

# H2 Pump Drive 2021 Product Catalog

Rapid Rugged Global



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### **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, multiplex, triplex 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 in a system that require constant pressure or flow, then this is the drive for you.

#### **STANDARD FEATURES - HARDWARE**

- 240V: 7.5HP~25HP (ND), 5HP~20HP (HD)
- 480V: 7.5HP~800HP (ND), 5HP~600HP (HD)
- Protected Chassis IP20, 7.5~300HP / Open Chassis IP00, 400~800HP UL EnclosedType 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)

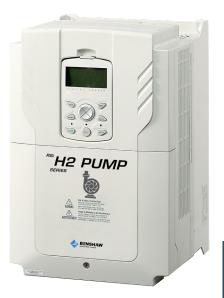
#### COMMUNICATIONS

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
- · Lead/Lag load share
- 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

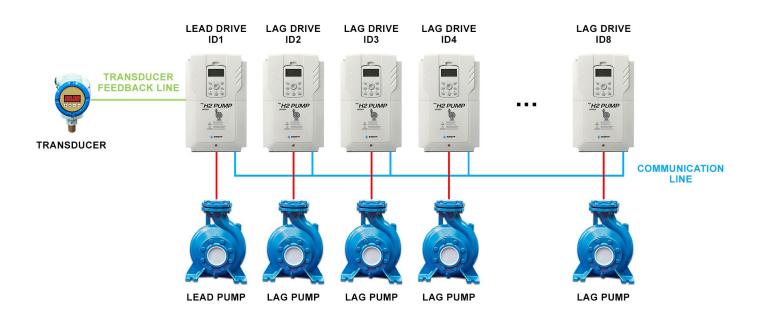
This mode is also referred to as "Master-Follower" or Lead-Lag/ Loadshare:

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 communications, which eliminates the need for additional options by using the Modbus RTU communications. 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
- The pump is controlled by the unique PID function of AC drive, 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 is 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 - PRICING**

| 230V    |              | Normal Duty |           | Heavy Duty |          |       |            |       |                      |        |            |
|---------|--------------|-------------|-----------|------------|----------|-------|------------|-------|----------------------|--------|------------|
|         |              | 120%        | OL/1 min. | 150% (     | OL/1min. | Dime  | nsions (in | ches) |                      |        |            |
| Model N | lumber       | ΗP          | Amps      | HP         | Amps     | Н     | W          | D     | Degree of Protection | Weight | List Price |
| VFD-RSI | I-007-H2P-2C | 7.5         | 22        | 5          | 17       | 9.13  | 6.30       | 7.13  | IP20                 | 7.3    | \$1,260    |
| VFD-RSI | I-010-H2P-2C | 10          | 30        | 7.5        | 24       | 9.13  | 6.30       | 7.13  | IP20                 | 7.3    | \$1,400    |
| VFD-RSI | I-015-H2P-2C | 15          | 42        | 10         | 32       | 9.13  | 6.30       | 7.13  | IP20                 | 7.3    | \$1,580    |
| VFD-RSI | I-020-H2P-2C | 20          | 56        | 15         | 46       | 11.42 | 7.09       | 8.08  | IP20                 | 10.1   | \$2,200    |
| VFD-RSI | I-025-H2P-2C | 25          | 69        | 20         | 60       | 13.78 | 8.66       | 8.79  | IP20                 | 15.7   | \$2,700    |

| 460V               | Normal Duty<br>120% OL/1 min. |       | Heavy Duty<br>150% OL/1min. |      | Dimensions (inches) |       |       |                      |        |            |
|--------------------|-------------------------------|-------|-----------------------------|------|---------------------|-------|-------|----------------------|--------|------------|
| Model Number       | HP                            | Amps  | HP                          | Amps | Н                   | W     | D     | Degree of Protection | Weight | List Price |
| VFD-RSI-007-H2P-4C | 7.5                           | 12    | 5                           | 8    | 9.13                | 6.30  | 7.13  | IP20                 | 7.3    | \$1,200    |
| VFD-RSI-010-H2P-4C | 10                            | 16    | 7.5                         | 12   | 9.13                | 6.30  | 7.13  | IP20                 | 7.3    | \$1,220    |
| VFD-RSI-015-H2P-4C | 15                            | 24    | 10                          | 15   | 9.13                | 6.30  | 7.13  | IP20                 | 7.4    | \$1,460    |
| VFD-RSI-020-H2P-4C | 20                            | 30    | 15                          | 22   | 11.42               | 7.09  | 8.08  | IP20                 | 10.1   | \$2,000    |
| VFD-RSI-025-H2P-4C | 25                            | 38    | 20                          | 28   | 11.42               | 7.09  | 8.08  | IP20                 | 10.6   | \$2,400    |
| VFD-RSI-030-H2P-4C | 30                            | 45    | 25                          | 35   | 13.78               | 8.66  | 8.79  | IP20                 | 16.5   | \$2,780    |
| VFD-RSI-040-H2P-4C | 40                            | 61    | 30                          | 41   | 13.78               | 8.66  | 8.79  | IP20                 | 16.5   | \$2,900    |
| VFD-RSI-050-H2P-4C | 50                            | 75    | 40                          | 55   | 17.72               | 10.83 | 11.18 | IP20                 | 57     | \$4,180    |
| VFD-RSI-060-H2P-4C | 60                            | 91    | 50                          | 67   | 20.08               | 12.80 | 11.18 | IP20                 | 77     | \$5,200    |
| VFD-RSI-075-H2P-4C | 75                            | 107   | 60                          | 81   | 20.08               | 12.80 | 11.18 | IP20                 | 77     | \$5,580    |
| VFD-RSI-100-H2P-4C | 100                           | 142   | 75                          | 106  | 21.67               | 12.80 | 12.17 | IP20                 | 95     | \$6,990    |
| VFD-RSI-125-H2P-4C | 125                           | 169   | 100                         | 136  | 21.67               | 12.80 | 12.17 | IP20                 | 95     | \$7,800    |
| VFD-RSI-150-H2P-4C | 150                           | 223** | 125                         | 169  | 27.80               | 11.81 | 15.20 | IP20                 | 123    | \$10,480   |
| VFD-RSI-200-H2P-4C | 200                           | 264** | 150                         | 195  | 27.80               | 11.81 | 15.20 | IP20                 | 123    | \$11,100   |
| VFD-RSI-250-H2P-4C | 250                           | 325** | 200                         | 255  | 27.76               | 14.96 | 15.59 | IP20                 | 165    | \$13,600   |
| VFD-RSI-300-H2P-4C | 300                           | 370** | 250                         | 303  | 27.76               | 14.96 | 15.59 | IP20                 | 165    | \$15,700   |
| VFD-RSI-400-H2P-4C | 400                           | 481** | 300                         | 375  | 36.34               | 16.77 | 17.32 | IP20                 | 265    | \$23,100   |
| VFD-RSI-500-H2P-4C | 500                           | 613** | 400                         | 478  | 39.37               | 23.62 | 19.69 | IP20                 | 409    | \$37,300   |
| VFD-RSI-650-H2P-4C | 650                           | 770** | 500                         | 591  | 39.37               | 23.62 | 19.69 | IP20                 | 409    | \$41,700   |
| VFD-RSI-800-H2P-4C | 800                           | 962** | 600                         | 740  | 41.50               | 30.55 | 19.67 | IP20                 | 584    | \$50,100   |

Units with \*\* rated for 110% current for 60 seconds.



### **H2P SERIES - INPUT AND OUTPUT SPECIFICATIONS**

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

|                              | RSI-XXX-H2F  | -2C  | (   | 007   | 010   | 015   | 020   | 025   |  |
|------------------------------|--|--|---|---|---|---|---|---|--|
|                              |  | HP   |   | 7.5   | 10  | 15  | 20  | 25  |  |
| 240V,                        | Normal Duty<br>120% OL   | kW   |   | 5.5   | 7.5   | 11  | 15  | 18.5  |  |
|                              | 120 % OL   | Amps   |   | 22  | 30  | 42  | 56  | 69  |  |
| Ø Input                      |  | HP   |   | 5   | 7.5   | 10  | 15  | 20  |  |
|                              | Heavy Duty   | kW   | ;   | 3.7   | 5.5   | 7.5   | 11  | 15  |  |
|                              | 150% OL  | Amps   |   | 17  | 24  | 32  | 46  | 60  |  |
| 240V,                        | Normal Duty  | HP   | :   | 3.0   | 5.0   | 7.5   | 10.0  | -   |  |
| Ø Input                      | 120% OL  | Amps   |   | 11  | 16  | 23  | 30  | 37  |  |
|                              |  | Rated Capacity   | r (kVA)   | 8.4   | 11.4  | 16.0  | 21.3  | 26.3  |  |
|                              |  |  | 0-400H  | 0-400Hz (V/Hz, Slip Compensation)   |   |   |   |   |  |
|                              | Output frequence   | У  | 0-120⊢  | Iz (IM Sensorless)  | )   |   |   |   |  |
|                              |  |  | 0-180   | Iz (PM Sensorless   | 5)  |   |   |   |  |
|                              | Output voltage (   | /)   | 3-Phas  | e 0-240 V   |   |   |   |   |  |
|                              | Voltage (V)  | Three-Phase  | e 3-Phas  | e 200-400 VAC (-1   | 15% -+10%)  |   |   |   |  |
|                              | voitage (v)  | Single-Phase   | e 1-Phas  | e 240 VAC (-5%  | +10%)   |   |   |   |  |
| Rated Input                  | Input frequency  | Three-Phase  |   | łz (+/-5%)  |   |   |   |   |  |
|                              |  | Single-Phase   | e 60Hz (-   | +/-5%) only   |   |   |   |   |  |
|                              | Rated Current (A   | )  | 2   | 3.7   | 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)   |  |
| Hea                          | t Dissipation (W)  |  |   | 180 248   |   | 330   | 451   | 600   |  |
| Deg                          | gree of Protection   |  | IP20, <b>f</b>  | or UL type 1 a  | add conduit   | box option.   |   |   |  |
| 30V, 7.5HP -                 | 30HP (5.5 - 22 kW)   |  |   |   |   |   |   | ,   |  |
|                              | RSI-XXX-H2P-4C   |  | 007   | 010   | 015   | 020   | 025   | 030   |  |
|                              | Newslo   | HP   | 7.5   | 10  | 15  | 20  | 25  | 30  |  |
|                              | Normal Duty<br>120% OL   | kW   | 5.5   | 7.5   | 11  | 15  | 18.5  | 22  |  |
|                              |  |  | 10  | 1.0   |   |   |   |   |  |
|                              |  | Amps   | 12  | 16  | 24  | 30  | 38  | 45  |  |
|                              |  | Amps<br>HP   | 5.0   | 16<br>7.5   | 24<br>10  | 30<br>15  | 38<br>20  | 45<br>25  |  |
| 180V,<br>3Ø Input            | Heavy Duty   |  |   |   |   |   |   |   |  |
|                              |  | HP   | 5.0   | 7.5   | 10  | 15  | 20  | 25  |  |
| 3Ø Input<br>240V,            | Heavy Duty   | HP<br>kW   | 5.0<br>3.7  | 7.5<br>5.5  | 10  | 15<br>11  | 20<br>15  | 25<br>18.5  |  |
| 9Ø Input<br>240V,            | Heavy Duty<br>150% OL  | HP<br>kW<br>Amps   | 5.0<br>3.7<br>8   | 7.5<br>5.5<br>12  | 10<br>7.5<br>15   | 15<br>11<br>22  | 20<br>15<br>28  | 25<br>18.5<br>35  |  |
| 3Ø Input<br>240V,            | Heavy Duty<br>150% OL<br>Normal Duty<br>120% OL  | HP<br>kW<br>Amps<br>HP   | 5.0<br>3.7<br>8<br>3-5  | 7.5<br>5.5<br>12<br>5   | 10<br>7.5<br>15<br>10   | 15<br>11<br>22<br>10  | 20<br>15<br>28<br>15  | 25<br>18.5<br>35<br>20  |  |
|                              | Heavy Duty<br>150% OL<br>Normal Duty<br>120% OL<br>Rate  | HP<br>kW<br>Amps<br>HP<br>Amps   | 5.0<br>3.7<br>8<br>3-5<br>6.8<br>9.1<br>0-400Hz (V/Hz   | 7.5<br>5.5<br>12<br>5<br>9.2<br>12.2<br>; Slip Compensat  | 10<br>7.5<br>15<br>10<br>14<br>18.3   | 15<br>11<br>22<br>10<br>17  | 20<br>15<br>28<br>15<br>28<br>15<br>22                      | 25<br>18.5<br>35<br>20<br>26                                    |  |
| 3Ø Input<br>240V,            | Heavy Duty<br>150% OL<br>Normal Duty<br>120% OL  | HP<br>kW<br>Amps<br>HP<br>Amps   | 5.0<br>3.7<br>8<br>3-5<br>6.8<br>9.1<br>0-400Hz (V/Hz<br>0-120Hz (IM S  | 7.5<br>5.5<br>12<br>5<br>9.2<br>12.2<br>c, Slip Compensat<br>ensorless)   | 10<br>7.5<br>15<br>10<br>14<br>18.3   | 15<br>11<br>22<br>10<br>17  | 20<br>15<br>28<br>15<br>28<br>15<br>22                      | 25<br>18.5<br>35<br>20<br>26                                    |  |
| 3Ø Input<br>240V,            | Heavy Duty<br>150% OL<br>Normal Duty<br>120% OL<br>Rate<br>Output frequency  | HP<br>kW<br>Amps<br>HP<br>Amps   | 5.0<br>3.7<br>8<br>3-5<br>6.8<br>9.1<br>0-400Hz (V/Hz<br>0-120Hz (IM S<br>0-180Hz (PM S   | 7.5<br>5.5<br>12<br>5<br>9.2<br>12.2<br>; Slip Compensat<br>ensorless)<br>Sensorless)   | 10<br>7.5<br>15<br>10<br>14<br>18.3   | 15<br>11<br>22<br>10<br>17  | 20<br>15<br>28<br>15<br>28<br>15<br>22                      | 25<br>18.5<br>35<br>20<br>26                                    |  |
| 3Ø Input<br>240V,            | Heavy Duty<br>150% OL<br>Normal Duty<br>120% OL<br>Rate  | HP<br>kW<br>Amps<br>HP<br>Amps<br>d Capacity (kVA)   | 5.0<br>3.7<br>8<br>3-5<br>6.8<br>9.1<br>0-400Hz (V/Hz<br>0-120Hz (IM S<br>0-180Hz (PM S<br>3-Phase 0-480  | 7.5<br>5.5<br>12<br>5<br>9.2<br>12.2<br>;, Slip Compensat<br>ensorless)<br>Sensorless)  | 10<br>7.5<br>15<br>10<br>14<br>18.3<br>ion)                                 | 15<br>11<br>22<br>10<br>17  | 20<br>15<br>28<br>15<br>28<br>15<br>22                      | 25<br>18.5<br>35<br>20<br>26                                    |  |
| Ø Input<br>40V,              | Heavy Duty<br>150% OL<br>Normal Duty<br>120% OL<br>Rate<br>Output frequency  | HP<br>kW<br>Amps<br>HP<br>Amps<br>d Capacity (kVA)   | 5.0<br>3.7<br>8<br>3-5<br>6.8<br>9.1<br>0-400Hz (V/Hz<br>0-120Hz (IM S<br>0-180Hz (PM S<br>0-180Hz (PM S<br>3-Phase 0-480<br>3-Phase 380-4  | 7.5<br>5.5<br>12<br>5<br>9.2<br>12.2<br>; Slip Compensat<br>ensorless)<br>Sensorless)<br>V<br>80 VAC (-15% -+1  | 10<br>7.5<br>15<br>10<br>14<br>18.3<br>ion)                                 | 15<br>11<br>22<br>10<br>17  | 20<br>15<br>28<br>15<br>28<br>15<br>22                      | 25<br>18.5<br>35<br>20<br>26                                    |  |
| Ø Input<br>40V,<br>Ø Input   | Heavy Duty<br>150% OL<br>Normal Duty<br>120% OL<br>Rate<br>Output frequency<br>Output voltage (V)  | HP<br>kW<br>Amps<br>HP<br>Amps<br>d Capacity (kVA)<br>d Capacity (kVA)                     | 5.0<br>3.7<br>8<br>3-5<br>6.8<br>9.1<br>0-400Hz (V/Hz<br>0-120Hz (IM S<br>0-120Hz (IM S<br>0-180Hz (PM S<br>3-Phase 0-480<br>3-Phase 380-4<br>1-Phase 480 V   | 7.5<br>5.5<br>12<br>5<br>9.2<br>12.2<br>5, Slip Compensat<br>ensorless)<br>Sensorless)<br>VV<br>80 VAC (-15% -+1<br>AC (-5% -+10%)                            | 10<br>7.5<br>15<br>10<br>14<br>18.3<br>ion)                                 | 15<br>11<br>22<br>10<br>17  | 20<br>15<br>28<br>15<br>28<br>15<br>22                      | 25<br>18.5<br>35<br>20<br>26                                    |  |
| Ø Input<br>40V,<br>Ø Input   | Heavy Duty<br>150% OL<br>Normal Duty<br>120% OL<br>Rate<br>Output frequency<br>Output voltage (V)  | HP<br>kW<br>Amps<br>HP<br>Amps<br>d Capacity (kVA)<br>d Capacity (kVA)                     | 5.0<br>3.7<br>8<br>3-5<br>6.8<br>9.1<br>0-400Hz (V/Hz<br>0-120Hz (IM S<br>0-180Hz (PM 3<br>3-Phase 0-480<br>3-Phase 380-4<br>1-Phase 480 V<br>50-60Hz (+/-5)  | 7.5<br>5.5<br>12<br>5<br>9.2<br>12.2<br>c, Slip Compensat<br>ensorless)<br>Sensorless)<br>VV<br>80 VAC (-15% -+1<br>AC (-5% -+10%)<br>%)                      | 10<br>7.5<br>15<br>10<br>14<br>18.3<br>ion)                                 | 15<br>11<br>22<br>10<br>17  | 20<br>15<br>28<br>15<br>28<br>15<br>22                      | 25<br>18.5<br>35<br>20<br>26                                    |  |
| Ø Input<br>40V,<br>Ø Input   | Heavy Duty<br>150% OL<br>Normal Duty<br>120% OL<br>Rate<br>Output frequency<br>Output voltage (V)<br>Voltage (V)<br>Input frequency                                      | HP<br>kW<br>Amps<br>HP<br>Amps<br>d Capacity (kVA)<br>d Capacity (kVA)                     | 5.0<br>3.7<br>8<br>3-5<br>6.8<br>9.1<br>0-400Hz (V/Hz<br>0-120Hz (IM S<br>0-120Hz (IM S<br>0-180Hz (PM S<br>3-Phase 0-480<br>3-Phase 380-4<br>1-Phase 480 V<br>50-60Hz (+/-5%)                                | 7.5<br>5.5<br>12<br>5<br>9.2<br>12.2<br>5, Slip Compensat<br>ensorless)<br>5<br>80 VAC (-15% -+1<br>AC (-5% -+10%)<br>%)<br>only                              | 10<br>7.5<br>15<br>10<br>14<br>18.3<br>ion)                                 | 15<br>11<br>22<br>10<br>17<br>23.0  | 20<br>15<br>28<br>15<br>22<br>29.0                          | 25<br>18.5<br>35<br>20<br>26<br>34.3                            |  |
| Ø Input<br>40V,<br>Ø Input   | Heavy Duty<br>150% OL<br>Normal Duty<br>120% OL<br>Rate<br>Output frequency<br>Output voltage (V)<br>Voltage (V)<br>Input frequency<br>Rated Current (A)                 | HP<br>kW<br>Amps<br>HP<br>Amps<br>d Capacity (kVA)<br>d Capacity (kVA)                     | 5.0<br>3.7<br>8<br>3-5<br>6.8<br>9.1<br>0-400Hz (V/Hz<br>0-120Hz (IM S<br>0-120Hz (IM S<br>0-180Hz (PM S<br>3-Phase 0-480<br>3-Phase 380-4<br>1-Phase 480 V<br>50-60Hz (+/-5%)<br>12.2                        | 7.5<br>5.5<br>12<br>5<br>9.2<br>12.2<br>5, Slip Compensat<br>ensorless)<br>Sensorless)<br>VV<br>80 VAC (-15% -+1<br>AC (-5% -+10%)<br>%)<br>only<br>17.5      | 10<br>7.5<br>15<br>10<br>14<br>18.3<br>ion)                                 | 15<br>11<br>22<br>10<br>17<br>23.0  | 20<br>15<br>28<br>15<br>22<br>29.0                          | 25<br>18.5<br>35<br>20<br>26<br>34.3                            |  |
| 3Ø Input<br>240V,<br>Ø Input | Heavy Duty<br>150% OL<br>Normal Duty<br>120% OL<br>Rate<br>Output frequency<br>Output voltage (V)<br>Voltage (V)<br>Input frequency                                      | HP<br>kW<br>Amps<br>HP<br>Amps<br>d Capacity (kVA)<br>d Capacity (kVA)                     | 5.0<br>3.7<br>8<br>3-5<br>6.8<br>9.1<br>0-400Hz (V/Hz<br>0-120Hz (IM S<br>0-120Hz (IM S<br>0-180Hz (PM 3<br>3-Phase 0-480<br>3-Phase 380-4<br>1-Phase 480 V<br>50-60Hz (+/-5%)<br>12.2<br>7.3                 | 7.5<br>5.5<br>12<br>5<br>9.2<br>12.2<br>; Slip Compensat<br>ensorless)<br>Sensorless)<br>V<br>80 VAC (-15% -+1<br>AC (-5% -+10%)<br>%)<br>only<br>17.5<br>7.3 | 10<br>7.5<br>15<br>10<br>14<br>18.3<br>ion)<br>10%)                         | 15<br>11<br>22<br>10<br>17<br>23.0<br>23.0<br>33.4<br>10.1  | 20<br>15<br>28<br>15<br>22<br>29.0<br>29.0<br>42.5<br>10.6  | 25<br>18.5<br>35<br>20<br>26<br>34.3<br>50.7<br>16.5            |  |
| Kated Input                  | Heavy Duty<br>150% OL<br>Normal Duty<br>120% OL<br>Rate<br>Output frequency<br>Output voltage (V)<br>Voltage (V)<br>Input frequency<br>Rated Current (A)<br>ght lbs (kg) | HP<br>kW<br>Amps<br>HP<br>Amps<br>d Capacity (kVA)<br>d Capacity (kVA)                     | 5.0<br>3.7<br>8<br>3-5<br>6.8<br>9.1<br>0-400Hz (V/Hz<br>0-120Hz (IM S<br>0-120Hz (IM S<br>0-180Hz (PM S<br>3-Phase 0-480<br>3-Phase 380-4<br>1-Phase 480 V<br>50-60Hz (+/-5%)<br>12.2<br>7.3<br>(3.3)        | 7.5<br>5.5<br>12<br>5<br>9.2<br>12.2<br>5, Slip Compensat<br>ensorless)<br>5<br>80 VAC (-15% -+1<br>AC (-5% -+10%)<br>%)<br>only<br>17.5<br>7.3<br>(3.3)      | 10<br>7.5<br>15<br>10<br>14<br>18.3<br>ion)<br>10%)<br>26.5<br>7.5<br>(3.4) | 15<br>11<br>22<br>10<br>17<br>23.0<br>33.4<br>10.1<br>(4.6)   | 20<br>15<br>28<br>15<br>22<br>29.0<br>42.5<br>10.6<br>(4.8) | 25<br>18.5<br>20<br>26<br>34.3<br>34.3<br>50.7<br>16.5<br>(7.5) |  |
| Kated Input                  | Heavy Duty<br>150% OL<br>Normal Duty<br>120% OL<br>Rate<br>Output frequency<br>Output voltage (V)<br>Voltage (V)<br>Input frequency<br>Rated Current (A)                 | HP<br>kW<br>Amps<br>HP<br>Amps<br>d Capacity (kVA)<br>d Capacity (kVA)<br>d Capacity (kVA) | 5.0<br>3.7<br>8<br>3-5<br>6.8<br>9.1<br>0-400Hz (V/Hz<br>0-120Hz (IM S<br>0-120Hz (IM S<br>0-180Hz (PM S<br>3-Phase 0-480<br>3-Phase 380-4<br>1-Phase 480 V<br>50-60Hz (+/-5%)<br>12.2<br>7.3<br>(3.3)<br>172 | 7.5<br>5.5<br>12<br>5<br>9.2<br>12.2<br>; Slip Compensat<br>ensorless)<br>Sensorless)<br>V<br>80 VAC (-15% -+1<br>AC (-5% -+10%)<br>%)<br>only<br>17.5<br>7.3 | 10<br>7.5<br>15<br>10<br>14<br>18.3<br>ion)<br>26.5<br>7.5<br>(3.4)<br>322  | 15         11         22         10         17         23.0         33.4         10.1         (4.6)         451 | 20<br>15<br>28<br>15<br>22<br>29.0<br>29.0<br>42.5<br>10.6  | 25<br>18.5<br>35<br>20<br>26<br>34.3<br>50.7<br>16.5            |  |

### **H2P SERIES - INPUT AND OUTPUT SPECIFICATIONS**

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

|             | RSI-XXX-H2P-4C         |                   | 040                               | 050                | 060                | 075   | 100   | 125   |  |  |  |  |
|-------------|------------------------|-------------------|-----------------------------------|--------------------|--------------------|-------|-------|-------|--|--|--|--|
|             |                        | HP                | 40                                | 50                 | 60                 | 75    | 100   | 125   |  |  |  |  |
| 480V,       | Normal Duty<br>120% OL | kW                | 30                                | 37                 | 45                 | 55    | 75    | 90    |  |  |  |  |
|             |                        | Amps              | 61                                | 75                 | 91                 | 107   | 142   | 169   |  |  |  |  |
| 3Ø Input    |                        | HP                | 30                                | 40                 | 50                 | 60    | 75    | 100   |  |  |  |  |
|             | Heavy Duty<br>150% OL  | kW                | 22                                | 30                 | 37                 | 45    | 55    | 75    |  |  |  |  |
|             | 130 % 02               | Amps              | 41                                | 55                 | 67                 | 81    | 106   | 136   |  |  |  |  |
| 240V,       | Normal Duty            | HP                | 25                                | 30                 | 30                 | 40    | 50-60 | 60    |  |  |  |  |
| 1Ø Input    | 120% OL                | Amps              | 36                                | 39                 | 47                 | 55    | 73    | 86    |  |  |  |  |
|             | Rate                   | ed Capacity (kVA) | 46.5                              | 57.1               | 69.4               | 82.0  | 108.2 | 128.8 |  |  |  |  |
|             |                        |                   | 0-400Hz (V/Hz, Slip Compensation) |                    |                    |       |       |       |  |  |  |  |
|             | Output frequency       |                   | 0-120Hz (IM Sensorless)           |                    |                    |       |       |       |  |  |  |  |
|             |                        |                   | 0-180Hz (PM Sensorless)           |                    |                    |       |       |       |  |  |  |  |
|             | Output voltage (V)     |                   | 3-Phase 0-480V                    |                    |                    |       |       |       |  |  |  |  |
|             | Voltage (V)            | Three-Phase       | 3-Phase 380-480 VAC (-15% -+10%)  |                    |                    |       |       |       |  |  |  |  |
|             |                        | Single-Phase      | 1-Phase 480 VAC (-5% -+10%)       |                    |                    |       |       |       |  |  |  |  |
| Rated Input | Input frequency        | Three-Phase       | 50-60Hz (+/-5%)                   |                    |                    |       |       |       |  |  |  |  |
|             | mput nequency          | Single-Phase      | 60Hz (+/-5%) only                 |                    |                    |       |       |       |  |  |  |  |
|             | Rated Current (A)      |                   | 69.1                              | 69.3               | 84.6               | 100.1 | 133.6 | 160.0 |  |  |  |  |
| Weig        | ght lbs (kg)           | lbs               | 16.5                              | 57.3               | 77.2               | 77.2  | 94.8  | 94.8  |  |  |  |  |
|             |                        | kg                | (7.5)                             | (26)               | (35)               | (35)  | (43)  | (43)  |  |  |  |  |
| Hea         | at Dissipation (W)     |                   | 880                               | 1170               | 1443               | 1710  | 2090  | 2775  |  |  |  |  |
| Deg         | gree of Protection     |                   | IP20, UL Type                     | 1 achieved with op | otional conduit bo | x     |       |       |  |  |  |  |

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

|                      | RSI-XXX-H2P-4          | 4C                      | 150  | 200                              | 250        | 300    | 400   | 500     | 650     | 800   |  |  |
|----------------------|------------------------|-------------------------|--|----------------------------------|------------|--------|-------|---------|---------|-------|--|--|
|                      |                        | HP                      | 150  | 200                              | 250        | 300    | 400   | 500     | 650     | 800   |  |  |
|                      | Normal Duty<br>110% OL | kW                      | 110  | 132                              | 160        | 185    | 250   | 315     | 400     | 500   |  |  |
|                      | 11070 02               | Amps                    | 223  | 264                              | 325        | 370    | 481   | 613     | 770     | 962   |  |  |
| 180V,<br>3Ø Input    |                        | HP                      | 125  | 150                              | 200        | 250    | 300   | 400     | 500     | 600   |  |  |
| oo mpar              | Heavy Duty<br>150% OL  | kW                      | 90   | 110                              | 132        | 160    | 185   | 250     | 315     | 375   |  |  |
|                      | 150 % OL               | Amps                    | 169  | 195                              | 255        | 303    | 375   | 478     | 591     | 740   |  |  |
|                      | Rate                   | d Capacity (kVA)        | 170  | 201                              | 248        | 282    | 367   | 467     | 587     | 733   |  |  |
|                      | Output freque          | ,                       |  | Hz, Slip Comp<br>1 Sensorless)   | pensation) |        |       |         |         |       |  |  |
|                      |                        |                         |  |                                  |            |        |       |         |         |       |  |  |
|                      | <b>U</b>               | Voltage (V) Three-Phase |  | 3-Phase 380-480 VAC (-15% -+10%) |            |        |       |         |         |       |  |  |
| Rated Input          | Input<br>frequency     |                         |  | -5%)                             |            |        |       |         |         |       |  |  |
|                      | Rated Current (A)      |                         | 215.1  | 254.6                            | 315.3      | 358.9  | 469.3 | 598.1   | 751.3   | 938.6 |  |  |
| Weigh                | t 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) |  |  |
| Hea                  | at Dissipation (V      | V)                      | 3960   | 4752                             | 5600       | 6475   | 8500  | 10.4k   | 13.2k   | 16k   |  |  |
| Degree of Protection |                        |                         | ion 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 - SPECIFICATION DETAILS**

|           | ltems                           |   | Description               |                            |  |  |  |  |
|-----------|---------------------------------|---|---------------------------|----------------------------|--|--|--|--|
|           | Control method                  | V/F control   |                           |                            |  |  |  |  |
|           |                                 | Digital command: 0.01Hz   |                           |                            |  |  |  |  |
| Control   | Frequency settings resolution   | Analog command: 0.06Hz (60Hz stan   | dard)                     |                            |  |  |  |  |
|           | Frequency                       | 1% of maximum output frequency  |                           |                            |  |  |  |  |
|           | V/F pattern                     | Linear, Square Reduction, User V/F  |                           |                            |  |  |  |  |
|           |                                 |   |                           |                            |  |  |  |  |
|           | Overload capacity (Normal Duty) | 1HP~125HP (0.75~90 kW)  |                           | Rated current: 120% 1 min. |  |  |  |  |
|           |                                 | 150HP~800HP (110~500kW)   |                           | Rated current: 110% 1 min. |  |  |  |  |
|           | Torque boost                    | Manual torque boost, automatic torqu  | ue boost                  |                            |  |  |  |  |
|           | Operation Type                  |   |                           |                            |  |  |  |  |
|           | Start/Stop                      | Keypad, Terminal strip, Communicatio  | ons                       |                            |  |  |  |  |
|           |                                 | Analog type: -10 - 10V, 0-10 V, 0-20 m.   | A (Main and Auxiliary)    |                            |  |  |  |  |
|           | Frequency settings              | Digital type: keypad, pulse train input   |                           |                            |  |  |  |  |
|           |                                 | Communication: RS-485 (Modbus), Fieldbus Options  |                           |                            |  |  |  |  |
|           |                                 | H2 Pump Software  | BACnet and Metasys-N2     | 2                          |  |  |  |  |
|           |                                 |   | Load Tuning               |                            |  |  |  |  |
|           |                                 | MMC - Multi-Motor Control   | Decel Valve Ramp          |                            |  |  |  |  |
|           |                                 | Lead/Lag and Alternating  |                           |                            |  |  |  |  |
|           |                                 | Pre-Fill, Soft Fill   | Flow Compensation         | Flow Compensation          |  |  |  |  |
|           |                                 | Start and End Ramp  | Energy Saving Operation   | n                          |  |  |  |  |
|           |                                 | Backspin Timer  |                           |                            |  |  |  |  |
|           |                                 | Flow Compensation   |                           |                            |  |  |  |  |
|           |                                 | Pump Clean Operation  |                           |                            |  |  |  |  |
|           |                                 | Basic   | Advanced                  | Advanced                   |  |  |  |  |
| Operation |                                 | Quick Start   | Auto Tuning               |                            |  |  |  |  |
|           |                                 | Accel/Decel Times   |                           |                            |  |  |  |  |
|           |                                 | Start/Stop Operation  | Torque Limits             |                            |  |  |  |  |
|           |                                 | Frequency Reference   |                           |                            |  |  |  |  |
|           |                                 | Sources   |                           |                            |  |  |  |  |
|           |                                 | Jog and Jog Start   | Event Timer (RTC)         |                            |  |  |  |  |
|           |                                 | Torque Boost  | Energy Save Mode          |                            |  |  |  |  |
|           | Functions                       | 2nd Source (HOA)  | Multi-Stage Accel/Decel   | Times                      |  |  |  |  |
|           |                                 | Auxiliary Frequency   | Dwell Frequency Operation |                            |  |  |  |  |
|           |                                 | Auxiliary Frequency         Dwell Frequency Operation           Reference         Regen Avoidance |                           |                            |  |  |  |  |
|           |                                 | Negen Avoidance           V/Hz. Control         VFD Fan Control                                   |                           |                            |  |  |  |  |
|           |                                 | V/Hz. Pattern   | Timer                     |                            |  |  |  |  |
|           |                                 | Step Frequencies/ Fixed Speed   |                           |                            |  |  |  |  |
|           |                                 | Accel/Decel Pattern   | Pre-Heat Loss of Power    |                            |  |  |  |  |
|           |                                 | Accel/Decel Pattern         Loss of Power           Start Modes         KEB (Ride Through)        |                           |                            |  |  |  |  |
|           |                                 | Start Hodes         KEB (Hide Hilodgi)           Stop Modes         Safe Stop                     |                           |                            |  |  |  |  |
|           |                                 | FWD/REV Run Prevention  | Speed Search              |                            |  |  |  |  |

## **H2P SERIES - SPECIFICATION DETAILS**

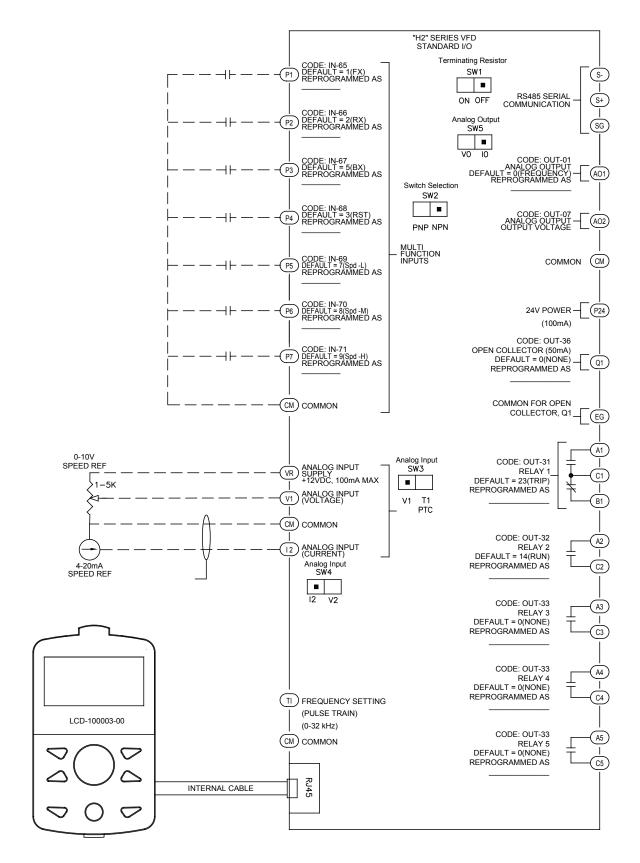
|            | l         | tems                             |  | Description              |  |  |  |  |
|------------|-----------|----------------------------------|--|--------------------------|--|--|--|--|
|            |           |                                  | Auto Start   | Braking                  |  |  |  |  |
|            |           |                                  | Auto Reset/Restart   | Power Braking            |  |  |  |  |
|            |           |                                  | Frequency Limits   | DC Injection Braking     |  |  |  |  |
|            | Functions |                                  | Jump Frequencies   | Flux Braking             |  |  |  |  |
|            |           |                                  | 3-Wire Control   | Stall Prevention         |  |  |  |  |
|            |           |                                  | Fire Mode  | External Brake Control   |  |  |  |  |
|            |           | Digital input terminals<br>P1-P7 | Select PNP (Source) or NPN (Sink) mode. Functions of the digital inputs are set with parame<br>IN-65 through IN-71 |                          |  |  |  |  |
|            |           |                                  |  | 2nd Source - HOA/LOR     |  |  |  |  |
|            |           |                                  | Forward/Reverse Operation  | Up/Down Operation        |  |  |  |  |
|            |           |                                  | Reset  | Analog Hold              |  |  |  |  |
|            |           |                                  | External Trip  | PID Disable              |  |  |  |  |
|            | Input     |                                  | Emergency Stop   | Jog Start FWD/REV        |  |  |  |  |
| Operation  | linput    | Functions                        | Output Disable (Bx)  | Pre-Excite               |  |  |  |  |
|            |           |                                  | Jog  | Timer Input              |  |  |  |  |
|            |           |                                  | Fixed Speed - Step   | Fire Mode                |  |  |  |  |
|            |           |                                  | Frequency  | Event Timer              |  |  |  |  |
|            |           |                                  | Run Enable/Disable (Safety)  | Pre-Heat                 |  |  |  |  |
|            |           | Pulse train                      | 0-30 kHz, Low Level: 0-0.8 V, High Level: 3.5-12 V   |                          |  |  |  |  |
|            |           |                                  | N.O. : Less than AC 250V 2A, DC 30V 3A   |                          |  |  |  |  |
|            |           | (1) Fault relay (Form C)         | N.O.: Less than AC 250V 1A, DC 30V   | / 1A                     |  |  |  |  |
|            | Output    | (4) Programmable relays          | N.O. (A-C): Less than 250V, 5A   |                          |  |  |  |  |
|            |           | (Form A)                         | Less than DC 30V, 5A   |                          |  |  |  |  |
|            |           | (1) Open collector terminal      | Less than DC 26V, 50 mA  |                          |  |  |  |  |
|            |           | Analog output                    | 0-12 Vdc (0-20 mA): Selectable Frequency, output current, output voltage, DC bus voltage, others                   |                          |  |  |  |  |
|            |           | Pulse train                      | Maximum 32 kHz   |                          |  |  |  |  |
|            |           |                                  | Motor Over Load  | Fan Trip                 |  |  |  |  |
|            |           |                                  | Under Load   | Internal Fan Trip        |  |  |  |  |
|            |           |                                  | Over Current 1   | Motor Over Heat          |  |  |  |  |
|            |           |                                  | Over Voltage   | Lost Keypad              |  |  |  |  |
|            |           |                                  | Low Voltage  | Fuse Open                |  |  |  |  |
|            |           |                                  | Low Voltage 2  | Pipe Broken              |  |  |  |  |
|            |           |                                  | Ground Fault   | Broken Belt              |  |  |  |  |
| Protection | Trip      |                                  | E-Thermal  | Lost Command (Speed Ref) |  |  |  |  |
| Function   |           |                                  | 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 - SPECIFICATION DETAILS**

|                     | Items                    | Description   |
|---------------------|--------------------------|---|
|                     | Alarm                    | Command loss, Motor overload/under load, Broken Belt, Inverter overload, DB (braking) rate alarm, Pump Clean, Pipe Broken, Fire Mode, Level Detection (LDT) |
| Protection Function |                          | Less than 8 ms: Continue Operation  |
|                     | Instantaneous Power Loss | More than 8 ms: KEB and/or Auto restart operation   |
|                     | Cooling type             | Forced fan cooling structure  |
|                     |                          | UL Open, IP20: 1HP~7.5HP (0.75kW~5.5kW)   |
|                     | Protection structure     | UL Open, IP00: 400HP~800HP (250kW~500kW)  |
|                     |                          | UL Type 1 with conduit box (option) installation (up to 800 HP)   |
|                     | Ambient temperature      | -10°C to 50°C. 2.5% current derate per degree C above 40°C (25% derate at 50°C ambient).  |
|                     |                          | No ice or frost should be present   |
|                     | Ambient humidity         | Relative humidity less than 95% RH (to avoid condensation)  |
| Structure / working | Storage temperature      | -4°F~149°F (-20°C~65°C)   |
| environment         | Surrounding environment  | Prevent contact with corrosive gases, inflammable gases, oil stains, dust and other pollutants.<br>1HP~800HP (0.75 kW ~ 500 kW) Pollution Degree 2          |
|                     |                          | Maximum 3,280 ft (1,000m) above sea level for standard operation.   |
|                     | Operation altitude       | 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.                               |
|                     | Operation oscillation    | Less than 1.0 G (9.8 m/sec <sup>2</sup> )   |
|                     | Pressure                 | 10~15 PSI (70-106 kPa)  |

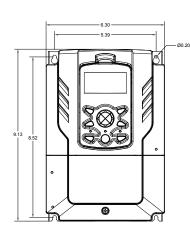
### **H2P SERIES - WIRING**

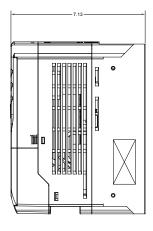




240V, 7.5 HP - 15 HP

480V, 7.5 HP - 15 HP



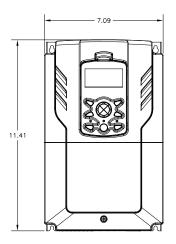


FRONT VIEW

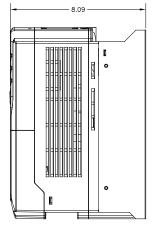
RIGHT SIDE VIEW

240V, 20 HP

480V, 20 HP - 25 HP



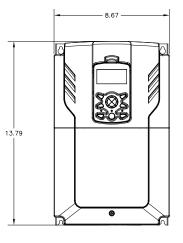
FRONT VIEW

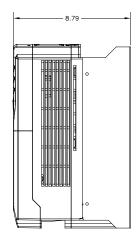


RIGHT SIDE VIEW

240V, 25 HP

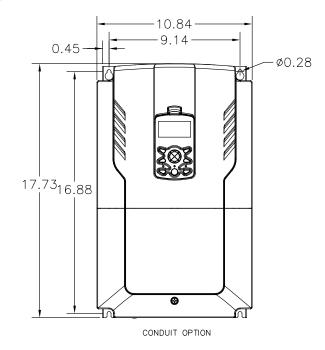
480V, 30 HP - 40 HP

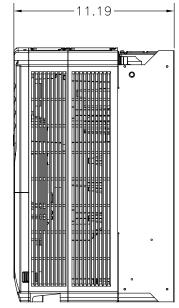




FRONT VIEW

480V, 50 HP

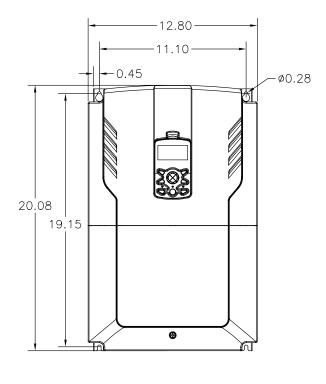




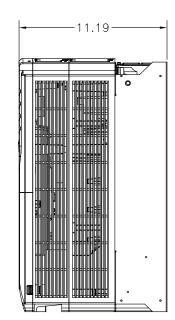
FRONT VIEW

RIGHT SIDE VIEW

480V, 60 HP - 75 HP

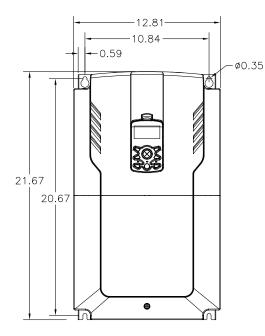


FRONT VIEW





480V, 100 HP - 125 HP



FRONT VIEW

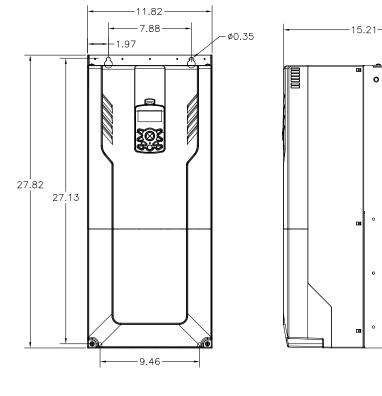
RIGHT SIDE VIEW

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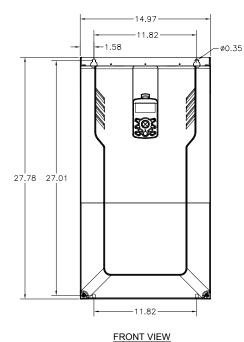
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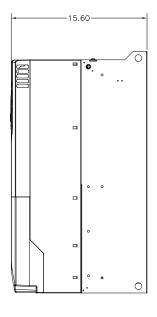
480V, 150 HP - 200 HP



FRONT VIEW

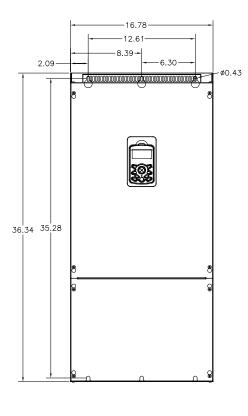
480V, 250 HP - 300 HP

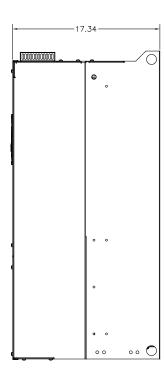




RIGHT SIDE VIEW

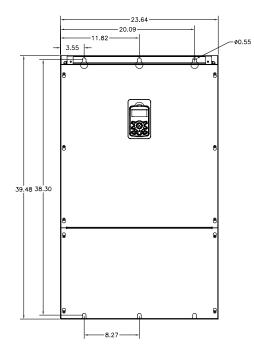
480V, 400 HP



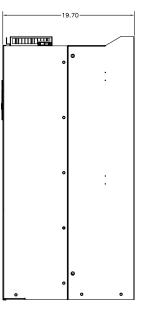


FRONT VIEW

480V, 500 HP - 650 HP

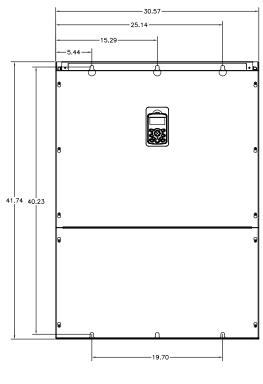


FRONT VIEW

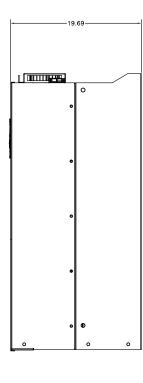


RIGHT SIDE VIEW

480V, 800 HP



FRONT VIEW





Benshaw's standard products are stocked in warehouses in the USA and Canada... ready for shipment to support your critical needs:

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