

H-Max Drives

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H-Max Drives

Product Description

Eaton's H-Max Series VFD has software and hardware designed specifically for the HVAC, pump industry. The ultra-efficient DC capacitor and power structure allows the drive to consume less energy, lowering greenhouse gases.

The I/O configuration is designed with wiring ergonomics in mind by including removable terminal blocks. The main, easily removable, control board used for all drive frames with six digital IN, two analog IN, one analog OUT, three relay OUT accepts two additional I/O or communication board. In addition, the control board has built-in RS-485 and Ethernet communication.

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

In addition to the Active Energy Control Algorithm to maximize motor efficiency, the drive boasts an ultra-efficient DC capacitor and power structure to allow less energy consumption, lowering greenhouse gases.

Features and Benefits

Hardware

- Thin metal capacitor design—ultra-efficient drive operation and extended self life (up to five years without reforming)
- Integrated 5% DC link choke with Input surge protection—protects against voltage spikes and provides a clean wave form to the motor
- EMI/RFI filters standard on all drives—meets EMC Category 2 for commercial applications
- Real-time clock—supports calendaring and time stamped fault history
- Graphic LCD display and keypad—supports simple menu navigation as well as on-screen diagnostics and troubleshooting
- HAND-OFF-AUTO and drive-bypass selector on keypad—simplifies control
- Standard I/O: 6DI, 2AI, 1AO, 2 Form C RO (NO/NC), 1 Form A RO (NO)—supports requirements for most installations

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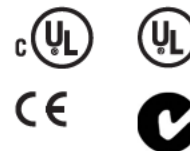
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Standards and Certifications

Product

- IEC 61800-5-1
- CE
- UL508C
- cUL
- C-Tick Mark
- OSHPD Seismic Certified
- Plenum Rated



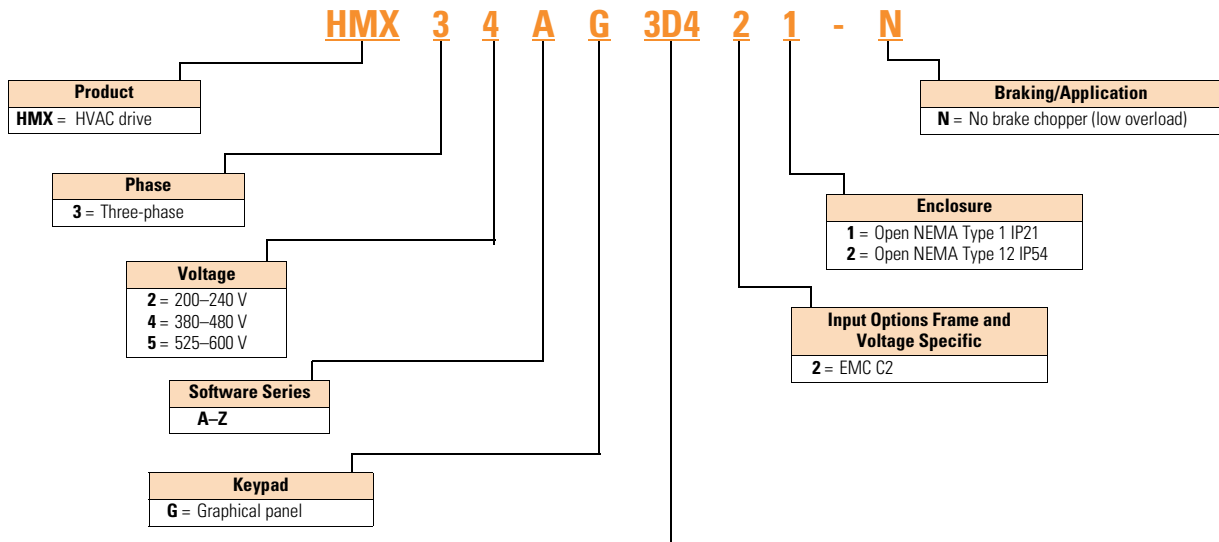
- Onboard RS 485: Modbus, N2, BACnet—meets needs of most communication requirements
- Onboard Ethernet: BACnet/IP, Modbus/TCP—meets needs of most communication requirements
- Two expansion slots—intended to support additional I/O or communication protocols as necessary
- Quick disconnect terminals for I/O connections—supports fast easy installation

Software

- Active energy control—minimizes energy losses in your motor resulting in industry leading energy efficiency for your application
- Quick Start Wizard upon initial power up—supports fast easy installation
- Copy/paste functionality on drive keypad—allows for fast setup of multiple drives
- Pre-programmed I/O—supports fast easy installation for most applications

Catalog Number Selection

H-Max Series Drives



Amperes		
200–240 Volts	380–480 Volts	525–600 Volts
3D7 = 3.7 A–0.75 hp, 0.55 kW	3D4 = 3.4 A–1.5 hp, 1.1 kW	3D9 = 3.9 A, 3 hp, 2.2 kW
4D8 = 4.8 A–1 hp, 0.75 kW	4D8 = 4.8–2 hp, 1.5 kW	6D1 = 6.1 A, 5 hp, 3.7 kW
6D6 = 6.6 A–1.5 hp, 1.1 kW	5D6 = 5.6 A–3 hp, 2.2 kW	9D0 = 9 A, 7.5 hp, 5.5 kW
8D0 = 8 A–2 hp, 1.5 kW	8D0 = 8 A–4 hp, 3 kW	011 = 11 A, 10 hp, 7.5 kW
011 = 11 A–3 hp, 2.2 kW	9D6 = 9.6 A–5 hp, 4 kW	018 = 18 A, 15 hp, 11 kW
012 = 12 A–4 hp, 3 kW	012 = 12 A–7.5 hp, 5.5 kW	022 = 22 A, 20 hp, 15 kW
018 = 18 A–5 hp, 4 kW	016 = 16 A–10 hp, 7.5 kW	027 = 27 A, 25 hp, 18 kW
024 = 24 A–7.5 hp, 5.5 kW	023 = 23 A–15 hp, 11 kW	034 = 34 A, 30 hp, 22 kW
031 = 31 A–10 hp, 7.5 kW	031 = 31 A–20 hp, 15 kW	041 = 41 A, 40 hp, 30 kW
048 = 48 A–15 hp, 11 kW	038 = 38 A–25 hp, 18.5 kW	052 = 52 A, 50 hp, 37 kW
062 = 62 A–20 hp, 15 kW	046 = 46 A–30 hp, 22 kW	062 = 62 A, 60 hp, 45 kW
075 = 75 A–25 hp, 18.5 kW	061 = 61 A–40 hp, 30 kW	080 = 80 A, 75 hp, 55 kW
088 = 88 A–30 hp, 22 kW	072 = 72 A–50 hp, 37 kW	100 = 100 A, 100 hp, 75 kW
105 = 105 A–40 hp, 30 kW	087 = 87 A–60 hp, 45 kW	125 = 125 A, 125 hp, 90 kW
140 = 140 A–50 hp, 37 kW	105 = 105 A–75 hp, 55 kW	144 = 144 A, 150 hp, 110 kW
170 = 170 A–60 hp, 45 kW	140 = 140 A–100 hp, 75 kW	208 = 208 A, 200 hp, 160 kW
205 = 205 A–75 hp, 55 kW	170 = 170 A–125 hp, 90 kW	
261 = 261 A–100 hp, 75 kW	205 = 205 A–150 hp, 110 kW	
310 = 310 A–125 hp, 90 kW	261 = 261 A–200 hp, 132 kW	
	310 = 310 A–250 hp, 160 kW	

Notes

All boards are varnished (conformed coated). Corrosion resistant.

Battery included in all drives for real-time clock.

Keypad kit includes HOA bypass.

Keypad kit includes HOA, back reset for Europe application.

EMI/RFI filters included.

DC link choke included.

Product Selection

H-Max Series Drives—230 Vac

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NEMA Type 1



NEMA Type 1/IP21

FS Frame Size	Drive Output Current		Assigned Motor Ratings			Catalog Number
	Low Overload Full Load Amps at 40 °C	Horsepower	Drive kW 230 Vac/50 Hz	230 Vac NEC Amps ①	Low Overload Full Load Amps at 50 °C	
4	3.7	0.75	0.55	3.2	2.6	HMX32AG3D721-N
	4.8	1	0.75	4.2	3.7	HMX32AG4D821-N
	6.6	1.5	1.1	6.6	4.8	HMX32AG6D621-N
	8	2	1.5	6.8	6.6	HMX32AG8D021-N
	11	3	2.2	9.6	8	HMX32AG01121-N
	12.5	4	3	N/A	11	HMX32AG01221-N
5	18	5	4	15.2	12.5	HMX32AG01821-N
	24	7.5	5.5	22	18	HMX32AG02421-N
	31	10	7.5	28	24	HMX32AG03121-N
6	48	15	11	42	31	HMX32AG04821-N
	62	20	15	54	48	HMX32AG06221-N
7	75	25	18.5	68	62	HMX32AG07521-N
	88	30	22	80	75	HMX32AG08821-N
	105	40	30	104	88	HMX32AG10521-N
8	140	50	37	130	105	HMX32AG14021-N
	170	60	45	154	140	HMX32AG17021-N
	205	75	55	192	170	HMX32AG20521-N
9	261	100	75	248	205	HMX32AG26121-N
	310	125	90	N/A	261	HMX32AG31021-N

NEMA Type 12



NEMA Type 12/IP54

FS Frame Size	Drive Output Current		Assigned Motor Ratings			Catalog Number
	Low Overload Full Load Amps at 40 °C	Horsepower	Drive kW 230 Vac/50 Hz	230 Vac NEC Amps ①	Low Overload Full Load Amps at 50 °C	
4	3.7	0.75	0.55	3.2	2.6	HMX32AG3D722-N
	4.8	1	0.75	4.2	3.7	HMX32AG4D822-N
	6.6	1.5	1.1	6.6	4.8	HMX32AG6D622-N
	8	2	1.5	6.8	6.6	HMX32AG8D022-N
	11	3	2.2	9.6	8	HMX32AG01122-N
	12.5	4	3	N/A	11	HMX32AG01222-N
5	18	5	4	15.2	12	HMX32AG01822-N
	24	7.5	5.5	22	18	HMX32AG02422-N
	31	10	7.5	28	24	HMX32AG03122-N
6	48	15	11	42	31	HMX32AG04822-N
	62	20	15	54	48	HMX32AG06222-N
7	75	25	18.5	68	62	HMX32AG07522-N
	88	30	22	80	75	HMX32AG08822-N
	105	40	30	104	88	HMX32AG10522-N
8	140	50	37	130	105	HMX32AG14022-N
	170	60	45	154	140	HMX32AG17022-N
	205	75	55	192	170	HMX32AG20522-N
9	261	100	75	248	205	HMX32AG26122-N
	310	125	90	N/A	261	HMX32AG31022-N

Note

① For sizing reference.

H-Max Series Drives—480 Vac

NEMA Type 1



NEMA Type 1/IP21

FS Frame Size	Drive Output Current		Assigned Motor Ratings			Catalog Number
	Low Overload Full Load Amps at 40 °C	Horsepower	Drive kW 400 Vac/50 Hz	480 Vac NEC Amps ①	Low Overload Full Load Amps at 50 °C	
4	3.4	1.5	1.1	2.1	2.6	HMX34AG3D421-N
	4.8	2	1.5	3.4	3.4	HMX34AG4D821-N
	5.6	3	2.2	5.6	4.8	HMX34AG5D621-N
	8.0	4	3.0	N/A	5.6	HMX34AG8D021-N
	9.6	5	4	7.6	8	HMX34AG9D621-N
5	12	7.5	5.5	11	9.6	HMX34AG01221-N
	16	10	7.5	14	12	HMX34AG01621-N
	23	15	11	21	16	HMX34AG02321-N
6	31	20	15	27	23	HMX34AG03121-N
	38	25	18.5	34	31	HMX34AG03821-N
	46	30	22	40	38	HMX34AG04621-N
7	61	40	30	52	46	HMX34AG06121-N
	72	50	37	65	61	HMX34AG07221-N
	87	60	45	77	72	HMX34AG08721-N
8	105	75	55	96	87	HMX34AG10521-N
	140	100	75	124	105	HMX34AG14021-N
	170	125	90	156	140	HMX34AG17021-N
9	205	150	110	180	170	HMX34AG20521-N
	261	200	132	240	205	HMX34AG26121-N
	310	250	160	302	261	HMX34AG31021-N

NEMA Type 12



NEMA Type 12/IP54

FS Frame Size	Drive Output Current		Assigned Motor Ratings			Catalog Number
	Low Overload Full Load Amps at 40 °C	Horsepower	Drive kW 400 Vac/50 Hz	480 Vac NEC Amps ①	Low Overload Full Load Amps at 50 °C	
4	3.4	1.5	1.1	2.1	2.6	HMX34AG3D422-N
	4.8	2	1.5	3.4	3.4	HMX34AG4D822-N
	5.6	3	2.2	5.6	4.8	HMX34AG5D622-N
	8.0	4	3.0	N/A	5.6	HMX34AG8D022-N
	9.6	5	4	7.6	8	HMX34AG9D622-N
5	12	7.5	5.5	11	9.6	HMX34AG01222-N
	16	10	7.5	14	12	HMX34AG01622-N
	23	15	11	21	16	HMX34AG02322-N
6	31	20	15	27	23	HMX34AG03122-N
	38	25	18.5	34	31	HMX34AG03822-N
	46	30	22	40	38	HMX34AG04622-N
7	61	40	30	52	46	HMX34AG06122-N
	72	50	37	65	61	HMX34AG07222-N
	87	60	45	77	72	HMX34AG08722-N
8	105	75	55	96	87	HMX34AG10522-N
	140	100	75	124	105	HMX34AG14022-N
	170	125	90	156	140	HMX34AG17022-N
9	205	150	110	180	170	HMX34AG20522-N
	261	200	132	240	205	HMX34AG26122-N
	310	250	160	302	261	HMX34AG31022-N

Note

① For sizing reference.

H-Max Series Drives—600 Vac

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NEMA Type 1



NEMA Type 1/IP21

FS Frame Size	Drive Output Current		Assigned Motor Ratings			Catalog Number
	Low Overload Full Load Amps at 40 °C	Horsepower	Drive kW 575 Vac/50 Hz	575 Vac NEC Amps ①	Low Overload Full Load Amps at 50 °C	
5	3.9	3	2.2	4.6	3.3	HMX35AG3D921-N
	6.1	5	3.7	6.8	5.2	HMX35AG6D121-N
	9	7.5	5.5	9	7.7	HMX35AG9D021-N
	11	10	7.5	10.5	9.4	HMX35AG01121-N
6	18	15	11	19.9	15.3	HMX35AG01821-N
	22	20	15	23.3	18.7	HMX35AG02221-N
	27	25	18	27.2	23	HMX35AG02721-N
	34	30	22	32.8	28.9	HMX35AG03421-N
7	41	40	30	45.3	34.9	HMX35AG04121-N
	52	50	37	53.8	44.2	HMX35AG05221-N
	62	60	45	62.2	52.7	HMX35AG06221-N
8	80	75	55	90	68	HMX35AG08021-N
	100	100	75	106	85	HMX35AG10021-N
	125	125	90	127	106.3	HMX35AG12521-N
9	144	150	110	156	122.4	HMX35AG14421-N
	208	200	160	212	176.8	HMX35AG20821-N

NEMA Type 12



NEMA Type 12/IP54

FS Frame Size	Drive Output Current		Assigned Motor Ratings			Catalog Number
	Low Overload Full Load Amps at 40 °C	Horsepower	Drive kW 575 Vac/50 Hz	575 Vac NEC Amps ①	Low Overload Full Load Amps at 50 °C	
5	3.9	3	2.2	4.6	3.3	HMX35AG3D922-N
	6.1	5	3.7	6.8	5.2	HMX35AG6D122-N
	9	7.5	5.5	9	7.7	HMX35AG9D022-N
	11	10	7.5	10.5	9.4	HMX35AG01122-N
6	18	15	11	19.9	15.3	HMX35AG01822-N
	22	20	15	23.3	18.7	HMX35AG02222-N
	27	25	18	27.2	23	HMX35AG02722-N
	34	30	22	32.8	28.9	HMX35AG03422-N
7	41	40	30	45.3	34.9	HMX35AG04122-N
	52	50	37	53.8	44.2	HMX35AG05222-N
	62	60	45	62.2	52.7	HMX35AG06222-N
8	80	75	55	90	68	HMX35AG08022-N
	100	100	75	106	85	HMX35AG10022-N
	125	125	90	127	106.3	HMX35AG12522-N
9	144	150	110	156	122.4	HMX35AG14422-N
	208	200	160	212	176.8	HMX35AG20822-N

Note

① For sizing reference.

Onboard Network Communications**Johnson Controls Metasys N2**

H-Max Series provides communication between the drive and a Johnson Controls Metasys™ N2 network. With this connection, the drive can be controlled, monitored and programmed from the Metasys system. N2 can be selected and programmed by the drive keypad.

BACnet

H-Max Series provides communication to BACnet networks. Data transfer is master-slave/token passing (MS/TP) RS-485.

BACnet/IP

100Base-T interface.

Modbus TCP

Ethernet based protocol.

Modbus RTU

H-Max Series provides communication to Modbus RTU RS-485 as a slave on a Modbus network. Other communication parameters include an address range from 1–247; a parity of None, Odd or Even; and the stop bit is 1.

H-Max Series Option Board Kits Available for Slot B

The factory issued relay option board can be replaced with the following option

boards to customize the drive for your application needs.

The standard board provides 2 Form C RO (NO/NC) and 1 Form A RO (NO).

Option Boards Mounted in Slot B

Option Kit Description	Option Kit Catalog Number
I/O expander card, 2 RO and thermistor input	Relay Board 2

H-Max Series Option Board Kits Available for Slots D and E

The H-Max Series 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 option boards.

The H-Max Series factory-installed standard board configuration includes an I/O board and a relay output board.

Option Boards Mounted in Slots D and E

Option Kit Description	Option Kit Catalog Number
6 x DI /DO, each digital input can be individually programmed as digital output	XXM-IO-B1-A
1RO Form C (NO/NC), 1RO Form A (NO), 1 thermistor	XXM-IO-B2-A
1 x AI, 2 x AO (isolated)	XXM-IO-B4-A
3 x RO Form A (NO)	XXM-IO-B5-A
1RO Form A (NO), 5DI 42–240 Vac input	XXM-IO-B9-A
1 x AO, 1 x DO, 1 x RO	XXM-IO-BF-A
LonWorks®	XXM-COM-C4-A

NEMA Type 1 to NEMA Type 12/IP54 Conversion Kit

The NEMA Type 12/IP54 option kit is used to convert a NEMA Type 1 to a NEMA Type 12 drive.

Kit consists of a drive cover, fan kit and plugs.

NEMA Type 12/IP54 Cover

Option Kit Description	Option Kit Catalog Number
FS4-branded N12/IP54 cover with gasket, plastic plug, fans, Eaton logos	FS4-N12KIT
FS5-branded N12/IP54 cover with gasket, plastic plug, fans, Eaton logos	FS5-N12KIT
FS6-branded N12/IP54 cover with gasket, plastic plug, fans, Eaton logos	FS6-N12KIT

Accessories

Flange Kits

The flange kit is used when the power section heat sink is mounted through the back panel of an enclosure.

Flange Kit NEMA Type 12/IP54

Includes flange, mounting brackets, NEMA Type 12 fan components, air shroud screws and plugs.

Frames FS4–FS7 ^{①②}

Description	Catalog Number
NEMA Type 12/IP54	
FS4 N12/IP54 flange kit (mounting N1 drive into N12 enclosure)	FS4-Flange-N12KIT
FS5 N12/IP54 flange kit (mounting N1 drive into N12 enclosure)	FS5-Flange-N12KIT
FS6 N12/IP54 flange kit (mounting N1 drive into N12 enclosure)	FS6-Flange-N12KIT
FS7 N12/IP54 flange kit (mounting N1 drive into N12 enclosure)	FS7-Flange-N12KIT

Keypad Accessories

Remote Mounting Keypad Kit

Frames FS4–FS9

Description	Catalog Number
Remote mounting keypad kit—bezel and cable	OPTRMT-BP-HMAX-WLABL

Drive Demo

H-Max Series Drive Demo

Demos and Power Supply

Description	Catalog Number
H-Max Series bypass demo	H-MAX-BYPASS-DEMO
Hand-held 24 V auxiliary power supply—used to supply power to the control module in order to perform keypad programming before the drive is connected to line voltage	9000XAUX24 V

Notes

- ① For installation of a NEMA Type 1 drive into a NEMA Type 12 oversized enclosure.
- ② Frame size 8 and 9 must be ordered from the factory as a flange mount unit.

Replacement Parts

Control Board/Keypad

Description	Current Catalog Number
H-Max series graphic bypass, HOA	KeypadbypassHOA
H-Max series graphic back, HOA	KeypadbackHOA
H-Max control board replacement	HMX-SPR-CTRLBOARD

PC Cable

Description	Catalog Number
Remote download USB to RJ-45 cable with software driver disk	REM-USB-Down

Replacement Relay Board in Slot B

Description	Catalog Number
Replacement relay board qty 2 Form C relay, qty 1 Form A relay	Relay board 1

Main Fan

Description	Catalog Number
FS4 main fan	FS4-Main Fan
FS5 main fan	FS5-Main Fan
FS6 main fan	FS6-Main Fan
FS7 main fan	FS7-Main Fan
FS8 main fan	FS8-Main Fan
FS9 main fan	FS9-Main Fan

Internal Fan

Description	Catalog Number
FS4 internal fan (IP54/NEMA 12)	FS4-Internal Fan
FS5 internal fan (IP54/NEMA 12)	FS5-Internal Fan
FS6 internal fan (IP54/NEMA 12)	FS6-Internal Fan
FS7 internal fan (IP54/NEMA 12)	FS7-Internal Fan
FS8 internal fan (IP54/NEMA 12)	FS8-Internal Fan
FS9 internal fan (IP54/NEMA 12)	FS9-Internal Fan

Line and Load Reactors

A line and load reactor is a three-phase inductance filter that can be placed on the line and load side of the AFD to help improve the harmonic performance of the system. Consult the factory for additional filtering options and further technical details.

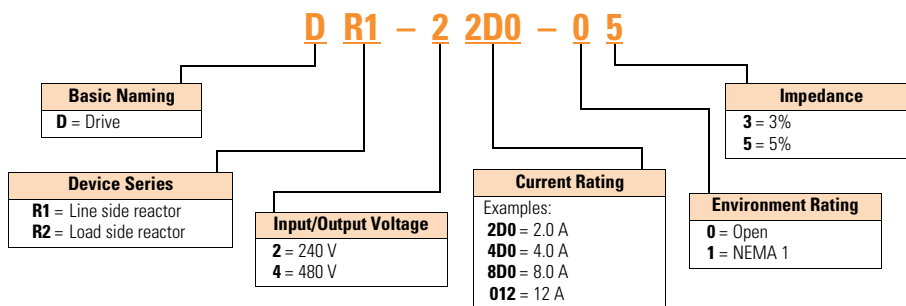
DR1 Line Reactor

A line reactor helps to provide a moderate reduction in current harmonics similar to a DC choke. It also provides increased input protection for AFD and its semiconductors from line transients helping to extend the life of the AFD.

DR2 Output Reactor

An output filter is used to reduce the transient voltage (dV/dt) at the motor terminals. The output filter is recommended for cable lengths exceeding 100 ft (30 m) with a drive of 3 hp and above and for cable lengths of 33 ft (10 m) with a drive of 2 hp and below.

Line and Load Reactors—Catalog Number Selection



Line and Load Reactors—240 V

hp (VT)	Open Load Reactor		Line Reactor		NEMA 1 Load Reactor		Line Reactor	
	3%	5%	3%	5%	3%	5%	3%	5%
0.75	DR2-24D0-03	DR2-24D0-05	DR1-23D2-03	DR1-23D2-05	DR2-24D0-13	DR2-24D0-15	DR1-23D2-13	DR1-23D2-15
1	DR2-24D0-03	DR2-28D0-05	DR1-24D2-03	DR1-24D2-05	DR2-24D0-13	DR2-28D0-15	DR1-24D2-13	DR1-24D2-15
1.5	DR2-28D0-03	DR2-28D0-05	DR1-26D0-03	DR1-26D0-05	DR2-28D0-13	DR2-28D0-15	DR1-26D0-13	DR1-26D0-15
2	DR2-28D0-03	DR2-28D0-05	DR1-26D8-03	DR1-26D8-05	DR2-28D0-13	DR2-28D0-15	DR1-26D8-13	DR1-26D8-15
3	DR2-2012-03	DR2-2012-05	DR1-29D6-03	DR1-29D6-05	DR2-2012-13	DR2-2012-15	DR1-29D6-13	DR1-29D6-15
5	DR2-2018-03	DR2-2018-05	DR1-2015-03	DR1-2015-05	DR2-2018-13	DR2-2018-15	DR1-2015-13	DR1-2015-15
7.5	DR2-2025-03	DR2-2025-05	DR1-2022-03	DR1-2022-05	DR2-2025-13	DR2-2025-15	DR1-2022-13	DR1-2022-15
10	DR2-2035-03	DR2-2035-05	DR1-2028-03	DR1-2028-05	DR2-2035-13	DR2-2035-15	DR1-2028-13	DR1-2028-15
15	DR2-2045-03	DR2-2045-05	DR1-2042-03	DR1-2042-05	DR2-2045-13	DR2-2045-15	DR1-2042-13	DR1-2042-15
20	DR2-2055-03	DR2-2055-05	DR1-2054-03	DR1-2054-05	DR2-2055-13	DR2-2055-15	DR1-2054-13	DR1-2054-15
25	DR2-2080-03	DR2-2080-05	DR1-2068-03	DR1-2068-05	DR2-2080-13	DR2-2080-15	DR1-2068-13	DR1-2068-15
30	DR2-2080-03	DR2-2100-05	DR1-2080-03	DR1-2080-05	DR2-2080-13	DR2-2100-15	DR1-2080-13	DR1-2080-15
40	DR2-2100-03	DR2-2100-05	DR1-2104-03	DR1-2104-05	DR2-2100-13	DR2-2100-15	DR1-2104-13	DR1-2104-15
50	DR2-2130-03	DR2-2130-05	DR1-2130-03	DR1-2130-05	DR2-2130-13	DR2-2130-15	DR1-2130-13	DR1-2130-15
60	DR2-2160-03	DR2-2200-15	DR1-2154-03	DR1-2154-05	DR2-2160-13	DR2-2200-15	DR1-2154-13	DR1-2154-15
75	DR2-2200-13	DR2-2200-15	DR1-2192-03	DR1-2192-05	DR2-2200-13	DR2-2200-15	DR1-2192-13	DR1-2192-15
100	DR2-2225-13	DR2-2225-15	DR1-2248-03	DR1-2248-05	DR2-2225-13	DR2-2225-15	DR1-2248-13	DR1-2248-15
125	DR2-2320-13	DR2-2320-15	DR1-2312-03	DR1-2312-05	DR2-2320-13	DR2-2320-15	DR1-2312-13	DR1-2312-15

Line and Load Reactors—480 V

hp (VT)	Open Load Reactor		Line Reactor		NEMA 1 Load Reactor		Line Reactor	
	3%	5%	3%	5%	3%	5%	3%	5%
1.5	DR2-44D0-05	DR2-44D0-05	DR1-43D0-03	DR1-43D0-05	DR2-44D0-13	DR2-44D0-15	DR1-43D0-13	DR1-43D0-15
2	DR2-44D0-03	DR2-44D0-05	DR1-43D4-03	DR1-43D4-05	DR2-44D0-13	DR2-44D0-15	DR1-43D4-13	DR1-43D4-15
3	DR2-48D0-03	DR2-48D0-05	DR1-44D8-03	DR1-44D8-05	DR2-48D0-13	DR2-48D0-15	DR1-44D8-13	DR1-44D8-15
5	DR2-48D0-03	DR2-48D0-05	DR1-47D6-03	DR1-47D6-05	DR2-48D0-13	DR2-48D0-15	DR1-47D6-13	DR1-47D6-15
7.5	DR2-4012-03	DR2-4012-05	DR1-4011-03	DR1-4011-05	DR2-4012-13	DR2-4012-15	DR1-4011-13	DR1-4011-15
10	DR2-4018-03	DR2-4018-05	DR1-4014-03	DR1-4014-05	DR2-4018-13	DR2-4018-15	DR1-4014-13	DR1-4014-15
15	DR2-4025-03	DR2-4025-05	DR1-4021-03	DR1-4021-05	DR2-4025-13	DR2-4025-15	DR1-4021-13	DR1-4021-15
20	DR2-4025-03	DR2-4025-05	DR1-4027-03	DR1-4027-05	DR2-4025-13	DR2-4025-15	DR1-4027-13	DR1-4027-15
25	DR2-4035-03	DR2-4035-05	DR1-4034-03	DR1-4034-05	DR2-4035-13	DR2-4035-15	DR1-4034-13	DR1-4034-15
30	DR2-4045-03	DR2-4045-05	DR1-4040-03	DR1-4040-05	DR2-4045-13	DR2-4045-15	DR1-4040-13	DR1-4040-15
40	DR2-4055-03	DR2-4055-05	DR1-4052-03	DR1-4052-05	DR2-4055-13	DR2-4055-15	DR1-4052-13	DR1-4052-15
50	DR2-4080-03	DR2-4080-05	DR1-4065-03	DR1-4065-05	DR2-4080-13	DR2-4080-15	DR1-4065-13	DR1-4065-15
60	DR2-4100-03	DR2-4080-05	DR1-4077-03	DR1-4077-05	DR2-4100-13	DR2-4080-15	DR1-4077-13	DR1-4077-15
75	DR2-4100-03	DR2-4100-05	DR1-4096-03	DR1-4096-05	DR2-4100-13	DR2-4100-15	DR1-4096-13	DR1-4096-15
100	DR2-4130-03	DR2-4130-05	DR1-4124-03	DR1-4124-05	DR2-4130-13	DR2-4130-15	DR1-4124-13	DR1-4124-15
125	DR2-4160-03	DR2-4160-05	DR1-4156-03	DR1-4156-05	DR2-4160-13	DR2-4160-15	DR1-4156-13	DR1-4156-15
150	DR2-4200-13	DR2-4200-15	DR1-4180-03	DR1-4180-05	DR2-4200-13	DR2-4200-15	DR1-4180-13	DR1-4180-15
200	DR2-4250-13	DR2-4250-15	DR1-4240-03	DR1-4240-05	DR2-4250-13	DR2-4250-15	DR1-4240-13	DR1-4240-15

Technical Data and Specifications

H-Max Series Drives

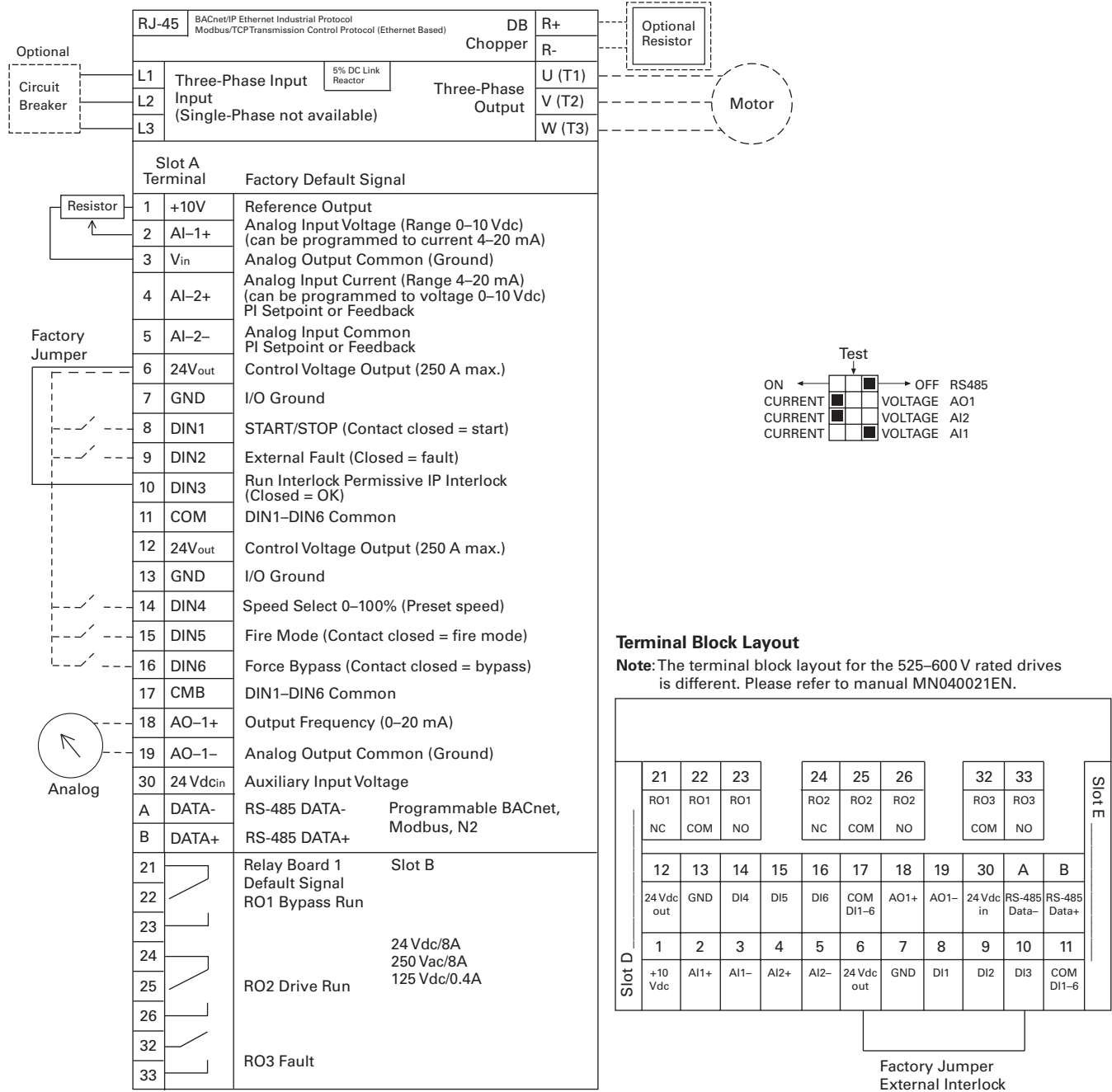
Description	Specification
Input Ratings	
Input voltage (V_{in})	200–240 Vac, 380–480 Vac, 525–600 Vac, –10%/+10%
Input frequency (f_{in})	50/60 Hz (variation up to 47–66 Hz)
Connection to power	Once per minute or less (typical operation)
Short-circuit withstand rating	100 kAIC
Output Ratings	
Output voltage	0 to V_{in}/U_{in} line voltage in
Continuous output current	Ambient temperature max. 104 °F (40 °C)
I_L overload	1.1 x I_L (1 min./10 min.)
Overload current	110% (1 min./10 min.)
Initial output current	150% for two seconds
Output frequency	0 to 320 Hz
Frequency resolution	0.01 Hz
Control Characteristics	
Control method	Frequency control (V/f) open loop sensorless vector control
Switching frequency	1–310 amps FS4–9: default 6 kHz
Frequency reference	Analog input: Resolution 0.1% (10-bit), accuracy $\pm 1\%$ Panel reference: Resolution 0.01 Hz
Field weakening point	8 to 320 Hz
Acceleration time	0.1 to 3000 seconds
Deceleration time	0.1 to 3000 seconds
Braking torque	DC brake: 30% x T_n
Ambient Conditions	
Ambient operating temperature	FS4–FS9: 14 °F (–10 °C), no frost to 104 °F (40 °C) (Drive can operate at 122 °F (50 °C), see Pages V6-T2-172 and V6-T2-173)
Storage temperature	–40° to 158 °F (–40° to 70 °C)
Relative humidity	0 to 95% RH, noncondensing, non-corrosive, no dripping water
Air quality	Chemical vapors: IEC 60721-3-3, unit in operation, Class 3C2; Mechanical particles: 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); 380–480 V
Vibration	FS4–FS9: EN 61800-5-1, EN 60068-2-6; 5 to 150 Hz, displacement amplitude 1 mm (peak) at 5 to 15.8 Hz, max. acceleration amplitude 1G at 15.8 to 150 Hz
Shock	EN 61800-5-1, EN 60068-2-27 UPS Drop test (for applicable UPS weights) Storage and shipping: max. 15 g, 11 ms (in package)
Enclosure class	NEMA Type 1/IP21 or NEMA Type 12/IP54 (keypad required for IP54/Type 12)
Standards	
EMC	Immunity: Fulfills all EMC immunity requirements; Emissions: EN 61800-3, LEVEL H (EMC C2)
Emissions	EMC level dependent— +EMC 2: EN61800-3 (2004) Category C2 Delivered with Class C2 EMC filtering as default.
Efficiency	97.5% at 480 V 96.6% at 208/230 V

Description	Specification
Control Connections	
Analog input voltage	0 to 10 V, $R = 200$ kohms differential Resolution 0.1%; Accuracy $\pm 1\%$ DIP switch selection (voltage/current)
Analog input current	0(4) to 20 mA; $R_i = 250$ ohms differential
Digital inputs (6)	Positive or negative logic; 18 to 30 Vdc
Auxiliary voltage	+24 V $\pm 10\%$, max. 250 mA
Output reference voltage	+10 V $\pm 3\%$, max. load 10 mA
Analog output	0–10 V, 0(4) to 20 mA; R_L max. 500 ohms; Resolution 10 bit; Accuracy $\pm 2\%$ DIP switch selection (voltage/current)
Relay outputs	3 programmable, 2 Form C, 1 Form A relay outputs Switching capacity: 24 Vdc/8 A, 250 Vac/8 A, 125 Vdc/0.4 A
Hard wire jumper	Between terminal 6 and 10 factory default
DIP switch setting default	RS-485 = off A01 = current A12 = current A11 = voltage
Protections	
Overcurrent protection	Yes
Overvoltage protection	Yes
DC bus regulation anti-trip	Yes (accelerates or decelerates the load)
Undervoltage protection	Yes
Earth fault protection	Yes (in case of earth fault in motor or motor cable, only the frequency converter is protected)
Input phase supervision	Yes (trips if any of the input phases are missing)
Motor phase supervision	Yes (trips if any of the output phases are missing)
Overtemperature protection	Yes
Motor overload protection	Yes
Motor stall protection	Yes
Motor underload protection	Yes
Short-circuit protection	Yes
Surge protection	Yes (varistor input)
Conformed coated (varnished) boards	Yes (prevents corrosion)

Wiring Diagram

Control Input/Output, PID Application

2



Standards

- Digital inputs D1–D6, relay out, analog in/out are freely programmed
- The user can assign a single input to multiple functions

Includes

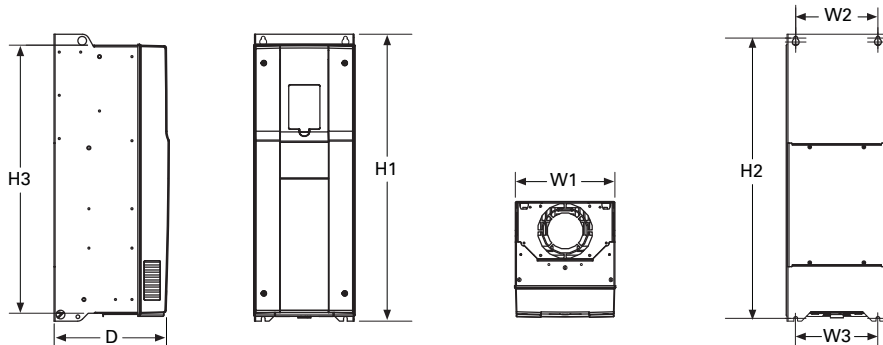
- Six digital input
- Two analog input
- One analog output
- Three relay output
- RS-485
- Ethernet (BACnet and Modbus)

Reliability

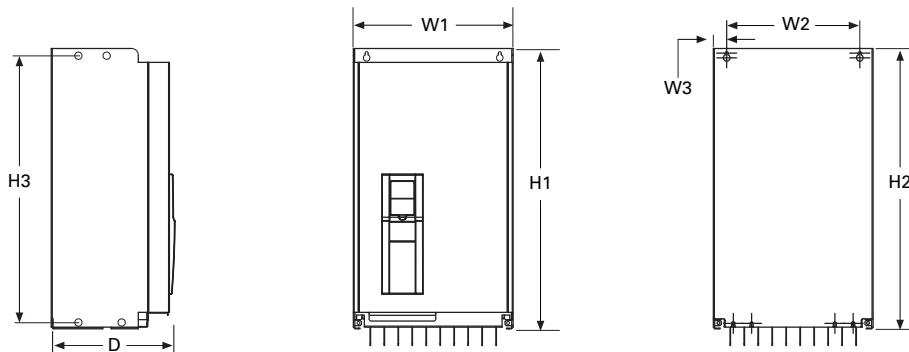
- Pretested components
- Conformal coated (varnished) boards
- 40 °C rated
- 110% overload for one minute
- Eaton Electrical Services & Systems national network of AF drive specialists

Dimensions

Approximate Dimensions in Inches (mm)

H-Max Series Frames FS4–FS7

Voltage	hp	kW	Amps	D	H1	Hole Center-to-Center H2	H3	W1	W2	W3	Weight in Lbs (kg)
FS4											
230 Vac	0.75–4	0.55–3.0	3.7–12.5	7.77 (197.3)	12.89 (327.5)	12.32 (313.0)	11.22 (285.0)	5.04 (128.0)	3.94 (100.0)	3.94 (100.0)	13.2 (6)
480 Vac	1.5–7.5	1.1–5.5	3.4–12								
FS5											
230 Vac	5–10	4–7.5	18–31	8.73 (221.6)	16.50 (419.0)	15.98 (406.0)	15.04 (382.0)	5.67 (144.0)	4.53 (115.0)	3.94 (100.0)	22.0 (10)
480 Vac	10–20	7.5–15	16–31								
FS6											
230 Vac	15–20	11–15	48–62	9.29 (236.0)	21.93 (557.0)	21.28 (540.5)	20.24 (514.0)	7.68 (195.0)	5.83 (148.0)	5.83 (148.0)	44.1 (20)
480 Vac	25–40	18.5–30	38–61								
FS7											
230 Vac	25–30	18.5–30	75–105	10.49 (266.5)	25.98 (660.0)	25.39 (645.0)	24.29 (617.0)	9.06 (230.0)	7.48 (190.0)	7.48 (190.0)	82.6 (37.5)
480 Vac	50–75	37–55	72–105								

H-Max Series Frames FS8 and FS9

Voltage	hp	kW	Amps	D	H1	Hole Center-to-Center H2	H3	W1	W2	W3	Weight in Lbs (kg)
FS8											
230 Vac	50–75	37–55	140–205	13.76 (349.6)	38.02 (965.7)	37.26 (946.4)	37.26 (946.4)	11.42 (290.1)	9.29 (236.0)	1.42 (36.0)	154.3 (70)
480 Vac	100–150	75–110									
FS9											
230 Vac	100–120	75–90	261–310	14.63 (371.6)	33.09 (890.4)	31.89 (810.0)	31.89 (810.0)	18.90 (480.0)	15.75 (400.0)	1.57 (40.0)	238.1 (108)
480 Vac	200–250	132–160									

Note: For flange dimension, please reference User Manual.

H-Max IntelliPass and IntelliDisconnect Drives

2



Contents

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Product Selection	V6-T2-184
Technical Data and Specifications	V6-T2-194
Wiring Diagrams	V6-T2-195
Dimensions	V6-T2-197

H-Max IntelliPass and IntelliDisconnect Drives

Product Description

The IntelliPass electronic bypass is a two or optional three contactor design using a 24 Vdc **XT** Series contactor with an optional manual override switch that allows the unit to run in bypass without the H-Max Series drive.

The IntelliPass software parameters utilize engineering units common to the HVAC industry. Onboard startup wizard guarantees flawless commissioning with plug-and-play screen entry. Available in NEMA/UL Type 1, Type 12 and Type 3R with optional pre-engineered operator devices to meet all customized specification requirements.

The IntelliPass construction features allow for easy installation, reliable operation and serviceability with additional onboard wire space, and removable conduit plates with knockouts.

Features and Benefits

Industry-leading energy saving solution—uses the Eaton H-Max drive with Active Energy Control algorithm.

Built to be as tough as the application—Eaton’s robust design boasts an industrial grade enclosure and industry proven components.

- Industrial Power Supply
- **XT** Contactors
- 22 mm Pilot Devices

Built-in electronic bypass capability with external 24 Vdc power supply allows the H-Max drive to control the bypass circuit through the keypad, digital input or BMS communications and in fault conditions.

Designed with Our Customers in Mind

- Removable top and bottom entry panels
- Door-mounted graphic display and keypad
- Easily accessible connection terminals with removable I/O terminal connections

Engineered Product Solution

- The Eaton H-Max IntelliPass and IntelliDisconnect products are available with a variety of factory tested and certified options meeting or exceeding UL508C requirements

Standards and Certifications

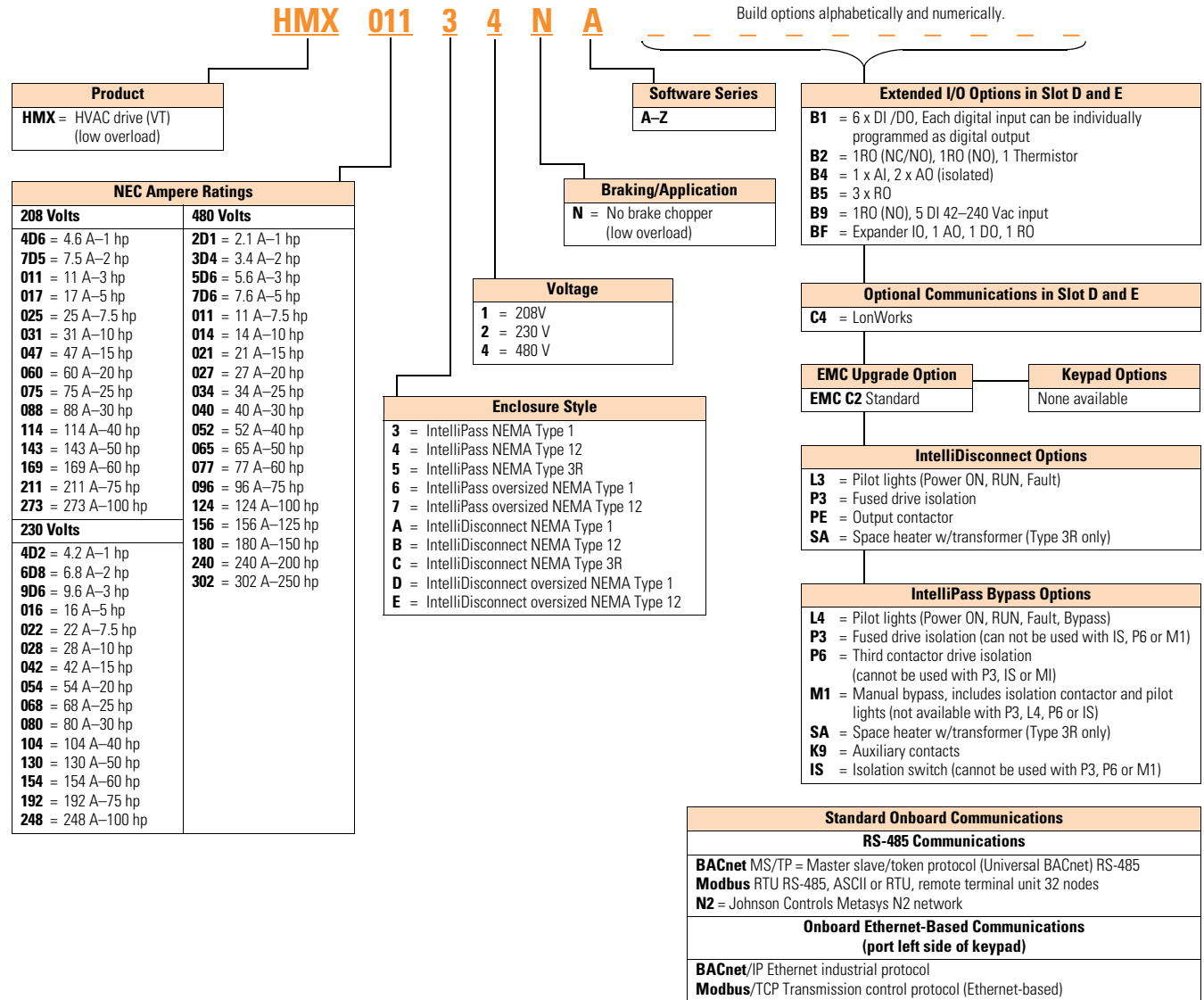
Product

- IEC 61800-5-1
- UL508C
- cUL
- OSHPD Seismic Certified



Catalog Number Selection

H-Max Series IntelliPass and IntelliDisconnect Drives



Notes

- IntelliPass—two contactor electronic bypass standard.
- All boards are varnished. Corrosion resistant.
- Battery included in all drives for real-time clock. Three year lifetime.
- Keypad kit includes HOA bypass.
- EMI/RFI filters included.
- DC link choke included.
- IntelliDisconnect includes 1 Form C and 1 Form A
- IntelliPass includes 1 Form A.
- When L3 or L4 option is selected, 1 Form A relay is used as well.
- For more relays required, select/order the B5 option card.

Product Selection

H-Max Series IntelliPass NEMA Type 1—Two Contactor Bypass Standard

2

HMX_

**208 Vac**

Enclosure Frame Size	Horsepower	Drive Rated NEC Amps	Catalog Number
FS4	1	4.6	HMX4D631NA
	2	7.5	HMX7D531NA
	3	11	HMX01131NA
FS5	5	17	HMX01731NA
	7.5	25	HMX02531NA
	10	31	HMX03131NA
FS6	15	47	HMX04731NA
FS7	20	60	HMX06031NA
	25	75	HMX07531NA
	30	88	HMX08831NA

230 Vac

Enclosure Frame Size	Horsepower	Drive Rated NEC Amps	Catalog Number
FS4	1	4.2	HMX4D232NA
	2	6.8	HMX6D832NA
	3	9.6	HMX9D632NA
FS5	5	16	HMX01632NA
	7.5	22	HMX02232NA
	10	28	HMX02832NA
FS6	15	42	HMX04232NA
FS7	20	54	HMX05432NA
	25	68	HMX06832NA
	30	80	HMX08032NA

480 Vac

Enclosure Frame Size	Horsepower	Drive Rated NEC Amps	Catalog Number
FS4	1	2.1	HMX2D134NA
	2	3.4	HMX3D434NA
	3	5.6	HMX5D634NA
	5	7.6	HMX7D634NA
	7.5	11	HMX01134NA
FS5	10	14	HMX01434NA
	15	21	HMX02134NA
	20	27	HMX02734NA
FS6	25	34	HMX03434NA
	30	40	HMX04034NA
	40	52	HMX05234NA
FS7	50	65	HMX06534NA
	60	77	HMX07734NA
	75	96	HMX09634NA

Notes

For Wiring Diagrams, see **Page V6-T2-196**.

For NEMA 12 or 3R enclosures, see Catalog Number Selection on **Page V6-T2-183**.

Call Technical Support for NEMA 3R specifics. Enclosure size and weight differ from NEMA 1 and 12 products.

H-Max Series IntelliPass NEMA Type 12—Two Contactor Bypass Standard

HMX

**208 Vac**

Enclosure Frame Size	Horsepower	Drive Rated NEC Amps	Catalog Number
FS4	1	4.6	HMX4D641NA
	2	7.5	HMX7D541NA
	3	11	HMX01141NA
FS5	5	17	HMX01741NA
	7.5	25	HMX02541NA
	10	31	HMX03141NA
FS6	15	47	HMX04741NA
FS7	20	60	HMX06041NA
	25	75	HMX07541NA
	30	88	HMX08841NA
D	40	114	HMX11471NA
	50	143	HMX14371NA
	60	169	HMX16971NA
5	75	211	HMX21171NA
	100	273	HMX27371NA

230 Vac

Enclosure Frame Size	Horsepower	Drive Rated NEC Amps	Catalog Number
FS4	1	4.2	HMX4D242NA
	2	6.8	HMX6D842NA
	3	9.6	HMX9D642NA
FS5	5	16	HMX01642NA
	7.5	22	HMX02242NA
	10	28	HMX02842NA
FS6	15	42	HMX04242NA
FS7	20	54	HMX05442NA
	25	68	HMX06842NA
	30	80	HMX08042NA
D	40	104	HMX10472NA
	50	130	HMX13072NA
	60	154	HMX15472NA
	75	192	HMX19272NA
5	100	248	HMX24872NA

NotesFor Wiring Diagrams, see **Page V6-T2-196**.For NEMA 12 or 3R enclosures, see Catalog Number Selection on **Page V6-T2-183**.

Call Technical Support for NEMA 3R specifics. Enclosure size and weight differ from NEMA 1 and 12 products.

HMX_

480 Vac



Enclosure Frame Size	Horsepower	Drive Rated NEC Amps	Catalog Number
FS4	1	2.1	HMX2D144NA
	2	3.4	HMX3D444NA
	3	5.6	HMX5D644NA
	5	7.6	HMX7D644NA
	7.5	11	HMX01144NA
FS5	10	14	HMX01444NA
	15	21	HMX02144NA
	20	27	HMX02744NA
FS6	25	34	HMX03444NA
	30	40	HMX04044NA
	40	52	HMX05244NA
FS7	50	65	HMX06544NA
	60	77	HMX07744NA
	75	96	HMX09644NA
D	100	124	HMX12747NA
	125	156	HMX15674NA
	150	180	HMX18074NA
5	200	240	HMX24074NA
	250	302	HMX30274NA

H-Max Series IntelliPass NEMA Type 3R—Two Contactor Bypass Standard

HMX_

208 Vac



Enclosure Frame Size	Horsepower	Drive Rated NEC Amps	Catalog Number
A	1	4.6	HMX4D651NA
	2	7.5	HMX7D551NA
	3	11	HMX01151NA
A	5	17	HMX01751NA
	7.5	25	HMX02551NA
	10	31	HMX03151NA
B	15	47	HMX04751NA
C	20	60	HMX06051NA
	25	75	HMX07551NA
	30	88	HMX08851NA
D	40	114	HMX11451NA
	50	143	HMX14351NA
	60	169	HMX16951NA
F	75	211	HMX21151NA
	100	273	HMA27351NA

NotesFor Wiring Diagrams, see **Page V6-T2-196**.For NEMA 12 or 3R enclosures, see Catalog Number Selection on **Page V6-T2-183**.

Call Technical Support for NEMA 3R specifics. Enclosure size and weight differ from NEMA 1 and 12 products.

HMX_

**230 Vac**

Enclosure Frame Size	Horsepower	Drive Rated NEC Amps	Catalog Number
A	1	4.2	HMX4D252NA
	2	6.8	HMX6D852NA
	3	9.6	HMX9D652NA
A	5	16	HMX01652NA
	7.5	22	HMX02252NA
	10	28	HMX02852NA
	15	42	HMX04252NA
B	20	54	HMX05452NA
C	25	68	HMX06852NA
	30	80	HMX08052NA
D	40	104	HMX10452NA
	50	130	HMX13052NA
	60	154	HMX15452NA
	75	192	HMX19252NA
F	100	248	HMX24852NA

480 Vac

Enclosure Frame Size	Horsepower	Drive Rated NEC Amps	Catalog Number
A	1	2.1	HMX2D154NA
	2	3.4	HMX3D454NA
	3	5.6	HMX5D654NA
	5	7.6	HMX7D654NA
	7.5	11	HMX01154NA
A	10	14	HMX01454NA
	15	21	HMX02154NA
	20	27	HMX02754NA
B	25	34	HMX03454NA
	30	40	HMX04054NA
	40	52	HMX05254NA
C	50	65	HMX06554NA
	60	77	HMX07754NA
	75	96	HMX09654NA
D	100	124	HMX12544NA
	125	156	HMX15654NA
	150	180	HMX18054NA
F	200	240	HMX24054NA
	250	302	HMX30254NA

Notes

For Wiring Diagrams, see [Page V6-T2-196](#).

For NEMA 12 or 3R enclosures, see Catalog Number Selection on [Page V6-T2-183](#).

Call Technical Support for NEMA 3R specifics. Enclosure size and weight differ from NEMA 1 and 12 products.

H-Max Series IntelliDisconnect NEMA Type 1—Main Disconnect Standard

2

**208 Vac**

Enclosure Frame Size	Horsepower	Drive Rated NEC Amps	Catalog Number
FS4	1	4.6	HMX4D6A1NA
	2	7.5	HMX7D5A1NA
	3	11	HMX011A1NA
FS5	5	17	HMX017A1NA
	7.5	25	HMX025A1NA
	10	31	HMX031A1NA
FS6	15	47	HMX047A1NA
FS7	20	60	HMX060A1NA
	25	75	HMX075A1NA
	30	88	HMX088A1NA

230 Vac

Enclosure Frame Size	Horsepower	Drive Rated NEC Amps	Catalog Number
FS4	1	4.2	HMX4D2A2NA
	2	6.8	HMX6D8A2NA
	3	9.6	HMX9D6A2NA
FS5	5	16	HMX016A2NA
	7.5	22	HMX022A2NA
	10	28	HMX028A2NA
FS6	15	42	HMX042A2NA
FS7	20	54	HMX054A2NA
	25	68	HMX068A2NA
	30	80	HMX080A2NA

480 Vac

Enclosure Frame Size	Horsepower	Drive Rated NEC Amps	Catalog Number
FS4	1	2.1	HMX2D1A4NA
	2	3.4	HMX3D4A4NA
	3	5.6	HMX5D6A4NA
	5	7.6	HMX7D6A4NA
	7.5	11	HMX011A4NA
FS5	10	14	HMX014A4NA
	15	21	HMX021A4NA
	20	27	HMX027A4NA
FS6	25	34	HMX034A4NA
	30	40	HMX040A4NA
	40	52	HMX052A4NA
FS7	50	65	HMX065A4NA
	60	77	HMX077A4NA
	75	96	HMX096A4NA

Notes

For Wiring Diagrams, see **Page V6-T2-196**.

For NEMA 12 or 3R enclosures, see Catalog Number Selection on **Page V6-T2-183**.

Call Technical Support for NEMA 3R specifics. Enclosure size and weight differ from NEMA 1 and 12 products.

H-Max Series IntelliDisconnect NEMA Type 12—Main Disconnect Standard

HMX

**208 Vac**

Enclosure Frame Size	Horsepower	Drive Rated NEC Amps	Catalog Number
FS4	1	4.6	HMX4D6B1NA
	2	7.5	HMX7D5B1NA
	3	11	HMX011B1NA
FS5	5	17	HMX017B1NA
	7.5	25	HMX025B1NA
	10	31	HMX031B1NA
FS6	15	47	HMX047B1NA
FS7	20	60	HMX060B1NA
	25	75	HMX075B1NA
	30	88	HMX088B1NA
D	40	114	HMX114E1NA
	50	143	HMX143E1NA
	60	169	HMX169E1NA
5	75	211	HMX211E1NA
	100	273	HMA273E1NA

230 Vac

Enclosure Frame Size	Horsepower	Drive Rated NEC Amps	Catalog Number
FS4	1	4.2	HMX4D2B2NA
	2	6.8	HMX6D8B2NA
	3	9.6	HMX9D6B2NA
FS5	5	16	HMX016B2NA
	7.5	22	HMX022B2NA
	10	28	HMX028B2NA
FS6	15	42	HMX042B2NA
FS7	20	54	HMX054B2NA
	25	68	HMX068B2NA
	30	80	HMX080B2NA
D	40	104	HMX104E2NA
	50	130	HMX130E2NA
	60	154	HMX154E2NA
	75	192	HMX192E2NA
5	100	248	HMX248E2NA

Notes

For Wiring Diagrams, see **Page V6-T2-196**.

For NEMA 12 or 3R enclosures, see Catalog Number Selection on **Page V6-T2-183**.

Call Technical Support for NEMA 3R specifics. Enclosure size and weight differ from NEMA 1 and 12 products.

HMX_

480 Vac

2



Enclosure Frame Size	Horsepower	Drive Rated NEC Amps	Catalog Number
FS4	1	2.1	HMX2D1B4NA
	2	3.4	HMX3D4B4NA
	3	5.6	HMX5D6B4NA
	5	7.6	HMX7D6B4NA
	7.5	11	HMX011B4NA
FS5	10	14	HMX014B4NA
	15	21	HMX021B4NA
	20	27	HMX027B4NA
FS6	25	34	HMX034B4NA
	30	40	HMX040B4NA
	40	52	HMX052B4NA
FS7	50	65	HMX065B4NA
	60	77	HMX077B4NA
	75	96	HMX096B4NA
D	100	124	HMX12E44NA
	125	156	HMX156E4NA
	150	180	HMX180E4NA
5	200	240	HMX240E4NA
	250	302	HMX302E4NA

Notes

For Wiring Diagrams, see **Page V6-T2-196**.

For NEMA 12 or 3R enclosures, see Catalog Number Selection on **Page V6-T2-183**.

Call Technical Support for NEMA 3R specifics. Enclosure size and weight differ from NEMA 1 and 12 products.

H-Max Series IntelliDisconnect NEMA Type 3R—Main Disconnect Standard

HMX

**208 Vac**

Enclosure Frame Size	Horsepower	Drive Rated NEC Amps	Catalog Number
A	1	4.6	HMX4D6C1NA
	2	7.5	HMX7D5C1NA
	3	11	HMX011C1NA
A	5	17	HMX017C1NA
	7.5	25	HMX025C1NA
	10	31	HMX031C1NA
	15	47	HMX047C1NA
B	20	60	HMX060C1NA
C	25	75	HMX075C1NA
	30	88	HMX088C1NA
D	40	114	HMX114C1NA
	50	143	HMX143C1NA
	60	169	HMX169C1NA
F	75	211	HMX211C1NA
	100	273	HMA273C1NA

230 Vac

Enclosure Frame Size	Horsepower	Drive Rated NEC Amps	Catalog Number
A	1	4.2	HMX4D2C2NA
	2	6.8	HMX6D8C2NA
	3	9.6	HMX9D6C2NA
A	5	16	HMX016C2NA
	7.5	22	HMX022C2NA
	10	28	HMX028C2NA
	15	42	HMX042C2NA
B	20	54	HMX054C2NA
C	25	68	HMX068C2NA
	30	80	HMX080C2NA
D	40	104	HMX104C2NA
	50	130	HMX130C2NA
	60	154	HMX154C2NA
	75	192	HMX192C2NA
F	100	248	HMX248C2NA

Notes

For Wiring Diagrams, see **Page V6-T2-196**.

For NEMA 12 or 3R enclosures, see Catalog Number Selection on **Page V6-T2-183**.

Call Technical Support for NEMA 3R specifics. Enclosure size and weight differ from NEMA 1 and 12 products.

HMX_

**480 Vac**

Enclosure Frame Size	Horsepower	Drive Rated NEC Amps	Catalog Number
A	1	2.1	HMX2D1C4NA
	2	3.4	HMX3D4C4NA
	3	5.6	HMX5D6C4NA
	5	7.6	HMX7D6C4NA
	7.5	11	HMX011C4NA
A	10	14	HMX014C4NA
	15	21	HMX021C4NA
	20	27	HMX027C4NA
B	25	34	HMX034C4NA
	30	40	HMX040C4NA
	40	52	HMX052C4NA
C	50	65	HMX065C4NA
	60	77	HMX077C4NA
	75	96	HMX096C4NA
D	100	124	HMX124C4NA
	125	156	HMX156C4NA
	150	180	HMX180C4NA
F	200	240	HMX240C4NA
	250	302	HMX302C4NA

Notes

For Wiring Diagrams, see **Page V6-T2-196**.

For NEMA 12 or 3R enclosures, see Catalog Number Selection on **Page V6-T2-183**.

Call Technical Support for NEMA 3R specifics. Enclosure size and weight differ from NEMA 1 and 12 products.

Onboard Network Communications**Johnson Controls Metasys N2**

H-Max Series provides communication between the drive and a Johnson Controls Metasys™ N2 network. With this connection, the drive can be controlled, monitored and programmed from the Metasys system. N2 can be selected and programmed by the drive keypad.

BACnet

H-Max Series provides communication to BACnet networks. Data transfer is master-slave/token passing (MS/TP) RS-485.

BACnet/IP

100Base-T interface.

Modbus TCP

Ethernet based protocol.

Modbus RTU

H-Max Series provides communication to Modbus RTU RS-485 as a slave on a Modbus network. Other communication parameters include an address range from 1 to 247; a parity of None, Odd or Even; and the stop bit is 1.

H-Max Series Option Board Kits Available for Slots D and E

The H-Max Series 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 option boards.

The H-Max Series factory-installed standard board configuration includes an I/O board and a relay output board.

Option Boards Mounted in Slots D and E

Option Kit Description	Option Kit Catalog Number
6 x DI /DO, each digital input can be individually programmed as digital output	XXMX-IO-B1-A
1RO Form C (NO/NC), 1RO Form A (NO), 1 thermistor	XXMX-IO-B2-A
1 x AI, 2 x AO (isolated)	XXMX-IO-B4-A
3 x RO Form A (NO)	XXMX-IO-B5-A
1RO Form A (NO), 5DI 42–240 Vac input	XXMX-IO-B9-A
LonWorks	XXMX-COM-C4-A
1 x AO, 1 x DO, 1 x RO	XXMX-IO-BF-A

Extended I/O Options in Slot D and E

Description	Suffix Number
6 x DI /DO, Each digital input can be individually programmed as digital output	B1
1RO (NC/NO), 1RO (NO), 1 Thermistor	B2
1 x AI, 2 x AO (isolated)	B4
3 x RO	B5
1RO (NO), 5 DI 42–240 Vac input	B9
Expander IO, 1 AO, 1 DO, 1 RO	BF

Optional Communications in Slot D and E

Description	Suffix Number
LonWorks	C4

IntelliDisconnect Options

Description	Suffix Number
Pilot lights (Power ON, RUN, Fault)	L3
Fused drive isolation (cannot be used with PE)	P3
Output contactor (cannot be used with P3)	PE
Space heater w/transformer (Type 3R only)	SA

IntelliPass Bypass Options

Description	Suffix Number
Pilot lights (Power ON, RUN, Fault)	L4
Fused drive isolation (can not be used with P6)	P3
Third contactor drive isolation (cannot be used with P3 or IS)	P6
Manual bypass switch located on front door	M1
Space heater w/transformer (Type 3R only)	SA
Auxiliary contacts	K9
Isolation switch	IS

Standard Onboard Communications

Description	Suffix Number
RS-485 Communications	
BACnet MS/TP = Master slave/token protocol (Universal BACnet) RS-485	BACnet
Modbus RTU RS-485, ASCII or RTU, remote terminal unit 32 nodes	Modbus
Johnson Controls Metasys N2 network	N2
Onboard Ethernet-Based Communications (port left side of keypad)	
BACnet/IP Ethernet industrial protocol	BACnet
Modbus/TCP Transmission control protocol (Ethernet-based)	Modbus

Technical Data and Specifications

Primary Design Features

Description	IntelliPass	IntelliDisconnect
CB MMP	Standard	Standard
2 contactor bypass	Standard	N/A
Electrical interlock	Standard	N/A
Third contactor (isolation)	Optional	N/A

H-Max Series Drives

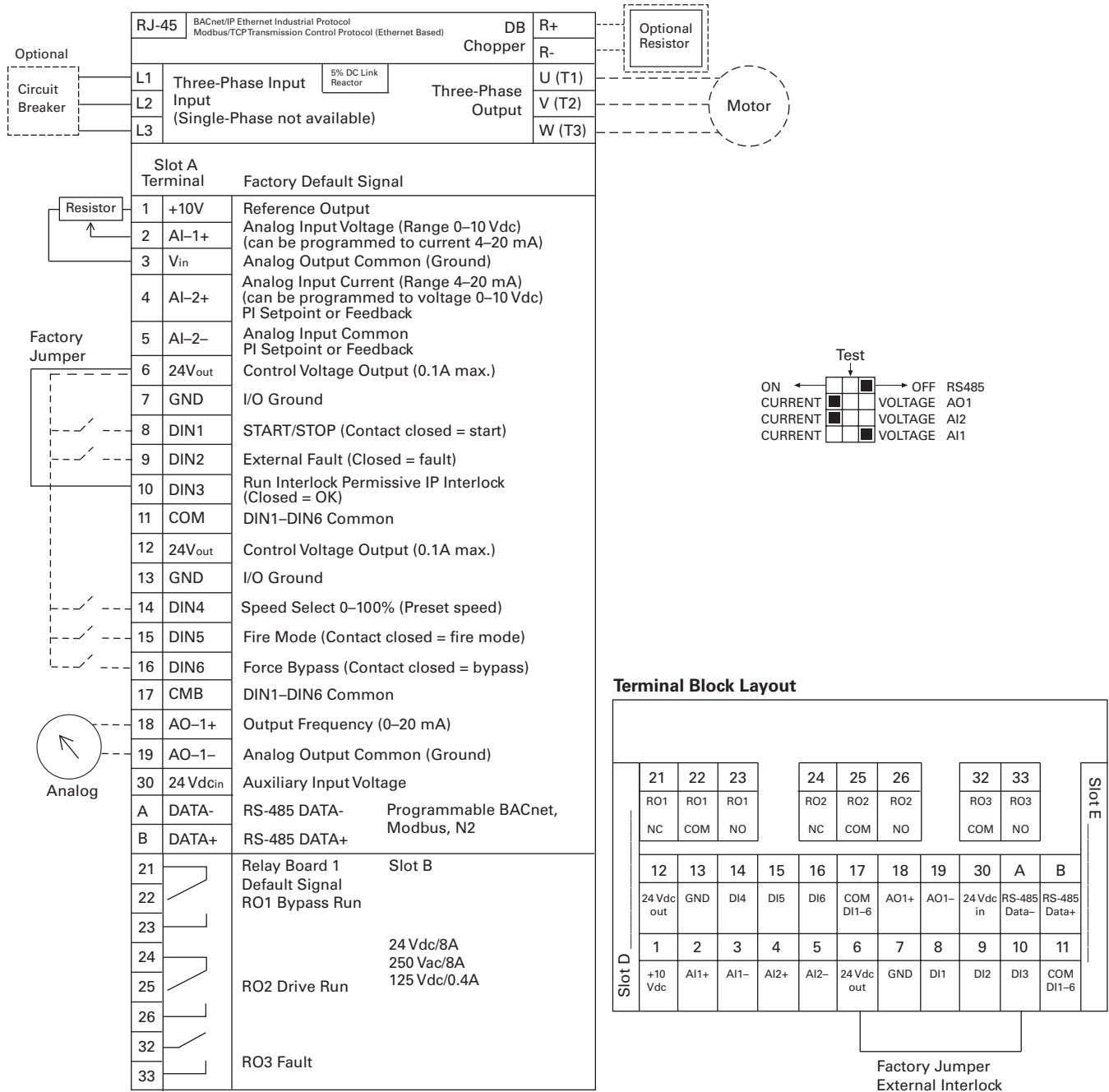
Description	Specification
Input Ratings	
Input voltage (V_{in})	208, 230, 480 Vac, $-10\%/+10\%$
Input frequency (f_{in})	50/60 Hz (variation up to 47–66 Hz)
Connection to power	Once per minute or less (typical operation)
Short-circuit withstand rating	65 kAIC combination
Output Ratings	
Output voltage	0 to V_{in}/U_{in} line voltage in
Continuous output current	Ambient temperature max. 104 °F (40 °C)
I_L overload	1.1 x I_L (1 min./10 min.)
Overload current	110% (1 min./10 min.)
Initial output current	150% for two seconds
Output frequency	0 to 320 Hz
Frequency resolution	0.01 Hz
Control Characteristics	
Control method	Frequency control (V/f) open loop sensorless vector control
Switching frequency	1–310 amps; adjustable with parameter 2.6.9 FS4–FS7: default 6 kHz
Frequency reference	Analog input: Resolution 0.1% (10-bit), accuracy $\pm 1\%$ Panel reference: Resolution 0.01 Hz
Field weakening point	8 to 320 Hz
Acceleration time	0.1 to 3000 seconds
Deceleration time	0.1 to 3000 seconds
Braking torque	DC brake: 30% x T_n
Ambient Conditions	
Ambient operating temperature	FS4–FS7: 14 °F (–10 °C), no frost to 104 °F (40 °C) (Drive can operate at 122 °F (50 °C))
Storage temperature	–40° to 158 °F (–40° to 70 °C)
Relative humidity	0 to 95% RH, noncondensing, non-corrosive, no dripping water
Air quality	Chemical vapors: IEC 60721-3-3, unit in operation, Class 3C2; Mechanical particles: 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); 380–480 V
Enclosure class	NEMA Type 1/IP21 or NEMA Type 12/IP54 (keypad required for IP54/Type 12)

Description	IntelliPass	IntelliDisconnect
Isolation switch	Optional	N/A
Top entry (power)	Standard	Standard
Bottom entry (power)	Standard	Standard
Output contactor	Standard	Optional

Description	Specification
Standards	
EMC	Immunity: Fulfills all EMC immunity requirements; Emissions: EN 61800-3, LEVEL H (EMC C2)
Emissions	EMC level dependent— +EMC 2: EN61800-3 (2004) Category C2 Delivered with Class C2 EMC filtering as default.
Control Connections	
Analog input voltage	0 to 10 V, $R = 200$ kohms differential Resolution 0.1%; Accuracy $\pm 1\%$ DIP switch selection (voltage/current)
Analog input current	0(4) to 20 mA; R_i –250 ohms differential
Digital inputs (6)	Positive or negative logic; 18 to 30 Vdc
Auxiliary voltage	+24 V $\pm 10\%$, max. load 250 mA
Output reference voltage	+10 V $+3\%$, max. load 10 mA
Analog output	0–10 V, 0(4) to 20 mA; R_L max. 500 ohms; Resolution 10 bit; Accuracy $\pm 2\%$; DIP switch selection (voltage/current)
Relay outputs	IntelliDisconnect: 2 programmable, 1 Form C, 1 Form A IntelliPass: 1 programmable, 1 Form A With L3 or L4 option, 1 Form A relay is used Switching capacity: 24 Vdc/8 A, 250 Vac/8 A, 125 Vdc/0.4 A
Hard wire jumper	Between terminal 6 and 10 factory default
DIP switch setting default	RS-485 = off A01 = current A12 = current A11 = voltage
Protections	
Overcurrent protection	Yes
Overvoltage protection	Yes
DC bus regulation anti-trip	Yes (accelerates or decelerates the load)
Undervoltage protection	Yes
Earth fault protection	Yes (in case of earth fault in motor or motor cable, only the frequency converter is protected)
Input phase supervision	Yes (trips if any of the input phases are missing)
Motor phase supervision	Yes (trips if any of the output phases are missing)
Overtemperature protection	Yes
Motor overload protection	Yes
Motor stall protection	Yes
Motor underload protection	Yes
Short-circuit protection	Yes
Surge protection	Yes (varistor input)
Conformed coated (varnished) board	Yes (prevents corrosion)

Wiring Diagrams

Control Input/Output, PID Application

**Standards**

- Digital inputs D1–D6, relay out, analog in/out are freely programmed
- The user can assign a single input to multiple functions

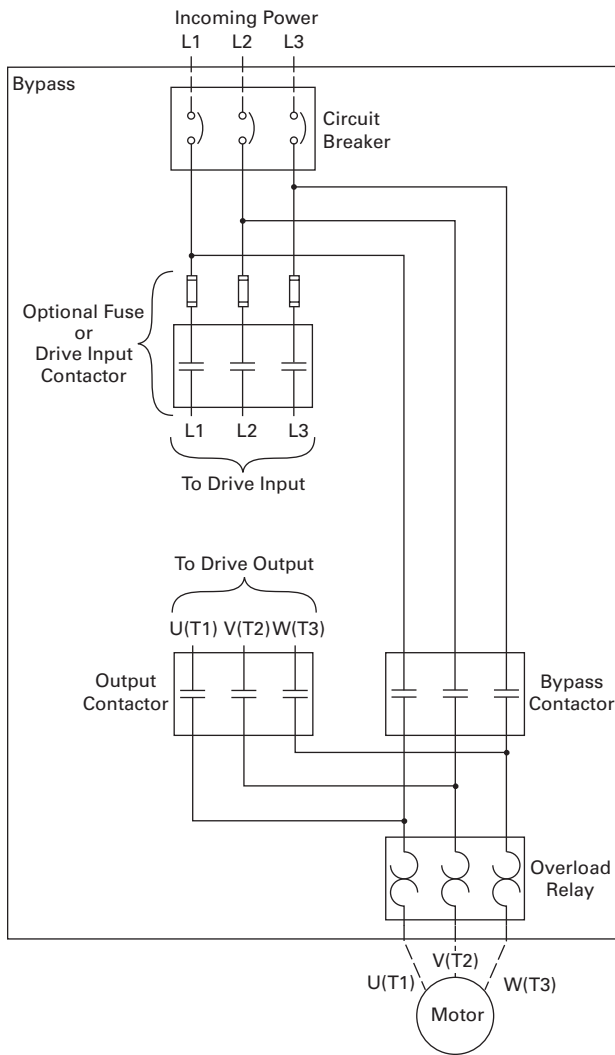
Includes

- Six digital input
- Two analog input
- One analog output
- Three relay outputs (2 relays are factory wired for bypass operation in IntelliPass configurations)
- RS-485
- Ethernet

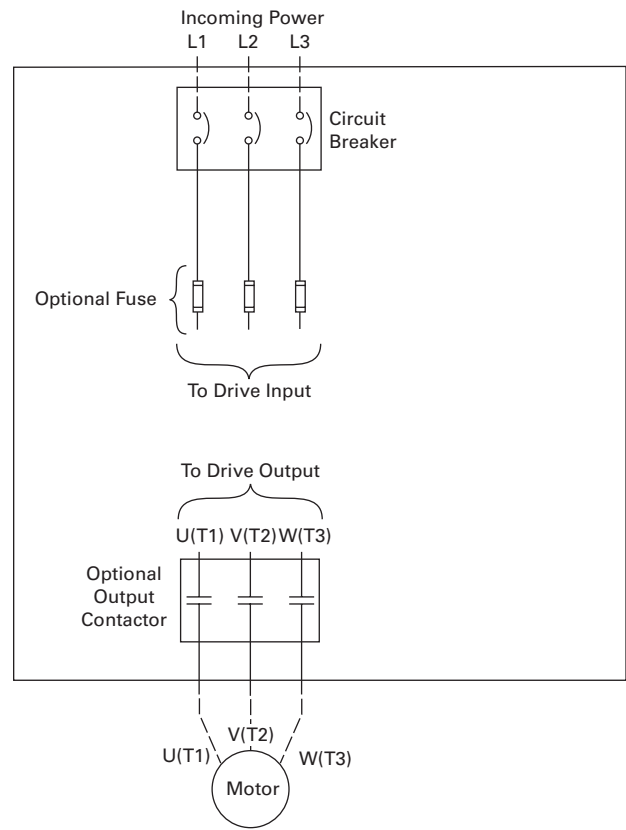
Reliability

- Pretested components
- Conformal coated (varnished) boards
- 40 °C rated
- 110% overload for one minute
- Eaton Electrical Services & Systems national network of AF drive specialists

H-Max Series IntelliPass

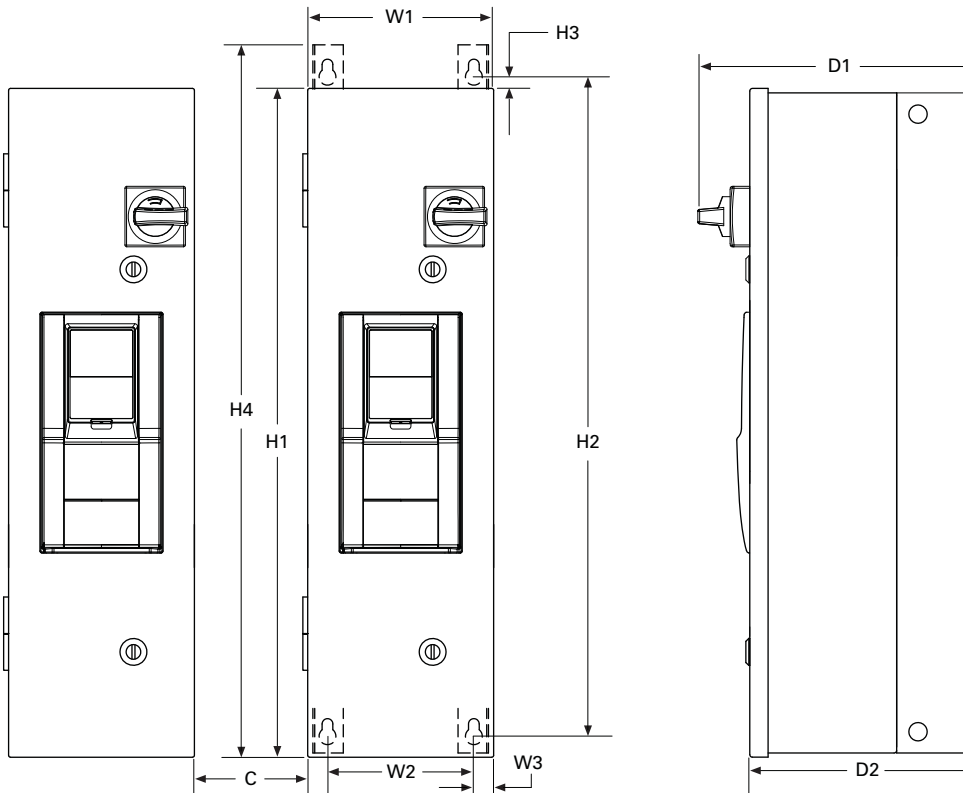


H-Max Series IntelliDisconnect Power Wiring



Dimensions

Approximate Dimensions in Inches (mm)

H-Max Series IntelliPass and IntelliDisconnect Drives

Distance to mount multiple drives.

	Top	Bottom
FR4	4.00 (101.6)	2.00 (50.8)
FR5	4.75 (120.7)	2.50 (63.5)
FR6	6.50 (165.1)	3.25 (82.6)
FR7	10.00 (254.0)	4.00 (101.6)

Consult factory or use manual for final dimensions.

Frame Size	Voltage	Horsepower (I _L)	H1	H2	H3	H4	C	W1	W2	W3	D1	D2	Weight in Lbs (kg)
FS4	208	1–3	30.00 (762.0)	29.41 (747.1)	0.25 (6.35)	31.00 (787.4)	3.00 (76.2)	7.88 (200.2)	6.25 (158.8)	0.75 (19.1)	12.49 (317.2)	10.36 (263.1)	45 (20.41)
	230	1–3											
	480	1–7.5											
FS5	208	5–10	37.00 (939.8)	36.72 (932.7)	0.25 (6.35)	38.31 (973.0)	3.00 (76.2)	9.60 (243.8)	7.97 (202.4)	0.75 (19.1)	15.35 (390.0)	13.22 (335.8)	57.5 (26.10)
	230	5–10											
	480	10–20											
FS6	208	15–20	45.45 (1154.4)	44.81 (1138.2)	0.25 (6.35)	46.4 (1178.6)	4.00 (101.6)	11.44 (290.6)	9.75 (247.6)	0.75 (19.1)	15.80 (401.3)	13.67 (347.2)	98.0 (44.45)
	230	15–20											
	480	25–40											
FS7	208	25–30	58.51 (1486.2)	57.87 (1470.0)	0.25 (6.35)	59.46 (1510.3)	5.00 (127.0)	14.52 (368.8)	12.83 (325.9)	0.75 (19.1)	15.68 (398.3)	13.72 (348.5)	165.0 (74.84)
	230	25–30											
	480	50–75											

Note: C distance is spacing required to mount multiple drives.

2.8

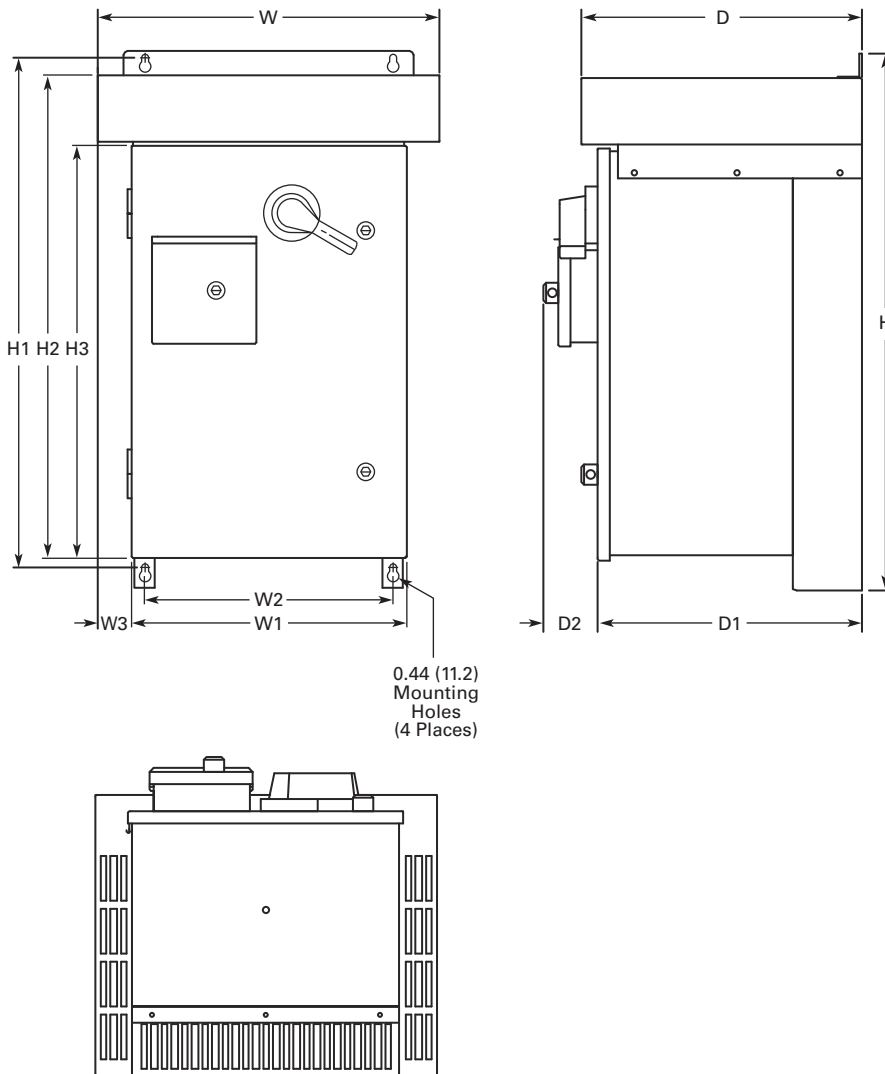
Adjustable Frequency Drives

H-Max Series Drives

Approximate Dimensions in Inches (mm)

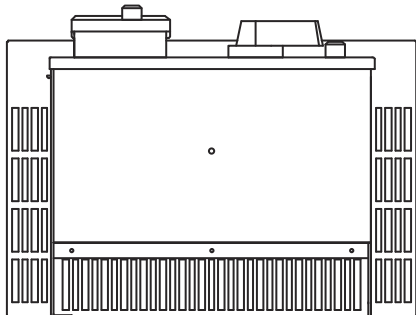
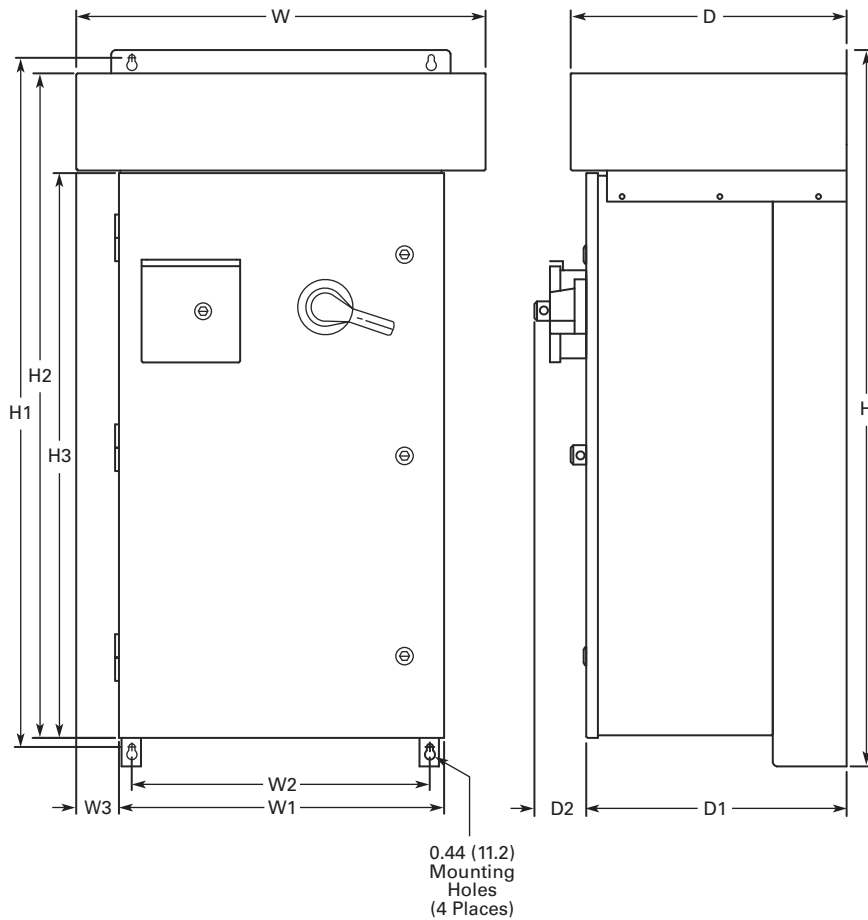
Enclosure Box A NEMA Type 3R

2



Voltage AC	hp (I _L)	H	H1	H2	H3	W	W1	W2	W3	D	D1	D2	Approx. Weight Lbs (kg)	Approx. Shipping Weight Lbs (kg)
Three-Phase														
208 V	1–10	33.00 (838.2)	31.36 (796.5)	29.67 (753.6)	25.35 (643.9)	21.05 (534.7)	16.92 (429.8)	15.30 (388.6)	2.07 (52.6)	17.24 (437.9)	16.26 (413.0)	3.31 (84.1)	170 (77)	215 (98)
230 V	1–10													
480 V	1–20													

Approximate Dimensions in Inches (mm)

Enclosure Box B NEMA Type 3R

Voltage AC	hp (I _L)	H	H1	H2	H3	W	W1	W2	W3	D	D1	D2	Approx. Weight Lbs (kg)	Approx. Shipping Weight Lbs (kg)
Three-Phase														
208 V	15	46.09 (1170.7)	44.45 (1129.0)	42.77 (1086.4)	36.35 (923.3)	26.31 (668.3)	20.92 (531.4)	19.30 (490.2)	2.69 (68.3)	17.74 (450.6)	16.76 (425.7)	3.31 (84.1)	235 (107)	290 (132)
230 V	15													
480 V	25-40													

2.8

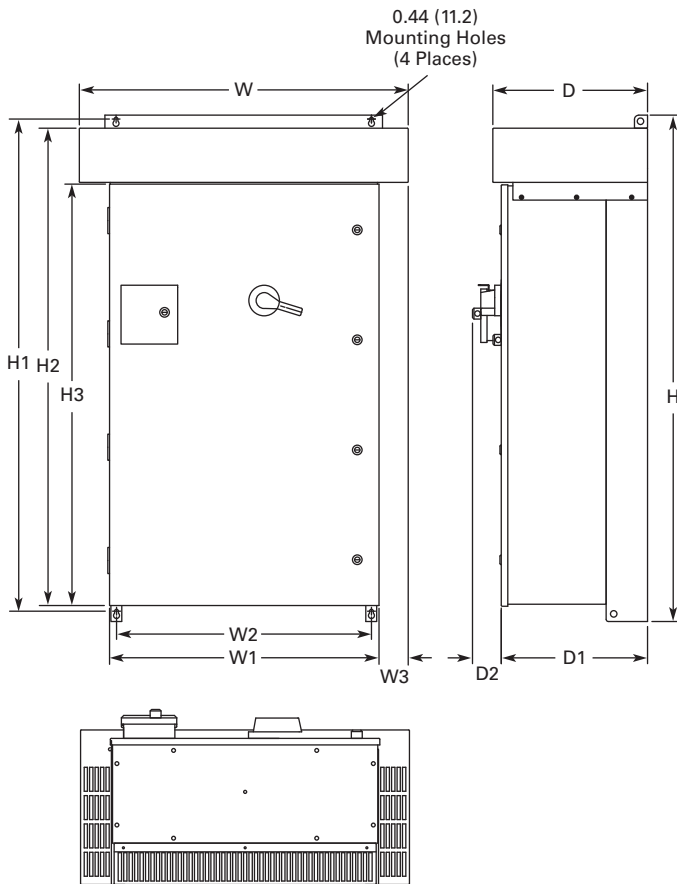
Adjustable Frequency Drives

H-Max Series Drives

Approximate Dimensions in Inches (mm)

Enclosure Box C NEMA Type 3R

2



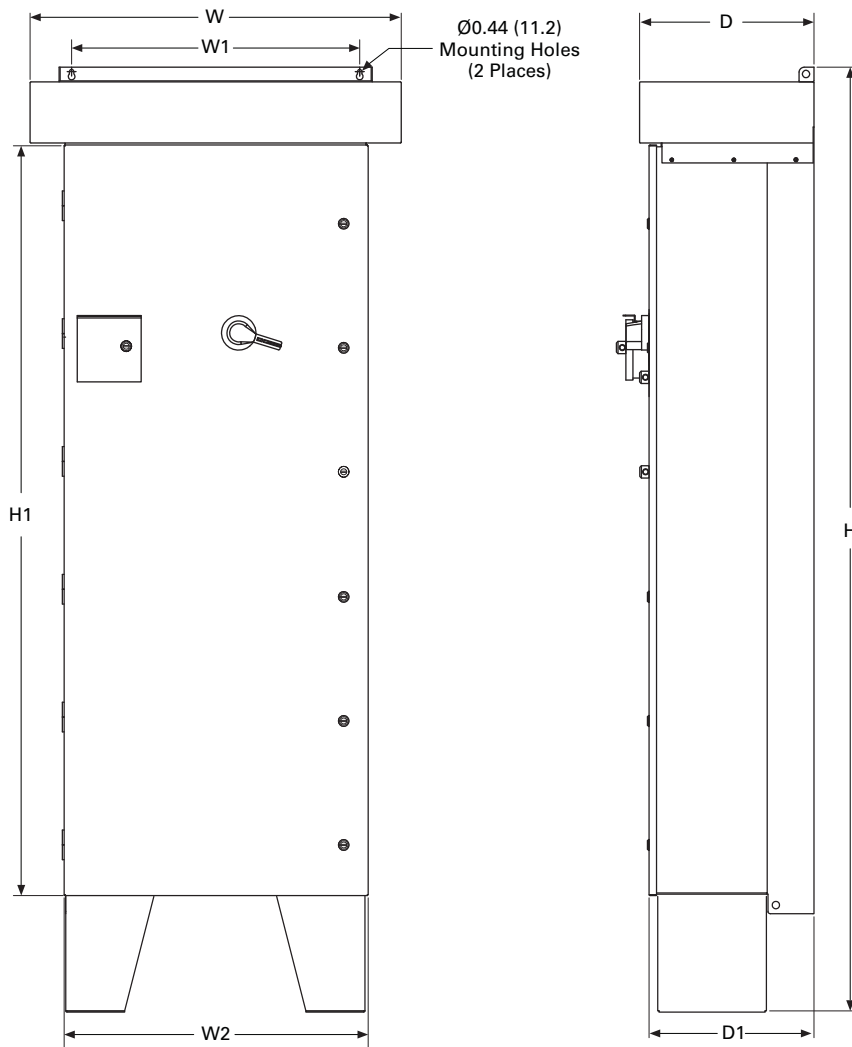
Voltage AC	hp (I _L)	H	H1	H2	H3	W	W1	W2	W3	D	D1	D2	Approx. Weight Lbs (kg)
Three-Phase													
208	20–30	58.09 (1475.5)	56.45 (1433.8)	54.77 (1391.2)	48.35 (1228.1)	37.73 (958.3)	30.92 (785.4)	29.30 (744.2)	3.34 (84.8)	17.74 (450.6)	16.77 (426.0)	3.31 (84.1)	①
230	20–30												
480	50–75												

Note

① Consult factory.

Approximate Dimensions in Inches (mm)

Enclosure Box D



Voltage AC	hp (I _L)	H	H1	W	W1	W2	D	D1	Approx. Weight Lbs (kg)
NEMA Type 12									
208	40–60	80.00	76.27	31.00	29.30	30.92	16.76	16.76	850
230	40–75	(2032.0)	(1937.3)	(787.4)	(744.2)	(785.4)	(425.7)	(425.7)	(386)
480	100–150								
NEMA Type 3R									
208	40–60	96.00	76.27	37.73	29.30	30.92	17.74	16.76	900
230	40–75	(2438.4)	(1937.3)	(958.3)	(744.2)	(785.4)	(450.6)	(425.7)	(409)
480	100–150								

2.8

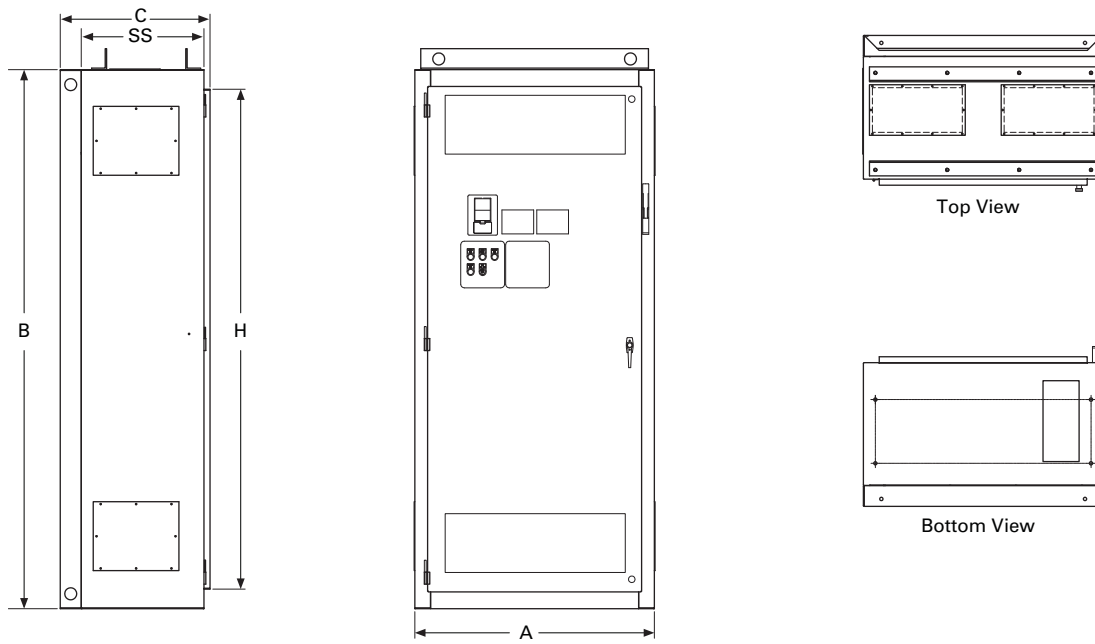
Adjustable Frequency Drives

H-Max Series Drives

Approximate Dimensions in Inches (mm)

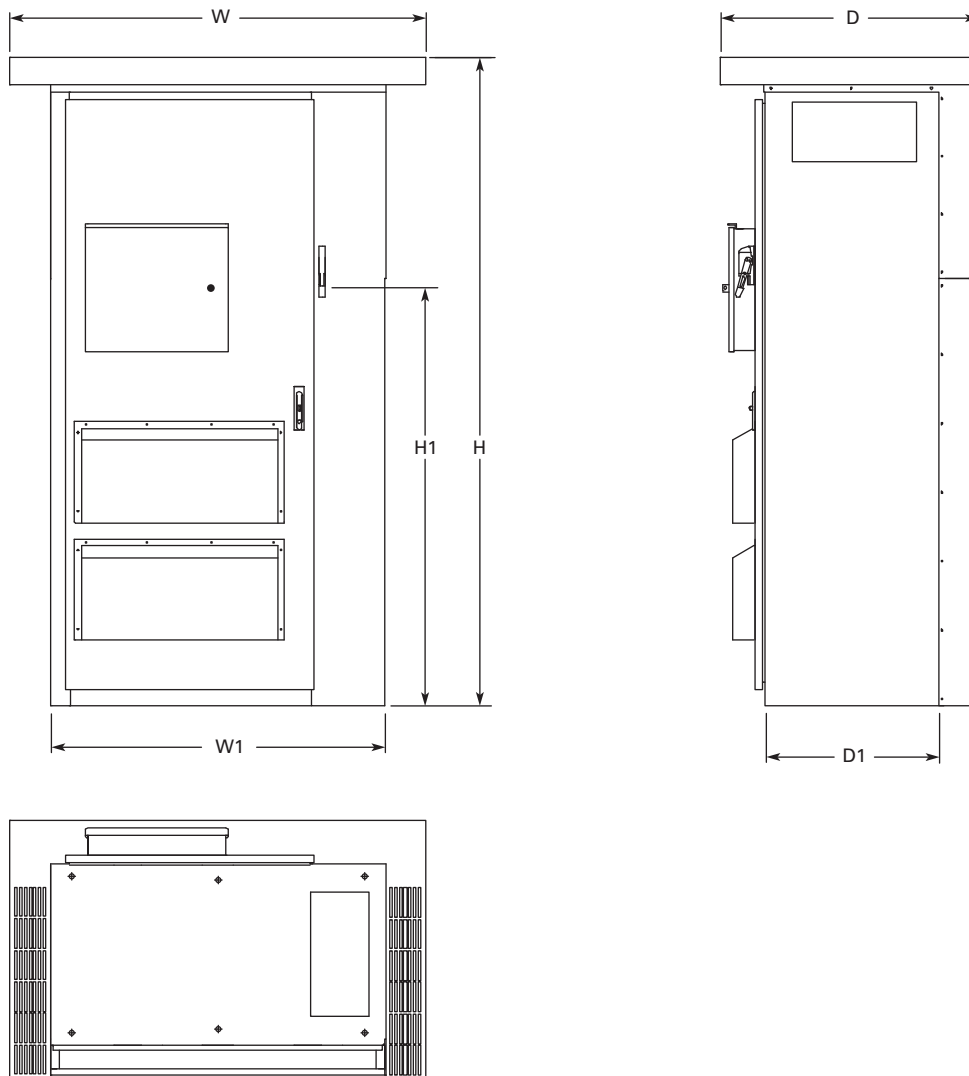
Enclosure Box 5

2



Voltage AC	hp (I _L)	Wide A	High B	Deep C	SS	Mounting D	D1	F	G	Door Height (H)	Approx. Weight Lbs (kg)
Three-phase											
208	75-100	40.00	90.00	25.00	20.50	36.00	2.00	8.00	10.80	83.45	1275
230	100	(1016.0)	(2286.0)	(635.0)	(520.7)	(914.4)	(50.8)	(203.2)	(274.3)	(2119.6)	(578)
480	200-250										

Approximate Dimensions in Inches (mm)

Enclosure Box F

Voltage AC	hp (I _L)	H	H1	W	W1	D	D1	Approx. Weight Lbs (kg)
Three-Phase								
208	75–100	93.58	69.51	60.00	48.00	37.50	26.00	1700
230	100	(2377.0)	(1765.5)	(1524.0)	(1219.2)	(952.5)	(660.4)	(772)
480	200–250							