HD2

High performance, torque vector inverters for AC motors 1.5kW - 500kW (2HP - 670HP)

- Three-phase (480V) up to 500kW (670HP)
- Torque Vector Control
- Integral ModbusRTU / RS485
- Bluetooth & WiFi Communication
- Multiple Expansion Options
- Safe Torque Off (STO) as Standard

HD2 High Performance AC Inverter Drives

The HD2 range of inverters offer unrivalled performance. Designed for controlling asynchronous AC induction motors and permanent magnet synchronous motors, the HD2 torque vector control range are packed full of features as standard that you would usually expect to find on considerably higher specified inverters.

Utilising the most advanced vector control technology, the HD2 range delivers sensorless and closed loop vector control for both asynchronous and synchronous motors giving exceptional speed response and control. HD2 offers unparalleled reliability, environmental adaptability, high precision and stable performance - everything you have come to expect from an IMO inverter drive.

The HD2 also offers some significant advantages to the customer including a huge range of functions with simple operation, industrial communication protocols (ModbusRTU, EtherCAT and Profinet) along with Bluetooth and WiFi communication for programming, and with more communication options in development.

2 YEAR WARRANTY

CE

c UL us

Modbus CANopen EtherNet/IP PROFIBUS PROFINET WiFi

Setting High Standards

The level of functionality offered by the HD2 range sets the bar high for others to compete with. For example, the HD2 offers two sets of motor parameters which allow users to deploy one HD2 inverter to control different motors, which ultimately leads to costs savings.

High Performance At Low Speeds

The HD2 range offers torque vector control across the full range. IMO is well renowned for manufacturing market-leading variable speed drives and the HD2, along with its sister HD1 inverter, heralds a new era in feature rich inverter drives due to the vast array of standard features included that you would normally expect only to find in considerably more expensive models.

The HD2 range delivers stable torque output even at low speeds thanks to its high speed processor, allowing the HD2 to be used in an even wider range of applications including lifts, conveyor systems and high-inertia loads that demand a higher starting torque and rapid controlled braking.

Enhanced Control Functionality

As you would expect, a drive from IMO isn't your average run-of-the-mill product. We produce solutions which tick every box, every time and the HD2 is no different. From offering motor auto-tune (both static and dynamic) which minimizes power losses, to PID control which allows motor operation whilst controlling temperature, pressure and flow rate without the use of an external device or controller, together with the inclusion of programmable logic functionality and encoder feedback capability, the HD2 is so packed with features that you wouldn't believe they fit inside its compact and user-friendly form.

- Torque Vector control
- Up to 150% starting torque
- Permanent magnet motor control
- Detachable keypad with copy
- Advanced LCD keypad
- IP20 / NEMA1 (full range)
- High speed processor
- Motor Auto-tune (static and dynamic)
- Safe Torque Off (STO)
- 2 motor parameter sets
- DC Injection braking
- Flux braking
- Integral brake chopper (<37kW)
- PID Control as standard
- PLC option card
- PG card (mulitple options)
- DCR (18.5kW-110kW)
- Conformal Coating as Standard

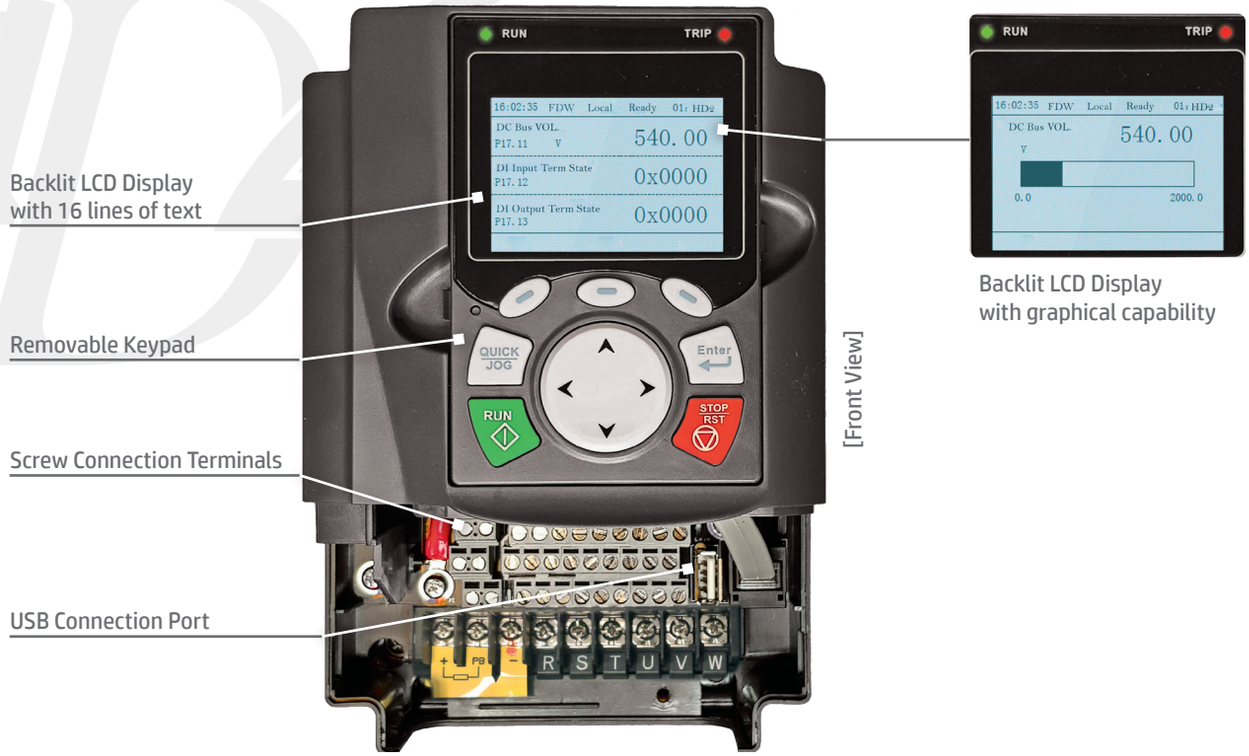
Connected For Communications

Every model in the HD2 range offers communication capability. The connection is completed by way of twisted-pair to the dedicated RS-485 terminals found on the control terminal block using the Modbus-RTU protocol or using any of the many communication option cards for which models up to and including 5.5kW can use two option cards simultaneously, whilst models upward of 7.5kW can use three.

New to this range are Bluetooth and WiFi wireless communication.

- Ethernet (proprietary) Card
- Modbus RTU/RS485 built in
- Profibus DP card
- CANopen card
- CAN master/slave card
- Profinet card
- Bluetooth card
- WiFi card
- PLC Option Cards
- I/O Expansion Card
- 6 Digital Inputs
- 2 Analogue Inputs
- 1 Analogue Output
- 2 Relay Outputs
- USB Port for firmware updates
- Ethernet IP Card
- EtherCAT Card
- Modbus TCP Card

HD2 Hardware Features



HD2 Application Examples

With the array of advanced features and filter options, the HD2 is suited for use in virtually any application, whether it be industrial, commercial or domestic. The following are examples of, but not limited to, the type of application where the HD2 can be employed:-

Heavy Duty Machinery

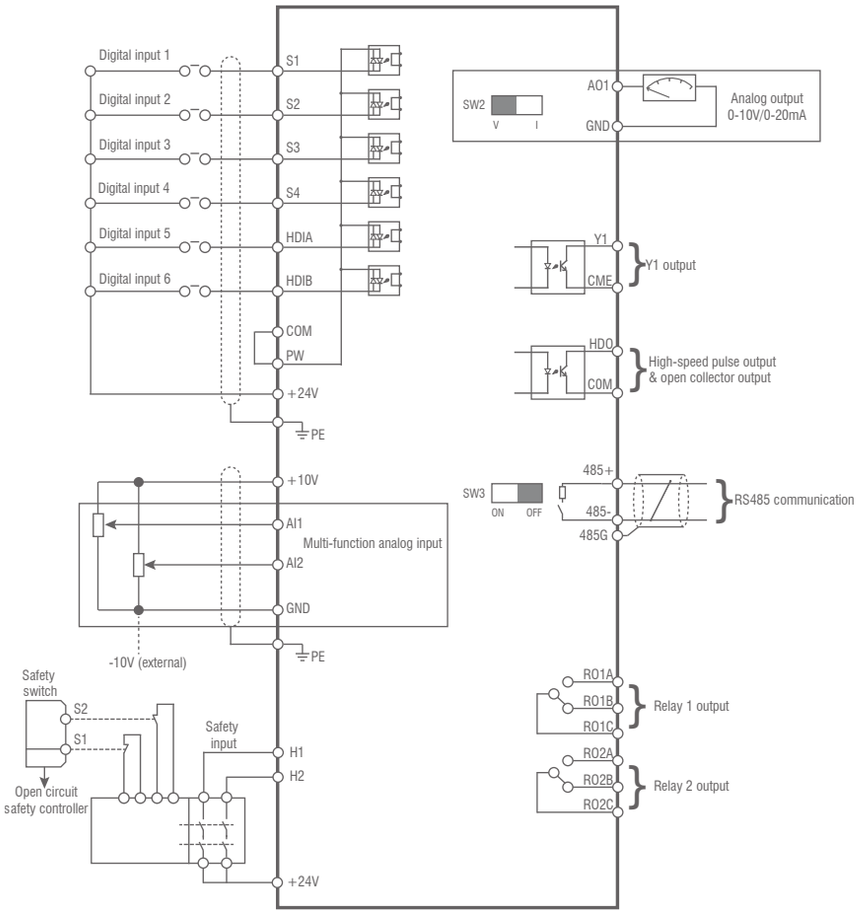
- Oil
- Mining
- Aggregates

Hoist Applications

- Elevators / Lifts
- Material Handling
- RTG Cranes

HD2 Terminal Layout

Terminal	Description
RO1A / RO2A	Relay Output N/O
RO1B / RO2B	Relay Output N/C
RO1C / RO2C	Relay Output Common
PE	Ground
PW	Input for external 24VDC supply
+24V	+24V for digital inputs
+10V	+10V for analog inputs
COM	0V common for digital inputs
CME	0V common for digital output
GND	0V common for analog input
H1	STO input 1
H2	STO input 2
S1 - S4	Digital input
HD1A / HD1B	Digital input / pulse input
AI1 / AI2	Analog input
AO1	Analog output
Y1	Digital output
HDO	Pulse output
485+	Comms +
485-	Comms -
485G	Comms ground



Conveyor Applications

- Metals
- Logistics
- Food Machinery

Pump & Fan Applications

- Fans
- HVAC
- Pumps
- BMS Systems
- Air Compression

Options & Ordering Codes

HD2 - 75A - 43 - UL

Series

HD2 Inverter Drive	HD2

Input 480V Three Phase

Output Power kW (HP)

1.5kW	(2HP)	**3.7A**	22kW	(30HP)	**45A**
2.2kW	(3HP)	**5A**	30kW	(40HP)	**60A**
4.0kW	(5.5HP)	**9.5A**	37kW	(50HP)	**75A**
5.5kW	(7.5HP)	**14A**	45kW	(60HP)	**92A**
7.5kW	(10HP)	**18.5A**	55kW	(75HP)	**115A**
11kW	(15HP)	**25A**	75kW	(100HP)	**150A**
15kW	(20HP)	**32A**	90kW	(125HP)	**180A**
18.5kW	(25HP)	**38A**	110kW	(150HP)	**215A**

HD2 - 260A - 43

Series

HD2 Inverter Drive	HD2

Input 480V Three Phase

Output Power kW (HP)

132kW	(175HP)	**260A**	280kW	(375HP)	**530A**
160kW	(215HP)	**305A**	315kW	(420HP)	**600A**
185kW	(250HP)	**340A**	355kW	(475HP)	**650A**
200kW	(270HP)	**380A**	400kW	(535HP)	**720A**
220kW	(300HP)	**425A**	450kW	(600HP)	**820A**
250kW	(335HP)	**480A**	500kW	(670HP)	**860A**

HD2 - 70A - 23

Series

HD2 Inverter Drive	HD2

Input 230V Three Phase

Output Power kW (HP)

0.75kW	(1HP)	**4.5A**	15kW	(20HP)	**55A**
1.5kW	(2HP)	**7A**	18.5kW	(25HP)	**70A**
2.2kW	(3HP)	**10A**	22kW	(30HP)	**80A**
4.0kW	(5.5HP)	**16A**	30kW	(40HP)	**110A**
5.5kW	(7.5HP)	**20A**	37kW	(50HP)	**130A**
7.5kW	(10HP)	**30A**	45kW	(60HP)	**160A**
11kW	(15HP)	**42A**	55kW	(75HP)	**200A**

HD2 Ratings & Specifications

	Model	HD Mode (150% Overload - 1 min)			ND Mode (120% Overload - 1 min)		
		Rated Power kW (HP)	Rated Input Current (A)	Rated Output Current (A)	Rated Power kW (HP)	Rated Input Current (A)	Rated Output Current (A)
Three Phase 480V	HD2-3.7A-43-UL	1.5 (2)	5	3.7	-	-	-
	HD2-5A-43-UL	2.2 (3)	5.8	5	-	-	-
	HD2-9.5A-43-UL	4 (5.5)	13.5	9.5	5.5 (7.5)	19.5	14
	HD2-14A-43-UL	5.5 (7.5)	19.5	14	7.5 (10)	25	18.5
	HD2-18.5A-43-UL	7.5 (10)	25	18.5	11 (15)	32	25
	HD2-25A-43-UL	11 (15)	32	25	15 (20)	40	32
	HD2-32A-43-UL	15 (20)	40	32	18.5 (25)	47	38
	HD2-38A-43-UL	18.5 (25)	47	38	22 (30)	56	45
	HD2-45A-43-UL	22 (30)	56	45	30 (40)	70	60
	HD2-60A-43-UL	30 (40)	70	60	37 (50)	80	75
	HD2-75A-43-UL	37 (50)	80	75	45 (60)	94	92
	HD2-92A-43-UL	45 (60)	94	92	55 (75)	128	115
	HD2-115A-43-UL	55 (75)	128	115	-	-	-
	HD2-150A-43-UL	75 (100)	160	150	90 (125)	190	180
	HD2-180A-43-UL	90 (125)	190	180	110 (150)	225	215
	HD2-215A-43-UL	110 (150)	225	215	-	-	-
	HD2-260A-43	132 (175)	265	260	160 (215)	310	305
	HD2-305A-43	160 (215)	310	305	185 (250)	345	340
	HD2-340A-43	185 (250)	345	340	200 (270)	385	380
	HD2-380A-43	200 (270)	385	380	220 (300)	430	425
	HD2-425A-43	220 (300)	430	425	250 (335)	485	480
	HD2-480A-43	250 (335)	485	480	280 (375)	545	530
	HD2-530A-43	280 (375)	545	530	315 (420)	610	600
	HD2-600A-43	315 (420)	610	600	350 (470)	625	650
	HD2-650A-43	350 (470)	625	650	400 (535)	715	720
	HD2-720A-43	400 (535)	715	720	-	-	-
	HD2-860A-43	500 (670)	890	860	-	-	-

	Model	Rated Power kW (HP)	Rated Input Current (A)	Rated Output Current (A)
Three Phase 230V	HD2-4.5A-23	0.75 (1)	5	4.5
	HD2-7A-23	1.5 (2)	7.7	7
	HD2-10A-23	2.2 (3)	11	10
	HD2-16A-23	4 (5.5)	17	16
	HD2-20A-23	5.5 (7.5)	21	20
	HD2-30A-23	7.5 (10)	31	30
	HD2-42A-23	11 (15)	43	42
	HD2-55A-23	15 (20)	56	55
	HD2-70A-23	18.5 (25)	71	70
	HD2-80A-23	22 (30)	81	80
	HD2-110A-23	30 (40)	112	110
	HD2-130A-23	37 (50)	132	130
	HD2-160A-23	45 (60)	163	160
	HD2-200A-23	55 (75)	200	200

Technical Specifications

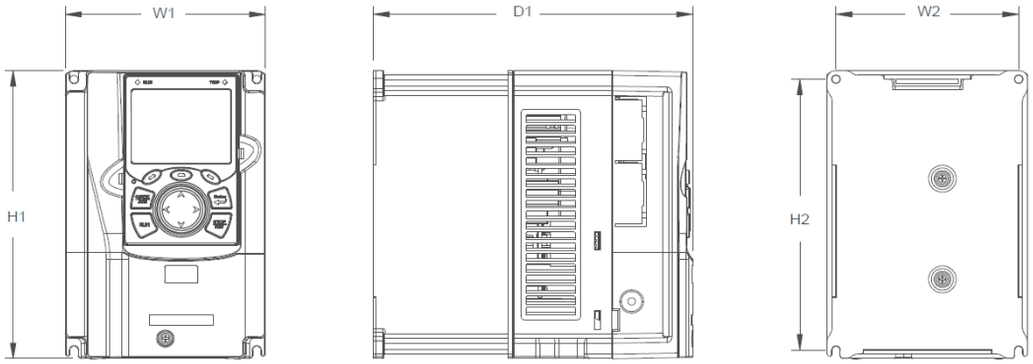
Function Description		Specification
Power Input	Input Voltage (V)	AC 3PH Rated Voltage - 230V; AC 3PH Rated Voltage - 480V;
	Allowable Voltage Fluctuation	-15% to +10%
	Input Frequency (Hz)	50Hz/60Hz, allowable range: 47-63Hz
Power Output	Output Voltage (V)	0-Input voltage
	Output Frequency (Hz)	0-400Hz
Technical Control Performance	Control Mode	SVPWM control, SVC, VC
	Motor Type	Asynchronous motor, permanent-magnet synchronous motor
	Speed Regulation Ratio	Asynchronous motor 1:200 (SVC); Synchronous motor1:20 (SVC); 1:1000 (VC)
	Speed Control Precision	±0.2% (SVC), ±0.02% (VC)
	Speed Fluctuation	±0.3% (SVC)
	Torque Response	<20ms (SVC), <10ms (VC)
	Torque Control Precision	10% (SVC), 5% (VC)
	Starting Torque	Asynchronous motor: 0.25Hz / 150% (SVC) Synchronous motor: 2.5Hz / 150% (SVC) 0Hz / 200% (VC)
	Overload Capacity	Constant Torque: 150%: 1 min; 180%: 10s; 200%: 1s Variable Torque: 120%: 1 min; 150%: 10s; 180%: 1s
Running Control Performance	Frequency Setup Mode	Digital, analog, pulse frequency, multi-step speed running, simple PLC, PID, Modbus communication, multiple Ethernet-based commuication
	Automatic Voltage Regulation Function	Keep the output voltage constant when grid voltage changes
	Fault Protection Function	Provide over 30 kinds of fault protection functions: overcurrent, overvoltage, undervoltage, over-temperature, phase loss and overload, etc.
	Speed Tracking Restart	Realise impact-free starting of the motor in rotating
Peripheral Interface	Analog Input	2 (AI1: 0-10V/4-20mA; AI2: -10V-+10V)
	Analog Output	1 (AO1: 0-10V/4-20mA)
	Digital Input	4x DI, 2x High Speed Inputs
	Digital Output	1x DO, 1x Pulse Output
	Relay Output	2x programmable relay output, NO/NC contact
	Communication Interface	1x RS485 (non-isolated), 1x USB
	STO Input	2x redundant input
Optional Cards	See Optional Expansion Cards p.18	
Other	Installation Mode	Wall mounting, Flange mounting, Floor mounting
	Temperature	-10°C to +50°C (Derating is required if the ambient temperature exceeds 40°C)
	Protection Level	IP20
	Cooling Mode	Forced air cooling
	Braking Unit	15kW or below built-in (230V models); 30kW or below built-in (480V models)
	STO Level	SIL2
	EMC Filter	All models fulfill the requirements of IEC61800-3 C3, up to 30m cable length shielded

Dimensions (mm)

	Model	W1	W2	H1	H2	D1	Frame Style
200V	HD2-4.5A-23	126	115	186	175	185	A
	HD2-7A-23 to HD2-10A-23	146	131	256	243.5	192	
	HD2-16A-23 to HD2-20A-23	170	151	320	303.5	219	
	HD2-30A-23	230	210	330	311	217	
	HD2-42A-23 to HD2-55A-23	255	237	400	384	242	
	HD2-70A-23 to HD2-110A-23	270	130	555	540	325	B
	HD2-130A-23 to HD2-200A-23	325	200	680	661	365	

	Model	W1	W2	W3	W4	H1	H2	D1	D2	Frame Style
400V	HD2-3.7A-43-UL to HD2-5A-43-UL	126	115	-	-	186	175	185	-	A
	HD2-9.5A-43-UL to HD2-14A-43-UL	146	131	-	-	256	243.5	192	-	
	HD2-18.5A-43-UL to HD2-25A-43-UL	170	151	-	-	320	303.5	219	-	
	HD2-32A-43-UL to HD2-38A-43-UL	230	210	-	-	330	311	217	-	
	HD2-45A-43-UL to HD2-60A-43-UL	255	237	-	-	400	384	242	-	
	HD2-75A-43-UL to HD2-115A-43-UL	270	130	-	-	555	540	325	-	B
	HD2-150A-43-UL to HD2-215A-43-UL	325	200	-	-	680	661	365	-	C
	HD2-260A-43 to HD2-380A-43	500	180	-	-	870	850	360	-	D
	HD2-425A-43 to HD2-600A-43	750	230	714	680	1410	1390	380	150	E
	HD2-650A-43 to HD2-860A-43	620	230	572	-	1700	1678	560	240	F

Frame Style A



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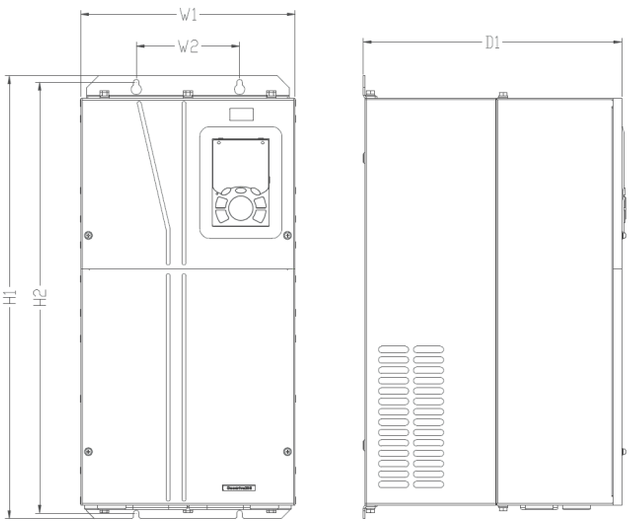

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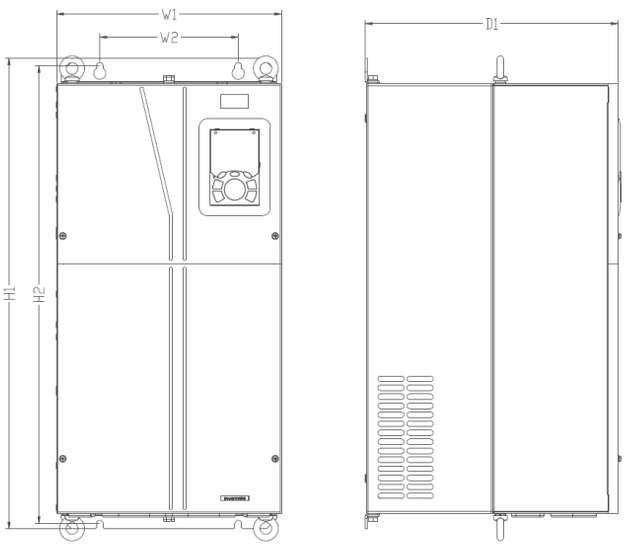

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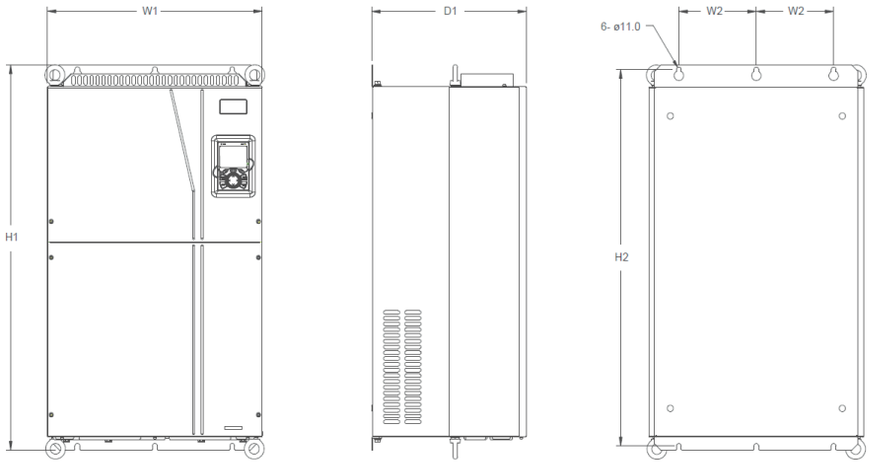

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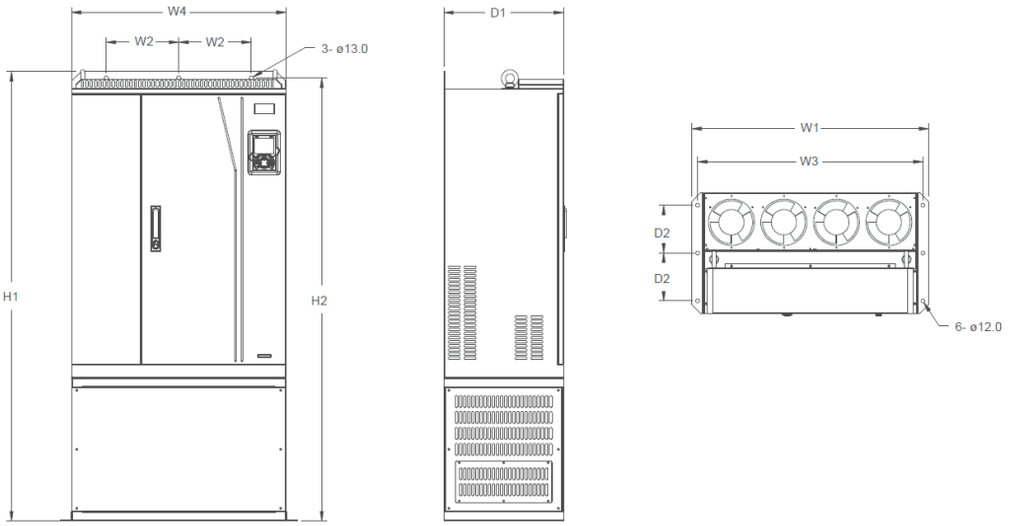

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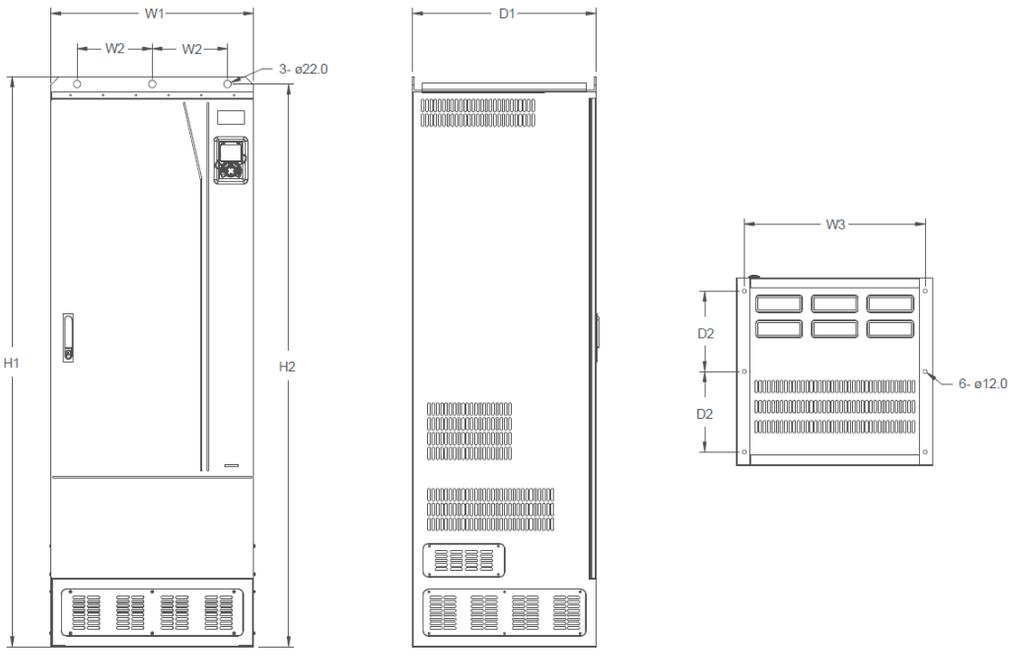

Optional Expansion Cards

Expansion Card Type	Part Number	Part Description
I/O Card	**HD2-E-IO**	IO Expansion Card (4DI, 1 DO, 1 AI, 1 AO, 2RO)
	HD2-E-IO2	IO Expansion Card (1 PT100, 1 PT1000, 4 DI, 2 RO)
PLC Card	**HD2-E-PLC**	Programmable Expansion Card (CODESYS)
Communication Card	**HD2-E-BTP**	Bluetooth Communication Card (Internal Antenna)
	HD2-E-BTM	Bluetooth Communication Card (External Antenna)
	HD2-E-ENET	Ethernet Communication Card
	HD2-E-EIP	Ethernet/IP Communication Card
	HD2-E-ECAT	EtherCAT Communication Card
	HD2-E-WFP	WiFi Communication Card (Internal Antenna)
	HD2-E-WFM	WiFi Communication Card (External Antenna)
	HD2-E-COP	CANopen Communication Card
	HD2-E-CAN	CAN Master-Slave Communication Card
	HD2-E-PDP	PROFIBUS-DP Comunication Card
	HD2-E-PRF	PROFINET Communication Card
	HD2-E-MTCP	Modbus TCP Communication Card
PG Card	**HD2-E-PGIM**	Multi-Function Incremental PG Card
	HD2-E-PGIM-24	24V Multi-Function Incremental PG Card
	HD2-E-PGI	5V Differential PG Card
	HD2-E-PGR	Rotary Transformer PG Card
Power Supply Card	**HD2-E-APS**	24V DC Aux. Power Supply Card
Accessories	**HD2-KP**	LCD Multi-function keypad
	HD2-KP-MB	Keypad mounting bracket

HD2-E-IO

HD2-E-PDP

HD2-E-WFP

HD2-E-PGI

Accessories

Inverter	Input Reactor	DC Reactor	Output Reactor	Braking unit
HD2-3.7A-43-UL	ACLC-1.5-4	DCLC-004-4	OCLC-1.5-4	Integral
HD2-5A-43-UL	ACLC-2.2-4	DCLC-7R5-4	OCLC-2.2-4	Integral
HD2-9.5A-43-UL	ACLC-4.0-4	DCLC-7R5-4	OCLC-4.0-4	Integral
HD2-14A-43-UL	ACLC-5.5-4	DCLC-015-4	OCLC-5.5-4	Integral
HD2-18.5A-43-UL	ACLC-7.5-4	DCLC-015-4	OCLC-7.5-4	Integral
HD2-25A-43-UL	ACLC-11-4	DCLC-018-4	OCLC-11-4	Integral
HD2-32A-43-UL	ACLC-15-4	DCLC-022-4	OCLC-15-4	Integral
HD2-38A-43-UL	ACLC-18-4	DCLC-030-4	OCLC-18-4	Integral
HD2-45A-43-UL	ACLC-22-4	DCLC-037-4	OCLC-22-4	Integral
HD2-60A-43-UL	ACLC-37-4	DCLC-045-4	OCLC-37-4	Integral
HD2-75A-43-UL	ACLC-37-4	DCLC-055-4	OCLC-37-4	Integral
HD2-92A-43-UL	ACLC-45-4	DCLC-055-4	OCLC-45-4	DBU45/75-4
HD2-115A-43-UL	ACLC-55-4	DCLC-075-4	OCLC-55-4	DBU45/75-4
HD2-150A-43-UL	ACLC-75-4	DCLC-090-4	OCLC-75-4	DBU45/75-4
HD2-180A-43-UL	ACLC-110-4	DCLC-132-4	OCLC-110-4	DBU90/110-4
HD2-215A-43-UL	ACLC-110-4	DCLC-132-4	OCLC-110-4	DBU90/110-4
HD2-260A-43	ACLC-160-4	DCLC-132-4	OCLC-200-4	DBU132-4
HD2-305A-43	ACLC-160-4	DCLC-160-4	OCLC-200-4	DBU160/200-4
HD2-340A-43	ACLC-200-4	DCLC-200-4	OCLC-200-4	DBU160/200-4
HD2-380A-43	ACLC-200-4	DCLC-220-4	OCLC-200-4	DBU160/200-4
HD2-425A-43	Integral	DCLC-280-4	OCLC-280-4	DBU220/250-4
HD2-480A-43	Integral	DCLC-280-4	OCLC-280-4	DBU220/250-4
HD2-530A-43	Integral	DCLC-280-4	OCLC-280-4	DBU160/200-4 (x2)
HD2-600A-43	Integral	DCLC-315-4	OCLC-350-4	DBU160/200-4 (x2)
HD2-650A-43	Integral	DCLC-400-4	OCLC-350-4	DBU160/200-4 (x2)
HD2-720A-43	Integral	DCLC-400-4	OCLC-400-4	DBU160/200-4 (x2)
HD2-820A-43	Integral	DCLC-500-4	OCLC-500-4	DBU160/200-4 (x2)
HD2-860A-43	Integral	DCLC-500-4	OCLC-500-4	DBU220/250-4 (x2)