23	15	20	31	DG1-34023FB-C21C
FR3	15	20	31	18.5	25	38	DG1-34031FB-C21C
	18.5	25	38	22	30	46	DG1-34038FB-C21C
	22	30	46	30	40	61	DG1-34046FB-C21C
FR4	30	40	61	37	50	72	DG1-34061FN-C21C
	37	50	72	45	60	87	DG1-34072FN-C21C
	45	60	87	55	75	105	DG1-34087FN-C21C
FR5	55	75	105	75	100	140	DG1-34105FN-C21C
	75	100	140	90	125	170	DG1-34140FN-C21C
	90	125	170	110	150	205	DG1-34170FN-C21C
FR6 ①	110	132	205	132	200	261	DG1-34205FN-C21C
	132	160	261	160	250	310	DG1-34261FN-C21C

PowerXL Series—DG1

IP54



Frame Size	400V 50 Hz Rated power kW (CT/Heavy load)	460V 60 Hz hp(CT/I _N)	Current (CT/I _N)	400V 50 Hz Rated power kW (VT/Light load)	460V 60 Hz hp(VT/I _L)	Current (VT/I _L)	Catalog Number
FR1	0.75	1	2.2	1.1	1.5	3.3	DG1-342D2FB-C54C
	1.1	1.5	3.3	1.5	2	4.3	DG1-343D3FB-C54C
	1.5	2	4.3	2.2	3	5.6	DG1-344D3FB-C54C
	2.2	3	5.6	3	5	7.6	DG1-345D6FB-C54C
	3	5	7.6	4	-	12	DG1-347D6FB-C54C
	4	-	9	5.5	7.5	12	DG1-349D0FB-C54C
FR2	5.5	7.5	12	7.5	10	16	DG1-34012FB-C54C
	7.5	10	16	11	15	23	DG1-34016FB-C54C
	11	15	23	15	20	31	DG1-34023FB-C54C
FR3	15	20	31	18.5	25	38	DG1-34031FB-C54C
	18.5	25	38	22	30	46	DG1-34038FB-C54C
	22	30	46	30	40	61	DG1-34046FB-C54C
FR4	30	40	61	37	50	72	DG1-34061FN-C54C
	37	50	72	45	60	87	DG1-34072FN-C54C
	45	60	87	55	75	105	DG1-34087FN-C54C
FR5	55	75	105	75	100	140	DG1-34105FN-C54C
	75	100	140	90	125	170	DG1-34140FN-C54C
	90	125	170	110	150	205	DG1-34170FN-C54C
FR6 ①	110	132	205	132	200	261	DG1-34205FN-C54C
	132	160	261	160	250	310	DG1-34261FN-C54C

Note:

① FR6 will be released in 2015.

Accessories

The PowerXL Series—DG1 drives can accommodate a wide selection of expander and adapter option boards to customize the drive for your application needs. The drive's control unit is designed to accept a total of two additional option boards.

The PowerXL Series—DG1 drives come with a factory-installed standard board configuration including the following:

- Standard I/O:
 - 8DI, 1DO
 - 2AI, 2AO
 - Three relays
- Standard communications:
 - Ethernet IP, Modbus TCP
 - RS-485: Modbus RTU
BACnet MS/TP

PowerXL Series—DG1 I/O Card Kits

Description	Catalog Number
3 x DI, 3 x DO, 1 x thermistor, 24 Vdc/EXT option card	DXG-EXT-3DI3DO1T
1 x AI, 2 x AO (isolated to control board) option card	DXG-EXT-1AI2AO
3 x relay dry contact (2NO + 1NO/NC) option card	DXG-EXT-3RO
3 x PT100 RTD thermistor input option card	DXG-EXT-THER1
6 x DI 240 Vac input option card	DXG-EXT-6DI

PowerXL Series—DG1 Communication Card Kits

Description	Catalog Number
PROFIBUS-DP communication card	DXG-NET-PROFIBUS
CANopen communication card	DXG-NET-CANOPEN
DeviceNet communication card	DXG-NET-DEVICENET
PROFIBUS DB9 to 5-pin adapter card	DXG-MNT-PROFIBUS
SmartWire communication card and module	DXG-NET-SWD
LonWorks communication card	DXG-NET-LONWORKS

PowerXL Series—DG1 Keypad Kits

Description	Catalog Number
Standard keypad	DXG-KEY-LCD
Remote keypad kit (0.5m cable)	DXG-KEY-RMTKIT
1m remote keypad cable	DXG-CBL-1MO
3m remote keypad cable	DXG-CBL-3MO
Remote keypad mounting holder only	DXG-KEY-HOLDER
IP54 keypad hole plug (maintain rating without keypad)	DXG-KEY-N12PLUG

PowerXL Series—DG1 Conversion and Flange Kits

The IP54 option kit is used to convert a IP21 to a IP54 drive. The kit includes cover, fan and grommets.

IP54 Conversion Kits

Description	Catalog Number
Frame 1 220V IP54 kit	DXG-ACC-2FR1N12KIT
Frame 1 400V IP54 kit	DXG-ACC-4FR1N12KIT
Frame 2 IP54 kit	DXG-ACC-FR2N12KIT
Frame 3 IP54 kit	DXG-ACC-FR3N12KIT

The flange kit is used when the power section heat sink is mounted through the back panel of an enclosure. The kit includes hardware, top flange plate, bottom flange plate and two side flange plates.

Flange Kits

Description	Catalog Number
Frame 1 flange kit IP54	DXG-ACC-FR1N12FK
Frame 2 flange kit IP54	DXG-ACC-FR2N12FK
Frame 3 flange kit IP54	DXG-ACC-FR3N12FK
Frame 4 flange kit IP54	DXG-ACC-FR4N12FK
Frame 5 flange kit IP54	DXG-ACC-FR5N12FK

PowerXL Series—DG1 Demo Units

Demo Units

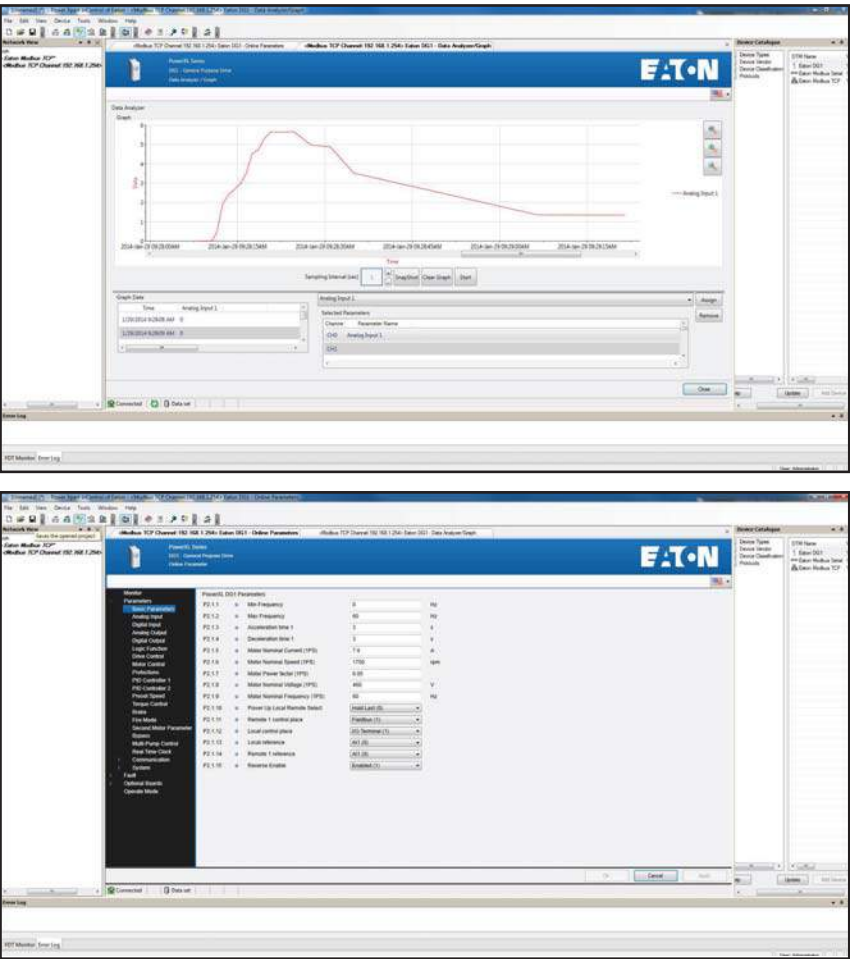
Description	Catalog Number
DG1 control module demo case	DG1-DEM01
DG1 full drive demo case	DG1-DEM02

Adjustable Frequency Drives

PowerXL Series—DG1 General Purpose Drive

PowerXpert inControl Software

The PowerXL Series PC Tool is designed for programming, controlling and monitoring of the DG1 drives. Features include loading parameters that can be saved to a file or printed, setting references, starting and stopping the motor, monitoring signals in graphical or text form, and real-time display.



PowerXpert inControl Software

Description	Catalog Number
Software kit (software, cable, manual)	DXG-ACC-SOFTWARE
Software cable (USB to RJ45 [RS-485])	DXG-CBL-PCCABLE
Real-time clock battery	DXG-ACC-RTBATT

Replacement Parts

Frame 1

Description	Catalog Number 220V	Catalog Number 400V	Catalog Number 600V
Standard keypad ^①	DXG-KEY-LCD	DXG-KEY-LCD	DXG-KEY-LCD
Main control board ^①	DXG-SPR-CTRLBOARD	DXG-SPR-CTRLBOARD	DXG-SPR-CTRLBOARD
Control board cover	DXG-SPR-BCOVER	DXG-SPR-BCOVER	DXG-SPR-BCOVER
Type 1/IP21 standard cover	DXG-SPR-FR1CVR	DXG-SPR-FR1CVR	②
Main fan kit ^①	DXG-SPR-FR1FAN	DXG-SPR-FR1FAN	②
Control fan	DXG-SPR-2FR1CF	DXG-SPR-4FR1CF	②
Main power board	DXG-SPR-2FR1MPB	DXG-SPR-4FR1MPB	②
EMI board	DXG-SPR-2FR1EB	DXG-SPR-4FR1EB	②
Middle chassis cover	DXG-SPR-FR1MCC	DXG-SPR-FR1MCC	②
Outer housing	DXG-SPR-FR10H	DXG-SPR-FR10H	②
UL conduit plate	DXG-SPR-FR1CPUL	DXG-SPR-FR1CPUL	②
IEC conduit plate	DXG-SPR-FR1CPIEC	DXG-SPR-FR1CPIEC	②

Frame 2

Description	Catalog Number 220V	Catalog Number 400V	Catalog Number 600V
Standard keypad ^①	DXG-KEY-LCD	DXG-KEY-LCD	DXG-KEY-LCD
Main control board ^①	DXG-SPR-CTRLBOARD	DXG-SPR-CTRLBOARD	DXG-SPR-CTRLBOARD
Control board cover	DXG-SPR-BCOVER	DXG-SPR-BCOVER	DXG-SPR-BCOVER
Type 1/IP21 standard cover	DXG-SPR-FR2CVR	DXG-SPR-FR2CVR	②
Main fan kit ^①	DXG-SPR-FR2FAN	DXG-SPR-FR2FAN	②
Control fan	DXG-SPR-FR2CF	DXG-SPR-FR2CF	②
Bus capacitor	DXG-SPR-2FR2BC	DXG-SPR-4FR24BC	②
Main power board	DXG-SPR-2FR2MPB	DXG-SPR-4FR2MPB	②
EMI board	DXG-SPR-2FR2EB	DXG-SPR-4FR2EB	②
IGBT module	DXG-SPR-FR2IGBT	DXG-SPR-FR2IGBT	②
Middle chassis cover	DXG-SPR-FR2MCC	DXG-SPR-FR2MCC	②
Outer housing	DXG-SPR-FR20H	DXG-SPR-FR20H	②
UL conduit plate	DXG-SPR-FR2CPUL	DXG-SPR-FR2CPUL	②
IEC conduit plate	DXG-SPR-FR2CPIEC	DXG-SPR-FR2CPIEC	②

Frame 3

Description	Catalog Number 220V	Catalog Number 400V	Catalog Number 600V
Standard keypad ^①	DXG-KEY-LCD	DXG-KEY-LCD	DXG-KEY-LCD
Main control board ^①	DXG-SPR-CTRLBOARD	DXG-SPR-CTRLBOARD	DXG-SPR-CTRLBOARD
Control board cover	DXG-SPR-BCOVER	DXG-SPR-BCOVER	DXG-SPR-BCOVER
Type 1/IP21 standard cover	DXG-SPR-FR3CVR	DXG-SPR-FR3CVR	②
Main fan kit ^①	DXG-SPR-FR3FAN	DXG-SPR-FR3FAN	②
Control fan	DXG-SPR-FR34CF	DXG-SPR-FR34CF	②
Bus capacitor	DXG-SPR-FR3BC	DXG-SPR-FR3BC	②
Main power board	DXG-SPR-2FR3MPB	DXG-SPR-4FR3MPB	②
EMI board	DXG-SPR-2FR3EB	DXG-SPR-4FR3EB	②
Drive board	DXG-SPR-2FR3DB	DXG-SPR-4FR3DB	②
Output board	DXG-SPR-FR30B	DXG-SPR-FR30B	②
Middle chassis cover	DXG-SPR-FR3MCC	DXG-SPR-FR3MCC	②
Outer housing	DXG-SPR-FR30H	DXG-SPR-FR30H	②
UL conduit plate	DXG-SPR-FR3CPUL	DXG-SPR-FR3CPUL	②
IEC conduit plate	DXG-SPR-FR3CPIEC	DXG-SPR-FR3CPIEC	②

Notes

- ^① Factory recommended spare parts.
^② 600V available in 2015.

Adjustable Frequency Drives

PowerXL Series—DG1 General Purpose Drive

Frame 4

Description	Catalog Number 220V	Catalog Number 400V	Catalog Number 600V
Standard keypad ^①	DXG-KEY-LCD	DXG-KEY-LCD	DXG-KEY-LCD
Main control board ^①	DXG-SPR-CTRLBOARD	DXG-SPR-CTRLBOARD	DXG-SPR-CTRLBOARD
Control board cover	DXG-SPR-BCOVER	DXG-SPR-BCOVER	DXG-SPR-BCOVER
Type 1/IP21 standard cover	DXG-SPR-FR4CVR	DXG-SPR-FR4CVR	②
Main fan kit ^①	DXG-SPR-FR4FAN	DXG-SPR-FR4FAN	②
Control fan	DXG-SPR-FR34CF	DXG-SPR-FR34CF	②
Bus capacitor	DXG-SPR-2FR4BC	DXG-SPR-4FR24BC	②
Main power board	DXG-SPR-2FR4MPB	DXG-SPR-4FR4MPB	②
EMI board	DXG-SPR-2FR4EB	DXG-SPR-4FR4EB	②
Softstart board	DXG-SPR-2FR4SB	DXG-SPR-4FR4SB	②
IGBT module	DXG-SPR-2FR4IGBT	DXG-SPR-4FR4IGBT	②
Rectifier module	DXG-SPR-2FR4RM	DXG-SPR-4FR4RM	②
Brake chopper module	DXG-SPR-2FR4BCM	DXG-SPR-4FR4BCM	②
Middle chassis cover	DXG-SPR-FR4MCC	DXG-SPR-FR4MCC	②
Outer housing	DXG-SPR-FR40H	DXG-SPR-FR40H	②
UL conduit plate	DXG-SPR-FR4CPUL	DXG-SPR-FR4CPUL	②
IEC conduit plate	DXG-SPR-FR4CPIEC	DXG-SPR-FR4CPIEC	②

Frame 5

Description	Catalog Number 220V	Catalog Number 400V	Catalog Number 600V
Standard keypad ^①	DXG-KEY-LCD	DXG-KEY-LCD	DXG-KEY-LCD
Main control board ^①	DXG-SPR-CTRLBOARD	DXG-SPR-CTRLBOARD	DXG-SPR-CTRLBOARD
Control board cover	DXG-SPR-BCOVER	DXG-SPR-BCOVER	DXG-SPR-BCOVER
Type 1/IP21 standard cover	DXG-SPR-FR5CVR	DXG-SPR-FR5CVR	②
Main fan kit ^①	DXG-SPR-FR5FAN	DXG-SPR-FR5FAN	②
Control fan	DXG-SPR-FR5CF	DXG-SPR-FR5CF	②
Bus capacitor	DXG-SPR-FR5BC	DXG-SPR-FR5BC	②
Main power board	DXG-SPR-2FR5MPB	DXG-SPR-4FR5MPB	②
EMI-1 board	DXG-SPR-2FR5E1B	DXG-SPR-4FR5E1B	②
EMI-2 board	DXG-SPR-2FR5E2B	DXG-SPR-4FR5E2B	②
EMI-3 board	DXG-SPR-2FR5E3B	DXG-SPR-4FR5E3B	②
IGBT module	DXG-SPR-FR5IGBT	DXG-SPR-FR5IGBT	②
Rectifier module	DXG-SPR-2FR5RM	DXG-SPR-4FR5RM	②
Brake chopper module	DXG-SPR-2FR5BCM	DXG-SPR-4FR5BCM	②
Middle chassis cover	DXG-SPR-FR5MCC	DXG-SPR-FR5MCC	②
Outer housing	DXG-SPR-FR50H	DXG-SPR-FR50H	②
UL conduit plate	DXG-SPR-FR5CPUL	DXG-SPR-FR5CPUL	②
IEC conduit plate	DXG-SPR-FR5IECCP	DXG-SPR-FR5IECCP	②

Notes

^① Factory recommended spare parts.

^② 600V available in 2015.

Technical Data and Specifications

PowerXL Series—DG1 Technical Data and Specifications

Attribute	Description	Specification
Input ratings	Input voltage U_{in}	208–240V, 380–500V, –15 to 10%
	Input frequency	50–60 Hz (variation up to 45–66 Hz)
	Connection to power	Once per minute or less
	Starting delay	3s (FR1 to FR2), 4s (FR3), 5s (FR4), 6s (FR5)
	Short-circuit withstand rating	100 kAIC
Output ratings	Output voltage	0 to U_{in}
	Continuous output current	IL: ambient temperature maximum 40°C, up to 60°C with derating, overload 1.1 x IL (1 min./10 min.) IH: ambient temperature maximum 50°C, up to 60°C with derating, overload 1.5 x IH (1 min./10 min.)
	Overload current	150% respectively 110% (1 min./10 min.)
	Initial output current	200% (2 sec./20 sec.)
	Output frequency	0–400 Hz (standard)
	Frequency resolution	0.01 Hz
Control characteristics	Control methods	Frequency control Speed control Open-loop speed control Open-loop torque control
	Switching frequency	Range: FR1–3: 1–12 kHz FR4–5: 1–10 kHz Defaults: FR1–3: 4 kHz (IH), 6 kHz (IL) FS4–5: 3.6 kHz Automatic switching frequency derating in case of overload.
	Frequency reference	Analog input: resolution 0.1% (10-bit), accuracy +1% Panel reference: resolution 0.01 Hz
	Field weakening point	20–400 Hz
	Acceleration time	0.1–3000 sec.
	Deceleration time	0.1–3000 sec.
	Braking torque	DC brake: 30% x T_n (without brake option) Dynamic braking (with optional brake chopper): 100% continuous maximum rating
	Ambient operating temperature	–10°C (no frost) to +50°C, up to +60°C with derating (CT)
	Storage temperature	–40° to +70°C
Ambient conditions	Relative humidity	0–95% RH, noncondensing, non-corrosive
	Air quality: • Chemical vapors • Mechanical particles	Tested according to IEC 60068-2-60 Test Key: Flowing mixed gas corrosion test, Method 1 (H ₂ S [hydrogen sulfide] and SO ₂ [sulfur dioxide]) Designed according to: IEC 60721-3-3, unit in operation, class 3C2 IEC 60721-3-3, unit in operation, class 3S2
	Altitude	100% load capacity (no derating) up to 1000m; 1% derating for each 100m above 1000m; max. 3000m(2000m for corner grounded TN systems)

Adjustable Frequency Drives

PowerXL Series—DG1 General Purpose Drive

PowerXL Series—DG1 Technical Data and Specifications, continued

Attribute	Description	Specification
Ambient conditions, continued	Vibration:	5–150 Hz
	• EN 61800-5-1	Displacement amplitude: 1 mm (peak) at 5 Hz to 15.8 Hz (FR1–FR5)
	• EN 60668-2-6	Maximum acceleration amplitude: 1g at 15.8 Hz to 150 Hz (FR1–FR5)
	Shock:	Storage and shipping: maximum 15g, 11 ms (in package)
	• ISTA 1 A	
	• EN 60068-2-27	
	Overvoltage	Overvoltage Category III
	Pollution degree	Pollution Degree 2
Standards	Enclosure class	IP21/Type 1 standard in entire kW/hp range IP54/Type 12 option Note: Keypad required to be mounted in drive for IP54/Type 12 rating
	Immunity	Fulfills EN 61800-3 (2004), first and second environment
	MTBF	FR1: 165,457 hours FR2: 134,833 hours FR3: 102,515 hours FR4: 121,567 hours FR5: 108,189 hours FR6: Available in 2015
	Safety	UL 508C, CSA C22.2 No. 274-13 and EN 61800-5-1
	EMC	+EMC2: EN 61800-3 (2004), Category C2 The drive can be modified for IT networks and corner grounding TN system
	Electrostatic discharge	Second environment, IEC 61000-4-2, 4 kV CD or 8 kV AD, Criterion B
Fieldbus connections	Fast transient burst	Second environment, IEC 61000-4-4, 2 kV/5 kHz, Criterion B
	Dielectrical strength	Primary to secondary: 3600 Vac/5100 Vdc Primary to earth: 2000 Vac/2828 Vdc
	Approvals	EN 61800-5-1 (2007), CE, UL and cUL (see nameplate for more detailed approvals)
	Onboard:	EtherNet/IP, Modbus® TCP, Modbus RTU, BACnet
Safety/protections	Overvoltage protection	Yes
	Overvoltage trip limit	240V drives: 456V 480V drives: 911V
	Undervoltage protection	Yes
	Undervoltage trip limit	240V drives: 211V 480V drives: 370V
	Earth fault protection	Yes
	Input phase supervision	Yes
	Motor phase supervision	Yes
	Overcurrent protection	Yes
	Unit overtemperature protection	Yes
	Motor overload protection	Yes
	Motor stall protection	Yes
	Motor underload protection	Yes
	DC bus overvoltage control	Yes
	Short-circuit protection of 24V reference voltages	Yes
	Surge protection	Yes (differential mode 2 kV; common mode 4 kV)
	Common coated boards	Yes (prevents corrosion)

Wiring Diagram

PowerXL Series—DG1 Control Wiring Diagram

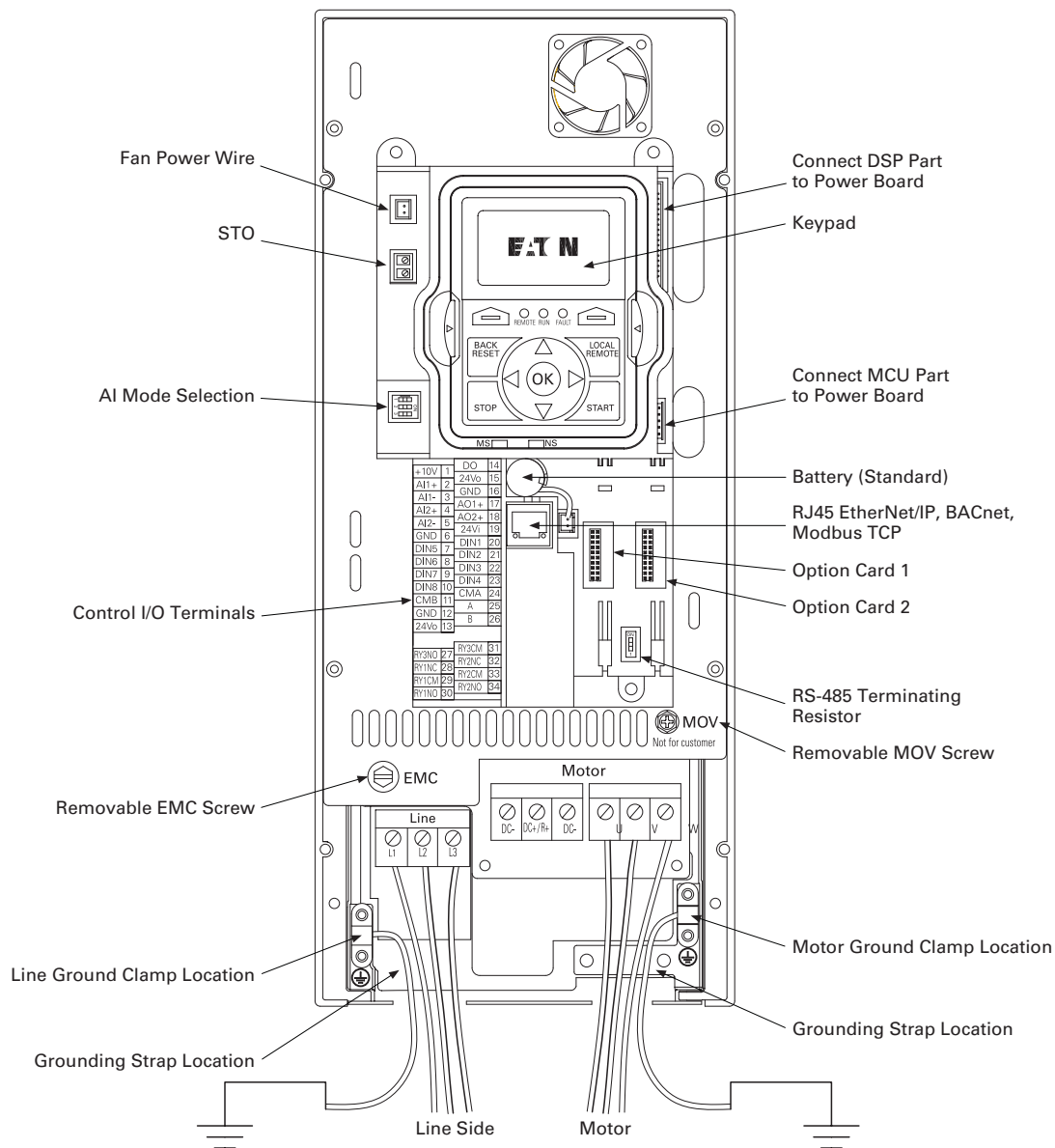
Pin	Signal Name	Signal	Default Setting	Description
1	+10V	Ref. Output Voltage	—	10 Vdc Supply Source
2	AI1+	Analog Input 1	0–10V	Voltage Speed Reference (Programmable to 4–20 mA)
3	AI1–	Analog Input 1 Ground	—	Analog Input 1 Common (Ground)
4	AI2+	Analog Input 2	4–20 mA	Current Speed Reference (Programmable to 0–10V)
5	AI2–	Analog Input 2 Ground	—	Analog Input 2 Common (Ground)
6	GND	I/O Signal Ground	—	I/O Ground for Reference and Control
7	DIN5	Digital Input 5	Preset Speed B0	Sets frequency output to Preset Speed 1
8	DIN6	Digital Input 6	Preset Speed B1	Sets frequency output to Preset Speed 2
9	DIN7	Digital Input 7	Emergency Stop	Input forces VFD output to shut off
10	DIN8	Digital Input 8	Force Remote	Input takes VFD from Local to Remote
11	CMB	DI5 to DI8 Common	Grounded	Allows source input
12	GND	I/O Signal Ground	—	I/O Ground for Reference and Control
13	24V	+24 Vdc Output	—	Control voltage output (100 mA Max)
14	DO1	Digital Output 1	Ready	Shows the drive is ready to run
15	24Vo	+24 Vdc Output	—	Control voltage output (100 mA Max)
16	GND	I/O Signal Ground	—	I/O Ground for Reference and Control
17	AO1+	Analog Output 1	Output Frequency	Shows Output frequency to motor 0–60 Hz (4–20 mA)
18	AO2+	Analog Output 2	Motor Current	Shows Motor current of motor 0–FLA (4–20 mA)
19	24Vi	+24VDC Input	—	External control voltage input
20	DIN1	Digital Input 1	Run Forward	Input starts drive in forward direction (start enable)
21	DIN2	Digital Input 2	Run Reverse	Input starts drive in reverse direction (start enable)
22	DIN3	Digital Input 3	External Fault	Input causes drive to fault
23	DIN4	Digital Input 4	Fault Reset	Input resets active faults
24	CMA	DI1 to DI4 Common	Grounded	Allows source input
25	A	RS-485 Signal A	—	Fieldbus Communication (Modbus, BACnet)
26	B	RS-485 Signal B	—	Fieldbus Communication (Modbus, BACnet)
27	R3NO	Relay 3 Normally Open	At Speed	Relay output 3 shows VFD is at Ref. Frequency
28	R1NC	Relay 1 Normally Closed	Run	Relay output 1 shows VFD is in a run state
29	R1CM	Relay 1 Common		
30	R1NO	Relay 1 Normally Open		
31	R3CM	Relay 3 Common	At Speed	Relay output 3 shows VFD is at Ref. Frequency
32	R2NC	Relay 2 Normally Closed	Fault	Relay output 2 shows VFD is in a fault state
33	R2CM	Relay 2 Common		
34	R2NO	Relay 2 Normally Open		

Adjustable Frequency Drives

PowerXL Series—DG1 General Purpose Drive

Control Board Layout

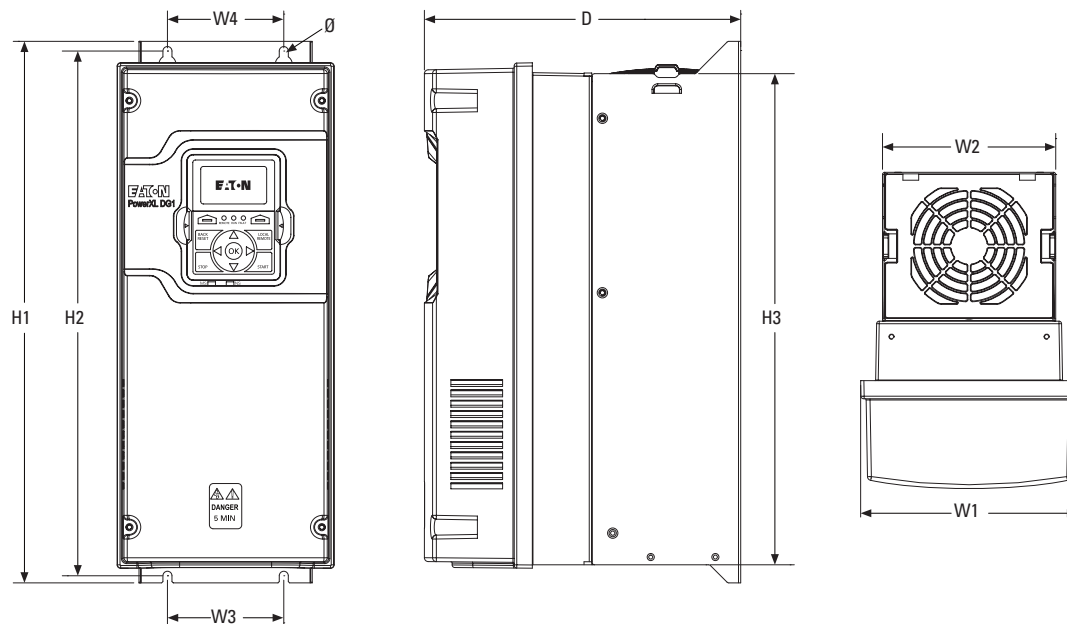
PowerXL Series—DG1 Control Board Layout



Dimensions

Approximate Dimensions in mm

PowerXL Series—DG1 Dimensions



Frame Size	Voltage	kW	Amperes (CT/I _H)	Approximate Dimensions in mm								Ø	Weight (kg)
				D	H1	H2	H3	W1	W2	W3	W4		
FR1	220 Vac	0.55–2.2	3.5–11	200.4	326.9	311.9	292.1	153.0	121.9	100.1	100.1	7.0	6.5
	400 Vac	0.75–3.7	2.3–7.6										
	600 Vac ^①	1.5–3.7	3.3–7.5										
FR2	220 Vac	3–5.5	12.5–25	244.7	419.1	405.9	380.0	167.8	134.1	90.0	90.0	7.0	10.6
	400 Vac	5.5–11	12–23										
	600 Vac ^①	5.5–11	10–18										
FR3	220 Vac	7.5–11	31–48	265.1	558.0	545.0	518.9	204.6	183.9	125.0	125.0	9.0	22.6
	400 Vac	15–22	31–46										
	600 Vac ^①	15–22	22–34										
FR4	220 Vac	15–22	61–88	294.0	629.9	617.5	591.1	237.7	231.9	205.0	205.0	9.0	35.2
	400 Vac	30–45	61–87										
	600 Vac ^①	30–45	41–62										
FR5	220 Vac	30–45	114–170	340.7	888.5	753.1	706.9	288.0	281.9	220.0	220.0	9.0	70.0
	400 Vac	55–90	105–170										
	600 Vac ^①	55–90	80–125										
FR6 ^①	220 Vac	55–75	211–261	①	①	①	①	①	①	①	①	①	①
	400 Vac	110–150	205–261										
	600 Vac ^①	110–160	144–208										

Note

^① FR6 and 600 Vac available in 2015.

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