

**H2 Inverter/
Encoderless Vector**



3/4 thru 50 Hp
3/4 thru 60 Hp
3/4 thru 60 Hp

180-264 VAC
340-528 VAC
515-660 VAC

3 Phase - 50/60 Hz
3 Phase - 50/60 Hz
3 Phase - 60 Hz

Applications: Constant torque or constant horsepower applications. New installations, replacements and original equipment manufacturers (OEM).

Features: NEMA 1 enclosure as standard. Output frequency 0 to 500 Hz with peak overload capacity of 175%. Separate accel/decel rates and controlled reversing. Built in two and three input PID process control loop.

Design Specifications

- Process follower 0-5 VDC, 0-10 VDC, 4-20 mA
- Free run or ramp stop
- Selectable preset speeds
- Jog speed
- Dynamic braking
- DC injection braking
- 2 analog meter outputs
- 2 opto isolated outputs
- 2 relay outputs
- Energy Optimization
- Adaptive Tuning
- Plug-in I/O connectors

Operator Keypad

- Forward/Reverse command
- Motor RUN and JOG
- Local/Remote key
- Stop command
- Parameter setting and display
- 128x64 graphical display
- Remote mount to 100 feet from control
- NEMA 4X enclosure when mounted on panel
- Upload and download parameter sets
- Help text displays

Environmental and Operating Conditions

- Input voltage
3 phase 200-240 VAC ±10%
3 phase 380-480 VAC ±10%
3 phase 575-600 VAC ±10%
- Input frequency -
50 or 60Hz ±5%
- Service factor - 1.0
- Duty - continuous
- Humidity - 90% max RH non-condensing
- Altitude - 3300 feet max without derate

Protective Features

- DC bus charge indicator
- Fault indicator
- Adjustable time based overload
- Cause of last 10 trips retained in memory
- Fault trace function
- Digital display for fault conditions with real time clock
- Linear heat sink thermal sensor
- Isolated control circuitry

Output Ratings	Overload Capacity	150% for 60 seconds; 175% for 3 seconds for constant torque 115% for 60 seconds for variable torque
	Frequency	0-500 Hz standard
	Voltage	0-Maximum input voltage (RMS)
Input Ratings	Frequency	50 or 60 Hz ± 5%
	Voltage	200-240 VAC ±10%; 380-480 VAC ± 10%; 575-600 ± 10%
	Phase	Three phase (or single phase with derate)
	Impedance	1% minimum from mains connection
Control Spec	Control Method	Sinewave carrier input, PWM output; selectable encoderless vector or V/Hz inverter
	PWM Frequency	Adjustable 1-5 kHz standard, 1-16 kHz quiet
	V/Hz Ratio	Linear to squared reduced, base frequency, output voltage, minimum frequency limit, maximum frequency limit
	Torque Boost	0-30% of input voltage; automatic with manual override
	Brake Torque	20% standard on Sizes AA and B, 1% standard on Size C
	Skip Frequency	Three zones 0-Max frequency
	Frequency Setting	0-5 VDC, 0-10 VDC, 4-20mA, digital via keypad, Serial Comms/USB 2.0 and ModBus RTU std.
	Accel/Decel	Separate accel/decel rates, 0-3600 sec to maximum frequency, linear, S-curve, C-curve
Protective Functions	PC Setup Software	Workbench Software available via connection to USB2.0 port for commissioning wizard, firmware download, parameter viewer, scope capture and cloning
	Inverter Trip	Over voltage, over current, under voltage, external trip, heatsink thermal, motor overload
	Stall Prevention	Over voltage suppression, overcurrent suppression
	External Output	OPTO isolated outputs, relay outputs, and LED indicator for trip
LCD Display	Short Circuit	Phase to phase, phase to ground
	Running	Output frequency, set frequency, output current(%), voltage, RPM, custom units, power, energy consumed
	Setting	Parameter values for setup and review
Ambient Conditions	Trip	Separate message for each trip, cause of last 10 trips retained in memory
	Temperature	-10 to + 45°C For UL Listing
	Cooling	Forced air included when required

OPTIONS: See page 184 for optional Expansion Boards including Ethernet, Isolated Input etc. See page 183 for optional Dynamic Braking Assemblies.

HVAC Motors

Farm Duty Motors

Definite Purpose Motors

Brake Motors

200 & 575 Volt Motors

IEC Frame Motors

50 Hertz Motors

Inverter/Vector Motors & Controls

Servo Motors and Controls

DC Motors and Controls

H2 Inverter/Encoderless Vector - 230 Volts

Hp	Volt	Output Current		Catalog Number	List Price	Mult. Sym.	Size
		Cont.	Peak				
Constant Torque - H2 Inverter - Output Ratings with 2.5 kHz PWM Frequency							
1	230	4.2	7.4	IHH201-E	951	E1	AA
2	230	6.8	11.9	IHH202-E	1082	E1	AA
3	230	9.6	16.8	IHH203-E	1264	E1	AA
5	230	15.2	26.6	IHH205-E	1455	E1	AA
7 1/2	230	22	38.5	IHH207-E	1813	E1	AA
10	230	28	49	IHH210-E	2550	E1	B
15	230	42	73.5	IHH215-E	3333	E1	B
20	230	54	94.5	IHH220-E	4118	E1	B
25	230	68	102	IHH225-E	5513	E1	C
30	230	80	120	IHH230-E	6327	E1	C
40	230	104	157	IHH240-M	8428	E1	C
50	230	130	150	IHH250-M	10341	E1	C
H2 "Quiet Drive™" Inverter - Output Ratings with 8.0 kHz PWM Frequency							
3/4	230	3.2	6.4	IHH201-E	951	E1	AA
1	230	4.2	7.4	IHH202-E	1082	E1	AA
2	230	6.8	11.9	IHH203-E	1264	E1	AA
3	230	9.6	16.8	IHH205-E	1455	E1	AA
5	230	15.2	26.6	IHH207-E	1813	E1	AA
7 1/2	230	22	38.5	IHH210-E	2550	E1	B
10	230	28	49	IHH215-E	3333	E1	B
15	230	42	73.5	IHH220-E	4118	E1	B
20	230	54	94.5	IHH225-E	5513	E1	C
25	230	68	102	IHH230-E	6327	E1	C
30	230	80	120	IHH240-M	8428	E1	C
40	230	104	157	IHH250-M	10341	E1	C

H2 Inverter/Encoderless Vector - 230 Volts

Hp	Volt	Output Current		Catalog Number	List Price	Mult. Sym.	Size
		Cont.	Peak				
Variable Torque - H2 Inverter - Output Ratings with 2.5 kHz PWM Frequency							
2	230	6.8	7.8	IHH201-E	951	E1	AA
3	230	9.6	11	IHH202-E	1082	E1	AA
5	230	15.2	17.5	IHH203-E	1264	E1	AA
7 1/2	230	22	25.3	IHH205-E	1455	E1	AA
10	230	28	32.2	IHH207-E	1813	E1	AA
15	230	42	48.3	IHH210-E	2550	E1	B
20	230	54	62.1	IHH215-E	3333	E1	B
30	230	80	92	IHH225-E	5513	E1	C
40	230	104	120	IHH230-E	6327	E1	C
50	230	130	150	IHH240-M	8428	E1	C
H2 "Quiet Drive™" Inverter - Output Ratings with 8.0 kHz PWM Frequency							
1	230	4.2	4.8	IHH201-E	951	E1	AA
2	230	6.8	7.8	IHH202-E	1082	E1	AA
3	230	9.6	11	IHH203-E	1264	E1	AA
5	230	15.2	17.5	IHH205-E	1455	E1	AA
7 1/2	230	22	25.3	IHH207-E	1813	E1	AA
10	230	28	32.2	IHH210-E	2550	E1	B
15	230	42	48.3	IHH215-E	3333	E1	B
20	230	54	62.1	IHH220-E	4118	E1	B
25	230	68	78.2	IHH225-E	5513	E1	C
30	230	80	92	IHH230-E	6327	E1	C
40	230	105	120	IHH240-M	8428	E1	C
50	230	130	150	IHH250-M	10341	E1	C

OPTIONS: Dimensions are listed on page 178. See page 184 for optional Expansion Boards. See page 183 for optional Dynamic Braking Assemblies. See notes on pages 8 and 9, and inside back flap.

H2 Inverter/Encoderless Vector - 460 Volts

Hp	Volt	Output Current		Catalog Number	List Price	Mult. Sym.	Size
		Cont.	Peak				
Constant Torque – H2 Inverter – Output Ratings with 2.5 kHz PWM Frequency							
1	460	2.1	3.7	IHH401-E	1260	E1	AA
2	460	3.4	6.0	IHH402-E	1449	E1	AA
3	460	4.8	8.4	IHH403-E	1685	E1	AA
5	460	7.6	13.3	IHH405-E	1891	E1	AA
7 1/2	460	11	19.3	IHH407-E	2719	E1	AA
10	460	14	24.5	IHH410-E	2888	E1	AA
15	460	21	36.8	IHH415-E	3436	E1	B
20	460	27	47.2	IHH420-E	4140	E1	B
25	460	34	59.5	IHH425-E	5455	E1	B
30	460	40	70	IHH430-E	6570	E1	C
40	460	52	91	IHH440-E	7698	E1	C
50	460	65	114	IHH450-E	10440	E1	C
H2 "Quiet Drive™" Inverter – Output Ratings with 8.0 kHz PWM Frequency							
3/4	460	1.6	2.8	IHH401-E	1260	E1	AA
1	460	2.1	3.7	IHH402-E	1449	E1	AA
2	460	3.4	6.0	IHH403-E	1685	E1	AA
3	460	4.8	8.4	IHH405-E	1891	E1	AA
5	460	7.6	13.3	IHH407-E	2719	E1	AA
7 1/2	460	11	19.3	IHH410-E	2888	E1	AA
10	460	14	24.5	IHH415-E	3436	E1	B
15	460	21	36.8	IHH420-E	4140	E1	B
20	460	27	47.2	IHH425-E	5455	E1	B
25	460	34	59.5	IHH430-E	6570	E1	C
30	460	40	70	IHH440-E	7698	E1	C
40	460	52	91	IHH450-E	10440	E1	C

H2 Inverter/Encoderless Vector - 460 Volts

Hp	Volt	Output Current		Catalog Number	List Price	Mult. Sym.	Size
		Cont.	Peak				
Variable Torque – H2 Inverter – Output Ratings with 2.5 kHz PWM Frequency							
2	460	3.4	3.9	IHH401-E	1260	E1	AA
3	460	4.8	5.5	IHH402-E	1449	E1	AA
5	460	7.6	8.8	IHH403-E	1685	E1	AA
7 1/2	460	11	12.7	IHH405-E	1891	E1	AA
10	460	14	16.1	IHH407-E	2719	E1	AA
15	460	21	24.2	IHH410-E	2888	E1	AA
20	460	27	31.1	IHH415-E	3436	E1	B
25	460	34	39.1	IHH420-E	4140	E1	B
30	460	40	46	IHH425-E	5455	E1	B
40	460	52	60	IHH430-E	6570	E1	C
50	460	65	75	IHH440-E	7698	E1	C
60	460	77	89	IHH450-E	10440	E1	C
H2 "Quiet Drive™" Inverter – Output Ratings with 8.0 kHz PWM Frequency							
1	460	2.1	2.4	IHH401-E	1260	E1	AA
2	460	3.4	3.9	IHH402-E	1449	E1	AA
3	460	4.8	5.5	IHH403-E	1685	E1	AA
5	460	7.6	8.8	IHH405-E	1891	E1	AA
7 1/2	460	11	12.7	IHH407-E	2719	E1	AA
10	460	14	16.1	IHH410-E	2888	E1	AA
15	460	21	24.2	IHH415-E	3436	E1	B
20	460	27	31.1	IHH420-E	4140	E1	B
25	460	34	39.1	IHH425-E	5455	E1	B
30	460	40	46	IHH430-E	6570	E1	C
40	460	52	60	IHH440-E	7698	E1	C
50	460	65	75	IHH450-E	10440	E1	C

OPTIONS: Dimensions are listed on page 178. See page 184 for optional Expansion Boards. See page 183 for optional Dynamic Braking Assemblies. See notes on pages 8 and 9, and inside back flap.

HVAC Motors

Farm Duty Motors

Definite Purpose Motors

Brake Motors

200 & 575 Volt Motors

IEC Frame Motors

50 Hertz Motors

Inverter/Vector Motors & Controls

Servo Motors and Controls

DC Motors and Controls

H2 Inverter/Encoderless Vector - 575 Volts

Hp	Volt	Output Current		Catalog Number	List Price	Mult. Sym.	Size
		Cont.	Peak				
Constant Torque - H2 Inverter - Output Ratings with 2.5 kHz PWM Frequency							
1	575	1.7	3.0	IHH501-E	1450	E1	AA
2	575	2.7	4.7	IHH502-E	1667	E1	AA
3	575	3.9	6.8	IHH503-E	1938	E1	AA
5	575	6.1	10.7	IHH505-E	2175	E1	AA
7 1/2	575	9	15.8	IHH507-E	3127	E1	AA
10	575	11	19.3	IHH510-E	3329	E1	AA
15	575	17	29.8	IHH515-E	4123	E1	B
20	575	22	38.5	IHH520-E	5189	E1	B
25	575	27	47.2	IHH525-E	6684	E1	B
30	575	32	56	IHH530-E	7576	E1	C
40	575	41	72	IHH540-E	9152	E1	C
50	575	52	60	IHH550-E	12529	E1	C
H2 "Quiet Drive™" Inverter - Output Ratings with 8.0 kHz PWM Frequency							
3/4	575	1.3	2.2	IHH501-E	1450	E1	AA
1	575	1.7	3.0	IHH502-E	1667	E1	AA
2	575	2.7	4.7	IHH503-E	1938	E1	AA
3	575	3.9	6.8	IHH505-E	2175	E1	AA
5	575	6.1	10.7	IHH507-E	3127	E1	AA
7 1/2	575	9	15.8	IHH510-E	3329	E1	AA
10	575	11	19.3	IHH515-E	4123	E1	B
15	575	17	29.8	IHH520-E	5189	E1	B
20	575	22	38.5	IHH525-E	6684	E1	B
25	575	27	47.2	IHH530-E	7576	E1	C
30	575	32	56	IHH540-E	9152	E1	C
40	575	41	72	IHH550-E	12529	E1	C

H2 Inverter/Encoderless Vector - 575 Volts

Hp	Volt	Output Current		Catalog Number	List Price	Mult. Sym.	Size
		Cont.	Peak				
Variable Torque - H2 Inverter - Output Ratings with 2.5 kHz PWM Frequency							
2	575	2.7	3.1	IHH501-E	1450	E1	AA
3	575	3.9	4.5	IHH502-E	1667	E1	AA
5	575	6.1	7.0	IHH503-E	1938	E1	AA
7 1/2	575	9	10.4	IHH505-E	2175	E1	AA
10	575	11	12.7	IHH507-E	3127	E1	AA
15	575	17	19.6	IHH510-E	3329	E1	AA
20	575	22	25.3	IHH515-E	4123	E1	B
25	575	27	31.0	IHH520-E	5189	E1	B
30	575	32	36.8	IHH525-E	6684	E1	B
40	575	41	47	IHH530-E	7576	E1	C
50	575	52	60	IHH540-E	9152	E1	C
60	575	62	71	IHH550-E	12529	E1	C
H2 "Quiet Drive™" Inverter - Output Ratings with 8.0 kHz PWM Frequency							
1	575	1.7	1.9	IHH501-E	1450	E1	AA
2	575	2.7	3.1	IHH502-E	1667	E1	AA
3	575	3.9	4.5	IHH503-E	1938	E1	AA
5	575	6.1	7.0	IHH505-E	2175	E1	AA
7 1/2	575	9	10.4	IHH507-E	3127	E1	AA
10	575	11	12.7	IHH510-E	3329	E1	AA
15	575	17	19.6	IHH515-E	4123	E1	B
20	575	22	25.3	IHH520-E	5189	E1	B
25	575	27	31	IHH525-E	6684	E1	B
30	575	32	36.8	IHH530-E	7576	E1	C
40	575	41	47	IHH540-E	9152	E1	C
50	575	52	60	IHH550-E	12529	E1	C

OPTIONS: See page 184 for optional Expansion Boards. See page 183 for optional Dynamic Braking Assemblies. See notes on pages 8 and 9, and inside back flap.

Dimensions in/(mm)

Size	Outside			Mounting		Ap'x Shpg. Wgt.
	Height	Width	Depth	Height	Width	
AA	12.272/(312)	7.974/(203)	7.930/(201)	11.82/(300)	7.38/(187)	20
B	18.000/(457)	9.100/(231)	9.480/(241)	15.95/(405)	7.00/(178)	30
C	22.000/(559)	9.100/(231)	9.480/(241)	19.95/(507)	7.00/(178)	60

H2 Vector Drive



3/4 thru 50 Hp
3/4 thru 60 Hp
3/4 thru 60 Hp

180-264 VAC
340-528 VAC
575-660 VAC

3 Phase - 50/60 Hz
3 Phase - 50/60 Hz
3 Phase - 60 Hz

Applications: Constant torque or constant horsepower applications. New installations, replacements and original equipment manufacturers (OEM).

Features: NEMA 1 enclosure as standard. Output frequency 0 to 500 Hz with peak overload capacity of 175%. Automatic tuning to motor and full rated torque down to zero speed. Digital speed or torque control. Built in two and three input PID process control loop.

Design Specifications

- Motor shaft orient to marker
- Process follow ± 5 VDC 0-5 VDC, ± 10 VDC 0-10 VDC ,4-20mA, digital via keypad or serial
- Linear or S-curve deceleration
- 15 preset speeds
- 2 assignable analog outputs
- 2 assignable opto outputs
- 2 assignable relay outputs
- 2 assignable analog inputs
- Auto tuning to motor
- Adaptive tuning to load
- USB 2.0 full speed port
- ModBus RTU port
- Plug-in I/O connectors

Operator Keypad

- Forward/Reverse command
- Motor RUN and JOG
- Local/Remote key
- Stop command
- 128 x 64 Graphical Display
- Remote mount to 100 feet from control
- NEMA 4X enclosure when mounted on panel
- Upload and download parameter sets
- Help text displays

Environmental and Operating Conditions

- Input voltage
3 phase 200-240 VAC $\pm 10\%$
3 phase 380-480 VAC $\pm 10\%$
3 phase 575-600 VAC $\pm 10\%$
- Input frequency
50 or 60Hz $\pm 5\%$
- Service factor - 1.0
- Duty - continuous
- Humidity - 90% max RH non-condensing
- Altitude - 3300 feet max without derate

Protective Features

- Adjustable current limit
- Isolated control circuitry
- Digital display for fault conditions with real time clock
- Fault trace function
- Selectable automatic restart at momentary power loss
- DC bus charge indicator
- Cause of last 10 trips retained in memory
- 24 VDC isolated user supply
- Isolated encoder power supply

Output Ratings	Overload Capacity	150% for 60 seconds, 175% for 3 seconds for constant torque 115% for 60 seconds for variable torque
	Frequency	0-500 Hz
	Voltage	0-maximum input voltage (RMS)
Input Ratings	Frequency	50 or 60 Hz $\pm 5\%$
	Voltage	200-240 VAC $\pm 10\%$, 380-480 VAC $\pm 10\%$; 575-600 VAC $\pm 10\%$
	Phase	Three phase (or single phase with derate)
	Impedance	1% minimum from mains connection
Control Spec	Control Method	Microprocessor controlled PWM output, selectable closed loop vector; encoderless vector; or V/Hz inverter
	PWM Frequency	Adjustable 1-5kHz STD, 1-16 kHz quiet
	Speed Setting	± 5 VDC, 0-5 VDC ± 10 VDC, 0-10 VDC, 4-20 mA; digital via keypad, Serial Comms/USB 2.0, and ModBus RTU standard
	Accel/Decel	0-3600 sec.
	Motor Matching	Automatic tuning to motor with manual override
	PC Setup Software	Workbench Software available via connection to USB2.0 port for commissioning wizard, firmware download, parameter viewer, scope capture and cloning
Motor Feedback	Feedback Type	Incremental encoder coupled to motor shaft; optional resolver feedback
	Pulses/Rev	60-20,000 selectable, 1024 standard
	Voltage Output	2 channel in quadrature, 5 VDC, differential
	Marker Pulse	Required for position orientation
	Power Input	5 VDC, 300 mA maximum
	Max. Frequency	4 MHz
	Positioning	Optional buffered encoder pulse train output for position loop controller
Protective Functions	Vector Trip	Missing control power, over current, over voltage, under voltage, motor over speed, encoder loss Over temperature (motor or control), output shorted or grounded, motor overload
	External Output	LED indicator for trip conditions, 4 assignable logic outputs, 2 assignable analog outputs 0-10 VDC, ± 10 VDC
	Short Circuit	Phase to phase, phase to ground
LED Display	Running	Output frequency, motor RPM; output current, voltage (selectable), power, energy consumed
	Setting	Parameter values for setup and review
	Trip	Separate message for each trip, last 10 trips retained in memory
Ambient Conditions	Temperature	-10 to 45°C for UL listing
	Cooling	Forced air included when required

OPTIONS: See page 184 for optional Expansion Boards including Ethernet, Isolated Input, etc. See pages 183 for optional Dynamic Braking Assemblies.

H2 Vector Drive - 230 Volts

Hp	Volt	Output Current		Catalog Number	List Price	Mult. Sym.	Size
		Cont.	Peak				
Constant Torque – H2 Vector – Output Ratings with 2.5 kHz PWM Frequency							
1	230	4.2	7.4	ZHH201-E	1416	E1	AA
2	230	6.8	11.9	ZHH202-E	1587	E1	AA
3	230	9.6	16.8	ZHH203-E	1830	E1	AA
5	230	15.2	26.6	ZHH205-E	2044	E1	AA
7 1/2	230	22	38.5	ZHH207-E	2412	E1	AA
10	230	28	49	ZHH210-E	3388	E1	B
15	230	42	73.5	ZHH215-E	4309	E1	B
20	230	54	94.5	ZHH220-E	4908	E1	B
25	230	68	102	ZHH225-E	7023	E1	C
30	230	80	120	ZHH230-E	7675	E1	C
40	230	104	157	ZHH240-M	10109	E1	C
50	230	130	150	ZHH250-M	12409	E1	C
H2 "Quiet Drive™" Vector – Output Ratings with 8.0 kHz PWM Frequency							
3/4	230	3.2	6.4	ZHH201-E	1416	E1	AA
1	230	4.2	7.4	ZHH202-E	1587	E1	AA
2	230	6.8	11.9	ZHH203-E	1830	E1	AA
3	230	9.6	16.8	ZHH205-E	2044	E1	AA
5	230	15.2	26.6	ZHH207-E	2412	E1	AA
7 1/2	230	22	38.5	ZHH210-E	3388	E1	B
10	230	28	49	ZHH215-E	4309	E1	B
15	230	42	73.5	ZHH220-E	4908	E1	B
20	230	54	94.5	ZHH225-E	7023	E1	C
25	230	68	102	ZHH230-E	7675	E1	C
30	230	80	120	ZHH240-M	10109	E1	C
40	230	104	157	ZHH250-M	12409	E1	C

H2 Vector Drive - 230 Volts

Hp	Volt	Output Current		Catalog Number	List Price	Mult. Sym.	Size
		Cont.	Peak				
Variable Torque – H2 Vector – Output Ratings with 2.5 kHz PWM Frequency							
2	230	6.8	7.8	ZHH201-E	1416	E1	AA
3	230	9.6	11	ZHH202-E	1587	E1	AA
5	230	15.2	17.5	ZHH203-E	1830	E1	AA
7 1/2	230	22	25.3	ZHH205-E	2044	E1	AA
10	230	28	32.2	ZHH207-E	2412	E1	AA
15	230	42	48.3	ZHH210-E	3388	E1	B
20	230	54	62.1	ZHH215-E	4309	E1	B
30	230	80	92	ZHH225-E	7023	E1	C
40	230	104	120	ZHH230-E	7675	E1	C
50	230	130	150	ZHH240-M	10109	E1	C
H2 "Quiet Drive™" Vector – Output Ratings with 8.0 kHz PWM Frequency							
1	230	4.2	4.8	ZHH201-E	1416	E1	AA
2	230	6.8	7.8	ZHH202-E	1587	E1	AA
3	230	9.6	11	ZHH203-E	1830	E1	AA
5	230	15.2	17.5	ZHH205-E	2044	E1	AA
7 1/2	230	22	25.3	ZHH207-E	2412	E1	AA
10	230	28	32.2	ZHH210-E	3388	E1	B
15	230	42	48.3	ZHH215-E	4309	E1	B
20	230	54	62.1	ZHH220-E	4908	E1	B
25	230	68	78.2	ZHH225-E	7023	E1	C
30	230	80	92	ZHH230-E	7675	E1	C
40	230	105	120	ZHH240-M	10109	E1	C
50	230	130	150	ZHH250-M	12409	E1	C

OPTIONS: Dimensions are listed on page 182. See pages 184 for optional Expansion Boards. See pages 183 for optional Dynamic Braking Assemblies. See notes on pages 8 and 9, and inside back flap.

H2 Vector Drive - 460 Volts

Hp	Volt	Output Current		Catalog Number	List Price	Mult. Sym.	Size
		Cont.	Peak				
Constant Torque – H2 Vector – Output Ratings with 2.5 kHz PWM Frequency							
1	460	2.1	3.7	ZHH401-E	1880	E1	AA
2	460	3.4	6.0	ZHH402-E	2157	E1	AA
3	460	4.8	8.4	ZHH403-E	2472	E1	AA
5	460	7.6	13.3	ZHH405-E	2732	E1	AA
7 1/2	460	11	19.3	ZHH407-E	3904	E1	AA
10	460	14	24.5	ZHH410-E	4064	E1	AA
15	460	21	36.8	ZHH415-E	4390	E1	B
20	460	27	47.2	ZHH420-E	4986	E1	B
25	460	34	59.5	ZHH425-E	6384	E1	B
30	460	40	70	ZHH430-E	7797	E1	C
40	460	52	91	ZHH440-E	9390	E1	C
50	460	65	114	ZHH450-E	12265	E1	C
H2 "Quiet Drive™" Vector – Output Ratings with 8.0 kHz PWM Frequency							
3/4	460	1.6	2.8	ZHH401-E	1880	E1	AA
1	460	2.1	3.7	ZHH402-E	2157	E1	AA
2	460	3.4	6.0	ZHH403-E	2472	E1	AA
3	460	4.8	8.4	ZHH405-E	2732	E1	AA
5	460	7.6	13.3	ZHH407-E	3904	E1	AA
7 1/2	460	11	19.3	ZHH410-E	4064	E1	AA
10	460	14	24.5	ZHH415-E	4390	E1	B
15	460	21	36.8	ZHH420-E	4986	E1	B
20	460	27	47.2	ZHH425-E	6384	E1	B
25	460	34	59.5	ZHH430-E	7797	E1	C
30	460	40	70	ZHH440-E	9390	E1	C
40	460	52	91	ZHH450-E	12265	E1	C

H2 Vector Drive - 460 Volts

Hp	Volt	Output Current		Catalog Number	List Price	Mult. Sym.	Size
		Cont.	Peak				
Variable Torque – H2 Vector – Output Ratings with 2.5 kHz PWM Frequency							
2	460	3.4	3.9	ZHH401-E	1880	E1	AA
3	460	4.8	5.5	ZHH402-E	2157	E1	AA
5	460	7.6	8.8	ZHH403-E	2472	E1	AA
7 1/2	460	11	12.7	ZHH405-E	2732	E1	AA
10	460	14	16.1	ZHH407-E	3904	E1	AA
15	460	21	24.2	ZHH410-E	4064	E1	AA
20	460	27	31.1	ZHH415-E	4390	E1	B
25	460	34	39.1	ZHH420-E	4986	E1	B
30	460	40	46	ZHH425-E	6384	E1	B
40	460	52	60	ZHH430-E	7797	E1	C
50	460	65	75	ZHH440-E	9390	E1	C
60	460	77	89	ZHH450-E	12265	E1	C
H2 "Quiet Drive™" Vector – Output Ratings with 8.0 kHz PWM Frequency							
1	460	2.1	2.4	ZHH401-E	1880	E1	AA
2	460	3.4	3.9	ZHH402-E	2157	E1	AA
3	460	4.8	5.5	ZHH403-E	2472	E1	AA
5	460	7.6	8.8	ZHH405-E	2732	E1	AA
7 1/2	460	11	12.7	ZHH407-E	3904	E1	AA
10	460	14	16.1	ZHH410-E	4064	E1	AA
15	460	21	24.2	ZHH415-E	4390	E1	B
20	460	27	31.1	ZHH420-E	4986	E1	B
25	460	34	39.1	ZHH425-E	6384	E1	B
30	460	40	46	ZHH430-E	7797	E1	C
40	460	52	60	ZHH440-E	9390	E1	C
50	460	65	75	ZHH450-E	12265	E1	C

OPTIONS: Dimensions are listed on page 182. See pages 184 for optional Expansion Boards. See pages 183 for optional Dynamic Braking Assemblies. See notes on pages 8 and 9, and inside back flap.

HVAC Motors

Farm Duty Motors

Definite Purpose Motors

Brake Motors

200 & 575 Volt Motors

IEC Frame Motors

50 Hertz Motors

Inverter/Vector Motors & Controls

Servo Motors and Controls

DC Motors and Controls

H2 Vector Drive - 575 Volts

Hp	Volt	Output Current		Catalog Number	List Price	Mult. Sym.	Size
		Cont.	Peak				
Constant Torque – H2 Vector – Output Ratings with 2.5 kHz PWM Frequency							
1	575	1.7	3	ZHH501-E	2163	E1	AA
2	575	2.7	4.7	ZHH502-E	2481	E1	AA
3	575	3.9	6.8	ZHH503-E	2843	E1	AA
5	575	6.1	10.7	ZHH505-E	3141	E1	AA
7 1/2	575	9	15.8	ZHH507-E	3962	E1	AA
10	575	11	19.3	ZHH510-E	4417	E1	AA
15	575	17	29.8	ZHH515-E	5268	E1	B
20	575	22	38.5	ZHH520-E	6135	E1	B
25	575	27	47.2	ZHH525-E	7727	E1	B
30	575	32	56	ZHH530-E	8725	E1	C
40	575	41	72	ZHH540-E	10758	E1	C
50	575	52	91	ZHH550-E	14719	E1	C
H2 "Quiet Drive™" Vector – Output Ratings with 8.0 kHz PWM Frequency							
3/4	575	1.3	2.2	ZHH501-E	2163	E1	AA
1	575	1.7	3	ZHH502-E	2481	E1	AA
2	575	2.1	4.7	ZHH503-E	2843	E1	AA
3	575	3.9	6.8	ZHH505-E	3141	E1	AA
5	575	6.1	10.7	ZHH507-E	3962	E1	AA
7 1/2	575	9	15.8	ZHH510-E	4417	E1	AA
10	575	11	19.3	ZHH515-E	5268	E1	B
15	575	17	29.8	ZHH520-E	6135	E1	B
20	575	22	38.5	ZHH525-E	7727	E1	B
25	575	27	47.2	ZHH530-E	8725	E1	C
30	575	32	56	ZHH540-E	10758	E1	C
40	575	41	72	ZHH550-E	14719	E1	C

H2 Vector Drive - 575 Volts

Hp	Volt	Output Current		Catalog Number	List Price	Mult. Sym.	Size
		Cont.	Peak				
Variable Torque – H2 Vector – Output Ratings with 2.5 kHz PWM Frequency							
2	575	2.7	3.1	ZHH501-E	2163	E1	AA
3	575	3.9	4.5	ZHH502-E	2481	E1	AA
5	575	6.1	7	ZHH503-E	2843	E1	AA
7 1/2	575	9	10.4	ZHH505-E	3141	E1	AA
10	575	11	12.7	ZHH507-E	3962	E1	AA
15	575	17	19.6	ZHH510-E	4417	E1	AA
20	575	22	25.3	ZHH515-E	5268	E1	B
25	575	27	31	ZHH520-E	6135	E1	B
30	575	32	36.8	ZHH525-E	7727	E1	B
40	575	41	47	ZHH530-E	8725	E1	C
50	575	52	60	ZHH540-E	10758	E1	C
60	575	62	71	ZHH550-E	14719	E1	C
H2 "Quiet Drive™" Vector – Output Ratings with 8.0 kHz PWM Frequency							
1	575	1.7	1.9	ZHH501-E	2163	E1	AA
2	575	2.7	3.1	ZHH502-E	2481	E1	AA
3	575	3.9	4.5	ZHH503-E	2843	E1	AA
5	575	6.1	7	ZHH505-E	3141	E1	AA
7 1/2	575	9	10.4	ZHH507-E	3962	E1	AA
10	575	11	12.7	ZHH510-E	4417	E1	AA
15	575	17	19.6	ZHH515-E	5268	E1	B
20	575	22	25.3	ZHH520-E	6135	E1	B
25	575	27	31	ZHH525-E	7727	E1	B
30	575	32	36.8	ZHH530-E	8725	E1	C
40	575	41	47	ZHH540-E	10758	E1	C
50	575	52	60	ZHH550-E	14719	E1	C

OPTIONS: See pages 184 for optional Expansion Boards. See pages 183 for optional Dynamic Braking Assemblies. See notes on pages 8 and 9, and inside back flap.

Dimensions in/(mm)

Size	Outside			Mounting		Ap'x Shpg. Wgt.
	Height	Width	Depth	Height	Width	
AA	12.272/(312)	7.974/(203)	7.930/(201)	11.82/(300)	7.38/(187)	20
B	18.000/(457)	9.100/(231)	9.480/(241)	15.95/(405)	7.00/(178)	30
C	22.000/(559)	9.100/(231)	9.480/(241)	19.95/(507)	7.00/(178)	60

H2 Drive Keypad Extension Cable

For the convenience of our customers, we offer a connector plug/cable assembly. This assembly provides the connectors from the keypad to the control for remote keypad operation.

Catalog Number	Cable Extension Length	List Price	Mult. Sym.	Ap'x. Shpg. Wgt.
CBLHH015KP	5 feet (1.5 meter)	39	E8	1
CBLHH030KP	10 feet (3.0 meter)	56	E8	1
CBLHH046KP	15 feet (4.6 meter)	73	E8	1
CBLHH061KP	20 feet (6.1 meter)	90	E8	2
CBLHH091KP	30 feet (9.1 meter)	106	E8	3
CBLHH152KP	50 feet (15.2 meter)	151	E8	3
CBLHH229KP	75 feet (22.9 meter)	219	E8	4
CBLHH305KP	100 feet (30.5 meter)	286	E8	5

H2 Drive Dynamic Braking Resistor Assemblies

Dynamic Braking Resistor Assemblies include braking resistors completely assembled and mounted into a NEMA 1 enclosure. Select the braking resistor that has correct ohm value for the control and adequate continuous watts capacity to meet load requirements.

Input Volts	Hp	Total Ohms	Continuous Rated Watts			
			600	1200	2400	4800
230	1-2	30	RGA630	RGA1230	RGA2430	
	3-7.5	20	RGA620	RGA1220	RGA2420	RGA4820
	10	10		RGA1210	RGA2410	RGA4810
	15-20	6		RGA1206	RGA2406	RGA4806
	25-40	4		RGA1204	RGA2404	RGA4804
	50	2				RGA4802
460	1-3	120	RGA6120	RGA12120	RGA24120	
	5-10	60	RGA660	RGA1260	RGA2460	RGA4860
	15-25	20	RGA620	RGA1220	RGA2420	RGA4820
	30-50	10		RGA1210	RGA2410	RGA4810
575	1-2	200			RGA24200	
	3-5	120	RGA6120	RGA12120	RGA24120	
	7.5-10	60	RGA660	RGA1260	RGA2460	RGA4860
	15-25	30	RGA630	RGA1230	RGA2430	RGA4830
	30	24		RGA1224	RGA2424	RGA4824
	40-50	14				RGA4814
		List Price	508	755	1156	1875
		Mult. Sym.	E8	E8	E8	E8

HVAC Motors
Farm Duty Motors
Definite Purpose Motors
Brake Motors
200 & 575 Volt Motors
IEC Frame Motors
50 Hertz Motors
Inverter/Vector Motors & Controls
Servo Motors and Controls
DC Motors and Controls

H2 Drive Expansion Boards

Baldor offers a wide variety of plug-in expansion boards for the Series H2 Inverter, H2 Vector, and H2 Servo Drives. Expansion boards allow the drive to be interfaced with various inputs and outputs. Each control has the capability to utilize up to two expansion boards.

Board Number	Description	List Price	Mult. Sym.												
EXBHH001A01	Ethernet Server Expansion Board Provides easy connection to all drive parameters for setup and review using any PC based Web Browser via an Ethernet connection. Download parameter values, operating conditions, and fault log data for review and archive. Uses standard RJ-45 female terminal for ethernet connection.	144	E8												
EXBHH002A01	Mint® Expansion Board Provides standalone Position Controller capability for a single axis and is programmable in MINT. Position capabilities include Master Axis Follower, Electronic Gearbox, Flying Shears, Registration, Virtual Master, and CAM functions. uses MINT Workbench V5 for setup and diagnostics. Master encoder input supports differential inputs for A, B and Z (Index pulse) and uses DB9 for connection. One CAN open channel is available for connection to additional I/O breakout box or CAN HMI terminal. Connection to PC is via USB1.1 connector. Includes CD Rom, and 2m USB cable.	662	E8												
EXBHH003A01 (See Note 1)	Isolated Input Expansion Board Contains 9 isolated inputs jumper configurable for 90-130 VAC. All inputs must be the same voltage – one side of all inputs is common. This board replaces all the opto inputs on the main control board. Uses screw terminals for connection.	187	E8												
EXBHH005A01	High Resolution Analog Board Allows one input with up to 16 bits resolution. DC inputs: ± 10V, 0-10V, ± 5V, 0-5V, with 300 microvolt resolution. Current inputs: 4-20 mA, with 0.6 microamps resolution. <table border="0" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">Input</td> <td style="text-align: center;">Resolution</td> </tr> <tr> <td style="text-align: center;">± 10 V</td> <td style="text-align: center;">16 bit</td> </tr> <tr> <td style="text-align: center;">0 - 10 V</td> <td style="text-align: center;">15 bit</td> </tr> <tr> <td style="text-align: center;">± 5 V</td> <td style="text-align: center;">15 bit</td> </tr> <tr> <td style="text-align: center;">0 - 5 V</td> <td style="text-align: center;">14 bit</td> </tr> <tr> <td style="text-align: center;">4 - 20 mA</td> <td style="text-align: center;">15 bit</td> </tr> </table> Both the 0-10 V and 4-20 mA inputs may be inverted to 10-0 V and 20-4 mA. Two outputs, each with ± 10 VDC, 0-10 VDC or 4-20 mA with inverting capability. This replaces the analog outputs on the main control board. Uses screw terminals for connection.	Input	Resolution	± 10 V	16 bit	0 - 10 V	15 bit	± 5 V	15 bit	0 - 5 V	14 bit	4 - 20 mA	15 bit	293	E8
Input	Resolution														
± 10 V	16 bit														
0 - 10 V	15 bit														
± 5 V	15 bit														
0 - 5 V	14 bit														
4 - 20 mA	15 bit														
EXBHH007A01 (See Note 1)	Master Pulse Reference / Isolated Pulse Follower–Bi-directional jumper selectable for: 1. Master quadrature pulse reference. Provides 5 volt quadrature A and B channel outputs with complements at a pulse rate proportional to accel-decel limited speed commands. Phase of B channel is reversed for reverse direction. 2. Master speed step-direction pulse reference. Provides 5 volt pulse and direction outputs with complements at a pulse rate proportional to accel-decel limited speed command. 3. Quadrature pulse follower. Provides opto isolated inputs for 5-15 volt quadrature A and B channel input speed commands and retransmits this input as 5 volt channel A and B outputs with complements at a pulse rate proportional to accel-decel limited speed command. Motor direction reverses with input channel phase reversal. 4. Speed step and direction pulse follower. Provides opto isolated inputs for 5-15 volt input pulse and direction. Commands and retransmits these inputs as 5 volt pulse and direction outputs with complements at a pulse rate proportional to accel-decel limited speed command.	479	E8												
EXBHH012A01	Ethernet IP Communications Expansion Board Allows H2 Drives to be connected to Ethernet IP Communications Bus. Uses plug-in terminals for connection.	487	E8												
EXBHH013A01	DeviceNet Expansion Board Allows H2 Drives to be connected to DeviceNet Communications Bus. Uses plug-in terminals for connection.	496	E8												
EXBHH014A01	Profibus DP Expansion Board Allows H2 Drives to be connected to Profibus Communications Bus. Uses plug-in terminals for connection.	596	E8												
EXBHH016A01	LonWorks Communications Expansion Board Allows H2 Drives to be connected to LonWorks Communications Bus. Uses plug-in terminals for connection.	487	E8												

NOTES: (1) Available mid-year.

**H2
AC Servo Control**

**3 thru 54 Amps
3 thru 27 Amps**

**180-264 VAC
340-528 VAC**

**3 Phase 50/60 Hz
3 Phase 50/60 Hz**



Applications: Automated machinery, material handling, packaging, food processing, textile fabrication, factory automation, and more.

Features: Fully protected and uses the industry standard ± 10 VDC input command. Simple English keypad provides setup and operation. Auto-tuning to configure the control and motor. Optional expansion boards extend product capability for application needs.

Design Specifications

- IGBT power devices
- Digital speed control or torque control
- Auto tuning to motor with manual-override
- Process follower capability
- Programmable linear or S-curve acceleration
- Simulated quadrature encoder output with index pulse
- 9 opto-isolated inputs
- 2 assignable analog outputs
- 2 assignable logic outputs
- 2 Assignable relay outputs
- 2 assignable analog inputs
- USB 2.0 full speed port
- Plug-in I/O connectors

Operator Keypad

- Forward/Reverse command
- Jog speed
- Local/Remote key
- Stop command
- 128 x 64 graphical display
- Remote mount to 100 feet from control
- NEMA 4 enclosure when mounted on panel
- Upload and download parameter sets
- Help text displays

Environmental and Operating Conditions

- Input voltage
 - Three phase 200-240 VAC $\pm 10\%$
 - Three phase 380-480 VAC $\pm 10\%$
- Input frequency - 50 or 60Hz $\pm 5\%$
- Service factor - 1.0
- Duty - continuous
- Humidity - 90% max RH non-condensing
- Altitude - 3300 feet max without derate

Protective Features

- Motor overspeed
- Adjustable current limit
- Isolated control circuitry
- Digital display for fault conditions with real time clock
- Fault trace functions
- 24 VDC isolated user supply
- Manual restart
- Over/Under voltage
- Line to line and line to ground faults
- Over-temperature
- Motor overload

Output Ratings	Overload Capacity		175% for 3 seconds (constant torque mode)	
			150% for 60 seconds (constant torque mode)	
	Output Current		See ratings table	
Input Ratings	Voltage		0 to maximum input VAC	
	Frequency			50 or 60 Hz $\pm 5\%$
	Voltage	- 230	180-264 VAC 3 phase 60 Hz / 180-230 VAC 3 phase 50 Hz	
		- 460	340-528 VAC 3 phase 60 Hz / 340-415 VAC 3 phase 50 Hz	
	Phase			Three phase (or single phase with derate)
Impedance			1% minimum from mains connection	
Control Spec	Control Method			Microprocessor controlled PWM output; field oriented vector control
	PWM Frequency			Standard 8 kHz - Adjustable 1-16 kHz with derating between 8-16 kHz
	Speed Setting			± 5 VDC, ± 10 VDC, 4-20 mA, digital via Keypad or Serial Comms/USB 2.0 and ModBus RTU standard
	Velocity Loop Bandwith			Theoretical open loop 100 Hz. maximum
	Current Loop Bandwith			Adjustable to 500 Hz
	Max. Output Frequency			500 Hz
	Motor Matching			Auto-tuning to motor with manual override
Feedback	PC Setup Software			Workbench Software available via connection to USB2.0 port for commissioning wizard, firmware download, parameter viewer, scope capture and cloning
	Feedback Type			Resolver coupler to motor shaft
	Sine & Cosine Inputs			2 Vrms $\pm 10\%$ (maximum coupled)
	Excitation (Reference Voltage)			4 Vrms @ 10 kHz
	Resolver Transformation Ratio			0.5 only
Keypad Display	Positioning			Output for position loop controller, simulated encoder 1024 ppr quadrature with index
	Display			Backlit LDC; 128 x 64 graphical display
	Keys			12 key membrane with tactile response
Ambient Conditions	Remote Mount			100 feet (30.3m) maximum from control
	Temperature			-10 to +45°C
	Humidity			10 to 90% RH non-condensing
	Altitude			to 3300 feet (1000 meters)
	Shock			1G
Vibration			0.5G at 10 to 60 Hz	

OPTIONS: Expansion Board: Master Pulse/Isolated Follower. High Resolution Analog, Isolated Input Board, and Ethernet. See page 208-209 for expansion and accessory boards.

HVAC Motors
Farm Duty Motors
Definite Purpose Motors
Brake Motors
200 & 575 Volt Motors
IEC Frame Motors
50 Hertz Motors
Inverter/Vector Motors & Controls
Servo Motors and Controls
DC Motors and Controls

H2 AC Servo Control

Input Voltage	8 kHz Amps		2.5 kHz Amps		Catalog Number	List Price	Mult. Sym.	Size
	Cont.	Peak	Cont.	Peak				
Constant Torque 230 Volt								
230	3.2	6.4	4.2	7.4	SHH2A03-E	1369	E3	AA
230	4.2	7.4	6.8	11.9	SHH2A04-E	1535	E3	AA
230	6.8	11.9	9.6	16.8	SHH2A07-E	1771	E3	AA
230	9.6	16.8	15.2	26.6	SHH2A10-E	1978	E3	AA
230	15.2	26.6	22	38.5	SHH2A16-E	2380	E3	AA
230	22	38.5	28	49	SHH2A22-E	3340	E3	B
230	28	49	42	73.5	SHH2A28-E	4256	E3	B
230	42	73.5	54	94.5	SHH2A42-E	5085	E3	B
230	54	94.5	68	102	SHH2A54-E	6094	E3	C
Constant Torque 460 Volt								
400/460	3.4	6.0	4.8	8.4	SHH4A04-E	2429	E3	AA
400/460	4.8	8.4	7.6	13.3	SHH4A05-E	2911	E3	AA
400/460	7.6	13.3	11	19.3	SHH4A08-E	3779	E3	AA
400/460	11	19.3	14	24.5	SHH4A11-E	3795	E3	AA
400/460	14	24.5	21	36.8	SHH4A15-E	4332	E3	B
400/460	21	36.8	27	47.2	SHH4A21-E	4658	E3	B
400/460	27	47.2	34	59.5	SHH4A27-E	5936	E3	B

NOTE: See page 208-209 for optional Expansion Boards. See page 206-207 for Dynamic Braking Assemblies.
 Red catalog number = New item

Dimensions in/(mm)

Size	Outside			Mounting		Ap'x Shpg. Wgt.
	Height	Width	Depth	Height	Width	
AA	12.272/(312)	7.974/(203)	7.930/(201)	11.82/(300)	7.38/(187)	20
B	18.000/(457)	9.100/(231)	9.480/(241)	15.95/(405)	7.00/(178)	30
C	22.000/(559)	9.100/(231)	9.480/(241)	19.95/(507)	7.00/(178)	60

**For additional servo motors, controls
and accessories, visit www.baldor.com**