

**TRANSMITTAL OF SUBMITTAL**

DATE: 5/31/23

**TO: Scott Miller**

CMG - City of Atlanta  
2528 Chattahoochee Circle  
Atlanta, GA 30318

New - Submittal    Resubmittal   X  

Project: East Area Water Quality Control Facility  
Improvements

Specification Section No. : 16515

Supplier/Vendor/Subcontractor: Contessa/ME  
Contractors

**FROM: LAKESHORE ENGINEERING**

\_\_\_\_\_ 1259 Ellsworth Drive  
\_\_\_\_\_ Atlanta, GA 30318


Manufacturer: EATON

**The following items are hereby submitted:**

Number of Copies	Description of Item Submitted (Type, Size, Model Number, Etc.)	Submittal number	Submittal Type	Contains Variation to Contract	
				No	Yes
Email	Adjustable Frequency Drives	16515-33.01	Product Data	X	

**Comments/Variation:**

CONTRACTOR hereby certifies that (i) CONTRACTOR has complied with the requirements of Contract Documents in preparation, review, and submission of designated Submittal and (ii) the Submittal is complete and in accordance with the Contract Documents and requirements of laws and regulations and governing agencies.

By: \_\_\_\_\_  \_\_\_\_\_  
Brandon Dow



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## **East Area Water Control Facility**

### Submittal for Approval

General Order

MAT0011132

Volume 1 of 1

Equipment:

Adjustable Frequency Drives

**ELLIOTT ELECTRIC SPLY ATLANTA GA PO# 46-050587**

**M E CONTRACTORS**

Date: 4/24/2023

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# Detail Bill of Material

**Project Name:** East Area Water Control Facility  
**General Order No:** MAT0011132

**Negotiation No:** AT130311X0K1  
**Alternate No:** 0009

Item No.	Qty	Product	Description
	2	Drives - Enclosed	EGS 6-Pulse Enclosed Drive w/ 5% Dual DC Link Choke, 10 HP (7.5 KW) Low Overload (IL) Rated, 480VAC Three Phase Input, NEMA 1 Enclosure w/ Brake Chopper Circuit

**Catalog No** EGS0144B120BB10000\*  
**Designation** 10 HP VFD

**Qty List of Materials**

- 1 Circuit Breaker
- 2 Clear Keypad Cover
- 1 Engineered Options
- 1 Voltage Indicator
- 1 Bug Screen
- 1 --->100KAIC Rated
- 1 3% Output Filter
- 1 22mm Start (Green) & Stop (Red) Buttons - M22 Series
- 1 22mm Power On (White), Drive Run (Green), & Drive Fault (Red) Light Kit - M22 Series
- 1 22mm HOA Switch - M22 Series
- 1 22mm Speed Pot - M22 Series
- 6 Control Relay
- 1 AX Enclosure
- 1 Varnished Boards (Standard)
- 1 Nameplates

Eaton Selling Policy 25-000 applies.

All orders must be released for manufacture within 90 days of date of order entry. If approval drawings are required, drawings must be returned approved for release within 60 days of mailing. If drawings are not returned accordingly, and/or if shipment is delayed for any reason, the price of the order will increase by 1.0% per month or fraction thereof for the time the shipment is delayed.

Seller shall not be responsible for any failure to perform, or delay in performance of, its obligations resulting from the COVID-19 pandemic or any future epidemic, and Buyer shall not be entitled to any damages resulting thereof.



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## **Contact Information**

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ColtonCHargus@eaton.com



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### PROJECT COMMENTS

**Approved**

Release all for manufacture.  
No re-submittal required.

**Approved as Noted**

Release all for manufacture.  
Make necessary changes  
Show changes on const. drawings.

**Partial Approval  
Revise and Re-submit**

Release approved sections  
for manufacture. Re-submit.  
Rejected sections

**Rejected**

No release  
Re-submit all.

The following information is pertinent with the return of this submittal. Eaton requires all information to be initialed and a final signature of responsible party.

- Lug Sizes for all equipment have been verified
- Top or Bottom Entry for all equipment has been verified
- Shipping splits have been verified
- Nameplate information has been verified for all equipment
- Orientation of breakers has been verified for all equipment

Stamp or Signature

\_\_\_\_\_

**Customer Comments:**

**No Comments** (check here).....



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## Adjustable Frequency Drives



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## **Section Table of Contents**

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Drawings

## General Information: Drives - Enclosed

### Drive Schedule

Item	Qty	Equipment ID	Catalog Number	Output HP	Output Amps	Output Voltage
	2	10 HP VFD	EGS0144B120BB1 0000*	10.0	14	480VAC Three Phase

### Item Information

Design Series:	Enclosed 6-Pulse DG1 Drive
Output Power:	10 HP (7.5 KW)
Rated Output Current (Amps):	14
Input Voltage:	480VAC Three Phase
Input Frequency	45 to 66 Hz
Output Voltage:	480VAC Three Phase
Output Frequency	0 to 320 Hz
Branch Protection:	
Short Circuit Current Rating:	100KAIC
Enclosure NEMA Rating:	NEMA 1
Enclosure Size:	AX
Drive Frame Size:	FR2
Onboard Comms:	BACnet MS/TP, Ethernet/IP, Modbus, & Modbus TCP
Optional Comms:	None

### Enclosure Information

NEMA Rating:	NEMA 1
Height (in):	26.74
Width (in):	20.92
Depth (in):	18.78
Weight (lbs):	215

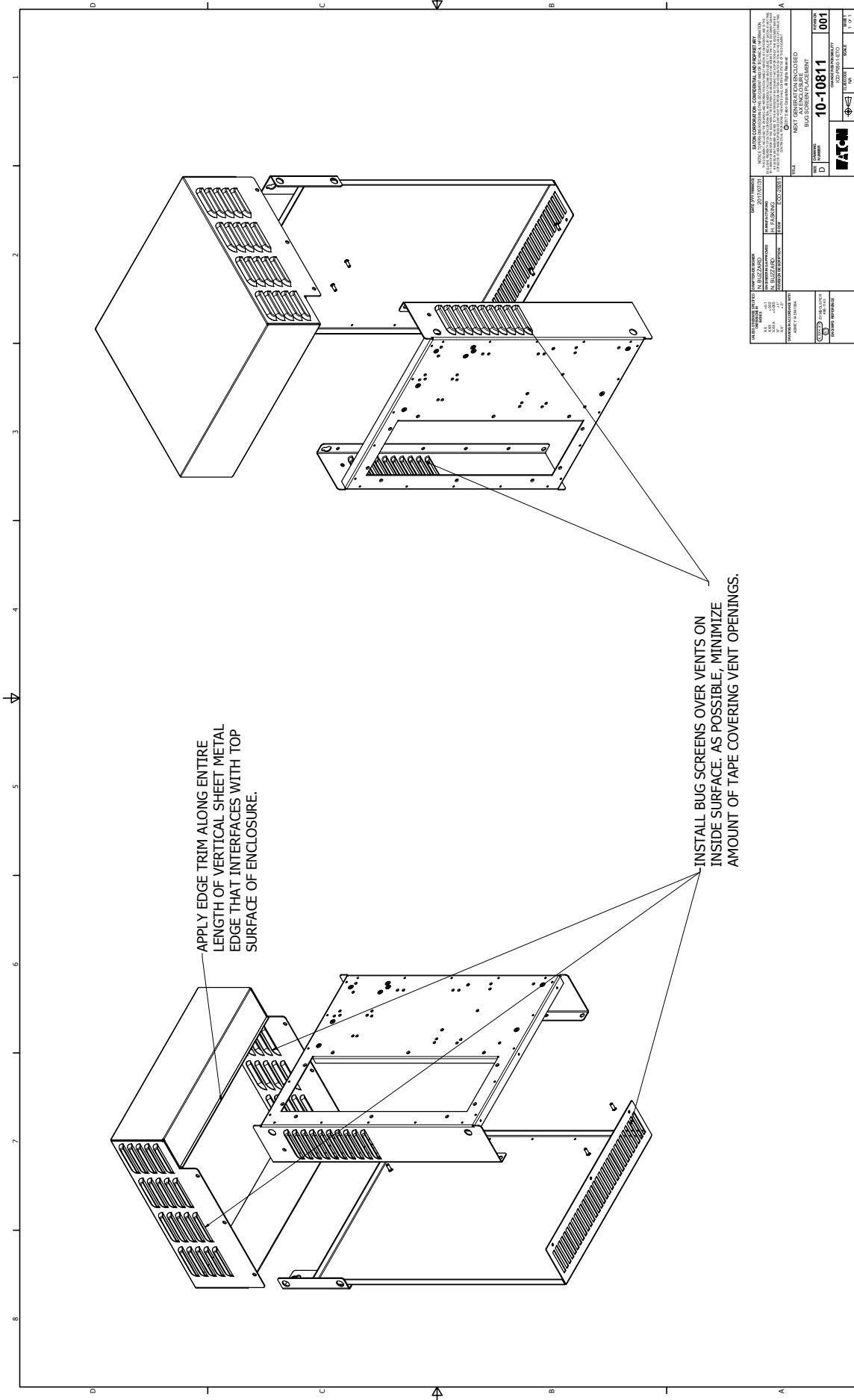
### Circuit Protection

FDC3030L  
3T100FB  
14-1/0  
30

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PREPARED BY NICHOLAS NATALE	DATE 4/24/2023	<b>Eaton</b>		
APPROVED BY	DATE	JOB NAME East Area Water Control Facility	DESIGNATION 10 HP VFD	
VERSION 10.0.11.0	TYPE Drives - Enclosed	DRAWING TYPE Customer Appr.		
NEG-ALT Number AT130311X0K1-0009	REVISION 0	DWG SIZE A	G.O. MAT0011132	ITEM SHEET 1 of 1





DATE PUBLISHED	2011/07/20	DATE REVISION	
BY	W. HULL/AND	BY	W. HULL/AND
FOR	FORWARD	FOR	FORWARD
REVISION DESCRIPTION	EGS0144B1	REVISION DESCRIPTION	EGS0144B1
APPROVED BY		APPROVED BY	
DATE		DATE	
TITLE BUG SCREEN PLACEMENT		PART NUMBER <b>10-10811</b>	
DRAWING NUMBER <b>10-10811</b>		DRAWING TITLE BUG SCREEN PLACEMENT	
DRAWING SCALE AS SHOWN		DRAWING SHEET 001	
DRAWING SHEET 001		DRAWING SHEET 001	
DRAWING SHEET 001		DRAWING SHEET 001	

GO/NEG-Alt-Date: MAT0011132-0009-4/24/2023 Item Number:	Job Name: East Area Water Control Facility Designation: 10 HP VFD
Catalog Number: EGS0144B120BB10000*	

1 2 3 4 5 6 7 8

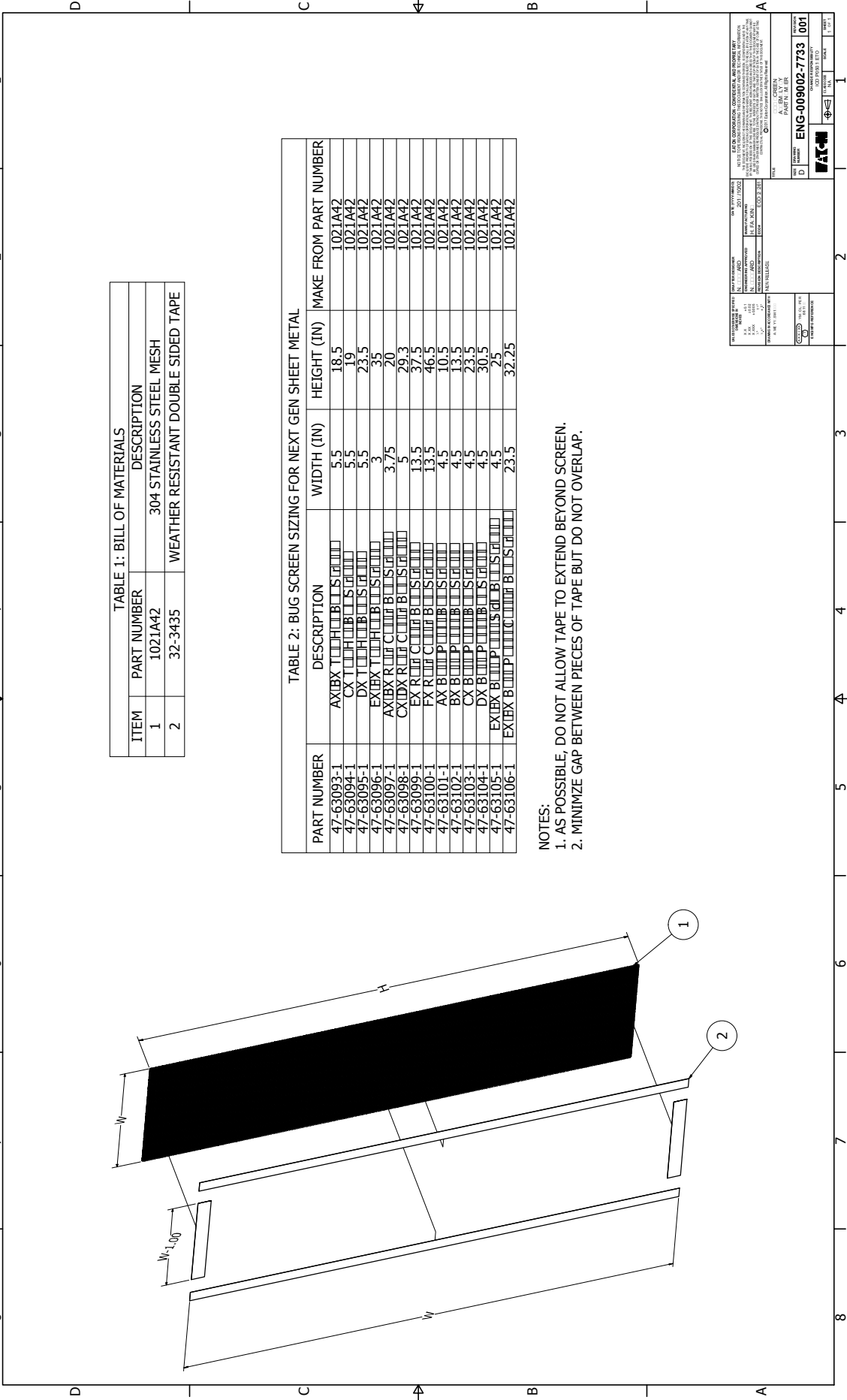


TABLE 1: BILL OF MATERIALS

ITEM	PART NUMBER	DESCRIPTION
1	1021A42	304 STAINLESS STEEL MESH
2	32-3435	WEATHER RESISTANT DOUBLE SIDED TAPE

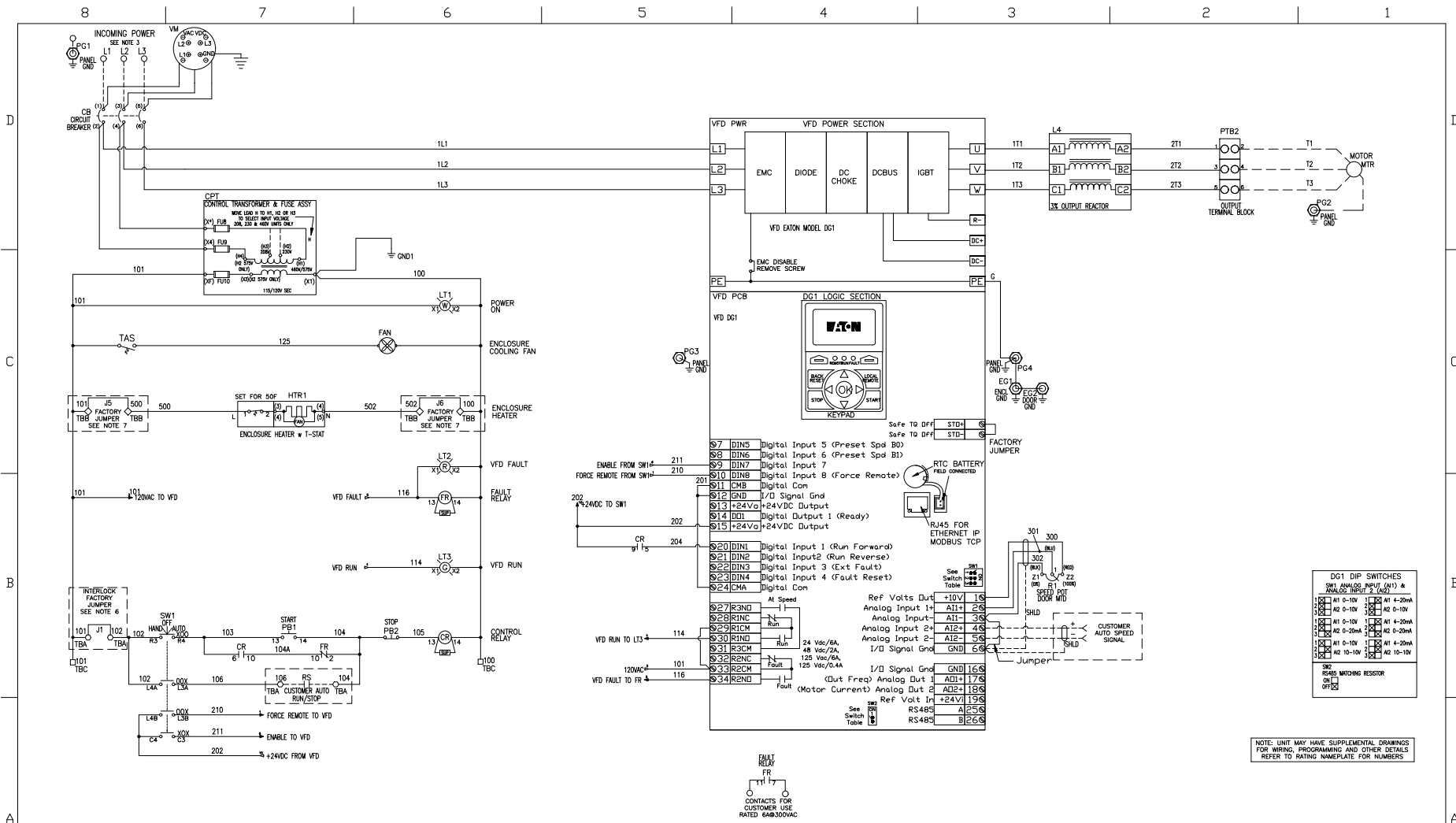
TABLE 2: BUG SCREEN SIZING FOR NEXT GEN SHEET METAL

PART NUMBER	DESCRIPTION	WIDTH (IN)	HEIGHT (IN)	MAKE FROM PART NUMBER
47-63093-1	AXIBX TUBULAR BOLLERS	5.5	18.5	1021A42
47-63094-1	CX TUBULAR BOLLERS	5.5	19	1021A42
47-63095-1	DX TUBULAR BOLLERS	5.5	23.5	1021A42
47-63096-1	EXIBX TUBULAR BOLLERS	3	35	1021A42
47-63097-1	AXIBX ROLL CURTAIN BOLLERS	3.75	20	1021A42
47-63098-1	CXIBX ROLL CURTAIN BOLLERS	5	29.3	1021A42
47-63099-1	EX ROLL CURTAIN BOLLERS	13.5	37.5	1021A42
47-63100-1	FX ROLL CURTAIN BOLLERS	46.5	46.5	1021A42
47-63101-1	AX BOLLER PULLERS	4.5	10.5	1021A42
47-63102-1	BX BOLLER PULLERS	4.5	13.5	1021A42
47-63103-1	CX BOLLER PULLERS	4.5	23.5	1021A42
47-63104-1	DX BOLLER PULLERS	4.5	30.5	1021A42
47-63105-1	EXIBX BOLLER PULLERS	4.5	25	1021A42
47-63106-1	EXIBX BOLLER PULLERS	23.5	32.25	1021A42

NOTES:  
 1. AS POSSIBLE, DO NOT ALLOW TAPE TO EXTEND BEYOND SCREEN.  
 2. MINIMIZE GAP BETWEEN PIECES OF TAPE BUT DO NOT OVERLAP.

1021A42 304 STAINLESS STEEL MESH  
 32-3435 WEATHER RESISTANT DOUBLE SIDED TAPE  
 ENG-009002-7733 001  
 EAST AREA WATER CONTROL FACILITY  
 10 HP VFD

GO/NEG-Alt-Date: MAT0011132-0009-4/24/2023 Item Number: EGS0144B120BB10000*	Job Name: East Area Water Control Facility Designation: 10 HP VFD
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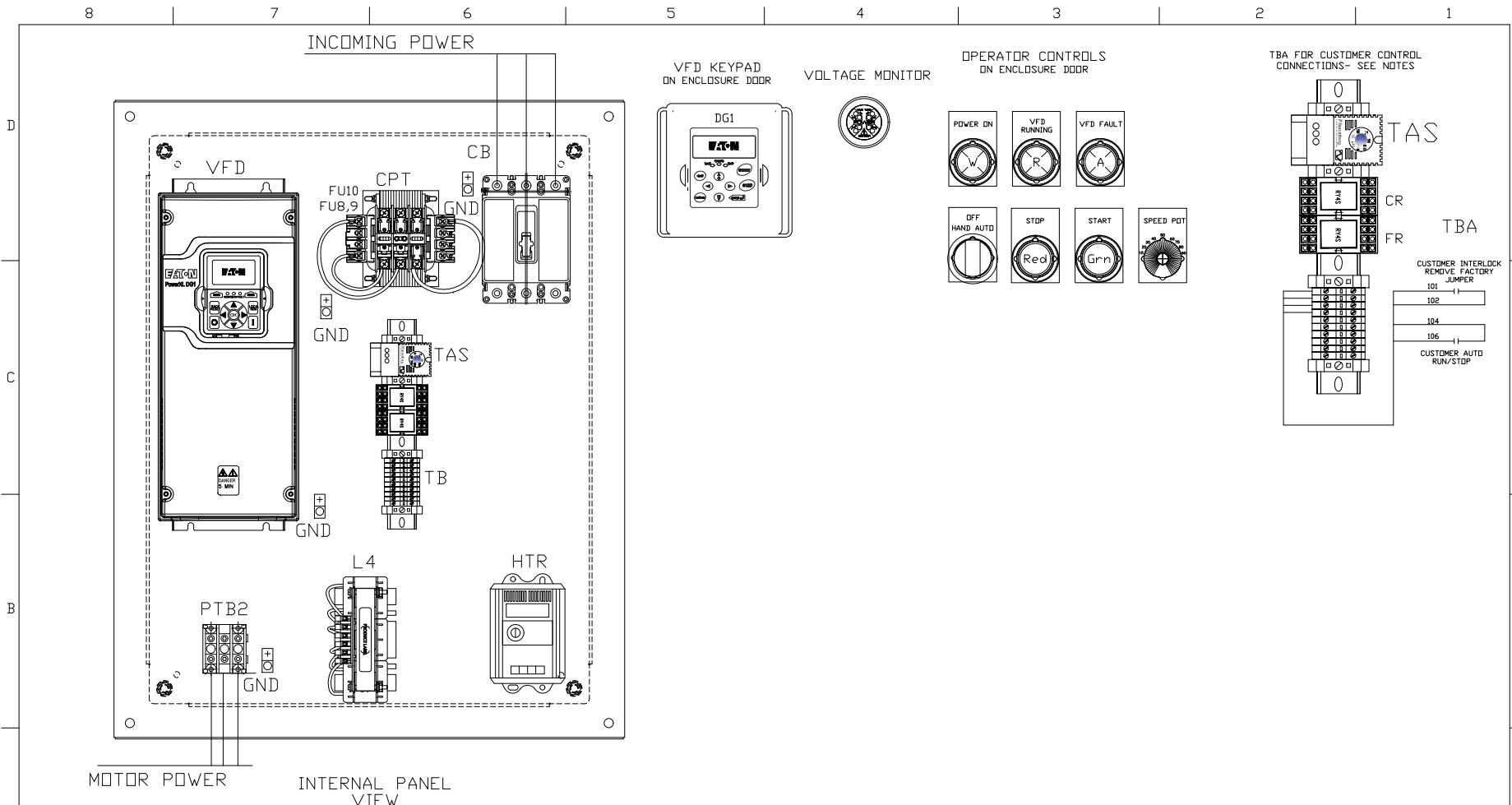
DG1 DIP SWITCHES			
SW1 ANALOG INPUT (AI1) & ANALOG INPUT 2 (AI2)		SW2 ANALOG INPUT 1 (AI1) & ANALOG INPUT 2 (AI2)	
AI1 0-10V	AI2 0-10V	AI1 4-20mA	AI2 4-20mA
AI1 0-10V	AI2 0-20mA	AI1 4-20mA	AI2 0-20mA
AI1 0-10V	AI2 10-10V	AI1 4-20mA	AI2 10-10V
AI1 0-10V	AI2 0-10V	AI1 4-20mA	AI2 10-10V

SEE RATED WATTS RESISTOR ON PCB

NOTE: UNIT MAY HAVE SUPPLEMENTAL DRAWINGS FOR WIRING, PROGRAMMING AND OTHER DETAILS. REFER TO RATING NAMEPLATE FOR NUMBERS.

- NOTES
- THIS EQUIPMENT MUST BE INSTALLED IN COMPLIANCE WITH THE NATIONAL ELECTRIC CODE AND ALL APPLICABLE STATE AND LOCAL CODES.
  - USE MULTIPLE CONDUITS TO SEPARATE CONTROL WIRES FROM INCOMING LINES AND OTHER POWER WIRING. DO NOT RUN LOGIC WIRING IN SAME CONDUIT AS CONTROL AND POWER WIRING.
  - REFER TO ENCLOSURE NAMEPLATE FOR INPUT/OUTPUT VOLTAGE AND CURRENT RATINGS.
  - CONNECT MOTOR FOR PROPER OUTPUT VOLTAGE PER MOTOR NAMEPLATE.
  - GROUNDING SYSTEM ON STUDS PROVIDED: PG1 & PG2.
  - REMOVAL OF INTERLOCK JUMPERS MAY NOT PREVENT MOTOR OPERATION IN ALL MODES—CONSULT FACTORY FOR PROPER OPERATION.
- TBA TERMINAL BLOCK FOR FIELD CONNECTIONS  
 □ TBC TERMINAL BLOCK FOR FACTORY CONNECTIONS  
 ○ DIRECT COMPONENT TERMINAL FOR FIELD CONNECTIONS

<b>NEW RELEASE</b> 		ECS0144B520BB10000*~5 HP VFD SLUDGE <b>TITLE</b> ELLIOTT ELECTRIC SPLY ATLANTA GA EAST AREA WATER CONTROL FACILITY	
DR VDT	DATE 04/13/22	DR DATE	
APPD	DATE	PRODUCT	DWG TYPE
ECO NUMBER 2200285	REVISION 01	G.O. NUMBER MAT001132	DWG NO. ENG-090400-12239
THIRD ANGLE PROJECTION	DWG. SIZE B	FILE TYPE AutoCAD	DWG FILENAME
SHEET 1 OF 1 SHEET NUMBER 1		SHEET TITLE CONTROL SCHEMATIC	



- NOTES**
1. SEE SCHEMATIC FOR DETAILS AND CONTROL LOGIC - FACTORY WIRING DETAILS OMITTED.
  2. REFER TO ENCLOSURE NAMEPLATE FOR INPUT/OUTPUT VOLTAGES AND CURRENT RATINGS.
  3. ENCLOSURE MUST BE GROUNDED USING INPUT AND OUTPUT STUDS PROVIDED.
  4. THIS EQUIPMENT MUST BE INSTALLED IN COMPLIANCE WITH THE NATIONAL ELECTRIC CODE AND ALL STATE/LOCAL CODES.
  5. USE MULTIPLE CONDUITS TO SEPARATE 120 CONTROL (TBA 101/102) WIRING FROM INCOMING POWER WIRING.
  6. REMOVAL OF INTERLOCK TBA 101/102 MAY NOT PREVENT MOTOR OPERATION IN ALL MODES- CONSULT FACTORY FOR DETAILS.

		DR DATE	TITLE	
		VDT DATE	ECS0144B520BB10000*-5 HP VFD SLUDGE	
CRD DATE	APPD DATE	PRODUCT	DWC TYPE	
		DG1	CONNECTION DIAGRAM	
THIRD ANGLE PROJECTION	DWG. SIZE	FILE TYPE	DWG. NUMBER	DWG. NO.
	B	AutoCAD	2200285	ENG-900500-12196
			REVISION	SHEET
			01	1 OF 1



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## Technical Documents



**DG1 General Purpose Enclosed Drive****Contents**

<b>Description</b>	<b>Page</b>
PowerXL DG1 Series Drives .....	<b>V6-T2-48</b>
PowerXL DG1 Series Enclosed Drives	
Catalog Number Selection .....	<b>V6-T2-75</b>
Production Selection .....	<b>V6-T2-77</b>
Enclosure Selection .....	<b>V6-T2-81</b>
Accessories .....	<b>V6-T2-82</b>
Options .....	<b>V6-T2-83</b>
Technical Data and Specifications .....	<b>V6-T2-84</b>
Wiring Diagram .....	<b>V6-T2-86</b>
Dimensions .....	<b>V6-T2-87</b>

**PowerXL DG1 Series Enclosed Drives****Product Description**

The DG1 Enclosed Drive family incorporates the latest Eaton drive technology into pre-engineered enclosed solutions covering the industry's most common applications. Using the benefits of the PowerXL DG1, the enclosed family provides enhanced user safety with the Safe Torque feature as well as industry-leading energy efficiency from the patented Active Energy Control algorithm. Eaton further raises the bar by providing customers with industry best lead times with the Rapid Response System. This system allows customers to select from 9 million standard configurations that have been pre-engineered with each configuration having a set lead time. The Rapid Response System delivers an improved quotation process and a faster delivery.

**Features and Benefits**

- Dual rated for both constant torque (CT) / high overload (IH) and variable torque (VT) / low overload applications
- Optional Brake Chopper for external braking applications
- Available circuit breaker, motor circuit protector, fused disconnect, isolation fusing and surge protection device options to provide input power protection
- Optional 3% input and output reactors provide a reduction in voltage and current harmonics on both line and load side
- Bypass options include a standard three-contactor design and a reduced voltage soft starter design
- Output contactor option provides a means for positive disconnection of the drive output from the motor terminals
- MotoRX and dV/dt filter options are used to reduce transients voltages at the motor terminals
- Customizable cover control options
- Padlockable disconnect

**Standards and Certifications**

- UL 508C



- The PowerXL DG1 comes standard with the following communication protocols:

- EtherNet/IP
- Modbus/TCP
- Modbus RTU
- BACnet MS/TP

**Communication Options**

- PROFIBUS-DP
- LonWorks
- CANopen
- DeviceNet

**Enclosure Ratings**

- NEMA Type 1
- NEMA Type 12
- NEMA Type 3R

**Mounting**

- Wall mount
- Floor mount: 12-inch legs
- Floor mount: 22-inch legs

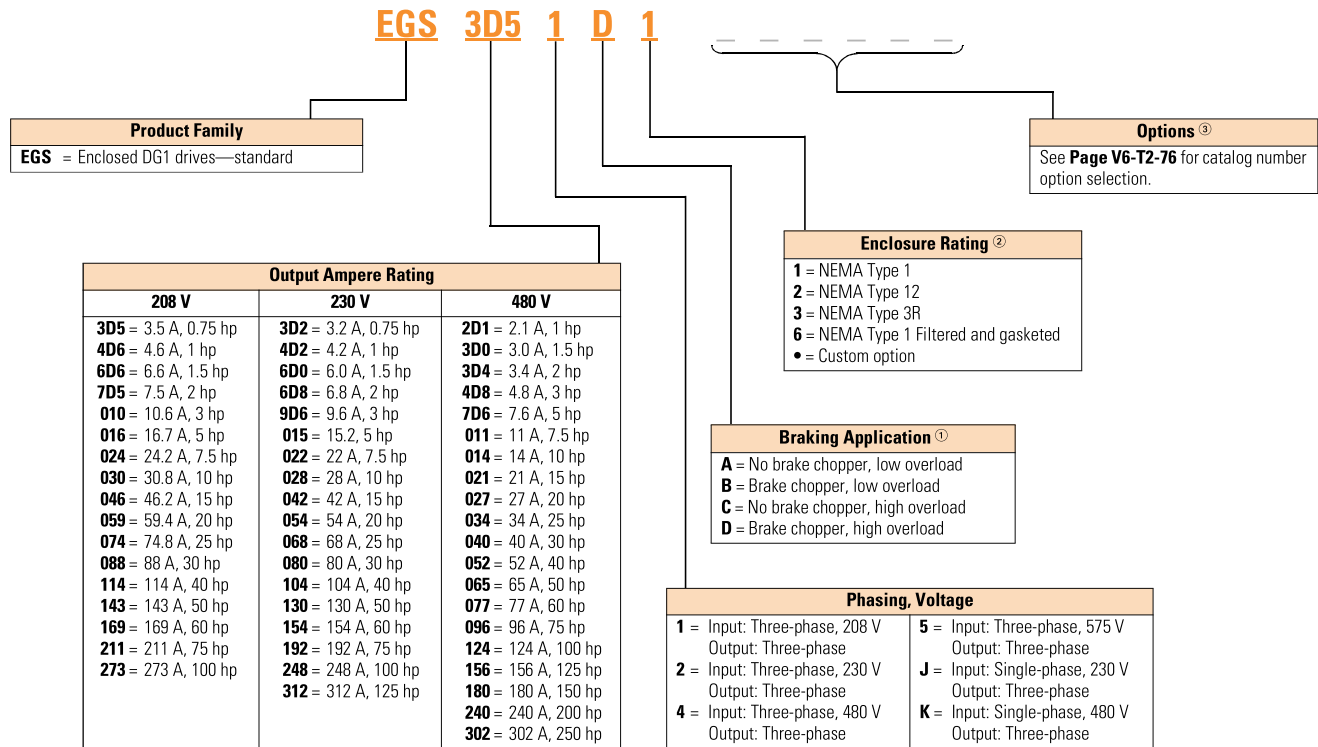
**Product Range**

- 208 V: 0.75–100 hp
- 230 V: 0.75–125 hp
- 480 V: 1–250 hp
- 230 V single-phase: 1–30 hp
- 480 V single-phase: 1.5–60 hp

## Catalog Number Selection

Catalog Number Selection is for reference only. Not all option combinations may be available.

### DG1 Enclosed—Base Catalog Number



### Notes

- ① Brake chopper is a factory-installed option only. Braking resistors sold separately. See DG1 drives starting on **Page V6-T2-59** for selection.
- ② Additional enclosure options including NEMA 4, 4X, 7 and 9 are available. Please contact the factory for configuration and pricing.
- ③ Part number configuration continued on the following page.

# 2.6

## Adjustable Frequency Drives

### PowerXL DG1 Series Drives

Catalog Number Selection is for reference only. Not all option combinations may be available.

#### DG1 Enclosed—Catalog Number Options

2

**EGS 3D5 1 D 1**

**2 0 0 B 1 0 0 0 0**

**Base Catalog Number Example**  
See **Page V6-T2-75** for base catalog number selection.

- Power Disconnect Options**
- 0 = None
  - 1 = MCP disconnect ①
  - 2 = Circuit breaker
  - 3 = Circuit breaker/isolation fusing
  - 4 = Circuit breaker/isolation fusing/3% input reactor
  - 5 = Circuit breaker/isolation fusing/SPD
  - 6 = Circuit breaker/isolation fusing/SPD/3% input reactor
  - 7 = Circuit breaker/3% input reactor
  - 8 = Circuit breaker/SPD
  - 9 = Circuit breaker/SPD/3% input reactor
  - A = Fused disconnect
  - B = Fused disconnect/SPD
  - C = Fused disconnect/SPD/3% input reactor
  - D = Fused disconnect/3% input reactor
  - E = Isolation fuses
  - F = Isolation fuses/3% input reactor
  - G = Isolation fuses/SPD
  - H = Isolation fuses/SPD/3% input reactor
  - = Custom option ②

- Bypass Options ③**
- 0 = None
  - 1 = Manual HOA bypass
  - 2 = Manual HOA bypass/isolation fusing
  - 3 = Manual HOA bypass/isolation fusing/3% input reactor
  - 4 = Manual HOA bypass/isolation fusing/SPD
  - 5 = Manual HOA bypass/isolation fusing/SPD/3% input reactor
  - 6 = Manual HOA bypass/3% input reactor
  - 7 = Manual HOA bypass/SPD
  - 8 = Manual HOA bypass/SPD/3% input reactor
  - H = Manual HOA RVSS bypass
  - J = Manual HOA RVSS bypass/isolation fusing
  - K = Manual HOA RVSS bypass/isolation fusing/3% input reactor
  - L = Manual HOA RVSS bypass/isolation fusing/SPD
  - M = Manual HOA RVSS bypass/isolation fusing/SPD/3% input reactor
  - N = Manual HOA RVSS bypass/3% input reactor
  - P = Manual HOA RVSS bypass/SPD
  - R = Manual HOA RVSS bypass/SPD/3% input reactor
  - = Custom option ②

- Output Power Options ④**
- 0 = None
  - A = Output contactor
  - B = 3% Output reactor
  - D = dV/dt filter
  - E = 3% Output Reactor/output contactor
  - G = dV/dt/output contactor
  - = Custom option ②

- Control Options ⑤**
- 0 = None
  - 1 = Speed pot
  - 2 = Start-stop pushbutton
  - 3 = Start-stop pushbutton with speed pot
  - A = HOA switch
  - B = Start-stop pushbutton with speed pot & HOA switch
  - C = Start-stop pushbutton with HOA switch
  - D = HOA switch with speed pot
  - = Custom option ②

**Option Boards 2**  
Same options and codes as Option Boards 1

- Option Boards 1**
- 0 = No option
  - 1 = 3 x DI, 3 x DO, 1 Thermistor, 24 Vdc/EXT
  - 2 = 1 x AI, 2 x AO (isolated to control board)
  - 3 = 3 x relay dry contact (2NO + 1NO/NC)
  - 4 = 3 x PT100 RTD thermistor input
  - 5 = 6 DI 240 Vac input
  - = Custom option ②

- Communication Options**
- 0 = No option
  - 1 = PROFIBUS-DP
  - 3 = CANopen (slave)
  - 4 = DeviceNet
  - 5 = PROFIBUS-DP (D9 connector)
  - D = SmartWire-DT
  - = Custom option ②

- Enclosure Options**
- 0 = None
  - 1 = Floor stand—12 inches
  - 2 = Floor stand—22 inches
  - A = Space heater
  - B = Space heater & 12-inch floor stands
  - C = Space heater & 22-inch floor stands
  - = Custom option ②

- Light Options ⑤**
- 0 = None
  - 1 = Non-bypass light kit—Power On, Run, Fault
  - 2 = Bypass light kit—On, VFD Run, Fault, Bypass Run
  - = Custom option ②

**Notes**

- ① HMCP disconnect option required and only available when bypass is selected.
- ② More options are available as Engineered to Order through the Bid Manager tool.
- ③ All bypass options include third contactor for drive isolation when in bypass mode.
- ④ Output contactor not available with bypass. Bypass comes standard with output contactor.
- ⑤ Pilot devices are 22 mm standard. 30 mm options are available as engineered to order through the Bid Manager tool.

## Production Selection

## DG1 Enclosed Drive



## 208 V Drives—Constant Torque (CT)/High Overload (IH) Enclosed Drives

hp	Current (A)	Drive Frame Size	NEMA Type 1	NEMA Type 12	NEMA Type 3R
			Base Catalog Number <sup>①</sup>	Base Catalog Number <sup>①</sup>	Base Catalog Number <sup>①</sup>
0.75	3.5	1	EGS3D51D1	EGS3D51D2	EGS3D51D3
1	4.6	1	EGS4D61D1	EGS4D61D2	EGS4D61D3
1.5	6.6	1	EGS6D61D1	EGS6D61D2	EGS6D61D3
2	7.5	1	EGS7D51D1	EGS7D51D2	EGS7D51D3
3	10.6	1	EGS0101D1	EGS0101D2	EGS0101D3
5	16.7	2	EGS0161D1	EGS0161D2	EGS0161D3
7.5	24.2	2	EGS0241D1	EGS0241D2	EGS0241D3
10	30.8	3	EGS0301D1	EGS0301D2	EGS0301D3
15	46.2	3	EGS0461D1	EGS0461D2	EGS0461D3
20	59.4	4	EGS0591C1	EGS0591C2	EGS0591C3
25	74.8	4	EGS0741C1	EGS0741C2	EGS0741C3
30	88	4	EGS0881C1	EGS0881C2	EGS0881C3
40	114	5	EGS1141C1	EGS1141C2	EGS1141C3
50	143	5	EGS1431C1	EGS1431C2	EGS1431C3
60	169	5	EGS1691C1	EGS1691C2	EGS1691C3
75 <sup>②</sup>	211	6	EGS2111C1 <sup>②</sup>	EGS2111C2 <sup>②</sup>	EGS2111C3 <sup>②</sup>
100 <sup>②③</sup>	261 <sup>③</sup>	6	EGS2611C1 <sup>②</sup>	EGS2611C2 <sup>②</sup>	EGS2611C3 <sup>②</sup>

## DG1 Enclosed Drive



## 208 V Drives—Variable Torque (VT)/Low Overload (IL) Enclosed Drives

hp	Current (A)	Drive Frame Size	NEMA Type 1	NEMA Type 12	NEMA Type 3R
			Base Catalog Number <sup>①</sup>	Base Catalog Number <sup>①</sup>	Base Catalog Number <sup>①</sup>
1	4.6	1	EGS4D61B1	EGS4D61B2	EGS4D61B3
1.5	6.6	1	EGS6D61B1	EGS6D61B2	EGS6D61B3
2	7.5	1	EGS7D51B1	EGS7D51B2	EGS7D51B3
3	10.6	1	EGS0101B1	EGS0101B2	EGS0101B3
5	16.7	2	EGS0161B1	EGS0161B2	EGS0161B3
7.5	24.2	2	EGS0241B1	EGS0241B2	EGS0241B3
10	30.8	2	EGS0301B1	EGS0301B2	EGS0301B3
15	46.2	3	EGS0461B1	EGS0461B2	EGS0461B3
20	59.4	3	EGS0591B1	EGS0591B2	EGS0591B3
25	74.8	4	EGS0741A1	EGS0741A2	EGS0741A3
30	88	4	EGS0881A1	EGS0881A2	EGS0881A3
40	114	4	EGS1141A1	EGS1141A2	EGS1141A3
50	143	5	EGS1431A1	EGS1431A2	EGS1431A3
60	169	5	EGS1691A1	EGS1691A2	EGS1691A3
75	211	5	EGS2111A1	EGS2111A2	EGS2111A3
100 <sup>②</sup>	273	6	EGS2731A1 <sup>②</sup>	EGS2731A2 <sup>②</sup>	EGS2731A3 <sup>②</sup>

**Notes**

<sup>①</sup> Table is for base catalog number reference only. For complete catalog number selection, see **Page V6-T2-76**.

<sup>②</sup> Available in 2017.

<sup>③</sup> These units are current rated. They do not meet NEC ampere rating at this horsepower.

# 2.6

## Adjustable Frequency Drives

### PowerXL DG1 Series Drives

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#### DG1 Enclosed Drive



#### 230 V Drives—Constant Torque (CT)/High Overload (H) Enclosed Drives

hp	Current (A)	Drive Frame Size	NEMA Type		
			1 Base Catalog Number ①	12 Base Catalog Number ①	3R Base Catalog Number ①
0.75	3.2	1	EGS3D22D1	EGS3D22D2	EGS3D22D3
1	4.2	1	EGS4D22D1	EGS4D22D2	EGS4D22D3
1.5	6	1	EGS6D02D1	EGS6D02D2	EGS6D02D3
2	6.8	1	EGS6D82D1	EGS6D82D2	EGS6D82D3
3	9.6	1	EGS9D62D1	EGS9D62D2	EGS9D62D3
5	15.2	2	EGS0152D1	EGS0152D2	EGS0152D3
7.5	22	2	EGS0222D1	EGS0222D2	EGS0222D3
10	28	3	EGS0282D1	EGS0282D2	EGS0282D3
15	42	3	EGS0422D1	EGS0422D2	EGS0422D3
20	54	4	EGS0542C1	EGS0542C2	EGS0542C3
25	68	4	EGS0682C1	EGS0682C2	EGS0682C3
30	80	4	EGS0802C1	EGS0802C2	EGS0802C3
40	104	5	EGS1042C1	EGS1042C2	EGS1042C3
50	130	5	EGS1302C1	EGS1302C2	EGS1302C3
60	154	5	EGS1542C1	EGS1542C2	EGS1542C3
75 ②	192	6	EGS1922C1 ②	EGS1922C2 ②	EGS1922C3 ②
100 ②	248	6	EGS2482C1 ②	EGS2482C2 ②	EGS2482C3 ②

#### DG1 Enclosed Drive



#### 230 V Drives—Variable Torque (VT)/Low Overload (L) Enclosed Drives

hp	Current (A)	Drive Frame Size	NEMA Type		
			1 Base Catalog Number ①	12 Base Catalog Number ①	3R Base Catalog Number ①
1	4.2	1	EGS4D22B1	EGS4D22B2	EGS4D22B3
1.5	6	1	EGS6D02B1	EGS6D02B2	EGS6D02B3
2	6.8	1	EGS6D82B1	EGS6D82B2	EGS6D82B3
3	9.6	1	EGS9D62B1	EGS9D62B2	EGS9D62B3
5	15.2	2	EGS0152B1	EGS0152B2	EGS0152B3
7.5	22	2	EGS0222B1	EGS0222B2	EGS0222B3
10	28	2	EGS0282B1	EGS0282B2	EGS0282B3
15	42	3	EGS0422B1	EGS0422B2	EGS0422B3
20	54	3	EGS0542B1	EGS0542B2	EGS0542B3
25	68	4	EGS0682A1	EGS0682A2	EGS0682A3
30	80	4	EGS0802A1	EGS0802A2	EGS0802A3
40	104	4	EGS1042A1	EGS1042A2	EGS1042A3
50	130	5	EGS1302A1	EGS1302A2	EGS1302A3
60	154	5	EGS1542A1	EGS1542A2	EGS1542A3
75	192	5	EGS1922A1	EGS1922A2	EGS1922A3
100 ②	248	6	EGS2482A1 ②	EGS2482A2 ②	EGS2482A3 ②
125 ②	312	6	EGS3122A1 ②	EGS3122A2 ②	EGS3122A3 ②

#### Notes

- ① Table is for base catalog number reference only. For complete catalog number selection, see [Page V6-T2-76](#).
- ② Available in 2017.

## DG1 Enclosed Drive



## 480 V Drives—Constant Torque (CT)/High Overload (IH) Enclosed Drives

hp	Current (A)	Drive Frame Size	NEMA Type 1 Base Catalog Number ①	NEMA Type 12 Base Catalog Number ①	NEMA Type 3R Base Catalog Number ①
1	2.1	1	EGS2D14D1	EGS2D14D2	EGS2D14D3
1.5	3	1	EGS3D04D1	EGS3D04D2	EGS3D04D3
2	3.4	1	EGS3D44D1	EGS3D44D2	EGS3D44D3
3	4.8	1	EGS4D84D1	EGS4D84D2	EGS4D84D3
5	7.6	1	EGS7D64D1	EGS7D64D2	EGS7D64D3
7.5	11	2	EGS0114D1	EGS0114D2	EGS0114D3
10	14	2	EGS0144D1	EGS0144D2	EGS0144D3
15	21	2	EGS0214D1	EGS0214D2	EGS0214D3
20	27	3	EGS0274D1	EGS0274D2	EGS0274D3
25	34	3	EGS0344D1	EGS0344D2	EGS0344D3
30	40	3	EGS0404D1	EGS0404D2	EGS0404D3
40	52	4	EGS0524C1	EGS0524C2	EGS0524C3
50	65	4	EGS0654C1	EGS0654C2	EGS0654C3
60	77	4	EGS0774C1	EGS0774C2	EGS0774C3
75	96	5	EGS0964C1	EGS0964C2	EGS0964C3
100	124	5	EGS1244C1	EGS1244C2	EGS1244C3
125	156	5	EGS1564C1	EGS1564C2	EGS1564C3
150 ②	180	6	EGS1804C1 ②	EGS1804C2 ②	EGS1804C3 ②
200 ②	240	6	EGS2404C1 ②	EGS2404C2 ②	EGS2404C3 ②

## DG1 Enclosed Drive



## 480 V Drives—Variable Torque (VT)/Low Overload (L) Enclosed Drives

hp	Current (A)	Drive Frame Size	NEMA Type 1 Base Catalog Number ①	NEMA Type 12 Base Catalog Number ①	NEMA Type 3R Base Catalog Number ①
1.5	3	1	EGS3D04B1	EGS3D04B2	EGS3D04B3
2	3.4	1	EGS3D44B1	EGS3D44B2	EGS3D44B3
3	4.8	1	EGS4D84B1	EGS4D84B2	EGS4D84B3
5	7.6	1	EGS7D64B1	EGS7D64B2	EGS7D64B3
7.5	11	1	EGS0114B1	EGS0114B2	EGS0114B3
10	14	2	EGS0144B1	EGS0144B2	EGS0144B3
15	21	2	EGS0214B1	EGS0214B2	EGS0214B3
20	27	2	EGS0274B1	EGS0274B2	EGS0274B3
25	34	3	EGS0344B1	EGS0344B2	EGS0344B3
30	40	3	EGS0404B1	EGS0404B2	EGS0404B3
40	52	3	EGS0524B1	EGS0524B2	EGS0524B3
50	65	4	EGS0654A1	EGS0654A2	EGS0654A3
60	77	4	EGS0774A1	EGS0774A2	EGS0774A3
75	96	4	EGS0964A1	EGS0964A2	EGS0964A3
100	124	5	EGS1244A1	EGS1244A2	EGS1244A3
125	156	5	EGS1564A1	EGS1564A2	EGS1564A3
150	180	5	EGS1804A1	EGS1804A2	EGS1804A3
200 ②	240	6	EGS2404A1 ②	EGS2404A2 ②	EGS2404A3 ②
250 ②	302	6	EGS3024A1 ②	EGS3024A2 ②	EGS3024A3 ②

**Notes**

① Table is for base catalog number reference only. For complete catalog number selection, see **Page V6-T2-76**.

② Available in 2017.

# 2.6

## Adjustable Frequency Drives

### PowerXL DG1 Series Drives

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#### DG1 Enclosed Drive



#### 230 V Single-Phase Drives—Variable Torque (VT)/Low Overload (L) Enclosed Drives

hp	Current (A)	Drive Frame Size	NEMA Type 1 Base Catalog Number <sup>①</sup>	NEMA Type 12 Base Catalog Number <sup>①</sup>	NEMA Type 3R Base Catalog Number <sup>①</sup>
<b>Low Overload (VT) Enclosed Drives</b>					
0.75	3.2	1	EGS3D2JB1	EGS3D2JB2	EGS3D2JB3
1	4.2	1	EGS4D2JB1	EGS4D2JB2	EGS4D2JB3
1.5	6	2	EGS6D0JB1	EGS6D0JB2	EGS6D0JB3
2	6.8	2	EGS6D8JB1	EGS6D8JB2	EGS6D8JB3
3	9.6	2	EGS9D6JB1	EGS9D6JB2	EGS9D6JB3
5	15.2	2	EGS015JB1	EGS015JB2	EGS015JB3
7.5	22	3	EGS022JB1	EGS022JB2	EGS022JB3
10	28	3	EGS028JB1	EGS028JB2	EGS028JB3
15	42	4	EGS042JB1	EGS042JB2	EGS042JB3
20	54	4	EGS054JB1	EGS054JB2	EGS054JB3
25	68	5	EGS068JA1	EGS068JA2	EGS068JA3
30	80	5	EGS080JA1	EGS080JA2	EGS080JA3
40	104	5	EGS104JA1	EGS104JA2	EGS104JA3

#### DG1 Enclosed Drive



#### 480 V Single-Phase Drives—Variable Torque (VT)/Low Overload (L) Enclosed Drives

hp	Current (A)	Drive Frame Size	NEMA Type 1 Base Catalog Number <sup>①</sup>	NEMA Type 12 Base Catalog Number <sup>①</sup>	NEMA Type 3R Base Catalog Number <sup>①</sup>
<b>Low Overload (VT) Enclosed Drives</b>					
1	2.1	1	EGS2D1KB1	EGS2D1KB2	EGS2D1KB3
1.5	3	1	EGS3D0KB1	EGS3D0KB2	EGS3D0KB3
2	3.4	1	EGS3D4KB1	EGS3D4KB2	EGS3D4KB3
3	4.8	1	EGS4D8KB1	EGS4D8KB2	EGS4D8KB3
5	7.6	2	EGS7D6KB1	EGS7D6KB2	EGS7D6KB3
7.5	11	2	EGS011KB1	EGS011KB2	EGS011KB3
10	14	2	EGS014KB1	EGS014KB2	EGS014KB3
15	21	3	EGS021KB1	EGS021KB2	EGS021KB3
20	27	4	EGS027KB1	EGS027KB2	EGS027KB3
25	34	4	EGS034KB1	EGS034KB2	EGS034KB3
30	40	4	EGS040KB1	EGS040KB2	EGS040KB3
40	52	5	EGS052KB1	EGS052KB2	EGS052KB3
50	65	5	EGS065KA1	EGS065KA2	EGS065KA3
60	77	5	EGS077KA1	EGS077KA2	EGS077KA3

**Note**

<sup>①</sup> Table is for base catalog number reference only. For complete catalog number selection, see **Page V6-T2-76**.

## Enclosure Selection

### EGS

Enclosure selection charts are based on physical space limitations only and only to be used as a reference. For actual enclosure sizing, refer to Bid Manager.

**Note:** Standard enclosure sizing includes dedicated space for a circuit breaker or fusible disconnect, CPT, SPD, heater/thermostat, control relay and terminal blocks.

### Standard Enclosure X-Space

Enclosure Size	Frame 1	Frame 2	Frame 3	Frame 4	Frame 5
AX	2	2	2	—	—
BX	4	4	4	4	—
CX	7	7	7	7	7
DX	18	18	18	18	18

### Standard Power Options X-Space

Power Options	Frame 1	Frame 2	Frame 3	Frame 4	Frame 5
Isolation fuses	1	1	1	1	1
3% Input reactor	2	2	3	5	6
3% Output reactor	1	1	3	5	6
dV/dt filter	3	3	3	5	6
Output contactor	1	1	1	1	1

**Note:** Bypass enclosure sizing includes dedicated space for a MCP, CPT, input contactor, output bypass contactors, overload relay, SPD, heater/thermostat, control relay and terminal blocks.

### Bypass Enclosure X-Space

Enclosure Size	Frame 1	Frame 2	Frame 3	Frame 4	Frame 5
AX	0	0	0	—	—
BX	2	2	2	0	—
CX	5	5	5	3	2
DX	16	16	16	14	13

### Bypass Power Options X-Space

Power Options	Frame 1	Frame 2	Frame 3	Frame 4	Frame 5
Isolation fuses	1	1	1	1	1
3% Input reactor	2	2	3	5	6
RVSS bypass	2	2	2	3	4
3% output reactor	1	1	3	5	6
dV/dt filter	3	3	3	5	6

**Note:** Single-phase enclosure sizing includes dedicated space for a capacitor kit, circuit breaker or fusible disconnect, CPT, SPD, heater/thermostat, control relay and terminal blocks.

### Single-Phase Enclosure X-Space

Enclosure Size	Frame 1	Frame 2	Frame 3	Frame 4	Frame 5
AX	0	0	—	—	—
BX	2	2	1	1	—
CX	5	5	4	4	4
DX	16	16	15	15	15

### Single-Phase Power Options X-Space

Power Options	Frame 1	Frame 2	Frame 3	Frame 4	Frame 5
Isolation fuses	1	1	1	1	1
3% Input reactor	2	2	3	5	6
3% Output reactor	1	1	3	5	6
dV/dt filter	3	3	3	5	6
Output contactor	1	1	1	1	1



### 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
  - 2FC, 1FA 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	<b>DXG-EXT-3DI3DO1T</b>
1 x AI, 2 x AO (isolated to control board) option card	<b>DXG-EXT-1AI2AO</b>
3 x relay dry contact (2NO + 1NO/NC) option card	<b>DXG-EXT-3R0</b>
3 x PT100 RTD thermistor input option card	<b>DXG-EXT-THER1</b>
6 x DI 240 Vac input option card	<b>DXG-EXT-6DI</b>

### PowerXL Series—DG1 Communication Card Kits

Description	Catalog Number
PROFIBUS-DP communication card	<b>DXG-NET-PROFB</b>
CANopen communication card	<b>DXG-NET-CANOPEN</b>
DeviceNet communication card	<b>DXG-NET-DEVICENET</b>
PROFIBUS DB9 to 5-pin adapter card	<b>DXG-NET-PROAD</b>
SmartWire communication card and module	<b>DXG-NET-SWD</b> <sup>①</sup>

#### Note

<sup>①</sup> Available in January 2017.

## Options

### Input Power Options

Option	Description
HMCP Disconnect	The HMCP motor protection circuit breaker uses an electronic trip unit to provide typical motor overload relay functionality and short-circuit protection against potential phase-to-phase or phase-to-ground faults.
Circuit Breaker	Utilizes a circuit breaker to provide a means of short-circuit protection for the power cables between it and the drive, and protection from high-level ground faults on the power cable. Allows a convenient means of disconnecting the drive from the line, and the operating mechanism can be padlocked in the OFF position. This is factory mounted in the enclosure.
Isolation Fusing	Provides high-level fault protection of the drive input power circuit from the load side of the fuses to the input side of the power transistors. This option consists of three 200 kA fuses that are factory mounted in the enclosure.
3% Input Reactor	The input reactor is a three-phase series inductance on the line side of an AFD. It is used to provide a reduction in voltage and current harmonics. It also provides increased input protection for AFD and its semiconductors from line transients.
SPD	Provides a UL 1449 surge protection device (SPD) rated for 40 kA/ph that is connected to the line side terminals.
Fused Disconnect	Utilizes fusing to provide a means of short-circuit protection for the power cables between it and the drive, and protection from high-level ground faults on the power cable. Allows a convenient means of disconnecting the drive from the line, and the operating mechanism can be padlocked in the OFF position. This is factory mounted in the enclosure.

### Bypass Options

Option	Description
Manual HOA Bypass	Provides a three-position selector switch that allows the user to select either a HAND or AUTO mode of operation. HAND mode is defaulted keypad operation, and AUTO mode is defaulted to control from an external terminal source. These modes of operation can be configured via programming to allow for alternate combinations of start and speed sources. Start and speed sources include keypad, I/O and fieldbus.
Manual HOA RVSS Bypass	This option adds a reduced voltage soft starter to bypass assembly for soft starting in bypass mode.

### Output Power Options

Option	Description
Output Contactor	Provides a means for positive disconnection of the drive output from the motor terminals. The contactor coil is controlled by the drive's run or permissive logic. NC and NO auxiliary contacts rated at 10 A, 600 Vac are provided for customer use. This option includes a low VA 115 Vac fused control power transformer and is factory mounted in the enclosure.
3% Output Reactor	The output reactor is a three-phase series inductance on the load side of a VFD. It is used to reduce transient voltage (dv/dt) and peak voltages at the motor terminals. A 3% output filter is recommended for motor cable lengths up to 300 ft (10 m).
dV/dt Filter	Used to reduce the transient voltage (dV/dt) at the motor terminals. Recommended for motor cable lengths over 300 ft (10 m) and up to 1000 ft (304.8 m). This option is mounted in the enclosure.

### Control Options

Option	Description
Speed Pot	Provides the ability to adjust the frequency reference using a door-mounted potentiometer. This option uses the 10 Vdc reference to generate a 0–10 V signal at the analog voltage input signal terminal. When the HOA bypass option is added, the speed is controlled when the HOA switch is in the HAND position. Without the HOA bypass option, a two-position switch (labeled local/remote) is provided on the keypad to select speed reference from the speed potentiometer or a remote speed signal.
HOA Switch	Provides a three-position selector switch that allows the user to select either a HAND or AUTO mode of operation. HAND mode is defaulted to keypad operation, and AUTO mode is defaulted to control from an external terminal source. These modes of operation can be configured via drive programming to allow for alternate combinations of start and speed sources. Start and speed sources include Keypad, I/O and fieldbus.
Start-Stop Pushbutton	Provides door-mounted START and STOP pushbuttons for either bypass or non-bypass configurations.

### Light Options

Option	Description
Non-Bypass Light Kit—Power On, Run, Fault	Provides a white POWER ON light that indicates power to the enclosed cabinet, a green RUN light that indicates the drive is running and a red FAULT light that indicates a drive fault has occurred.
Bypass Light Kit—On, VFD Run, Fault, Bypass Run	Provides a white POWER ON light that indicates power to the enclosed cabinet, a green RUN light that indicates the drive is running, a red FAULT light that indicates a drive fault has occurred and an amber light that indicates when the motor is running in Bypass mode.

### Enclosure Options

Option	Description
Floor Stand 12 in	Converts a normally wall-mounted enclosure to a floor-standing enclosure with a height of 12 in (304.8 mm).
Floor Stand 22 in	Converts a normally wall-mounted enclosure to a floor-standing enclosure with a height of 22 in (558.8 mm).

## Technical Data and Specifications

### PowerXL Series—DG1 Technical Data and Specifications

2

Attribute	Description	Specification	
Input ratings	Input voltage $U_{in}$	208 V, 230 V, 480 V, 575 V, –15 to 10%	
	Input frequency	50 Hz to 60 Hz (variation up to 45 Hz to 66 Hz)	
	Connection to power	Once per minute or less	
	Starting delay	3 s (FR1 to FR2), 4 s (FR3), 5 s (FR4), 6 s (FR5 and FR6)	
	Short-circuit withstand rating	100 kAIC (fuses and circuit breakers)	
Output ratings	Output voltage	0 to $U_{in}$	
	Output current	$I_L$ : ambient temperature maximum 40 °C, up to 60 °C with derating, overload 1.1 x $I_L$ (1 min./10 min.) $I_H$ : ambient temperature maximum 50 °C, up to 60 °C with derating, overload 1.5 x $I_H$ (1 min./10 min.)	
	Initial output current	200% (2 s / 20 s)	
	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	230 V / 480 V range: FR1–3: 1 kHz to 12 kHz FR4–6: 1 kHz to 10 kHz  230 V / 480 V defaults: FR1–3: 4 kHz FR4–5: 3.6 kHz FR6: 2 kHz  575 V range: FR1–6: 1 kHz to 6 kHz  575 V defaults: FR1–4: 3 kHz FR5–6: 2 kHz  Automatic switching frequency derating in case of overload.	
	Frequency reference	Analog input: resolution 0.1% (10-bit), accuracy +1% Analog output: resolution 0.1% (10-bit), accuracy +1% Panel reference: resolution 0.01 Hz	
	Field weakening point	20 Hz to 400 Hz	
	Acceleration time	0.1 s to 3000 s	
	Deceleration time	0.1 s to 3000 s	
	Braking torque	DC brake: 30% x Motor Rated Torque ( $T_n$ ) (without brake chopper) Dynamic braking (with optional brake chopper using an external brake resistor): 100% continuous maximum rating	
	Ambient conditions	Ambient operating temperature	–10 °C (no frost) to +40 °C
		Storage temperature	–40 °C to +70 °C
		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 <sub>2</sub> S [hydrogen sulfide] and SO <sub>2</sub> [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 3280 ft (1000 m); 1% derating for each 328 ft (100 m) above 3280 ft (1000 m); max. 9842 ft (3000 m) (2000 m for corner grounded earth main systems) For 575 V product, maximum altitude is 6561 ft (2000 m) regardless of main system	

## PowerXL Series—DG1 Technical Data and Specifications, continued

Attribute	Description	Specification
Ambient conditions, continued	Overvoltage	Overvoltage Category III
	Pollution degree	Pollution Degree 2
	Enclosure class	NEMA Type 1, 12, 3R
	Immunity	Fulfills EN 61800-3 (2004), first and second environment
Standards	Safety	UL 508C, EN 61800-5-1
	Approvals	UL and cUL
Fieldbus connections		Onboard: EtherNet/IP, Modbus <sup>®</sup> TCP, Modbus RTU, BACnet
Safety/protections	Overvoltage protection	Yes
	Overvoltage trip limit	230 V drives: 456 V 480 V drives: 911 V 575 V drives: 1100 V
	Undervoltage protection	Yes
	Undervoltage trip limit	230 V drives: 211 V 480 V drives: 370 V 575 V drives: 550 V
	Earth fault protection	Yes Default: 15% motor FLA Minimum: 0% motor FLA Maximum: 30% motor FLA
	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 24 V reference voltages	Yes
	Surge protection	Yes (differential mode 2 kV; common mode 4 kV 230 V drives: 275 Vac, 10,000 A 480 V drives: 320 Vac, 8000 A 575 V drives: 385 Vac, 10,000 A
Common coated boards	Yes (prevents corrosion)	
Efficiency	Drive efficiency ratings <sup>Ⓞ</sup>	480 V: FR1 = 97.7% FR2 = 97.9% FR3 = 97.7% FR4 = 98.0% FR5 = 98.2%
		230 V: FR1 = 96.7% FR2 = 97.4% FR3 = 97.2% FR4 = 97.4% FR5 = 97.7%

**Note**

<sup>Ⓞ</sup> Based on DG1 efficiency ratings in an enclosure with no options.

# 2.6

## Adjustable Frequency Drives

### PowerXL DG1 Series Drives

#### Wiring Diagram

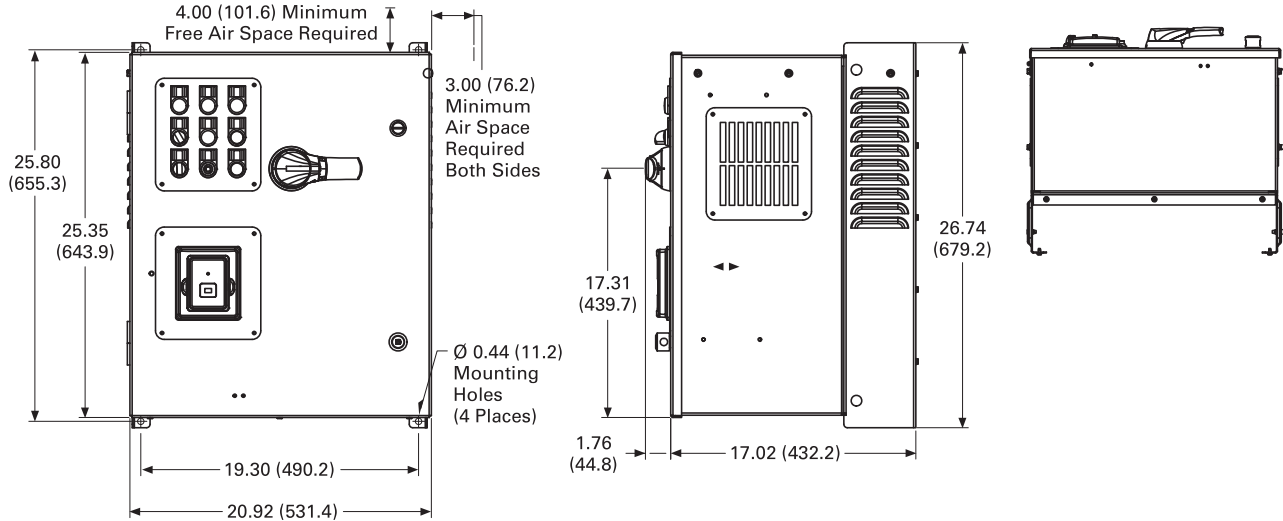
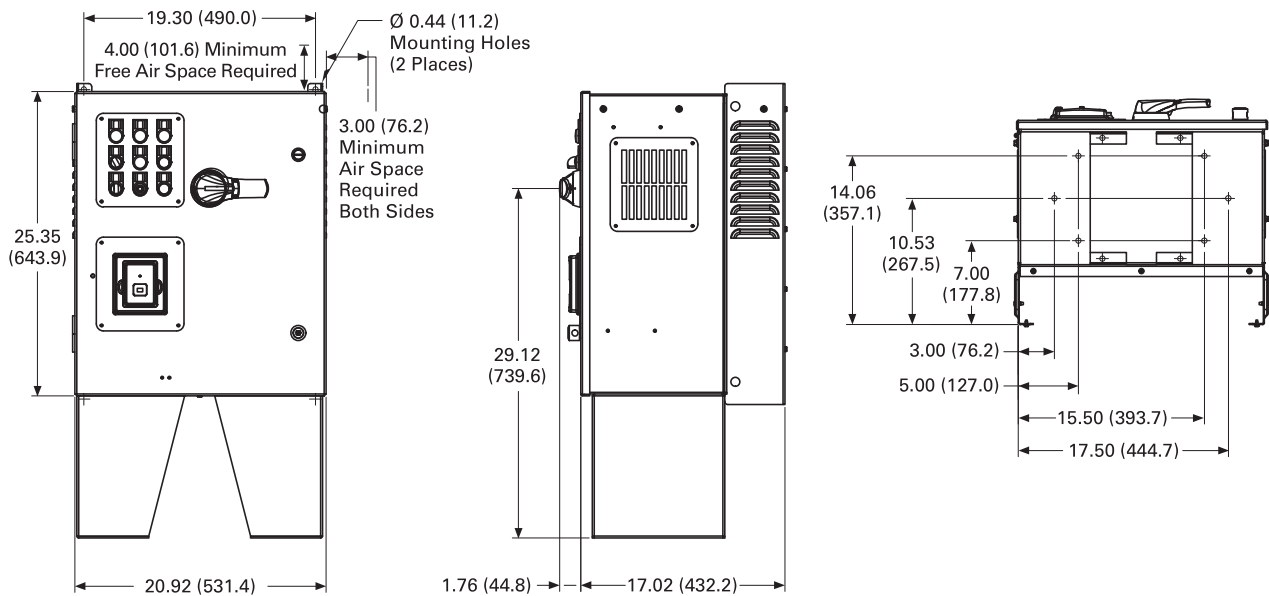
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PowerXL Series—DG1 Control Wiring Diagram

Pin	Signal Name	Signal	Default Setting	Description
1	+10 V	Ref. Output Voltage	—	10 Vdc Supply Source
2	AI1+	Analog Input 1	0–10 V	Voltage Speed Reference (Programmable to 4 mA to 20 mA)
3	AI1–	Analog Input 1 Ground	—	Analog Input 1 Common (Ground)
4	AI2+	Analog Input 2	4 mA to 20 mA	Current Speed Reference (Programmable to 0–10 V)
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 (TI–)	Input forces VFD output to shut off
10	DIN8	Digital Input 8	Force Remote (TI+)	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	24 V	+24 Vdc Output	—	Control voltage output (100 mA max.)
14	DO1	Digital Output 1	Ready	Shows the drive is ready to run
15	24 Vo	+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 mA to 20 mA)
18	AO2+	Analog Output 2	Motor Current	Shows Motor current of motor 0–FLA (4 mA to 20 mA)
19	24 Vi	+24 Vdc 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		

**Dimensions**

Approximate Dimensions in Inches (mm)

**AX Box Type 1****AX Box Type 1—12 Inch Floor Stands**

# 2.6

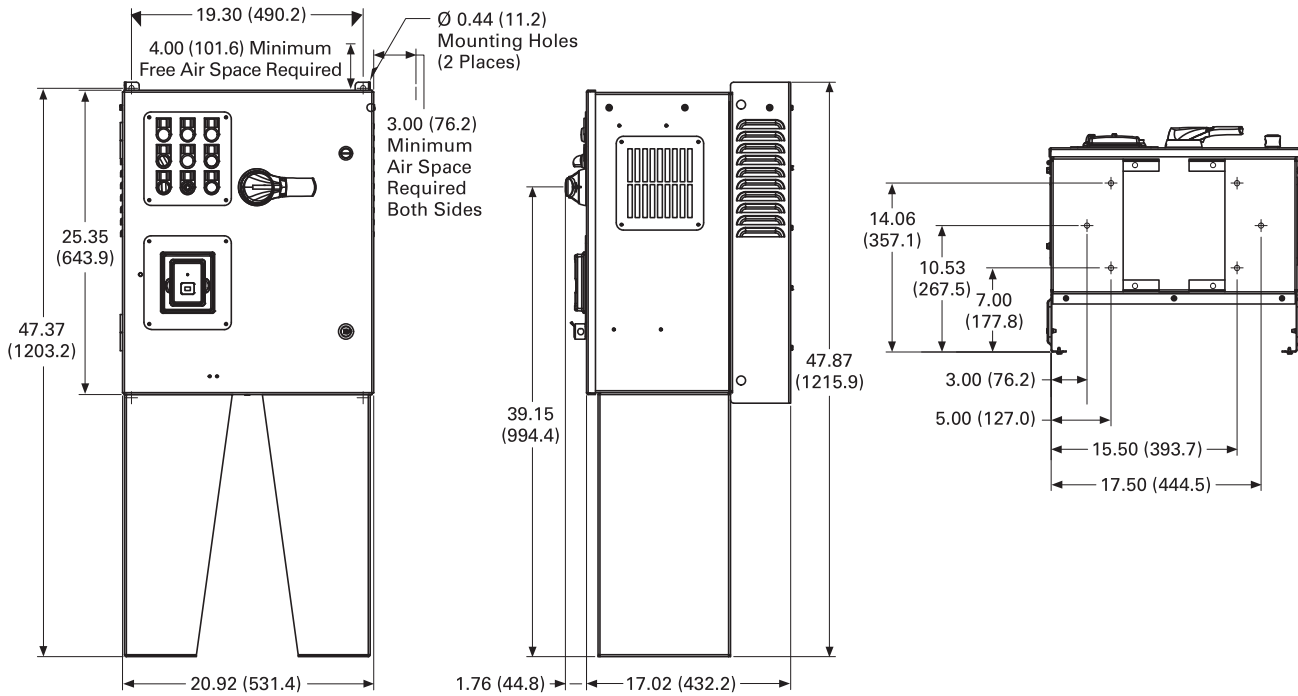
## Adjustable Frequency Drives

### PowerXL DG1 Series Drives

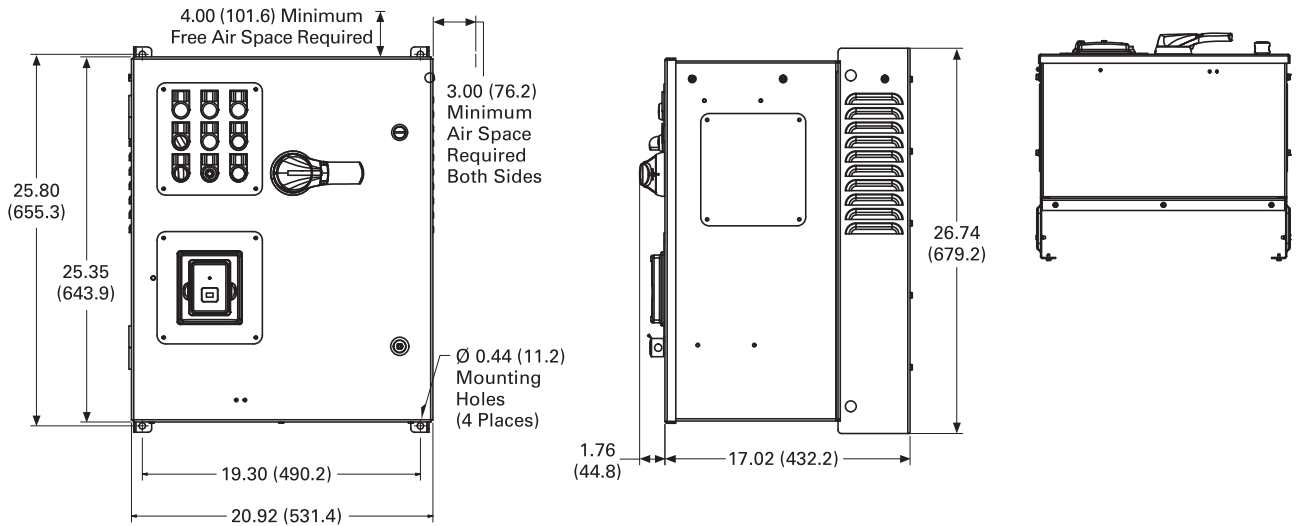
Approximate Dimensions in Inches (mm)

#### AX Box Type 1—22 Inch Floor Stands

2

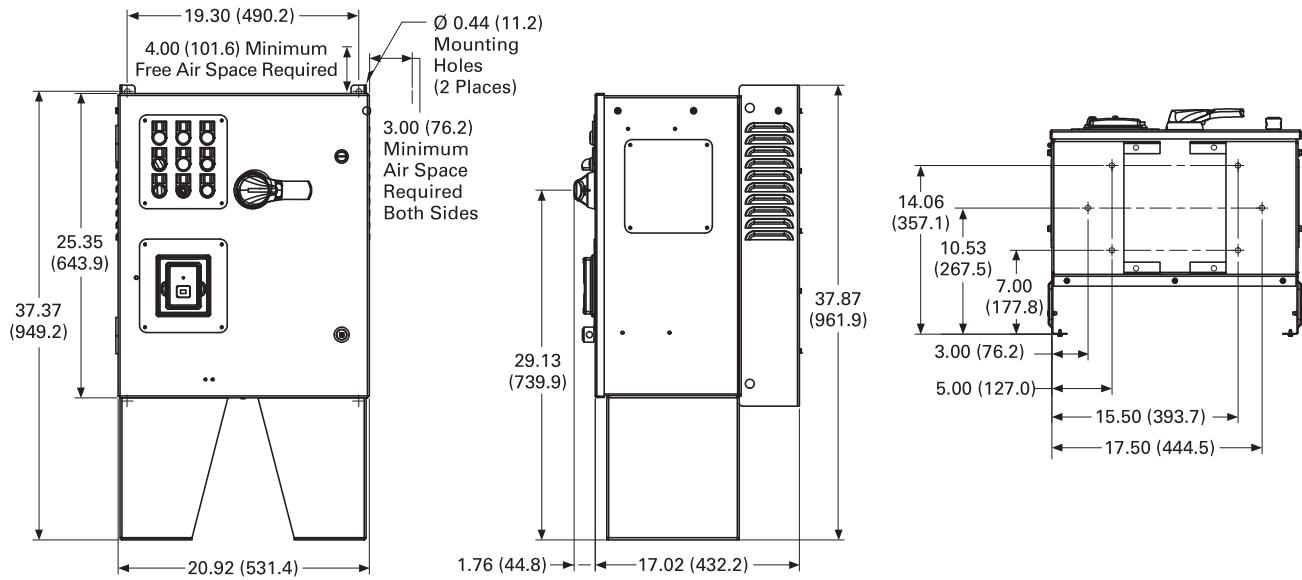


#### AX Box Type 12

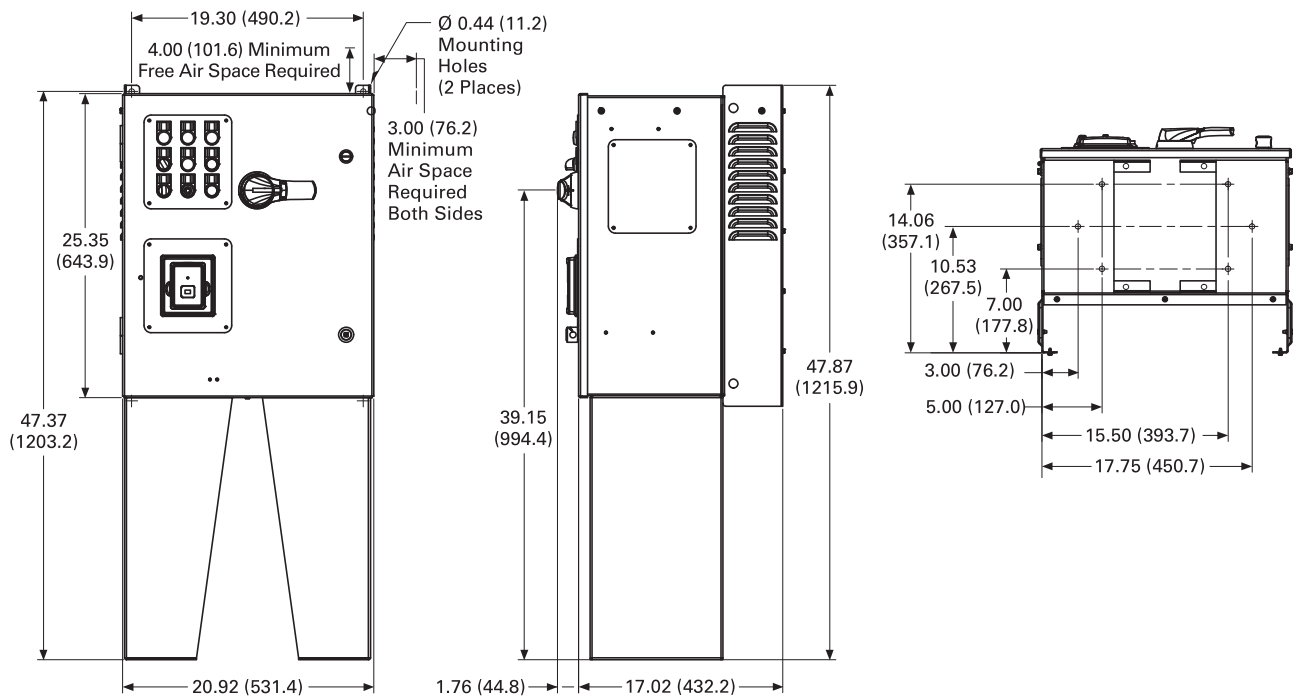


Approximate Dimensions in Inches (mm)

### AX Box Type 12—12 Inch Floor Stands



### AX Box Type 12—22 Inch Floor Stands





# 2.6

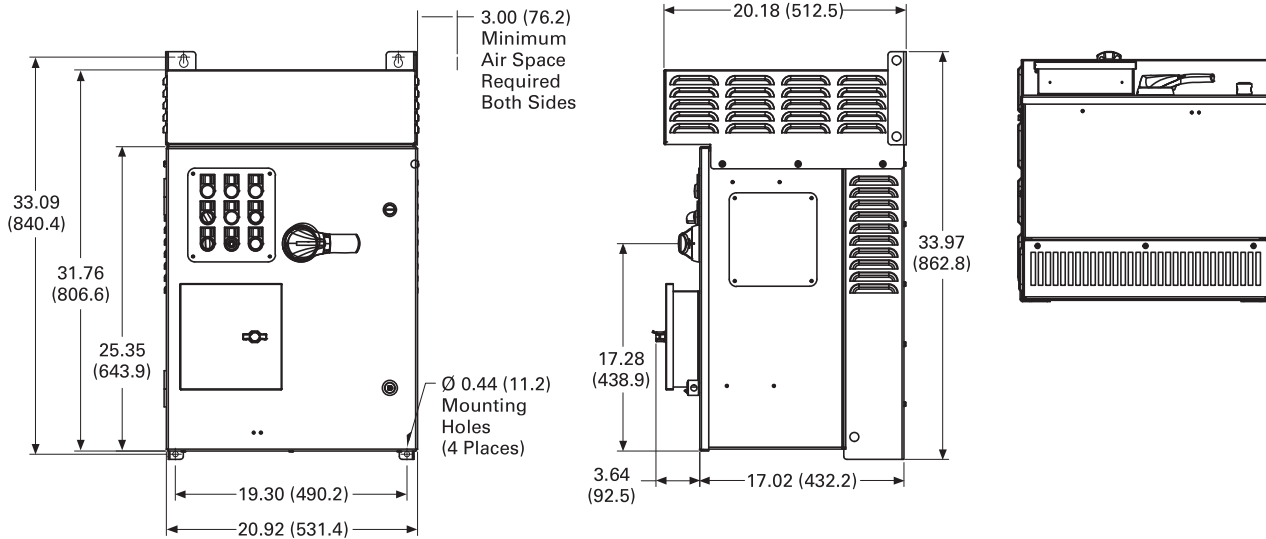
## Adjustable Frequency Drives

### PowerXL DG1 Series Drives

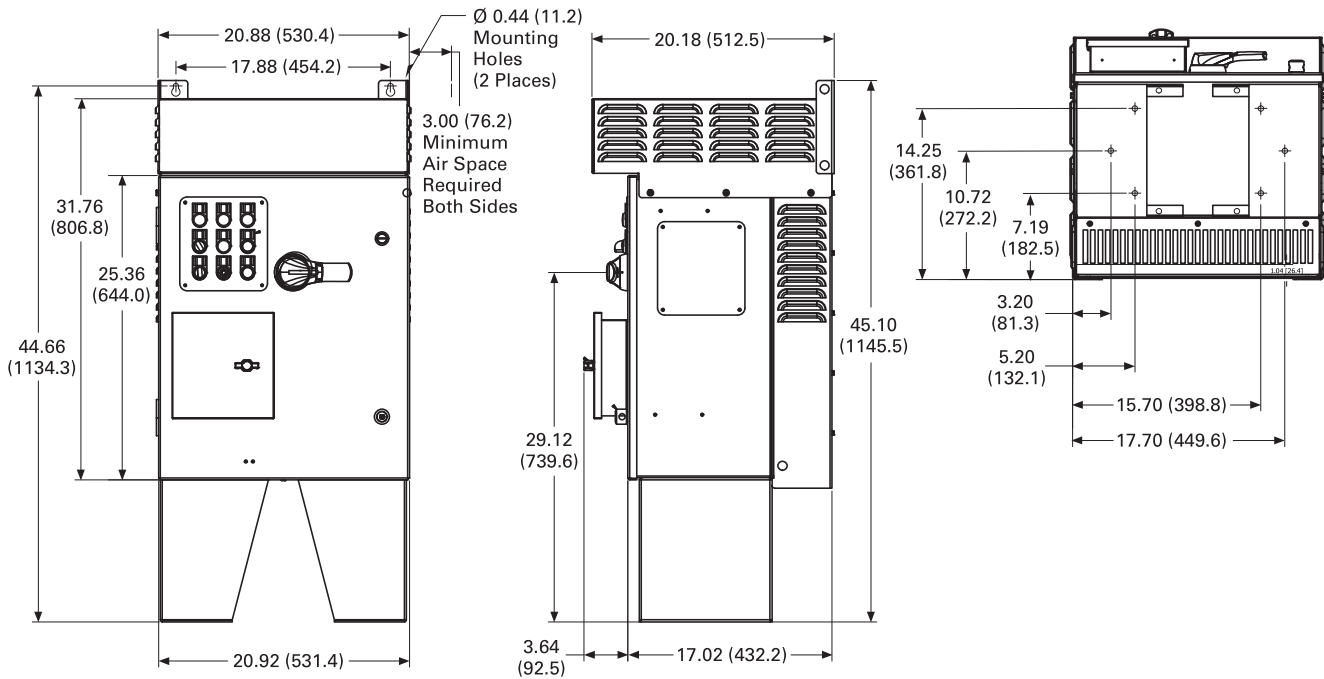
Approximate Dimensions in Inches (mm)

2

#### AX Box Type 3R

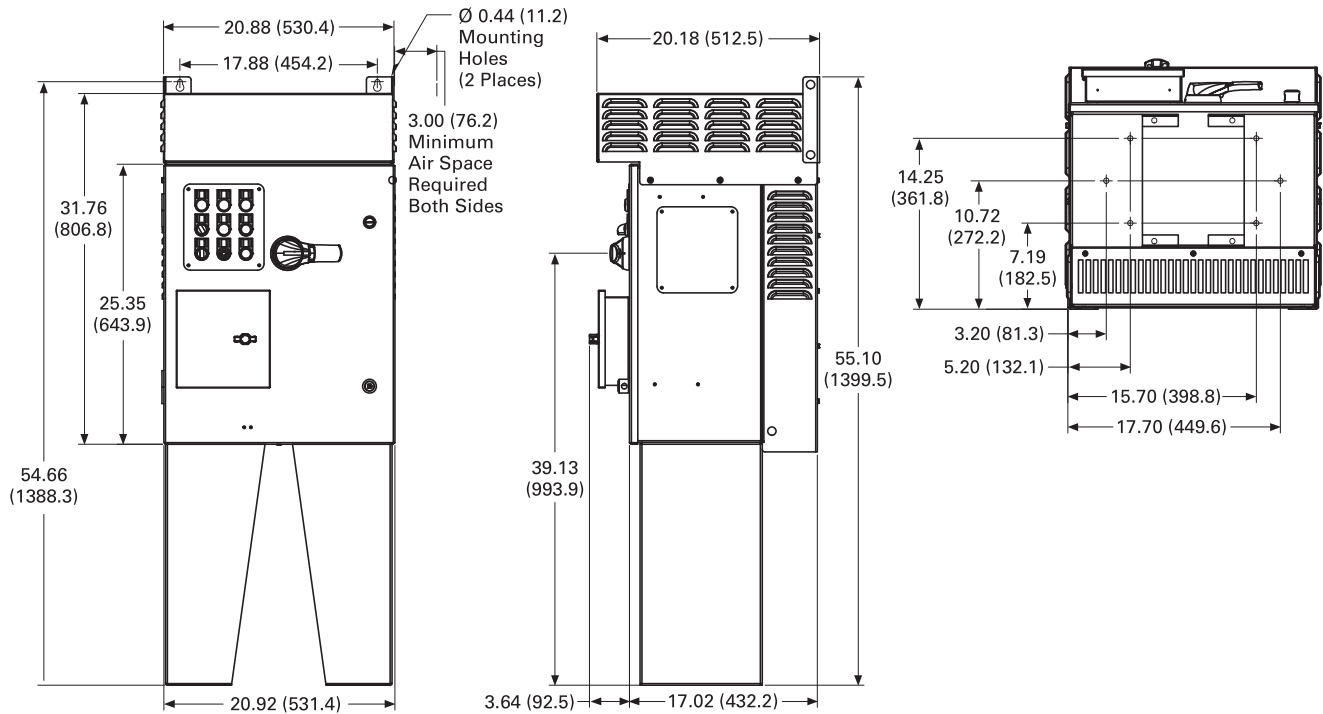


#### AX Box Type 3R—12 Inch Floor Stands

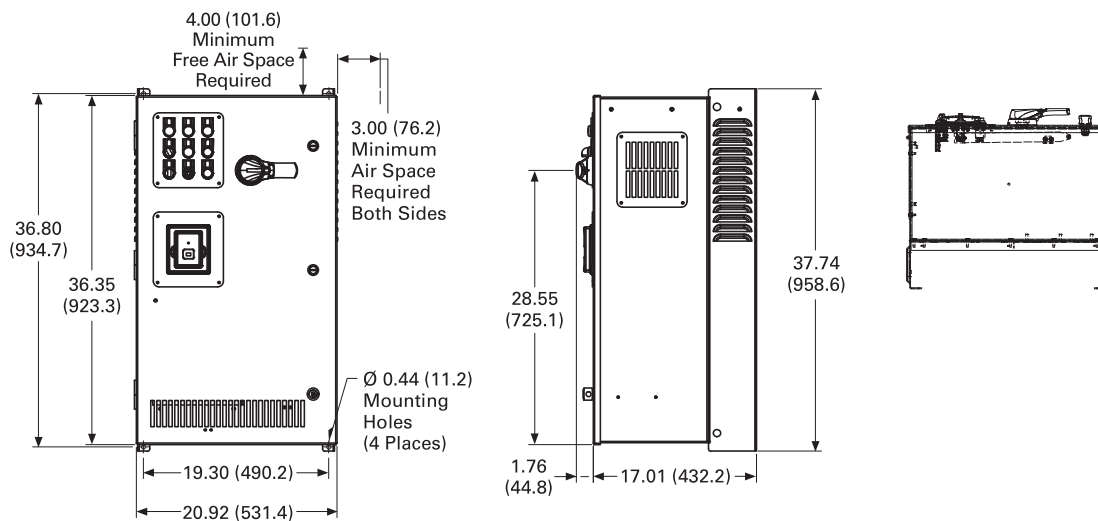


Approximate Dimensions in Inches (mm)

### AX Box Type 3R—22 Inch Floor Stands



### BX Box Type 1



# 2.6

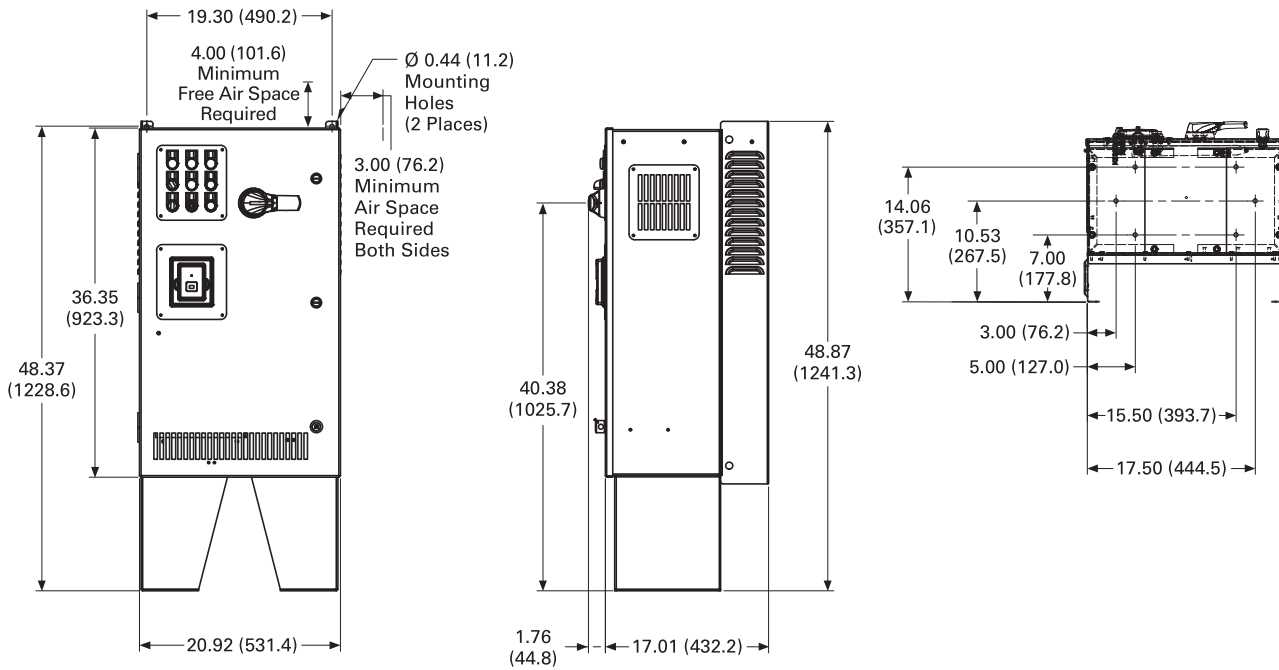
## Adjustable Frequency Drives

### PowerXL DG1 Series Drives

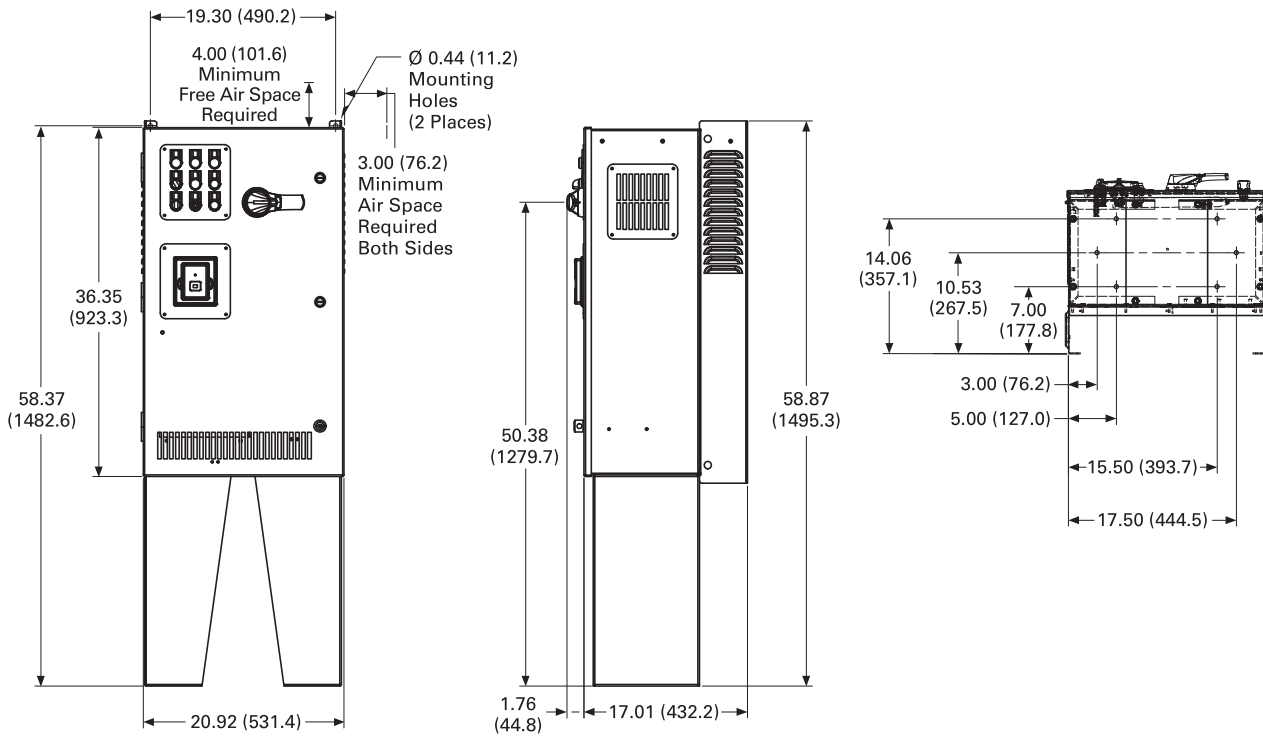
Approximate Dimensions in Inches (mm)

2

#### BX Box Type 1—12 Inch Floor Stands

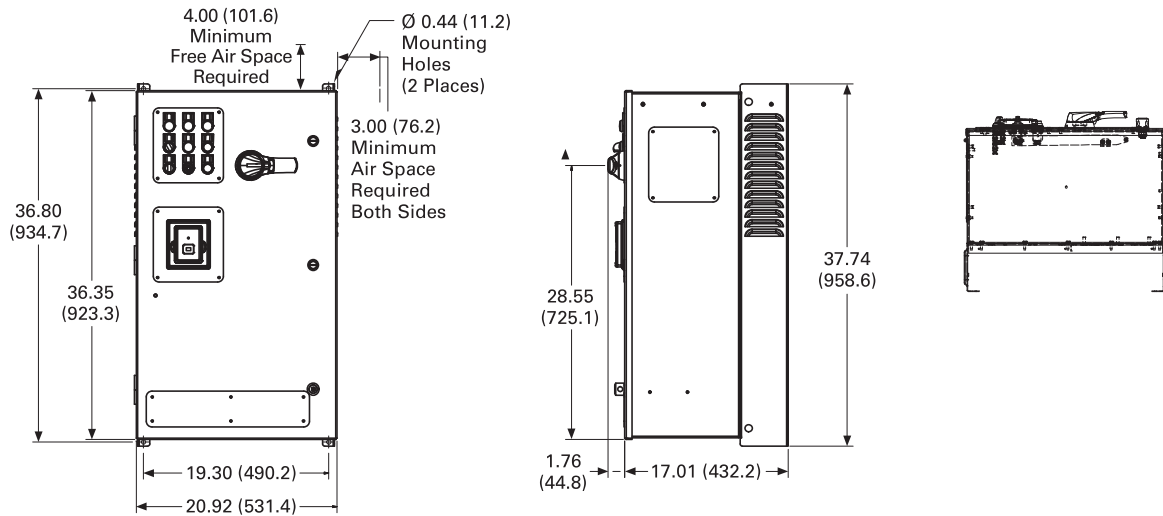


#### BX Box Type 1—22 Inch Floor Stands

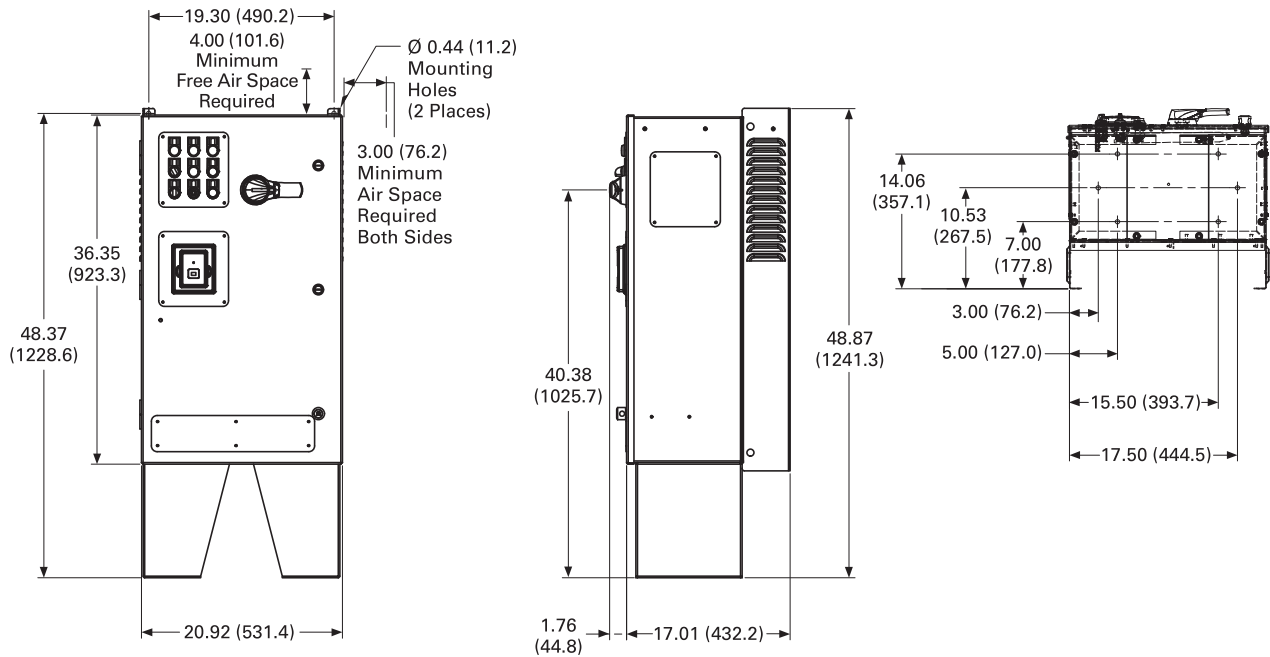


Approximate Dimensions in Inches (mm)

### BX Box Type 12



### BX Box Type 12—12 Inch Floor Stands



# 2.6

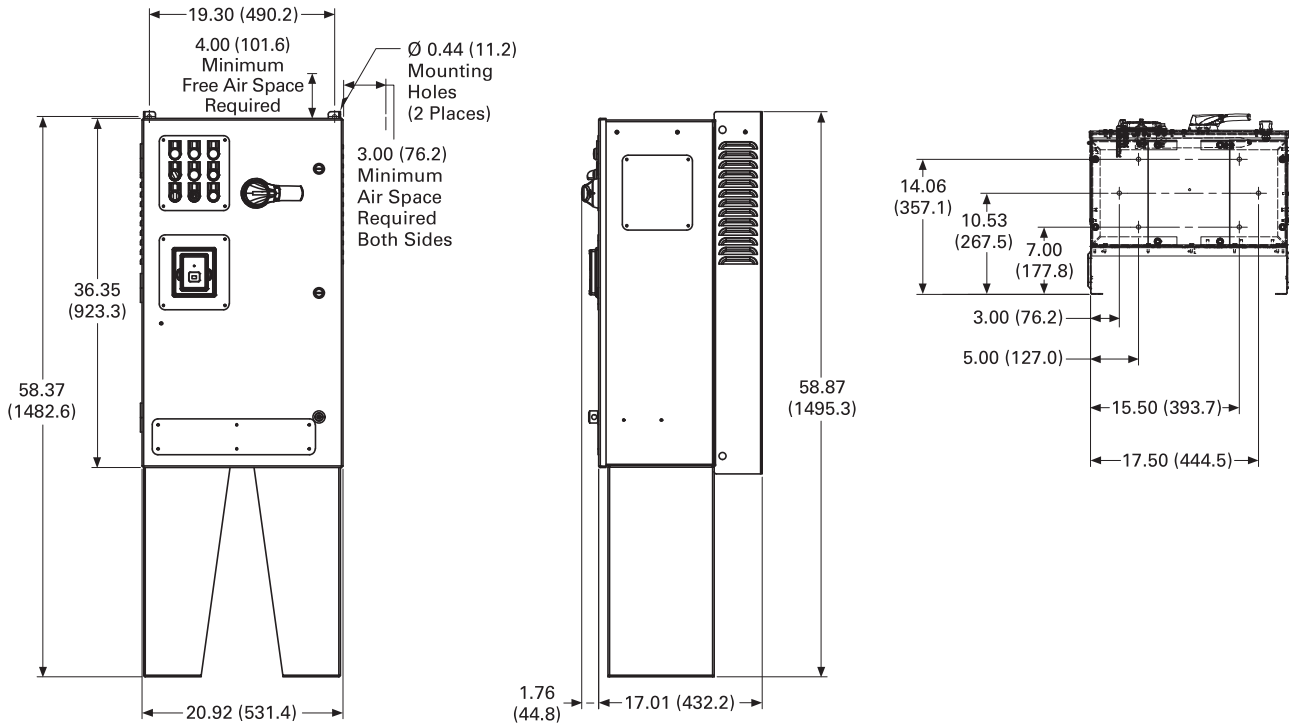
## Adjustable Frequency Drives

### PowerXL DG1 Series Drives

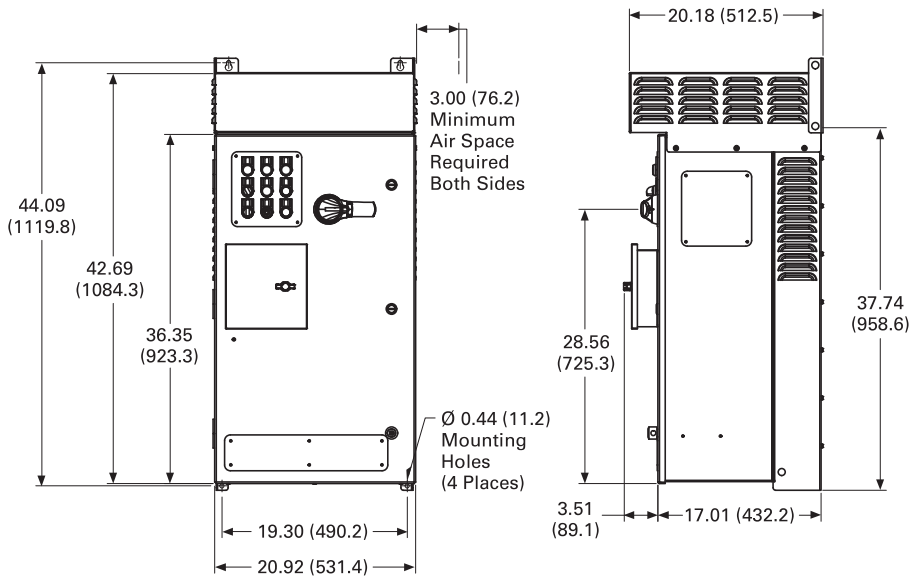
Approximate Dimensions in Inches (mm)

#### BX Box Type 12–22 Inch Floor Stands

2

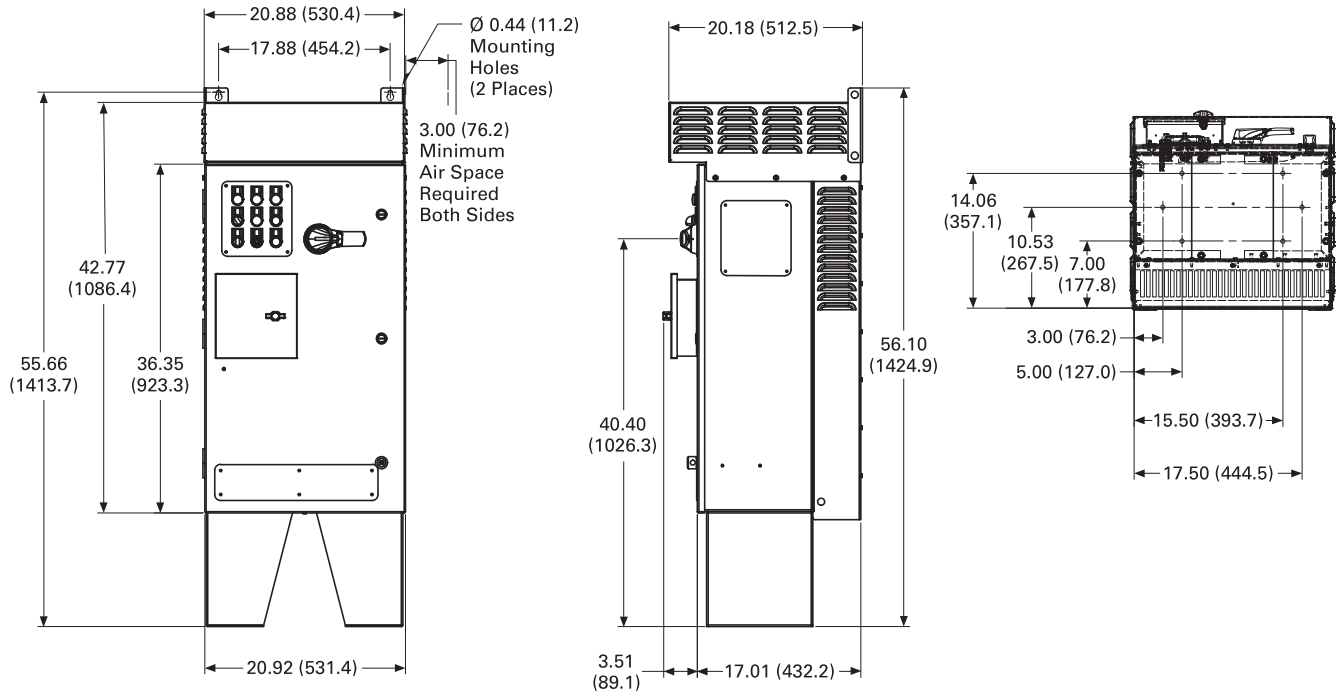


#### BX Box Type 3R

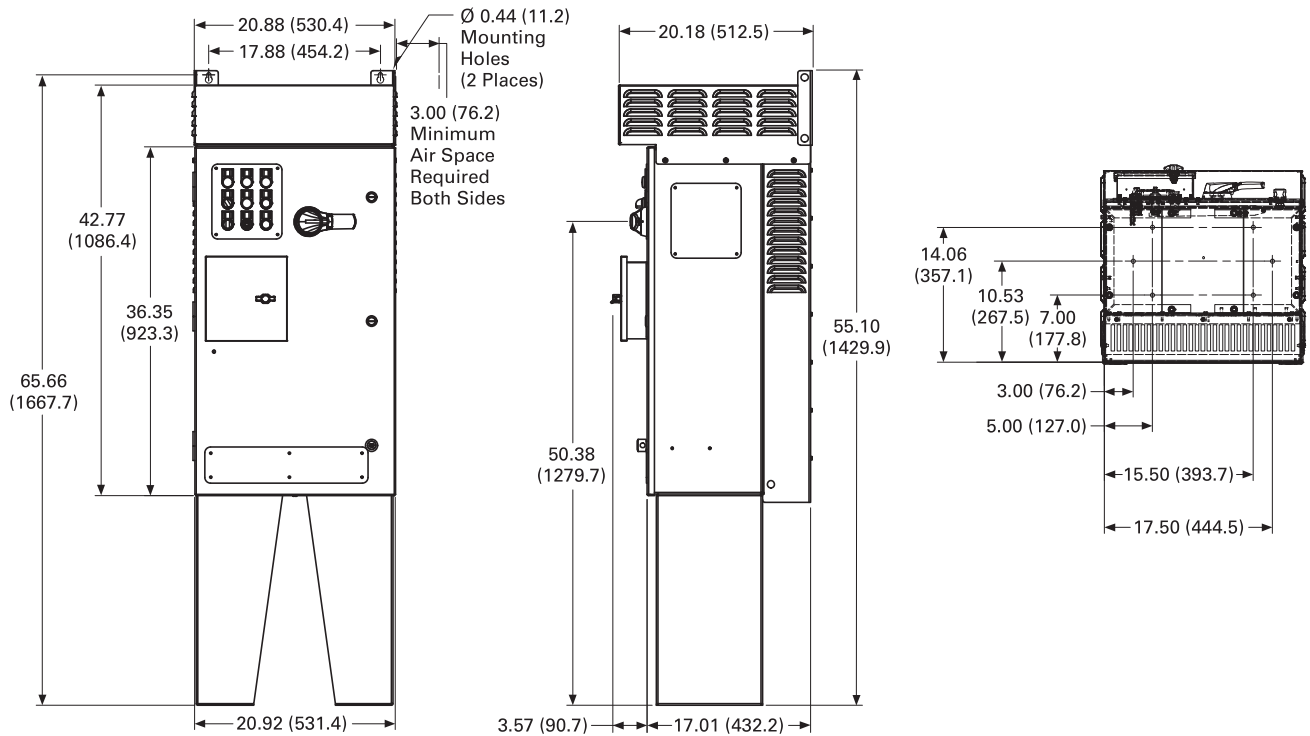


Approximate Dimensions in Inches (mm)

### BX Box Type 3R—12 Inch Floor Stands



### BX Box Type 3R—22 Inch Floor Stands



# 2.6

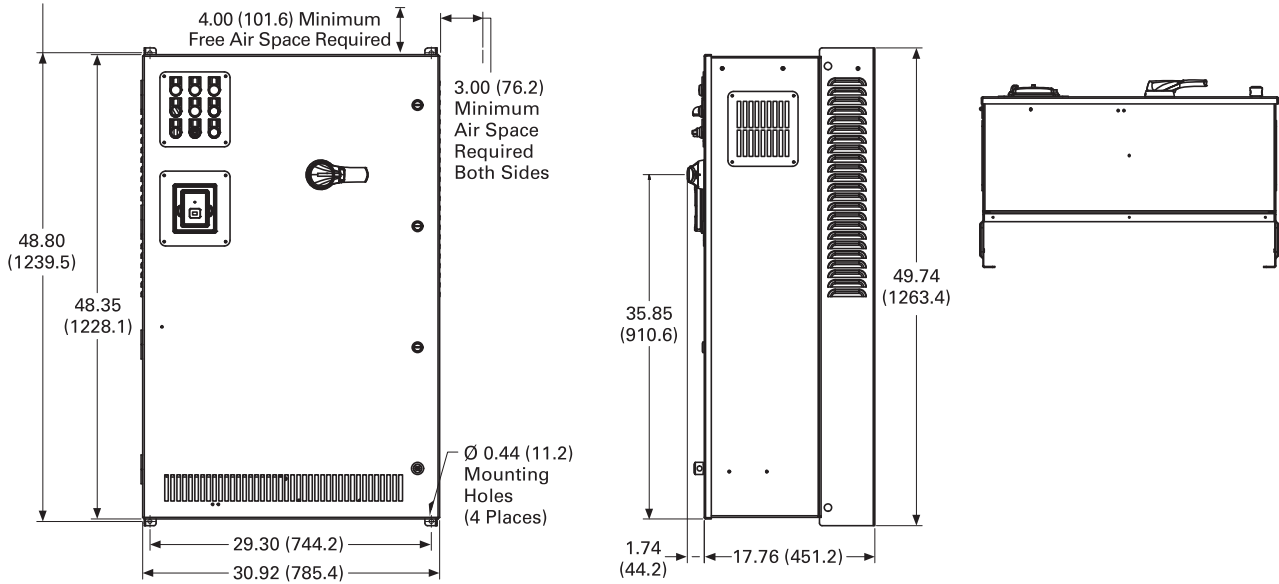
## Adjustable Frequency Drives

### PowerXL DG1 Series Drives

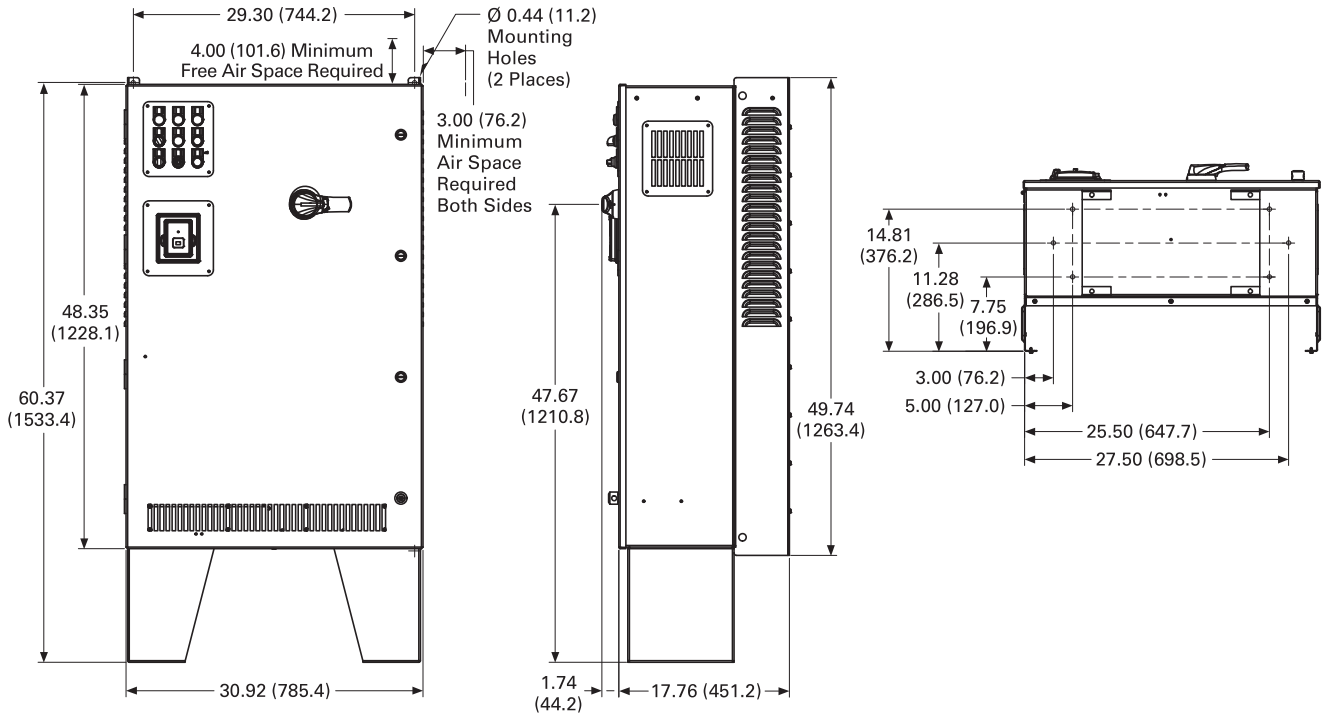
Approximate Dimensions in Inches (mm)

#### CX Box Type 1

2

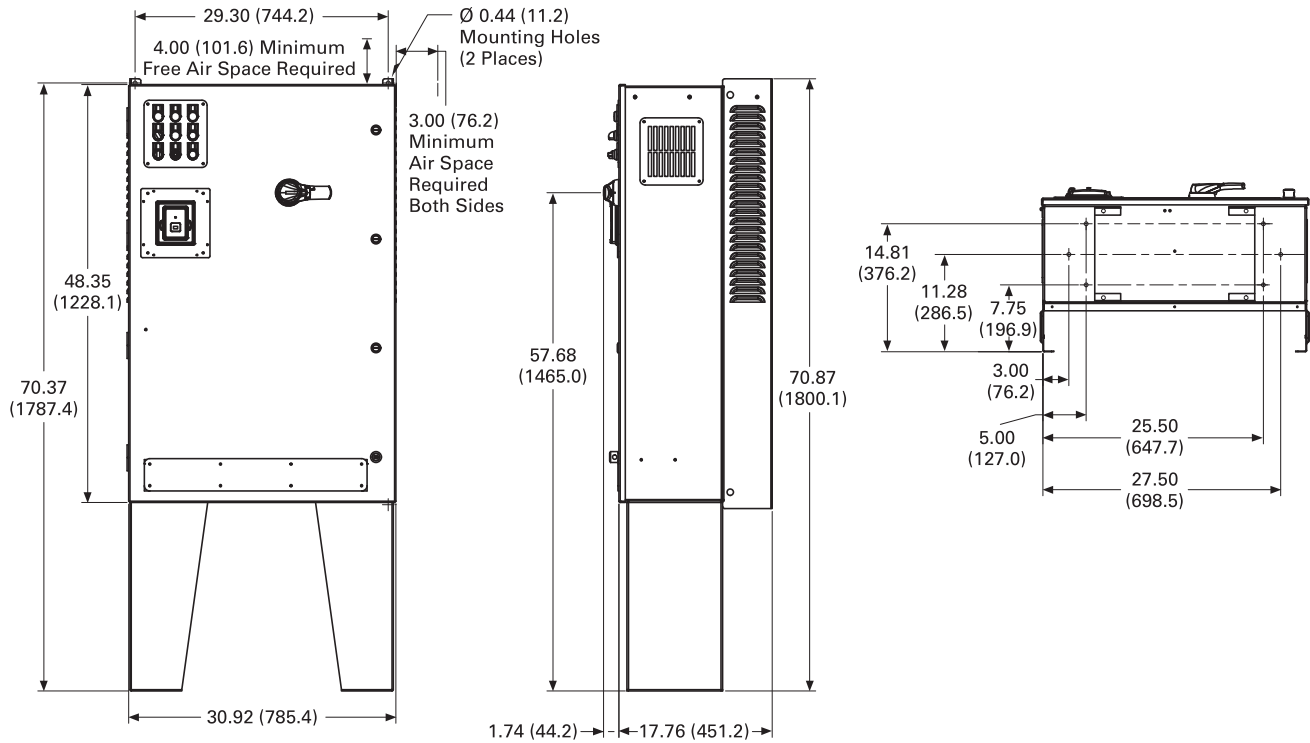


#### CX Box Type 1—12 Inch Floor Stands

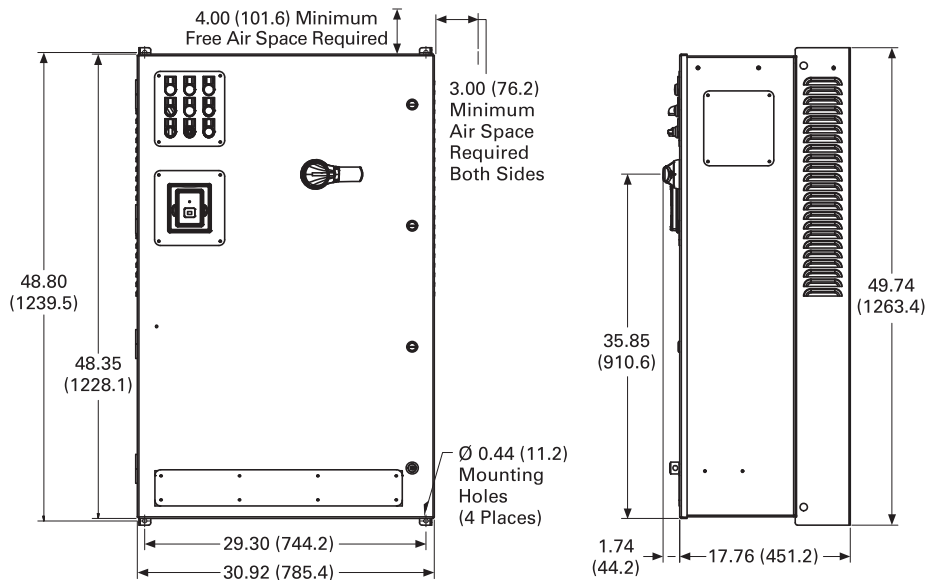


Approximate Dimensions in Inches (mm)

### CX Box Type 1—22 Inch Floor Stands



### CX Box Type 12





# 2.6

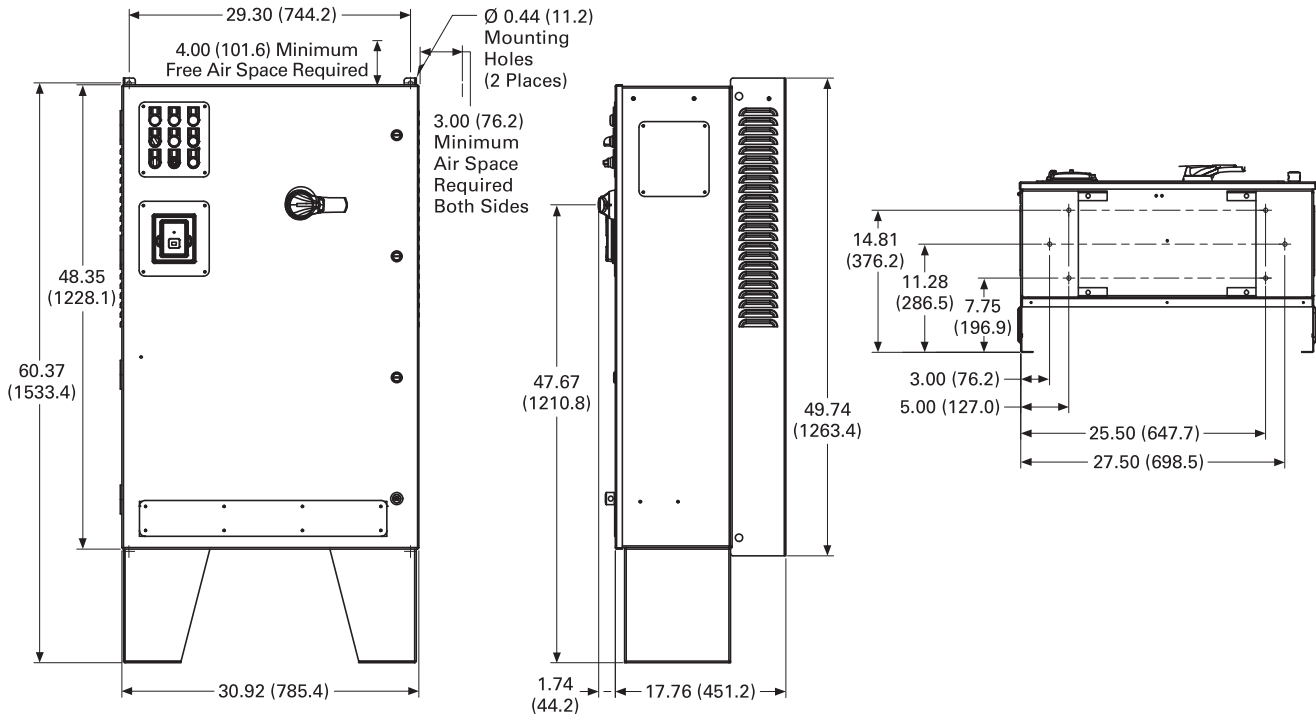
## Adjustable Frequency Drives

### PowerXL DG1 Series Drives

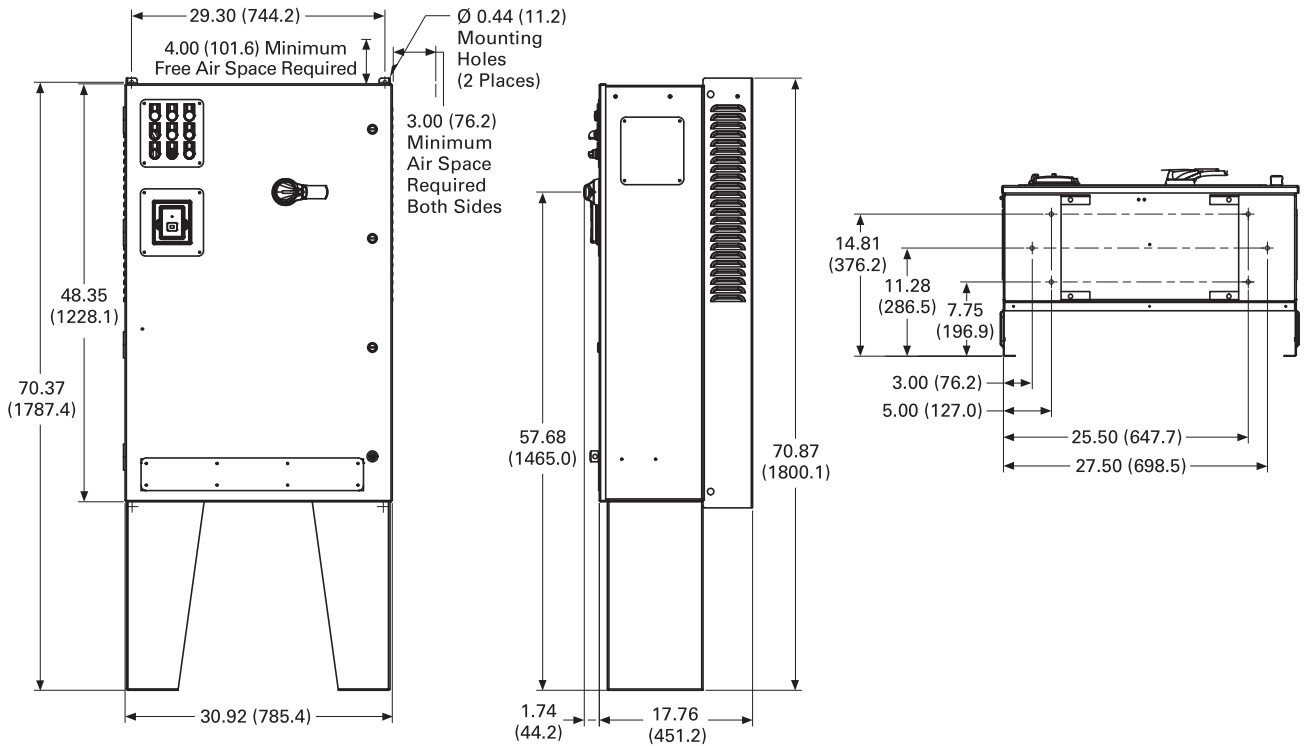
Approximate Dimensions in Inches (mm)

2

#### CX Box Type 12—12 Inch Floor Stands

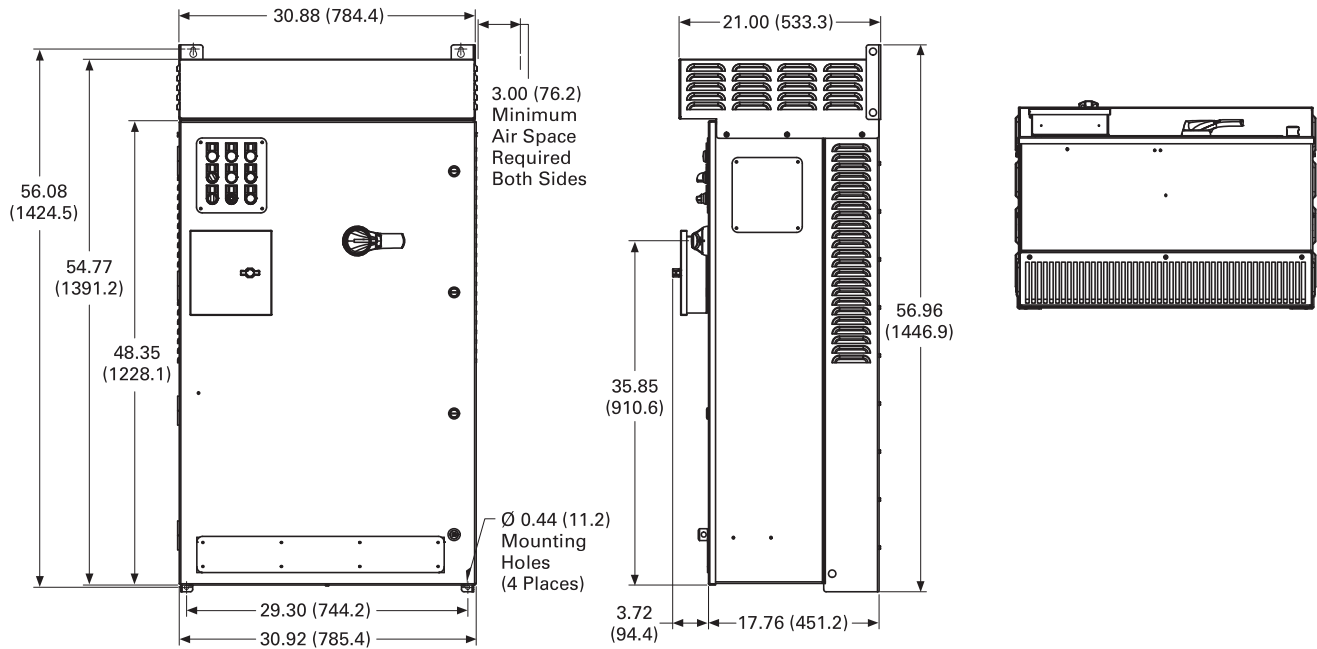


#### CX Box Type 12—22 Inch Floor Stands

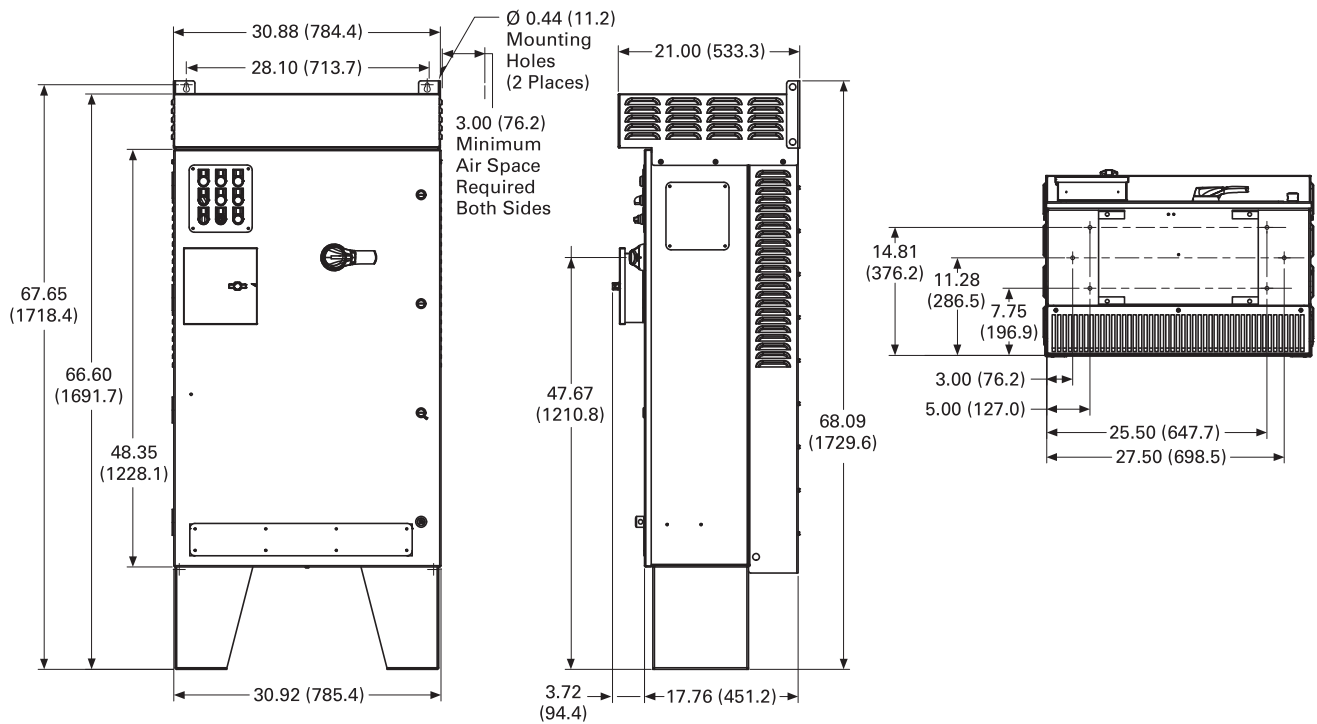


Approximate Dimensions in Inches (mm)

### CX Box Type 3R



### CX Box Type 3R—12 Inch Floor Stands



# 2.6

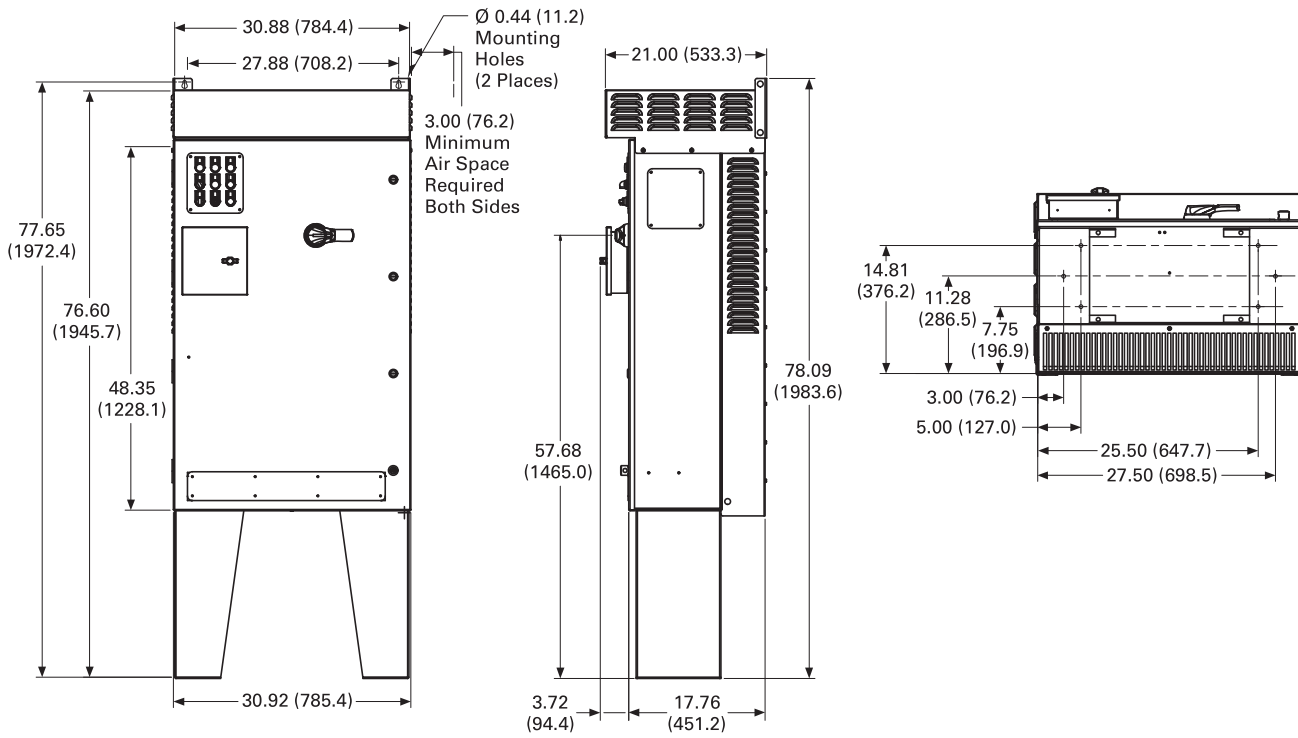
## Adjustable Frequency Drives

### PowerXL DG1 Series Drives

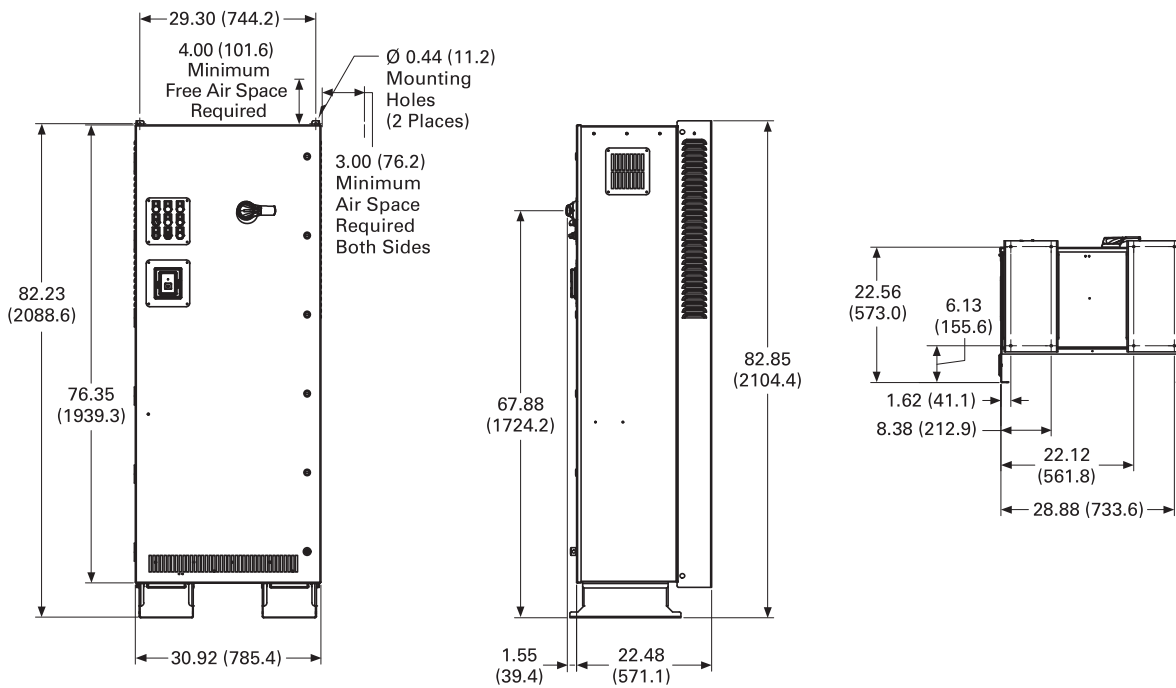
Approximate Dimensions in Inches (mm)

2

#### CX Box Type 3R—22 Inch Floor Stands

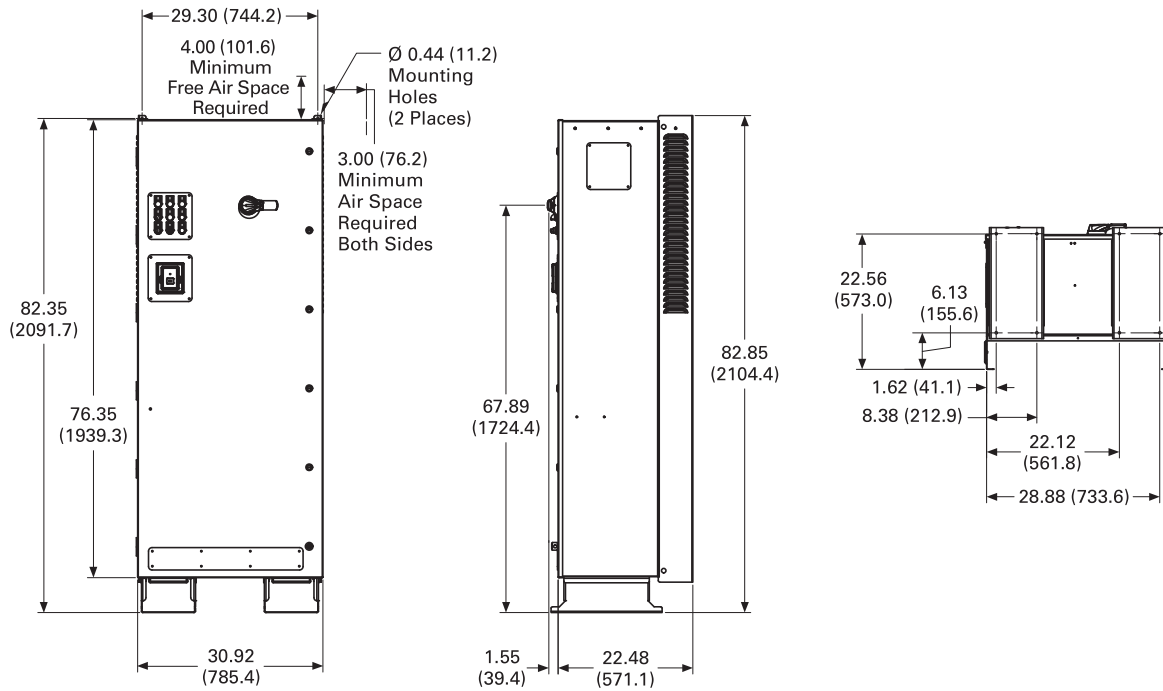


#### DX Box Type 1

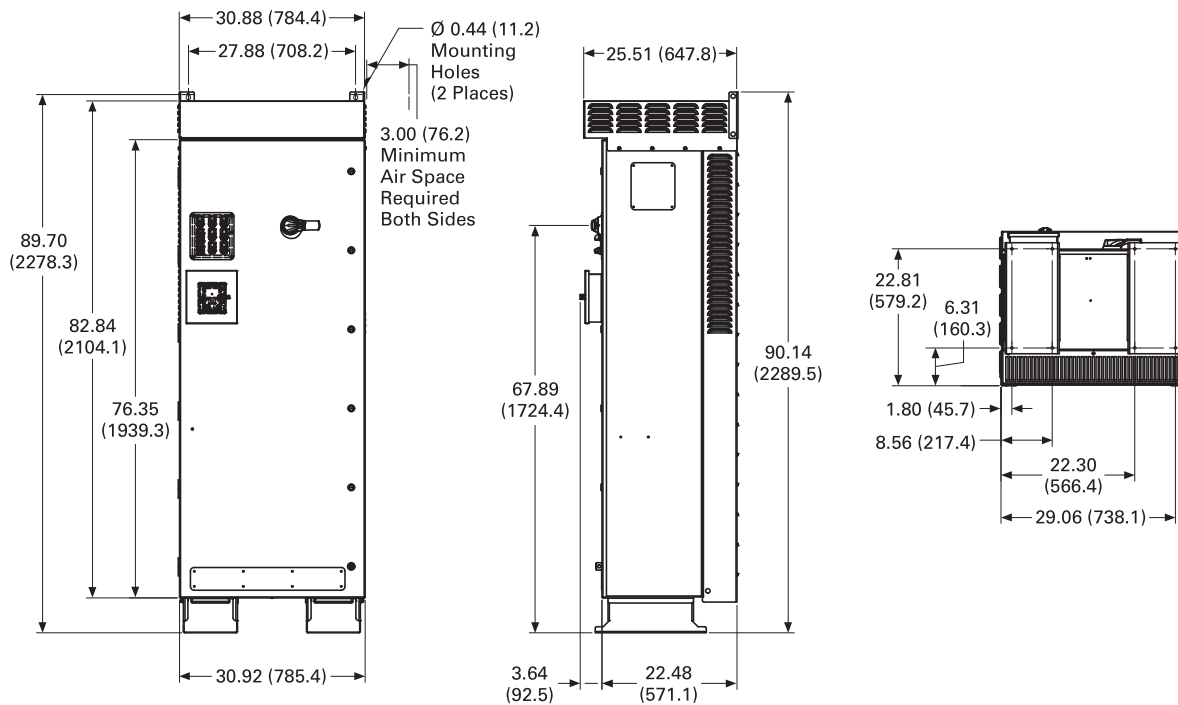


Approximate Dimensions in Inches (mm)

### DX Box Type 12



### DX Box Type 3R



The Eaton logo consists of the word "EATON" in a bold, blue, sans-serif font. The letter "O" is stylized as a white circle with a blue dot in the center, creating a circular graphic element.

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## Eaton Drives Warranty & Commercial Exchange Policy - Supplement to Selling Policy 25-000

Eaton warrants to Buyer, subject to the limitations and conditions stated herein, that all new products shall be free from defects in material and workmanship and shall deliver their rated output as indicated on the nameplates.

### Drive Product Warranty

Drive Family	1 Year	2 Year	3 Year	4 Year	5 Year	6 Year
Micro Drives (DE1, DC1, DA1, MMX)	Standard	Standard	Not Available	Not Available	Not Available	Not Available
HVAC Drives (DH1 / HMX)	Standard	Standard	Certified 3	Extended 4	Extended 5	Consult Factory
Industrial Drives (DG1, SVX, SPX, LCX, RGX, EFG, EGS, CFX, CPX)	Standard	Standard	Certified 3	Extended 4	Extended 5	Consult Factory

### Standard Warranty

- 24 months from date of shipment from Eaton warehouse (open drives) or enclosed drive plant
- Covers parts or replacement drive after factory approval
- Labor and travel costs are not included
- Replacement parts or replacement drive carry 90 days or the remainder of the original warranty period
- Due to the special nature of the SVX, SPX Frame 10 and larger, this warranty shall not be applicable to these products unless start-up is performed by an Eaton Authorized Commissioning Agent. (**See Certified 3, Extended 4 and Extended 5 warranties**)
- This warranty policy does not cover failure or damage due to the following:
  - Storage, installation, operation, maintenance, or repaired or altered outside of the Eaton factory or by anyone other than an Eaton Certified Technician not in conformance with Eaton's recommendations (Reference Troubleshooting and Maintenance Document from After-market Web Site- [www.Eaton.com/Drives](http://www.Eaton.com/Drives) ) and industry standard practice
  - Due to accident, misuse, abuse or negligence.
  - If damage occurred by the shipping company contact [Eatoncargoclaims@expeditors.com](mailto:Eatoncargoclaims@expeditors.com) or call 1-800-706-5640
- See below for Eaton Warranty Claim Process

### Certified 3 – Extended 3 Year Warranty

- Reference the **Drive Product Warranty & Standard Warranty** above with the following additions:
  - Startup must be performed by an Eaton authorized commissioner (charges may apply)
  - To find an Eaton Authorized commissioner visit [www.Eaton.com/VFDAftermarket](http://www.Eaton.com/VFDAftermarket)
  - This warranty is no charge including parts, labor and travel (within the contiguous US)

### Extended 4 – Extended 4 Year Warranty

- This warranty includes the **Certified 3** Warranty with the following addition:
  - The Certified 4 has a net cost of 5% of the net price of the drive

### Extended 5 – Extended 5 Year Warranty

- This warranty includes the **Certified 3** Warranty with the following addition:
  - The Certified 5 has a net cost of 15% of the net price of the drive

## Warranty Claim Process

1. Required information prior to calling Drives TRC (Technical Resource Center):
  - a. Original Eaton GO# (general order number)
  - b. Catalog number
  - c. Serial number (For enclosed packages, the serial & general order numbers are on enclosure door)
  - d. Customer job site location
  - e. Job site contact information
  - f. Detailed description of the issue
  
2. Before warranty status can be confirmed, and parts and/or service provided, it is required to contact the Drives TRC for troubleshooting assistance, in order to determine if the problem is in the VFD, and eliminate possible external causes.
  - a. Call the TRC at 877.ETN.CARE (877.386.2273) Option 2, Option 6, Option 4. Please have the above information available during the call.
  - b. Send pictures and documentation if needed to: [TRCDrivesTechSupport@Eaton.com](mailto:TRCDrivesTechSupport@Eaton.com)
  
3. The TRC will help determine warranty status, and if parts, replacements, and/or service is needed, and will provide you with a SR (Service Request) Number.
  - a. Be sure to write down the TRC SR Number.
  
4. Warranty Claim Processing:
  - a. Parts Only: contact CORE (Center of Returns Excellence) at 800.410.2910 (or [CORE@eaton.com](mailto:CORE@eaton.com))
    - Return replaced components per the instructions provided on the return paperwork.
    - Parts are shipped standard freight. If expedited shipping is required please request.
  - b. Onsite Service Required: a CQM (Customer Quality Management) form must be filled out on "JOE" (for Eaton employees), or contact EatonCare at 877.ETN.CARE (386.2273) Option 4, Option 2, for CQM assistance.
    - See attached file "CQM FORM Rev. 10\_22\_2013.pdf" for the information which will be required. Be sure to include the TRC SR Number in the CQM form.
    - When entering a CQM in Joe (for Eaton employees) assign the CQM to "Watertown Warranty" ([TRCDrivesTechSupport@eaton.com](mailto:TRCDrivesTechSupport@eaton.com)). For non-Eaton employees, this will be taken care of by EatonCare as they assist you with the CQM process.
    - Upon receipt of the CQM, the Drives TRC / Aftermarket team will supply replacement material and authorize an EWARF to the local Eaton Services team (EESS) or ISP (Independent Service Provider) who will schedule the service work.
  
5. Returned parts will be evaluated by the Product Integrity Center (PIC) in Watertown, WI for warranty validation.

## Product Return Policy

- Returns must be coordinated through the original point of purchase.
- Return freight charges are at the customer's expense.
- No products shall be returned to Eaton's plant except in accordance with Eaton's prior written instructions.
- Items returned to Eaton without prior authorization, or without proper paperwork to identify the Returned material as an authorized return, will be returned to the Buyer at Buyer expense.
- Buyer shall return defective product or make available such defective product for Eaton's inspection at Buyer's place of business.
- Buyer is to return the defective item to Eaton within 30 days after the claim is authorized. If the defective item is not returned to Eaton within 30 days, if an exchange was shipped at no charge Buyer will be invoiced for the price of the replacement item at current purchase price levels.

- If it is determined that the returned item failed for reasons not covered by warranty (above in **Standard Warranty**) , the Buyer will be invoiced for the replacement item at current purchase price levels.
- To remedy a product defect, Eaton may, at its option, elect to repair, rebuild or replace the defective product using new or reconditioned parts or product. In this case, the repaired, rebuilt or replaced product shall be warranted hereunder for the unexpired portion of the original warranty period or 90 days from shipment of replacement product, whichever is longer.
- If the item returned is determined to be a non-warranty failure, the Buyer will be notified of the repair or replace options available.
- Returned product evaluation time frame
  - Goal of 10 days from date received
  - Repair timeframe is 2-8 weeks depending on parts availability
  - Non warranty returns will be shipped at distributors expense
  - Tracking information can be found in VISTA by using the repair/replacement GO number
  - If the claim is found to be non-warranty, the contact person has 30 days to provide additional information for review
  - If there is no response to the claim after 30 days on hold the part/drive will be returned as is, at the distributors expense and additional charges may apply

### **Warranty Limitations**

The foregoing warranty is exclusive except for warranties of title and against patent infringement. Eaton disclaims all other warranties including any implied warranties of merchantability and fitness for a particular purpose. Corrections on non-conformities in the manner and for the period of time provided above shall constitute Eaton's sole liability and Buyer's exclusive remedy for failure of Eaton to meet its warranty obligations, whether claims of the Buyer are based in contract, in tort (including negligence or strict liability) or otherwise.

### **Limitation of Liability**

The remedies of the Buyer set forth herein are exclusive and are its sole remedies for any failure of Eaton to comply with its obligations hereunder. In no event shall Eaton be liable in contract, in tort, (including negligence or strict liability) or otherwise for damage to property or equipment other than products sold hereunder, loss of profit or revenue, loss of use of products, cost of capital, claims of Eaton drives.



# **Commercial Exchange Policy**

## **Warranty Claim Types:**

CE - Commercial Exchange

CA - Corrective Action, Eaton mistake

RE - Return

    Type E – Exchange

    Type N – Non-warranty repair

    Type W– Warranty repair

WC – Warranty Credit

A commercial exchange (CE) return is for registered, stocked products with a valid Product ID. A CE return is product in inventory that needs to be returned for credit, which may include stock rotation, customer errors and overstock. For defective products that fall within the warranty eligibility period, a warranty claim (WC) return should be used.

For Open Drives to be eligible for a commercial return, they must be returned within 18 months of the original manufacturing date code as found on the packaging label. For Enclosed Drives, they must be returned within 12 months from shipment from Eaton as found on the General Order (GO) number. Product returned outside of this period will not be given credit and will be scrapped. See Table 1 for the level of credit that will be provided if returned in good working condition and in the original packaging.

**Table 1 – Condition Code / Credit Level:**

<b>Condition Code</b>	<b>Description</b>	<b>% of Credit</b>
N	Standard warehoused current product (part of stock rotation) *typically stocked open drive as found in Vista with status W	100%
O	Standard warehoused current product (not part of stock rotation) *typically stocked open drive as found in Vista with status W	90%
R	Standard non-warehoused current product *typically non-stocked open drive as found in Vista with status FP	80%
F	Non-standard product *typically enclosed drive assembly	20%
G	Damaged or used product	10%
M	Prearranged agreement	Prearranged
P	Standard warehoused current product requiring repacking *20% of invoiced price or \$50, whichever is less	

## **Enter the CE return:**

- Use Vistaline on the Web (VOTW) to enter a return. Required fields are Quantity, Product ID and Invoice Price for each item.
- Determine the condition of the products to be returned. The condition will determine the amount of credit to be given. See Table 1 for condition codes and definitions. Use Vista to confirm if a product is a stocked item or not. A stocked item in vista will have a W status.
- Determine if the return qualifies as a stock rotation return. This return waives the 10% restocking fee on standard products. If returning one or two items, you may want to include them in your next stock rotation return to optimize credit.

**Receive confirmation and authorization via email or fax:**

- Prior to packaging any product, check confirmation and authorization of the return, sent via email or fax after a return is entered via VOTW.
- Be aware that multiple return locations are possible. Shipping product to an incorrect return location will result in delays. Do not deduct any amount until the returned product is shipped, received by return location and evaluated, and the authorized credit memo is received.

**Prepare material for return shipment:**

- Prepare product for shipment per packing guidelines shown on this page. Include one packing slip per shippable unit (1 per box or pallet), ensuring that product is returned to the correct location.
- Remove all labels, stickers or markings not found on original packaging to optimize the credit. If the returned product requires repackaging, a 20% fee will be assessed with a maximum amount of \$50 per unit, whichever is smaller.
- Check returned product from customers for evidence of use or installation.
- For maximum credit, take photos of larger returns (>\$10,000) and send to [W34ReturnCoreCustomerService@eaton.com](mailto:W34ReturnCoreCustomerService@eaton.com) with the Claim ID in the subject line. Alternatively, work with your Eaton Distributor Sales Representatives prior to shipping.
- Affix authorization paperwork with the Claim ID to each shippable unit, making copies as necessary.

**Receive credit memo and deduct:**

- An evaluation report will be emailed or faxed, indicating credit amount for the return within two weeks of shipping a return material if the process above is followed correctly.
- Once an evaluation report is sent, a credit memo will be issued within two to four business days in the amount shown on the evaluation report. A distributor is now able to deduct the authorized amount, referencing the credit memo number.

**Packing guidelines for return product:**

- Each shipment must include a packing list per each shippable unit (package or pallet).
- Affix authorization paperwork with Claim ID to each shippable unit, making copies as necessary; ensure that product is returned to the correct facility.
- If a shipment is greater than one pallet or carton, it must include a consolidated packing list (master list) on the last shippable unit. Maximum pallet load height (including pallet) of 38 inches (pallet shipments and bulk packs). Target pallet load weight of 1500 pounds with maximum weight limit of 2000 pounds.
- Pallet shipments to be stretch-wrapped or banded. Heavy product to be placed in bottom of carton and pallets. Lighter product to be placed on top of the heavier products.
- All loose items must be packaged with bubble wrap. All parcel cartons must use two layers of bubble wrap on the inside bottom of the carton to protect products from breakage.
- Do not use padded envelopes as a parts shipping container. Cardboard sheets should be used between pallet layers where applicable.
- Consolidate like styles and separate mixed styles to help facilitate breakdown and reduce errors
- Ranpak paper or other appropriate packaging material to be used for void fill and block-and-brace techniques where needed on pallets. Balance the weight evenly on the pallet to avoid excessive weight on one end. Never use damaged pallets with broken/missing boards or protruding nails that could cause a safety hazard.

## Drives Aftermarket Contacts

### Technical Resource Center (TRC)

- Contact TRC for trouble shooting issues prior to return
- Phone 800-322-4986,
- Email [TRCDrivesTechSupport@Eaton.com](mailto:TRCDrivesTechSupport@Eaton.com)

### Center of Return Excellence (CORE)

- Claim Creation
- Email [CORE@Eaton.com](mailto:CORE@Eaton.com)

### Aftermarket Support

- Customer support for Drives regarding Claim updates, status, etc.
- Email [VFDAftermarketeg@eaton.com](mailto:VFDAftermarketeg@eaton.com)
- TRC call is warranty consideration only; the unit still needs to be returned for evaluation of final warranty determination.
- Case/Call Log number must be referenced on the claim
- Regarding warranty claims, the GO number and the item number must be referenced
- Contact person on claim will receive any quotes and additional information
- Non Warranty Test and evaluation fees can be obtained by Contacting CORE or Aftermarket

**Eaton**  
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Cleveland, OH 44122 USA  
Eaton.com

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Printed in USA  
Publication No. TD040003EN  
December 2018

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The Eaton logo consists of the word "EATON" in a bold, blue, sans-serif font. The letter "O" is stylized as a white circle with a blue dot in the center, creating a circular graphic element.

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# PowerXL DA1 and DC1 micro drive product families update

PowerXL DA1 and DC1 drives were launched in January 2014 and provide a fuller portfolio and unique solutions for MOEM applications. These micro drives have the capability and product positioning to be competitive with all drive manufacturers in the micro drive market.

## APPLICATIONS/INSTALLATIONS

- Conveyor motor control
- Pump control and protection
- Fan or air handling systems control
- Permanent magnet motor control
- Standard low horsepower motor frequency control

## MARKETS

- |   |  |
|---|--|
| <input type="checkbox"/> Alternative energy           | <input checked="" type="checkbox"/> Industrial and manufacturing |
| <input type="checkbox"/> Commercial construction      | <input type="checkbox"/> Infrastructure                          |
| <input type="checkbox"/> Data centers                 | <input checked="" type="checkbox"/> Machine building             |
| <input type="checkbox"/> Education                    | <input type="checkbox"/> Mineral and mining                      |
| <input type="checkbox"/> Electric utilities           | <input type="checkbox"/> Oil and gas                             |
| <input type="checkbox"/> Electronics                  | <input checked="" type="checkbox"/> Pulp and paper               |
| <input checked="" type="checkbox"/> Food and beverage | <input type="checkbox"/> Residential construction                |
| <input type="checkbox"/> Government                   | <input type="checkbox"/> Transportation                          |
| <input type="checkbox"/> Health care                  | <input checked="" type="checkbox"/> Water/wastewater             |

## TYPICAL CUSTOMERS

- |  |  |
|--|--|
| • Conveyor integrators and manufacturers | • Corrugated and paper system manufacturers                        |
| • Panel builders and integrators         | • Any customer who requires speed controls of a motor, pump or fan |
| • Fan, pump and compressor OEMs          |  |

## TARGET REGIONS AND COUNTRIES

### Regions

- Americas
- EMEA
- APAC

### Countries

- United States, Canada, Mexico, Brazil, Colombia
- Germany, UK, Netherlands, others

## Key features and benefits

Feature	Benefit
SmartWire-DT™ connectivity	All SmartWire-DT benefits, including reduction of panel space and wiring, installation and troubleshooting times
Easy menu navigation	Easy-to-navigate parameters allow for quick configuration and diagnostics
drivesConnect PC Tool	Unique Bluetooth module simplifies commissioning and diagnostics using the data logger and monitoring functionality with the PC Tool
STO SIL 2 function	Safe Torque Off allows the device to be used in SIL 2 rated safety applications
PM motor capability	Provides higher efficiency corresponding to the permanent magnet motor
Single-phase motor capability	Unique applications that require speed control of single-phase motors
IP66 option	Reduces material and labor costs for mounting a separate enclosure, disconnect, keypad and potentiometer



## HOW TO FIND BUSINESS

### What to look for

- Belt conveyor systems OEMs looking for a drive with small side clearances
- Integrators needing remotely mounted drives with local controls and means of disconnect
- Applications using permanent magnet (PM) motors requiring rated devices with special software parameters
- MOEMs looking to replace an across-the-line starter with a simplified frequency controller

### How we address key business challenges

- RJ45 daisy-chain feature allows for one remote mount keypad that views/controls multiple drives
- Programmable digital and analog inputs allow for I/O count changes due to application tweaks
- The Copy/Paste Bluetooth module saves startup time by allowing the customer to program similar drive parameters
- An IP66 rated drive with integrated disconnect and control can save the customer money, time and space compared to mounting these required devices separately

### Customer reaction

Reaction	Reply
Are the DC1 and DA1 rated for constant or variable torque?	They are rated for constant torque, but they can be de-rated for variable torque application with a few parameter settings to optimize performance.
Do these drives have a PID loop?	The DA1 has PID loop while the DC1 only has PI loop.
What does IP66 correlate to in NEMA ratings?	IP66 = NEMA 4: protection from dust, oil and non-corrosive materials and protection from water, even powerful jets.
Can I expand the communications on the DC1?	No, if the applications require anything more than Modbus RTU and CANopen, it will require the DA1.

### Important questions

- What are the current and voltage ratings of your application and how many input and output phases?
- Are you using a permanent magnet motor?
- What kind of communication protocol is required?
- Do you require an RFI filter for incoming line noise?
- How is the motor, pump, fan, etc. being controlled currently? Where is it mounted?

### Key selling points

- The PowerXL drives have Modbus® RTU and CANopen native as standard. The DA1 has options for EtherNet/IP, EtherCAT, DeviceNet,™ PROFIBUS, ProfiNET, Modbus TCP and BACnet
- The DA1 includes an integrated RFI filter as standard and the DC1 has this as an option
- Easy menu navigation with 14 basic parameters allows for speedy startup
- Small size footprint and side-by-side mounting allow for small cabinets while still maintaining efficient heat dissipation

### Competitive summary

Company	Equivalent product	Comparison
Rockwell	PowerFlex 40, PowerFlex 525	DC1 is comparable to PowerFlex 40. DA1 is comparable to PowerFlex 525. PowerFlex 525 has EtherNet/IP on board, but DC1 is competitive on size and price.
ABB	ACS55, ACS150, ACS355	DC1 is equivalent to ACS55 and ACS150 in size, pricing and capabilities. ACS355 can control single-phase motors, has a PM motor and is IP66 rated, but DA1 can handle hard torque ratings.
Schneider	ATV12, ATV312, ATV32	DC1 is comparable to ATV12 but smaller with higher capabilities. ATV312 and ATV32 have capabilities in-between the DC1 and DA1 and include optional communication modules, but do not include a PM motor offering and are not IP66 rated.

## COMPLEMENTARY PRODUCTS

- SmartWire-DT
- M22 line of products
- Safety relay (ES4P)
- E-stop (M22 or 10250T)
- FAZ circuit breakers
- Series C® circuit breakers
- Series G® circuit breakers

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Printed in USA  
Publication No. SB040001EN / Z15161  
April 2014



## ADDITIONAL SALES RESOURCES

- PA040003EN: PowerXL DC1 Product Aid
- PA039001EN: PowerXL DA1 Product Aid
- CC039002EN: Competitive Comparison
- BR040002EN: Eaton Variable Frequency Drive Product Overview
- drivesConnect: Software downloadable on Eaton DC1 and DA1 webpages

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*For technical support, contact:*



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### PROJECT COMMENTS

**Approved**

Release all for manufacture.  
No re-submittal required.

**Approved as Noted**

Release all for manufacture.  
Make necessary changes  
Show changes on const. drawings.

**Partial Approval  
Revise and Re-submit**

Release approved sections  
for manufacture. Re-submit.  
Rejected sections

**Rejected**

No release  
Re-submit all.

- Lug Sizes for all equipment have been verified
- Top or Bottom Entry for all equipment has been verified
- Shipping splits have been verified
- Nameplate information has been verified for all equipment
- Orientation of breakers has been verified for all equipment

Stamp or Signature

\_\_\_\_\_

**Customer Comments:**

**No Comments** (check here).....

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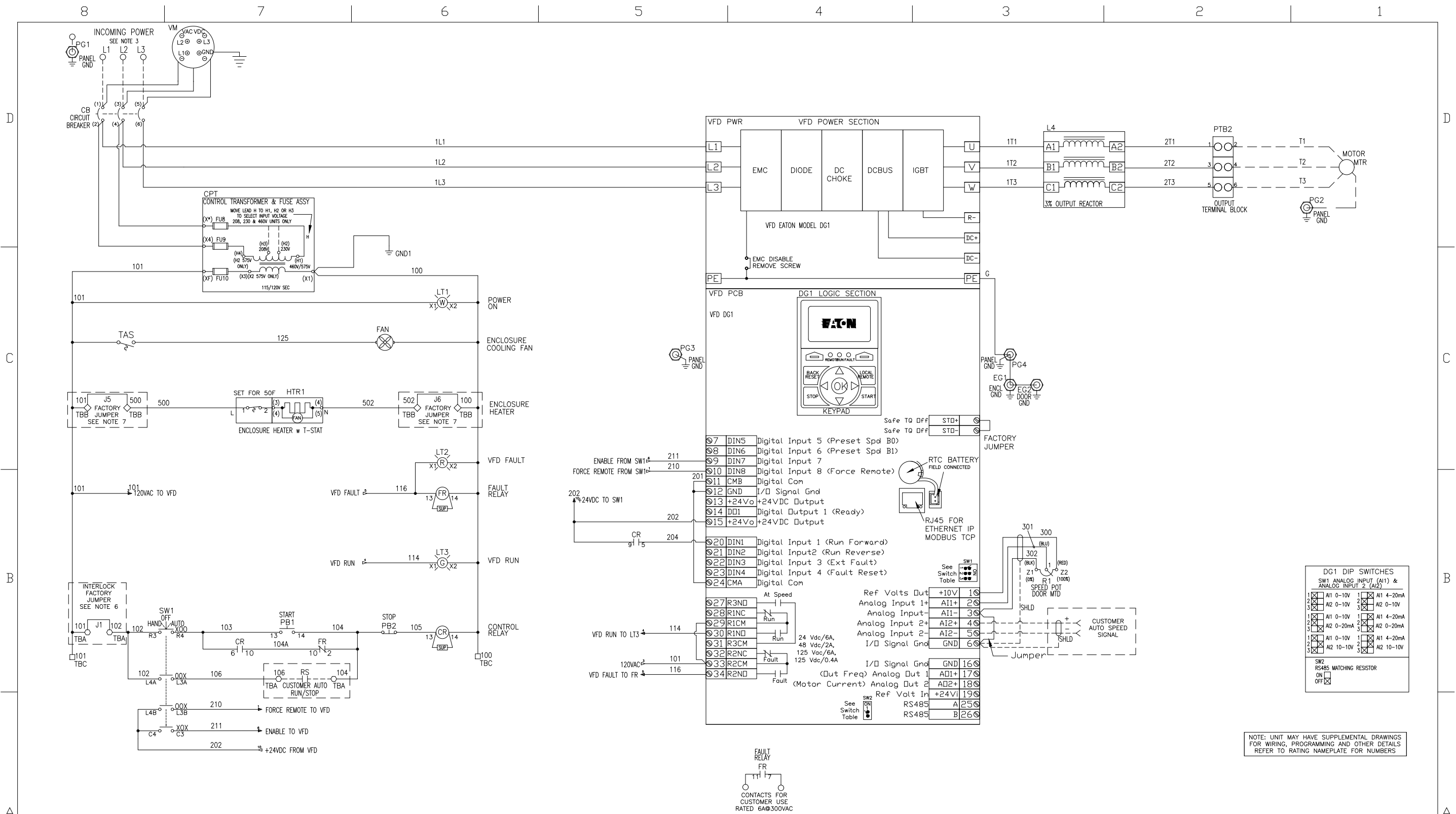
# Master Document Index

**Drives - Enclosed**  
**Drives - Enclosed**

	Drawing Description	Document Name	Rev
1	Master Drawing List	D00FRV3M01.DOC	2
2	MAT0011132 ELLIOTT ELECTRIC SPLY ATLANTA GA	ENG-000710-12087.DWG	01
3	MAT0011132 ELLIOTT ELECTRIC SPLY ATLANTA GA	ENG-090400-12239.DWG	01
4	MAT0011132 ELLIOTT ELECTRIC SPLY ATLANTA GA	ENG-900500-12196.DWG	01

<b>User</b> Karen Estrada	<b>Date</b> 5/16/2022 12:16:56 PM	THE INFORMATION ON THIS DOCUMENT WAS CREATED BY EATON CORPORATION. IT WAS DISCLOSED IN CONFIDENCE AND IS ONLY TO BE USED FOR THE PURPOSE IN WHICH IT WAS SUPPLIED.	 <small>Powering Business Worldwide</small>
		<b>AT130311X0K1</b>	
		<b>5 HP VFD sludge</b>	<b>Approval Drawings</b>
<b>REVISION</b>	<b>DWG SIZE</b>	<b>G.O.</b>	<b>DWG</b>
<b>2</b>	<b>A</b>	<b>MAT0011132-012</b>	<b>D00FRV3M01.DOC</b>
			<b>SHEET</b> 1 of 1





- NOTES**
1. THIS EQUIPMENT MUST BE INSTALLED IN COMPLIANCE WITH THE NATIONAL ELECTRIC CODE AND ALL APPLICABLE STATE AND LOCAL CODES.
  2. USE MULTIPLE CONDUITS TO SEPARATE CONTROL WIRES FROM INCOMING LINES AND OTHER POWER WIRING. DO NOT RUN LOGIC WIRING IN SAME CONDUIT AS CONTROL AND POWER WIRING.
  3. REFER TO ENCLOSURE NAMEPLATE FOR INPUT/OUTPUT VOLTAGE AND CURRENT RATINGS.
  4. CONNECT MOTOR FOR PROPER OUTPUT VOLTAGE PER MOTOR NAMEPLATE.
  5. GROUND SYSTEM ON STUDS PROVIDED: PG1 & PG2.
  6. REMOVAL OF INTERLOCK JUMPERS MAY NOT PREVENT MOTOR OPERATION IN ALL MODES—CONSULT FACTORY FOR PROPER OPERATION.
- TBA TERMINAL BLOCK FOR FIELD CONNECTIONS  
 TBC TERMINAL BLOCK FOR FACTORY CONNECTIONS  
 DIRECT COMPONENT TERMINAL FOR FIELD CONNECTIONS

⑦	DIN5	Digital Input 5 (Preset Spd B0)
⑧	DIN6	Digital Input 6 (Preset Spd B1)
⑨	DIN7	Digital Input 7
⑩	DIN8	Digital Input 8 (Force Remote)
⑪	CMB	Digital Com
⑫	GND	I/O Signal Gnd
⑬	+24V <sub>o</sub>	+24VDC Output
⑭	DD1	Digital Output 1 (Ready)
⑮	+24V <sub>o</sub>	+24VDC Output
⑳	DIN1	Digital Input 1 (Run Forward)
㉑	DIN2	Digital Input 2 (Run Reverse)
㉒	DIN3	Digital Input 3 (Ext Fault)
㉓	DIN4	Digital Input 4 (Fault Reset)
㉔	CMA	Digital Com
㉖	R3ND	At Speed
㉗	R1NC	Run
㉘	R1CM	Run
㉙	R1ND	Run
㉚	R3CM	24 Vdc/6A, 48 Vdc/2A, 125 Vdc/6A, 125 Vdc/0.4A
㉛	R2NC	Fault
㉜	R2CM	Fault
㉝	R2ND	Fault

**DG1 DIP SWITCHES**

SW1 ANALOG INPUT (AI1) & ANALOG INPUT 2 (AI2)

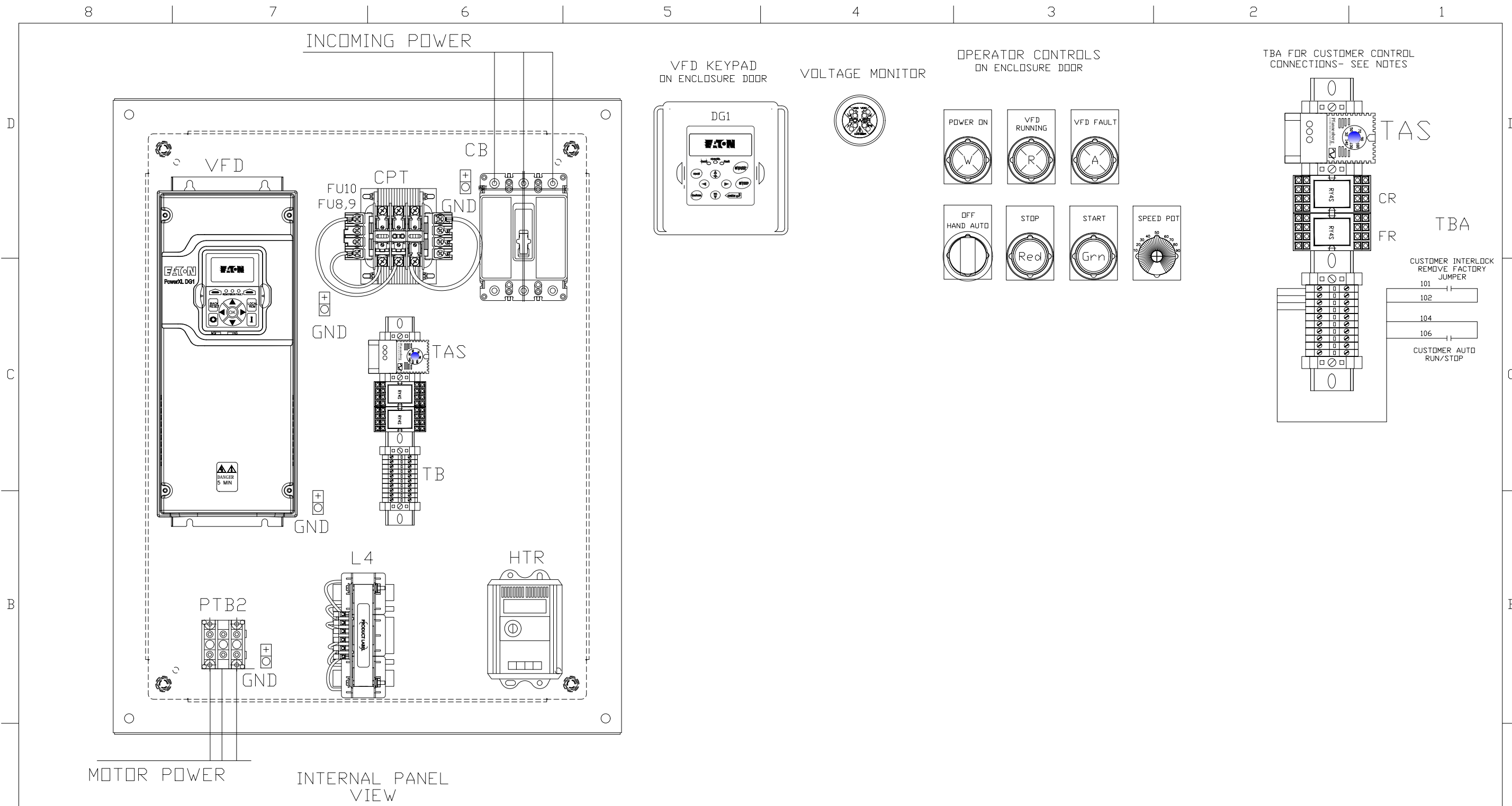
1	AI1 0-10V	1	AI1 4-20mA
2	AI2 0-10V	2	AI2 0-10V
3	AI1 0-10V	3	AI1 4-20mA
4	AI2 0-20mA	4	AI2 0-20mA
5	AI1 0-10V	5	AI1 4-20mA
6	AI2 10-10V	6	AI2 10-10V

SW2 RS485 MATCHING RESISTOR  
ON  OFF

NOTE: UNIT MAY HAVE SUPPLEMENTAL DRAWINGS FOR WIRING, PROGRAMMING AND OTHER DETAILS REFER TO RATING NAMEPLATE FOR NUMBERS

NEW RELEASE		DR	DATE	EGS0144B520BB10000*-5 HP VFD SLUDGE	
		VDT	04/13/22	TITLE	
THIRD ANGLE PROJECTION		CKD	DATE	ELLIOTT ELECTRIC SPLY ATLANTA GA EAST AREA WATER CONTROL FACILITY	
		APFD	DATE	PRODUCT	DWG TYPE
DWG. SIZE	FILE TYPE	ECO NUMBER	REVISION	G.O. NUMBER	DWG NO.
B	AutoCAD	2200285	01	MAT0011132	ENG-090400-12239
					SHEET 1 OF 1





MOTOR POWER INTERNAL PANEL VIEW

NOTES

1. SEE SCHEMATIC FOR DETAILS AND CONTROL LOGIC - FACTORY WIRING DETAILS OMITTED.
2. REFER TO ENCLOSURE NAMEPLATE FOR INPUT/OUTPUT VOLTAGES AND CURRENT RATINGS.
3. ENCLOSURE MUST BE GROUNDED USING INPUT AND OUTPUT STUDS PROVIDED.
4. THIS EQUIPMENT MUST BE INSTALLED IN COMPLIANCE WITH THE NATIONAL ELECTRIC CODE AND ALL STATE/LOCAL CODES.
5. USE MULTIPLE CONDUITS TO SEPARATE 120 CONTROL (TBA 101/102) WIRING FROM INCOMING POWER WIRING.
6. REMOVAL OF INTERLOCK TBA 101/102 MAY NOT PREVENT MOTOR OPERATION IN ALL MODES- CONSULT FACTORY FOR DETAILS.

NEW RELEASE		DR	DATE	EGS0144B520BB10000*-5 HP VFD SLUDGE	
		VDT	04/13/22	TITLE	
		CKD	DATE	ELLIOTT ELECTRIC SPLY ATLANTA GA	
				EAST AREA WATER CONTROL FACILITY	
		APPD	DATE	PRODUCT	DWG TYPE
				DG1	CONNECTION DIAGRAM
THIRD ANGLE PROJECTION	DWG. SIZE	FILE TYPE	.DWG FILENAME	ECO NUMBER	REVISION
	B	AutoCAD		2200285	01
		G.O. NUMBER	DWG NO.	SHEET	
		MAT0011132	ENG-900500-12196	1 OF 1	

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## DG1 General Purpose Enclosed Drive



## PowerXL DG1 Series Enclosed Drives

## Product Description

The DG1 Enclosed Drive family incorporates the latest Eaton drive technology into pre-engineered enclosed solutions covering the industry's most common applications. Using the benefits of the PowerXL DG1, the enclosed family provides enhanced user safety with the Safe Torque feature as well as industry-leading energy efficiency from the patented Active Energy Control algorithm. Eaton further raises the bar by providing customers with industry best lead times with the Rapid Response System. This system allows customers to select from 9 million standard configurations that have been pre-engineered with each configuration having a set lead time. The Rapid Response System delivers an improved quotation process and a faster delivery.

## Features and Benefits

- Dual rated for both constant torque (CT) / high overload ( $I_H$ ) and variable torque (VT) / low overload applications
- Optional Brake Chopper for external braking applications
- Available circuit breaker, motor circuit protector, fused disconnect, isolation fusing and surge protection device options to provide input power protection
- Optional 3% input and output reactors provide a reduction in voltage and current harmonics on both line and load side
- Bypass options include a standard three-contactor design and a reduced voltage soft starter design
- Output contactor option provides a means for positive disconnection of the drive output from the motor terminals
- MotoRX and dV/dt filter options are used to reduce transients voltages at the motor terminals
- Customizable cover control options
- Padlockable disconnect

## Contents

## Description

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Enclosure Selection	V6-T2-81
Accessories	V6-T2-82
Options	V6-T2-83
Technical Data and Specifications	V6-T2-84
Wiring Diagram	V6-T2-86
Dimensions	V6-T2-87

## Standards and Certifications

- UL 508C



- The PowerXL DG1 comes standard with the following communication protocols:
  - EtherNet/IP
  - Modbus/TCP
  - Modbus RTU
  - BACnet MS/TP

## Communication Options

- PROFIBUS-DP
- LonWorks
- CANopen
- DeviceNet

## Enclosure Ratings

- NEMA Type 1
- NEMA Type 12
- NEMA Type 3R

## Mounting

- Wall mount
- Floor mount: 12-inch legs
- Floor mount: 22-inch legs

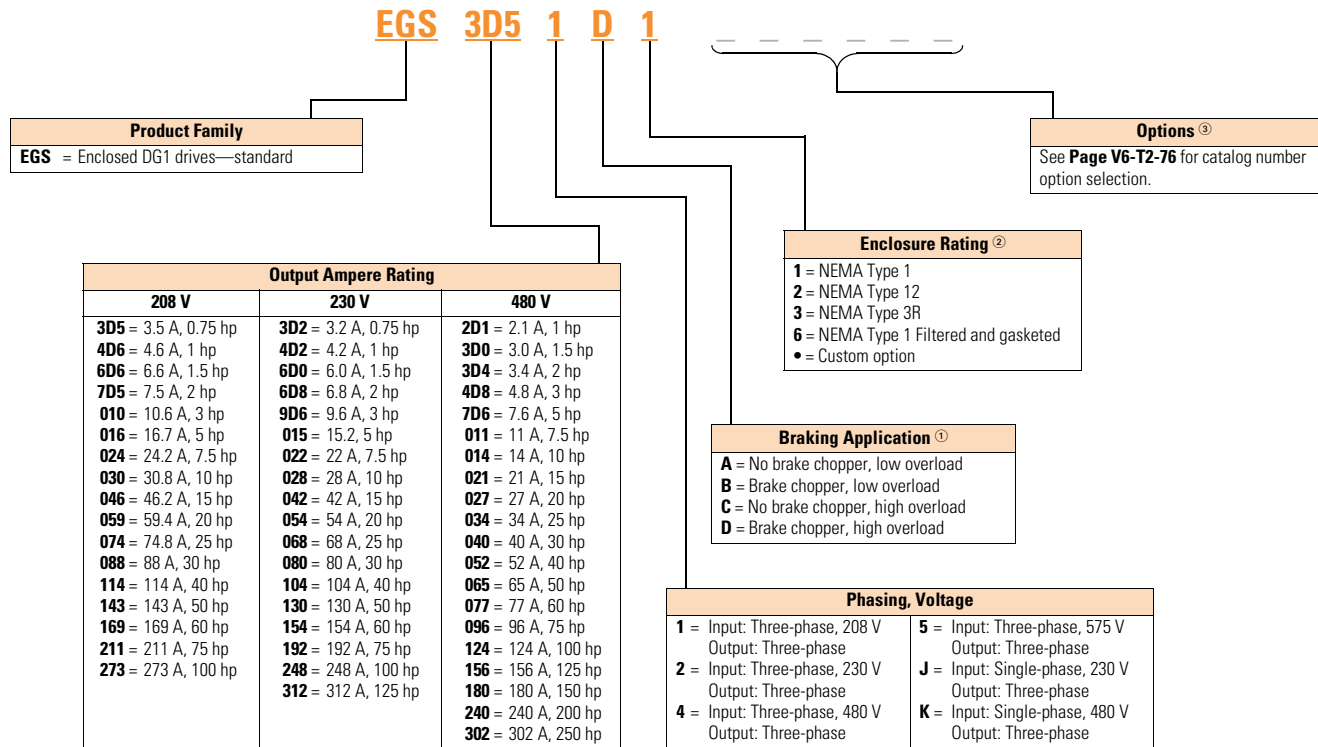
## Product Range

- 208 V: 0.75–100 hp
- 230 V: 0.75–125 hp
- 480 V: 1–250 hp
- 230 V single-phase: 1–30 hp
- 480 V single-phase: 1.5–60 hp

## Catalog Number Selection

Catalog Number Selection is for reference only. Not all option combinations may be available.

### DG1 Enclosed—Base Catalog Number



### Notes

- <sup>(1)</sup> Brake chopper is a factory-installed option only. Braking resistors sold separately. See DG1 drives starting on Page V6-T2-59 for selection.
- <sup>(2)</sup> Additional enclosure options including NEMA 4, 4X, 7 and 9 are available. Please contact the factory for configuration and pricing.
- <sup>(3)</sup> Part number configuration continued on the following page.

# 2.6

## Adjustable Frequency Drives

### PowerXL DG1 Series Drives

Catalog Number Selection is for reference only. Not all option combinations may be available.

#### DG1 Enclosed—Catalog Number Options

2

**EGS 3D5 1 D 1**

**2 0 0 B 1 0 0 0 0**

**Base Catalog Number Example**  
See **Page V6-T2-75** for base catalog number selection.

**Power Disconnect Options**

- 0 = None
- 1 = MCP disconnect ①
- 2 = Circuit breaker
- 3 = Circuit breaker/isolation fusing
- 4 = Circuit breaker/isolation fusing/3% input reactor
- 5 = Circuit breaker/isolation fusing/SPD
- 6 = Circuit breaker/isolation fusing/SPD/3% input reactor
- 7 = Circuit breaker/3% input reactor
- 8 = Circuit breaker/SPD
- 9 = Circuit breaker/SPD/3% input reactor
- A = Fused disconnect
- B = Fused disconnect/SPD
- C = Fused disconnect/SPD/3% input reactor
- D = Fused disconnect/3% input reactor
- E = Isolation fuses
- F = Isolation fuses/3% input reactor
- G = Isolation fuses/SPD
- H = Isolation fuses/SPD/3% input reactor
- = Custom option ②

**Bypass Options ③**

- 0 = None
- 1 = Manual HOA bypass
- 2 = Manual HOA bypass/isolation fusing
- 3 = Manual HOA bypass/isolation fusing/3% input reactor
- 4 = Manual HOA bypass/isolation fusing/SPD
- 5 = Manual HOA bypass/isolation fusing/SPD/3% input reactor
- 6 = Manual HOA bypass/3% input reactor
- 7 = Manual HOA bypass/SPD
- 8 = Manual HOA bypass/SPD/3% input reactor
- H = Manual HOA RVSS bypass
- J = Manual HOA RVSS bypass/isolation fusing
- K = Manual HOA RVSS bypass/isolation fusing/3% input reactor
- L = Manual HOA RVSS bypass/isolation fusing/SPD
- M = Manual HOA RVSS bypass/isolation fusing/SPD/3% input reactor
- N = Manual HOA RVSS bypass/3% input reactor
- P = Manual HOA RVSS bypass/SPD
- R = Manual HOA RVSS bypass/SPD/3% input reactor
- = Custom option ②

**Output Power Options ④**

- 0 = None
- A = Output contactor
- B = 3% Output reactor
- D = dV/dt filter
- E = 3% Output Reactor/output contactor
- G = dV/dt/output contactor
- = Custom option ②

**Control Options ⑤**

- 0 = None
- 1 = Speed pot
- 2 = Start-stop pushbutton
- 3 = Start-stop pushbutton with speed pot
- A = HOA switch
- B = Start-stop pushbutton with speed pot & HOA switch
- C = Start-stop pushbutton with HOA switch
- D = HOA switch with speed pot
- = Custom option ②

**Option Boards 2**  
Same options and codes as Option Boards 1

**Option Boards 1**

- 0 = No option
- 1 = 3 x DI, 3 x DO, 1 Thermistor, 24 Vdc/EXT
- 2 = 1 x AI, 2 x AO (isolated to control board)
- 3 = 3 x relay dry contact (2NO + 1NO/NC)
- 4 = 3 x PT100 RTD thermistor input
- 5 = 6 DI 240 Vac input
- = Custom option ②

**Communication Options**

- 0 = No option
- 1 = PROFIBUS-DP
- 3 = CANopen (slave)
- 4 = DeviceNet
- 5 = PROFIBUS-DP (D9 connector)
- D = SmartWire-DT
- = Custom option ②

**Enclosure Options**

- 0 = None
- 1 = Floor stand—12 inches
- 2 = Floor stand—22 inches
- A = Space heater
- B = Space heater & 12-inch floor stands
- C = Space heater & 22-inch floor stands
- = Custom option ②

**Light Options ⑤**

- 0 = None
- 1 = Non-bypass light kit—Power On, Run, Fault
- 2 = Bypass light kit—On, VFD Run, Fault, Bypass Run
- = Custom option ②

**Notes**

- ① HMCP disconnect option required and only available when bypass is selected.
- ② More options are available as Engineered to Order through the Bid Manager tool.
- ③ All bypass options include third contactor for drive isolation when in bypass mode.
- ④ Output contactor not available with bypass. Bypass comes standard with output contactor.
- ⑤ Pilot devices are 22 mm standard. 30 mm options are available as engineered to order through the Bid Manager tool.

## Production Selection

## DG1 Enclosed Drive



## 208 V Drives—Constant Torque (CT)/High Overload (H) Enclosed Drives

hp	Current (A)	Drive Frame Size	NEMA Type 1	NEMA Type 12	NEMA Type 3R
			Base Catalog Number <sup>①</sup>	Base Catalog Number <sup>①</sup>	Base Catalog Number <sup>①</sup>
0.75	3.5	1	EGS3D51D1	EGS3D51D2	EGS3D51D3
1	4.6	1	EGS4D61D1	EGS4D61D2	EGS4D61D3
1.5	6.6	1	EGS6D61D1	EGS6D61D2	EGS6D61D3
2	7.5	1	EGS7D51D1	EGS7D51D2	EGS7D51D3
3	10.6	1	EGS0101D1	EGS0101D2	EGS0101D3
5	16.7	2	EGS0161D1	EGS0161D2	EGS0161D3
7.5	24.2	2	EGS0241D1	EGS0241D2	EGS0241D3
10	30.8	3	EGS0301D1	EGS0301D2	EGS0301D3
15	46.2	3	EGS0461D1	EGS0461D2	EGS0461D3
20	59.4	4	EGS0591C1	EGS0591C2	EGS0591C3
25	74.8	4	EGS0741C1	EGS0741C2	EGS0741C3
30	88	4	EGS0881C1	EGS0881C2	EGS0881C3
40	114	5	EGS1141C1	EGS1141C2	EGS1141C3
50	143	5	EGS1431C1	EGS1431C2	EGS1431C3
60	169	5	EGS1691C1	EGS1691C2	EGS1691C3
75 <sup>②</sup>	211	6	EGS2111C1 <sup>②</sup>	EGS2111C2 <sup>②</sup>	EGS2111C3 <sup>②</sup>
100 <sup>②③</sup>	261 <sup>③</sup>	6	EGS2611C1 <sup>②</sup>	EGS2611C2 <sup>②</sup>	EGS2611C3 <sup>②</sup>

## DG1 Enclosed Drive



## 208 V Drives—Variable Torque (VT)/Low Overload (L) Enclosed Drives

hp	Current (A)	Drive Frame Size	NEMA Type 1	NEMA Type 12	NEMA Type 3R
			Base Catalog Number <sup>①</sup>	Base Catalog Number <sup>①</sup>	Base Catalog Number <sup>①</sup>
1	4.6	1	EGS4D61B1	EGS4D61B2	EGS4D61B3
1.5	6.6	1	EGS6D61B1	EGS6D61B2	EGS6D61B3
2	7.5	1	EGS7D51B1	EGS7D51B2	EGS7D51B3
3	10.6	1	EGS0101B1	EGS0101B2	EGS0101B3
5	16.7	2	EGS0161B1	EGS0161B2	EGS0161B3
7.5	24.2	2	EGS0241B1	EGS0241B2	EGS0241B3
10	30.8	2	EGS0301B1	EGS0301B2	EGS0301B3
15	46.2	3	EGS0461B1	EGS0461B2	EGS0461B3
20	59.4	3	EGS0591B1	EGS0591B2	EGS0591B3
25	74.8	4	EGS0741A1	EGS0741A2	EGS0741A3
30	88	4	EGS0881A1	EGS0881A2	EGS0881A3
40	114	4	EGS1141A1	EGS1141A2	EGS1141A3
50	143	5	EGS1431A1	EGS1431A2	EGS1431A3
60	169	5	EGS1691A1	EGS1691A2	EGS1691A3
75	211	5	EGS2111A1	EGS2111A2	EGS2111A3
100 <sup>②</sup>	273	6	EGS2731A1 <sup>②</sup>	EGS2731A2 <sup>②</sup>	EGS2731A3 <sup>②</sup>

**Notes**

<sup>①</sup> Table is for base catalog number reference only. For complete catalog number selection, see **Page V6-T2-76**.

<sup>②</sup> Available in 2017.

<sup>③</sup> These units are current rated. They do not meet NEC ampere rating at this horsepower.

# 2.6

## Adjustable Frequency Drives

### PowerXL DG1 Series Drives

2

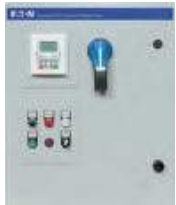
#### DG1 Enclosed Drive



#### 230 V Drives—Constant Torque (CT)/High Overload (H) Enclosed Drives

hp	Current (A)	Drive Frame Size	NEMA Type		
			1 Base Catalog Number ①	12 Base Catalog Number ①	3R Base Catalog Number ①
0.75	3.2	1	EGS3D22D1	EGS3D22D2	EGS3D22D3
1	4.2	1	EGS4D22D1	EGS4D22D2	EGS4D22D3
1.5	6	1	EGS6D02D1	EGS6D02D2	EGS6D02D3
2	6.8	1	EGS6D82D1	EGS6D82D2	EGS6D82D3
3	9.6	1	EGS9D62D1	EGS9D62D2	EGS9D62D3
5	15.2	2	EGS0152D1	EGS0152D2	EGS0152D3
7.5	22	2	EGS0222D1	EGS0222D2	EGS0222D3
10	28	3	EGS0282D1	EGS0282D2	EGS0282D3
15	42	3	EGS0422D1	EGS0422D2	EGS0422D3
20	54	4	EGS0542C1	EGS0542C2	EGS0542C3
25	68	4	EGS0682C1	EGS0682C2	EGS0682C3
30	80	4	EGS0802C1	EGS0802C2	EGS0802C3
40	104	5	EGS1042C1	EGS1042C2	EGS1042C3
50	130	5	EGS1302C1	EGS1302C2	EGS1302C3
60	154	5	EGS1542C1	EGS1542C2	EGS1542C3
75 ②	192	6	EGS1922C1 ②	EGS1922C2 ②	EGS1922C3 ②
100 ②	248	6	EGS2482C1 ②	EGS2482C2 ②	EGS2482C3 ②

#### DG1 Enclosed Drive



#### 230 V Drives—Variable Torque (VT)/Low Overload (L) Enclosed Drives

hp	Current (A)	Drive Frame Size	NEMA Type		
			1 Base Catalog Number ①	12 Base Catalog Number ①	3R Base Catalog Number ①
1	4.2	1	EGS4D22B1	EGS4D22B2	EGS4D22B3
1.5	6	1	EGS6D02B1	EGS6D02B2	EGS6D02B3
2	6.8	1	EGS6D82B1	EGS6D82B2	EGS6D82B3
3	9.6	1	EGS9D62B1	EGS9D62B2	EGS9D62B3
5	15.2	2	EGS0152B1	EGS0152B2	EGS0152B3
7.5	22	2	EGS0222B1	EGS0222B2	EGS0222B3
10	28	2	EGS0282B1	EGS0282B2	EGS0282B3
15	42	3	EGS0422B1	EGS0422B2	EGS0422B3
20	54	3	EGS0542B1	EGS0542B2	EGS0542B3
25	68	4	EGS0682A1	EGS0682A2	EGS0682A3
30	80	4	EGS0802A1	EGS0802A2	EGS0802A3
40	104	4	EGS1042A1	EGS1042A2	EGS1042A3
50	130	5	EGS1302A1	EGS1302A2	EGS1302A3
60	154	5	EGS1542A1	EGS1542A2	EGS1542A3
75	192	5	EGS1922A1	EGS1922A2	EGS1922A3
100 ②	248	6	EGS2482A1 ②	EGS2482A2 ②	EGS2482A3 ②
125 ②	312	6	EGS3122A1 ②	EGS3122A2 ②	EGS3122A3 ②

**Notes**

- ① Table is for base catalog number reference only. For complete catalog number selection, see **Page V6-T2-76**.
- ② Available in 2017.

## DG1 Enclosed Drive



## 480 V Drives—Constant Torque (CT)/High Overload (IH) Enclosed Drives

hp	Current (A)	Drive Frame Size	NEMA Type 1 Base Catalog Number ①	NEMA Type 12 Base Catalog Number ①	NEMA Type 3R Base Catalog Number ①
1	2.1	1	EGS2D14D1	EGS2D14D2	EGS2D14D3
1.5	3	1	EGS3D04D1	EGS3D04D2	EGS3D04D3
2	3.4	1	EGS3D44D1	EGS3D44D2	EGS3D44D3
3	4.8	1	EGS4D84D1	EGS4D84D2	EGS4D84D3
5	7.6	1	EGS7D64D1	EGS7D64D2	EGS7D64D3
7.5	11	2	EGS0114D1	EGS0114D2	EGS0114D3
10	14	2	EGS0144D1	EGS0144D2	EGS0144D3
15	21	2	EGS0214D1	EGS0214D2	EGS0214D3
20	27	3	EGS0274D1	EGS0274D2	EGS0274D3
25	34	3	EGS0344D1	EGS0344D2	EGS0344D3
30	40	3	EGS0404D1	EGS0404D2	EGS0404D3
40	52	4	EGS0524C1	EGS0524C2	EGS0524C3
50	65	4	EGS0654C1	EGS0654C2	EGS0654C3
60	77	4	EGS0774C1	EGS0774C2	EGS0774C3
75	96	5	EGS0964C1	EGS0964C2	EGS0964C3
100	124	5	EGS1244C1	EGS1244C2	EGS1244C3
125	156	5	EGS1564C1	EGS1564C2	EGS1564C3
150 ②	180	6	EGS1804C1 ②	EGS1804C2 ②	EGS1804C3 ②
200 ②	240	6	EGS2404C1 ②	EGS2404C2 ②	EGS2404C3 ②

## DG1 Enclosed Drive



## 480 V Drives—Variable Torque (VT)/Low Overload (L) Enclosed Drives

hp	Current (A)	Drive Frame Size	NEMA Type 1 Base Catalog Number ①	NEMA Type 12 Base Catalog Number ①	NEMA Type 3R Base Catalog Number ①
1.5	3	1	EGS3D04B1	EGS3D04B2	EGS3D04B3
2	3.4	1	EGS3D44B1	EGS3D44B2	EGS3D44B3
3	4.8	1	EGS4D84B1	EGS4D84B2	EGS4D84B3
5	7.6	1	EGS7D64B1	EGS7D64B2	EGS7D64B3
7.5	11	1	EGS0114B1	EGS0114B2	EGS0114B3
10	14	2	EGS0144B1	EGS0144B2	EGS0144B3
15	21	2	EGS0214B1	EGS0214B2	EGS0214B3
20	27	2	EGS0274B1	EGS0274B2	EGS0274B3
25	34	3	EGS0344B1	EGS0344B2	EGS0344B3
30	40	3	EGS0404B1	EGS0404B2	EGS0404B3
40	52	3	EGS0524B1	EGS0524B2	EGS0524B3
50	65	4	EGS0654A1	EGS0654A2	EGS0654A3
60	77	4	EGS0774A1	EGS0774A2	EGS0774A3
75	96	4	EGS0964A1	EGS0964A2	EGS0964A3
100	124	5	EGS1244A1	EGS1244A2	EGS1244A3
125	156	5	EGS1564A1	EGS1564A2	EGS1564A3
150	180	5	EGS1804A1	EGS1804A2	EGS1804A3
200 ②	240	6	EGS2404A1 ②	EGS2404A2 ②	EGS2404A3 ②
250 ②	302	6	EGS3024A1 ②	EGS3024A2 ②	EGS3024A3 ②

**Notes**

① Table is for base catalog number reference only. For complete catalog number selection, see **Page V6-T2-76**.

② Available in 2017.



## DG1 Enclosed Drive



## 230 V Single-Phase Drives—Variable Torque (VT)/Low Overload (L) Enclosed Drives

hp	Current (A)	Drive Frame Size	NEMA Type 1 Base Catalog Number <sup>①</sup>	NEMA Type 12 Base Catalog Number <sup>①</sup>	NEMA Type 3R Base Catalog Number <sup>①</sup>
<b>Low Overload (VT) Enclosed Drives</b>					
0.75	3.2	1	EGS3D2JB1	EGS3D2JB2	EGS3D2JB3
1	4.2	1	EGS4D2JB1	EGS4D2JB2	EGS4D2JB3
1.5	6	2	EGS6D0JB1	EGS6D0JB2	EGS6D0JB3
2	6.8	2	EGS6D8JB1	EGS6D8JB2	EGS6D8JB3
3	9.6	2	EGS9D6JB1	EGS9D6JB2	EGS9D6JB3
5	15.2	2	EGS015JB1	EGS015JB2	EGS015JB3
7.5	22	3	EGS022JB1	EGS022JB2	EGS022JB3
10	28	3	EGS028JB1	EGS028JB2	EGS028JB3
15	42	4	EGS042JB1	EGS042JB2	EGS042JB3
20	54	4	EGS054JB1	EGS054JB2	EGS054JB3
25	68	5	EGS068JA1	EGS068JA2	EGS068JA3
30	80	5	EGS080JA1	EGS080JA2	EGS080JA3
40	104	5	EGS104JA1	EGS104JA2	EGS104JA3

## DG1 Enclosed Drive



## 480 V Single-Phase Drives—Variable Torque (VT)/Low Overload (L) Enclosed Drives

hp	Current (A)	Drive Frame Size	NEMA Type 1 Base Catalog Number <sup>①</sup>	NEMA Type 12 Base Catalog Number <sup>①</sup>	NEMA Type 3R Base Catalog Number <sup>①</sup>
<b>Low Overload (VT) Enclosed Drives</b>					
1	2.1	1	EGS2D1KB1	EGS2D1KB2	EGS2D1KB3
1.5	3	1	EGS3D0KB1	EGS3D0KB2	EGS3D0KB3
2	3.4	1	EGS3D4KB1	EGS3D4KB2	EGS3D4KB3
3	4.8	1	EGS4D8KB1	EGS4D8KB2	EGS4D8KB3
5	7.6	2	EGS7D6KB1	EGS7D6KB2	EGS7D6KB3
7.5	11	2	EGS011KB1	EGS011KB2	EGS011KB3
10	14	2	EGS014KB1	EGS014KB2	EGS014KB3
15	21	3	EGS021KB1	EGS021KB2	EGS021KB3
20	27	4	EGS027KB1	EGS027KB2	EGS027KB3
25	34	4	EGS034KB1	EGS034KB2	EGS034KB3
30	40	4	EGS040KB1	EGS040KB2	EGS040KB3
40	52	5	EGS052KB1	EGS052KB2	EGS052KB3
50	65	5	EGS065KA1	EGS065KA2	EGS065KA3
60	77	5	EGS077KA1	EGS077KA2	EGS077KA3

**Note**

<sup>①</sup> Table is for base catalog number reference only. For complete catalog number selection, see **Page V6-T2-76**.

## Enclosure Selection

### EGS

Enclosure selection charts are based on physical space limitations only and only to be used as a reference. For actual enclosure sizing, refer to Bid Manager.

**Note:** Standard enclosure sizing includes dedicated space for a circuit breaker or fusible disconnect, CPT, SPD, heater/thermostat, control relay and terminal blocks.

### Standard Enclosure X-Space

Enclosure Size	Frame 1	Frame 2	Frame 3	Frame 4	Frame 5
AX	2	2	2	—	—
BX	4	4	4	4	—
CX	7	7	7	7	7
DX	18	18	18	18	18

### Standard Power Options X-Space

Power Options	Frame 1	Frame 2	Frame 3	Frame 4	Frame 5
Isolation fuses	1	1	1	1	1
3% Input reactor	2	2	3	5	6
3% Output reactor	1	1	3	5	6
dV/dt filter	3	3	3	5	6
Output contactor	1	1	1	1	1

**Note:** Bypass enclosure sizing includes dedicated space for a MCP, CPT, input contactor, output bypass contactors, overload relay, SPD, heater/thermostat, control relay and terminal blocks.

### Bypass Enclosure X-Space

Enclosure Size	Frame 1	Frame 2	Frame 3	Frame 4	Frame 5
AX	0	0	0	—	—
BX	2	2	2	0	—
CX	5	5	5	3	2
DX	16	16	16	14	13

### Bypass Power Options X-Space

Power Options	Frame 1	Frame 2	Frame 3	Frame 4	Frame 5
Isolation fuses	1	1	1	1	1
3% Input reactor	2	2	3	5	6
RVSS bypass	2	2	2	3	4
3% output reactor	1	1	3	5	6
dV/dt filter	3	3	3	5	6

**Note:** Single-phase enclosure sizing includes dedicated space for a capacitor kit, circuit breaker or fusible disconnect, CPT, SPD, heater/thermostat, control relay and terminal blocks.

### Single-Phase Enclosure X-Space

Enclosure Size	Frame 1	Frame 2	Frame 3	Frame 4	Frame 5
AX	0	0	—	—	—
BX	2	2	1	1	—
CX	5	5	4	4	4
DX	16	16	15	15	15

### Single-Phase Power Options X-Space

Power Options	Frame 1	Frame 2	Frame 3	Frame 4	Frame 5
Isolation fuses	1	1	1	1	1
3% Input reactor	2	2	3	5	6
3% Output reactor	1	1	3	5	6
dV/dt filter	3	3	3	5	6
Output contactor	1	1	1	1	1

### 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
  - 2FC, 1FA 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	<b>DXG-EXT-3DI3DO1T</b>
1 x AI, 2 x AO (isolated to control board) option card	<b>DXG-EXT-1AI2AO</b>
3 x relay dry contact (2NO + 1NO/NC) option card	<b>DXG-EXT-3R0</b>
3 x PT100 RTD thermistor input option card	<b>DXG-EXT-THER1</b>
6 x DI 240 Vac input option card	<b>DXG-EXT-6DI</b>

### PowerXL Series—DG1 Communication Card Kits

Description	Catalog Number
PROFIBUS-DP communication card	<b>DXG-NET-PROFB</b>
CANopen communication card	<b>DXG-NET-CANOPEN</b>
DeviceNet communication card	<b>DXG-NET-DEVICENET</b>
PROFIBUS DB9 to 5-pin adapter card	<b>DXG-NET-PROAD</b>
SmartWire communication card and module	<b>DXG-NET-SWD</b> <sup>①</sup>

#### Note

<sup>①</sup> Available in January 2017.

## Options

### Input Power Options

Option	Description
HMCP Disconnect	The HMCP motor protection circuit breaker uses an electronic trip unit to provide typical motor overload relay functionality and short-circuit protection against potential phase-to-phase or phase-to-ground faults.
Circuit Breaker	Utilizes a circuit breaker to provide a means of short-circuit protection for the power cables between it and the drive, and protection from high-level ground faults on the power cable. Allows a convenient means of disconnecting the drive from the line, and the operating mechanism can be padlocked in the OFF position. This is factory mounted in the enclosure.
Isolation Fusing	Provides high-level fault protection of the drive input power circuit from the load side of the fuses to the input side of the power transistors. This option consists of three 200 kA fuses that are factory mounted in the enclosure.
3% Input Reactor	The input reactor is a three-phase series inductance on the line side of an AFD. It is used to provide a reduction in voltage and current harmonics. It also provides increased input protection for AFD and its semiconductors from line transients.
SPD	Provides a UL 1449 surge protection device (SPD) rated for 40 kA/ph that is connected to the line side terminals.
Fused Disconnect	Utilizes fusing to provide a means of short-circuit protection for the power cables between it and the drive, and protection from high-level ground faults on the power cable. Allows a convenient means of disconnecting the drive from the line, and the operating mechanism can be padlocked in the OFF position. This is factory mounted in the enclosure.

### Bypass Options

Option	Description
Manual HOA Bypass	Provides a three-position selector switch that allows the user to select either a HAND or AUTO mode of operation. HAND mode is defaulted keypad operation, and AUTO mode is defaulted to control from an external terminal source. These modes of operation can be configured via programming to allow for alternate combinations of start and speed sources. Start and speed sources include keypad, I/O and fieldbus.
Manual HOA RVSS Bypass	This option adds a reduced voltage soft starter to bypass assembly for soft starting in bypass mode.

### Output Power Options

Option	Description
Output Contactor	Provides a means for positive disconnection of the drive output from the motor terminals. The contactor coil is controlled by the drive's run or permissive logic. NC and NO auxiliary contacts rated at 10 A, 600 Vac are provided for customer use. This option includes a low VA 115 Vac fused control power transformer and is factory mounted in the enclosure.
3% Output Reactor	The output reactor is a three-phase series inductance on the load side of a VFD. It is used to reduce transient voltage (dv/dt) and peak voltages at the motor terminals. A 3% output filter is recommended for motor cable lengths up to 300 ft (10 m).
dV/dt Filter	Used to reduce the transient voltage (dV/dt) at the motor terminals. Recommended for motor cable lengths over 300 ft (10 m) and up to 1000 ft (304.8 m). This option is mounted in the enclosure.

### Control Options

Option	Description
Speed Pot	Provides the ability to adjust the frequency reference using a door-mounted potentiometer. This option uses the 10 Vdc reference to generate a 0–10 V signal at the analog voltage input signal terminal. When the HOA bypass option is added, the speed is controlled when the HOA switch is in the HAND position. Without the HOA bypass option, a two-position switch (labeled local/remote) is provided on the keypad to select speed reference from the speed potentiometer or a remote speed signal.
HOA Switch	Provides a three-position selector switch that allows the user to select either a HAND or AUTO mode of operation. HAND mode is defaulted to keypad operation, and AUTO mode is defaulted to control from an external terminal source. These modes of operation can be configured via drive programming to allow for alternate combinations of start and speed sources. Start and speed sources include Keypad, I/O and fieldbus.
Start-Stop Pushbutton	Provides door-mounted START and STOP pushbuttons for either bypass or non-bypass configurations.

### Light Options

Option	Description
Non-Bypass Light Kit—Power On, Run, Fault	Provides a white POWER ON light that indicates power to the enclosed cabinet, a green RUN light that indicates the drive is running and a red FAULT light that indicates a drive fault has occurred.
Bypass Light Kit—On, VFD Run, Fault, Bypass Run	Provides a white POWER ON light that indicates power to the enclosed cabinet, a green RUN light that indicates the drive is running, a red FAULT light that indicates a drive fault has occurred and an amber light that indicates when the motor is running in Bypass mode.

### Enclosure Options

Option	Description
Floor Stand 12 in	Converts a normally wall-mounted enclosure to a floor-standing enclosure with a height of 12 in (304.8 mm).
Floor Stand 22 in	Converts a normally wall-mounted enclosure to a floor-standing enclosure with a height of 22 in (558.8 mm).

## Technical Data and Specifications

### PowerXL Series—DG1 Technical Data and Specifications

2

Attribute	Description	Specification	
Input ratings	Input voltage $U_{in}$	208 V, 230 V, 480 V, 575 V, –15 to 10%	
	Input frequency	50 Hz to 60 Hz (variation up to 45 Hz to 66 Hz)	
	Connection to power	Once per minute or less	
	Starting delay	3 s (FR1 to FR2), 4 s (FR3), 5 s (FR4), 6 s (FR5 and FR6)	
	Short-circuit withstand rating	100 kAIC (fuses and circuit breakers)	
Output ratings	Output voltage	0 to $U_{in}$	
	Output current	$I_L$ : ambient temperature maximum 40 °C, up to 60 °C with derating, overload 1.1 x $I_L$ (1 min./10 min.) $I_H$ : ambient temperature maximum 50 °C, up to 60 °C with derating, overload 1.5 x $I_H$ (1 min./10 min.)	
	Initial output current	200% (2 s / 20 s)	
	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	230 V / 480 V range: FR1–3: 1 kHz to 12 kHz FR4–6: 1 kHz to 10 kHz  230 V / 480 V defaults: FR1–3: 4 kHz FR4–5: 3.6 kHz FR6: 2 kHz  575 V range: FR1–6: 1 kHz to 6 kHz  575 V defaults: FR1–4: 3 kHz FR5–6: 2 kHz  Automatic switching frequency derating in case of overload.	
	Frequency reference	Analog input: resolution 0.1% (10-bit), accuracy +1% Analog output: resolution 0.1% (10-bit), accuracy +1% Panel reference: resolution 0.01 Hz	
	Field weakening point	20 Hz to 400 Hz	
	Acceleration time	0.1 s to 3000 s	
	Deceleration time	0.1 s to 3000 s	
	Braking torque	DC brake: 30% x Motor Rated Torque ( $T_n$ ) (without brake chopper) Dynamic braking (with optional brake chopper using an external brake resistor): 100% continuous maximum rating	
	Ambient conditions	Ambient operating temperature	–10 °C (no frost) to +40 °C
		Storage temperature	–40 °C to +70 °C
		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 <sub>2</sub> S [hydrogen sulfide] and SO <sub>2</sub> [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 3280 ft (1000 m); 1% derating for each 328 ft (100 m) above 3280 ft (1000 m); max. 9842 ft (3000 m) (2000 m for corner grounded earth main systems) For 575 V product, maximum altitude is 6561 ft (2000 m) regardless of main system	

## PowerXL Series—DG1 Technical Data and Specifications, continued

Attribute	Description	Specification
Ambient conditions, continued	Overvoltage	Overvoltage Category III
	Pollution degree	Pollution Degree 2
	Enclosure class	NEMA Type 1, 12, 3R
	Immunity	Fulfills EN 61800-3 (2004), first and second environment
Standards	Safety	UL 508C, EN 61800-5-1
	Approvals	UL and cUL
Fieldbus connections		Onboard: EtherNet/IP, Modbus <sup>®</sup> TCP, Modbus RTU, BACnet
Safety/protections	Overvoltage protection	Yes
	Overvoltage trip limit	230 V drives: 456 V 480 V drives: 911 V 575 V drives: 1100 V
	Undervoltage protection	Yes
	Undervoltage trip limit	230 V drives: 211 V 480 V drives: 370 V 575 V drives: 550 V
	Earth fault protection	Yes Default: 15% motor FLA Minimum: 0% motor FLA Maximum: 30% motor FLA
	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 24 V reference voltages	Yes
	Surge protection	Yes (differential mode 2 kV; common mode 4 kV 230 V drives: 275 Vac, 10,000 A 480 V drives: 320 Vac, 8000 A 575 V drives: 385 Vac, 10,000 A
Common coated boards	Yes (prevents corrosion)	
Efficiency	Drive efficiency ratings <sup>Ⓢ</sup>	480 V: FR1 = 97.7% FR2 = 97.9% FR3 = 97.7% FR4 = 98.0% FR5 = 98.2%
		230 V: FR1 = 96.7% FR2 = 97.4% FR3 = 97.2% FR4 = 97.4% FR5 = 97.7%

**Note**

<sup>Ⓢ</sup> Based on DG1 efficiency ratings in an enclosure with no options.

# 2.6

## Adjustable Frequency Drives

### PowerXL DG1 Series Drives

#### Wiring Diagram

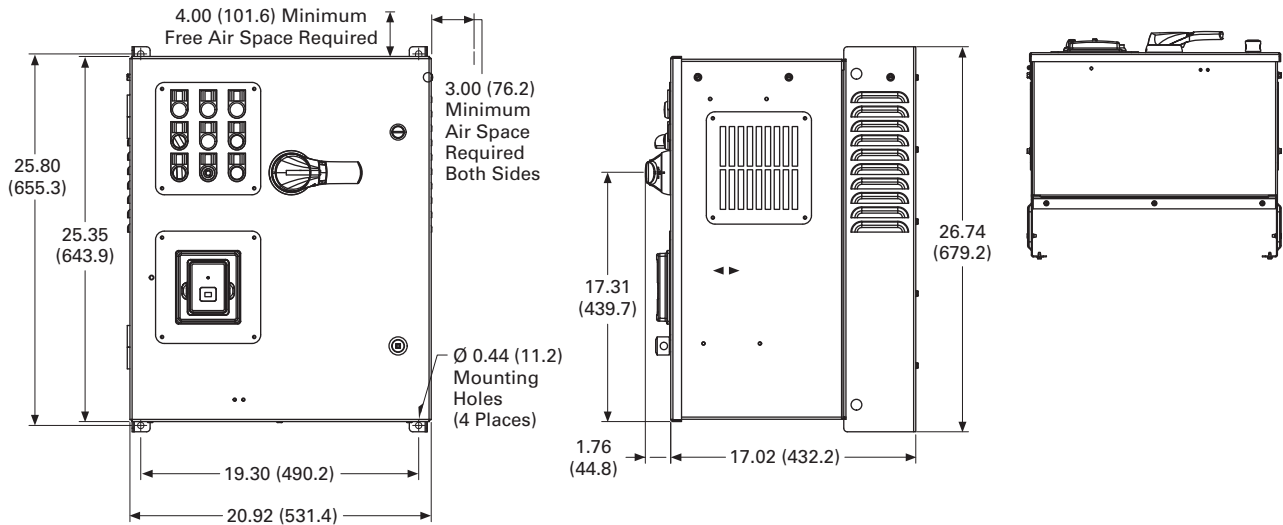
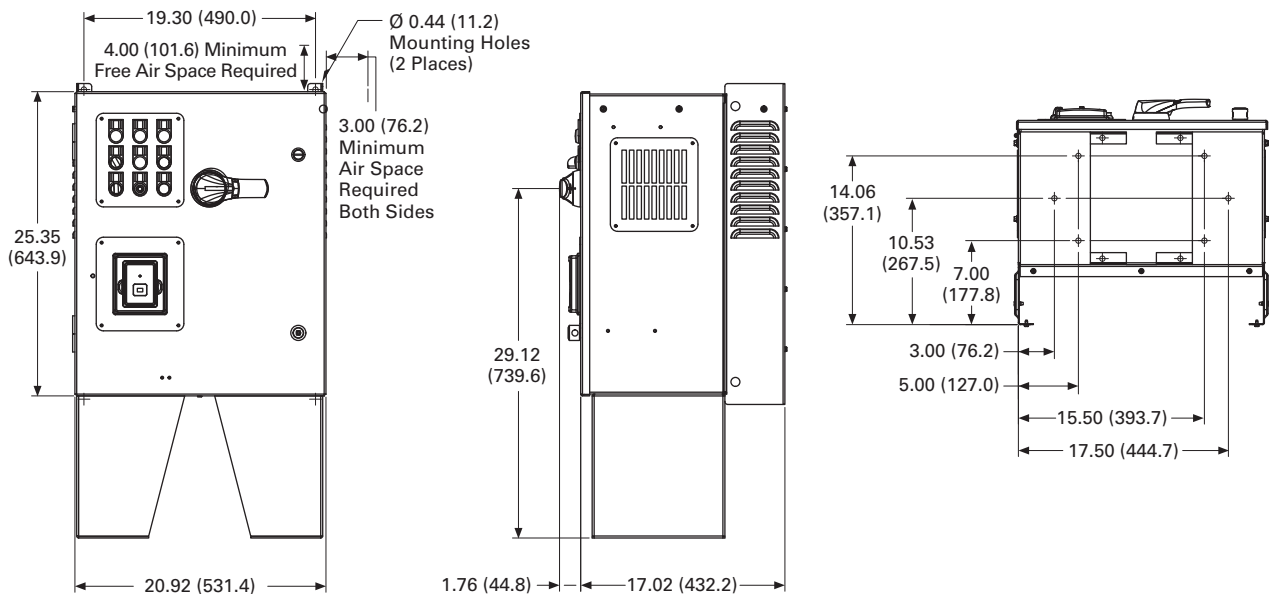
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PowerXL Series—DG1 Control Wiring Diagram

Pin	Signal Name	Signal	Default Setting	Description
1	+10 V	Ref. Output Voltage	—	10 Vdc Supply Source
2	AI1+	Analog Input 1	0–10 V	Voltage Speed Reference (Programmable to 4 mA to 20 mA)
3	AI1–	Analog Input 1 Ground	—	Analog Input 1 Common (Ground)
4	AI2+	Analog Input 2	4 mA to 20 mA	Current Speed Reference (Programmable to 0–10 V)
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 (TI–)	Input forces VFD output to shut off
10	DIN8	Digital Input 8	Force Remote (TI+)	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	24 V	+24 Vdc Output	—	Control voltage output (100 mA max.)
14	DO1	Digital Output 1	Ready	Shows the drive is ready to run
15	24 Vo	+24 Vdc Output	—	Control voltage output (100 mA max.)
16	GND	I/O Signal Ground	—	I/O Ground for Reference and Control
17	A01+	Analog Output 1	Output Frequency	Shows Output frequency to motor 0–60 Hz (4 mA to 20 mA)
18	A02+	Analog Output 2	Motor Current	Shows Motor current of motor 0–FLA (4 mA to 20 mA)
19	24 Vi	+24 Vdc 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		

**Dimensions**

Approximate Dimensions in Inches (mm)

**AX Box Type 1****AX Box Type 1—12 Inch Floor Stands**



# 2.6

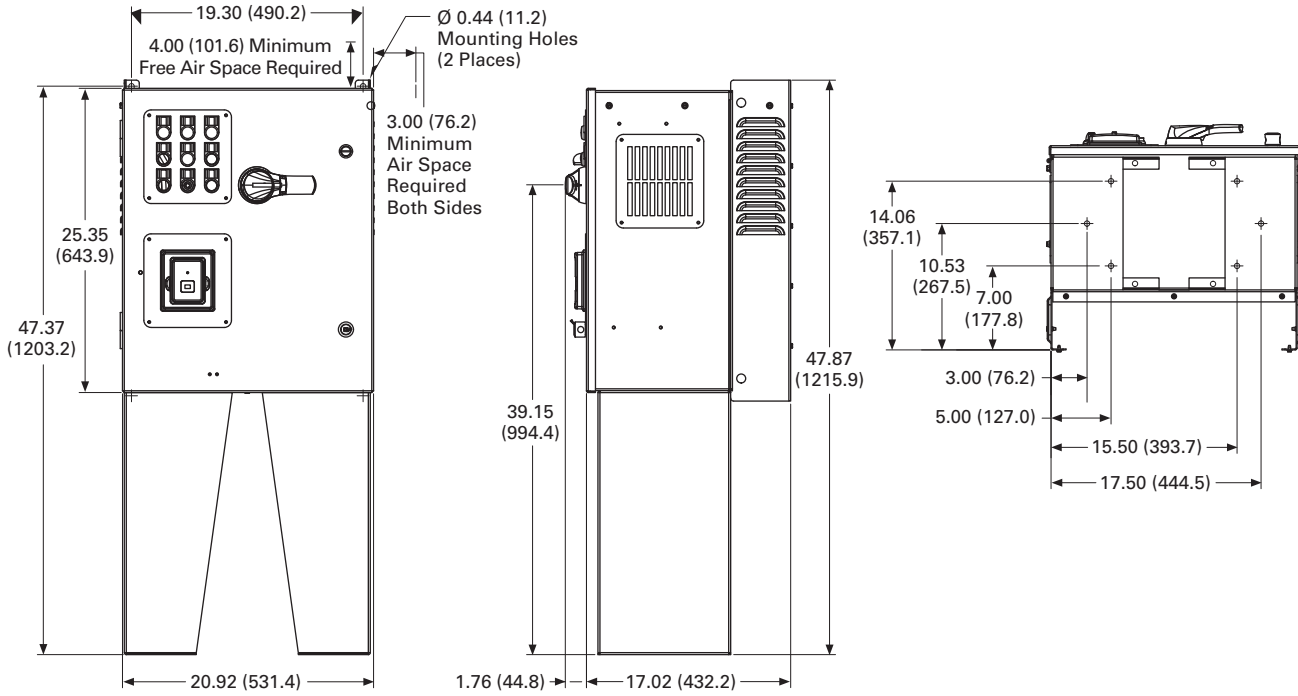
## Adjustable Frequency Drives

### PowerXL DG1 Series Drives

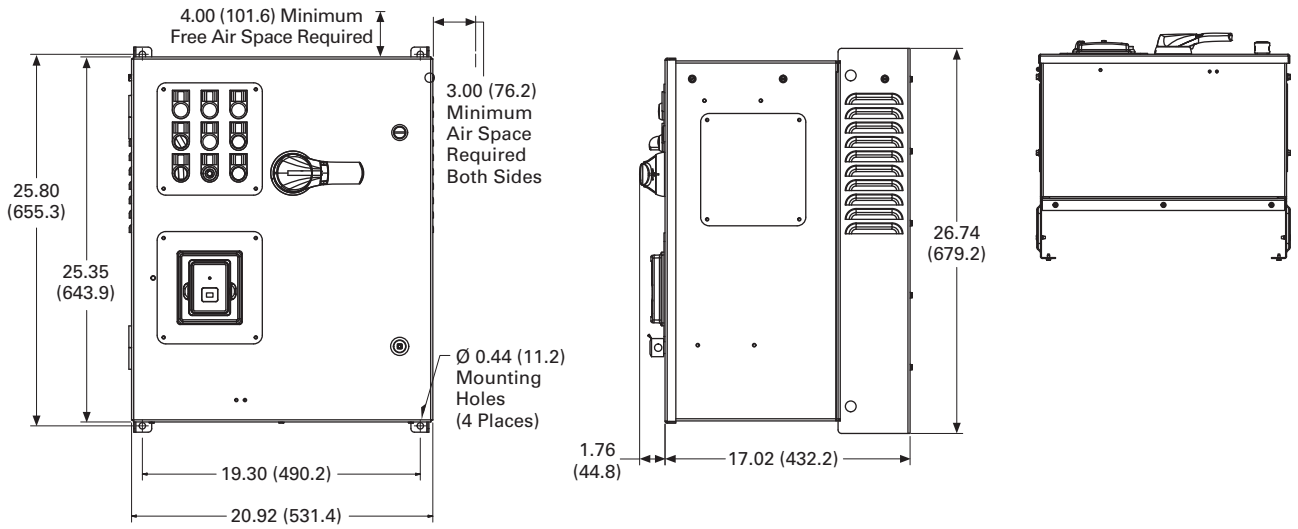
Approximate Dimensions in Inches (mm)

#### AX Box Type 1—22 Inch Floor Stands

2

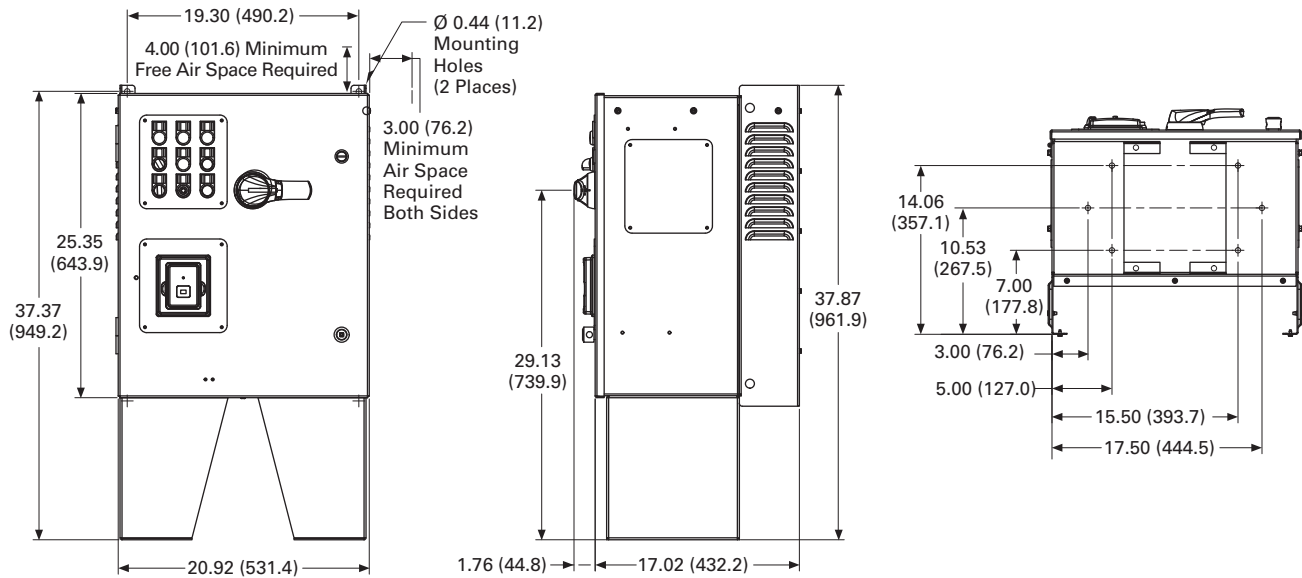


#### AX Box Type 12

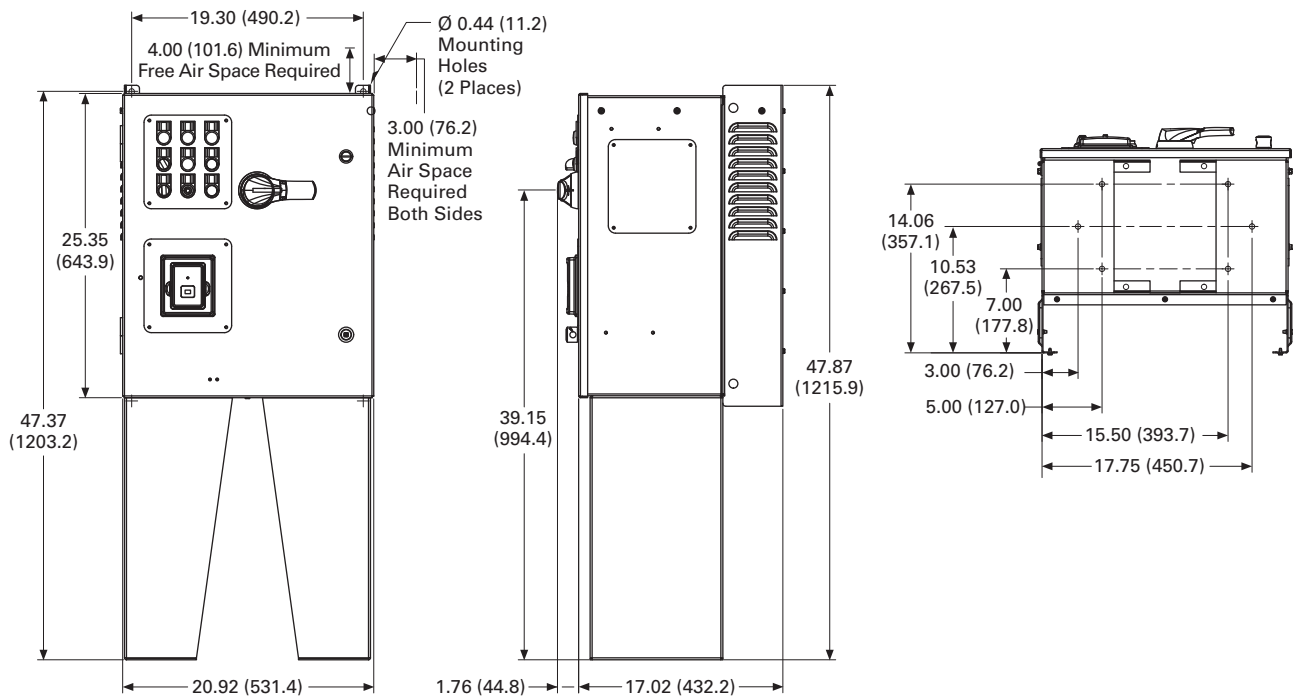


Approximate Dimensions in Inches (mm)

### AX Box Type 12—12 Inch Floor Stands



### AX Box Type 12—22 Inch Floor Stands



# 2.6

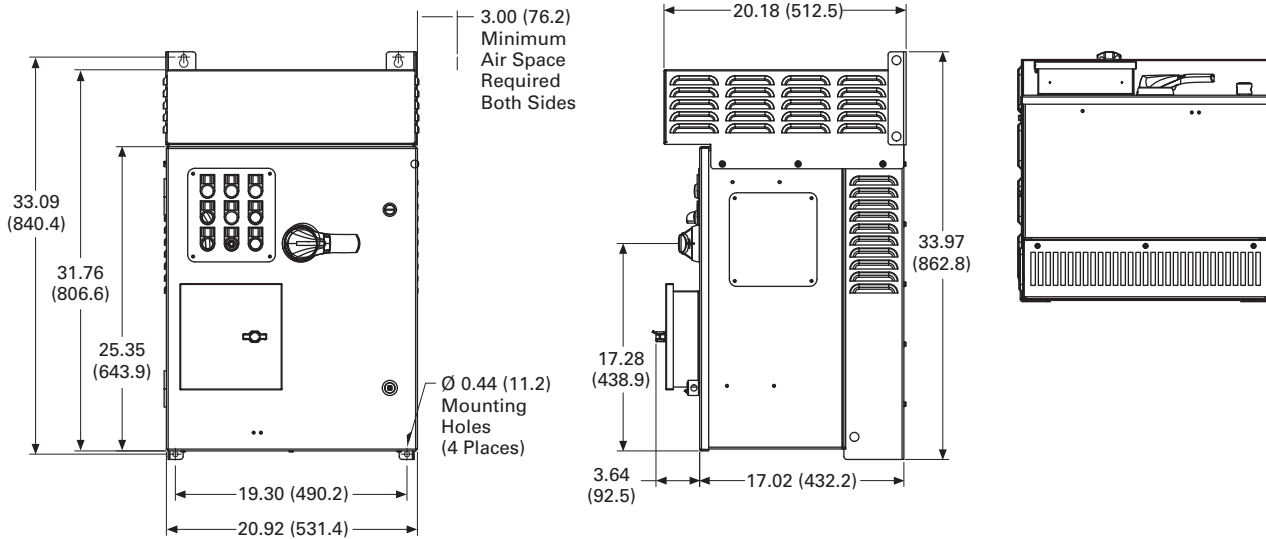
## Adjustable Frequency Drives

### PowerXL DG1 Series Drives

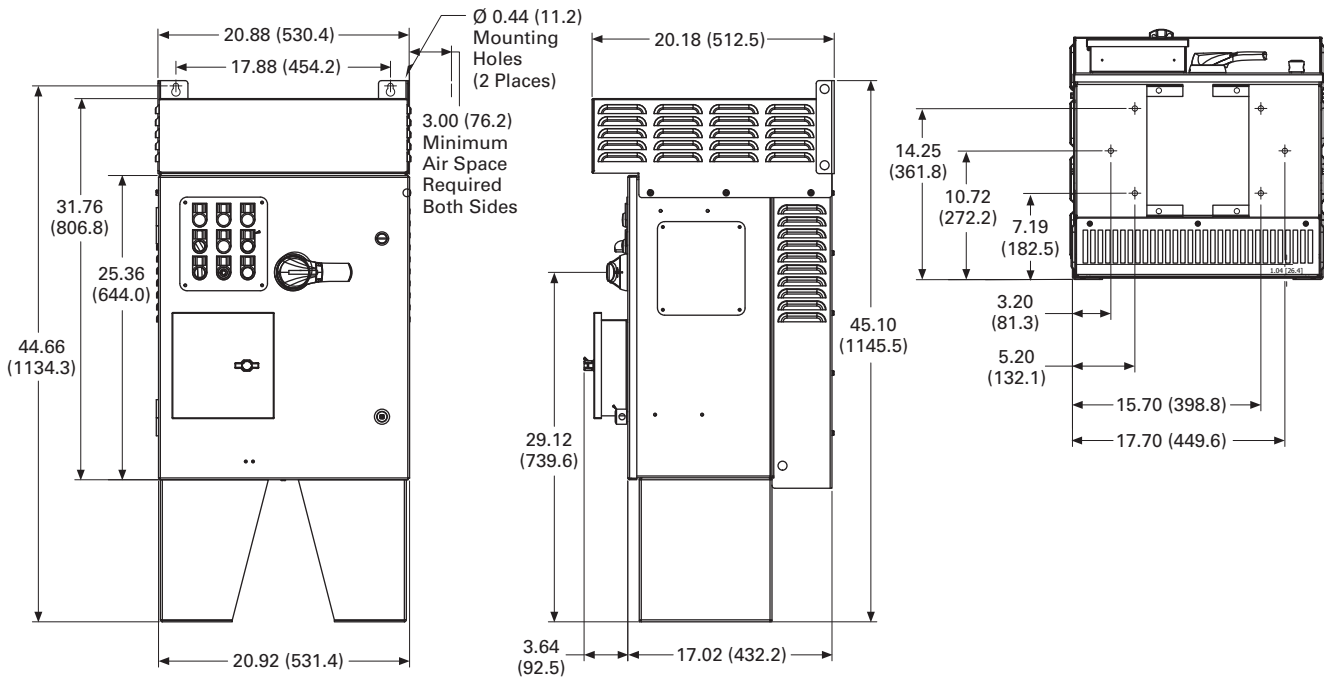
Approximate Dimensions in Inches (mm)

#### AX Box Type 3R

2

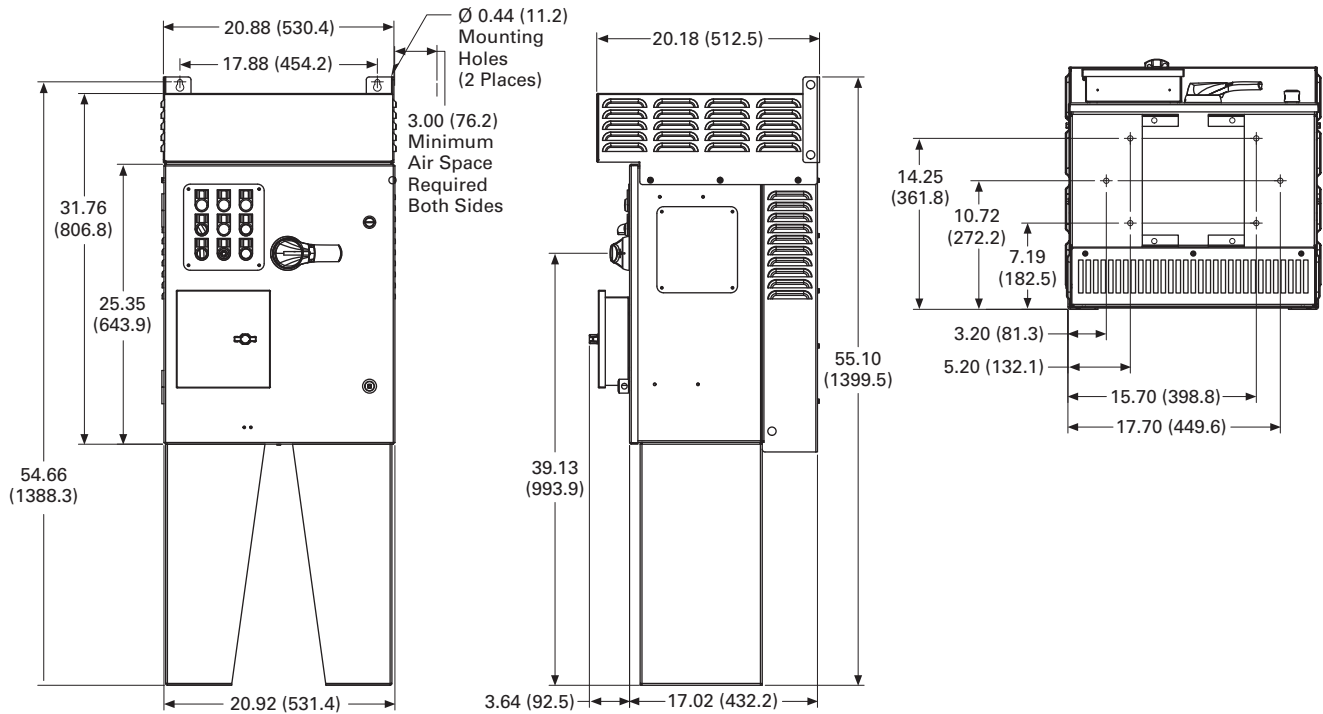


#### AX Box Type 3R—12 Inch Floor Stands

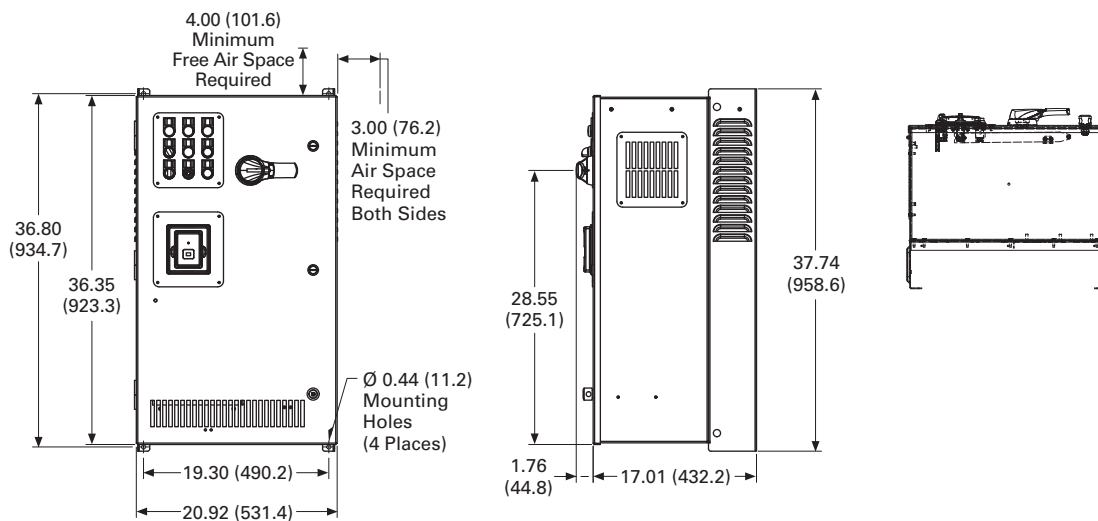


Approximate Dimensions in Inches (mm)

### AX Box Type 3R—22 Inch Floor Stands



### BX Box Type 1



# 2.6

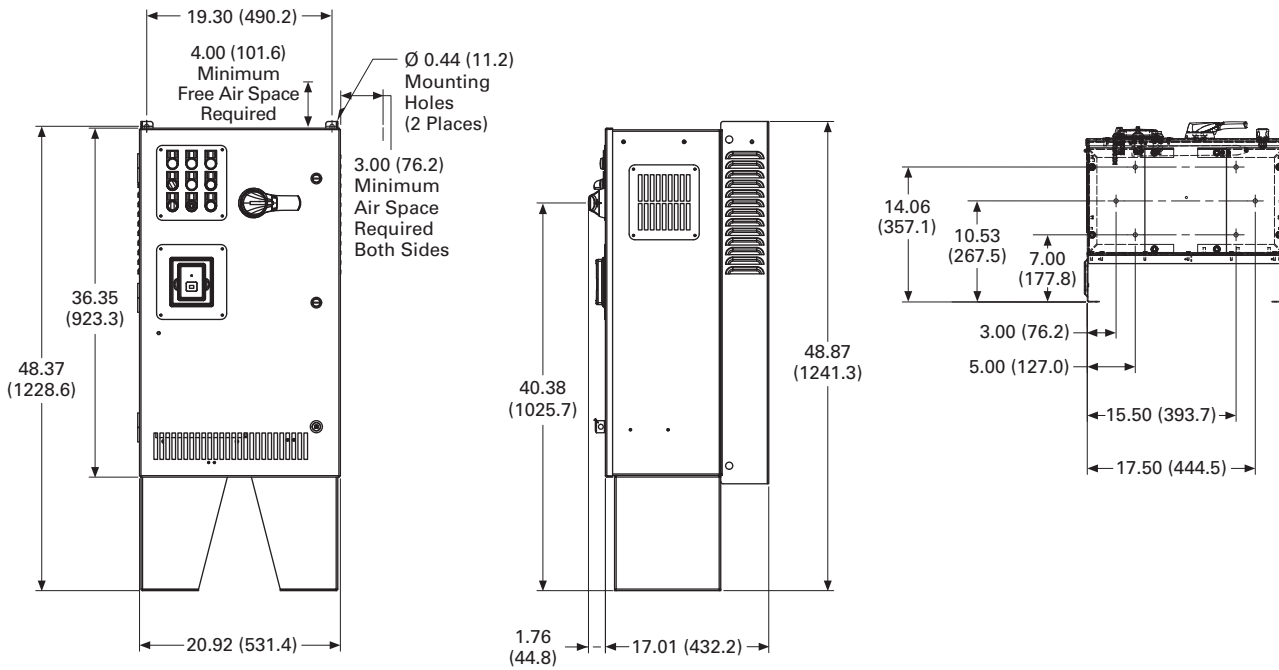
## Adjustable Frequency Drives

### PowerXL DG1 Series Drives

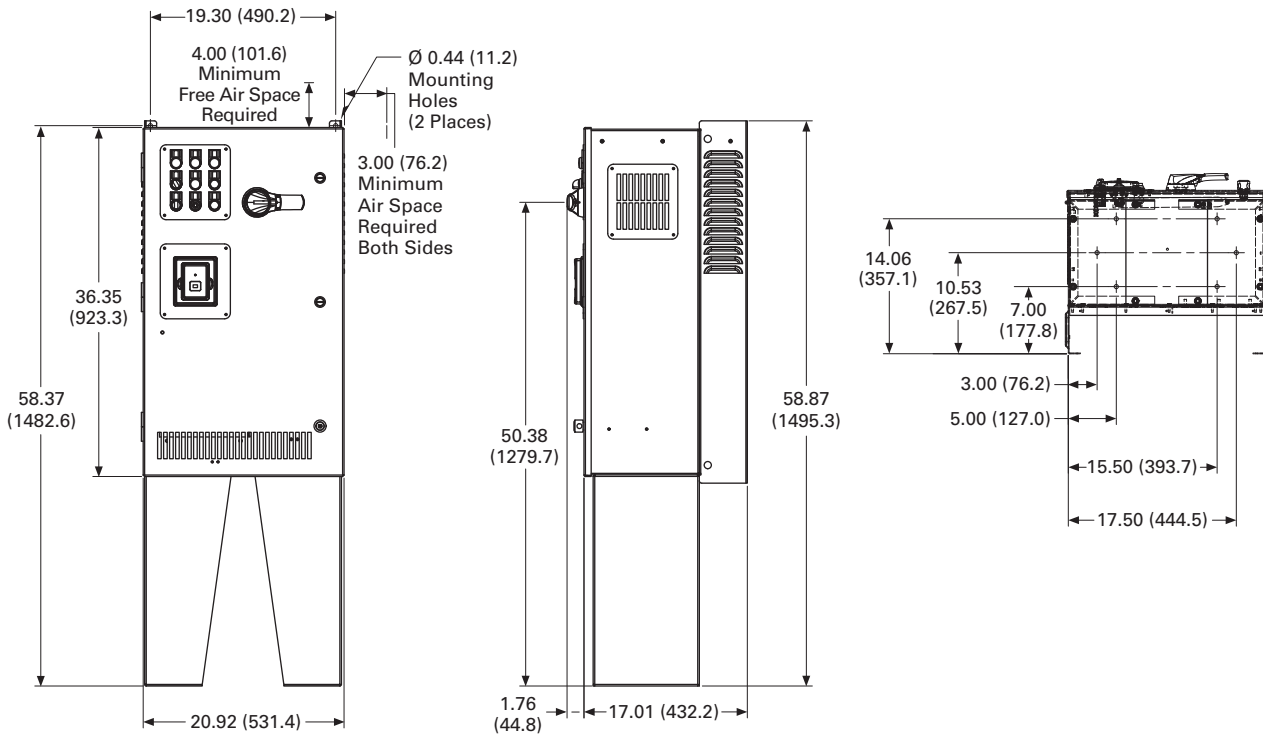
Approximate Dimensions in Inches (mm)

2

#### BX Box Type 1—12 Inch Floor Stands

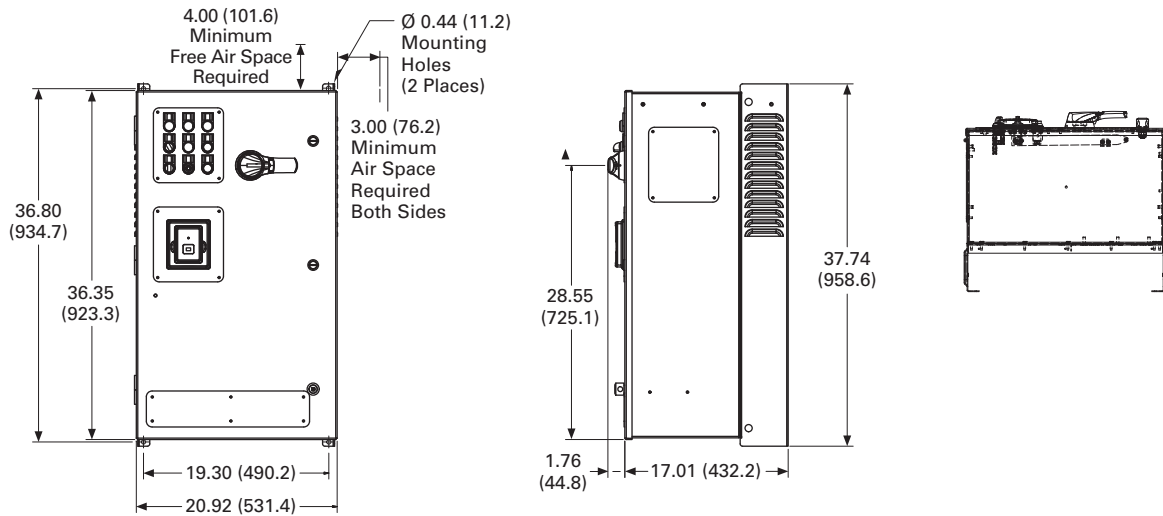


#### BX Box Type 1—22 Inch Floor Stands

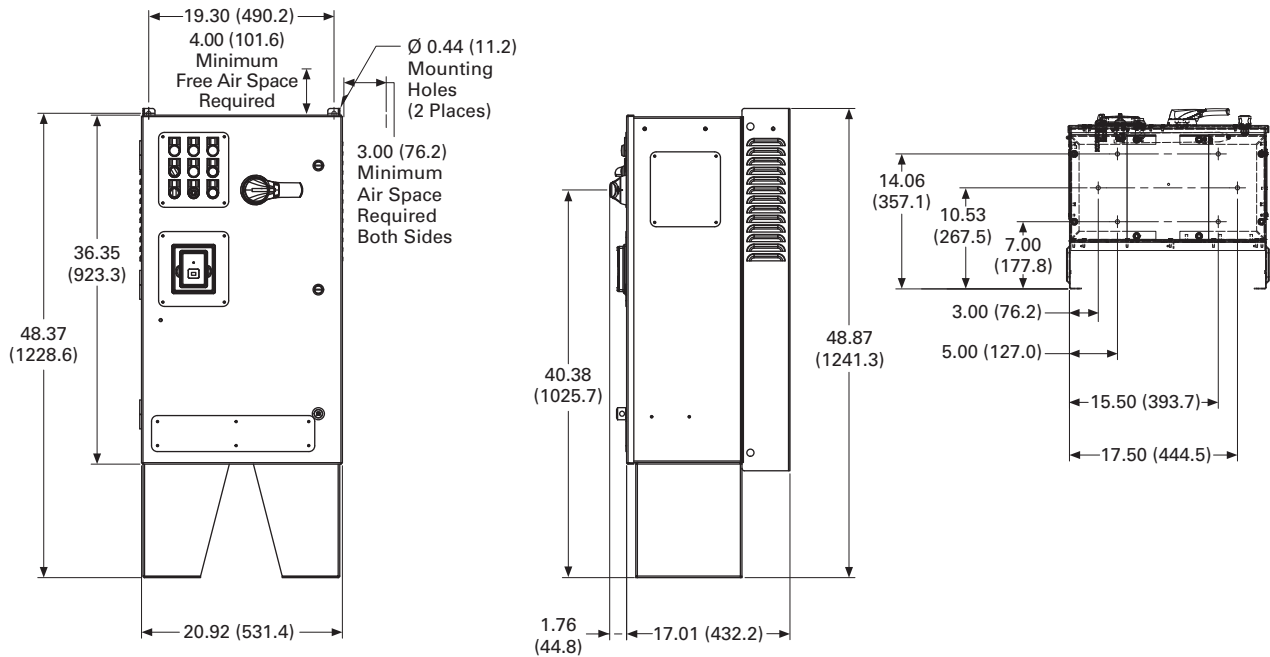


Approximate Dimensions in Inches (mm)

### BX Box Type 12



### BX Box Type 12—12 Inch Floor Stands



# 2.6

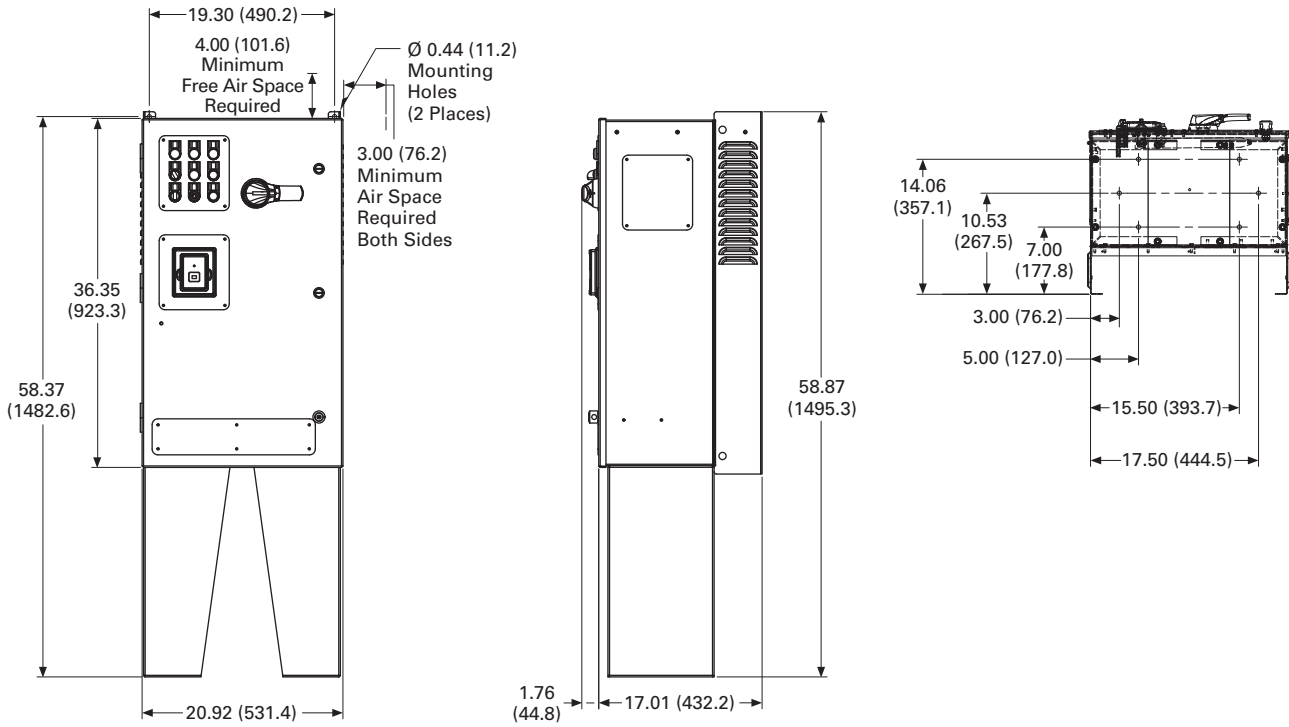
## Adjustable Frequency Drives

### PowerXL DG1 Series Drives

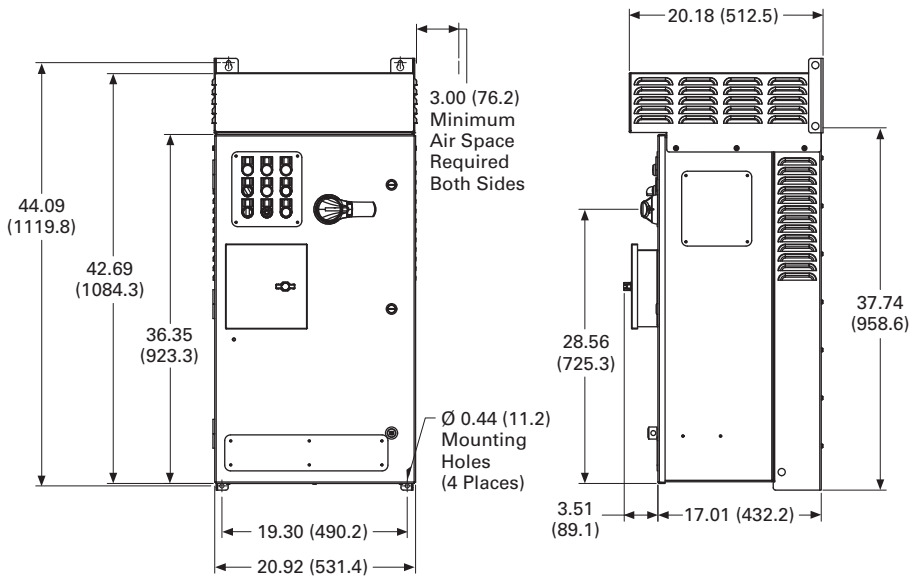
Approximate Dimensions in Inches (mm)

#### BX Box Type 12—22 Inch Floor Stands

2

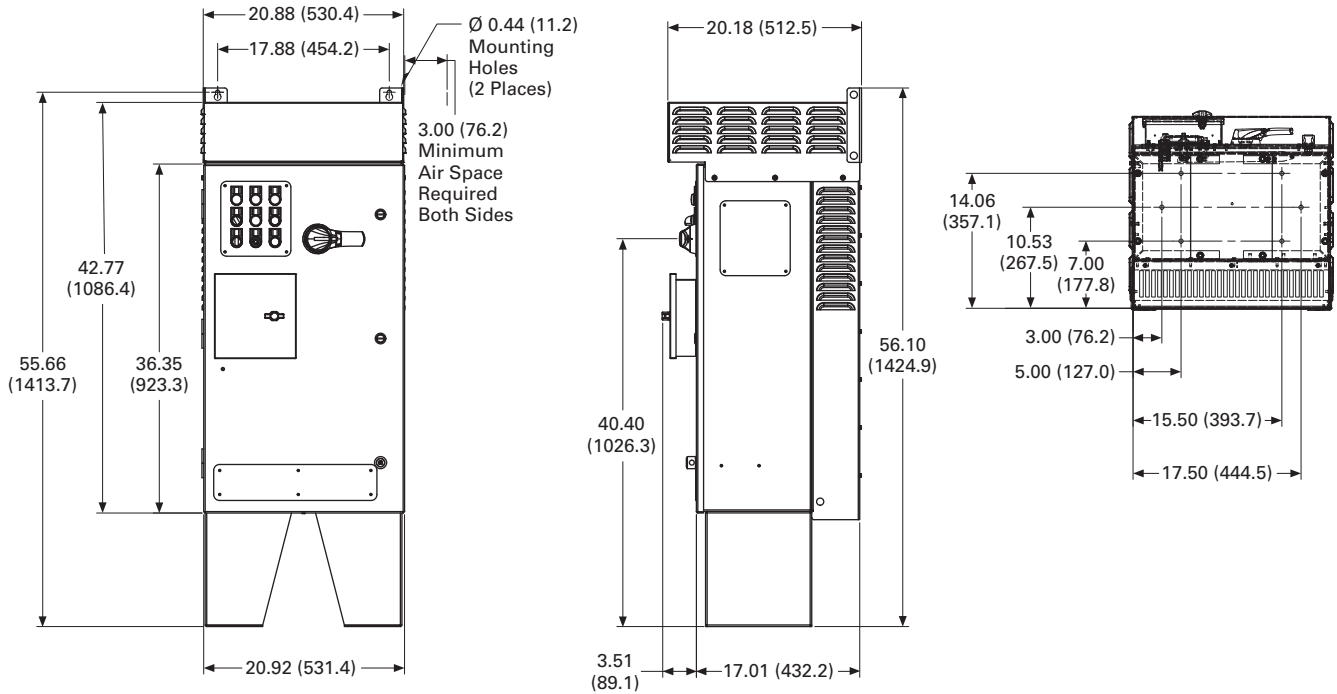


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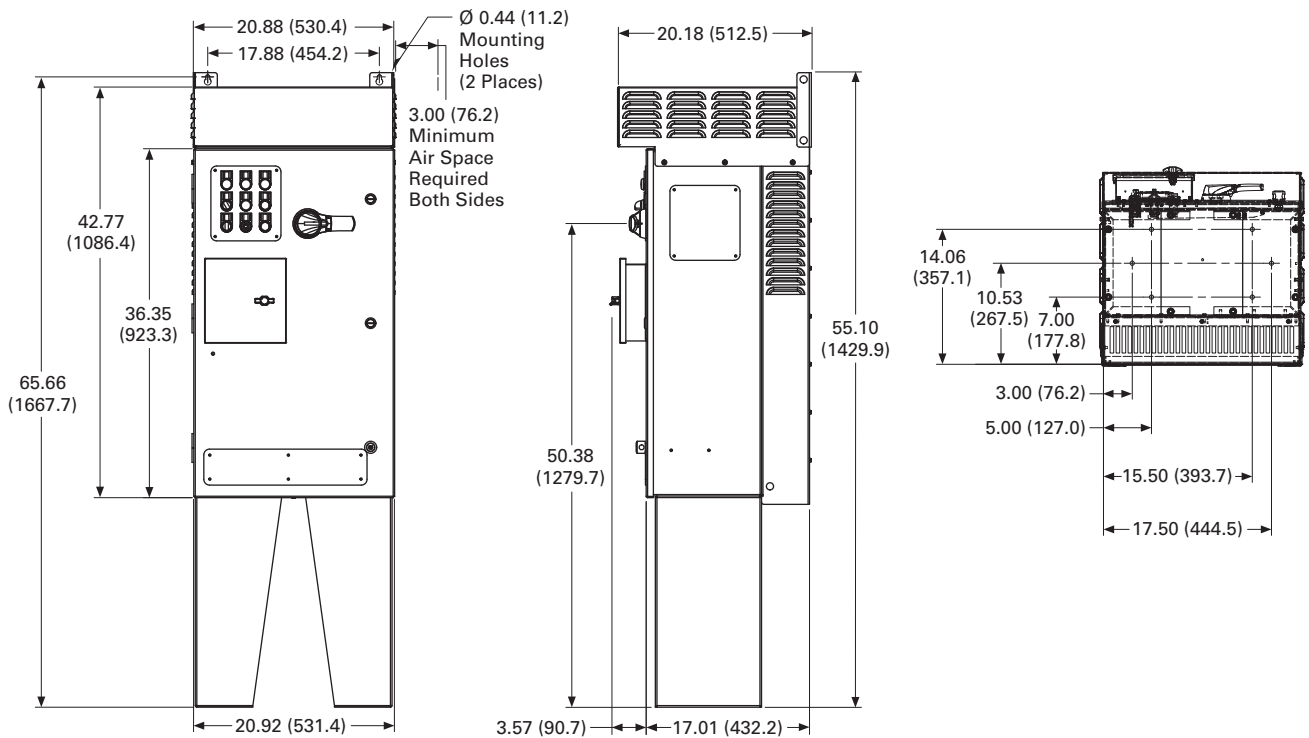


Approximate Dimensions in Inches (mm)

### BX Box Type 3R—12 Inch Floor Stands



### BX Box Type 3R—22 Inch Floor Stands





# 2.6

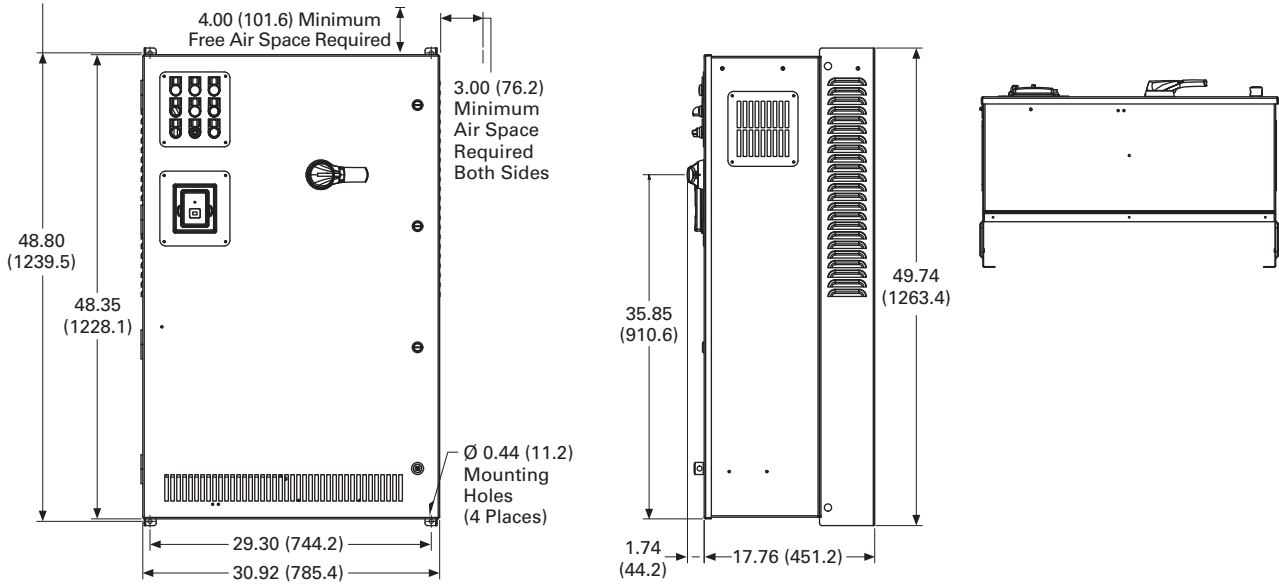
## Adjustable Frequency Drives

### PowerXL DG1 Series Drives

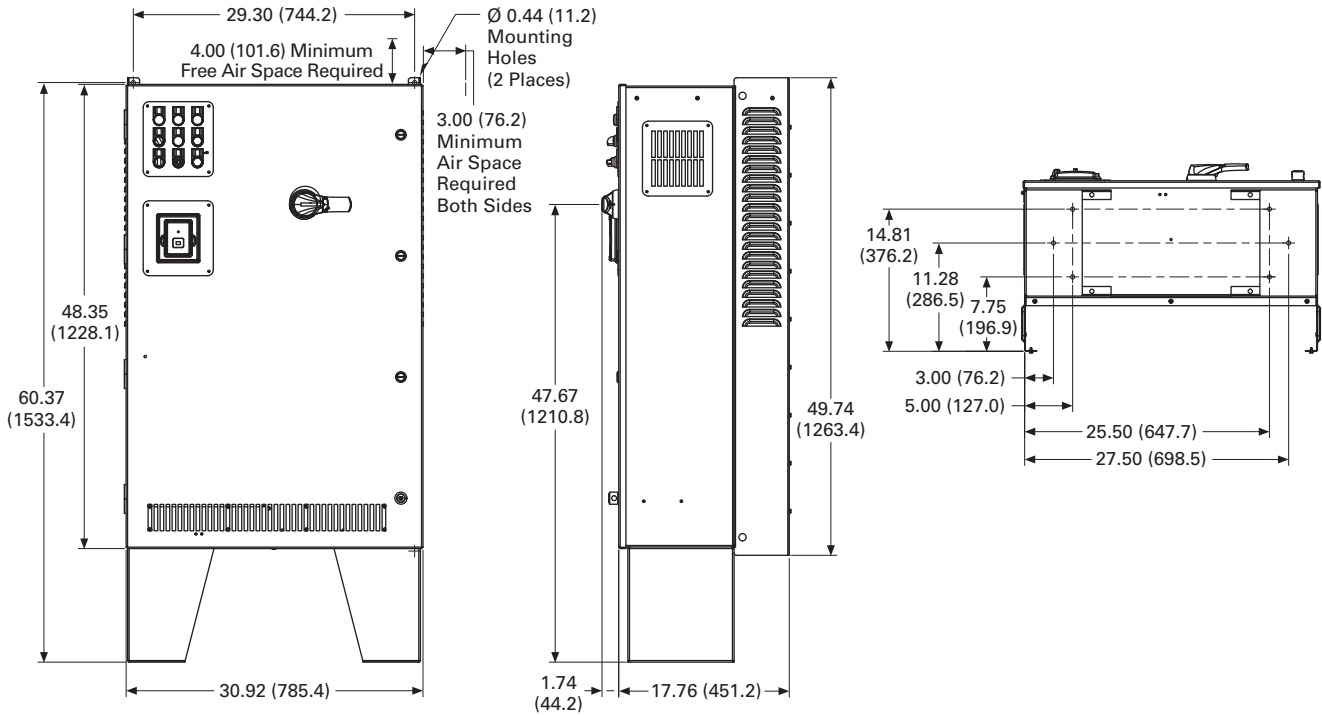
Approximate Dimensions in Inches (mm)

#### CX Box Type 1

2

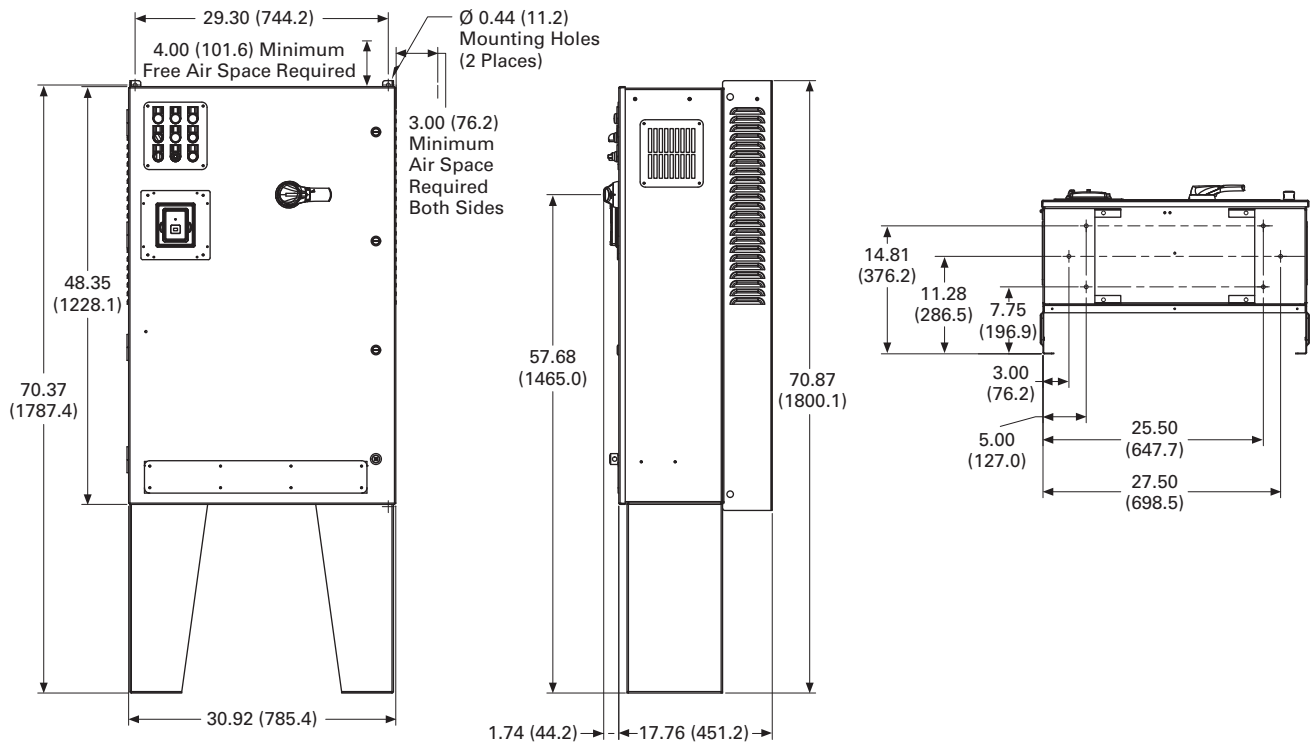


#### CX Box Type 1—12 Inch Floor Stands

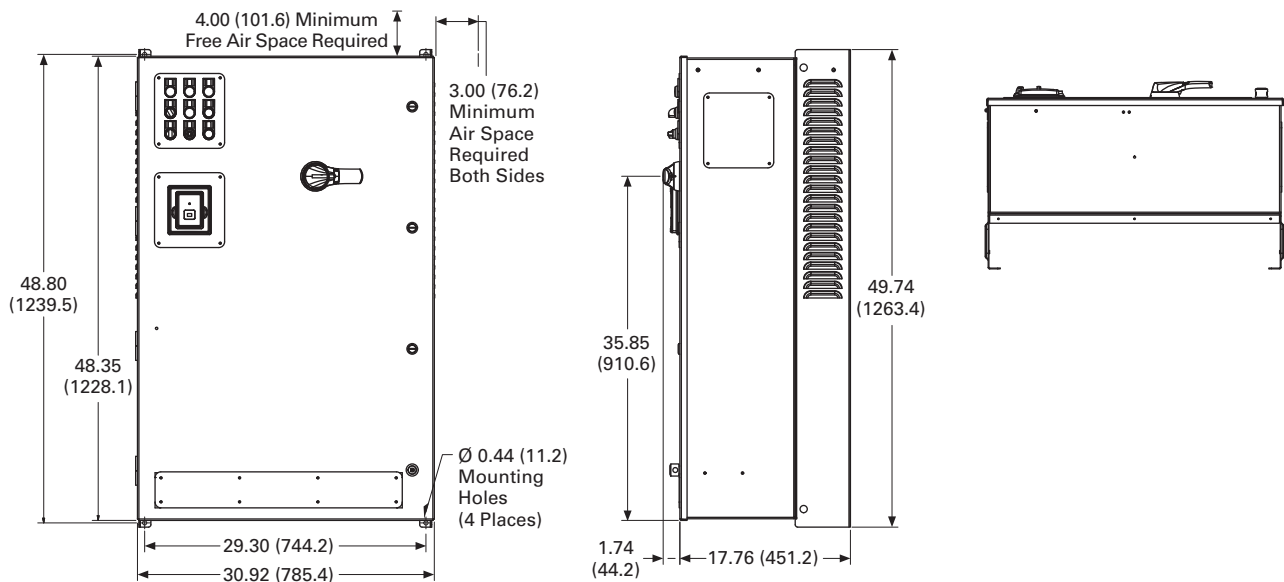


Approximate Dimensions in Inches (mm)

### CX Box Type 1—22 Inch Floor Stands



### CX Box Type 12



# 2.6

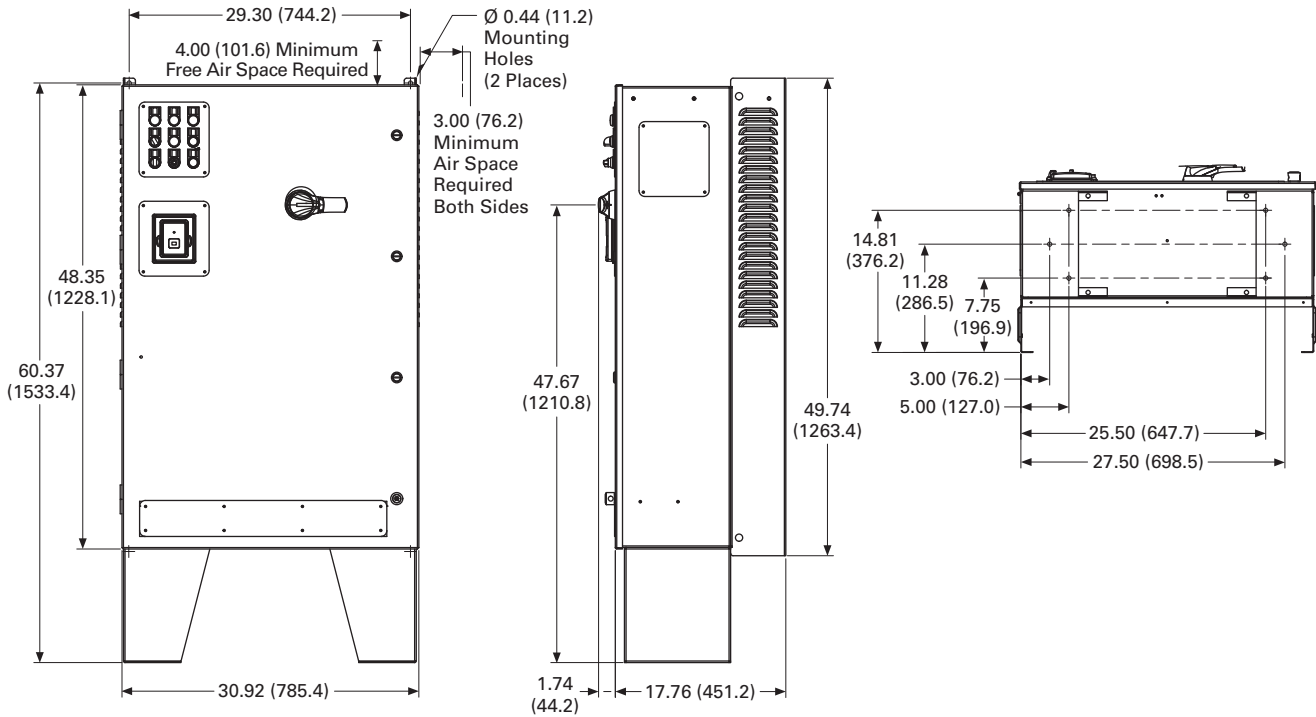
## Adjustable Frequency Drives

### PowerXL DG1 Series Drives

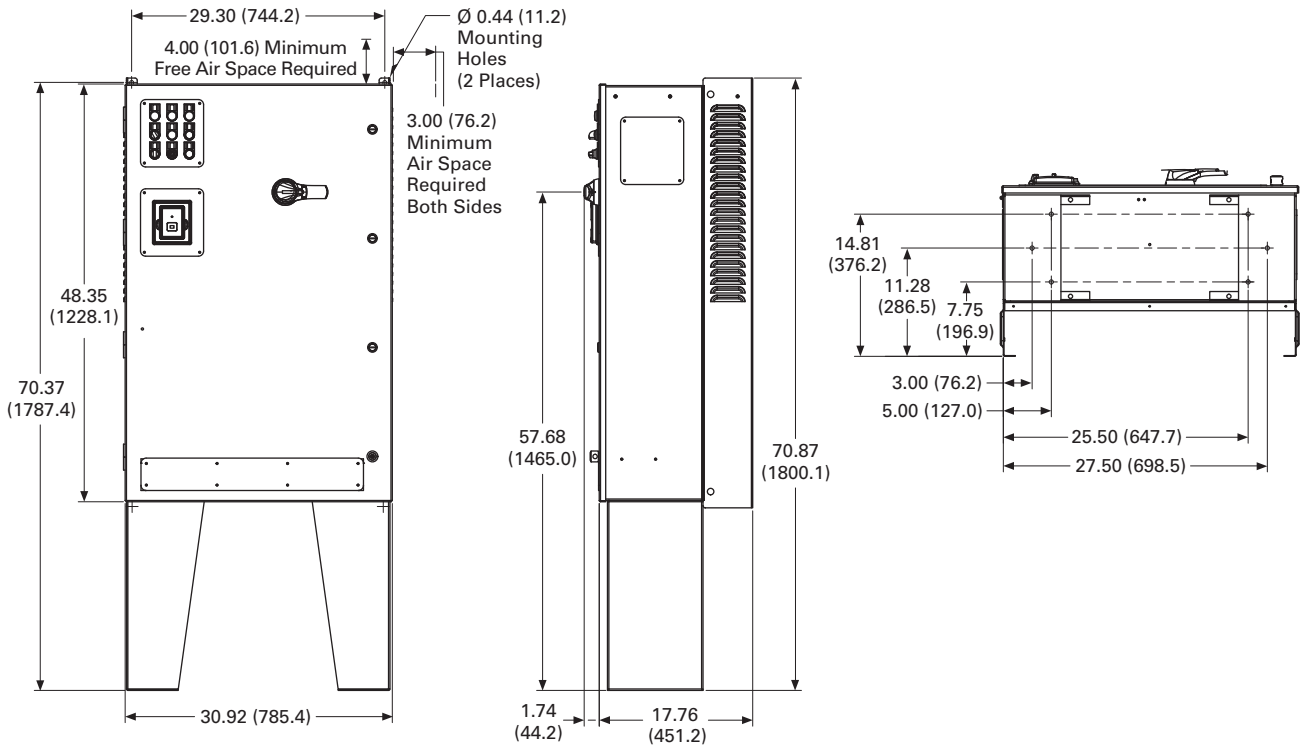
Approximate Dimensions in Inches (mm)

2

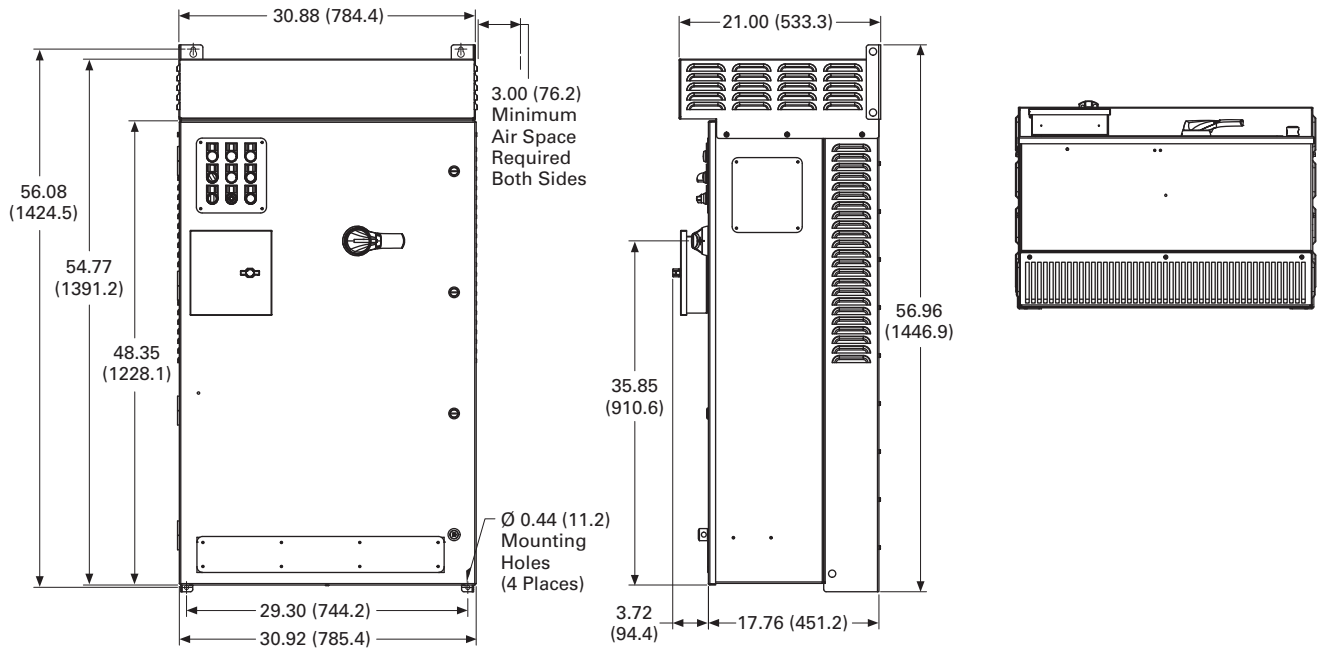
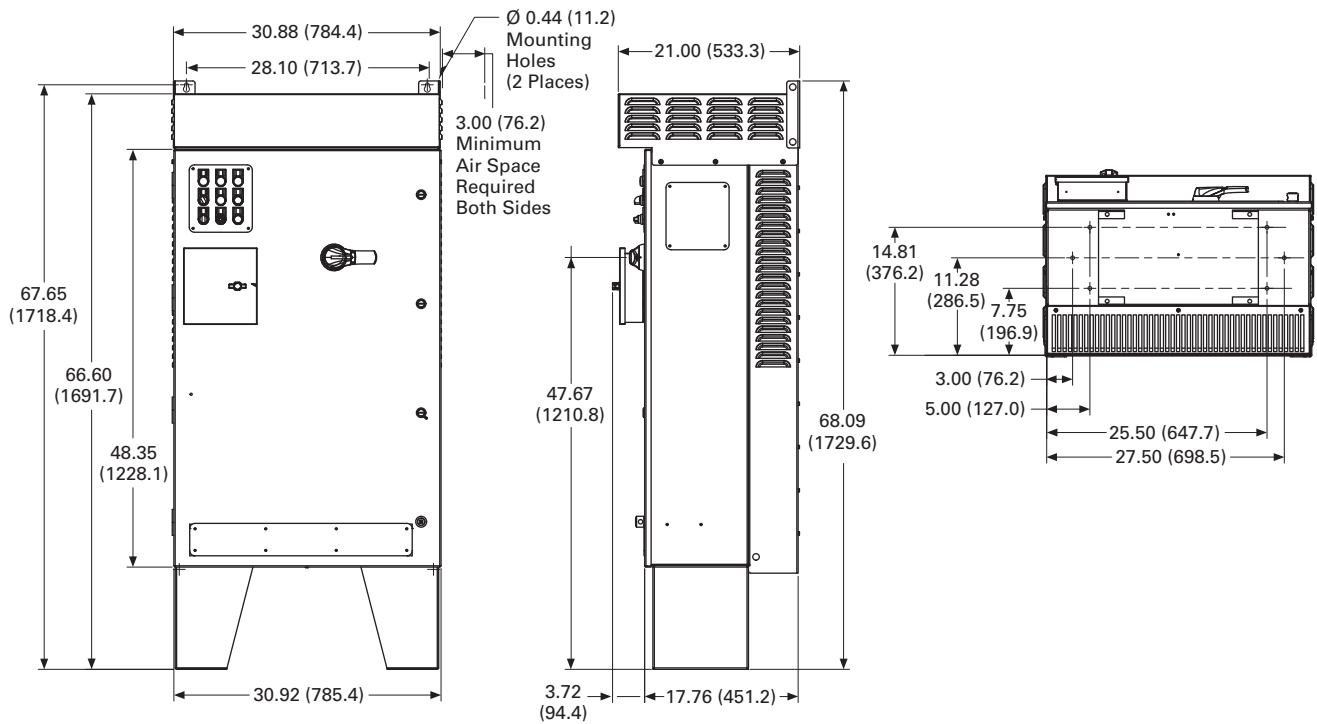
#### CX Box Type 12—12 Inch Floor Stands



#### CX Box Type 12—22 Inch Floor Stands



Approximate Dimensions in Inches (mm)

**CX Box Type 3R****CX Box Type 3R—12 Inch Floor Stands**

# 2.6

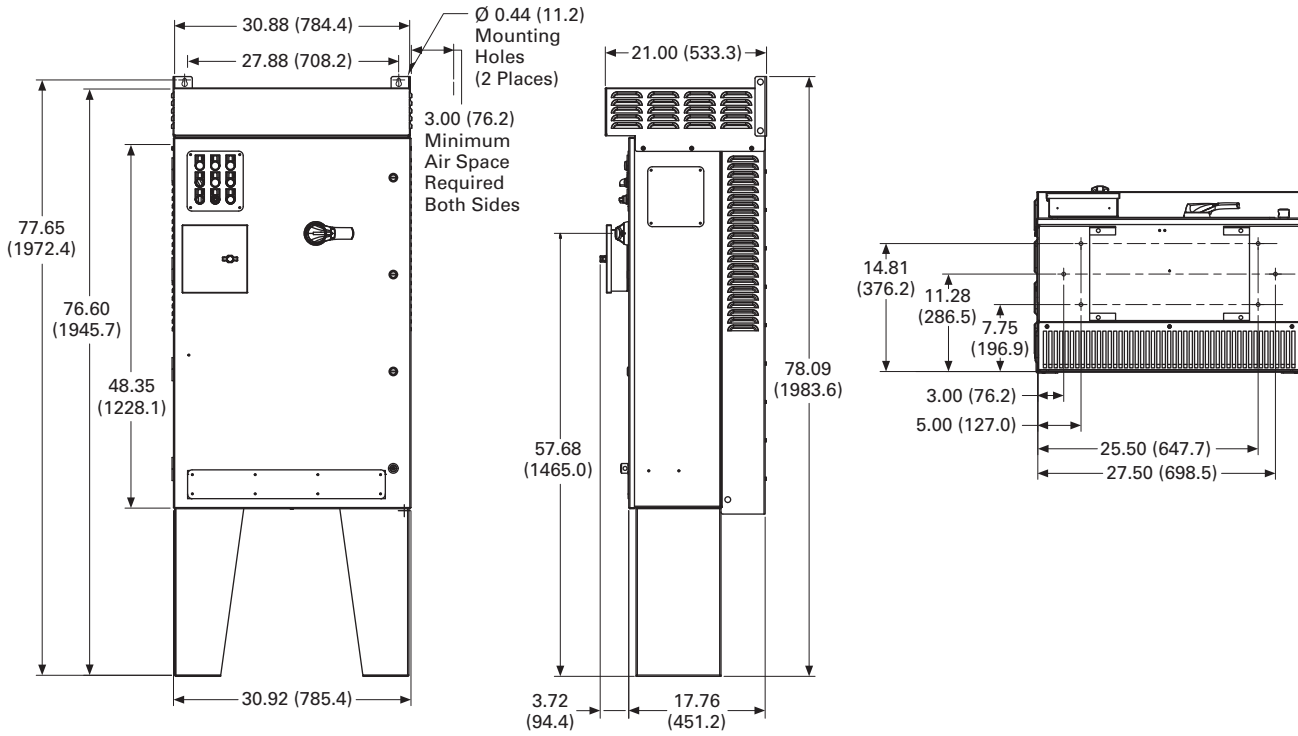
## Adjustable Frequency Drives

### PowerXL DG1 Series Drives

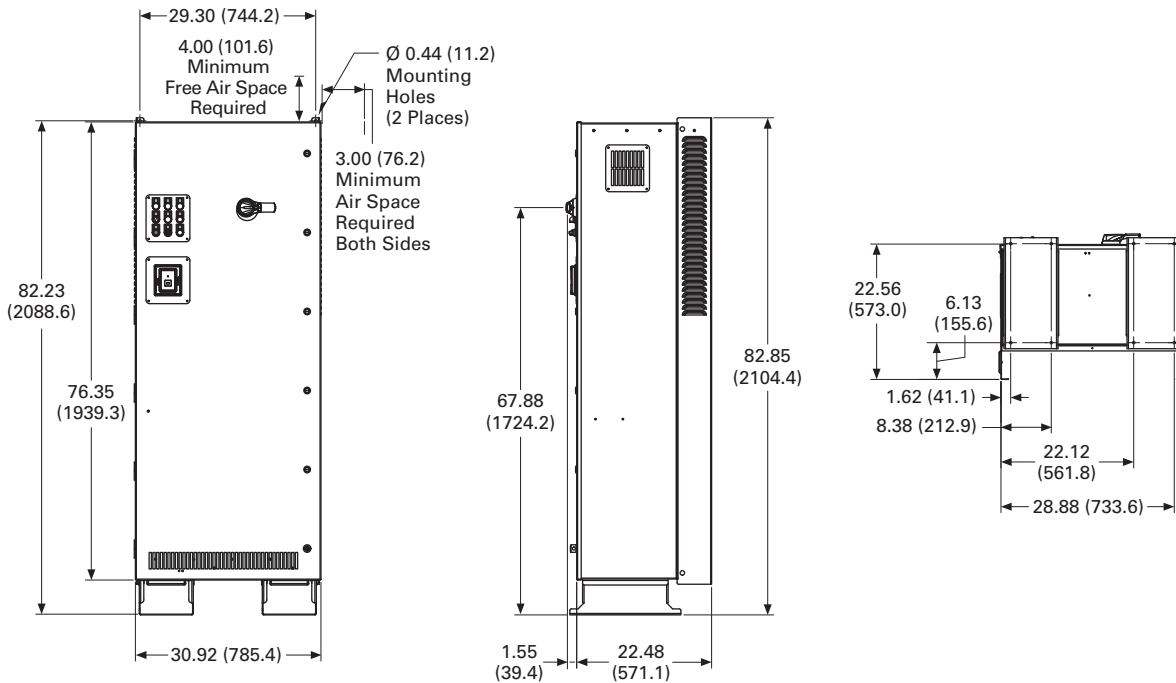
Approximate Dimensions in Inches (mm)

2

#### CX Box Type 3R—22 Inch Floor Stands

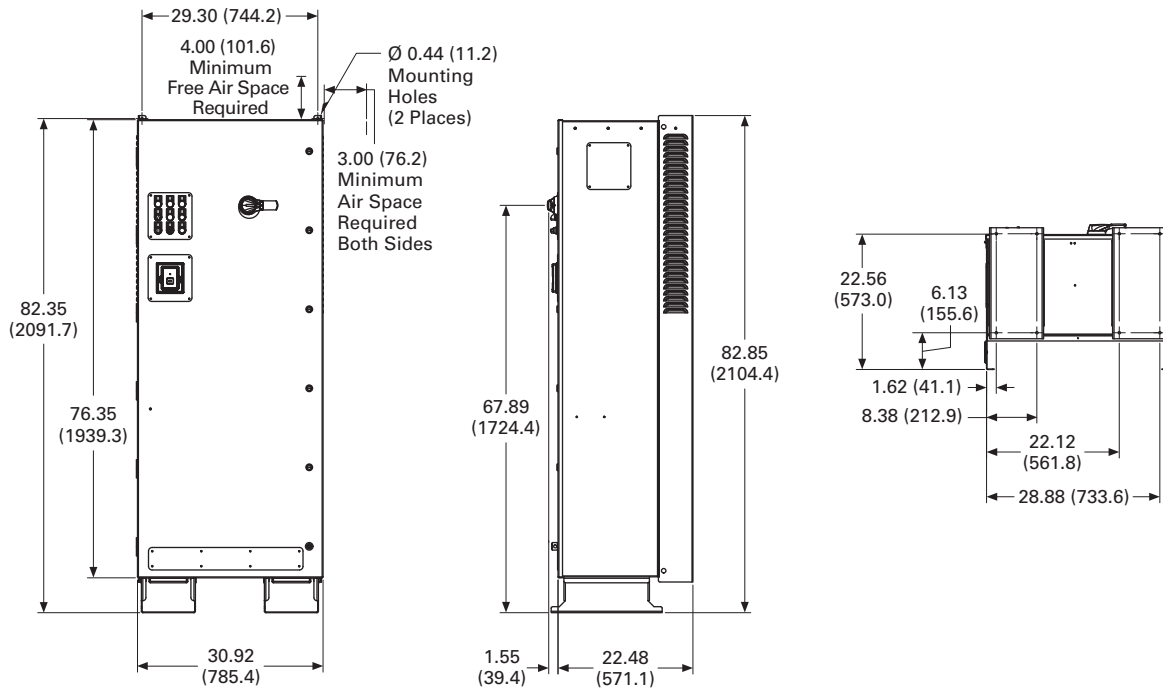


#### DX Box Type 1

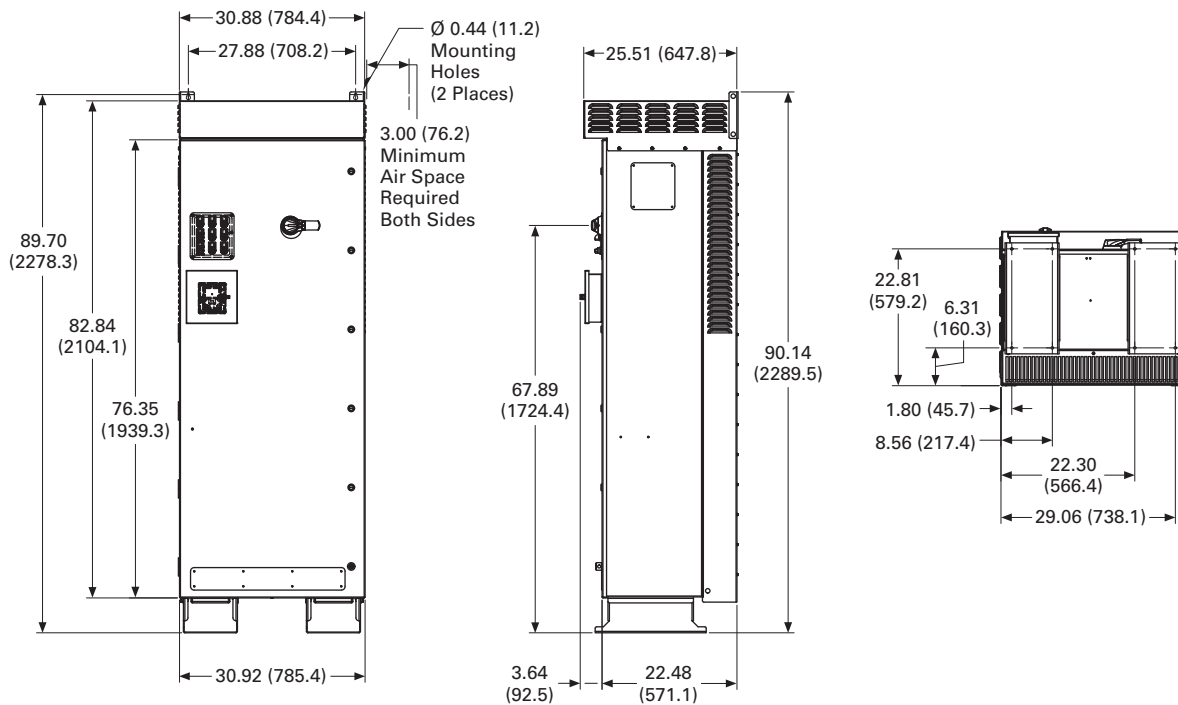


Approximate Dimensions in Inches (mm)

### DX Box Type 12



### DX Box Type 3R



The Eaton logo consists of the word "EATON" in a bold, blue, sans-serif font. The letter "O" is stylized as a white circle with a blue dot in the center, creating a visual effect of a power symbol or a stylized letter.

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## Eaton Drives Warranty & Commercial Exchange Policy - Supplement to Selling Policy 25-000

Eaton warrants to Buyer, subject to the limitations and conditions stated herein, that all new products shall be free from defects in material and workmanship and shall deliver their rated output as indicated on the nameplates.

### Drive Product Warranty

Drive Family	1 Year	2 Year	3 Year	4 Year	5 Year	6 Year
Micro Drives (DE1, DC1, DA1, MMX)	Standard	Standard	Not Available	Not Available	Not Available	Not Available
HVAC Drives (DH1 / HMX)	Standard	Standard	Certified 3	Extended 4	Extended 5	Consult Factory
Industrial Drives (DG1, SVX, SPX, LCX, RGX, EFG, EGS, CFX, CPX)	Standard	Standard	Certified 3	Extended 4	Extended 5	Consult Factory

### Standard Warranty

- 24 months from date of shipment from Eaton warehouse (open drives) or enclosed drive plant
- Covers parts or replacement drive after factory approval
- Labor and travel costs are not included
- Replacement parts or replacement drive carry 90 days or the remainder of the original warranty period
- Due to the special nature of the SVX, SPX Frame 10 and larger, this warranty shall not be applicable to these products unless start-up is performed by an Eaton Authorized Commissioning Agent. (**See Certified 3, Extended 4 and Extended 5 warranties**)
- This warranty policy does not cover failure or damage due to the following:
  - Storage, installation, operation, maintenance, or repaired or altered outside of the Eaton factory or by anyone other than an Eaton Certified Technician not in conformance with Eaton's recommendations (Reference Troubleshooting and Maintenance Document from After-market Web Site- [www.Eaton.com/Drives](http://www.Eaton.com/Drives) ) and industry standard practice
  - Due to accident, misuse, abuse or negligence.
  - If damage occurred by the shipping company contact [Eatoncargoclaims@expeditors.com](mailto:Eatoncargoclaims@expeditors.com) or call 1-800-706-5640
- See below for Eaton Warranty Claim Process

### Certified 3 – Extended 3 Year Warranty

- Reference the **Drive Product Warranty & Standard Warranty** above with the following additions:
  - Startup must be performed by an Eaton authorized commissioner (charges may apply)
  - To find an Eaton Authorized commissioner visit [www.Eaton.com/VFDAftermarket](http://www.Eaton.com/VFDAftermarket)
  - This warranty is no charge including parts, labor and travel (within the contiguous US)

### Extended 4 – Extended 4 Year Warranty

- This warranty includes the **Certified 3** Warranty with the following addition:
  - The Certified 4 has a net cost of 5% of the net price of the drive

### Extended 5 – Extended 5 Year Warranty

- This warranty includes the **Certified 3** Warranty with the following addition:
  - The Certified 5 has a net cost of 15% of the net price of the drive



## Warranty Claim Process

1. Required information prior to calling Drives TRC (Technical Resource Center):
  - a. Original Eaton GO# (general order number)
  - b. Catalog number
  - c. Serial number (For enclosed packages, the serial & general order numbers are on enclosure door)
  - d. Customer job site location
  - e. Job site contact information
  - f. Detailed description of the issue
  
2. Before warranty status can be confirmed, and parts and/or service provided, it is required to contact the Drives TRC for troubleshooting assistance, in order to determine if the problem is in the VFD, and eliminate possible external causes.
  - a. Call the TRC at 877.ETN.CARE (877.386.2273) Option 2, Option 6, Option 4. Please have the above information available during the call.
  - b. Send pictures and documentation if needed to: [TRCDrivesTechSupport@Eaton.com](mailto:TRCDrivesTechSupport@Eaton.com)
  
3. The TRC will help determine warranty status, and if parts, replacements, and/or service is needed, and will provide you with a SR (Service Request) Number.
  - a. Be sure to write down the TRC SR Number.
  
4. Warranty Claim Processing:
  - a. Parts Only: contact CORE (Center of Returns Excellence) at 800.410.2910 (or [CORE@eaton.com](mailto:CORE@eaton.com))
    - Return replaced components per the instructions provided on the return paperwork.
    - Parts are shipped standard freight. If expedited shipping is required please request.
  - b. Onsite Service Required: a CQM (Customer Quality Management) form must be filled out on "JOE" (for Eaton employees), or contact EatonCare at 877.ETN.CARE (386.2273) Option 4, Option 2, for CQM assistance.
    - See attached file "CQM FORM Rev. 10\_22\_2013.pdf" for the information which will be required. Be sure to include the TRC SR Number in the CQM form.
    - When entering a CQM in Joe (for Eaton employees) assign the CQM to "Watertown Warranty" ([TRCDrivesTechSupport@eaton.com](mailto:TRCDrivesTechSupport@eaton.com)). For non-Eaton employees, this will be taken care of by EatonCare as they assist you with the CQM process.
    - Upon receipt of the CQM, the Drives TRC / Aftermarket team will supply replacement material and authorize an EWARF to the local Eaton Services team (EESS) or ISP (Independent Service Provider) who will schedule the service work.
  
5. Returned parts will be evaluated by the Product Integrity Center (PIC) in Watertown, WI for warranty validation.

## Product Return Policy

- Returns must be coordinated through the original point of purchase.
- Return freight charges are at the customer's expense.
- No products shall be returned to Eaton's plant except in accordance with Eaton's prior written instructions.
- Items returned to Eaton without prior authorization, or without proper paperwork to identify the Returned material as an authorized return, will be returned to the Buyer at Buyer expense.
- Buyer shall return defective product or make available such defective product for Eaton's inspection at Buyer's place of business.
- Buyer is to return the defective item to Eaton within 30 days after the claim is authorized. If the defective item is not returned to Eaton within 30 days, if an exchange was shipped at no charge Buyer will be invoiced for the price of the replacement item at current purchase price levels.

- If it is determined that the returned item failed for reasons not covered by warranty (above in **Standard Warranty**) , the Buyer will be invoiced for the replacement item at current purchase price levels.
- To remedy a product defect, Eaton may, at its option, elect to repair, rebuild or replace the defective product using new or reconditioned parts or product. In this case, the repaired, rebuilt or replaced product shall be warranted hereunder for the unexpired portion of the original warranty period or 90 days from shipment of replacement product, whichever is longer.
- If the item returned is determined to be a non-warranty failure, the Buyer will be notified of the repair or replace options available.
- Returned product evaluation time frame
  - Goal of 10 days from date received
  - Repair timeframe is 2-8 weeks depending on parts availability
  - Non warranty returns will be shipped at distributors expense
  - Tracking information can be found in VISTA by using the repair/replacement GO number
  - If the claim is found to be non-warranty, the contact person has 30 days to provide additional information for review
  - If there is no response to the claim after 30 days on hold the part/drive will be returned as is, at the distributors expense and additional charges may apply

### **Warranty Limitations**

The foregoing warranty is exclusive except for warranties of title and against patent infringement. Eaton disclaims all other warranties including any implied warranties of merchantability and fitness for a particular purpose. Corrections on non-conformities in the manner and for the period of time provided above shall constitute Eaton's sole liability and Buyer's exclusive remedy for failure of Eaton to meet its warranty obligations, whether claims of the Buyer are based in contract, in tort (including negligence or strict liability) or otherwise.

### **Limitation of Liability**

The remedies of the Buyer set forth herein are exclusive and are its sole remedies for any failure of Eaton to comply with its obligations hereunder. In no event shall Eaton be liable in contract, in tort, (including negligence or strict liability) or otherwise for damage to property or equipment other than products sold hereunder, loss of profit or revenue, loss of use of products, cost of capital, claims of Eaton drives.

# **Commercial Exchange Policy**

## **Warranty Claim Types:**

CE - Commercial Exchange

CA - Corrective Action, Eaton mistake

RE - Return

    Type E – Exchange

    Type N – Non-warranty repair

    Type W- Warranty repair

WC – Warranty Credit

A commercial exchange (CE) return is for registered, stocked products with a valid Product ID. A CE return is product in inventory that needs to be returned for credit, which may include stock rotation, customer errors and overstock. For defective products that fall within the warranty eligibility period, a warranty claim (WC) return should be used.

For Open Drives to be eligible for a commercial return, they must be returned within 18 months of the original manufacturing date code as found on the packaging label. For Enclosed Drives, they must be returned within 12 months from shipment from Eaton as found on the General Order (GO) number. Product returned outside of this period will not be given credit and will be scrapped. See Table 1 for the level of credit that will be provided if returned in good working condition and in the original packaging.

**Table 1 – Condition Code / Credit Level:**

<b>Condition Code</b>	<b>Description</b>	<b>% of Credit</b>
N	Standard warehoused current product (part of stock rotation) *typically stocked open drive as found in Vista with status W	100%
O	Standard warehoused current product (not part of stock rotation) *typically stocked open drive as found in Vista with status W	90%
R	Standard non-warehoused current product *typically non-stocked open drive as found in Vista with status FP	80%
F	Non-standard product *typically enclosed drive assembly	20%
G	Damaged or used product	10%
M	Prearranged agreement	Prearranged
P	Standard warehoused current product requiring repacking *20% of invoiced price or \$50, whichever is less	

## **Enter the CE return:**

- Use Vistaline on the Web (VOTW) to enter a return. Required fields are Quantity, Product ID and Invoice Price for each item.
- Determine the condition of the products to be returned. The condition will determine the amount of credit to be given. See Table 1 for condition codes and definitions. Use Vista to confirm if a product is a stocked item or not. A stocked item in vista will have a W status.
- Determine if the return qualifies as a stock rotation return. This return waives the 10% restocking fee on standard products. If returning one or two items, you may want to include them in your next stock rotation return to optimize credit.

**Receive confirmation and authorization via email or fax:**

- Prior to packaging any product, check confirmation and authorization of the return, sent via email or fax after a return is entered via VOTW.
- Be aware that multiple return locations are possible. Shipping product to an incorrect return location will result in delays. Do not deduct any amount until the returned product is shipped, received by return location and evaluated, and the authorized credit memo is received.

**Prepare material for return shipment:**

- Prepare product for shipment per packing guidelines shown on this page. Include one packing slip per shippable unit (1 per box or pallet), ensuring that product is returned to the correct location.
- Remove all labels, stickers or markings not found on original packaging to optimize the credit. If the returned product requires repackaging, a 20% fee will be assessed with a maximum amount of \$50 per unit, whichever is smaller.
- Check returned product from customers for evidence of use or installation.
- For maximum credit, take photos of larger returns (>\$10,000) and send to W34ReturnCoreCustomerService@eaton.com with the Claim ID in the subject line. Alternatively, work with your Eaton Distributor Sales Representatives prior to shipping.
- Affix authorization paperwork with the Claim ID to each shippable unit, making copies as necessary.

**Receive credit memo and deduct:**

- An evaluation report will be emailed or faxed, indicating credit amount for the return within two weeks of shipping a return material if the process above is followed correctly.
- Once an evaluation report is sent, a credit memo will be issued within two to four business days in the amount shown on the evaluation report. A distributor is now able to deduct the authorized amount, referencing the credit memo number.

**Packing guidelines for return product:**

- Each shipment must include a packing list per each shippable unit (package or pallet).
- Affix authorization paperwork with Claim ID to each shippable unit, making copies as necessary; ensure that product is returned to the correct facility.
- If a shipment is greater than one pallet or carton, it must include a consolidated packing list (master list) on the last shippable unit. Maximum pallet load height (including pallet) of 38 inches (pallet shipments and bulk packs). Target pallet load weight of 1500 pounds with maximum weight limit of 2000 pounds.
- Pallet shipments to be stretch-wrapped or banded. Heavy product to be placed in bottom of carton and pallets. Lighter product to be placed on top of the heavier products.
- All loose items must be packaged with bubble wrap. All parcel cartons must use two layers of bubble wrap on the inside bottom of the carton to protect products from breakage.
- Do not use padded envelopes as a parts shipping container. Cardboard sheets should be used between pallet layers where applicable.
- Consolidate like styles and separate mixed styles to help facilitate breakdown and reduce errors
- Ranpak paper or other appropriate packaging material to be used for void fill and block-and-brace techniques where needed on pallets. Balance the weight evenly on the pallet to avoid excessive weight on one end. Never use damaged pallets with broken/missing boards or protruding nails that could cause a safety hazard.

## Drives Aftermarket Contacts

### Technical Resource Center (TRC)

- Contact TRC for trouble shooting issues prior to return
- Phone 800-322-4986,
- Email [TRCDrivesTechSupport@Eaton.com](mailto:TRCDrivesTechSupport@Eaton.com)

### Center of Return Excellence (CORE)

- Claim Creation
- Email [CORE@Eaton.com](mailto:CORE@Eaton.com)

### Aftermarket Support

- Customer support for Drives regarding Claim updates, status, etc.
- Email [VFDAftermarketeg@eaton.com](mailto:VFDAftermarketeg@eaton.com)
- TRC call is warranty consideration only; the unit still needs to be returned for evaluation of final warranty determination.
- Case/Call Log number must be referenced on the claim
- Regarding warranty claims, the GO number and the item number must be referenced
- Contact person on claim will receive any quotes and additional information
- Non Warranty Test and evaluation fees can be obtained by Contacting CORE or Aftermarket

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Printed in USA  
Publication No. TD040003EN  
December 2018

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# PowerXL DA1 and DC1 micro drive product families update

PowerXL DA1 and DC1 drives were launched in January 2014 and provide a fuller portfolio and unique solutions for MOEM applications. These micro drives have the capability and product positioning to be competitive with all drive manufacturers in the micro drive market.

## APPLICATIONS/INSTALLATIONS

- Conveyor motor control
- Pump control and protection
- Fan or air handling systems control
- Permanent magnet motor control
- Standard low horsepower motor frequency control

## MARKETS

- |   |  |
|---|--|
| <input type="checkbox"/> Alternative energy           | <input checked="" type="checkbox"/> Industrial and manufacturing |
| <input type="checkbox"/> Commercial construction      | <input type="checkbox"/> Infrastructure                          |
| <input type="checkbox"/> Data centers                 | <input checked="" type="checkbox"/> Machine building             |
| <input type="checkbox"/> Education                    | <input type="checkbox"/> Mineral and mining                      |
| <input type="checkbox"/> Electric utilities           | <input type="checkbox"/> Oil and gas                             |
| <input type="checkbox"/> Electronics                  | <input checked="" type="checkbox"/> Pulp and paper               |
| <input checked="" type="checkbox"/> Food and beverage | <input type="checkbox"/> Residential construction                |
| <input type="checkbox"/> Government                   | <input type="checkbox"/> Transportation                          |
| <input type="checkbox"/> Health care                  | <input checked="" type="checkbox"/> Water/wastewater             |

## TYPICAL CUSTOMERS

- |  |  |
|--|--|
| • Conveyor integrators and manufacturers | • Corrugated and paper system manufacturers                        |
| • Panel builders and integrators         | • Any customer who requires speed controls of a motor, pump or fan |
| • Fan, pump and compressor OEMs          |  |

## TARGET REGIONS AND COUNTRIES

### Regions

- Americas
- EMEA
- APAC

### Countries

- United States, Canada, Mexico, Brazil, Colombia
- Germany, UK, Netherlands, others

## Key features and benefits

Feature	Benefit
SmartWire-DT™ connectivity	All SmartWire-DT benefits, including reduction of panel space and wiring, installation and troubleshooting times
Easy menu navigation	Easy-to-navigate parameters allow for quick configuration and diagnostics
drivesConnect PC Tool	Unique Bluetooth module simplifies commissioning and diagnostics using the data logger and monitoring functionality with the PC Tool
STO SIL 2 function	Safe Torque Off allows the device to be used in SIL 2 rated safety applications
PM motor capability	Provides higher efficiency corresponding to the permanent magnet motor
Single-phase motor capability	Unique applications that require speed control of single-phase motors
IP66 option	Reduces material and labor costs for mounting a separate enclosure, disconnect, keypad and potentiometer



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## HOW TO FIND BUSINESS

### What to look for

- Belt conveyor systems OEMs looking for a drive with small side clearances
- Integrators needing remotely mounted drives with local controls and means of disconnect
- Applications using permanent magnet (PM) motors requiring rated devices with special software parameters
- MOEMs looking to replace an across-the-line starter with a simplified frequency controller

### How we address key business challenges

- RJ45 daisy-chain feature allows for one remote mount keypad that views/controls multiple drives
- Programmable digital and analog inputs allow for I/O count changes due to application tweaks
- The Copy/Paste Bluetooth module saves startup time by allowing the customer to program similar drive parameters
- An IP66 rated drive with integrated disconnect and control can save the customer money, time and space compared to mounting these required devices separately

### Customer reaction

Reaction	Reply
Are the DC1 and DA1 rated for constant or variable torque?	They are rated for constant torque, but they can be de-rated for variable torque application with a few parameter settings to optimize performance.
Do these drives have a PID loop?	The DA1 has PID loop while the DC1 only has PI loop.
What does IP66 correlate to in NEMA ratings?	IP66 = NEMA 4: protection from dust, oil and non-corrosive materials and protection from water, even powerful jets.
Can I expand the communications on the DC1?	No, if the applications require anything more than Modbus RTU and CANopen, it will require the DA1.

### Important questions

- What are the current and voltage ratings of your application and how many input and output phases?
- Are you using a permanent magnet motor?
- What kind of communication protocol is required?
- Do you require an RFI filter for incoming line noise?
- How is the motor, pump, fan, etc. being controlled currently? Where is it mounted?

### Key selling points

- The PowerXL drives have Modbus® RTU and CANopen native as standard. The DA1 has options for EtherNet/IP, EtherCAT, DeviceNet,™ PROFIBUS, ProfiNET, Modbus TCP and BACnet
- The DA1 includes an integrated RFI filter as standard and the DC1 has this as an option
- Easy menu navigation with 14 basic parameters allows for speedy startup
- Small size footprint and side-by-side mounting allow for small cabinets while still maintaining efficient heat dissipation

### Competitive summary

Company	Equivalent product	Comparison
Rockwell	PowerFlex 40, PowerFlex 525	DC1 is comparable to PowerFlex 40. DA1 is comparable to PowerFlex 525. PowerFlex 525 has EtherNet/IP on board, but DC1 is competitive on size and price.
ABB	ACS55, ACS150, ACS355	DC1 is equivalent to ACS55 and ACS150 in size, pricing and capabilities. ACS355 can control single-phase motors, has a PM motor and is IP66 rated, but DA1 can handle hard torque ratings.
Schneider	ATV12, ATV312, ATV32	DC1 is comparable to ATV12 but smaller with higher capabilities. ATV312 and ATV32 have capabilities in-between the DC1 and DA1 and include optional communication modules, but do not include a PM motor offering and are not IP66 rated.

## COMPLEMENTARY PRODUCTS

- SmartWire-DT
- M22 line of products
- Safety relay (ES4P)
- E-stop (M22 or 10250T)
- FAZ circuit breakers
- Series C® circuit breakers
- Series G® circuit breakers

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Printed in USA  
Publication No. SB040001EN / Z15161  
April 2014



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## ADDITIONAL SALES RESOURCES

- PA040003EN: PowerXL DC1 Product Aid
- PA039001EN: PowerXL DA1 Product Aid
- CC039002EN: Competitive Comparison
- BR040002EN: Eaton Variable Frequency Drive Product Overview
- drivesConnect: Software downloadable on Eaton DC1 and DA1 webpages

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