BENSHAW
Applied Motor Controls
AN AMCONEX GROUP COMPANY

Product Catalog

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Low Voltage Variable Frequency Drives

Rapid | Rugged | Global

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Introduction

As an industry leader in motor control, Benshaw is known for their offering of standard and custom engineered drive packages. If an off-the-shelf unit does not meet your needs, our dedicated team can design the drive solution you need.

Benshaw now offers a complete range of low voltage variable speed drive solutions ... from multi-purpose micro drives and high performance industrial drives to IEEE 519 clean power drives, NEMA 4X washdown duty drives and custom configured packaged drive solutions.

Benshaw GM2 Series is a sensorless vector, variable frequency drive. This micro-drive may be small...but don't let looks fool you. The GM2 Series offers enhanced performance and reliable operation in a robust, yet compact, user-friendly design. Powerful, yet small...it is the ideal choice for cost sensitive OEM or end user requirements. And it is the ideal drive for Benshaw distributors to keep in stock because of its versatility.

The **Benshaw S Series** is a compact yet powerful AC drive designed for the most demanding applications. Available in 'normal duty' ratings up to 15HP and 'heavy duty' ratings up to 10HP, the S Series puts you in control. Whether your application calls for V/Hz control, Sensorless Vector Control or Torque Control, the S Series has you covered. Modbus RTU is standard with optional communication protocols available.

The **Benshaw SW Series** NEMA 4X Washdown Drives are heavy duty rated for applications from 0.5-30HP. Designed for high pressure washdown, all SW Series drives feature a rugged UL Type 4X (IP66) indoor rated polycarbonate enclosure that exceeds NEMA 1, 12, 4 and 4X standards. A convenient built-in power disconnect switch, 4 digit, 7-segment display and an optional remote LCD Display/Keypad with a Quick Start menu, make it easy to program and control.

The **Benshaw H2 Series** sets the new standard for variable frequency drives. It can be used as a general purpose industrial drive with V/hz or Vector control (with ratings for normal or heavy duty applications from 5-800HP). For fan and pumps applications, simply use the built-in macros designed to meet the basic requirements of the water/wastewater, irrigation and HVAC industries. Built in communication protocols include Modbus-RTU, BACnet and Metasys-N2.

GM2 SERIES - GENERAL PURPOSE MICRO DRIVE

The Benshaw GM2 Series is a sensorless vector, variable frequency drive. This micro-drive may be small...but don't let looks fool you. The GM2 Series offers enhanced performance and reliable operation in a robust, yet compact, user-friendly design. Powerful, yet small...it is the ideal choice for cost sensitive OEM or end user requirements. And it is the ideal drive for Benshaw distributors to keep in stock because of its versatility. The GM2 Series is easy to install, simple to program and offers dual ratings for both normal and heavy duty applications.

STANDARD FEATURES - HARDWARE

- Dual Rated - Normal and Heavy Duty
- 240V: 1HP~15 HP (ND), 0.5 HP~10HP (HD)
- 480V: 1HP~15 HP (ND), 0.5 HP~10 HP (HD)
- Display - 4 digit, 7 Segment with 4 LED Indicators
- Protected Chassis - UL Open (IP20)
- DIN Rail mounting (up to 7.5 HP, 5.5 kW)
- EMC Filter (480V only)
- Internal Brake IGBT
- Single Phase Input (derating required)
- Built in Potentiometer
- RJ45 Port (Modbus-RTU) or Remote 7-Segment Display/Keypad

STANDARD FEATURES - SOFTWARE

- Modbus - RTU
- Control - V/Hz, Sensorless Vector, Slip Compensation
- Auto Tuning
- Torque Limits
- PID Control
- Regen Avoidance
- Kinetic Energy Buffering (KEB), Ride Through

COMMUNICATIONS

Standard: Modbus-RTU

Option: Ethernet/IP - Modbus-TCP

WinDRIVE: PC Based Software for Commissioning and Monitoring

Feature	Benefit
Robust Design	Construction of the air flow design minimizes exposure of critical components (IGBT, PCB, etc.) to outside contaminants
Built-in EMC Filter	Embedded C3 EMC filter to meet EN618000-3 standards and provide noise reduction
V/F Acceleration and Deceleration Function	• Auto torque boost (ATB) enhancing acceleration performance in V/F mode • Flux braking enhancing deceleration performance in V/F mode
Sensorless Vector Control	Performs enhanced high torque at low speed with sensorless vector control
KEB Operation (Kinetic Energy Buffering)	DC link voltage is maintained during power loss or brownout by using regenerative energy from the motor
Flying Start	Select optimal flying start operation for different applications
Fan Life-cycle Diagnosis	Keypad displays a replacement warning at 50,000 hours of fan operating time or user setting level of fan replacement
Material Design	Enhanced thermal resistance and increased thickness to prevent damage

GM2 SERIES - SELECTION CHART

240V - Open Chassis	Normal Duty 120% OL / 1 min.		Heavy Duty 150% OL / 1min.		Dimensions (inches)			
Model Number	HP	Amps	HP	Amps	H	W	D	Weight (lbs)
VFD-RSI-001-GM2-2C	1.0	3.1	0.5	2.5	6.46	3.40	5.50	2.3
VFD-RSI-002-GM2-2C	2.0	6	1.0	5	6.46	3.40	5.50	2.3
VFD-RSI-003-GM2-2C	3.0	9.6	2.0	8	6.98	3.98	6.25	3.0
VFD-RSI-005-GM2-2C	5.0	12	3.0	11	6.98	3.98	6.25	3.1
VFD-RSI-007-GM2-2C	7.5	18	5.0	17	7.60	5.31	6.25	4.2
VFD-RSI-010-GM2-2C	10	30	7.5	24	9.46	7.10	6.00	6.8
VFD-RSI-015-GM2-2C	15	40	10	32	9.46	7.10	6.00	7.1

480V - Open Chassis	Normal Duty 120% OL / 1 min.		Heavy Duty 150% OL / 1min.		Dimensions (inches)			
Model Number	HP	Amps	HP	Amps	H	W	D	Weight (lbs)
VFD-RSI-001-GM2-4C	1.0	2	0.5	1.3	6.46	3.40	5.50	2.3
VFD-RSI-002-GM2-4C	2.0	3.1	1.0	2.5	6.46	3.40	5.50	2.4
VFD-RSI-003-GM2-4C	3.0	5.1	2.0	4	6.98	3.98	6.25	3.2
VFD-RSI-005-GM2-4C	5.0	6.9	3.0	5.5	6.98	3.98	6.25	3.2
VFD-RSI-007-GM2-4C	7.5	10	5.0	9	7.60	5.31	6.25	4.4
VFD-RSI-010-GM2-4C	10	16	7.5	12	9.46	7.10	6.00	7.1
VFD-RSI-015-GM2-4C	15	23	10	16	9.46	7.10	6.00	7.2

GM2 Series - Accessories

Model Number	Description
PC-100093-00	Ethernet / IP, Modbus - TCP option, dual port
KP-100002-00	Keypad / display (7-Segment LED), remote, w / 1M cable
KP-100002-01	Keypad / display (7-Segment LED), remote, w / 2M cable
KP-100002-02	Keypad / display (7-Segment LED), remote, w / 3M cable
KP-100002-03	Keypad / display (7-Segment LED), remote, w / 5M cable
EN-101036-00	Conduit box, 1HP - 2HP, 230V / 480V
EN-101036-01	Conduit box, 3HP - 5HP, 230V / 480V
EN-101036-02	Conduit box, 7.5HP, 230V / 480V
EN-101036-03	Conduit box, 10HP - 15HP, 230V / 480V

GM2 SERIES - INPUT AND OUTPUT SPECIFICATIONS

3-Phase 240V, 1 HP - 15 HP (0.75 - 11 kW)

RSI-XXX-GM2-2C			001	002	003	005	007	010	015
240V, w/3Ø Input	Normal Duty, 120% OL	HP	1	2	3	4	7.5	10	15
		kW	0.75	1.5	2.2	4	5.5	7.5	11
		Amps	3.1	6	9.6	12	18	30	40
		KVA	1.2	2.3	3.8	4.6	6.9	11.4	15.2
	Heavy Duty, 150% OL	HP	0.5	1	2	3	5	7.5	10
		kW	0.4	0.75	1.5	2.2	4	5.5	7.5
		Amps	2.5	5	8	11	17	24	32
		KVA	1	1.9	3	4.2	6.5	9.1	12.2
240V, w/1Ø Input	Normal Duty	HP	-	0.75	1.5	2	3	5	7.5
		Amps	2	3.6	5.9	6.7	9.8	16.3	22
	Heavy Duty	HP	-	0.5	1	1.5	3	3	5
		Amps	1.5	2.8	4.6	6.1	9.3	12.8	17.4
Rated Output	Output frequency		0-400 Hz (IM Sensorless: 0 - 120 Hz)						
	Output voltage (V)		3-phase 200-240V						
	Voltage (V)		3-phase 200-240VAC (- 15% to + 10%)						
			1-phase 240VAC (- 5% to + 10%)						
	Input frequency		3-phase 50-60 Hz (± 5%)						
			1-phase 60Hz only (± 5%)						
	Rated Current (A)	Normal Duty	3	6.3	10.8	13.1	19.4	32.7	44.2
		Heavy Duty	2.2	4.9	8.4	11.8	18.5	25.8	34.9
Weight (lb / kg)		lbs	2.3	2.3	3	3	4.2	6.8	7.1
		kg	1.04	1.06	1.36	1.4	1.89	3.08	3.21
Heat Dissipation (W)			22	45	79	117	208	281	382
Degree of Protection			UL Open Type (IP20), UL Type 1 achieved with optional conduit box						

GM2 SERIES - INPUT AND OUTPUT SPECIFICATIONS

3-Phase 480V, 1 HP - 15 HP (0.75 - 11 kW)

RSI-XXX-GM2-4C			001	002	003	005	007	010	015
480V, w/3Ø Input	Normal Duty, 120% OL	HP	1	2	3	5	7.5	10	15
		kW	0.75	1.5	2.2	4	5.5	7.5	11
		Amps	2	3.1	5.1	6.9	10	16	23
		KVA	1.5	2.4	3.9	5.3	7.6	12.2	17.5
	Heavy Duty, 150% OL	HP	0.5	1	2	3	5	7.5	10
		kW	0.4	0.75	1.5	2.2	4	5.5	7.5
		Amps	1.3	2.5	4	5.5	9	12	16
		KVA	1	1.9	3	4.2	6.5	9.1	12.2
480V, w/1Ø Input	Normal Duty	HP	0.5	0.75	1~1.5	2	3	5	7.5
		Amps	1.3	1.9	2.8	3.6	5.4	8.7	12.6
	Heavy Duty	HP	-	0.5	1	1.5	3	3	5
		Amps	0.7	1.4	2.1	2.8	4.9	6.4	8.7
Rated Output	Output frequency		0-400 Hz (IM Sensorless: 0-120 Hz)						
	Output voltage (V)		3-phase 380-480 V						
Rated Input	Voltage (V)		3-phase 380-480 VAC (- 15% to + 10%)						
			1-phase 480VAC (- 5% - + 10%)						
	Input frequency		3-phase 50-60 Hz (± 5%)						
			1-phase 60 Hz only (± 5%)						
	Rated Current (A)	Normal Duty	2	3.3	5.5	7.5	10.8	17.5	25.4
		Heavy Duty	1.1	2.4	4.2	5.9	9.8	12.9	17.5
Weight (lb / kg)		lbs	2.3	2.4	3.2	3.2	4.4	7.1	7.2
		kg	1.04	1.08	1.44	1.46	1.98	3.24	3.28
Heat Dissipation (W)			24	42	71	99	176	231	315
Degree of Protection			UL Open Type (IP20), UL Type 1 achieved with optional conduit box						

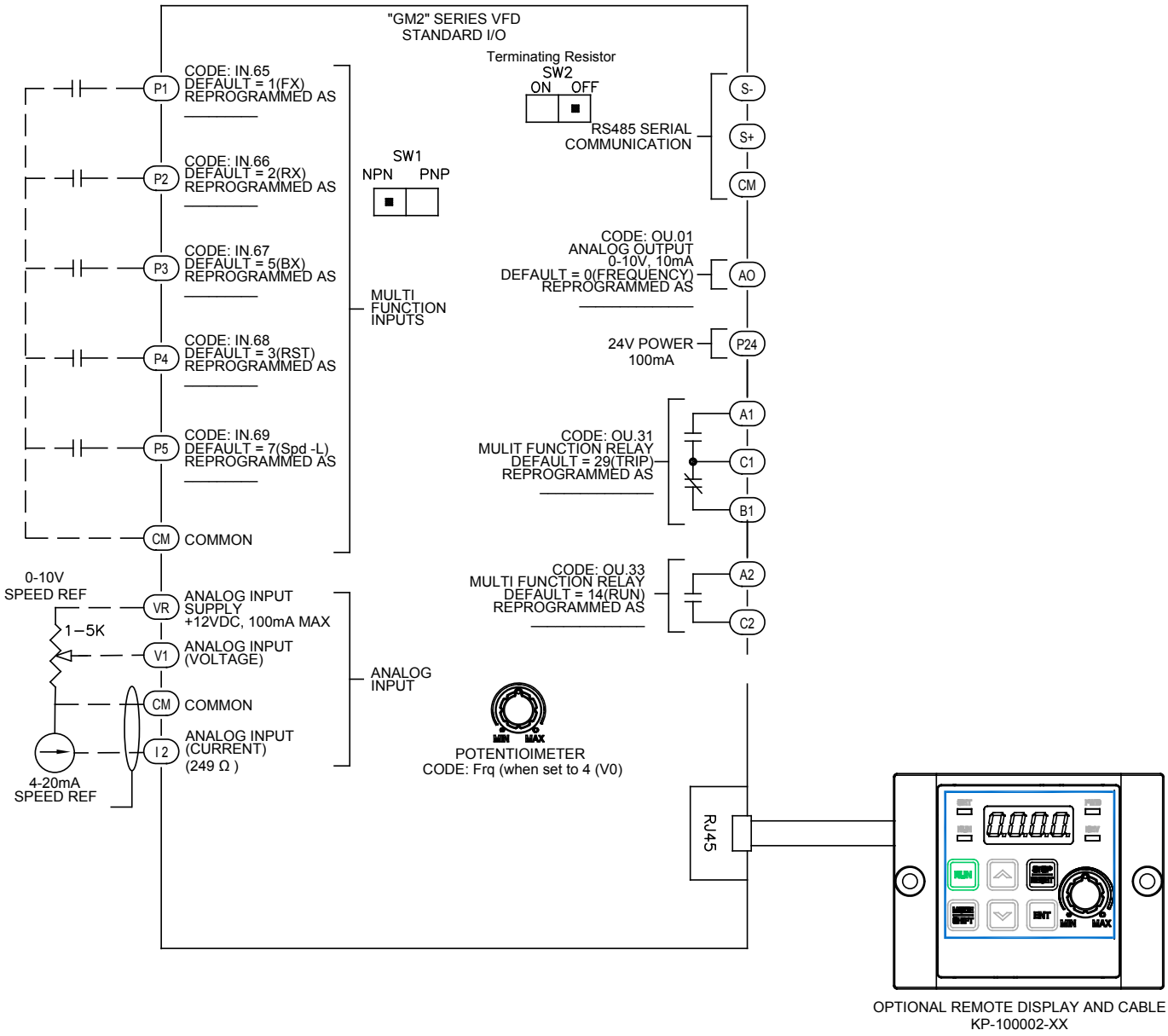
GM2 SERIES - PRODUCT SPECIFICATION DETAILS

Feature			Description	
Control	Control method		V/F control, Sensorless Vector, Slip Compensation	
	Frequency settings resolution		Digital command: 0.01 Hz	
			Analog command: 0.06 Hz (60 Hz standard)	
	Frequency accuracy		1% of maximum output frequency	
	V/F pattern		Linear, Square Reduction, User V/F	
	Overload capacity		Normal Duty: 120%, 1 minute	
			Heavy Duty: 150%, 1 minute	
	Torque boost		Manual torque boost, Automatic torque boost	
Operation	Start/Stop		Keypad, terminal strip, communication operation	
	Frequency settings		Analog type: 0-10 V, 4-20 mA, -10 +10 V (bipolar)	
			Digital type: keypad	
	Operation functions		**Basic**	**Advanced**
			Start/Stop operation	Sensorless Vector Control
			Start/Stop Modes	Auto Tuning
			Frequency Reference Sources	Torque Limits
			Auxiliary Frequency Reference	PID Control
			Multi-Step Speeds	Slip Compensation
			Multi-Step Accel/Decel Times	Energy Save Mode
			2nd Source (HOA)	Regen Avoidance
			Accel/Decel Times	VFD Fan Control
			Accel/Decel Patterns	
			Dwell Frequency Operation	**Loss of Power**
			Jog	Ride Through (KEB)
			Auto Start	Safe Stop
			Auto Resert/Restart	Speed Search
			V/Hz. Control Pattern	**Braking**
			Linear, Squared, User V/Hz	DC Injection Braking
			Torque Boost	Stall Prevention
				Power Braking
			FWD/REV Run Prevention	Flux Braking
			Frequency Limits	External Brake Control
			Jump Frequencies	
			3-wire Control	
			Fire Mode	
	Input	(5) Multi-function terminals (P1 -P5)	Select PNP (Source) or NPN (Sink) mode	
			Functions of the digital inputs are set with parameters In. 65 - In. 69	
			• Forward/Reverse	• Run Enable (Interlock)
			• Reset	• External trip
			• Emergency stop	• Jog operation (FWD/REV)
			• Multi-Step frequencies	• Multi-Step Acc/Dec
			• DC braking during stop	• Second motor selection
			• Frequency increase	• Up/Down Frequency
			• 3-wire	• Analog Hold (frequency)
			• Acc/Dec/Stop	• Exit PID Operation

GM2 SERIES - PRODUCT SPECIFICATION DETAILS

Feature			Description	
Operation	Output	Multi-function relays	Programmable Output Relays	AC 250V, 1A DC 30V, 1A
			Relay 1 (A1-C1-B1)	
			Relay 2 (A2-C2)	
		Analog output	0-12 VDC: Programmable Analog Output	
Protection	Trip		• Motor Overload	• Under Torque
			• Motor Under Load	• Inverter Over Heat
			• Over Current (OC1)	• Short Circuit (OC2)
			• Over Voltage	• External Trip
			• Low Voltage	• Hardware Fault
			• Ground Fault	• Temperature Sensor (NTC)
			• Motor Over Heat (Eth)	• Fan Fault
			• Phase Open (In/Out)	• Pre-PID Operation Failure
			• Inverter Overload	• External Brake Trip
			• No Motor Trip	• Reference Loss
			• Over Torque	• Option Board Trip
	Alarm		Warnings: Reference Loss, Motor Overload, Motor Under Load, Inverter Overload, Fan, Dynamic Braking Rate Warning, Auto Tuning Error, Inverter Overheat	
	Instantaneous Power Outage		Normal Duty: Less than 8ms (~1/2 cycle)	
			Heavy Duty: Less than 15ms (~1 cycle)	
			For longer outages use KEB operation and/or Auto Restart operation	
Structure / Working Environment	Cooling type		Forced fan cooling structure	
	Protection structure		UL Open Type (IP20), UL Enclosed Type 1 is achieved with conduit box installation (option)	
	Ambient Operating Temperature		14°F ~ + 104°F (- 10°C ~+ 40°C)	
			Derating: 2% output amps for every degree above 104°F (40°C), maximum 122°F (50°C)	
			No ice or frost should be present	
	Ambient humidity		Less than 95% RH (avoid condensation forming)	
	Storage temperature		-4°F ~ + 149°F (- 20°C ~ + 65°C)	
	Environmental factors		Prevent contact with corrosive gases, flammable gases, oil stains, dust, and other pollutants (Pollution Degree 2 Environment)	
	Operation /Altitude/Vibration		3280 ft (1,000 m)	
			Apply derating of 1% voltage/output current for every 100 m above 1,000 m, maximum of 4,000 m	
			Less than 9.8 m/sec^2 (1G)	
	Air pressure		10 ~ 15 PSI (70 ~ 106 kPa)	

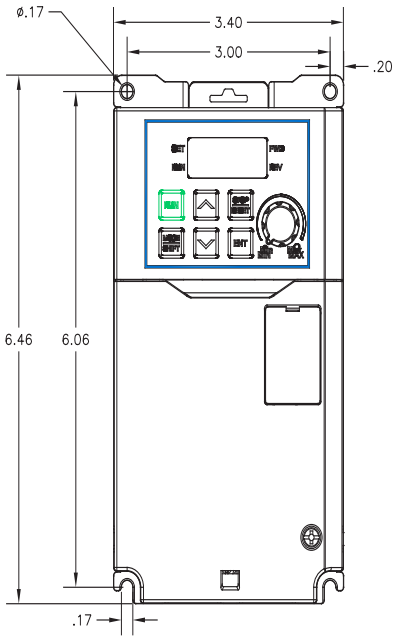
GM2 SERIES - WIRING



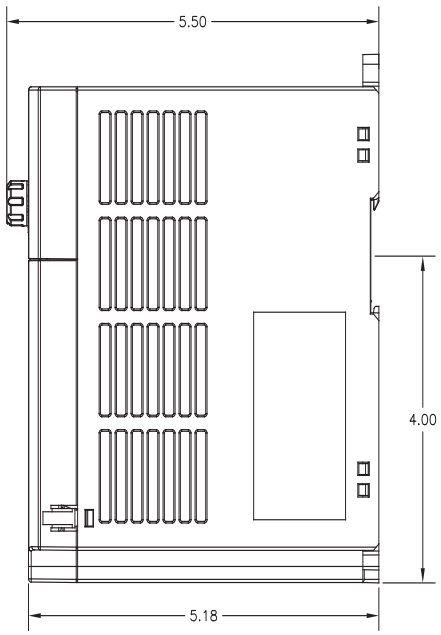
GM2 SERIES - DRAWINGS

240V, 1 HP - 2 HP

480V, 1 HP - 2 HP



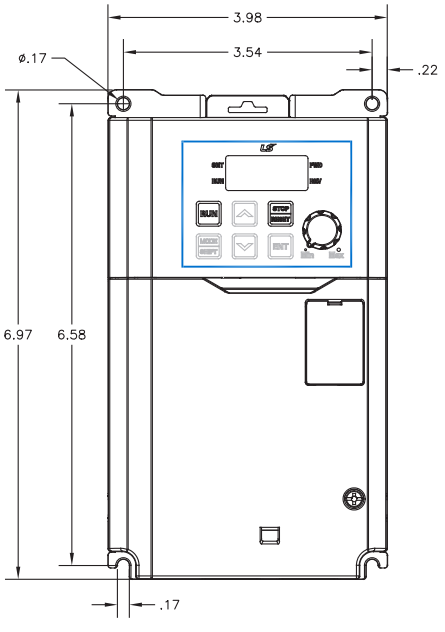
FRONT VIEW



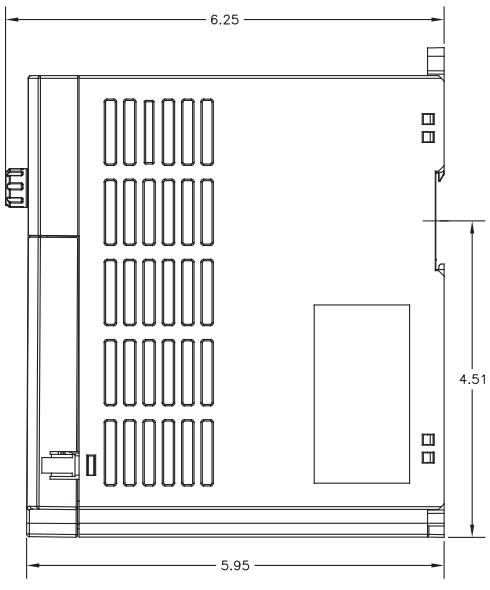
SIDE VIEW

240V, 3 HP - 5 HP

480V, 3 HP - 5 HP



FRONT VIEW

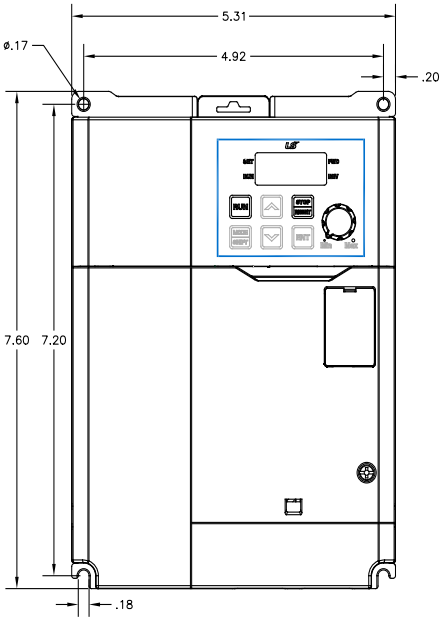


SIDE VIEW

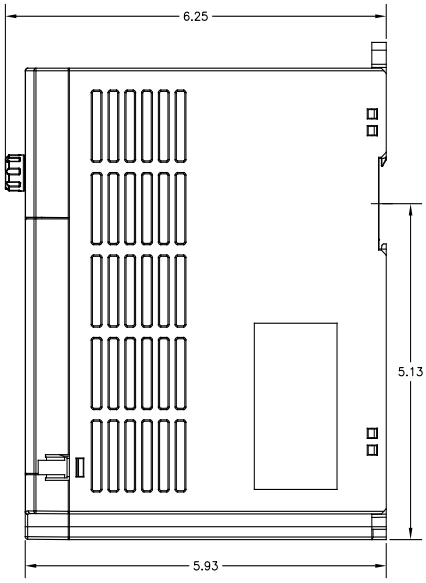
GM2 SERIES - DRAWINGS

240V, 7.5 HP

480V, 7.5 HP



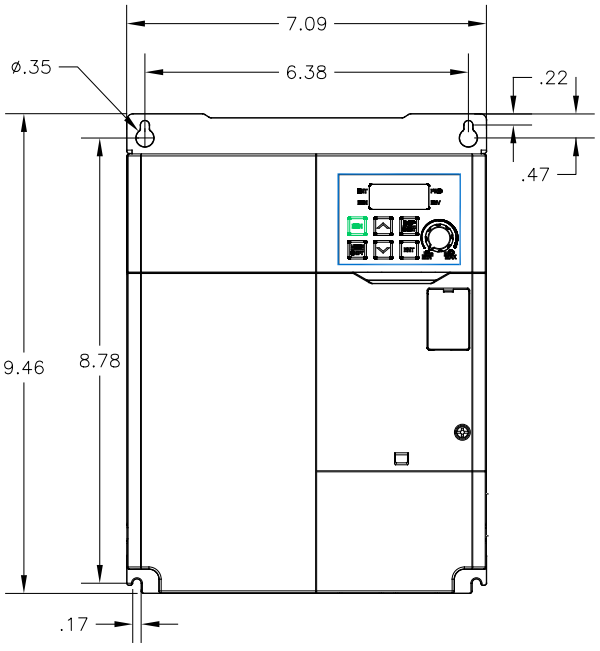
FRONT VIEW



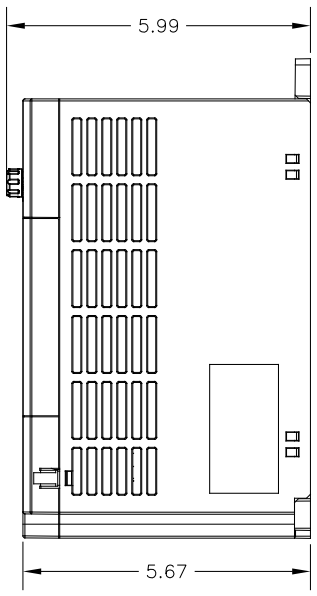
SIDE VIEW

240V, 10 HP - 15 HP

480V, 10 HP - 15 HP



FRONT VIEW



SIDE VIEW

S SERIES - MICRO DRIVES

The Benshaw S Series is a compact yet powerful AC drive designed for the most demanding applications. Available in 'normal duty' ratings up to 15HP and 'heavy duty' ratings up to 10HP, the S Series puts you in control. Whether your application calls for V/Hz control, Sensorless Vector Control or Torque Control, the S Series has you covered. Modbus RTU is standard with optional communication protocols available. And, as with all Benshaw AC drives, the S Series complies with industrial standards including UL/cUL, CE and includes built-in EMC filters (480V models) and Safe Torque Off (STO) input. The best part about the S Series drive is how easy it is to convert from an IP20 protected chassis to a UL Type 1 per UL 61800-5-1 rating with the addition of a convenient conduit box (a standard Benshaw stock item).
A plenum rating per UL 2043 is also achieved with the addition of the conduit box.

FEATURES

Dual Rated:

- Normal Duty up to 15HP
- Heavy Duty up to 10HP

Control Modes:

- V/Hz Control
- Sensorless Vector (IM and PMAC)
- Slip Compensation
- Torque Control

Hardware:

- Compact Size
- EMC Filter Built in (460V only)
- Internal Brake IGBT (external resistor required)
- Single Phase Input (derating required)
- IP20 Protected Chassis Enclosure Standard

Functions:

- PID Control
- Kinetic Energy Buffering (KEB) for power loss ride through
- Regen Avoidance for press applications
- Fire Pump Mode
- STO (Safe Torque Off)
- Energy Savings
- Flying Start
- PLC Functionality with 18 steps user programmable sequence
- Peer to Peer communications for Master/Slave Control

OPTIONS

- Extended I/O Card
- Remote LCD Display/Keypad
- Conduit Box for UL Type 1 and Plenum rating
- Adapter Flange for Fins Out Cooling

COMMUNICATIONS

- Ethernet IP/Modbus - TCP
- Profibus -DP
- Profinet
- CANopen

S SERIES - SELECTION CHART

Protected Chassis - 240V	Normal Duty 120% for 60 sec.		Heavy Duty 150% for 60 sec.		Dimensions (inches)		
Model Number	HP	Amps	HP	Amps	H	W	D
VFD-RSI-001-SS-2C	1	3.1	0.5	2.5	5.04	2.68	4.84
VFD-RSI-002-SS-2C	2	6	1	5	5.04	2.68	5.04
VFD-RSI-003-SS-2C	3	10	2	8	5.04	3.94	5.12
VFD-RSI-005-SS-2C	5	12	3	11	5.04	3.94	5.71
VFD-RSI-007-SS-2C	7.5	18	5.4	17	5.04	5.51	5.71
VFD-RSI-010-SS-2C	10	30	7.5	24	9.13	6.3	5.51
VFD-RSI-015-SS-2C	15	40	10	32	9.13	6.3	5.51

Protected Chassis - 480V	Normal Duty 120% for 60 sec.		Heavy Duty 150% for 60 sec.		Dimensions (inches)		
Model Number	HP	Amps	HP	Amps	H	W	D
VFD-RSI-001-SS-4C	1	2.0	0.5	1.3	7.09	2.68	5.12
VFD-RSI-002-SS-4C	2	3.1	1	2.5	7.09	2.68	5.12
VFD-RSI-003-SS-4C	3	5.1	2	4	7.09	3.94	5.51
VFD-RSI-005-SS-4C	5	6.9	3	5.5	7.09	3.94	5.51
VFD-RSI-007-SS-4C	7.5	10	5.4	9	7.09	5.51	5.51
VFD-RSI-010-SS-4C	10	16	7.5	12	9.13	6.3	5.51
VFD-RSI-015-SS-4C	15	23	10	16	9.13	6.3	5.51

S SERIES - ACCESSORIES

DISPLAY / KEYPAD REMOTE MOUNTING

Part Number	Description
LCD-100004-00	Remote LCD Display/Keypad, S & SW Series VFD
VFD-2M-RE-CABLE-H2	Bezel & Cable, RJ45, 2M, S/SW/H2 Series VFD, for Remote Mounting
VFD-3M-RE-CABLE-H2	Bezel & Cable, RJ45, 3M, S/SW/H2 Series VFD, for Remote Mounting
CV-100017-00	LCD Cover, Remote Mounting, NEMA 4X, S, SW & H2 Series VFD

COMMUNICATION CARDS AND I/O CARDS

Part Number	Description
PC-100090-00	Extended I/O Card, S & SW Series VFD
PC-100092-00	Ethernet IP & Modbus TCP Option Card
PC-100091-00	Profibus-DP Option Card*
PC-100094-00	CANopen Option Card
PC-100095-00	Profinet Option Card

* Profibus cannot be use with SW VFD.

NEMA 1 CONDUIT KITS

Part Number	Description
EN-100994-00	Conduit Box, 1 HP~2 HP, 230V
EN-100994-01	Conduit Box, 3 HP~5 HP, 230V
EN-100994-02	Conduit Box, 7.5 HP, 230V
EN-100994-03	Conduit Box, 10 HP~15 HP, 230V/460V
EN-100994-04	Conduit Box, 1 HP~2 HP, 460V
EN-100994-05	Conduit Box, 3 HP~5 HP, 460V
EN-100994-06	Conduit Box, 7.5 HP, 460V

FINS OUT MOUNTING FLANGES

Part Number	Description
BRKT-100770-00	Mounting flange, 1 HP~2 HP, 230V
BRKT-100770-01	Mounting flange, 3 HP~5 HP, 230V
BRKT-100770-02	Mounting flange, 7.5 HP, 230V
BRKT-100770-03	Mounting flange, 10 HP~15 HP, 230V/460V
BRKT-100770-04	Mounting flange, 1 HP~2 HP, 460V
BRKT-100770-05	Mounting flange, 3 HP~5 HP, 460V
BRKT-100770-06	Mounting flange, 7.5 HP, 460V

S SERIES - INPUT AND OUTPUT SPECIFICATIONS

3-Phase 240V, 1 HP - 15 HP (0.75 - 11 kW)

RSI-XXX-SS-2C			001	002	003	005	007	010	015
240V, w/3Ø Input	Normal Duty 120% OL	HP	1	2	3	5	7.5	10	15
		kW	0.75	1.5	2.2	3.7	5.5	7.5	11
		Amps	3.1	6	10	12	18	30	40
		KVA	1.2	2.3	3.8	4.6	6.9	11.4	15.2
	Heavy Duty 150% OL	HP	0.5	1	2	3	5.4	7.5	10
		kW	0.4	0.75	1.5	2.2	4	5.5	7.5
		Amps	2.5	5	8	11	17	24	32
		KVA	1	1.9	3	4.2	6.5	9.1	12.2
240V, w/1Ø Input	Normal Duty 120% OL	HP	-	0.75	1	1.5	3	5	7..5
		Amps	1.8	3.3	5.7	6.6	9.9	16	22
	Heavy Duty 150% OL	HP	-	0.5	1	1.5	2	3	5
		Amps	1.5	2.8	4.6	6.1	9.3	13	18
Rated Output	Output frequency		0.00~400.00 (Hz), V/F, Slip Compensation						
			0.00~120.00 (Hz), IM Sensorless						
			0.00~180.00 (Hz), PM Sensorless						
	Output voltage (V)		3-phase 0-240 V						
Rated Input	Working voltage (V)		3-phase 200-240 VAC (-15% to +10%)						
			1-phase 240 VAC (-5% to +10%)						
	Input frequency		3-phase 50-60 Hz (±5%)						
			1-phase 60Hz (±5%).)						
	3-phase current (A)	Normal Duty	3	6.3	10.8	13.1	19.4	32.7	44.2
		Heavy Duty	2.2	4.9	8.4	11.8	18.5	25.8	34.9
Weight (lb/kg)		lbs	2	2	2.86	3.3	4.4	7.3	7.3
		kg	0.9	0.9	1.3	1.5	2	3.3	3.3

S SERIES - INPUT AND OUTPUT SPECIFICATIONS

3-Phase 480V, 1 HP - 15 HP (0.75 - 11 kW)

RSI-XXX-SS-2C			001	002	003	005	007	010	015
480V, w/3Ø Input	Normal Duty 120% OL	HP	1	2	3	5	7.5	10	15
		kW	0.75	1.5	2.2	3.7	5.5	7.5	11
		Amps	2	3.1	5.1	6.9	10	16	23
		KVA	1.5	2.4	3.9	5.3	7.6	12.2	17.5
	Heavy Duty 150% OL	HP	0.5	1	2	3	5.4	7.5	10
		kW	0.4	0.75	1.5	2.2	4	5.5	7.5
		Amps	1.25	2.5	4	5.5	9	12	16
		KVA	1	1.9	3	4.2	6.5	9.1	12.2
480V, w/1Ø Input	Normal Duty 120% OL	HP	0.5	0.75	1.5	2	3	5	10
		Amps	1.3	1.9	3	3.9	5.9	9.5	14
	Heavy Duty 150% OL	HP	-	0.5	0.75	1	2	2	3
		Amps	0.8	1.5	2.3	3.1	5.4	7.1	9.5
Rated Output	Output frequency		0.00~400.00 (Hz), V/F, Slip Compensation						
			0.00~120.00 (Hz), IM Sensorless						
			0.00~180.00 (Hz), PM Sensorless						
	Output voltage (V)		3-phase 0-480 V						
Rated Input	Working voltage (V)		3-phase 380-480 VAC (-15% to +10%)						
			1-phase 480 VAC (-5% to +10%)						
	Input frequency		3-phase 50-60 Hz (±5%)						
			1-phase 60Hz (±5%).)						
	3-phase current (A)	Normal Duty	2	3.3	5.5	7.5	10.8	17.5	25.4
		Heavy Duty	1.1	2.4	4.2	5.9	9.8	12.9	17.5
Weight (lb/kg) w/EMC filter		lbs	2.6	2.6	3.9	4.1	4.9	7.3	7.5
		kg	1.18	1.18	1.77	1.8	2.23	3.3	3.4

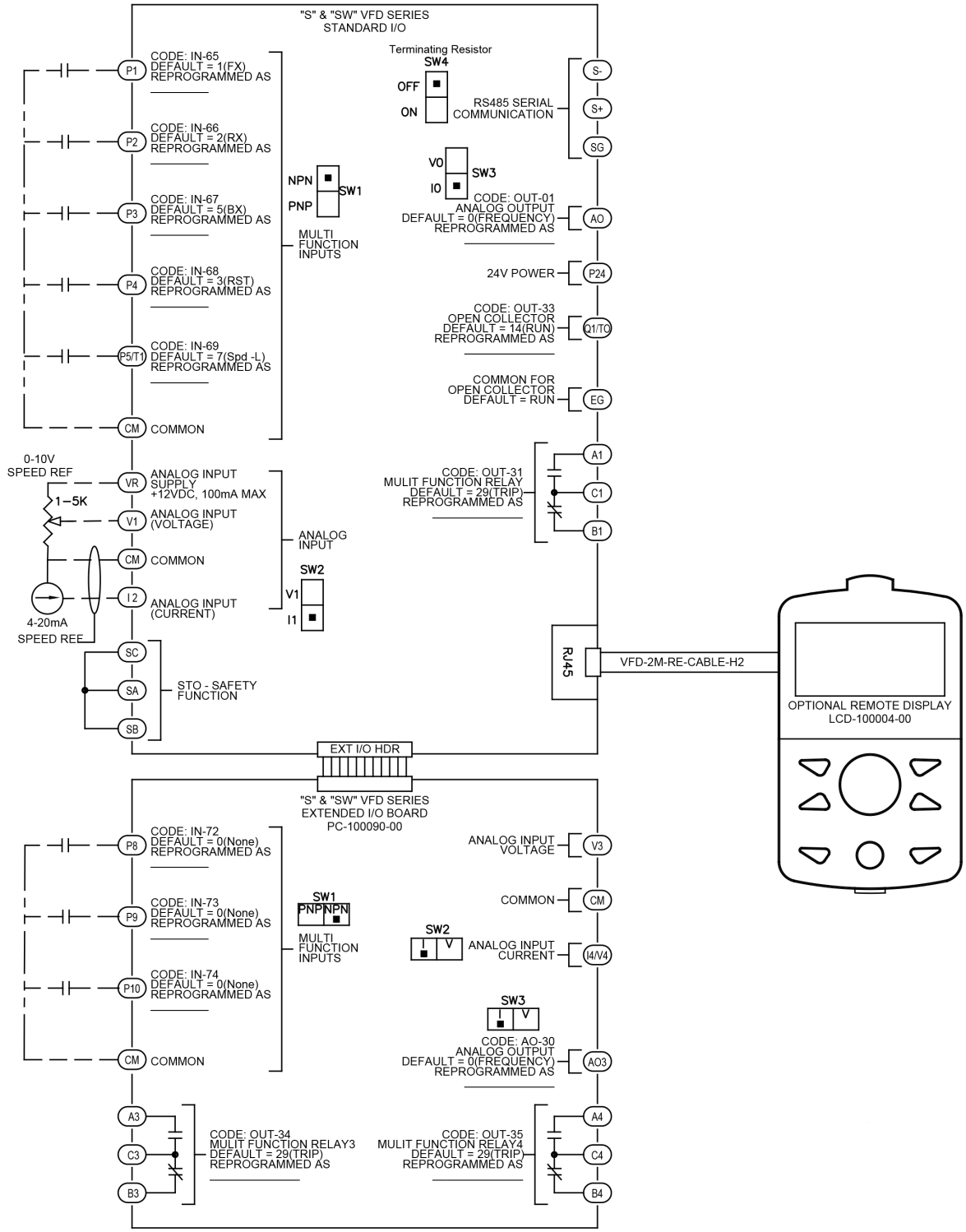
S SERIES - PRODUCT SPECIFICATION DETAILS

Feature			Description	
Control	Control method		V/F control, Slip Compensation, Sensorless Vector (IM and PM), IM Torque Control	
	Frequency settings resolution		Digital command: 0.01 Hz	Analog command:0.06 Hz (60Hz standard)
	Frequency accuracy		1% of maximum output frequency	
	V/F pattern		Linear, Square Reduction, User V/F	
	Overload capacity		Normal Duty: 120%, 1 minute	Heavy Duty: 150%, 1 minute
	Torque boost		Manual torque boost, Automatic torque boost	
Operation	Operation Type			
	Start/Stop		Keypad, terminal strip or communications	
	Frequency settings		Analog type: 0~10V, 0/4~20mA, -10~10V Digital type: Keypad, Pulse Train input, communications	
	Operation function		**Basic**	**Advanced**
			Start/Stop Operation	Sensorless Vector Control
			Start/Stop Modes	IM and PM motors
			Frequency Reference Sources	Auto Tuning
			Auxiliary Frequency Reference	Torque Control, Torque Limits
			Multi-Step Speeds	PID Control
			Multi-Step Accel/Decel Times	Slip Compensation
			2nd Source (HOA)	Energy Save Mode
			Accel/Decel Times	Regen Avoidance
			Accel/Decel Patterns	VFD Fan Control
			Dwell Frequency Operation	
			Jog	**Loss of Power**
			Auto Start	Ride Through (KEB)
			Auto Reset/Restart	Safe Stop
				Speed Search
			V/Hz. Control Pattern	
			Linear, Squared, User V/Hz	**Braking**
			Torque Boost	DC Injection Braking
				Stall Prevention
			FWD/REV Run Prevention	Power Braking
			Frequency Limits	Flux Braking
			Jump Frequencies	External Brake Control
			3-Wire Control	
			Fire Mode	
	Input	(5) Multi-function input terminal (P1 - P5)	Select PNP (Source) or NPN (Sink) mode	
			Functions of the digital inputs are set with parameters In.65 - In.69	
			• Forward/Reverse	• Run Enable (Interlock)
			• Reset	• External trip
			• Emergency stop	• Jog operation (FWD/REV)
			• Multi-Step frequencies	• Multi-step Accel/Decel
			• DC braking during stop	• Second motor selection
			• Frequency increase	• Up/Down Frequency

S SERIES - PRODUCT SPECIFICATION DETAILS

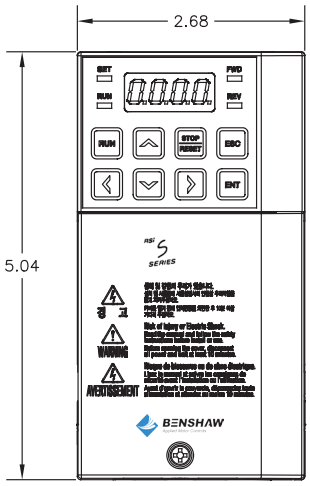
Feature			Description	
Operation	Input	(5) Multi-function input terminal (P1 -P5)	• 3-Wire	• Analog Hold (frequency)
			• Accel/Decel/Stop	• Exit PID Operation
				• Auxiliary Input (2nd Soruce), HOA
		Pulse Train	• 0-32 kHz, Low Level: 0-2, 5V, High Level: 3, 5-12V	
	Output	Open collector (Q1)	Fault output, VFD operating status, many others	Less than DC 24V, 50mA
		Relay, R1		Less than AC 250V, 1A
				Less than DC 30V, 1A
		Analog Output	0/4-20mA / 0-12 VDC (Switch Selectable): Select frequency, output current, output voltage, DC terminal voltage and others	
		Pulse Train	Maximum 32kHz, 10-12V	
			• Motor Overload	• Under Torque
			• Motor Under Load	• Inverter Over Heat
			• Over Current (OC1)	• Short Circuit (OC2)
			• Over Voltage	• External Trip
			• Low Voltage	• Hardware Fault
			• Ground Fault	• Temperature Sensor (NTC)
			• Motor Over Heat (Eth)	• Fan Fault
			• Phase Open (In/Out)	• Pre-PID Operation Failure
			• Inverter Overload	• External Brake Trip
			• No Motor Trip	• Reference Loss
			• Over Torque	• Option Board Trip
			• Safety (STO) A, B Trip	• Loss of Communications
	Alarm		Warnings: Reference Loss, Motor Overload, Motor Under Load, Inverter Overload, Fan, Dynamic Braking Rate Warning, Auto Tuning Error, Inverter Overheat	
	Instantaneous Loss of Power		Normal Duty: Less than 8 ms (~ 1/2 cycle)	
			Heavy Duty: Less than 15 ms (~ 1 cycle)	
			For longer outages use KEB operation and/or Auto Restart operation	
Structure / working environment	Cooling type		Forced cooling type: 240V: 2 HP ~ 15 HP 480V: 1 HP ~ 15 HP	
	Protection structure		IP20, UL Open Type	
			UL Type 1 is achieved with conduit box installation (option)	
	Ambient temperature		14°F ~+ 104°F (- 10°C ~ + 40°C)	
			Derating: 2% output amps for every degree above 104°F (40°C) maximum 122°F (50°C)	
	Ambient humidity		Less than 90% RH (to avoid condensation forming)	
	Storage temperature		- 4°F ~ + 149°F (- 20°C ~ + 65°C)	
	Surrounding environment		Prevent contact with corrosive gases, inflammable gases, oil stains, dust, and other pollutants (Pollution Degree 2 Environment)	
	Operation altitude/oscillation		3,280 ft (1000 m). Apply derating of 1% voltage/output current for every 328 ft (100m) above 3,280 ft (1,000 m), maximum of 13,123 ft (4,000 m)	
			Less than 9.8 m/sec^2 (1G)	
	Pressure		10 ~ 15 PSI (70 ~ 106 kPa)	

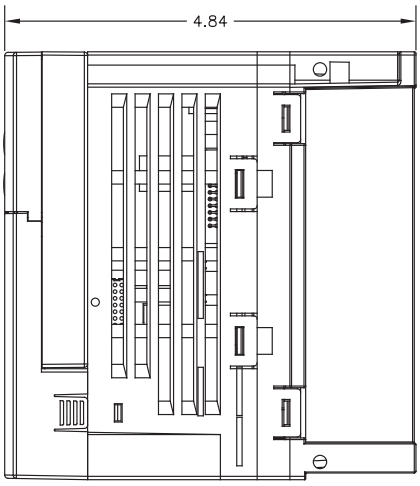
S SERIES - WIRING



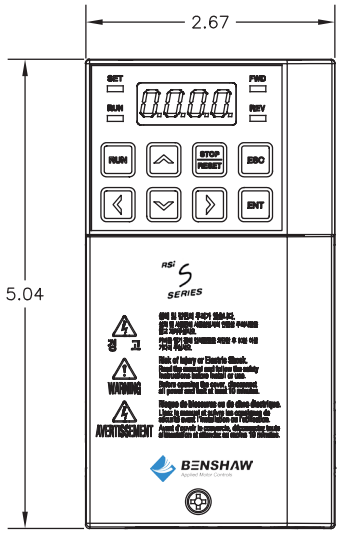
S SERIES - DRAWINGS

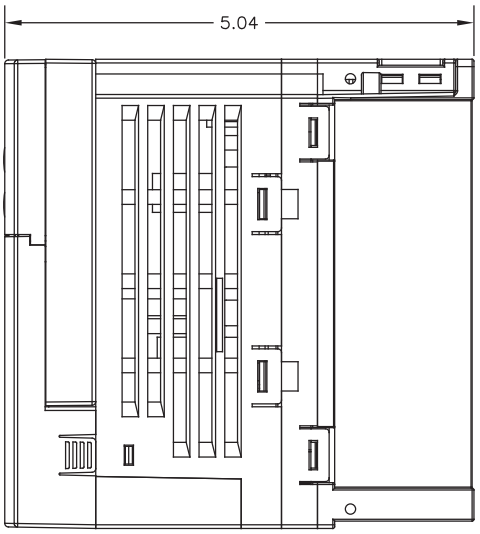
240V, 1 HP



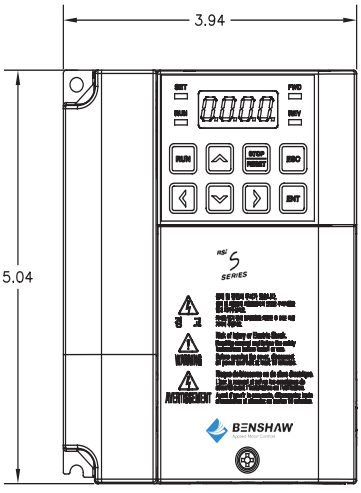


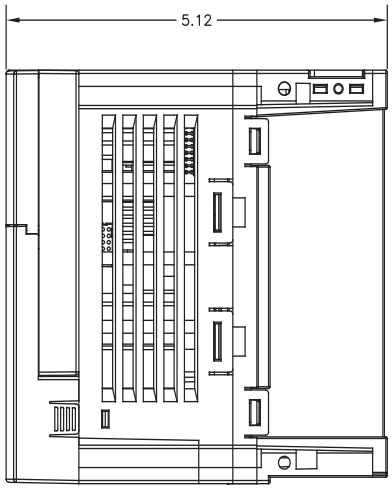
240V, 2 HP





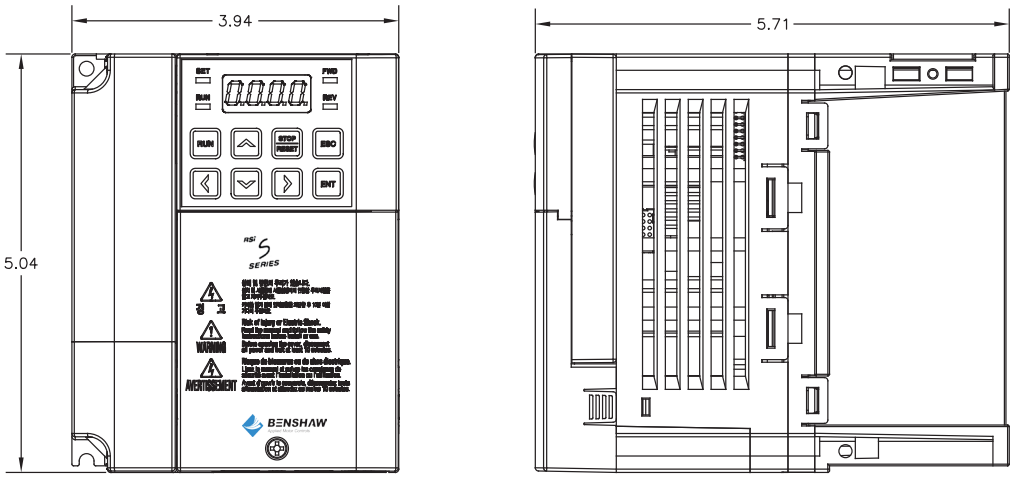
240V, 3 HP



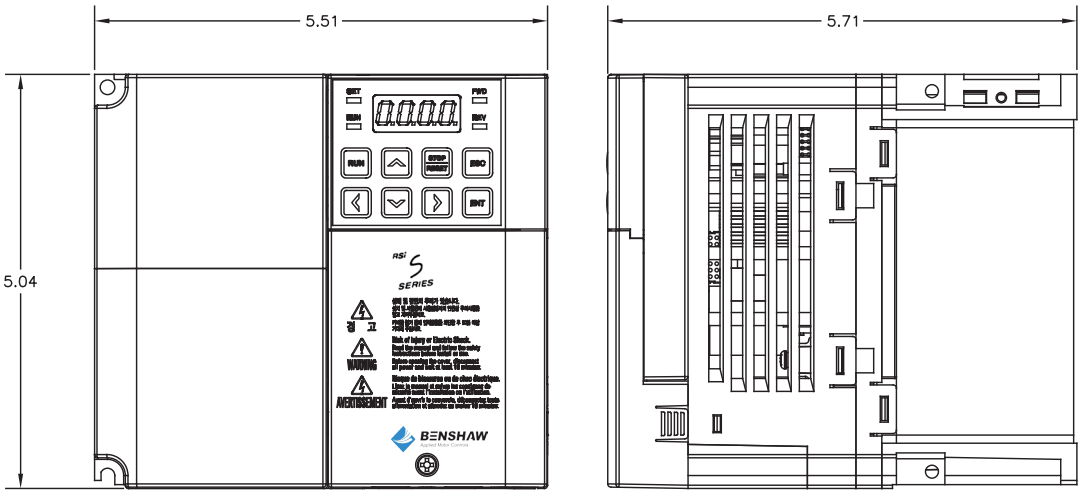


S SERIES - DRAWINGS

240V, 5 HP

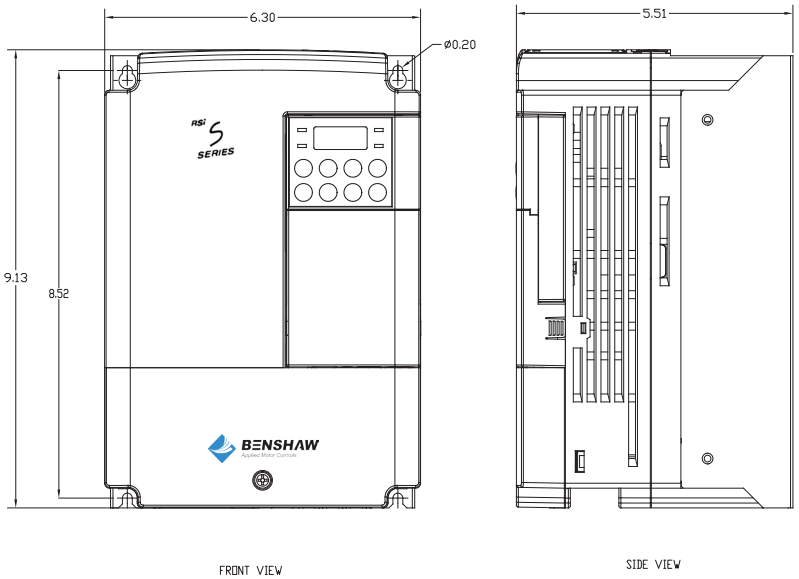


240V, 7.5 HP



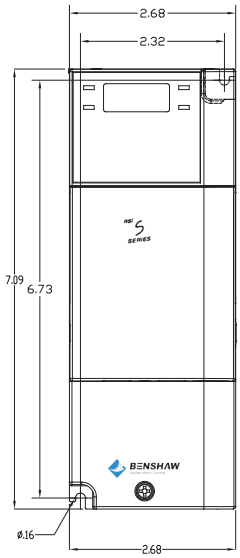
240V, 10 HP - 15 HP

480V, 10 HP - 15 HP

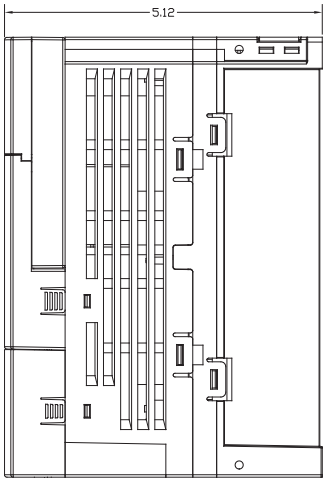


S SERIES - DRAWINGS

480V, 1 HP - 2 HP

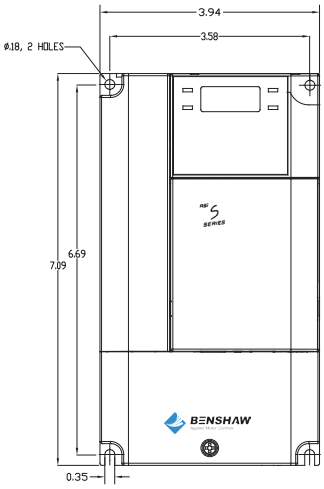


FRONT VIEW

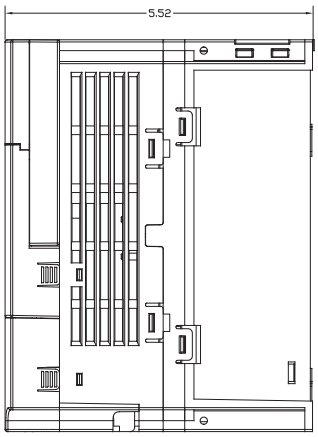


SIDE VIEW

480V, 3 HP - 5 HP

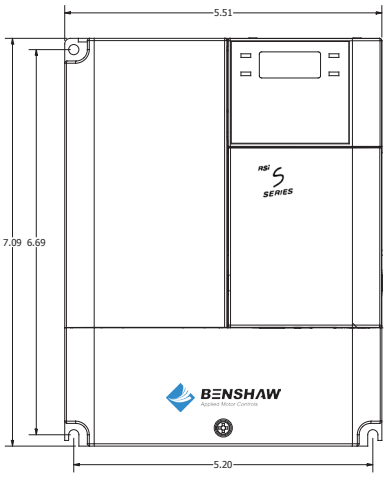


FRONT VIEW

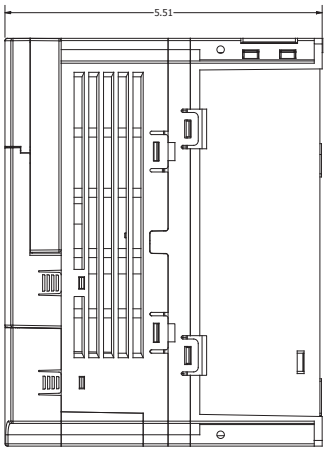


SIDE VIEW

480V, 7.5 HP



FRONT VIEW



SIDE VIEW

SW SERIES - OVERVIEW

The Benshaw SW Series NEMA 4X Washdown Drives are heavy duty rated for applications from 0.5-30HP. Designed for high pressure washdown, all SW Series drives feature a rugged UL Type 4X (IP66) indoor rated polycarbonate enclosure that exceeds NEMA 1, 12, 4 and 4X standards. A convenient built-in power disconnect switch, 4 digit- 7 segment display and an optional remote LCD Display/Keypad with a Quick Start menu, make it easy to program and control. And, standard software gives you the flexibility of programming the drive for V/Hz, Sensorless Vector or Slip Compensation operation...whatever your application requires. An on-board RJ45 Port (Modbus-RTU) and built in EMC filter (480V models) are included in this unique, compact AC drive. The SW Series is the ideal product for either stand-alone or side-by-side installation in the harshest of environments and washdown installations.

STANDARD FEATURES - HARDWARE

- Heavy Duty rated
  - 240V 0.5 HP ~ 20 HP
  - 480V 0.5 HP ~ 30 HP
- Power Disconnect Switch - Built-in
- Display - 4 digit, 7 segment with 4 LED Indicators
- Washdown rated - UL Type 4X (IP66), Indoor only
- EMC Filter (480V only)
- Internal Brake IGBT
- Single Phase Input (derating required)
- RJ45 Port (Modbus - RTU or Remote LCD)

STANDARD FEATURES - SOFTWARE

- Modbus - RTU (via RJ45 or I/O Terminals)
- Control - V/Hz., Sensorless Vector (SVC), Slip Compensation
- Auto Tuning
- SVC (Induction and Permanent Magnet Motors)
- Torque Limits
- PID Control
- Safe Torque Off (STO)
- Fire Mode Input
- Regen Avoidance
- Kinetic Energy Buffering (KEB), Ride Through

SW SERIES - SELECTION CHART

240V

Model Number	kW Rating	Heavy Duty 150% OL / 1min. HP	Amps	Dimensions (inches) H	W	D	Degree of Protection*	Weight (lbs)
VFD-RSI-0F5-SW-24	0.4	0.5	2.5	10.1	7.09	6.85	UL Type 4X / IP66	7.9
VFD-RSI-001-SW-24	0.75	1	5	10.1	7.09	6.85	UL Type 4X / IP66	7.9
VFD-RSI-002-SW-24	1.5	2	8	10.19	8.66	7.91	UL Type 4X / IP66	11.5
VFD-RSI-003-SW-24	2.2	3	11	10.19	8.66	7.91	UL Type 4X / IP66	11.7
VFD-RSI-005-SW-24	3.7	5	16	10.19	8.66	7.91	UL Type 4X / IP66	12.3
VFD-RSI-007-SW-24	5.5	7.5	24	12.91	9.84	8.94	UL Type 4X / IP66	19.8
VFD-RSI-010-SW-24	7.5	10	32	12.91	9.84	8.94	UL Type 4X / IP66	19.8
VFD-RSI-015-SW-24	11	15	46	15.73	10.24	9.66	UL Type 4X / IP66	21.2
VFD-RSI-020-SW-24	15	20	60	18.11	11.81	9.84	UL Type 4X / IP66	26.7

* Indoor Washdown only.

480V

Model Number	kW Rating	Heavy Duty 150% OL / 1min. HP	Amps	Dimensions (inches) H	W	D	Degree of Protection*	Weight (lbs)
VFD-RSI-0F5-SW-44	0.4	0.5	1.3	10.1	7.09	6.85	UL Type 4X / IP66	8.2
VFD-RSI-001-SW-44	0.75	1	2.5	10.1	7.09	6.85	UL Type 4X / IP66	8.2
VFD-RSI-002-SW-44	1.5	2	4	10.19	8.6	7.91	UL Type 4X / IP66	11.7
VFD-RSI-003-SW-44	2.2	3	5.5	10.19	8.6	7.91	UL Type 4X / IP66	12.1
VFD-RSI-005-SW-44	3.7	5	8	10.19	8.6	7.91	UL Type 4X / IP66	12.3
VFD-RSI-007-SW-44	5.5	7.5	12	12.91	9.84	8.94	UL Type 4X / IP66	19.4
VFD-RSI-010-SW-44	7.5	10	16	12.91	9.84	8.94	UL Type 4X / IP66	19.6
VFD-RSI-015-SW-44	11	15	24	15.73	10.24	9.66	UL Type 4X / IP66	21.2
VFD-RSI-020-SW-44	15	20	30	15.73	10.24	9.66	UL Type 4X / IP66	21.6
VFD-RSI-025-SW-44	18.5	25	39	18.11	11.81	9.84	UL Type 4X / IP66	27.3
VFD-RSI-030-SW-44	22	30	45	18.11	11.81	9.84	UL Type 4X / IP66	27.3

* Indoor Washdown only.

SW Series - Accessories

DISPLAY / KEYPAD REMOTE MOUNTING

Part Number	Description
LCD-100004-00	Remote LCD Display/Keypad, S & SW Series VFD
VFD-2M-RE-CABLE-H2	Bezel & Cable, RJ45, 2M, S/SW/H2 Series VFD, for Remote Mounting
VFD-3M-RE-CABLE-H2	Bezel & Cable, RJ45, 3M, S/SW/H2 Series VFD, for Remote Mounting
CV-100017-00	LCD Cover, Remote Mounting, NEMA 4X, S, SW & H2 Series VFD with 3M Cable

COMMUNICATION CARDS AND I/O CARDS

Part Number	Description
PC-100090-00	Extended I/O Card, S & SW Series VFD
PC-100092-00	Ethernet IP & Modbus TCP Option Card
PC-100094-00	CANopen Option Card
PC-100095-00	Profinet Option Card

SW SERIES - INPUT AND OUTPUT SPECIFICATIONS

240V, 0.5 HP - 5 HP (0.4 - 3.7 kW)

RSI-XXX-SW-24			0F5	001	002	003	005
240V, w/3Ø Input	Heavy Duty 150% OL	HP	0.5	1	2	3	5
		kW	0.4	0.75	1.5	2.2	3.7
		Amps	2.5	5	8	11	16
		KVA	1	1.9	3	4.2	6.1
240V, w/1Ø Input		HP	-	0.5	1	1.5	2
		Amps	1.5	2.8	4.6	6.1	8.8
Rated Output	Output frequency		0-400 Hz (V/Hz, Slip Comp.) 0-120 Hz (IM Sensorless) 0-180 Hz (PM Sensorless)				
	Output voltage (V)		3-phase 0-240V				
Rated Input	Working voltage (V)		3-phase 200-240 VAC (-15% to + 10%) Single Phase: 240 VAC (-5% to + 10%)				
	Input frequency		3-phase 50-60 Hz (± 5%) Single Phase 60 Hz (± 5%)				
	Rated current (A)		2.2	4.9	8.4	11.8	17.5
Heat Dissipation		Watts	11.6	10.5	39.5	41.9	100.0
Weight		lbs	7.9	7.9	11.5	11.9	12.1
		kg	3.6	3.6	5.2	5.4	5.5
Degree of Protection			UL Type 4X (IP66) - Indoor Only				

240V, 7.5 HP - 20 HP (5.5 - 15 kW)

RSI-XXX-SW-24			007	010	015	020
240V, w/3Ø Input	Heavy Duty 150% OL	HP	7.5	10	15	20
		kW	5.5	7.5	11	15
		Amps	24	32	46	60
		KVA	9.1	12.2	17.5	22.9
240V, w/1Ø Input		HP	3	5	7.5	10
		Amps	13	18	26	33
Rated Output	Output frequency		0-400 Hz (V/Hz, Slip Comp.) 0-120 Hz (IM Sensorless) 0-180 Hz (PM Sensorless)			
	Output voltage (V)		3-phase 0-240V			
Rated Input	Working voltage (V)		3-phase 200-240 VAC (-15% to + 10%) Single Phase: 240 VAC (-5% to + 10%)			
	Input frequency		3-phase 50-60 Hz (± 5%) Single Phase 60 Hz (± 5%)			
	Rated current (A)		25.8	34.9	50.8	66.7
Heat Dissipation		Watts	137	149	191	302
Weight		lbs	19.4	19.4	20.7	26.2
		kg	8.8	8.8	9.4	11.9
Degree of Protection			UL Type 4X (IP66) - Indoor Only			

SW SERIES - INPUT AND OUTPUT SPECIFICATIONS

480V, 0.5 HP - 5 HP (0.4 - 3.7 kW)

RSI-XXX-SW-24			0F5	001	002	003	005
480V, w/3Ø Input	Heavy Duty 150% OL	HP	0.5	1	2	3	5
		kW	0.4	0.75	1.5	2.2	3.7
		Amps	1.3	2.5	4	5.5	8
		KVA	1	1.9	3	4.2	6.1
480V, w/1Ø Input		HP	-	0.5	1	1.5	3
		Amps	0.8	1.5	2.3	3.1	4.8
Rated Output	Output frequency		0-400 Hz (V/Hz, Slip Comp.) 0-120 Hz (IM Sensorless) 0-180 Hz (PM Sensorless)				
	Output voltage (V)		3-phase 0-480V				
Rated Input	Working voltage (V)		3-phase 380-480 VAC (-15% to + 10%) Single Phase: 480 VAC (-5% to + 10%)				
	Input frequency		3-phase 50-60 Hz (± 5%) Single Phase 60 Hz (± 5%)				
	Rated current (A)		1.1	2.4	4.2	5.9	8.7
Heat Dissipation		Watts	8.1	4.7	27.9	25.6	62.8
Weight		lbs	7.9	7.9	11.5	11.9	12.1
		kg	3.6	3.6	5.2	5.4	5.5
Degree of Protection			UL Type 4X (IP66) - Indoor Only				

480V, 7.5 HP - 30 HP (5.5 - 22 kW)

RSI-XXX-SW-24			007	010	015	020	025	030
480V, w/3Ø Input	Heavy Duty 150% OL	HP	7.5	10	15	20	25	30
		kW	5.5	7.5	11	15	18.5	22
		Amps	12	16	24	30	39	45
		KVA	9.1	12.2	18.3	22.9	29.7	34.3
480V, w/1Ø Input		HP	3	5	10	10	15	20
		Amps	7.1	9.5	15	18	23	27
Rated Output	Output frequency		0-400 Hz (V/Hz, Slip Comp.) 0-120 Hz (IM Sensorless) 0-180 Hz (PM Sensorless)					
	Output voltage (V)		3-phase 0-480V					
Rated Input	Working voltage (V)		3-phase 380-480 VAC (-15% to + 10%) Single Phase: 480 VAC (-5% to + 10%)					
	Input frequency		3-phase 50-60 Hz (± 5%) Single Phase 60 Hz (± 5%)					
	Rated current (A)		12.9	17.5	26.5	33.4	43.6	50.7
Heat Dissipation		Watts	95	87	155	169	277	287
Weight		lbs	19	19.2	20.7	21.2	26.9	26.9
		kg	8.6	8.7	9.4	9.6	12.2	12.2
Degree of Protection			UL Type 4X (IP66) - Indoor Only					

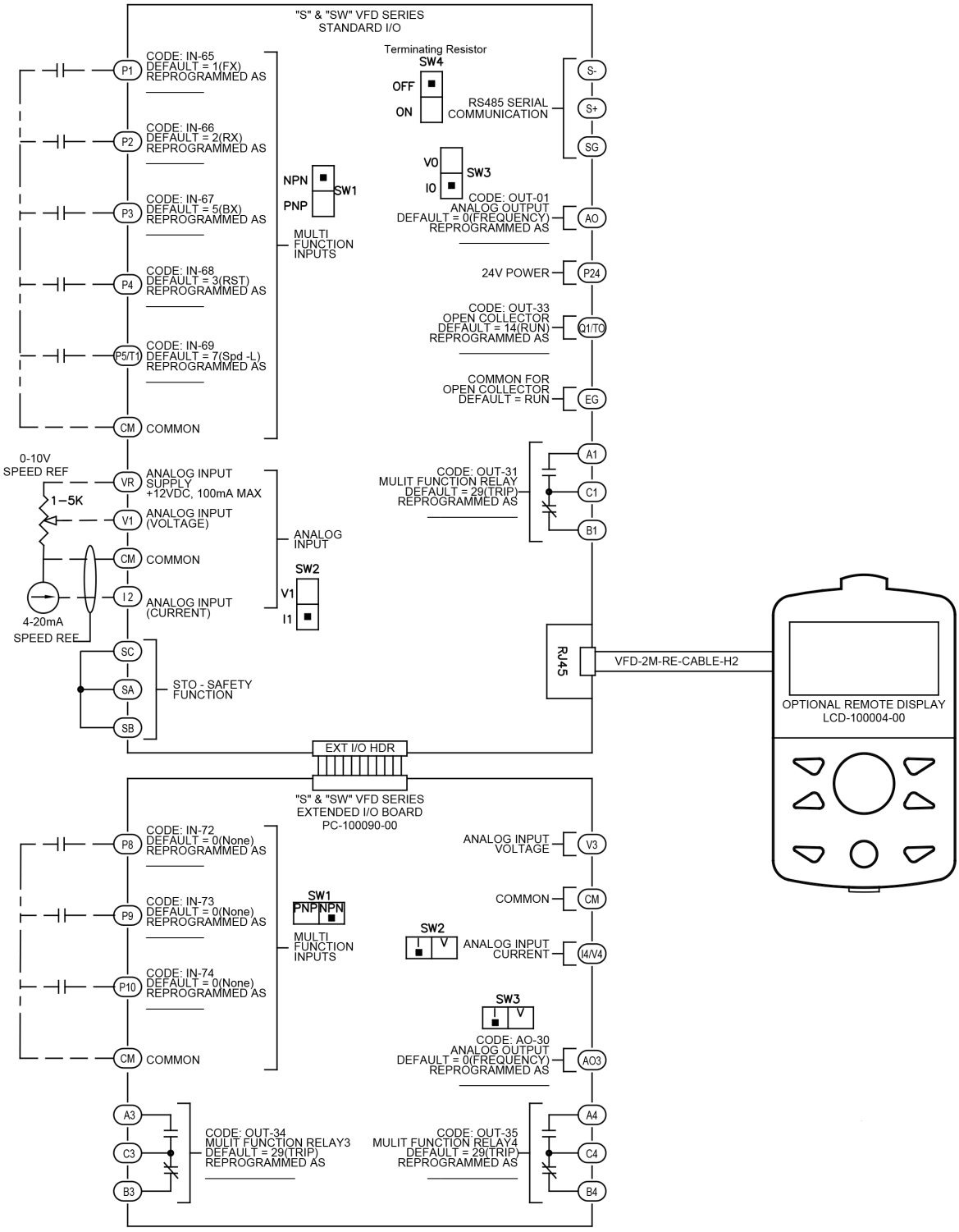
SW SERIES - PRODUCT SPECIFICATION DETAILS

Feature			Description	
Control	Control method		V/F control, Slip compensation, Sensorless vector (IM and PM), IM Torque Control	
	Frequency settings resolution		Digital command: 0.01 Hz	
			Analog command: 0.06 Hz (60 Hz standard)	
	Frequency accuracy		1% of maximum output frequency	
	V/F pattern		Linear, Square Reduction, User V/F	
	Overload capacity		Heavy Duty: 150%, 1 minute	
	Torque boost		Manual torque boost, Automatic torque boost	
	Start/Stop		Keypad, terminal strip, or communication operation	
	Frequency settings		Analog type: 0~10V, 0/4~20mA, -10~10V	
			Digital type: Keypad, Pulse Train input, communications	
Operation	Operation functions		**Basic**	**Advanced**
			Start/Stop Operation	Sensorless Vector Control
			Start/Stop Modes	IM and PM motors
			Frequency Reference Sources	Auto Tuning
			Auxiliary Frequency Reference	Torque Control, Torque Limits
			Multi-Step Speeds	PID Control
			Multi-Step Accel/Decel Times	Slip Compensation
			2nd Source (HOA)	Energy Save Mode
			Accel/Decel Times	Regen Avoidance
			Accel/Decel Patterns	VFD Fan Control
			Dwell Frequency Operation	
			Jog	**Loss of Power**
			Auto Start	Ride Through (KEB)
			Auto Reset/Restart	Safe Stop
				Speed Search
			V/Hz. Control Pattern	
			Linear, Squared, User V/Hz	**Braking**
			Torque Boost	DC Injection Braking
				Stall Prevention
			FWD/REV Run Prevention	Power Braking
			Frequency Limits	Flux Braking
			Jump Frequencies	External Brake Control
			3-Wire Control	
			Fire Mode	
	Input	(5) Multi-function terminals (P1 -P5)	Select PNP (Source) or NPN (Sink) mode	
			Functions of the digital inputs are set with parameters In. 65 - In. 69	
			• Forward/Reverse	• Run Enable (Interlock)
			• Reset	• External trip
			• Emergency stop	• Jog operation (FWD/REV)
			• Multi-Step frequencies	• Multi-Step Acc/Dec

SW SERIES - PRODUCT SPECIFICATION DETAILS

Feature			Description	
Input	(5) Multi-function terminals (P1-P5))		• DC braking during stop	• Second motor selection
			• Frequency increase	• Up/Down Frequency
			• 3-Wire	• Analog Hold (frequency)
			• Acc/Dec/Stop	• Exit PID Operation
			• Select acc/dec/stop	• Auxiliary Input (2nd Source), HOA
	Pulse train		0-32 kHz,10-12V	
Operation	Output	Open collector (Q1)	Fault output, inverter operating status, many others	Less than DC 24V, 50mA
		Relay, R1		Less than (N.O., N.C.) AC250V 1A
				Less than DC 30V, 1A
		Analog output	0-12VDC 0(4)-20mA / 0-12VDC (Switch Selectable): Select frequency, output current, output voltage, DC terminal voltage and others	
		Pulse train	0-32 kHz, Low Level: 0-2.5V, High Level: 3.5-12V	
Protection	Trip		• Motor Overload	• Under Torque
			• Motor Under Load	• Inverter Over Heat
			• Over Current (0C1)	• Short Circuit (0C2)
			• Over Voltage	• External Trip
			• Low Voltage	• Hardware Fault
			• Ground Fault	• Temperature Sensor (NTC)
			• Motor Over Heat (Eth)	• Fan Fault
			• Phase Open (In/Out)	• Pre-PID Operation Failure
			• Inverter Overload	• External Brake Trip
			• No Motor Trip	• Reference Loss
			• Over Torque	• Option Board Trip
			• Safety (STO) A, B Trip	
	Alarm		Warnings: Reference Loss, Motor Overload, Motor Under Load, Inverter Overload, Fan, Dynamic Braking Rate Warning, Auto Tuning Error, Inverter Overheat	
	Instantaneous Loss of Power		Heavy Duty: Less than 15 ms (~1 cycle)	
			For longer outages use KEB operation and/or Auto Restart operation	
Structure / Working Environment	Cooling type		Forced fan cooling structure	
			Forced cooling type: 240V 0.5HP ~ 20HP 480V: 0.5HP ~ 30HP	
	Protection structure		IP66 (NEMA 4X Indoor Only)	
	Ambient Operating Temperature		14°F ~ + 104°F (-1 0°C ~+ 40°C)	
			No ice or frost should be present	
	Ambient humidity		Less than 90% RH (avoid condensation forming)	
	Storage temperature		-4°F ~ + 149°F (- 20°C ~ + 65°C)	
	Surrounding environment		Prevent contact with corrosive gases, inflammable gases, oil stains, dust, and other pollutants (Pollution Degree 3 Environment).	
	Operation /Altitude/Vibration		3,280 ft. (1000m). Apply derating of 1%voltage/output current for every 328 ft. (100m) above 3280 ft (1,000m)	
			Less than 9.8 m/sec^2 (1G)	
	Pressure		10 ~ 15 PSI (70~106 kPa)	

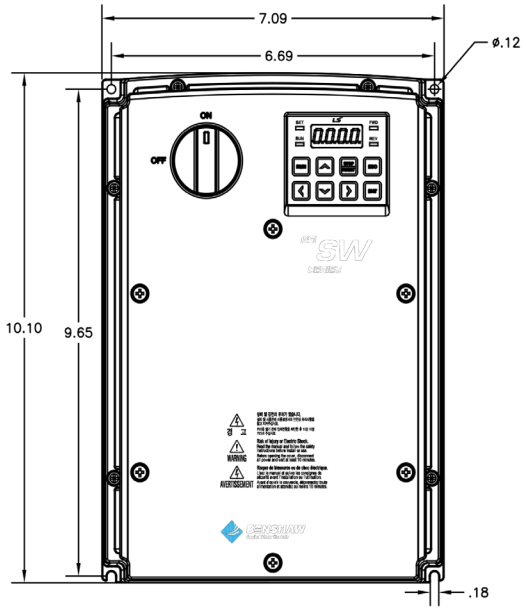
SW SERIES - WIRING



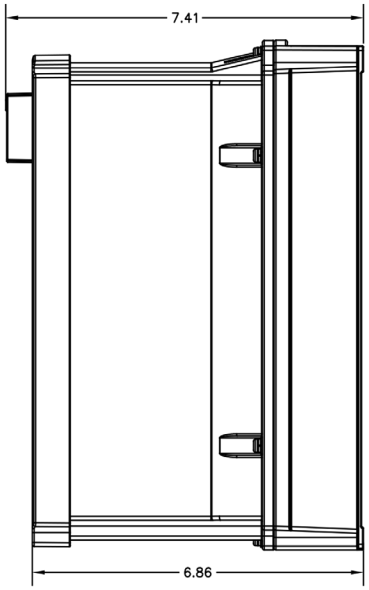
SW SERIES - DRAWINGS

240V, 0.5 HP - 1 HP

480V, 0.5 HP - 1 HP



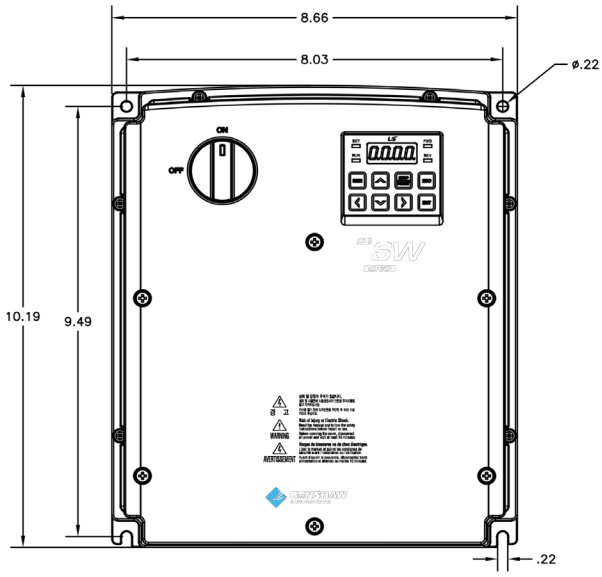
FRONT VIEW



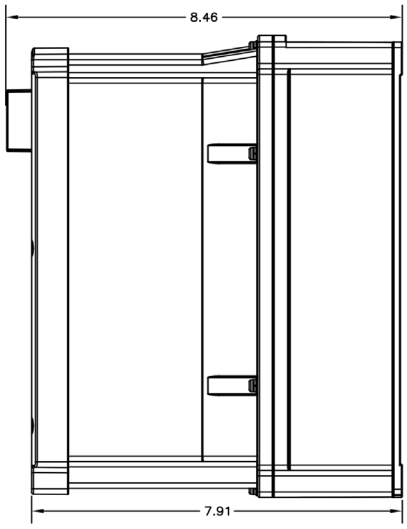
SIDE VIEW

240V, 2 HP -5 HP

480V, 2 HP - 5 HP



FRONT VIEW

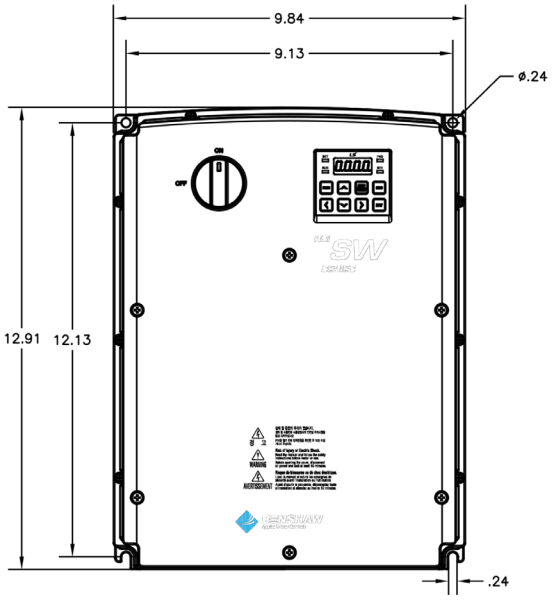


SIDE VIEW

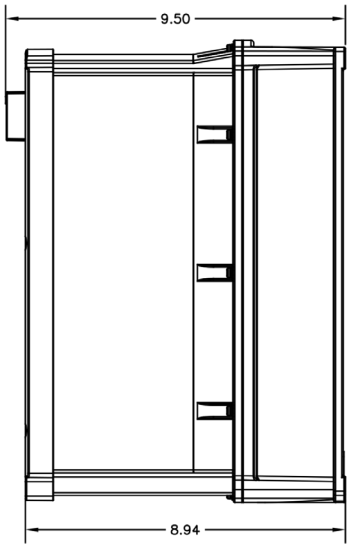
SW SERIES - DRAWINGS

240V, 7.5 HP - 10 HP

480V, 7.5 HP - 10 HP



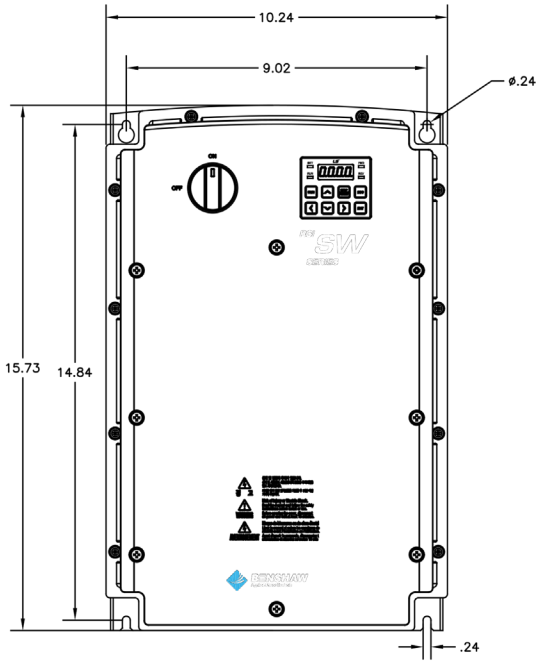
FRONT VIEW



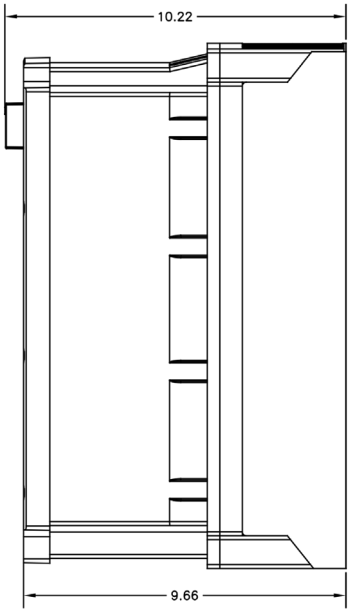
SIDE VIEW

240V, 15 HP

480V, 15 HP - 20 HP



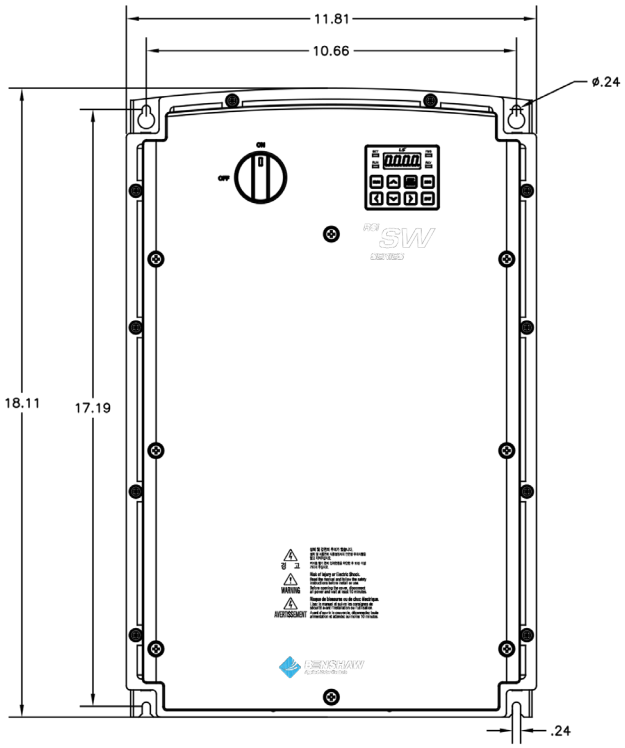
FRONT VIEW



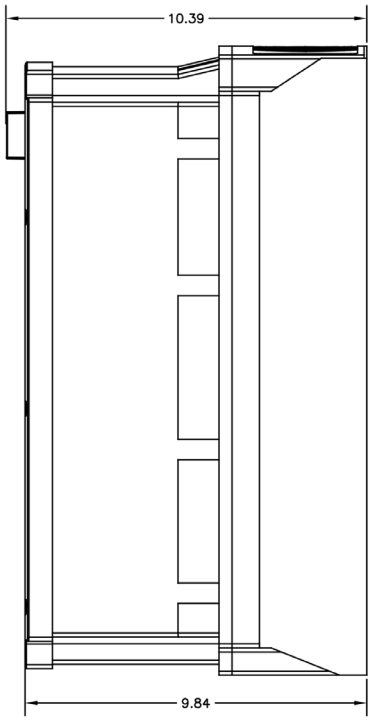
SIDE VIEW

SW SERIES - DRAWINGS

480V, 25 HP - 30 HP



FRONT VIEW



SIDE VIEW

H2 SERIES - MULTI-PURPOSE DRIVE

The Benshaw H2 Series sets the new standard for variable frequency drives. It can be used as a general purpose industrial drive with V/hz or Vector control (with ratings for normal or heavy duty applications from 5-800HP). For fan and pumps applications, simply use the built-in macros designed to meet the basic requirements of the water/wastewater, irrigation and HVAC industries.

This multi-purpose drive complies with industries standards including UL/cUL, CE and has built-in EMC filters (standard in all 480V models). Compact, yet full-featured...the H2 Series is the ideal choice for OEMs, panel builders and end users.

STANDARD FEATURES - HARDWARE

- Dual rating - Normal and Heavy Duty
- 240V: 7.5HP~125HP (ND), 5HP~100HP (HD)
- 480V: 7.5HP~800HP (ND), 5HP~600HP (HD)
- 575V: 7.5HP~125HP (ND), 5HP~100HP (HD)
- Protected Chassis IP20
- LCD Display/Keypad
- EMC Filter (480V only, 7.5-40HP and 150-800HP)
- Internal Brake IGBT (240V all, 480V ≤ 40HP)
- Single Phase Input (derating required)
- Plenum Rated (with Conduit Option)

STANDARD FEATURES - SOFTWARE

- Quick Start Menu on Power Up
- Control - V/Hz, Sensorless Vector Control, Slip Compensation
- Auto Tuning
- Macro Selection - Pump, Fan, or Constant Torque
- Torque Limits
- PID Control
- Regen Avoidance
- Kinetic Energy Buffering(KEB), Ride Through
- Decel Brake Control

H2 SERIES PUMP / FAN SOFTWARE - STANDARD FEATURES

- PID control with sleep and wake-up, broken pipe and under load detection
- Multi Motor Control - One drive to control the starting and stopping of up to 5 auxiliary motors
- Lead/lag and alternating control
- Pre-fill and Soft-fill
- Standard BACnet and Metasys-N2
- Fire mode input
- Start and End Ramp - settings for quicker accel/decel times when below minimum speeds
- Decel Valve Ramp - Separate decel ramp frequency and time settings when stopping
- Time Event Scheduling - Program run times for 7 days operation
- Flow Compensation - Compensate for losses in long pipe lengths
- Backspin Timer
- Pump Clean Operation
- Load Tuning
- Drive Output Level Detection - Set warning/trip limits (current, power, others) to detect drive operation beyond limits
- Energy Saving Operation
- Oil Pump Starter Control (compressor systems)

COMMUNICATIONS

Standard: RS-485 Modbus-RTU, BACnet, Metasys-N2

Options: Ethernet/IP, Modbus-TCP, Lonworks

WinDRIVE - PC Based Software for Commissioning and Monitoring

H2 SERIES - SELECTION CHART

240V

Model Number	Normal Duty 110/120% OL/1 min. HP	Amps	Heavy Duty 150% OL/1min. HP	Amps	Dimensions (inches) H	W	D	Degree of Protection*	Weight (lbs)	DC Link Reactor	Dynamic Braking
VFD-RSI-007-H2-2C	7.5	22	5	17	9.13	6.30	7.13	IP20	7.3	No	Internal IGBT
VFD-RSI-010-H2-2C	10	30	7.5	24	9.13	6.30	7.13	IP20	7.3	No	Internal IGBT
VFD-RSI-015-H2-2C	15	42	10	32	9.13	6.30	7.13	IP20	7.3	No	Internal IGBT
VFD-RSI-020-H2-2C	20	56	15	46	11.42	7.09	8.08	IP20	10.1	No	Internal IGBT
VFD-RSI-025-H2-2C	25	69	20	60	13.78	8.66	8.79	IP20	15.7	No	Internal IGBT
VFD-RSI-030-H2-2C	30	82	25	68	17.72	10.83	11.18	IP20	55.8	No	No
VFD-RSI-040-H2-2C	40	110	30	81	20.08	12.80	11.18	IP20	72.5	No	No
VFD-RSI-050-H2-2C	50	142	40	106	21.65	12.80	12.17	IP20	86.4	No	No
VFD-RSI-060-H2-2C	60	169	50	136	21.65	12.80	12.17	IP20	90.6	No	No
VFD-RSI-075-H2-2C	75	223**	60	169	27.80	11.81	15.20	IP20	118.2	No	No
VFD-RSI-100-H2-2C	100	264**	75	195	27.80	11.81	15.20	IP20	121.9	No	No
VFD-RSI-125-H2-2C	125	325**	100	255	27.76	14.96	15.59	IP20	159.2	No	No

480V

Model Number	Normal Duty 110/120% OL/1 min. HP	Amps	Heavy Duty 150% OL/1min. HP	Amps	Dimensions (inches) H	W	D	Degree of Protection*	Weight (lbs)	DC Link Reactor	Dynamic Braking
VFD-RSI-007-H2-4C	7.5	12	5	8	9.13	6.30	7.13	IP20	7.3	No	Internal IGBT
VFD-RSI-010-H2-4C	10	16	7.5	12	9.13	6.30	7.13	IP20	7.3	No	Internal IGBT
VFD-RSI-015-H2-4C	15	24	10	15	9.13	6.30	7.13	IP20	7.4	No	Internal IGBT
VFD-RSI-020-H2-4C	20	30	15	22	11.42	7.09	8.08	IP20	10.1	No	Internal IGBT
VFD-RSI-025-H2-4C	25	38	20	28	11.42	7.09	8.08	IP20	10.6	No	Internal IGBT
VFD-RSI-030-H2-4C	30	45	25	35	13.78	8.66	8.79	IP20	16.5	No	Internal IGBT
VFD-RSI-040-H2-4C	40	61	30	41	13.78	8.66	8.79	IP20	16.5	No	Internal IGBT
VFD-RSI-050-H2-4C	50	75	40	55	17.72	10.83	11.18	IP20	57	Yes	External***
VFD-RSI-060-H2-4C	60	91	50	67	20.08	12.80	11.18	IP20	77	Yes	External***
VFD-RSI-075-H2-4C	75	107	60	81	20.08	12.80	11.18	IP20	77	Yes	External***
VFD-RSI-100-H2-4C	100	142	75	106	21.67	12.80	12.17	IP20	95	Yes	External***
VFD-RSI-125-H2-4C	125	169	100	136	21.67	12.80	12.17	IP20	95	Yes	External***
VFD-RSI-150-H2-4C	150	223**	125	169	27.80	11.81	15.20	IP20	123	Yes	External***
VFD-RSI-200-H2-4C	200	264**	150	195	27.80	11.81	15.20	IP20	123	Yes	External***
VFD-RSI-250-H2-4C	250	325**	200	255	27.76	14.96	15.59	IP20	165	Yes	External***
VFD-RSI-300-H2-4C	300	370**	250	303	27.76	14.96	15.59	IP20	165	Yes	External***
VFD-RSI-400-H2-4C	400	481**	300	375	36.34	16.77	17.32	IP00	265	Yes	External***
VFD-RSI-500-H2-4C	500	613**	400	478	39.37	23.62	19.69	IP00	409	Yes	External***
VFD-RSI-650-H2-4C	650	770**	500	591	39.37	23.62	19.69	IP00	409	Yes	External***
VFD-RSI-800-H2-4C	800	962**	600	740	41.50	30.55	19.67	IP00	584	Yes	External***

* For UL type 1 add conduit box option.
** Normal Duty 110%.
*** Requires External Braking (DBU and DBR), Consult Factory.

H2 SERIES - SELECTION CHART

575V

	Normal Duty 110% OL/1 min.		Heavy Duty 150% OL/1min.		Dimensions (inches)						
Model Number	HP	Amps	HP	Amps	H	W	D	Degree of Protection*	Weight (lbs)	DC Link Reactor	Dynamic Braking
VFD-RSI-007-H2-61	7.5	9	5	6.6	18.90	7.09	8.08	UL Type 1	20.9	In condiut	Internal IGBT
VFD-RSI-010-H2-61	10	12	7.5	9	18.90	7.09	8.08	UL Type 1	21.2	In condiut	Internal IGBT
VFD-RSI-015-H2-61	15	17	10	12	18.90	7.09	8.08	UL Type 1	21.9	In condiut	Internal IGBT
VFD-RSI-020-H2-61	20	23	15	17	18.90	7.09	8.08	UL Type 1	22.1	In condiut	Internal IGBT
VFD-RSI-025-H2-61	25	27	20	23	18.90	7.09	8.08	UL Type 1	22.4	In condiut	Internal IGBT
VFD-RSI-030-H2-61	30	34	25	27	21.65	8.66	8.79	UL Type 1	31.5	In condiut	No
VFD-RSI-040-H2-61	40	43	30	34	21.65	8.66	8.79	UL Type 1	32.3	In condiut	No
VFD-RSI-050-H2-6C	50	55	40	43	17.72	10.83	11.18	IP00/UL Open	55.1	Yes	No
VFD-RSI-060-H2-6C	60	64	50	55	20.08	12.80	11.18	IP00/UL Open	74.1	Yes	No
VFD-RSI-075-H2-6C	75	80	60	64	20.08	12.80	11.18	IP00/UL Open	74.3	Yes	No
VFD-RSI-100-H2-6C	100	104	75	80	21.65	12.80	12.09	IP00/UL Open	96.1	Yes	No
VFD-RSI-125-H2-6C	125	128	100	104	21.65	12.80	12.09	IP00/UL Open	96.4	Yes	No

600V

	Normal Duty 110% OL/1 min.		Heavy Duty 150% OL/1min.		Dimensions (inches)						
Model Number	HP	Amps	HP	Amps	H	W	D	Degree of Protection*	Weight (lbs)	DC Link Reactor	Dynamic Braking
VFD-RSI-150-H5-6C	150	120	125	156	27.8	15	15.6	IP00/UL Open	165	Yes	No
VFD-RSI-200-H2-6C	200	146	150	187	27.8	15	15.6	IP00/UL Open	165	Yes	No
VFD-RSI-250-H2-6C	250	187	200	227	27.8	15	15.6	IP00/UL Open	165	Yes	No
VFD-RSI-300-H2-6C	300	227	250	271	27.8	15	15.6	IP00/UL Open	165	Yes	No
VFD-RSI-350-H2-6C	350	271	300	315	36.3	17.3	17.3	IP00/UL Open	264.5	Yes	No
VFD-RSI-400-H2-61	400	315	350	374	36.3	17.3	17.3	IP00/UL Open	264.5	Yes	No

Note - This offering is only available in Canada.

H2 SERIES - OPTIONS AND ACCESSORIES

Option Cards

Model Number	Description
PC-100096-00	Lonworks Option Card
PC-100097-00	Extended I/O Card
PC-100098-00	Ethernet/IP, Modbus-TCP Option, Dual Port

Fins Out Mounting

Model Number	Description
BRKT-100770-03	Mounting Flange, 240V : 7.5~15HP / 480V: 7.5~15HP
BRKT-100794-00	Mounting Flange, 240V : 20HP / 480V : 20~25HP
BRKT-100794-01	Mounting Flange, 240V : 25HP / 480V : 30~40HP
BRKT-100794-02	Mounting Flange, 240V: 30HP / 480V: 50HP / 575V: 50HP
BRKT-100794-03	Mounting Flange, 240V: 40HP / 480V : 60~75HP / 575V: 60~75HP
BRKT-100794-04	Mounting Flange, 240V: 50~60HP / 480V: 100~25HP / 575V: 100~125HP
BRKT-100794-05	Mounting Flange, 240V: 75~100HP / 480V : 150~200HP
BRKT-100794-06	Mounting Flange, 240V: 125HP / 480V : 250~300HP
BRKT-100794-07	Mounting Flange, 480V : 400HP
BRKT-100794-08	Mounting Flange, 480V : 500~650HP
BRKT-100794-09	Mounting Flange, 480V : 800HP

Conduit Box

Model Number	Description
EN-101040-00	Conduit Box, 240V : 20HP/ 480V : 20~25HP
EN-101040-01	Conduit Box, 240V : 25HP/480V : 30~40HP
EN-101040-02	Conduit Box, 240V: 30HP / 480V : 50HP / 575V: 50HP
EN-101040-03	Conduit Box, 240V: 40HP / 480V : 60~75HP / 575V: 60~75HP
EN-101040-04	Conduit Box, 240V: 50~60HP / 480V: 100~125HP / 575V: 100~125HP
EN-101040-05	Conduit Box, 240V: 75~100HP/ 480V : 150~200HP
EN-101040-06	Conduit Box, 240V: 125HP / 480V : 250~300HP / 575V: 150~300HP
EN-101040-07	Conduit Box, 480V : 400HP / 575V: 300~400HP
EN-101040-08	Conduit Box, 480V : 500~650HP
EN-101040-09	Conduit Box, 480V : 800HP
EN-101040-10	Conduit Box, 240V : 7.5HP~15HP / 480V : 7.5HP~15HP

Keypad / LCD Display Items

Model Number	Description
KP-100003-00	Keypad Blank Insert (at VFD when Remote Mounting LCD)
VFD-2M-RE-CABLE-H2	Bezel & Cable, RJ45, 2M, S/SW/H2 Series VFD, for Remote Mounting
VFD-3M-RE-CABLE-H2	Bezel & Cable, RJ45, 3M, S/SW/H2 Series VFD, for Remote Mounting
CV-100017-00	LCD Cover, Remote Mounting, NEMA 4X, S, SW & H2 Series VFD
LCD-100003-00	LCD Keypad/Display, H2 Series VFD (Spare Part)

H2 SERIES - INPUT AND OUTPUT SPECIFICATIONS

240V, 7.5HP - 25HP (5.5 - 18.5 kW)

RSI-XXX-H2-2C			007	010	015	020	025
240V, w/3Ø Input	Normal Duty 120% OL	HP	7.5	10	15	20	25
		kW	5.5	7.5	11	15	18.5
		Amps	22	30	42	56	69
	Heavy Duty 150% OL	HP	5	7.5	10	15	20
		kW	3.7	5.5	7.5	11	15
		Amps	17	24	32	46	60
240V, w/1Ø Input	Normal Duty 120% OL	HP	3.0	5.0	7.5	10.0	-
		Amps	11	16	23	30	37
	Rated Capacity (kVA)		8.4	11.4	16.0	21.3	26.3
	Output frequency		0-400Hz (V/Hz, Slip Compensation) 0-120Hz (IM Sensorless) 0-180Hz (PM Sensorless)				
	Output voltage (V)		3-Phase 0-240 V				
Rated Input	Voltage (V)	Three-Phase	3-Phase 200-240 VAC (- 15% -+ 10%)				
		Single-Phase	1-Phase 240 VAC (- 5% -+ 10%)				
	Input frequency	Three-Phase	50-60Hz (+/- 5%)				
		Single-Phase	60Hz (+/- 5%) only				
	Rated Current (A)		23.7	32.7	46.4	62.3	77.2
Weight lbs (kg)		lbs	7.3	7.3	7.3	10.1	15.6
		(kg)	(3.3)	(3.3)	(3.3)	(4.6)	(7.1)
Heat Dissipation (W)			180	248	330	451	600
Degree of Protection			UL Open Type (IP20), UL Type 1 achieved with optional conduit box				

240V, 30HP - 125HP (22 kW - 90 kW)

RSI-XXX-H2-2C			030	040	050	060	075*	100*	125*
240V, w/3Ø Input	Normal Duty 110%* / 120% OL	HP	30	40	50	60	75	100	125
		kW	22	30	37	45	55	75	90
		Amps	82	110	142	169	223	264	325
	Heavy Duty 150% OL	HP	25	30	40	50	60	75	100
		kW	18.5	22	30	37	45	55	75
		Amps	68	81	106	136	169	195	255
240V, w/1Ø Input	Normal Duty 110%* / 120% OL	HP	15	20	25	30	40	50	60
		Amps	45	58	78	92	122	145	178
	ND Rated Capacity (kVA)		31.2	41.9	54.1	64.4	85	100.6	123.8
	Output frequency		0-400Hz (V/Hz, Slip Compensation)						
	Output voltage (V)		3-Phase 0-240 V						
Rated Input	Voltage (V)	Three-Phase	3-Phase 200-240 VAC (- 15% -+ 10%)						
		Single-Phase	1-Phase 240 VAC (- 5% -+ 10%)						
	Input frequency	Three-Phase	50-60Hz (+/- 5%)						
		Single-Phase	60Hz (+/- 5%) only						
	Rated Current (A)		74.8	101	131.2	159	211.1	251.4	313.2
Weight lbs (kg)		lbs	55.8	72.5	86.4	90.6	118.2	121.9	159.2
		(kg)	(25.3)	(32.9)	(39.2)	(41.1)	(53.6)	(55.3)	(72.2)
Heat Dissipation (W)			893	1245	1480	1814	2150	2963	3438
Degree of Protection			UL Open Type (IP20), UL Type 1 achieved with optional conduit box						

H2 SERIES - INPUT AND OUTPUT SPECIFICATIONS

480V, 7.5HP - 30HP (5.5 - 22 kW)

RSI-XXX-H4-4C			007	010	015	020	025	030
480V, w/3Ø Input	Normal Duty 120% OL	HP	7.5	10	15	20	25	30
		kW	5.5	7.5	11	15	18.5	22
		Amps	12	16	24	30	38	45
	Heavy Duty 150% OL	HP	5.0	7.5	10	15	20	25
		kW	3.7	5.5	7.5	11	15	18.5
		Amps	8	12	15	22	28	35
480V, w/1Ø Input	Normal Duty 120% OL	HP	3-5	5	10	10	15	20
		Amps	6.8	9.2	14	17	22	26
	Rated Capacity (kVA)		9.1	12.2	18.3	23.0	29.0	34.3
	Output frequency		0-400Hz (V/Hz, Slip Compensation) 0-120Hz (IM Sensorless) 0-180Hz (PM Sensorless)					
	Output voltage (V)		3-Phase 0-480 V					
Rated Input	Voltage (V)	Three-Phase	3-Phase 380-480 VAC (- 15% - + 10%)					
		Single-Phase	1-Phase 480 VAC (- 5% - + 10%)					
	Input frequency	Three-Phase	50-60Hz (+/- 5%)					
		Single-Phase	60Hz (+/- 5%) only					
	Rated Current (A)		12.2	17.5	26.5	33.4	42.5	50.7
Weight lbs (kg)		lbs	7.3	7.3	7.5	10.1	10.6	16.5
		(kg)	(3.3)	(3.3)	(3.4)	(4.6)	(4.8)	(7.5)
Heat Dissipation (W)			172	237	322	451	615	740
Degree of Protection			UL Open Type (IP20), UL Type 1 achieved with optional conduit box					

H2 SERIES - INPUT AND OUTPUT SPECIFICATIONS

480V, 40 HP - 125 HP (30 - 90 kW)

RSI-XXX-H2-4C			040	050	060	075	100	125
480V, w/3Ø Input	Normal Duty 120% OL	HP	40	50	60	75	100	125
		kW	30	37	45	55	75	90
		Amps	61	75	91	107	142	169
	Heavy Duty 150% OL	HP	30	40	50	60	75	100
		kW	22	30	37	45	55	75
		Amps	41	55	67	81	106	136
480V, w/1Ø Input	Normal Duty 120% OL	HP	25	30	30	40	50-60	60
		Amps	36	39	47	55	73	86
	Rated Capacity (kVA)		46.5	57.1	69.4	82.0	108.2	128.8
	Output frequency		0-400Hz (V/Hz, Slip Compensation) 0-120Hz (IM Sensorless) 0-180Hz (PM Sensorless)					
	Output voltage (V)		3-Phase 0-480V					
Rated Input	Voltage (V)	Three-Phase	3-Phase 380-480 VAC (- 15% - + 10%)					
		Single-Phase	1-Phase 480 VAC (- 5% - + 10%)					
	Input frequency	Three-Phase	50-60Hz (+/- 5%)					
		Single-Phase	60Hz (+/- 5%) only					
	Rated Current (A)		69.1	69.3	84.6	100.1	133.6	160.0
Weight lbs (kg)		lbs	16.5	57.3	77.2	77.2	94.8	94.8
		(kg)	(7.5)	(26)	(35)	(35)	(43)	(43)
Heat Dissipation (W)			880	1170	1443	1710	2090	2775
Degree of Protection			UL Open Type (IP20), UL Type 1 achieved with optional conduit box					

480V, 150 HP - 800 HP (110 - 500 kW)

RSI-XXX-H2-4C			150	200	250	300	400	500	650	800
480V, w/3Ø Input	Normal Duty 110% OL	HP	150	200	250	300	400	500	650	800
		kW	110	132	160	185	250	315	400	500
		Amps	223	264	325	370	481	613	770	962
	Heavy Duty 150% OL	HP	125	150	200	250	300	400	500	600
		kW	90	110	132	160	185	250	315	375
		Amps	169	195	255	303	375	478	591	740
	Rated Capacity (kVA)		170	201	248	282	367	467	587	733
	Output frequency		0-400Hz (V/Hz, Slip Compensation) 0-120Hz (IM Sensorless)							
	Output voltage (V)		3-Phase 0-480V							
Rated Input	Voltage (V)	Three-Phase	3-Phase 380-480 VAC (- 15% - + 10%)							
	Input frequency	Three-Phase	50-60Hz (+/-5%)							
	Rated Current (A)		215.1	254.6	315.3	358.9	469.3	598.1	751.3	938.6
Weight lbs (kg)		lbs	123	123	164.7	164.7	264.6	409	409	584
		(kg)	(55.8)	(55.8)	(74.7)	(74.7)	(120)	(185.5)	(185.5)	(265)
Heat Dissipation (W)			3960	4752	5600	6475	8500	10.4k	13.2k	16k
Degree of Protection			7.5HP~300HP (0.75 kW~185 kW): UL Open (IP20), UL Type 1 achieved with optional conduit box 400HP~800HP (250 kW~500 kW): UL Open (IP00), UL Type 1 achieved with optional conduit box							

H2 SERIES - INPUT AND OUTPUT SPECIFICATIONS

575V, 7.5HP - 30HP (5.5 kW - 22 kW)

VFD-RSI-XXX-H2-61			007	010	015	020	025	030
575V, w/3Ø Input	Normal Duty 110% OL	HP	7.5	10	15	20	25	30
		kW	5.5	7.5	11	15	18.5	22
		Amps	9	12	17	23	27	34
	Heavy Duty 150% OL	HP	5	7.5	10	15	20	25
		kW	3.7	5.5	7.5	11	15	18.5
		Amps	6.6	9	12	17	23	27
Rated Output	ND Rated Capacity (kVA)		9	12	16.9	22.9	26.9	33.9
	Output frequency		0–120 Hz (V/Hz, Slip Comp., IM Sensorless)					
	Output voltage (V)		3-Phase 0–600 V					
Rated Input	Voltage (V)	Three-Phase	3-Phase 525-600 VAC (-15%–+10%)					
	Input frequency	Three-Phase	60 Hz (+/-5%)					
	ND Rated Current (A)		8	10.7	15.3	20.9	25	30.8
	HD Rated Current (A)		6.5	8.9	12	17.2	23.5	27
Weight lbs (kg)		lbs	20.86	21.21	21.87	22.09	22.35	31.53
		(kg)	(9.46)	(9.62)	(9.92)	(10.02)	(10.14)	(14.3)
Heat Dissipation (W)			224	282	376	527	644	773
Degree of Protection			UL Type 1 with installed conduit box					

- The horse power rating is based on a standard 4-pole motor rating.
- The KVA rating is based on the Normal Duty rating and 575 V for 575 V inverters.
- The rated output current is limited based on the carrier frequency set at CON-04.

575V, 40HP - 125HP (30 kW - 90 kW)

VFD-RSI-XXX-H2-6C			040	050	060	075	100	125
575V, w/3Ø Input	Normal Duty 110% OL	HP	40	50	60	75	100	125
		kW	30	37	45	55	75	90
		Amps	43	55	64	80	104	128
	Heavy Duty 150% OL	HP	30	40	50	60	75	100
		kW	22	30	37	45	55	75
		Amps	34	43	55	64	80	104
Rated Output	ND Rated Capacity (kVA)		42.8	54.8	63.7	79.7	103.6	127.5
	Output frequency		0–120 Hz (V/Hz, Slip Comp., IM Sensorless)					
	Output voltage (V)		3-Phase 0–600 V					
Rated Input	Voltage (V)	Three-Phase	3-Phase 525-600 VAC (-15%–+10%)					
	Input frequency	Three-Phase	60 Hz (+/-5%)					
	ND Rated Current (A)		40.2	52	60	74	102	123
	HD Rated Current (A)		35.2	45	57	65	87	110
Weight lbs (kg)		lbs	32.32	55.07	74.12	74.25	96.12	96.43
		(kg)	(14.66)	(24.98)	(33.62)	(33.68)	(43.60)	(43.74)
Heat Dissipation (W)			992	1245	1496	1848	2553	2942
Degree of Protection			UL Open (IP20), UL Type 1 achieved with optional conduit box					

- The horse power rating is based on a standard 4-pole motor rating.
- The KVA rating is based on the Normal Duty rating and 575 V for 575 V inverters.
- The rated output current is limited based on the carrier frequency set at CON-04.

H2 SERIES - INPUT AND OUTPUT SPECIFICATIONS

600V, 150 HP - 400 HP (30 - 90 kW)

RSI-XXX-H2-6C			150	200	250	300	350	400
600V, w/3Ø Input	Normal Duty 120% OL	HP	150	200	250	300	350	400
		kW	110	132	160	200	250	300
		Amps	156	200	242	290	336	400
	Heavy Duty 150% OL	HP	125	150	200	250	300	350
		kW	90	110	132	160	200	250
		Amps	128	156	200	242	290	336
	Rated Capacity (kVA)		155	199	241	289	335	398
	Output frequency		0-120Hz (V/Hz, Slip Comp., IM Sensorless)					
	Output voltage (V)		3-Phase 0-600V					
Rated Input	Voltage (V)	Three-Phase	525-600 VAC (- 15% - + 10%)					
		Single-Phase	-					
	Input frequency	Three-Phase	60Hz (+/- 5%)					
		Single-Phase	-					
	Rated Current (A) ND/HD		146/120	187/146	227/187	271/227	315/271	374/315
Weight lbs (kg)		lbs	165	165	165	165	264.5	264.5
		(kg)	75	75	75	75	120	121
Heat Dissipation (W)			3472	4118	4822	6556	8700	10740
Degree of Protection			UL Open Type (IP20), UL Type 1 achieved with optional conduit box					

Note - This offering is only available in Canada.

H2 SERIES - PRODUCT SPECIFICATION DETAILS

Items		Description	
Control	Control method	V/F control, Slip Compensation, Sensorless Vector (IM* and PM**) with Torque Limits (240V and 480V only) * IM Sensorless does not apply to 240V, 30HP~125HP. ** PM Sensorless does not apply to 240V, 30HP~125, 480V, 150HP~800HP and all 575V inverters.	
	Frequency setting	Digital command: 0.01Hz	
	Frequency accuracy	1% of maximum output frequency	
	V/F pattern	Linear, Square Reduction, User V/F	
	Overload capacity (Normal Duty)	240V, 7.5 HP ~ 60HP	120% / 1 min.
		240V, 75 HP ~ 125 HP	110% / 1 min.
		480V, 7.5 HP ~ 125 HP	120% / 1 min.
		480V, 150 HP ~ 800 HP	110% / 1 min.
		575V, 7.5 HP ~ 125 HP	110% / 1 min.
	Overload Capacity (Heavy Duty)	240V, 5.0 HP ~ 100 HP	150% / 1 min.
		480V, 5.0 HP ~ 600 HP	150% / 1 min.
		575V, 5.0 HP ~ 100 HP	150% / 1 min.
	Torque boost	Manual torque boost, automatic torque boost	
Operation	**Operation Type**		
	Start/Stop	Keypad, Terminal strip, Communications	
	Frequency (Speed) settings	Analog Input: (1) 0–10 V, (1) 0/4–20 mA, Switch selectable to 0–10 Vdc	
		Digital Inputs: Keypad, Fixed Speed, Pulse Train	
		Communication: RS-485 (Modbus), Metasys-N2, BACnet, Fieldbus Options	
	Functions	**Basic**	**Advanced**
		Quick Start Menu	Sensorless Vector Control*
		Start/Stop Operation	IM* and PM** motors
		Start/Stop Modes	Auto Tuning
		Frequency Reference Sources	Torque Limits
		Auxiliary Frequency Reference	PID Control
		Multi-Step Speeds	Slip Compensation
		Multi-Step Accel/Decel Times	Event Timer (RTC)
		2nd Source (HOA)	Energy Save Mode
		Accel/Decel Times	Regen Avoidance
		Accel/Decel Patterns	VFD Fan Control
		Dwell Frequency Operation	
		Jog	**Other**
		Auto Start	Timer Relay Input/Output Function
		Auto Reset/Restart	Pre Heat
		Jog and Jog Start	Oil Pump Starter Control
		FWD/REV Run Prevention	Damper Monitor and Control
		Frequency Limits	
		Jump Frequencies	**Loss of Power**
		3-Wire Control	Ride Through (KEB)
		Fire Mode	Safe Stop
			Speed Search

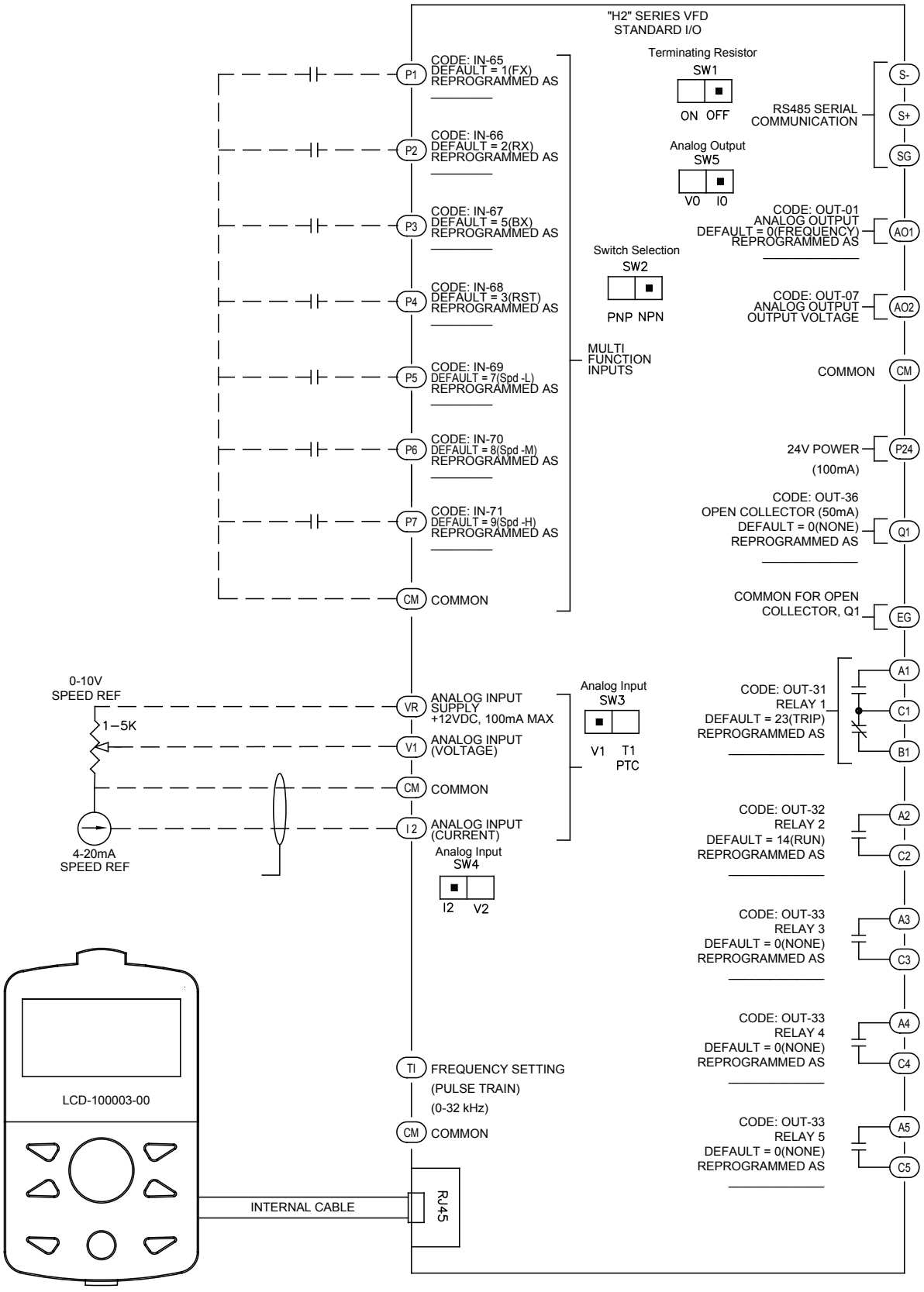
H2 SERIES - PRODUCT SPECIFICATION DETAILS

Items			Description	
Operation	Functions		**V/Hz. Control Pattern**	**Braking**
			Linear, Squared, User V/Hz	DC Injection Braking
			Torque Boost	Stall Prevention
				Power Breaking
				Flux Breaking
				External Brake Control
			H2 Pump Software	
			Lead/Lag and Alternating	Broken Pipe Detection
			Jockey Pump Control	BACnet and Metasys-N2
			MMC - Multi-Motor Control	Pump Load Tuning
			Pre-Fill, Soft Fill	Decel Valve Ramp
			Start and End Ramp	Time Event Scheduling
			Backspin Timer	Flow Compensation
			Pump Clean Operation	Energy Saving Operation
		Analog	(1) 0-10 V, (1) 0/4-20 mA, Switch selectable to 0-10 Vdc	
	Input	Digital inputs	(7), Select PNP (Source) or NPN (Sink) mode. NO/NC selectable. Functions of the digital inputs are set with parameters IN-65 through IN-71.	
		Functions	Forward/Reverse Operation	2nd Source - HOA/LOR
			Reset	Up/Down Operation
			External Trip	Analog Hold
			Emergency Stop	PID Disable
			Output Disable (Bx)	Jog Start FWD/REV
			Jog	Pre-Excite
			Fixed Speed - Step Freq's	Timer Input
			Run Enable/Disable (Safety)	Fire Mode
			3-Wire Control Select	Event Timer
			Damper Monitor and Control	Pre-Heat
		Pulse train	0-30 kHz, Low Level: 0-0.8 V, High Level: 3.5-12 V	
	Output	(1) Fault relay (Form C)	N.O. : Less than AC 250V, 2A, DC 30V, 3A N.C.: Less than AC 250V, 1A, DC 30V, 1A	
		(4) Programmable relays (Form A)	N.O. (A-C): Less than 250V, 5A Less than DC 30V, 5A	
		(1) Open collector terminal	Less than DC 26V, 50 mA	
		(2) Analog Outputs	AO1: 0(4) - 20mA, Switch selectable to 0-10 VDC	
			AO2: 0-10VDC	
		Pulse train	Maximum 32 kHz, 0-12V	

H2 SERIES - PRODUCT SPECIFICATION DETAILS

Items		Description	
Protection Functions	Trip	Motor Over Load	Fan Trip
		Under Load	Internal Fan Trip
		Over Current 1	Motor Over Heat (PTC Input)
		Over Voltage	Lost Keypad
		Low Voltage	Fuse Open
		Low Voltage 2	Pipe Broken
		Ground Fault	Broken Belt
		E-Thermal	Lost Speed Reference
		Out Phase Open	I/O Board Trip
		In Phase Open	
		Inverter Over Load	**Fan/Pump related trips**
		No Motor Trip	Damper Trip
		Inverter over Heat	Level Detect Trip
		Over Current 2	Pump Cleaning Trip
		External Trip	
		Hardware Diagnostic	
	Alarm	Overload/underload, Lost Command, Inverter overload, DB (braking) rate	
	Instantaneous Power	Less than 8 ms: Continue Operation	
Structure / working environ-ment	Cooling type	Force fan cooling structure	
	Protection structure	UL Open, IP 20: 7.5 HP ~ 300 HP (5.5 kW ~ 185 kW) UL Open, IP00: 400 HP ~ 800 HP (250 kW ~ 500kW) UL Type 1 with conduit box (option) installation (up to 800 HP).	
	Ambient temperature	14°F~104°F (- 10°C~40°C)	
	Ambient humidity	Relative humidity less than 95% RH (to avoid condensation)	
	Storage temperature	-4°F–149°F (-20 °C-65°C)	
	Environment	Prevent contact with corrosive gases, flammable gases, oil stains, dust, and other pollutants.	
		7.5 HP ~ 800 HP (5.5 kW ~ 500 kW) Pollution Degree 2	
	Altitude	Maximum 3,280 ft (1,000m) above see level for standard operation. Above derate the drive rated voltage and the rated output current by 1% for every 328 ft (100m) up to 13,123 ft (4,000) max.	
	Vibration	Less than 1.0 G (9.8m/sec^2).	
	Pressure	10 ~ 15 PSI (70-106 kPa)	

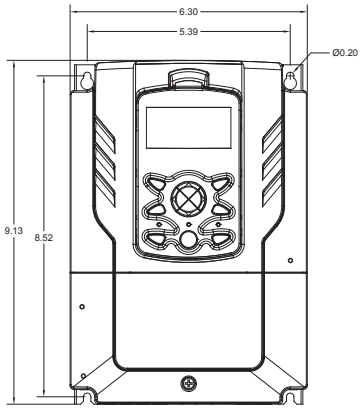
H2 SERIES - WIRING



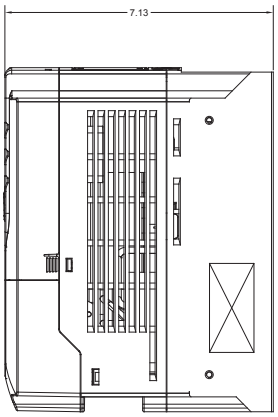
H2 SERIES - DRAWINGS

240V, 7.5 HP - 15 HP

480V, 7.5 HP - 15 HP



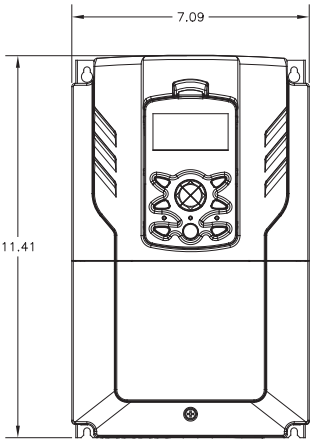
FRONT VIEW



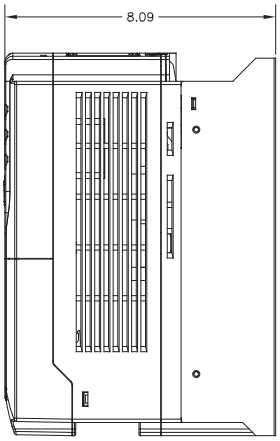
RIGHT SIDE VIEW

240V, 20 HP

480V, 20 HP - 25 HP



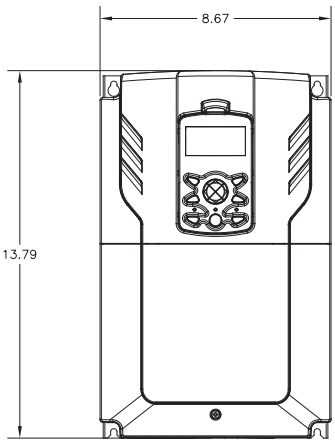
FRONT VIEW



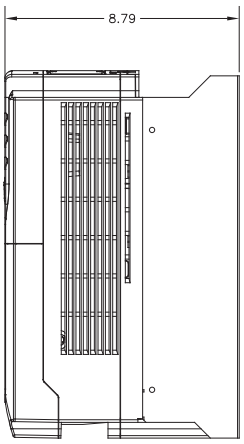
RIGHT SIDE VIEW

240V, 25 HP

480V, 30 HP - 40 HP



FRONT VIEW



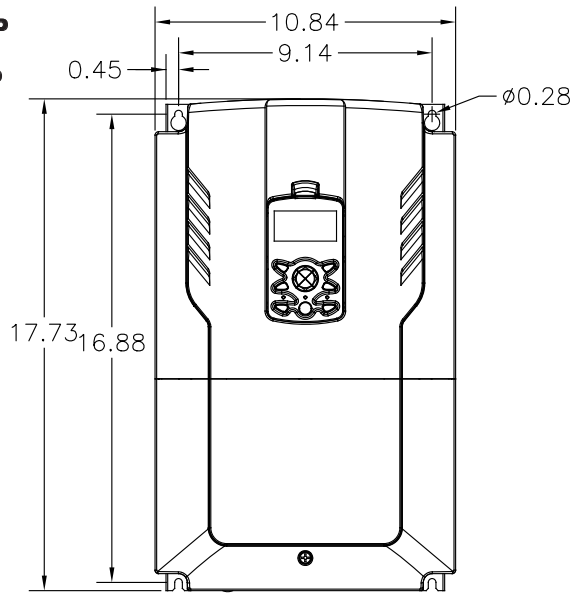
RIGHT SIDE VIEW

H2 SERIES - DRAWINGS

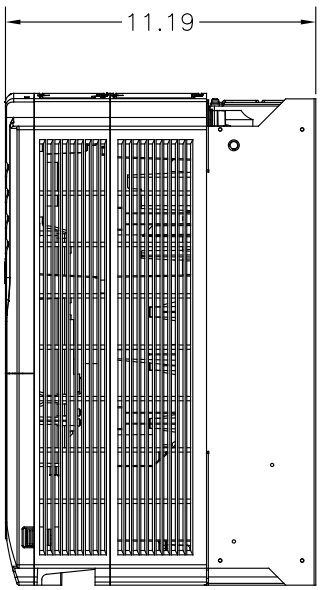
240V, 30HP

480V, 50 HP

575V, 50HP



FRONT VIEW

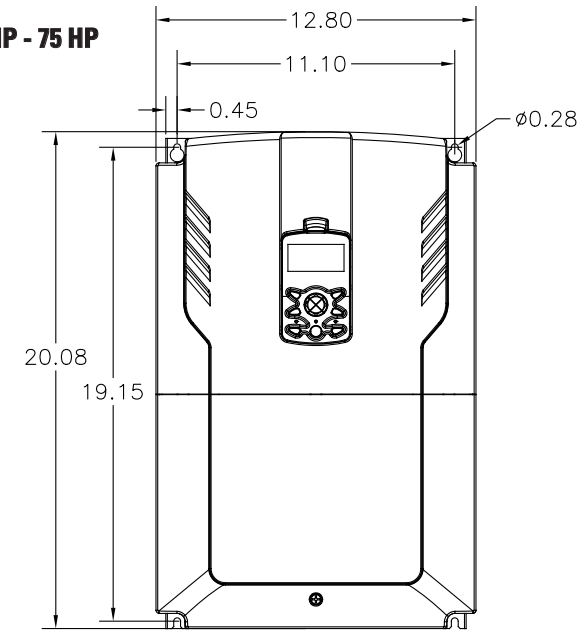


RIGHT SIDE VIEW

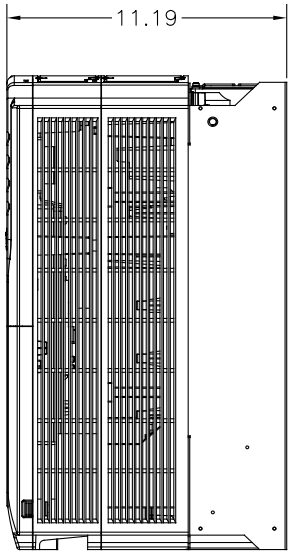
240V, 40 HP

480V, 60 HP - 75 HP

575V, 60 HP - 75 HP



FRONT VIEW



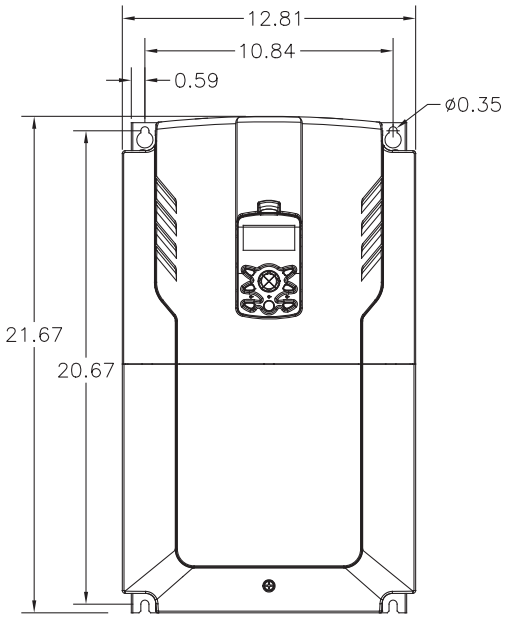
RIGHT SIDE VIEW

H2 SERIES - DRAWINGS

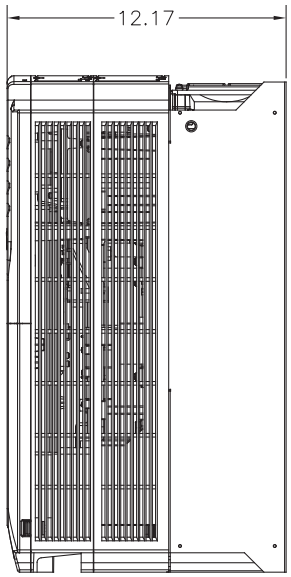
240V, 50 HP - 60 HP

480V, 100 HP - 125 HP

575V, 100 HP -125 HP



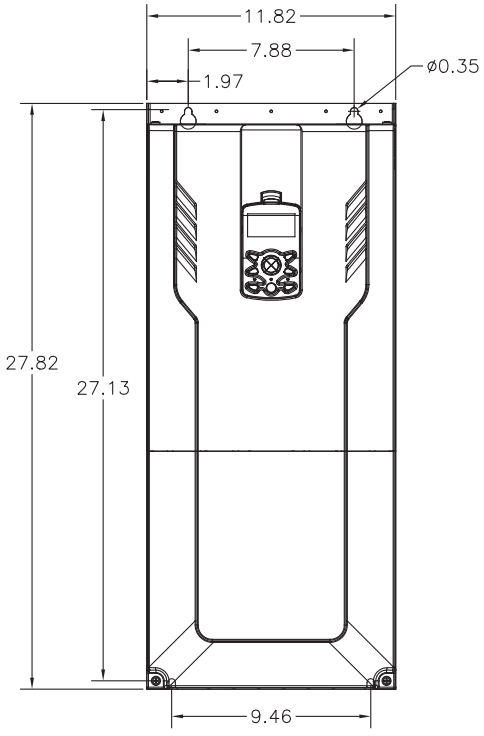
FRONT VIEW



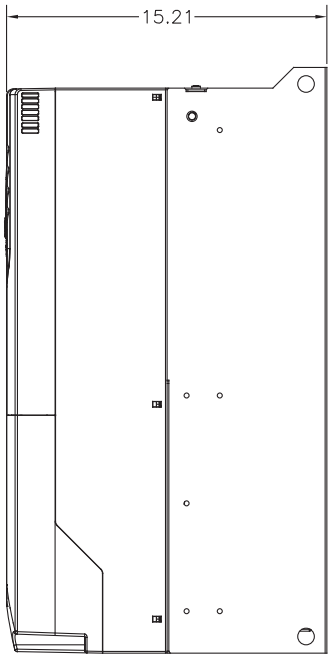
RIGHT SIDE VIEW

240V, 75 HP -100 HP

480V, 150 HP - 200 HP



FRONT VIEW

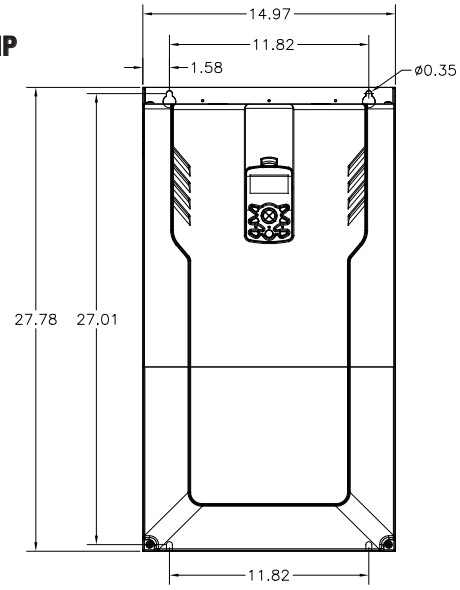


RIGHT SIDE VIEW

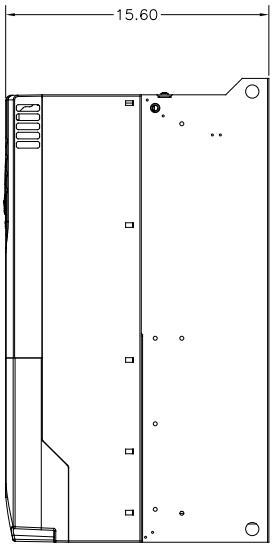
H2 SERIES - DRAWINGS

240V, 125 HP

480V, 250 HP - 300 HP

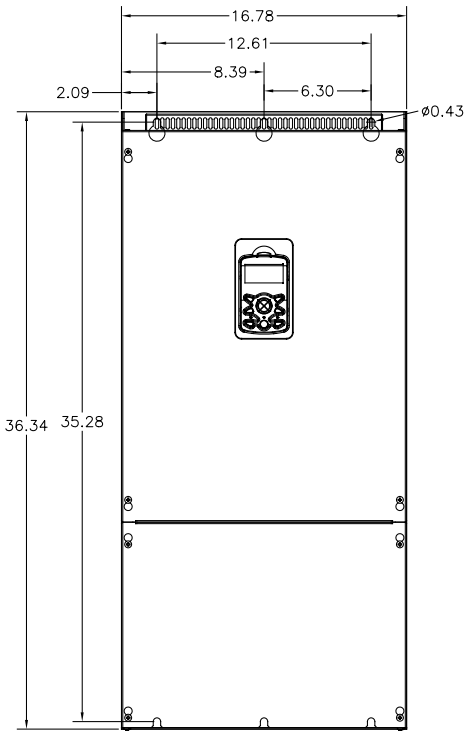


FRONT VIEW

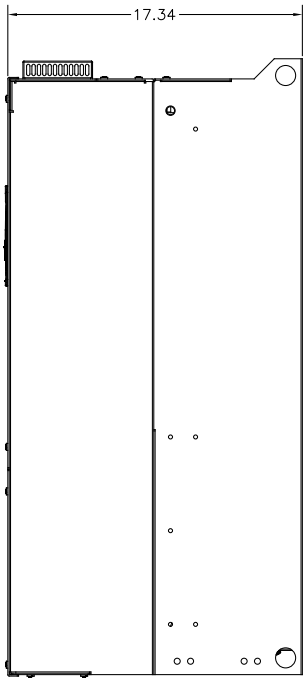


RIGHT SIDE VIEW

480V, 400 HP



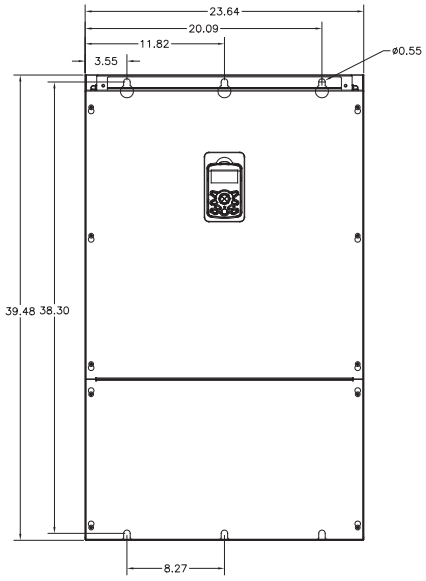
FRONT VIEW



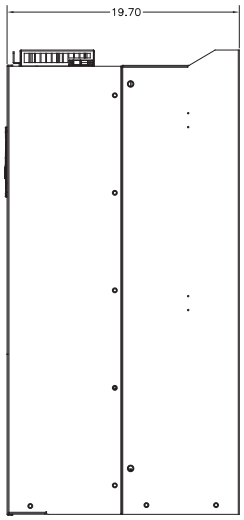
RIGHT SIDE VIEW

H2 SERIES - DRAWINGS

480V, 500 HP - 650 HP

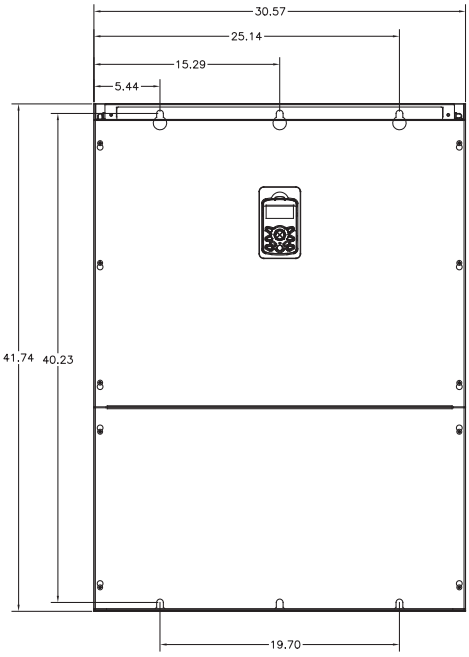


FRONT VIEW



RIGHT SIDE VIEW

480V, 800 HP

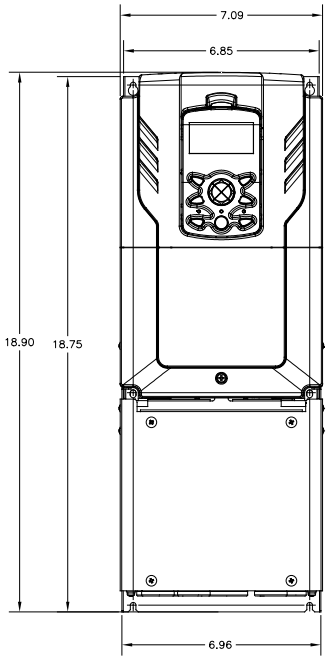


FRONT VIEW

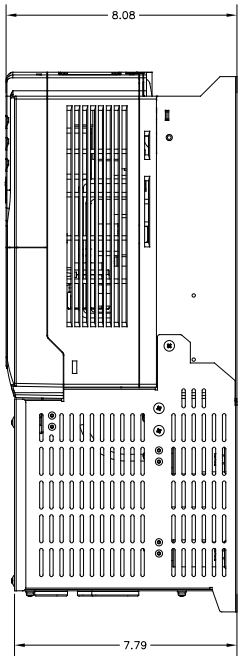
RIGHT SIDE VIEW

H2 SERIES - DRAWINGS

575V, 7.5 HP - 25 HP

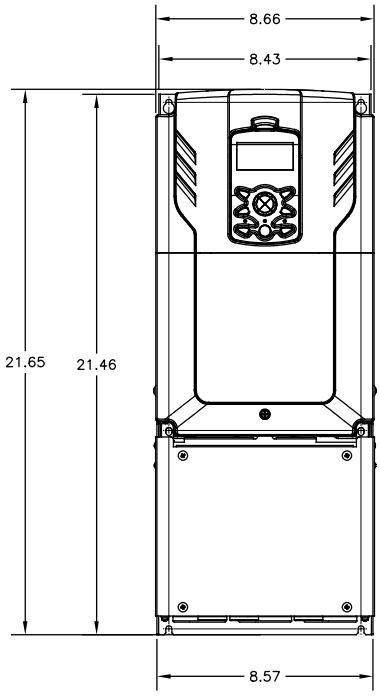


FRONT VIEW

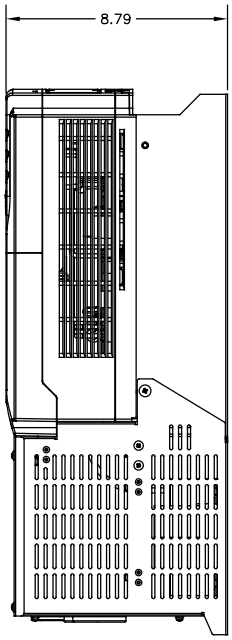


RIGHT SIDE VIEW

575V, 30 HP - 40 HP



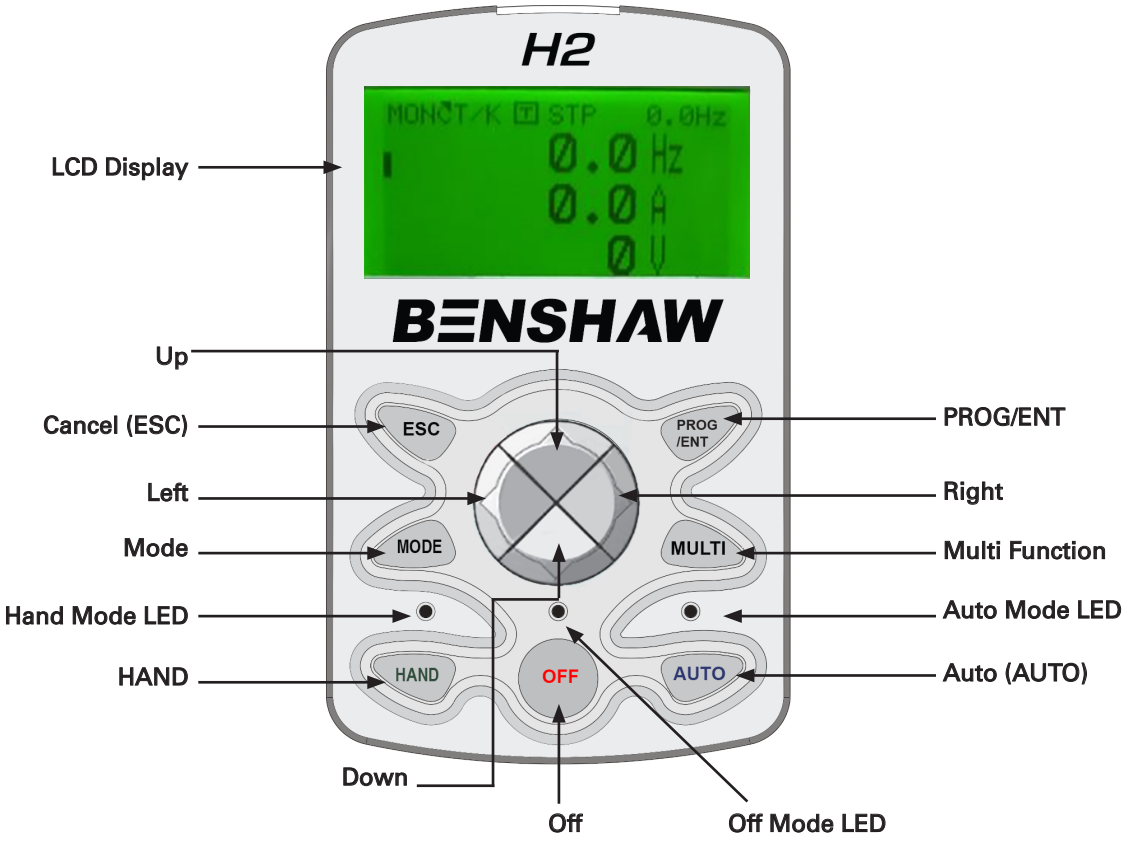
FRONT VIEW



RIGHT SIDE VIEW

H2 SERIES - PROGRAMMING

H2 Series - LCD Display/Keypad



Key	Description
LCD Display	• Displays Operating Modes and Parameter Groups • Command Source • Operating Status and four (4) monitor items
Cancel (ESC)	• While in the Edit state, reverts back to previously saved value • When pressed while switching codes within the group, it is switched to the first paramter of the group
Program (PROG/ENT)	• When pressed once, enter the Program mode (Parameter Edit mode). • When pressed again, after changes, changed data is saved.
Left/Right	• Move between PAR groups and move the cursor when in PROG Mode
Up/Down	• Move between parameters and increase/decrease parameter values when in PROG Mode
Hand (HAND)	• It is used to select Keypad (HAND) operation
OFF	• Off and Fault Reset
Multifunction (MULTI)	• Can be used to assign User Group parameters
Auto (AUTO)	• It is used to select AUTO operation
MODE	• Monitor Mode -> Parameter Mode - > Configure Mode

COMPARISON CHART - H2 SERIES AND H2 PUMP

Series	H2	H2 Pump
Features		
LCD Keypad with Hand/Auto/Off modes and Read/Write/Save	•	•
Quick Start Menu for easy basic commissioning	•	•
Constant Torque Macro for Quick Setup	•	
Pump and Fan Macros for Quick Setup	•	•
Single VFD, Multi-Motor/Pump Control (ATL Contactor based)		•
Multi-VFD, Multi-Motor/Pump Control (Lead/Lag, Alternating, Jockey Pump Control)		•
User Defined Parameter Lists for custom applications	•	•
PID Control	•	•
V/HZ control: Linear, Squared, or User Defined	•	•
Sensorless Vector for Induction* or PM** motors * SVC IM Motor Control 240 max. 25 HP ** SVC PM Motor Control 240V max 25 HP 480V max 125 HP 575V not applicable	•	
Torque Limiting Functions	•	
Slip Compensation	•	
Auto-Tuning: Stationary and Rotating	•	
Auto and Manual Torque Boost	•	•
Dwell Operation	•	•
Motor Brake Control	•	•
On/Off Delay Timers for Digital Inputs	•	•
Regen Prevention for cyclical regenerative loads	•	•
Flow Compensation	•	•
Lube Pump Operation	•	•
Pump Clean Operation	•	•
Start and End Ramp Optimization	•	•
Load Tuning	•	•
Level Detection	•	•
Pipe Break Detection	•	•
Pre-Heating Function	•	•
Timed Event Scheduling	•	•
Kinetic Energy Buffering/Power Loss Ride Through	•	•
Anti-Resonance/Skip Frequency	•	•
Fire Mode	•	•
Energy Save Mode	•	•
Speed Search/Flying Start	•	•
Auto-Restart/Auto-Fault Reset	•	•
Backspin Delay Start	•	•

NOTE: H2 Pump does not apply to 575V inverters.

H2P SERIES - PUMP/FAN DRIVE

The Benshaw H2P Series sets the new standard for variable frequency drives for pump and fans applications. It includes application software designed to perform many functions including advanced PID functions, multiple pump or multistage pump control, lead lag, simplex, duplex, triplex, multiplex with the capacity of multiplexing up to 8 drives. Cost saving result by reducing PLC's and peripherals typically required to achieve these functions that are now integral to the drive... The results are reduced maintenance cost, better system control, and improved pump and pipe monitoring and protection. If you have one or multiple motors/pumps in a system that require constant pressure or flow, then this is the drive for you.

STANDARD FEATURES - HARDWARE

- 240V: 7.5HP~125HP (ND), 5HP~100HP (HD)
- 480V: 7.5HP~800HP (ND), 5HP~600HP (HD)
- Protected Chassis IP20, 7.5~300HP / Open Chassis IP00, 400~800HP
  UL Enclosed Type 1 with optional conduit box (7.5HP~800HP)
- LCD Display/Keypad
- EMC Filter Compliant Category C3 (480V, 7.5HP - 800HP)
- Single Phase Input (derating required)
- Plenum Rated (conduit option required)
- Built in DC Reactor (480V, 50HP~800HP)

COMMUNICATIONS

Standard: RS-485 Modbus - RTU, BACnet, Metasys-N2

Options: Ethernet/IP, Modbus -TCP, Lonworks

H2P SERIES PUMP / FAN SOFTWARE

- PID Control with Sleep Mode and Wake Up Boost, Broken Pipe and Under Load Detection
- Multi Motor Control - One drive to control the starting and stopping of up to 5 auxiliary motors up to 8 with option card
- Multiplex mode, simplex, duplex, triplex up to 8 motors
- Master-follower
- Multiplex via RS-485
- Jockey Pump Control
- Lead/Lag and Alternating
- Pre-Fill and Soft-Fill
- Fire Mode Input
- Start and End Ramp - settings for quicker accel/decel times when below minimum speeds
- Decel Valve Ramp - Separate decel ramp frequency and time settings when stopping
- Time Event Scheduling - Program run times for 7 days operation
- Flow Compensation - Compensate for losses in long pipe lengths
- Backspin Timer
- Pump Clean Operation
- Load Tuning
- Drive Output Level Detection - Set warning/trip limits (current, power, others) to detect drive operation beyond limits
- Oil Pump Starter Control
- Damper Control and Monitoring
- Broken Pipe Detection
- Under Load Detection
- Pre-Heat Function (Condensation Control)

WinDRIVE - PC Based Software for Commissioning and Monitoring

H2P SERIES - LEAD LAG OPERATION

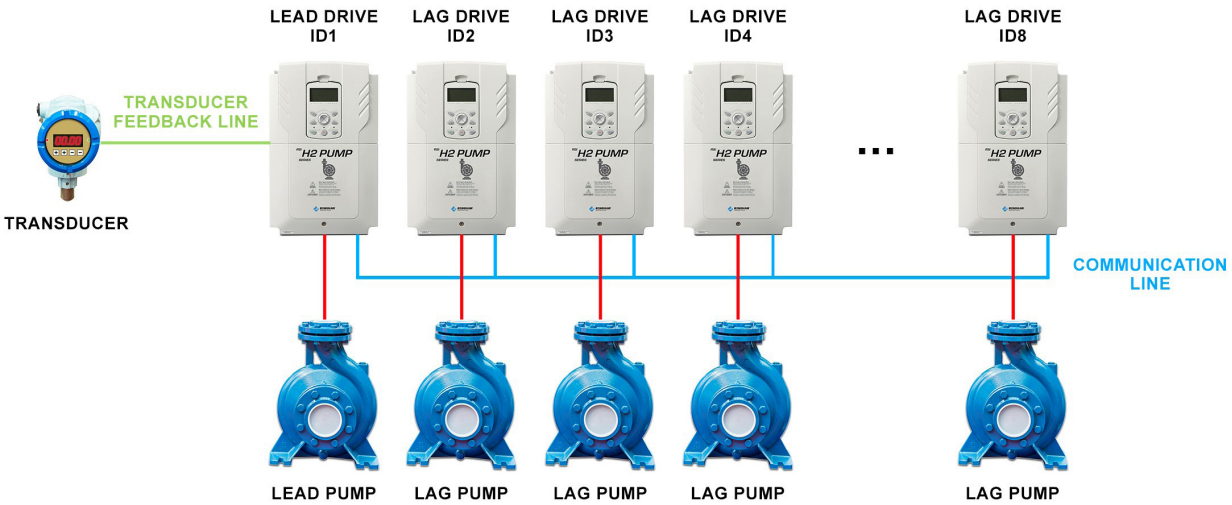
MULTI-STAGE PUMP CONTROL

This mode is also referred to as "Master-Follower" or Lead-Lag/ with Alternating option".

The system can be configured without using a controller (such as a PLC) by connecting the drives via communications. Wiring is minimized with the use of Modbus-RTU communications, which eliminates the need for additional options. Running order and alterations are based upon operation time. If a failure occurs to the master drive, the next drive will run as the master.

FEATURES:

- Pumps are individually connected to AC drives, and a master drive controls the entire system
- Pumps are controlled by the unique PID function of the AC drives, so external devices such as PLCs or contactors are not required
- The speed of each pump is controlled by individual AC drives to save energy
- Since the operating time of each pump can be evenly distributed, the life expectancy of the pumping equipment is extended, reducing the total system operating cost
- If the master AC drive malfunctions, the next AC drive takes over as the master, and continuously controls the system without failure



H2P SERIES - SELECTION CHART

240V	Normal Duty 110%** 120% OL/1 min.		Heavy Duty 150% OL/1min.		Dimensions (inches)				
Model Number	HP	Amps	HP	Amps	H	W	D	Degree of Protection*	Weight
VFD-RSI-007-H2P-2C	7.5	22	5	17	9.13	6.30	7.13	IP20	7.3
VFD-RSI-010-H2P-2C	10	30	7.5	24	9.13	6.30	7.13	IP20	7.3
VFD-RSI-015-H2P-2C	15	42	10	32	9.13	6.30	7.13	IP20	7.3
VFD-RSI-020-H2P-2C	20	56	15	46	11.42	7.09	8.08	IP20	10.1
VFD-RSI-025-H2P-2C	25	69	20	60	13.78	8.66	8.79	IP20	15.7
VFD-RSI-030-H2P-2C	30	82	25	68	17.72	10.83	11.18	IP20	55.8
VFD-RSI-040-H2P-2C	40	110	30	81	20.08	12.80	11.18	IP20	72.5
VFD-RSI-050-H2P-2C	50	142	40	106	21.65	12.80	12.17	IP20	86.4
VFD-RSI-060-H2P-2C	60	169	50	136	21.65	12.80	12.7	IP20	90.6
VFD-RSI-075-H2P-2C	75	223**	60	169	27.80	11.81	15.20	IP20	118.2
VFD-RSI-100-H2P-2C	100	264**	75	195	27.80	11.81	15.20	IP20	121.9
VFD-RSI-125-H2P-2C	125	325**	100	255	27.76	14.96	15.59	IP20	159.2

* For UL type 1 add conduit box option.
** Normal Duty 110%.

480V	Normal Duty 110%**120% OL/1 min.		Heavy Duty 150% OL/1min.		Dimensions (inches)				
Model Number	HP	Amps	HP	Amps	H	W	D	Degree of Protection	Weight
VFD-RSI-007-H2P-4C	7.5	12	5	8	9.13	6.30	7.13	IP20	7.3
VFD-RSI-010-H2P-4C	10	16	7.5	12	9.13	6.30	7.13	IP20	7.3
VFD-RSI-015-H2P-4C	15	24	10	15	9.13	6.30	7.13	IP20	7.4
VFD-RSI-020-H2P-4C	20	30	15	22	11.42	7.09	8.08	IP20	10.1
VFD-RSI-025-H2P-4C	25	38	20	28	11.42	7.09	8.08	IP20	10.6
VFD-RSI-030-H2P-4C	30	45	25	35	13.78	8.66	8.79	IP20	16.5
VFD-RSI-040-H2P-4C	40	61	30	41	13.78	8.66	8.79	IP20	16.5
VFD-RSI-050-H2P-4C	50	75	40	55	17.72	10.83	11.18	IP20	57
VFD-RSI-060-H2P-4C	60	91	50	67	20.08	12.80	11.18	IP20	77
VFD-RSI-075-H2P-4C	75	107	60	81	20.08	12.80	11.18	IP20	77
VFD-RSI-100-H2P-4C	100	142	75	106	21.67	12.80	12.17	IP20	95
VFD-RSI-125-H2P-4C	125	169	100	136	21.67	12.80	12.17	IP20	95
VFD-RSI-150-H2P-4C	150	223**	125	169	27.80	11.81	15.20	IP20	123
VFD-RSI-200-H2P-4C	200	264**	150	195	27.80	11.81	15.20	IP20	123
VFD-RSI-250-H2P-4C	250	325**	200	255	27.76	14.96	15.59	IP20	165
VFD-RSI-300-H2P-4C	300	370**	250	303	27.76	14.96	15.59	IP20	165
VFD-RSI-400-H2P-4C	400	481**	300	375	36.34	16.77	17.32	IP00	265
VFD-RSI-500-H2P-4C	500	613**	400	478	39.37	23.62	19.69	IP00	409
VFD-RSI-650-H2P-4C	650	770**	500	591	39.37	23.62	19.69	IP00	409
VFD-RSI-800-H2P-4C	800	962**	600	740	41.50	30.55	19.67	IP00	584

* For UL type 1 add conduit box option.
** Normal Duty 110%.
*** Requires External Braking (DBU and DBR), Consult Factory.

H2P SERIES - INPUT AND OUTPUT SPECIFICATIONS

240V, 7.5HP - 25HP (5.5 - 18.5 kW)

RSI-XXX-H2P-2C			007	010	015	020	025
240V, w/3Ø Input	Normal Duty 120% OL	HP	7.5	10	15	20	25
		kW	5.5	7.5	11	15	18.5
		Amps	22	30	42	56	69
	Heavy Duty 150% OL	HP	5	7.5	10	15	20
		kW	3.7	5.5	7.5	11	15
		Amps	17	24	32	46	60
240V, w/1Ø Input	Normal Duty 120% OL	HP	3.0	5.0	7.5	10.0	-
		Amps	11	16	23	30	37
	Rated Capacity (kVA)		8.4	11.4	16.0	21.3	26.3
	Output frequency		0-400Hz (V/Hz, Slip Compensation)				
	Output voltage (V)		3-Phase 0-240 V				
Rated Input	Voltage (V)	Three-Phase	3-Phase 200-240 VAC (- 15% - + 10%)				
		Single-Phase	1-Phase 240 VAC (- 5% - + 10%)				
	Input frequency	Three-Phase	50-60Hz (+/- 5%)				
		Single-Phase	60Hz (+/- 5%) only				
	Rated Current (A)		23.7	32.7	46.4	62.3	77.2
Weight lbs (kg)		lbs	7.3	7.3	7.3	10.1	15.6
		kg	(3.3)	(3.3)	(3.3)	(4.6)	(7.1)
Heat Dissipation (W)			180	248	330	451	600
Degree of Protection			UL Open Type (IP20), UL Type 1 achieved with optional conduit box				

240V, 30HP -125HP (22 kW - 90 kW)

RSI-XXX-H2P-2C			030	040	050	060	075*	100*	125*
240V, w/3Ø Input	Normal Duty 110%* / 120% OL	HP	30	40	50	60	75	100	125
		kW	22	30	37	45	55	75	90
		Amps	82	110	142	169	223	264	325
	Heavy Duty 150% OL	HP	25	30	40	50	60	75	100
		kW	18.5	22	30	37	45	55	75
		Amps	68	81	106	136	169	195	255
240V, w/1Ø Input	Normal Duty 110%* / 120% OL	HP	15	20	25	30	40	50	60
		Amps	45	58	78	92	122	145	178
	ND Rated Capacity (kVA)		31.2	41.9	54.1	64.4	85	100.6	123.8
	Output frequency		0-400Hz (V/Hz, Slip Compensation)						
	Output voltage (V)		3-Phase 0-240 V						
Rated Input	Voltage (V)	Three-Phase	3-Phase 200-240 VAC (- 15% -+ 10%)						
		Single-Phase	1-Phase 240 VAC (- 5% -+ 10%)						
	Input frequency	Three-Phase	50-60Hz (+/- 5%)						
		Single-Phase	60Hz (+/- 5%) only						
	Rated Current (A)		74.8	101	131.2	159	211.1	251.4	313.2
Weight lbs (kg)		lbs	55.8	72.5	86.4	90.6	118.2	121.9	159.2
		(kg)	(25.3)	(32.9)	(39.2)	(41.1)	(53.6)	(55.3)	(72.2)
Heat Dissipation (W)			893	1245	1480	1814	2150	2963	3438
Degree of Protection			UL Open Type (IP20), UL Type 1 achieved with optional conduit box						

H2P SERIES - INPUT AND OUTPUT SPECIFICATIONS

480V, 7.5HP - 30HP (5.5 - 22 kW)

RSI-XXX-H2P-4C			007	010	015	020	025	030
480V, w/3Ø Input	Normal Duty 120% OL	HP	7.5	10	15	20	25	30
		kW	5.5	7.5	11	15	18.5	22
		Amps	12	16	24	30	38	45
	Heavy Duty 150% OL	HP	5.0	7.5	10	15	20	25
		kW	3.7	5.5	7.5	11	15	18.5
		Amps	8	12	15	22	28	35
480V, w/1Ø Input	Normal Duty 120% OL	HP	3-5	5	10	10	15	20
		Amps	6.8	9.2	14	17	22	26
	Rated Capacity (kVA)		9.1	12.2	18.3	23.0	29.0	34.3
	Output frequency		0-400Hz (V/Hz, Slip Compensation)					
	Output voltage (V)		3-Phase 0-480 V					
Rated Input	Voltage (V)	Three-Phase	3-Phase 380-480 VAC (- 15% - + 10%)					
		Single-Phase	1-Phase 480 VAC (- 5% - + 10%)					
	Input frequency	Three-Phase	50-60Hz (+/- 5%)					
		Single-Phase	60Hz (+/- 5%) only					
	Rated Current (A)		12.2	17.5	26.5	33.4	42.5	50.7
Weight lbs (kg)		lbs	7.3	7.3	7.5	10.1	10.6	16.5
		kg	(3.3)	(3.3)	(3.4)	(4.6)	(4.8)	(7.5)
Heat Dissipation (W)			172	237	322	451	615	740
Degree of Protection			UL Open Type (IP20), UL Type 1 achieved with optional conduit box					

480V, 40 HP -125 HP (30 - 90 kW)

RSI-XXX-H2P-4C			040	050	060	075	100	125
480V, w/3Ø Input	Normal Duty 120% OL	HP	40	50	60	75	100	125
		kW	30	37	45	55	75	90
		Amps	61	75	91	107	142	169
	Heavy Duty 150% OL	HP	30	40	50	60	75	100
		kW	22	30	37	45	55	75
		Amps	41	55	67	81	106	136
480V, w/1Ø Input	Normal Duty 120% OL	HP	25	30	30	40	50-60	60
		Amps	36	39	47	55	73	86
	Rated Capacity (kVA)		46.5	57.1	69.4	82.0	108.2	128.8
	Output frequency		0-400Hz (V/Hz, Slip Compensation)					
	Output voltage (V)		3-Phase 0-480V					
Rated Input	Voltage (V)	Three-Phase	3-Phase 380-480 VAC (- 15% - + 10%)					
		Single-Phase	1-Phase 480 VAC (- 5% - + 10%)					
	Input frequency	Three-Phase	50-60Hz (+/- 5%)					
		Single-Phase	60Hz (+/- 5%) only					
	Rated Current (A)		69.1	69.3	84.6	100.1	133.6	160.0
Weight lbs (kg)		lbs	16.5	57.3	77.2	77.2	94.8	94.8
		kg	(7.5)	(26)	(35)	(35)	(43)	(43)
Heat Dissipation (W)			880	1170	1443	1710	2090	2775
Degree of Protection			UL Open Type (IP20), UL Type 1 achieved with optional conduit box					

H2P SERIES - INPUT AND OUTPUT SPECIFICATIONS

480V, 150 HP -800 HP (110 - 500 kW)

RSI-XXX-H2P-4C			150	200	250	300	400	500	650	800
480V, w/3Ø Input	Normal Duty 110% OL	HP	150	200	250	300	400	500	650	800
		kW	110	132	160	185	250	315	400	500
		Amps	223	264	325	370	481	613	770	962
	Heavy Duty 150% OL	HP	125	150	200	250	300	400	500	600
		kW	90	110	132	160	185	250	315	375
		Amps	169	195	255	303	375	478	591	740
	Rated Capacity (kVA)		170	201	248	282	367	467	587	733
	Output frequency		0-400Hz (V/Hz, Slip Compensation)							
	Output voltage (V)		3-Phase 0-480V							
Rated Input	Voltage (V)	Three-Phase	3-Phase 380-480 VAC (-15% - + 10%)							
	Input frequency	Three-Phase	50-60Hz (+/-5%)							
	Rated Current (A)		215.1	254.6	315.3	358.9	469.3	598.1	751.3	938.6
Weight lbs (kg)		lbs	123	123	164.7	164.7	264.6	409	409	584
		kg	(55.8)	(55.8)	(74.7)	(74.7)	(120)	(185.5)	(185.5)	(265)
Heat Dissipation (W)			3960	4752	5600	6475	8500	10.4k	13.2k	16k
Degree of Protection			1HP~300HP (0.75 kW~185 kW): UL Open (IP20), UL Type 1 achieved with optional conduit box 400HP~800HP (250 kW~500 kW): UL Open (IP00), UL Type 1 achieved with optional conduit box							

H2P SERIES - PRODUCT SPECIFICATION DETAILS

Items		Description	
Control	Control method	V/F control, Slip Compensation	
	Frequency setting	Digital command: 0.01 Hz	
	Frequency accuracy	1% of maximum output frequency	
	V/F pattern	Linear, Square Reduction, User V/F	
	Overload capacity (Normal Duty)	240V, 7.5 HP ~ 60 HP	120% / 1 min.
		240V, 75 HP ~ 125 HP	110% / 1 min.
		480V, 7.5 HP ~ 125 HP	120% / 1 min.
		480V, 150 HP ~ 800 HP	110% / 1 min.
	Overload capacity (Heavy Duty)	240V, 5.0 HP ~ 100 HP	150% / 1 min.
		480V, 5.0 HP ~ 600 HP	150% / 1 min.
	Torque boost	Manual torque boost, automatic torque boost	
Operation	**Operation Type**		
	Start/Stop	Keypad, Terminal strip, Communications	
	Frequency (Speed) Settings	Analog Inputs: (1) 0–10 V, (1) 0/4–20 mA, Switch selectable to 0–10 Vdc	
		Digital Inputs: Keypad, Fixed Speed, Pulse Train	
		Communications: RS-485 (Modbus), Metasys-N2, BACnet, Fieldbus Options	
		H2 Pump Software	
	Functions	Lead/Lag and Alternating	Broken Pipe Detection
		Jockey Pump Control	BACnet and Metasys-N2
		MMC - Multi-Motor Control	Pump Load Tuning
		Pre-Fill, Soft Fill	Decel Valve Ramp
		Start and End Ramp	Time Event Scheduling
		Backspin Timer	Flow Compensation
		Pump Clean Operation	Energy Saving Operation
		Basic	**Advanced**
		Quick Start Menu	Auto Tuning
		Start/Stop Operation	PID Control
		Start/Stop Modes	Slip Compensation
		Frequency Reference Sources	Event Timer (RTC)
		Auxiliary Frequency Reference	Energy Save Mode
		Multi-Step Speeds	Regen Avoidance
		Multi-Step Accel/Decel Times	VFD Fan Control
		2nd Source (HOA)	**Other**
		Accel/Decel Times	Timer Relay Input/Output Function
		Accel/Decel Patterns	Pre Heat
		Dwell Frequency Operation	Oil Pump Starter Control
		Jog	Damper Monitor and Control
		Auto Start	
		Auto Reset/Restart	**Loss of Power**
		Jog and Jog Start	Ride Through (KEB)
		FWD/REV Run Prevention	Safe Stop
		Frequency Limits	Speed Search
		Jump Frequencies	

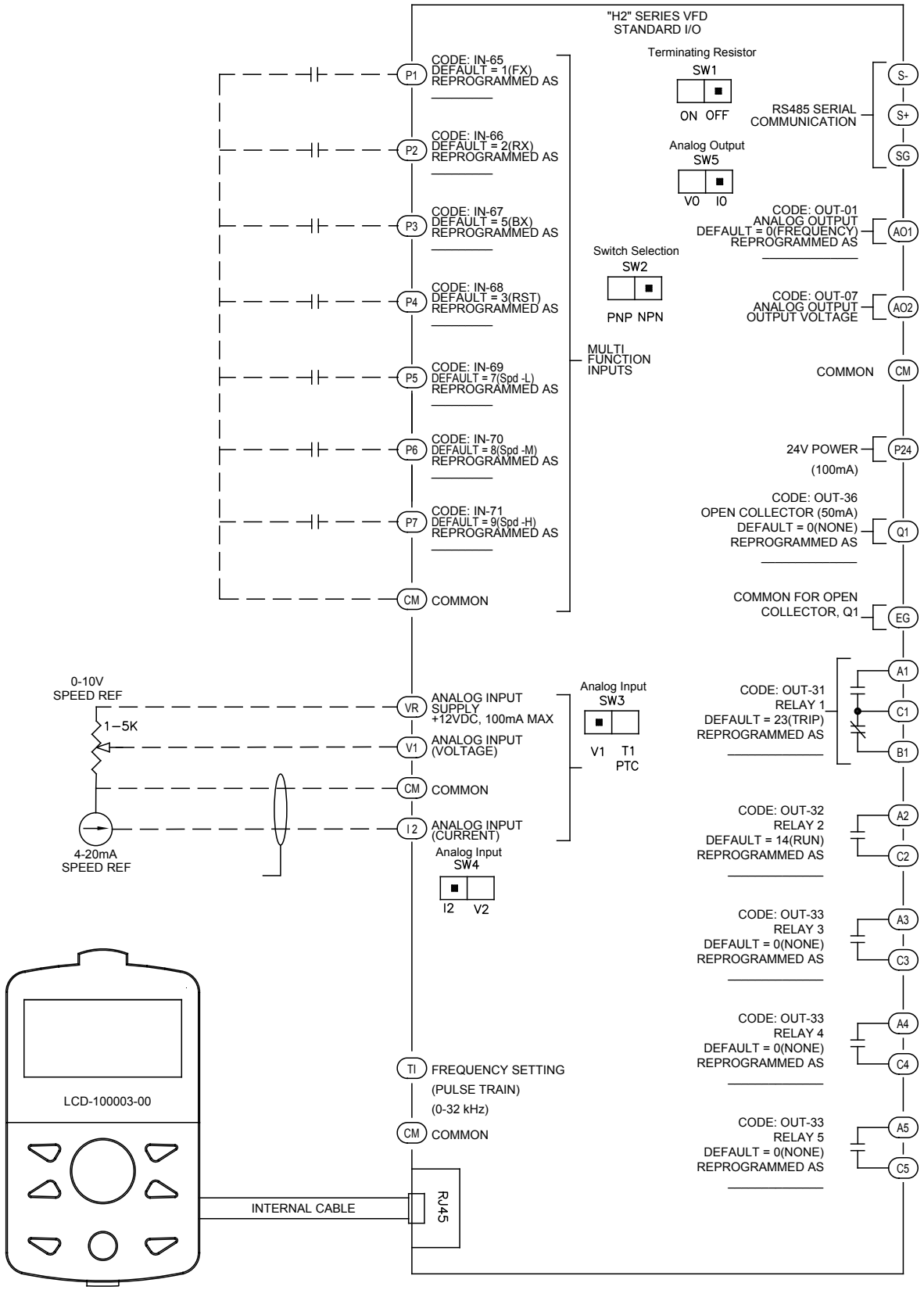
H2P SERIES - PRODUCT SPECIFICATION DETAILS

Items			Description	
Operation	Functions		3-Wire Control	**Braking**
			Fire Mode	DC Injection Braking
				Stall Prevention
			V/Hz. Control Pattern	Power Braking
			Linear, Squared, User V/Hz	Flux Braking
			Torque Boost	External Brake Control
	Input	Analog	(1) 0–10 V, (1) 0/4–20 mA, Switch selectable to 0–10 Vdc	
		Digital inputs	(7), Select PNP (Source) or NPN (Sink) mode. NO/NC selectable. Functions of the digital inputs are set with parameters IN-65 through IN-71	
		Functions	Forward/Reverse Operation	2nd Source - HOA/LOR
			Reset	Up/Down Operation
			External Trip	Analog Hold
			Emergency Stop	PID Disable
			Output Disable (Bx)	Jog Start FWD/REV
			Jog	Pre-Excite
			Fixed Speed - Step Freq's	Timer Input
			Run Enable/Disable (Safety)	Fire Mode
			3-Wire Control Select	Event Timer
			Damper Monitor and Control	Pre-Heat
		Pulse train	0-32 kHz, Low Level: 0-0.8 V, High Level: 3.5-12 V	
	Output	(1) Fault relay (Form C)	N.O. : Less than AC 250V, 2A, DC 30V, 3A N.C.: Less than AC 250V, 1A, DC 30V,1A	
		(4) Programmable relays (Form A)	N.O. (A-C): Less than 250V, 5A Less than DC 30V, 5A	
		(1) Open collector terminal	Less than DC 26V, 50 mA	
		(2) Analog Outputs	AO1: 0(4) - 20 mA, Switch selectable to 0–10 Vdc AO2: 0-10VDC Frequency, Current, Voltage, Power, DC Bus Voltage, Fixed, more.	
		Pulse train	Maximum 32 kHz, 0-12 V	
Protection Function	Trip		Motor Over Load	Fan Trip
			Under Load	Internal Fan Trip
			Over Current 1	Motor Over Heat (PTC Input)
			Over Voltage	Lost Keypad
			Low Voltage	Fuse Open
			Low Voltage 2	Pipe Broken
			Ground Fault	Broken Belt
			E-Thermal	Lost Speed Reference
			Out Phase Open	I/O Board Trip
			In Phase Open	
			Inverter Over Load	**Fan/Pump related trips**
			No Motor Trip	Damper Trip
			Inverter over Heat	Level Detected Trip
			Over Current 2	MMC Interlock Trip
			External Trip	Pump Cleaning Trip
			Hardware Diagnostic	

H2P SERIES - PRODUCT SPECIFICATION DETAILS

Items		Description
Protection Functions	Alarm	Overload/underload, Lost Command, Inverter overload, DB (braking) rate alarm, Pump Clean, Pipe Broken, Broken Belt, Fire Mode, Level Detection (LDT).
	Instantaneous Power	Less than 8 ms: Continue Operation
Structure / working environment	Cooling type	Forced fan cooling structure
	Protection structure	UL Open, IP 20: 7.5 HP ~ 300 HP (5.5 kW ~ 185 kW) UL Open, IP 00: 400 HP ~ 800 HP (250 kW ~ 500kW) UL Type 1 with conduit box (option) installation (up to 800 HP).
	Ambient temperature	14°F~104°F (-10°C~40°C) 2.5% / amp current derating up to 122°F (50°C) max. No ice or frost should be present
	Ambient humidity	Relative humidity less than 95% RH (to avoid condensation)
	Storage temperature	- 4°F~149°F (- 20°C ~ 65°C)
	Environment	Prevent contact with corrosive gases, inflammable gases, oil stains, dust and other pollutants. 7.5HP~800HP (5.5 kW ~ 500 kW) Pollution Degree 2
	Altitude	Maximum 3,280 ft (1,000m) above sea level for standard operation. Above derate the drive rated voltage and the rated output current by 1% for every 328 ft (100m) up to 13,123 ft (4,000m) max.
	Vibration	Less than 1.0 G (9.8 m/sec^2)
	Pressure	10~15 PSI (70-106 kPa)

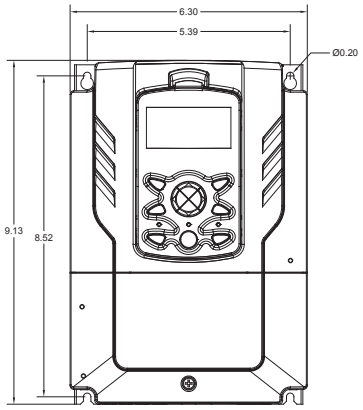
H2P SERIES - WIRING



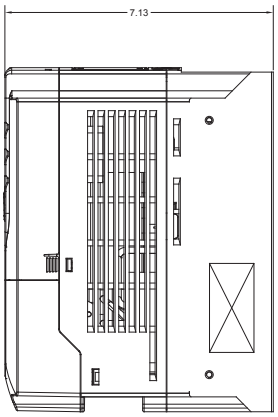
H2P SERIES - DRAWINGS

240V, 7.5 HP - 15 HP

480V, 7.5 HP - 15 HP



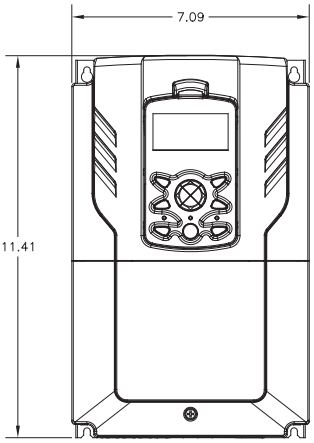
FRONT VIEW



RIGHT SIDE VIEW

240V, 20 HP

480V, 20 HP - 25 HP



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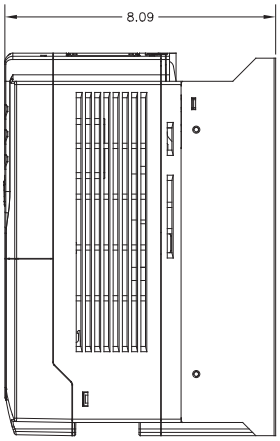
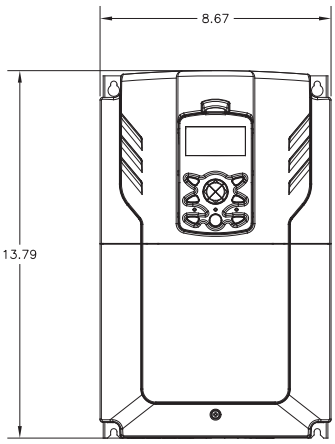


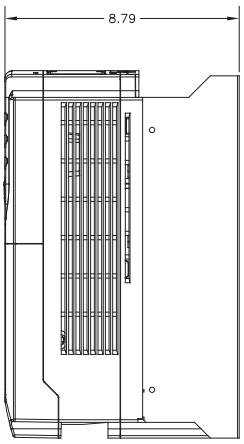
RIGHT SIDE VIEW

240V, 25 HP

480V, 30 HP - 40 HP



FRONT VIEW

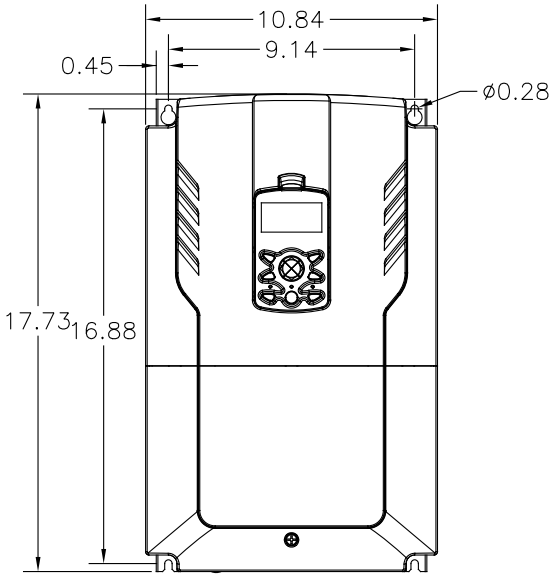


RIGHT SIDE VIEW

H2P SERIES - DRAWINGS

240V, 30 HP

480V, 50 HP



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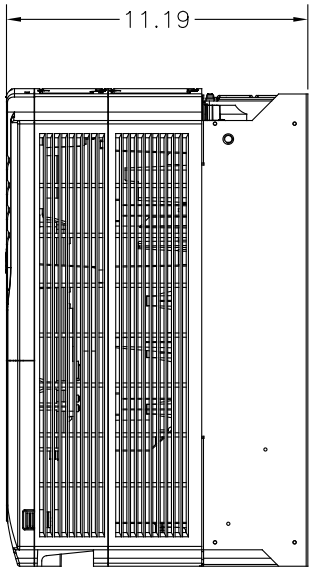
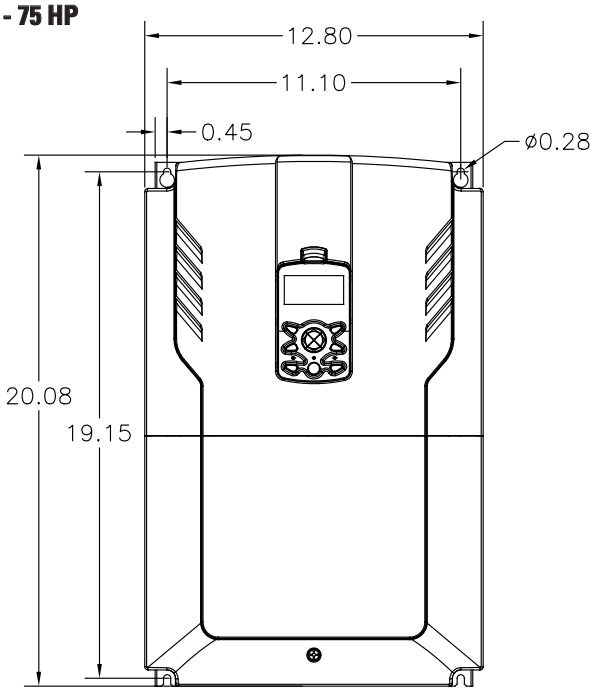


RIGHT SIDE VIEW

240V, 40 HP

480V, 60 HP - 75 HP



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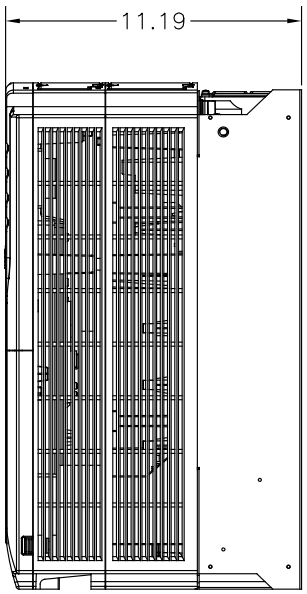
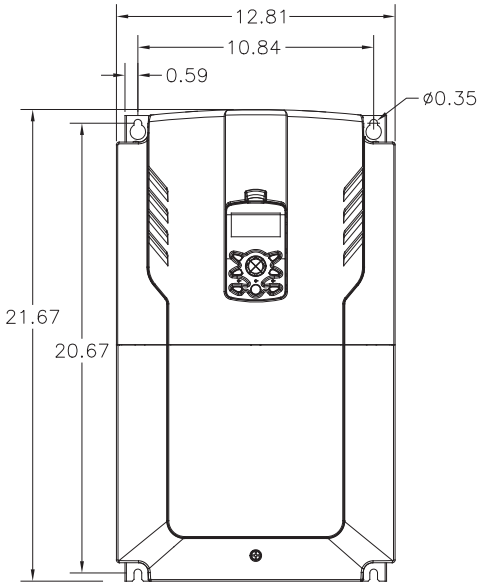


RIGHT SIDE VIEW

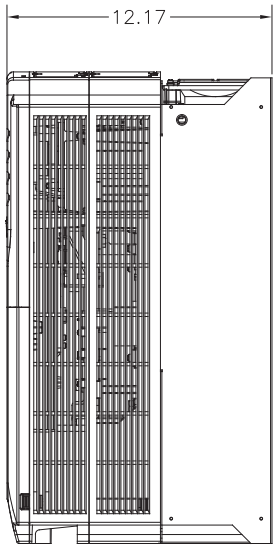
H2P SERIES - DRAWINGS

240V, 50 HP ~ 60 HP

480V, 100 HP - 125 HP



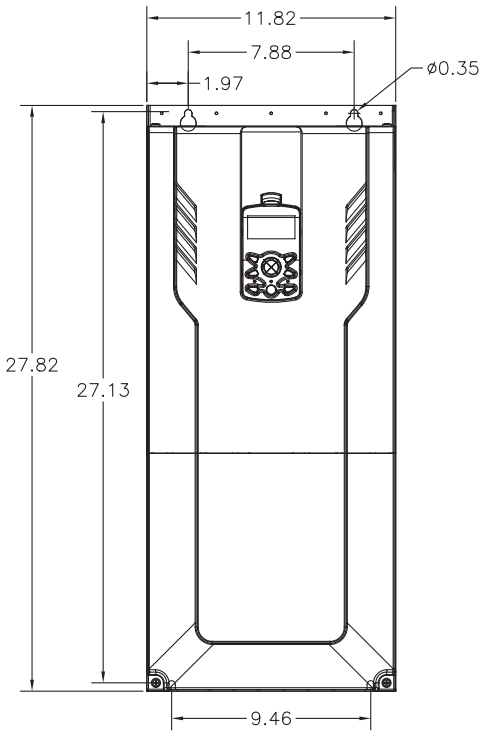
FRONT VIEW



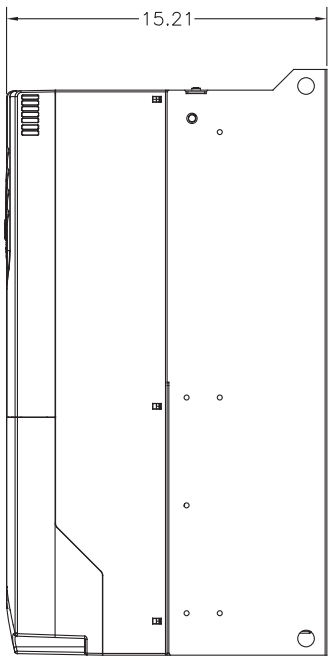
RIGHT SIDE VIEW

240V, 75 HP ~ 100 HP

480V, 150 HP - 200 HP



FRONT VIEW

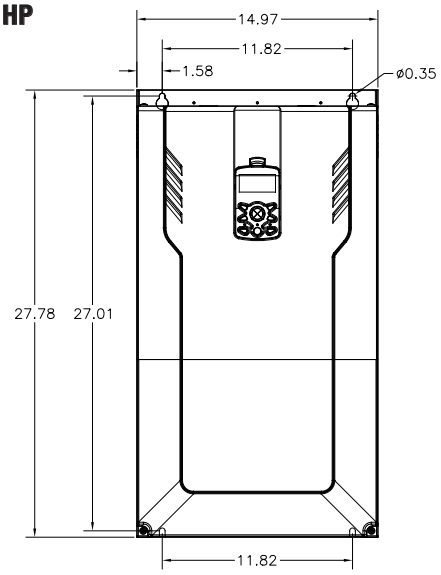


RIGHT SIDE VIEW

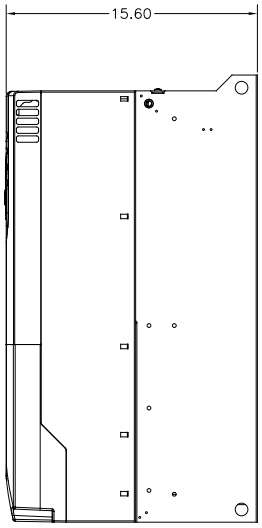
H2P SERIES - DRAWINGS

240V, 125 HP

480V, 250 HP - 300 HP

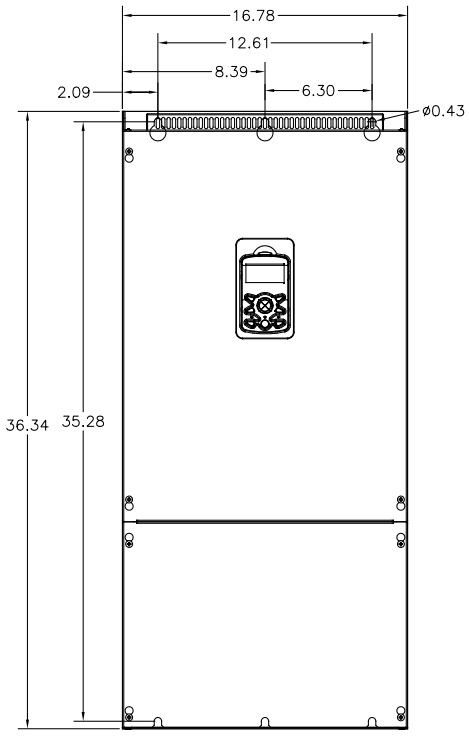


FRONT VIEW



RIGHT SIDE VIEW

480V, 400 HP



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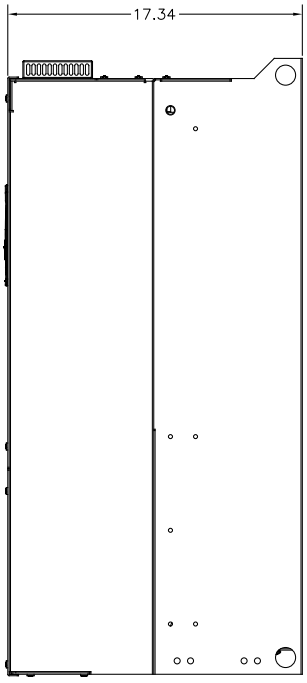
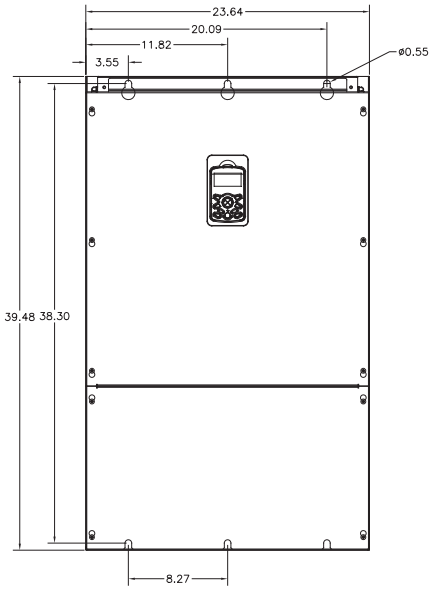


RIGHT SIDE VIEW

H2P SERIES - DRAWINGS

480V, 500 HP - 650 HP



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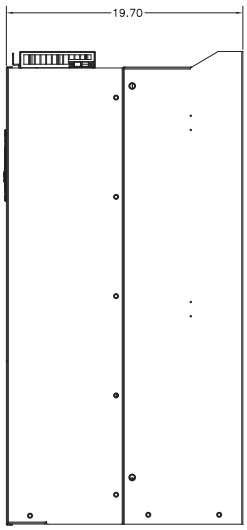
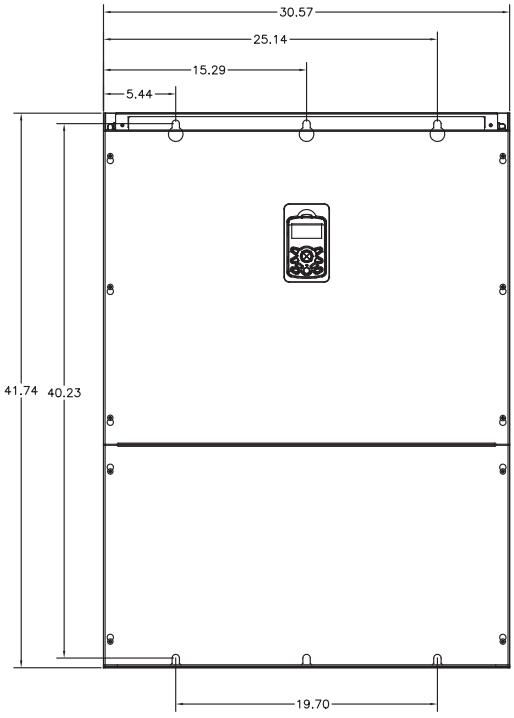


RIGHT SIDE VIEW

480V, 800 HP



FRONT VIEW

RIGHT SIDE VIEW

H2X / H2E SERIES

Standard and Engineered Low Voltage Drive Packages

As an industry leader in motor control, Benshaw is known for their offering of standard and custom engineered drive packages. If an off-the-shelf unit does not meet your needs, our dedicated engineering team can design the drive solution you need. With our extensive inventory of components from Benshaw circuit breakers and contactors to our variety of VFDs, enclosures, and pilot devices...we've got you covered. Select the enclosure, disconnect, bypass, pilot devices and the control scheme required for your application and we'll do the rest. You can count on Benshaw to get it 'right from the start'.

Standard and customized engineered solutions for your most demanding applications.

COMBINATION DRIVE PACKAGES — TO MEET YOUR REQUIREMENTS

- Circuit breaker (65 KAIC rated)
- Fusible disconnect protection
- Flange or rotary handle mechanism

CONTROL & PROTECTION — TO YOUR SPECIFICATIONS

- Pilot devices, control power transformers, switches, meters, relays, space heaters, protective devices and more

BYPASS OPTIONS — FOR SERVICE AND RELIABILITY

- Three contactor bypass
- Soft starter bypass

FILTERS & REACTORS — FOR YOUR UNIQUE APPLICATION

- Line reactors, 3% and 5%
- Long lead filters
- Load reactors
- Harmonic filters
- 18-pulse systems

ENCLOSURES — TO MATCH YOUR ENVIRONMENT

- Standard designs — NEMA 1, 12, 3R
- Special enclosures — NEMA 4, 4X, air conditioned
- Custom enclosures
- Motor control panel (MCP), multiple VFD's in one package

H2X SERIES

Standard Low Voltage Drive Packages

WEB STOCKED

STANDARD HARDWARE FEATURES:

- Heavy duty rated packaged H2 Series drive
- NEMA 3R ventilated enclosure
- 65 KAIC Circuit breaker with rotary operator
- Stock models up to 200HP
- Door mounted:
  - Keypad
  - Start/Stop push buttons
  - Run indicator light
  - Fault indicator light
  - Speed potentiometer
  - Hand-Off-Auto selector switch

H2X SERIES - STANDARD SOFTWARE FEATURES

- Control Modes
  - V/Hz. (Linear, Squared, User defined)
  - Sensorless Vector (IM or PM) with Auto Tuning (Static or Rotational)
  - Slip Compensation
- Application Macros
  - Pump
  - Fan
  - Constant Torque
- Communications (built in)
  - BACnet
  - Metasys-N2
- PID Control (Single Loop, Dual Loop) with:
  - Sleep, Sleep Boost and Wake Up
  - Broken Pipe Detection
  - Under Load Detection
  - Select from 40 units of measure
- Pump Clean Operation
- Time Event Scheduling (24/7 Programmable Operation)
- Pump Load Tuning
- Energy Saving Operation
- Flow Compensation
- Backspin Timer
- Pre-fill and Soft-fill
- Fire mode input
- Oil Pump Starter Control (compressor systems)

H2X SERIES - SELECTION CHART

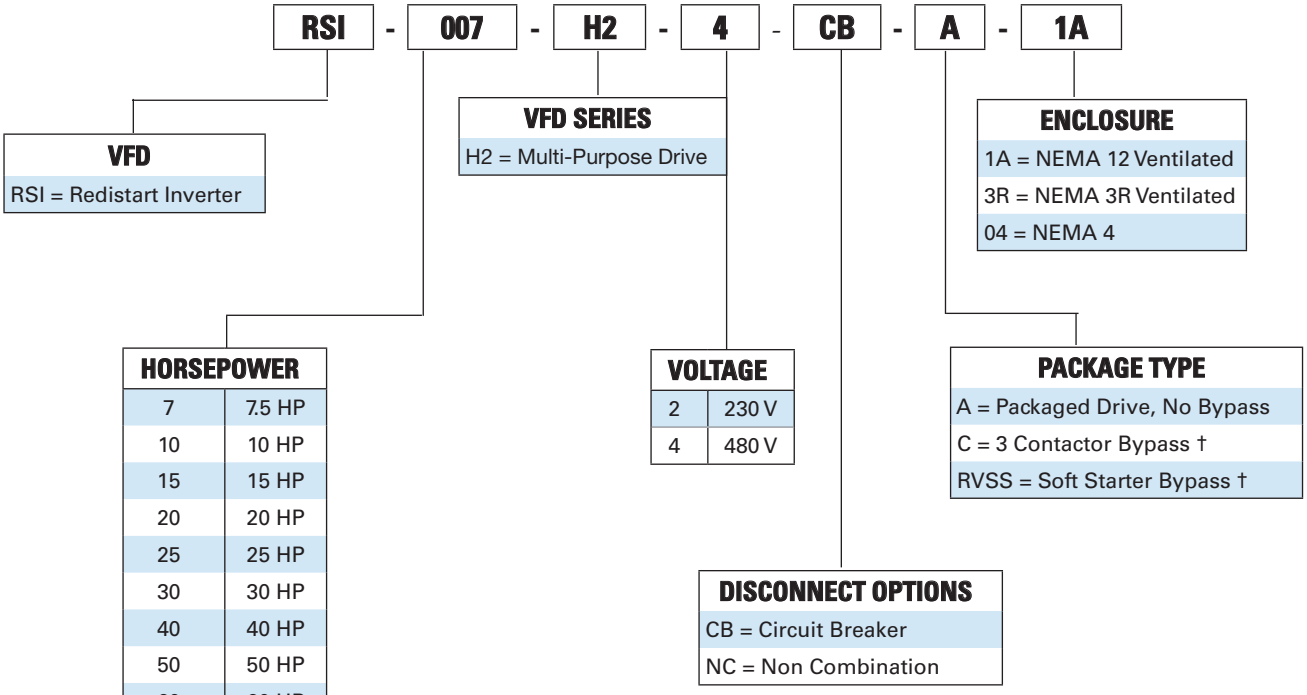
Standard Low Voltage Drive Packages

480V	Drive Rating Heavy Duty 150% OL/1 min		Circuit Breaker (65 KAIC) Size	Dimensions (inches)
Model Number	HP	Amps	Amps	(H x W x D)
RSI-005-H2XHD4-CB-A-3R	5	8	15	24" x 24" x 12"
RSI-007-H2XHD4-CB-A-3R	7.5	12	20	24" x 24" x 12"
RSI-010-H2XHD4-CB-A-3R	10	15	30	24" x 24" x 12"
RSI-015-H2XHD4-CB-A-3R	15	22	40	30" x 30" x 12"
RSI-020-H2XHD4-CB-A-3R	20	28	50	30" x 30" x 12"
RSI-025-H2XHD4-CB-A-3R	25	35	60	30" x 30" x 12"
RSI-030-H2XHD4-CB-A-3R	30	41	80	30" x 30" x 12"
RSI-040-H2XHD4-CB-A-3R	40	55	100	36" x 30" x 16"
RSI-050-H2XHD4-CB-A-3R	50	67	125	36" x 30" x 16"
RSI-060-H2XHD4-CB-A-3R	60	81	150	36" x 30" x 16"
RSI-075-H2XHD4-CB-A-3R	75	106	200	36" x 30" x 16"
RSI-100-H2XHD4-CB-A-3R	100	136	225	36" x 30" x 16"
RSI-125-H2XHD4-CB-A-3R	125	169	250	48" x 36" x 20"
RSI-150-H2XHD4-CB-A-3R	150	195	300	48" x 36" x 20"
RSI-200-H2XHD4-CB-A-3R	200	255	400	48" x 36" x 20"
RSI-250-H2XHD4-CB-A-3R	250	303	500	72" x 48" x 24"
RSI-300-H2XHD4-CB-A-3R	300	375	600	72" x 48" x 24"
RSI-400-H2XHD4-CB-A-3R	400	478	800	72" x 48" x 24"
RSI-500-H2XHD4-CB-A-3R	500	591	1000	72" x 48" x 24"
RSI-600-H2XHD4-CB-A-3R	600	740	1200	72" x 72" x 24"

Web stocked. Allow 2 weeks build if out of stock on web.
Built-to-order. Please allow 4 weeks lead time.
BenshawExpress.com

H2E SERIES - PART NUMBER ASSEMBLER

Engineered Low Voltage Drive Packages



HORSEPOWER	
7	7.5 HP
10	10 HP
15	15 HP
20	20 HP
25	25 HP
30	30 HP
40	40 HP
50	50 HP
60	60 HP
75	75 HP
100	100HP
125	125 HP
150	150 HP
200	200 HP
250	250 HP
300	300 HP
400	400 HP
500	500 HP
650	650 HP
800	800 HP

VOLTAGE	
2	230 V
4	480 V

† Contact Factory.

H2E SERIES - SELECTION CHART

Engineered Low Voltage Drive Packages

Enclosed Drives - Combination Circuit Breaker 230V

7.5 HP - 25 HP NEMA 12 AND 3R VENTILATED

230V	Normal Duty 120% Current/1min.		Heavy Duty 150% Current/1min.		Circuit Breaker (65KAIC)	Dimensions (inches)
Model Number	HP	Amps	HP	Amps	Amp Rating	(H x W x D)
RSI-007-H2-2-CB-X-XX	7	22	5	17	30 A	24" x 24" x 12"
RSI-010-H2-2-CB-X-XX	10	30	7.5	24	40 A	30" x 30" x 12"
RSI-015-H2-2-CB-X-XX	15	42	10	32	60 A	30" x 30" x 12"
RSI-020-H2-2-CB-X-XX	20	56	15	46	70 A	30" x 30" x 12"
RSI-025-H2-2-CB-X-XX	25	69	20	60	90 A	30" x 30" x 12"

Enclosed Drives - Combination Circuit Breaker 460V

7.5 HP - 800 HP NEMA 12 AND 3R VENTILATED

480V	Normal Duty 120% Current/1min.		Heavy Duty 150% Current/1min.		Circuit Breaker (65KAIC)	Dimensions (inches)
Model Number	HP	Amps	HP	Amps	Amp Rating	(H x W x D)
RSI-007-H2-4-CB-X-XX	7.5	12	5	8	15 A	24" x 24" x 12"
RSI-010-H2-4-CB-X-XX	10	16	7.5	12	20 A	24" x 24" x 12"
RSI-015-H2-4-CB-X-XX	15	24	10	15	30 A	24" x 24" x 12"
RSI-020-H2-4-CB-X-XX	20	30	15	22	40 A	30" x 30" x 12"
RSI-025-H2-4-CB-X-XX	25	38	20	28	50 A	30" x 30" x 12"
RSI-030-H2-4-CB-X-XX	30	45	25	35	60 A	30" x 30" x 12"
RSI-040-H2-4-CB-X-XX	40	61	30	41	80 A	30" x 30" x 12"
RSI-050-H2-4-CB-X-XX	50	75	40	55	100 A	36" x 30" x 16"
RSI-060-H2-4-CB-X-XX	60	91	50	67	125 A	36" x 30" x 16"
RSI-075-H2-4-CB-X-XX	75	107	60	81	150 A	36" x 30" x 16"
RSI-100-H2-4-CB-X-XX	100	142	75	106	200 A	36" x 30" x 16"
RSI-125-H2-4-CB-X-XX	125	169	100	136	225 A	36" x 30" x 16"
RSI-150-H2-4-CB-X-XX*	150	223**	125	169	250 A	48" x 36" x 20"
RSI-200-H2-4-CB-X-XX*	200	264**	150	195	300 A	48" x 36" x 20"
RSI-250-H2-4-CB-X-XX*	250	325**	200	255	400 A	48" x 36" x 20"
RSI-300-H2-4-CB-X-XX*	300	370**	250	303	500 A	72" x 48" x 24"
RSI-400-H2-4-CB-X-XX*	400	481**	300	375	600 A	72" x 48" x 24"
RSI-500-H2-4-CB-X-XX*	500	613**	400	478	800 A	72" x 48" x 24"
RSI-650-H2-4-CB-X-XX*	650	770**	500	591	1000 A	72" x 48" x 24"
RSI-800-H2-4-CB-X-XX*	800	962**	600	740	1200 A	72" x 48" x 24"

A-1A = VFD in fan and filtered enclosure.

A-3R = VFD in fan and filtered 3R enclosure.

*Units should be mounted out of direct sunlight.

For options refer to pages 74.

** 110% current for 1 minute.

H2E SERIES - OPTIONS

Engineered Low Voltage Drive Packages

PUSH-BUTTONS

Model Number	Description
QB	Raised Stop Push-Button — Red
QC	Flush Start Push-Button — Green
QD	Jog Push-Button - Yellow
QE	OI Reset Push-Button — (For External OI Relay) — Black
QF	Reset Push-Button — Black
QG	Raised Push-Button — Specify Color and Function
QH	Flush Push-Button — Specify Color and Function
QJ	Mushroom Head Stop Push-Button — Red
QK	Illuminated Push-Button — Specify Color and Function
QL	On/Off Push-Button
QM	O/L trip Reset Button

SELECTOR SWITCHES

Model Number	Description
QV	Hand-Off-Auto Selector Switch
QW	Local-Off-Remote Selector Switch
TV	Key-Operated Hand-Off-Auto Selector Switch
TW	Dual Ramps Selector Switch
TX	Two-Postion Selector Switch — Specify Function
TY	Three-Position Selector Switch — Specify Function
TZ	Other Selector Switch — Specify Function and Type

PILOT LIGHTS

Model Number	Description
QN	Red Run Light
RJ	Green Stop Light
RK	Amber Fault Light
RL	Green Ready Light
RM	Amber Bypass Light
RN	Red Light — Specify Function
RP	Green Light — Specify Function
RQ	Amber Light — Specify Function
RR	White Light — Specify Function
RS	Blue Light — Specify Function
RT	Push to Test Contact Assembly (Addition to Above)
QP	Power On Light — White

METERS

Model Number	Description
KT	Analog Ammeter
KU	Analog Ammeter (3-phase with selector)
KV	Analog Voltmeter
KW	Analog Voltmeter (3-phase with selector)
KX	Elapsed Timer Meter (analog, non-resettable)
KY	Operations Counter
KZ	AC Wattmeter
L2	AC Watt Hour Meter
L3	Other Power Metering - Specify Function
L4	Analog Ammeter (utilizes VFDs analog output)
L5	Analog Voltmeter (utilizes VFDs analog output)

POTENTIOMETERS

Model Number	Description
S7	1 Turn Potentiometer - NEMA 1
S8	10 Turn Potentiometer - NEMA 1

SPACE HEATERS

Model Number	Description
A171	Space Heater with Thermostat

For additional options, contact factory.

H2 IEEE 519/519P CLEAN POWER DRIVES

Benshaw H2 519 and 519P (passive filter) Series Clean Power Drives are designed and manufactured to limit voltage and current distortion levels to within the levels defined by IEEE-Std 519 ™. This eliminates the need for expensive, time consuming harmonic analysis. Our municipal projects and engineering team will work with you to configure a clean power solution that meets your specifications and requirements.

H2 519P with Passive Filter

KEY FEATURES

- H2 Series drive
- NEMA 1 ventilated enclosure
- 65 kAIC circuit breaker with lockable disconnect
- 519 (18 Pulse) includes phase-shifting transformer, a line reactor and a 12-pulse rectifier chassis unit
- 519P includes a passive harmonic filter design
- Control transformer with extra 120V capacity
- Door-mounted control
  - Keypad/LCD display
  - Start/stop buttons
  - Reset button
  - Hand-Off-Auto switch
  - Speed potentiometer
  - Run light
  - Fault light
  - Power On light
  - VFD-Off-Bypass switch (with bypass option)

OPTIONS

- Line Surge Protection
- Input (line) Fusing
- Bypass (Three Contactor or Soft Starter)
- Output Reactor or Long Lead Filter (dV/dT)
- Enclosures: NEMA 12, 3R

STANDARD DUTY: 100HP to 800HP @ 460 Vac

HEAVY DUTY: 75HP to 600HP @ 460 Vac

MODULAR DESIGN

The modular design of Benshaw H2 519/519P Series Clean Power Drives eliminates significant maintenance problems that were inherent in older drive designs. Drive reliability is enhanced by significantly reducing power module part counts. This design approach also allows each H2 Series drive unit to be custom-tailored to your specific requirements. An optional bypass design configuration (ATL or RVSS) is available for H2 519/519P drive packages when mission critical reliability is important and disruptive downtime cannot be tolerated.

H2 IEEE 519/519P CLEAN POWER DRIVES

18 Pulse, IEEE-519

The 519 Series drive packages combine Benshaw's H2 Series drive with an 18 Pulse Input. The input consists of a high impedance line reactor, a special designed auto-transformer with 9 phase shifted secondary taps and a 12 pulse rectifier unit. All components are housed in a Nema 1 enclosure (other ratings available) along with a 65Kaic rated Circuit Breaker and door mounted control.

460V, H2 SERIES, NEMA 1, NO BYPASS

Model Number	Standard Duty		Heavy Duty		Dimensions (in.)		
	HP	Amps	HP	Amps	H	W	D
RSI-519-050-H2-4-CB-A-01	50	65	40	52	90	36	30
RSI-519-060-H2-4-CB-A-01	60	77	50	65	90	36	30
RSI-519-075-H2-4-CB-A-01	75	96	60	77	90	36	30
RSI-519-100-H2-4-CB-A-01	100	124	75	96	90	36	30
RSI-519-125-H2-4-CB-A-01	125	156	100	124	90	36	30
RSI-519-150-H2-4-CB-A-01	150	180	125	156	90	48	30
RSI-519-200-H2-4-CB-A-01	200	240	150	180	90	48	30
RSI-519-250-H2-4-CB-A-01	250	302	200	240	90	54	30
RSI-519-300-H2-4-CB-A-01	300	361	250	302	90	72	36
RSI-519-400-H2-4-CB-A-01	400	477	300	361	90	72	36
RSI-519-500-H2-4-CB-A-01	500	590	400	477	90	78	36
RSI-519-650-H2-4-CB-A-01	650	770	500	590	90	120	36
RSI-519-800-H2-4-CB-A-01	800	962	600	740	90	120	36

H2 IEEE 519/519P CLEAN POWER DRIVES

18 Pulse, IEEE-519

460V, H2 SERIES, NEMA 1, WITH BYPASS (THREE CONTACTOR)

Model Number	Standard Duty		Heavy Duty		Dimensions (in.)		
	HP	Amps	HP	Amps	H	W	D
RSI-519-050-H2-4-CB-C-01	50	65	40	52	90	42	30
RSI-519-060-H2-4-CB-C-01	60	77	50	65	90	42	30
RSI-519-075-H2-4-CB-C-01	75	96	60	77	90	54	30
RSI-519-100-H2-4-CB-C-01	100	124	75	96	90	54	30
RSI-519-125-H2-4-CB-C-01	125	156	100	124	90	54	30
RSI-519-150-H2-4-CB-C-01	150	180	125	156	90	54	30
RSI-519-200-H2-4-CB-C-01	200	240	150	180	90	54	30
RSI-519-250-H2-4-CB-C-01	250	302	200	240	90	54	30
RSI-519-300-H2-4-CB-C-01	300	361	250	302	90	114	36
RSI-519-400-H2-4-CB-C-01	400	477	300	361	90	114	36
RSI-519-500-H2-4-CB-C-01	500	590	400	477	90	120	36
RSI-519-650-H2-4-CB-C-01	650	770	500	590	90	132	36
RSI-519-800-H2-4-CB-C-01	800	962	600	740	90	132	36

460V, H2 SERIES, NEMA 1, WITH BYPASS (RVSS)

Model Number	Standard Duty		Heavy Duty		Dimensions (in.)		
	HP	Amps	HP	Amps	H	W	D
RSI-519-050-H2-4-CB-SS-01	50	65	40	52	90	42	30
RSI-519-060-H2-4-CB-SS-01	60	77	50	65	90	42	30
RSI-519-075-H2-4-CB-SS-01	75	96	60	77	90	54	30
RSI-519-100-H2-4-CB-SS-01	100	124	75	96	90	54	30
RSI-519-125-H2-4-CB-SS-01	125	156	100	124	90	54	30
RSI-519-150-H2-4-CB-SS-01	150	180	125	156	90	54	30
RSI-519-200-H2-4-CB-SS-01	200	240	150	180	90	54	30
RSI-519-250-H2-4-CB-SS-01	250	302	200	240	90	54	30
RSI-519-300-H2-4-CB-SS-01	300	361	250	302	90	114	36
RSI-519-400-H2-4-CB-SS-01	400	477	300	361	90	114	36
RSI-519-500-H2-4-CB-SS-01	500	590	400	477	90	120	36
RSI-519-650-H2-4-CB-SS-01	650	770	500	590	90	132	36
RSI-519-800-H2-4-CB-SS-01	800	962	600	740	90	132	36

H2 IEEE 519/519P CLEAN POWER DRIVES

Passive Filter, IEEE-519P

The 519P Series drive packages combine Benshaw's H2 Series drive with a Passive Harmonic Filter. The input consists of (a) the main high impedance reactor, (b) the tuning reactor and (c) the capacitor bank. All components are housed in a Nema 1 enclosure (other ratings available) along with a 65Kaic rated Circuit Breaker and door mounted control.

460V, H2 SERIES, NEMA 1, NO BYPASS

Model Number	Standard Duty		Heavy Duty		Dimensions (in.)		
	HP	Amps	HP	Amps	H	W	D
RSI-519P-050-H2-4-CB-A-01	50	65	40	52	90	36	30
RSI-519P-060-H2-4-CB-A-01	60	77	50	65	90	36	30
RSI-519P-075-H2-4-CB-A-01	75	96	60	77	90	36	30
RSI-519P-100-H2-4-CB-A-01	100	124	75	96	90	36	30
RSI-519P-125-H2-4-CB-A-01	125	156	100	124	90	36	30
RSI-519P-150-H2-4-CB-A-01	150	180	125	156	90	48	30
RSI-519P-200-H2-4-CB-A-01	200	240	150	180	90	48	30
RSI-519P-250-H2-4-CB-A-01	250	302	200	240	90	54	30
RSI-519P-300-H2-4-CB-A-01	300	361	250	302	90	72	36
RSI-519P-400-H2-4-CB-A-01	400	477	300	361	90	72	36
RSI-519P-500-H2-4-CB-A-01	500	590	400	477	90	78	36
RSI-519P-650-H2-4-CB-A-01	650	770	500	590	90	120	36
RSI-519P-800-H2-4-CB-A-01	800	962	600	740	90	120	36

H2 IEEE 519/519P CLEAN POWER DRIVES

Passive Filter, IEEE-519P

460V, H2 SERIES, NEMA 1, WITH BYPASS (THREE CONTACTOR)

Model Number	Standard Duty		Heavy Duty		Dimensions (in.)		
	HP	Amps	HP	Amps	H	W	D
RSI-519P-050-H2-4-CB-C-01	50	65	40	52	90	42	30
RSI-519P-060-H2-4-CB-C-01	60	77	50	65	90	42	30
RSI-519P-075-H2-4-CB-C-01	75	96	60	77	90	54	30
RSI-519P-100-H2-4-CB-C-01	100	124	75	96	90	54	30
RSI-519P-125-H2-4-CB-C-01	125	156	100	124	90	54	30
RSI-519P-150-H2-4-CB-C-01	150	180	125	156	90	54	30
RSI-519P-200-H2-4-CB-C-01	200	240	150	180	90	54	30
RSI-519P-250-H2-4-CB-C-01	250	302	200	240	90	54	30
RSI-519P-300-H2-4-CB-C-01	300	361	250	302	90	114	36
RSI-519P-400-H2-4-CB-C-01	400	477	300	361	90	114	36
RSI-519P-500-H2-4-CB-C-01	500	590	400	477	90	120	36
RSI-519P-650-H2-4-CB-C-01	650	770	500	590	90	132	36
RSI-519P-800-H2-4-CB-C-01	800	962	600	740	90	132	36

460V, H2 SERIES, NEMA 1, WITH BYPASS (RVSS)

Model Number	Standard Duty		Heavy Duty		Dimensions (in.)		
	HP	Amps	HP	Amps	H	W	D
RSI-519P-050-H2-4-CB-SS-01	50	65	40	52	90	42	30
RSI-519P-060-H2-4-CB-SS-01	60	77	50	65	90	42	30
RSI-519P-075-H2-4-CB-SS-01	75	96	60	77	90	54	30
RSI-519P-100-H2-4-CB-SS-01	100	124	75	96	90	54	30
RSI-519P-125-H2-4-CB-SS-01	125	156	100	124	90	54	30
RSI-519P-150-H2-4-CB-SS-01	150	180	125	156	90	54	30
RSI-519P-200-H2-4-CB-SS-01	200	240	150	180	90	54	30
RSI-519P-250-H2-4-CB-SS-01	250	302	200	240	90	54	30
RSI-519P-300-H2-4-CB-SS-01	300	361	250	302	90	114	36
RSI-519P-400-H2-4-CB-SS-01	400	477	300	361	90	114	36
RSI-519P-500-H2-4-CB-SS-01	500	590	400	477	90	120	36
RSI-519P-650-H2-4-CB-SS-01	650	770	500	590	90	132	36
RSI-519P-800-H2-4-CB-SS-01	800	962	600	740	90	132	36

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