

## H-Max HVAC enclosed drives



# Reliability for the HVAC industry



The H-Max™ Series IntelliPass/IntelliDisconnect variable frequency drive is specifically designed to meet the needs of the HVAC industry by offering leading HVAC software and hardware features. With an industry-leading energy-efficiency algorithm, available options and robust design, it offers you increased efficiency, design compatibility and reliability.

### Product range

- 1–30 hp, 208/230 Vac
- 1–75 hp, 480 Vac
- NEMA® 1/IP21 or NEMA 12/IP54 or
- NEMA 3R/IP44 packaging

### Benefits

- Industry-leading energy-efficient solution
- Easy menu navigation
- Multi-monitoring capability
- Corrosion-resistant circuit boards
- Extended shelf life
- Meets EMC Class C2 requirements
- Ideal feature set for HVAC

### Features

- Active energy control algorithm
- Graphic display and keypad
- Onboard communications (RS-485: Modbus® BACnet, N2 Ethernet: Modbus TCP, BACnet/IP)
- Onboard I/O (6DI, 3RO, 2AI, 1AO)
- Conformal coated circuit boards
- Real-time clock with battery backup
- 5% DC link choke
- Thin metal film bus capacitors
- Variety of standard options
- OSHPD seismic certified



Product	FS4			FS5			FS6			FS7		
Voltage (Vac)	208	230	480	208	230	480	208	230	480	208	230	480
Horsepower	1–3	1–3	1–7.5	5–10	5–10	10–20	15–20	15–20	25–40	25–30	25–30	50–75
Amperes	4.5–10.6	4.2–9.6	2.1–11.0	16.7–30.8	15.2–28.0	14.0–27.0	46.2–59.4	42–54	34–52	74.9–88	68–80	65–96

# EATON

Powering Business Worldwide

## Primary design features

Description	IntelliPass	IntelliDisconnect
CB MMP	Standard	Standard
Two contactor bypass	Standard	N/A
Electrical interlock	Standard	N/A
Top entry (power)	Standard	Standard
Bottom entry (power)	Standard	Standard
Output contactor	Standard	Optional
Third contactor (isolation)	Optional	N/A
Isolation switch	Optional	N/A

## Input ratings

Description	Specification
Input voltage ( $V_{in}$ )	208, 230, 480 Vac, $\pm 10\%$
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

Description	Specification
Output voltage	0 to $V_{in}/U_{in}$ line voltage in
Continuous output current	Ambient temperature maximum 104°F (40°C)
$I_L$ overload	1.1 x $I_L$ (1/10 minutes)
Overload current	110% (1/10 minutes)
Initial output current	150% for two seconds
Output frequency	0 to 320 Hz
Frequency resolution	0.01 Hz

## Control characteristics

Description	Specification
Control method	Frequency control (V/f) open loop sensorless vector control
Switching frequency	1–310A; adjustable with parameter 2.7.7 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

## Ambient conditions

Description	Specification
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, noncorrosive, 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 (1000m); 1% derating for each 328 ft (100m) above 3280 ft (1000m); maximum 9842 ft (3000m); 380–480V
Vibration	FS4–FS7: IEC 60068-2-6, 10–150 Hz Displacement amplitude = 1 mm peak-to-peak, 10–15.8 Hz Maximum acceleration amplitude = 1G peak, 15.8–150 Hz
Shock	FS4–FS7: IEC 60068-2-27, 15G peak acceleration at 11 ms duration, 1/2-sine, ISTA™ 1A Certified
Enclosure class	NEMA Type 1/IP21, NEMA Type 12/IP54 or NEMA 3R/IP44

## Standards

Description	Specification
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

## Protections

Description	Specification
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)
Conformal coated (varnished) board	Yes (prevents corrosion)

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