

BHM Construction, LLC.

License # 900404

221 Gateway Rd West, Suite 405

Napa, Ca. 94558

(707) 643-4580-Tel (707) 643-4581-Fax

Project: Sylvia Mendez Elementary School

BID CLARIFICATION #6

- 1) The Bid Date is still set for March 28th, 2024 at 3pm, with the following exception:
 - Electrical scopes are to be provided by April 1st, 2024
 - Electrical scopes are to be in by April 1st, 2024, and final bids are to be submitted by April 2nd, 2024 at 10AM.

- 2) Please see attached RFI responses:

RFI 018 Backfill on the interior of the building

RFI 020 Pump & Boiler Selections

REQUEST FOR INFORMATION

| | | | |
|--|---|----------------------------|---------------------|
| PROJECT NAME Sylvia Mendez Elementary School | | JOB NO. 220 | |
| | | Pre-Bid RFI NO. 018 | |
| TO: LPA 60 South Market Street, Ste. 1250 San Jose, California 95113 | FROM: BHM Construction, Inc. 221 Gateway Road W, Ste.405, Napa, CA 94558 | | |
| SUBJECT: Backfill on the interior of the building | | | |
| CATEGORY: <input checked="" type="checkbox"/> NEED ADDITIONAL INFORMATION | | | |
| SPEC SECTION: | PARAGRAPH NO: | DRAWING NO: | DETAIL: |
| DESCRIPTION: We are looking at options for backfill on the interior of the building after excavation and structural concrete has been placed. Will ¾ Clean Crush be acceptable as backfill at all interior locations? | | | |
| CONTRACTOR'S PROPOSED RESOLUTION: | | | |
| <input type="checkbox"/> ATTACHMENT(S): | | | |
| <input type="checkbox"/> COST IMPACT: \$ EST. <input type="checkbox"/> TIME IMPACT: EST. | | | |
| CONTRACTOR SIGNATURE: | Leisa Peterson, PE | DATE ISSUED: 3/26/24 | DATE REQUIRED: ASAP |
| RESPONSE: | ZFA Structural Engineers/ Kate Spiesman & Angie Sommer 3/27/2024: ¾" gravel is structurally acceptable for backfill at the interior of the building after excavation and concrete has been placed, but ZFA defers to the geotechnical engineer's backfill recommendations. | | |
| <input type="checkbox"/> ATTACHMENTS: | | | |
| ARCHITECT SIGNATURE: | | | DATE: |

REQUEST FOR INFORMATION

| | | | |
|--|--------------------|--|---------------------|
| PROJECT NAME Sylvia Mendez Elementary School | | JOB NO. 220 | |
| | | Pre-Bid RFI NO. 020 | |
| TO: LPA 60 South Market Street, Ste. 1250 San Jose, California 95113 | | FROM: BHM Construction, Inc. 221 Gateway Road W, Ste.405, Napa, CA 94558 | |
| SUBJECT: Pump & Boiler Selections | | | |
| CATEGORY: <input checked="" type="checkbox"/> NEED ADDITIONAL INFORMATION | | | |
| SPEC SECTION: | PARAGRAPH NO: | DRAWING NO: | DETAIL: |
| DESCRIPTION: Please see the attached RFI from Heat Transfer Boiler Company. CONTRACTOR'S PROPOSED RESOLUTION: ATTACHMENTS: 23 pages | | | |
| <input type="checkbox"/> COST IMPACT: \$ EST. <input type="checkbox"/> TIME IMPACT: ___ EST. | | | |
| CONTRACTOR SIGNATURE: | Leisa Peterson, PE | DATE ISSUED: 3/26/24 | DATE REQUIRED: ASAP |
| RESPONSE: All pumps shall be single manufacturer - Bell & Gossett. Pump manufacturer and models shall be clarified in forthcoming addendum but baseline flow, head pressure, and options/remarks listed will not change. Pumps shall meet all required performance data listed in mechanical schedules. Regarding the boilers, LPA and the owner will not accept the proposal of Raypak or any alternate boiler manufacturer. Contractors to bid Patterson Kelly boiler as listed per boiler schedule. <u>LPA Mechanical E. Pulido R1</u> 3/27/24 | | | |
| <input type="checkbox"/> ATTACHMENTS: / | | | |
| ARCHITECT /SIGNATURE: | | | DATE: |

From: Jesus Quintero <Jesus@htecompany.com>
Sent: Monday, March 25, 2024 12:17 PM
To: Ring, Erik <ering@lpadesignstudios.com>
Cc: Frank Perez <Frank@htecompany.com>
Subject: Sylvia Mendez Elementary School- Pump & Boiler Selections

Good Morning Erik,

I'm with Heat Transfer Equipment Company, the Northern CA Armstrong representative bidding the pumps on the Sylvia Mendez Elementary School project in Berkeley, CA. Just wanted to reach out because the scheduled **Armstrong pumps for P-1,2** will not be capable of meeting the head requirement of 75' shown in the equipment schedule (please see pump curve below). With your approval, we would like to offer the attached selections instead. These are Armstrong vertical inline pumps with integrated VFDs suited for delivering the required duty point of 115gpm @ 75' as listed on the pump schedule. Additionally, I was hoping to get your approval on the attached Raypak boiler selection that we would like to offer as an equal to the Patterson-Kelley boilers (B-1,2,3,4) on the project.

Our bid is due to the contractor by 3/27, so I'm hoping we can get a response before then if possible. Please let me know if you have any questions or concerns in approving these alternate selections. I'm happy to provide anything else you may need for this. Thank you very much for your time and help, I hope to hear from you soon!

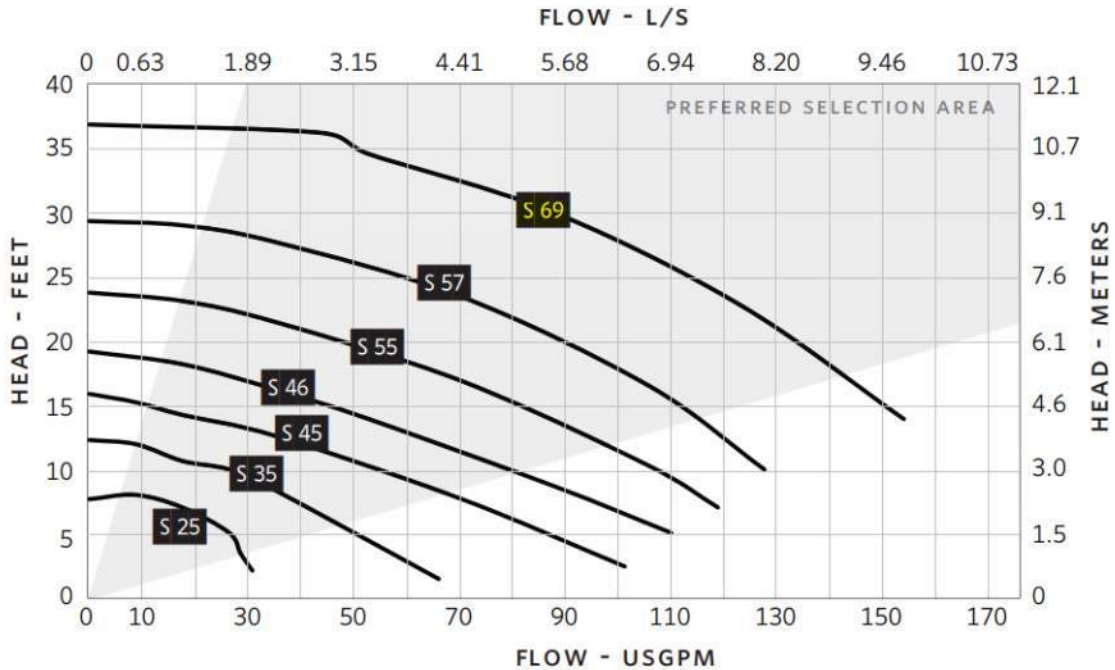
| BOILER SCHEDULE | | | | | | | | | | | | | | | | | | | |
|-----------------|------------------|----------------|-----------------|------------------|-------------------|----------------|------------------|------------------|----------------|--------------|---------|-------|------------|-------------|----------------------|------------------------|---------------------|---------------------|---------|
| UNIT | | | BOILER DATA | | | | CONNECTIONS | | ELECTRICAL | | | | | | | | | | |
| TAG | MFR | MODEL | LOCATION | INPUT (MMBtu/hr) | OUTPUT (MMBtu/hr) | MAX FLOW (GPM) | SUPPLY TEMP (°F) | RETURN TEMP (°F) | WATER (IN/OUT) | GAS (IN/OUT) | VOLTAGE | PHASE | WHS | MOCP | UNIT SIZE (L/W/H) FT | OPERATING HEIGHT (LBS) | INSTALL. DETAIL NO. | CONTROL. DETAIL NO. | REMARKS |
| B-1 | PATTERSON-KELLEY | P-K SOLIS 2000 | NORTH MECH ROOM | 2000 | 1620 | 162 | 140 | 130 | 3" | 1-1/2" | 208 | 1 | 10-A 118 A | 84"X39"X60" | 3000 | 030-AMT-04 | 030-AMB-01 | 1, 2, 3, 4, 5, 6 | |
| B-2 | PATTERSON-KELLEY | P-K SOLIS 2000 | NORTH MECH ROOM | 2000 | 1620 | 162 | 140 | 130 | 3" | 1-1/2" | 208 | 1 | 10-A 118 A | 84"X39"X60" | 3000 | 030-AMT-04 | 030-AMB-01 | 1, 2, 3, 4, 5, 6 | |
| B-3 | PATTERSON-KELLEY | P-K SOLIS 2000 | SOUTH MECH ROOM | 2000 | 1620 | 162 | 140 | 130 | 3" | 1-1/2" | 208 | 1 | 10-A 118 A | 84"X39"X60" | 3000 | 030-AMT-04 | 030-AMB-01 | 1, 2, 3, 4, 5, 6 | |
| B-4 | PATTERSON-KELLEY | P-K SOLIS 2000 | SOUTH MECH ROOM | 2000 | 1620 | 162 | 140 | 130 | 3" | 1-1/2" | 208 | 1 | 10-A 118 A | 84"X39"X60" | 3000 | 030-AMT-04 | 030-AMB-01 | 1, 2, 3, 4, 5, 6 | |

- REMARKS:
 1. ELECTRICAL: SINGLE POINT OF CONNECTION TO BOILER. PROVIDE SEPARATE ELECTRICAL 120V/1PH CIRCUIT FOR FACTORY PUMP (SEE REMARK #6).
 2. TURNDOWN: 10:1 MECHANICAL TURNDOWN MODULATION
 3. MATERIALS: 316 SS PIPES & TUBES SHEET WITH DN 50 HEAT EXCHANGER SHELL
 4. CONTROL: FACTORY CONTROLLER WITH ENG. CABINET MESTP INTERFACE CONVERTER
 5. PROVIDE PH NEUTRALIZATION TREATMENT ALKALINE TECHNOLOGIES MODEL 3000
 6. PROVIDE A FACTORY PUMP FOR EACH BOILER WITH A DEDICATED ELECTRICAL CIRCUIT

| PUMP SCHEDULE | | | | | | | | | | | | | | | | | | | |
|---------------|----------------|-------------|-------------------|-------------|--------|------------|------------|----|------|---------------|------------|-------|-------------|------|----------------------|------------------------|---------------------|---------------------|---------|
| UNIT | | | PUMP DATA | | | | MOTOR DATA | | | | ELECTRICAL | | | | | | | | |
| TAG | MFR | MODEL | SERVICE | LOCATION | TYPE | FLOW (GPM) | HEAD (FT) | HP | RPM | MOTOR CONTROL | VOLTAGE | PHASE | WHS | MOCP | UNIT SIZE (L/W/H) FT | OPERATING WEIGHT (LBS) | INSTALL. DETAIL NO. | CONTROL. DETAIL NO. | REMARKS |
| P-1 | ARMSTRONG | S-550-1 | HEATING HOT WATER | N-MECH ROOM | INLINE | 115 | 75 | 8 | 1800 | VFD | 208 V | 3 | 20"X12"X26" | 200 | 110-AMT-04 | 030-AMB-01 | 1, 3, 4, 5, 6 | | |
| P-2 | ARMSTRONG | S-550-1 | HEATING HOT WATER | N-MECH ROOM | INLINE | 115 | 75 | 8 | 1800 | VFD | 208 V | 3 | 20"X12"X26" | 200 | 110-AMT-04 | 030-AMB-01 | 1, 3, 4, 5, 6 | | |
| P-3 | BELL & GOSSETT | E-60 1.5AAB | HEATING HOT WATER | S-MECH ROOM | INLINE | 100 | 80 | 3 | 3600 | VFD | 208 V | 3 | 20"X12"X26" | 150 | 110-AMT-04 | 030-AMB-01 | 2, 3, 4, 5, 6 | | |
| P-4 | BELL & GOSSETT | E-60 1.5AAB | HEATING HOT WATER | S-MECH ROOM | INLINE | 100 | 80 | 3 | 3600 | VFD | 208 V | 3 | 20"X12"X26" | 150 | 110-AMT-04 | 030-AMB-01 | 2, 3, 4, 5, 6 | | |
| P-5 | ARMSTRONG | S-550-1 | BOILER SYSTEM | N-MECH ROOM | INLINE | 120 | 25 | 1 | 1750 | STARTER | 208 V | 3 | 18"X7"X23" | 140 | 110-AMT-04 | 030-AMB-01 | 3, 4, 5, 6 | | |
| P-7 | ARMSTRONG | S-550-1 | BOILER SYSTEM | S-MECH ROOM | INLINE | 120 | 25 | 1 | 1750 | STARTER | 208 V | 3 | 18"X7"X23" | 140 | 110-AMT-04 | 030-AMB-01 | 3, 4, 5, 6 | | |
| P-8 | ARMSTRONG | S-550-1 | BOILER SYSTEM | S-MECH ROOM | INLINE | 120 | 25 | 1 | 1750 | STARTER | 208 V | 3 | 18"X7"X23" | 140 | 110-AMT-04 | 030-AMB-01 | 3, 4, 5, 6 | | |

- REMARKS:
 1. PROVIDE WITH FACTORY INTEGRATED VFD'S
 2. PROVIDE WITH SEPARATE WALL MOUNTED FACTORY 850 VFD'S
 3. PIPES SUPPORTED
 4. INDOOR RATED
 5. MOUNT ON PUMP VIBRATION ISOLATION STANCHION PLATE, VIBRO-ACOUSTICS SPS OR EQUAL
 6. FACTORY STARTUP & SETUP INTEGRATION PROTOCOL W/ CONTROL'S CONTRACTOR

PERFORMANCE CURVE



Jesus Quintero

Engineering & Business Development



175 Harvard Avenue
Half Moon Bay, CA 94019
Office: (650)873-4353 Ext. 205
Cell: (818)406-3086

www.htecompany.com [htecompany.com]

Disclosure: The author of this e-mail is not a licensed professional engineer and does not furnish design services. Any engineering information or advice contained within this e-mail is the opinion of the author only based on the information available to him/her at the time, which may not be complete. Any engineering information or advice contained within this e-mail is not intended to and cannot be used by anyone as a substitute for the independent professional judgment or due diligence of the design professionals (including, without limitation, the engineer of record) involved in the project.

Please note: The information in this E-mail message, and any information transmitted with it, is confidential and may be legally privileged. It is intended only for the use of the individual(s) named above. If you are the intended recipient, be aware that your use of any confidential or personal information may be restricted by state and federal privacy laws. If you, the reader of this message, are not the intended recipient, you are hereby notified that you should not further copy, disseminate, distribute, read or forward this E-mail message. If you have received this E-mail message in error, please notify the sender by replying to this E-mail message and deleting the material from any computer.

This email may contain proprietary, business-confidential and/or privileged material and is intended only for the person or entity to which it is addressed. Information provided shall not be construed as official project information or direction until documented in a manner expressly stated in the contract documents. If you are not the intended recipient of this message, be aware that any use, review, retransmission, distribution, reproduction or any action taken in reliance upon this message is strictly prohibited. If you have received this email in error, please notify the sender and delete all copies of the original message. LPA, Inc. has taken all reasonable care in preparing this email, but does not warrant that this email, or any attachment, is free from computer viruses. LPA, Inc. accepts no liability for any damage caused by any virus transmitted by this email.

Submittal

Design Envelope Close-Coupled Vertical In-Line Pump

Model: Series Design Envelope Sensorless 4380 1505-005.0

| | |
|---|--|
| Project name: Sylvia Mendez ES Modernization | Representative: Heat Transfer Equipment Co. |
| Location: CA | Phone number: 650-873-4353 |
| Date submitted: 03/25/2024 | e-mail: sales@htecompany.com |
| Engineer: N/A | Submitted by: Frank Perez |

Application design data

| | | | |
|-----------------------------------|-------------------|------------------------|---------------------------|
| Tag number: | P-1, P-2 | Configuration: | Single |
| Service: | HEATING HOT WATER | Suction pressure: | 0 ft |
| Location: | N MECH ROOM | Fluid: | Non-Potable Fluid - Water |
| Qty: | 1 | Operating temperature: | 60 °F |
| Total system flow: | 115 USgpm | Duty flow per pump: | 115 USgpm |
| System head: | 75 ft | Viscosity: | 31 SSU |
| Environment: | Indoors | Specific gravity: | 1.0000 |
| Total dissolved solids: | 0 ppm | Safety factor % flow: | 0 % |
| Efficiency at Design: | 73.51 % | Safety factor % head: | 0 % |
| NPSHR: | 12.69 ft | Total Absorbed Power: | 2.96 hp |
| Min. maintained system pressure*: | 30 ft | Impeller diameter: | 4.96 in |
| Standby qty: | 0 | Pump/motor run qty: | 1 |
| PEIv: | 0.45 | ERvI: | 55 |
| Outlet velocity: | 18.12 ft/s | | |
| Redundancy %: | N/A | | |

*If minimum maintained system pressure is not known, default is 40% of design head.

Materials of construction

| | | | |
|------------------|---|----------------|-------------------------|
| Construction: | Low Pressure Ductile Iron | Impeller: | 316 Stainless Steel |
| Rating: | ANSI-125 | Casing o-ring: | EPDM |
| Connections: | ANSI-125 Flanges Inlet: 1.5in, Outlet: 1.5in | Flush line: | Braided Stainless Steel |
| Casing (volute): | Ductile Iron, E-coated | Stub shaft: | Carbon Steel |

Mechanical seal data

| | | | |
|--------------------|----------------------|--|--------------------------|
| Seal type: | Inside Single Spring | Rotating face: | Resin Bonded Carbon |
| Manufacturer code: | C-ssc L EPSS 2A | Stationary seat: | Sintered Silicon Carbide |
| Springs: | Stainless Steel | Secondary seal: | EPDM |
| Rotating hardware: | Stainless Steel | Maximum total dissolved solids (TDS) ****: | 2000 PPM |

Electrical data

| | | | |
|------------------------------|-----------|--------------------------------|--------------------|
| Supplier: | Armstrong | Insulation class: | Class F Insulation |
| Size: | 5 hp | Motor type: | Permanent Magnet |
| Frame size: | IEC112 | Efficiency: | IE5 |
| Enclosure: | TEFC | Power supply: | 208/3/60 |
| Operating speed @ 100% flow: | 3235 rpm | Operating speed @ 50% flow***: | 2263 rpm |

***Based on minimum pressure setting of 40% of design head

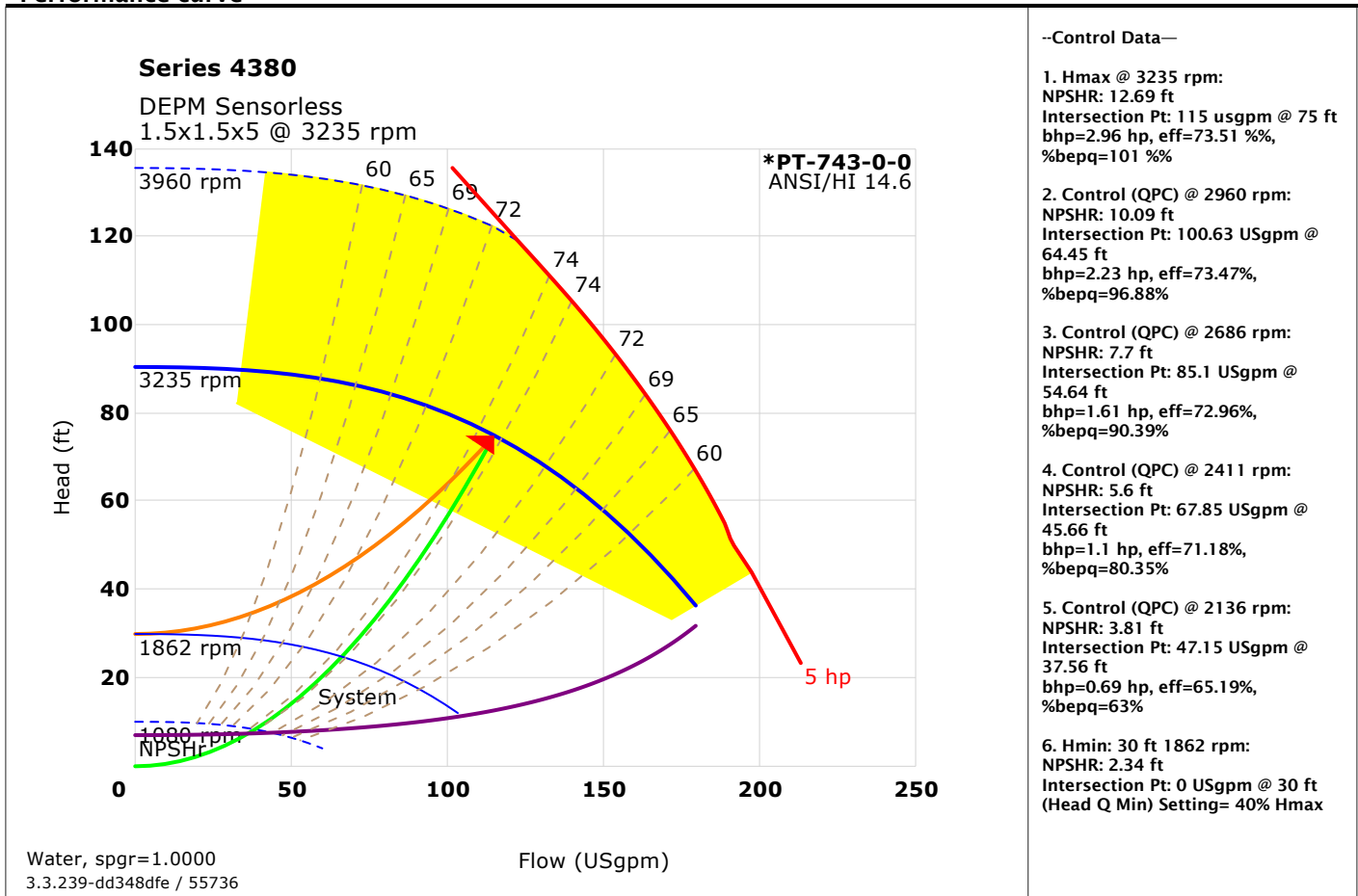
****Note: Please ensure proper seal is selected by inputting Total Dissolved Solids (TDS) in PPM in ADEPT if water quality is poor at site. Also select Flush Line Filter or Cyclone Separator if there are other contaminants in the fluid.

DEPM controller data

| | | | |
|---|------------------------------|----------------------|---|
| Sensorless control: | Yes-Quadratic press control | Communication port: | RS 485 |
| Communication protocol (*): | Default Field Reconfigurable | Analog inputs: | 2 (current or voltage) |
| Enclosure: | UL Type 12/IP55 | Analog outputs: | 1 (current or voltage) |
| Fused disconnect switch: | Loose Supply | Digital inputs: | 2 (programmable) |
| Control orientation: | L5 | Digital outputs: | 2 (programmable) |
| Expansion card: | None | Cooling: | Not Applicable |
| Absorbed Power/BHP at 50% load/flow and 55% of design head: | 1.63 hp | Ambient temperature: | 14°F to 113°F (up to 3280 ft elevation) |
| Meets ASHRAE 90.1: | Yes | EMI/RFI control: | Integrated filter to meet EN61800-3 |

(*): If Default - Field reconfigurable is selected, Default from factory will be BACnet MS/TP and can be reconfigured in the field.

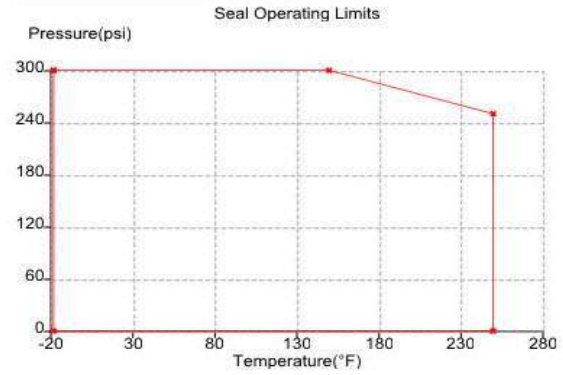
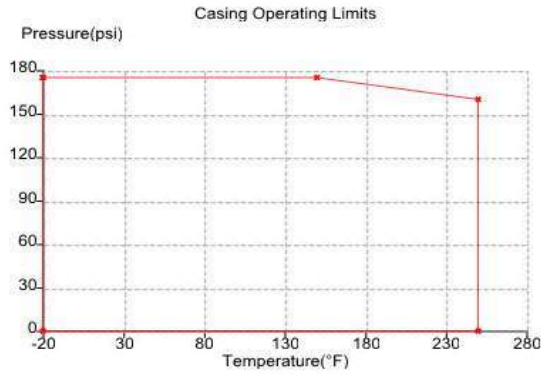
Performance curve



Design envelope pumping unit capability

| Operating point | Flow | Head | Efficiency |
|--|------------|-----------|------------|
| Full capability at 100% design flow | 115 USgpm | 122.37 ft | 71.93% |
| Design point | 115 USgpm | 75 ft | 73.51 % |
| 50% average flow (with default load profile) | 57.5 USgpm | 41.25 ft | 68.97 % |
| Motor Capability @ Rated Speed | 4.56 hp hp | | |

Operating limits (temperature - pressure)



Maximum pressure: 175 psi

Maximum temperature: 250 F

All Pump casings are hydrostatically tested to requirements of ANSI/HI 14.6 standard.

Options

| | | | |
|----------------------------|-----|---------------------------|----|
| Sensorless bundle: | Yes | DEPC Parallel sensorless: | No |
| Energy performance bundle: | No | Protection bundle: | No |
| Dual season setup: | No | Zone optimization bundle: | No |

Cooling

| | |
|---------------|-----|
| Q1: | N/A |
| H1: | N/A |
| H1 min: | N/A |
| Maximum flow: | N/A |

Heating

| | |
|---------------|-----|
| Q2: | N/A |
| H2: | N/A |
| H2 min: | N/A |
| Minimum flow: | N/A |

Optional Services

| | | | |
|-----------------------------|--|--------------------------|----|
| On-site pump commissioning: | Cost not Included | Extended warranty: | No |
| Pump manager: | Yes, Standard (1 Year Pump Manager Professional) | Include spare parts qty: | 0 |

Dimensional data (not for construction)

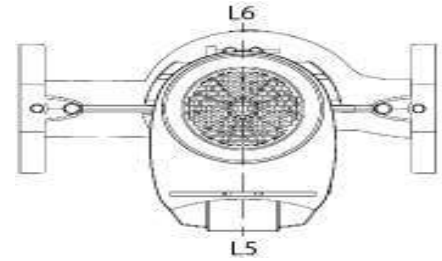
Side view

| Top view

The drawing and dimensions you are looking for are not available at this time.

Weight: 103.3 lb [46.86 kg], Units of measure: inches [millimeters]

- Not to scale
- R = minimum lifting clearance required above motor
- Coupling guard and flush line (not shown) are supplied
- Tolerance of ± 0.125 inch (± 3 mm) should be used
- For certified dimensions, please contact your Armstrong representative
- Pump equipped with casing drain plug and $\frac{1}{4}$ inch NPT suction and discharge gauge ports



Connection details

| Connection | Size | Rating | OD | Bolt quantity* | BCD | Bolt size |
|------------|------|----------|------|----------------|------|-----------|
| Inlet | 1.5 | ANSI-125 | 5.00 | 2 | 3.88 | 0.5 |
| Outlet | 1.5 | ANSI-125 | 5.00 | 2 | 3.88 | 0.5 |

*Equally spaced straddling centreline

Flow Readout Accuracy

The Design Envelope model selected will provide flow reading on the pump touchscreen & digitally for the BMS. The flow readout will be factory tested to ensure $\pm 5\%$ accuracy.

Special instructions

Reference Motor Specification AES 05007.
UL STD 778 & CSA STD C22.2 no.108 certified

Selected options

Testing: No Test Certification Required
 Seal Environment Accessories: None
 Fused Disconnect: Loose Supply
 Space Heater: No
 Sensorless Bundle: Sensorless control
 Constant flow control
 Constant pressure control
 Flow readout

Design Envelope pumps offer industry-leading efficiency and performance management capabilities for significantly reduced energy consumption. Armstrong has undertaken a multi-year project to transition our pump offering to an integrated design that use Design Envelope Permanent Magnet technology for even greater operating cost savings. In the sizes currently equipped with Design Envelope Permanent Magnet motors, the pumps are also more compact and lighter than our standard Design Envelope pumps.

Please note that depending on the pump sizes, your shipment may include a combination of:

- Design Envelope Permanent Magnet pumps
- Design Envelope Permanent Magnet pumps with IVS controls
- Design Envelope Pumps with Premium efficiency induction motors and IVS controls

DISCONNECT CONFIGURATION

- Site electrical input voltage : _____
- Number of 1PH 200-240V motors : 2hp & lower: _____
- Number of 3PH 200-240V motors : 10hp & lower: _____
- Number of 3PH 380-480V motors : 10hp & lower: _____
- Number of 3PH 575-660V motors : 10hp & lower: _____

FUSED DISCONNECT FOR WALL MOUNTING



TECHNICAL DATA

Enclosure: UL/NEEMA 4X rated

Terminals

Number of poles: 3-poles, ground

Terminal size acceptability: Copper conductors only, 75°C, 14-8AWG

Electrical/Environmental

Up to 600V / Up to 60A, 50/60Hz

Minimum short circuit rating: 10kA

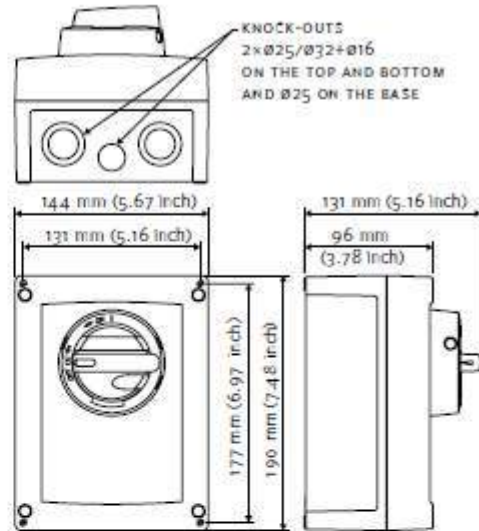
Ambient operating temperature: -10°C to +50°C (+14°F to +122°F)

Ambient storage temperature: -30°C to +65°C (-22°F to +149°F)

ARMSTRONG DISCONNECT SWITCH AND FUSE RATING - 1PH 200-240V INPUT POWER FOR USE WITH DESIGN ENVELOPE PERMANENT MAGNET MOTORS - FRAME 71

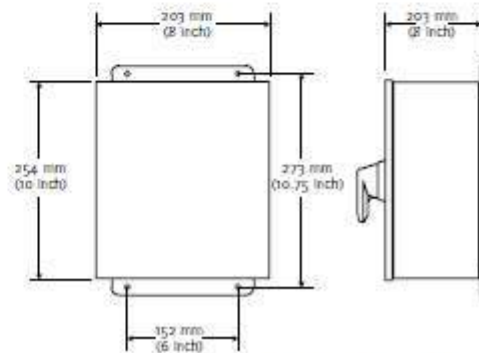
| RATED POWER | | DISCONNECT SWITCH RATING | FUSE RATING | FUSE CLASS TYPES | MAXIMUM DRIVER INPUT CURRENT (A) | |
|-------------|------|--------------------------|-------------|------------------|----------------------------------|---------|
| HP | KW | | | | 200 VAC | 240 VAC |
| 0.33 | 0.25 | 30A | 6A | CC FAST-ACTING | 2.0 | 1.6 |
| 0.5 | 0.37 | | 6A | | 2.6 | 2.0 |
| 0.75 | 0.55 | | 10A | J FAST-ACTING | 3.3 | 2.9 |
| 1 | 0.75 | | 10A | | 4.8 | 4.0 |
| 1.5 | 1.1 | | 15A | RK1 FAST-ACTING | 7.1 | 5.8 |
| 2 | 1.5 | | 20A | | 9.3 | 7.6 |

30A DISCONNECT



Weight: 3.5 lbs (1.6 kg)

60A DISCONNECT



Weight: 9 lbs (4.1 kg)

ARMSTRONG DISCONNECT SWITCH AND FUSE RATING - 3PH 200-240V INPUT POWER FOR USE WITH DESIGN ENVELOPE PERMANENT MAGNET MOTORS - DEPM

| RATED POWER | | DISCONNECT SWITCH RATING | FUSE RATING | FUSE CLASS TYPES | MAXIMUM DRIVER INPUT CURRENT (A) | |
|-------------|------|--------------------------|-------------|------------------|----------------------------------|---------|
| HP | KW | | | | 200 VAC | 240 VAC |
| 1 | 0.75 | 30A | 10A | CC FAST-ACTING | 3.1 | 2.7 |
| 1.5 | 1.1 | | 10A | | 4.2 | 3.7 |
| 2 | 1.5 | | 15A | J FAST-ACTING | 6.0 | 4.8 |
| 3 | 2.2 | | 20A | RK1 FAST-ACTING | 8.8 | 7.2 |
| 5 | 4 | | 30A | | 15.7 | 14.0 |
| 7.5 | 5.5 | 60A | 50A | J FAST-ACTING | 20.7 | 18.5 |
| 10 | 7.5 | | 60A | RK1 FAST-ACTING | 28.1 | 25.1 |

ARMSTRONG DISCONNECT SWITCH AND FUSE RATING - 3PH 200-240V INPUT POWER FOR USE WITH DESIGN ENVELOPE PERMANENT MAGNET MOTORS - DEPM2

| RATED POWER | | DISCONNECT SWITCH RATING | FUSE RATING | FUSE CLASS TYPES | MAXIMUM DRIVER INPUT CURRENT (A) | |
|-------------|-----|--------------------------|-------------|------------------|----------------------------------|---------|
| HP | KW | | | | 200 VAC | 240 VAC |
| 3 | 2.2 | 30A | 20A | CC FAST-ACTING | 7.4 | 6.4 |
| 5.5 | 4 | | 30A | | 14.2 | 12.6 |
| 7.5 | 5.5 | | 30A | | 19.0 | 16.6 |
| 10 | 7.5 | | 30A | | 26.2 | 23.0 |

ARMSTRONG DISCONNECT SWITCH AND FUSE RATING - 3PH 380V-480V INPUT POWER FOR USE WITH DESIGN ENVELOPE PERMANENT MAGNET MOTORS - FRAME 71

| RATED POWER | | DISCONNECT SWITCH RATING | FUSE RATING | FUSE CLASS TYPES | MAXIMUM DRIVER INPUT CURRENT (A) | | |
|-------------|------|--------------------------|-------------|------------------|----------------------------------|---------|------|
| HP | KW | | | | 380 VAC | 480 VAC | |
| 0.33 | 0.25 | 30A | 5A | CC FAST-ACTING | 1.3 | 0.8 | |
| 0.5 | 0.37 | | 5A | | 1.6 | 1.1 | |
| 0.75 | 0.55 | | 6A | | 1.9 | 1.5 | |
| 1 | 0.75 | | 6A | | 2.5 | 2.0 | |
| 1.5 | 1.1 | | 10A | | 4.1 | 3.5 | |
| 2 | 1.5 | | 10A | | J FAST-ACTING | 5.3 | 3.9 |
| 3 | 2.2 | | 10A | | RK1 FAST-ACTING | 6.5 | 5.8 |
| 4 | 3 | | 15A | | | 6.1 | 4.9 |
| 5 | 4 | | 20A | | | 9.2 | 7.1 |
| 7.5 | 5.5 | | 25A | | | 12.5 | 8.2 |
| 10 | 7.5 | | 30A | | | 18.5 | 14.5 |

ARMSTRONG DISCONNECT SWITCH AND FUSE RATING - 3PH 380V-480V INPUT POWER FOR USE WITH DESIGN ENVELOPE PERMANENT MAGNET MOTORS - DEPM

| RATED POWER | | DISCONNECT SWITCH RATING | FUSE RATING | FUSE CLASS TYPES | MAXIMUM DRIVER INPUT CURRENT (A) | | |
|-------------|------|--------------------------|-------------|------------------|----------------------------------|---------|------|
| HP | KW | | | | 380 VAC | 480 VAC | |
| 1 | 0.75 | 30A | 6A | CC FAST-ACTING | 2.1 | 1.7 | |
| 1.5 | 1.1 | | 6A | | 2.8 | 2.3 | |
| 2 | 1.5 | | 10A | | 4.8 | 4.1 | |
| 3 | 2.2 | | 10A | | J FAST-ACTING | 6.5 | 5.8 |
| 4 | 3 | | 15A | | RK1 FAST-ACTING | 6.1 | 4.9 |
| 5 | 4 | | 20A | | | 9.2 | 7.1 |
| 7.5 | 5.5 | | 25A | | | 12.5 | 8.2 |
| 10 | 7.5 | | 30A | | | 18.5 | 14.5 |

ARMSTRONG DISCONNECT SWITCH AND FUSE RATING - 3PH 380V-480V INPUT POWER FOR USE WITH DESIGN ENVELOPE PERMANENT MAGNET MOTORS - DEPM2

| RATED POWER | | DISCONNECT SWITCH RATING | FUSE RATING | FUSE CLASS TYPES | MAXIMUM DRIVER INPUT CURRENT (A) | |
|-------------|-----|--------------------------|-------------|------------------|----------------------------------|---------|
| HP | KW | | | | 380 VAC | 480 VAC |
| 3 | 2.2 | 30A | 10A | CC FAST-ACTING | 3.9 | 3.2 |
| 4 | 3 | | 10A | | 5.4 | 4.2 |
| 5.5 | 4 | | 15A | | 7.1 | 5.7 |
| 7.5 | 5.5 | | 15A | | 9.5 | 7.6 |
| 10 | 7.5 | | 25A | | 13.6 | 11.3 |
| 15 | 11 | | 30A | | 18.8 | 15.5 |

ARMSTRONG DISCONNECT SWITCH AND FUSE RATING - 3PH 575-600V INPUT POWER FOR USE WITH DESIGN ENVELOPE PERMANENT MAGNET MOTORS - DEPM MOTORS

| RATED POWER | | DISCONNECT SWITCH RATING | FUSE RATING | FUSE CLASS TYPES | MAXIMUM DRIVER INPUT CURRENT (A) | | |
|-------------|------|--------------------------|-------------|------------------|----------------------------------|---------|-----|
| HP | KW | | | | 575 VAC | 600 VAC | |
| 1 | 0.75 | 30A | 5A | CC FAST-ACTING | 1.6 | 1.3 | |
| 1.5 | 1.1 | | 6A | | 2.2 | 1.8 | |
| 2 | 1.5 | | 8A | | 2.0 | 1.6 | |
| 3 | 2.2 | | 10A | | J FAST-ACTING | 3.4 | 2.8 |
| 5 | 4 | | 20A | | RK1 FAST-ACTING | 5.5 | 4.9 |
| 7.5 | 5.5 | | 25A | | | 7.2 | 6.0 |
| 10 | 7.5 | 30A | | 9.8 | 9.4 | | |

ARMSTRONG DISCONNECT SWITCH AND FUSE RATING - 3PH 575-600V INPUT POWER FOR USE WITH DESIGN ENVELOPE PERMANENT MAGNET MOTORS - DEPM2 MOTORS

| RATED POWER | | DISCONNECT SWITCH RATING | FUSE RATING | FUSE CLASS TYPES | MAXIMUM DRIVER INPUT CURRENT (A) | |
|-------------|------|--------------------------|-------------|------------------|----------------------------------|---------|
| HP | KW | | | | 575 VAC | 600 VAC |
| 1 | 0.75 | 30A | 5A | CC FAST-ACTING | 1.6 | 1.5 |
| 1.5 | 1.1 | | 6A | | 2.1 | 2.0 |
| 2 | 1.5 | | 6A | | 2.6 | 2.6 |
| 3 | 2.2 | | 6A | | 3.5 | 3.2 |
| 5 | 4 | | 15A | | 5.7 | 5.3 |
| 7.5 | 5.5 | | 15A | | 7.5 | 7.4 |
| 10 | 7.5 | 30A | 10.8 | 10.1 | | |

All cabling and must comply with national and local regulations on cable cross-sections and ambient temperature

Submittal

Design Envelope Close-Coupled Vertical In-Line Pump

Model: Series Design Envelope Sensorless 4380 0205H-003.0

| | |
|---|--|
| Project name: Sylvia Mendez ES Modernization | Representative: Heat Transfer Equipment Co. |
| Location: CA | Phone number: 650-873-4353 |
| Date submitted: 03/25/2024 | e-mail: sales@htecompany.com |
| Engineer: N/A | Submitted by: Frank Perez |

Application design data

| | | | |
|-----------------------------------|-------------------|------------------------|---------------------------|
| Tag number: | P-3, P-4 | Configuration: | Single |
| Service: | HEATING HOT WATER | Suction pressure: | 0 ft |
| Location: | S MECH ROOM | Fluid: | Non-Potable Fluid - Water |
| Qty: | 1 | Operating temperature: | 60 °F |
| Total system flow: | 100 USgpm | Duty flow per pump: | 100 USgpm |
| System head: | 50 ft | Viscosity: | 31 SSU |
| Environment: | Indoors | Specific gravity: | 1.0000 |
| Total dissolved solids: | 0 ppm | Safety factor % flow: | 0 % |
| Efficiency at Design: | 74.32 % | Safety factor % head: | 0 % |
| NPSHR: | 3.68 ft | Total Absorbed Power: | 1.7 hp |
| Min. maintained system pressure*: | 20 ft | Impeller diameter: | 4.97 in |
| Standby qty: | 0 | Pump/motor run qty: | 1 |
| PEIv: | 0.43 | ERvI: | 57 |
| Outlet velocity: | 9.56 ft/s | | |
| Redundancy %: | N/A | | |

*If minimum maintained system pressure is not known, default is 40% of design head.

Materials of construction

| | | | |
|------------------|---|----------------|-------------------------|
| Construction: | Low Pressure Ductile Iron | Impeller: | 316 Stainless Steel |
| Rating: | ANSI-125 | Casing o-ring: | EPDM |
| Connections: | ANSI-125 Flanges Inlet: 2in, Outlet: 2in | Flush line: | Braided Stainless Steel |
| Casing (volute): | Ductile Iron, E-coated | Stub shaft: | Carbon Steel |

Mechanical seal data

| | | | |
|--------------------|----------------------|--|--------------------------|
| Seal type: | Inside Single Spring | Rotating face: | Resin Bonded Carbon |
| Manufacturer code: | C-ssc L EPSS 2A | Stationary seat: | Sintered Silicon Carbide |
| Springs: | Stainless Steel | Secondary seal: | EPDM |
| Rotating hardware: | Stainless Steel | Maximum total dissolved solids (TDS) ****: | 2000 PPM |

Electrical data

| | | | |
|------------------------------|-----------|--------------------------------|--------------------|
| Supplier: | Armstrong | Insulation class: | Class F Insulation |
| Size: | 3 hp | Motor type: | Permanent Magnet |
| Frame size: | IEC90 | Efficiency: | IE5 |
| Enclosure: | TEFC | Power supply: | 208/3/60 |
| Operating speed @ 100% flow: | 2671 rpm | Operating speed @ 50% flow***: | 1918 rpm |

***Based on minimum pressure setting of 40% of design head

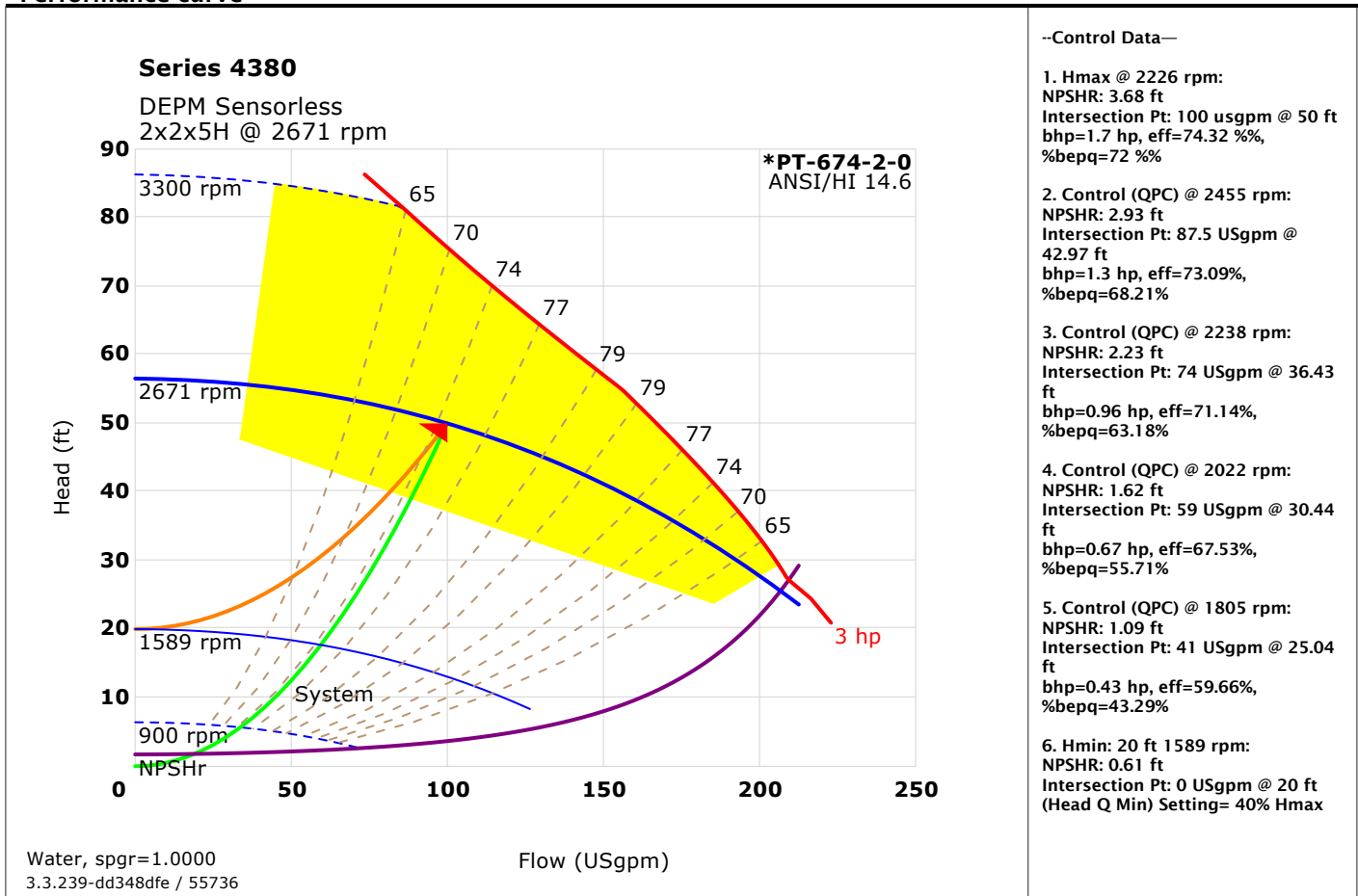
****Note: Please ensure proper seal is selected by inputting Total Dissolved Solids (TDS) in PPM in ADEPT if water quality is poor at site. Also select Flush Line Filter or Cyclone Separator if there are other contaminants in the fluid.

DEPM controller data

| | | | |
|---|------------------------------|----------------------|---|
| Sensorless control: | Yes-Quadratic press control | Communication port: | RS 485 |
| Communication protocol (*): | Default Field Reconfigurable | Analog inputs: | 2 (current or voltage) |
| Enclosure: | UL Type 12/IP55 | Analog outputs: | 1 (current or voltage) |
| Fused disconnect switch: | Loose Supply | Digital inputs: | 2 (programmable) |
| Control orientation: | L5 | Digital outputs: | 2 (programmable) |
| Expansion card: | None | Cooling: | Not Applicable |
| Absorbed Power/BHP at 50% load/flow and 55% of design head: | 0.93 hp | Ambient temperature: | 14°F to 113°F (up to 3280 ft elevation) |
| Meets ASHRAE 90.1: | No | EMI/RFI control: | Integrated filter to meet EN61800-3 |

(*): If Default - Field reconfigurable is selected, Default from factory will be BACnet MS/TP and can be reconfigured in the field.

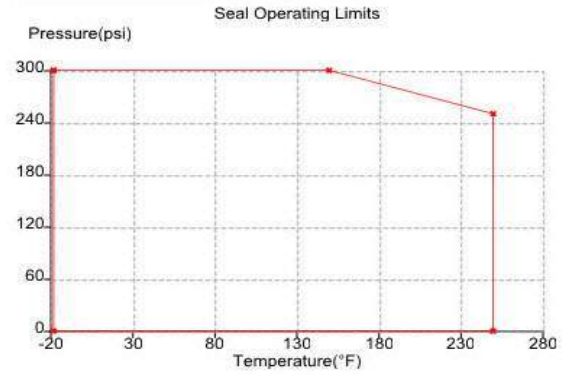
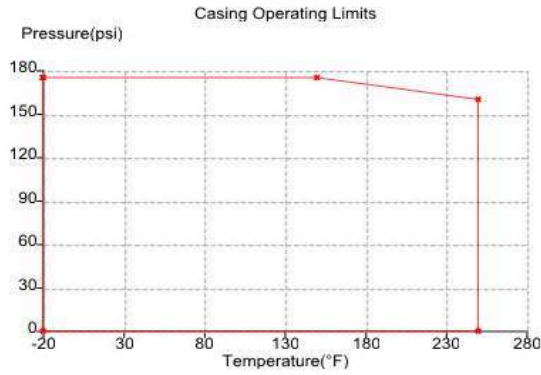
Performance curve



Design envelope pumping unit capability

| Operating point | Flow | Head | Efficiency |
|--|------------|----------|------------|
| Full capability at 100% design flow | 100 USgpm | 75.65 ft | 70.49% |
| Design point | 100 USgpm | 50 ft | 74.32 % |
| 50% average flow (with default load profile) | 50 USgpm | 27.5 ft | 64.26 % |
| Motor Capability @ Rated Speed | 2.45 hp hp | | |

Operating limits (temperature - pressure)



Maximum pressure: 175 psi

Maximum temperature: 250 F

All Pump casings are hydrostatically tested to requirements of ANSI/HI 14.6 standard.

Options

| | | | |
|----------------------------|-----|---------------------------|----|
| Sensorless bundle: | Yes | DEPC Parallel sensorless: | No |
| Energy performance bundle: | No | Protection bundle: | No |
| Dual season setup: | No | Zone optimization bundle: | No |

Cooling

| | |
|---------------|-----|
| Q1: | N/A |
| H1: | N/A |
| H1 min: | N/A |
| Maximum flow: | N/A |

Heating

| | |
|---------------|-----|
| Q2: | N/A |
| H2: | N/A |
| H2 min: | N/A |
| Minimum flow: | N/A |

Optional Services

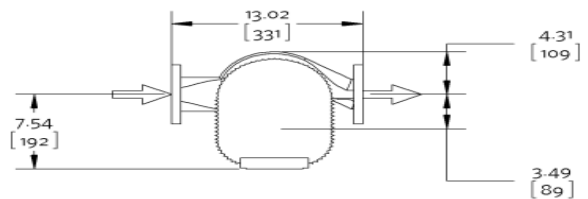
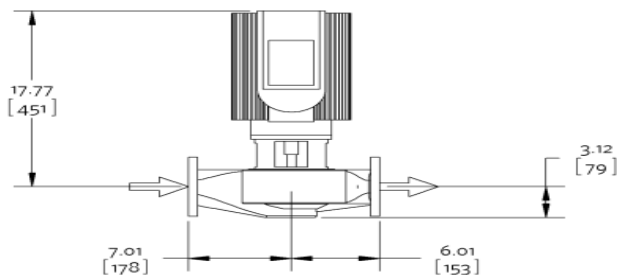
| | | | |
|-----------------------------|-----------------------------|--------------------------|----|
| On-site pump commissioning: | Cost not Included | Extended warranty: | No |
| Pump manager: | Yes-Configured Pump Manager | Include spare parts qty: | 0 |

Dimensional data (not for construction)

Side view

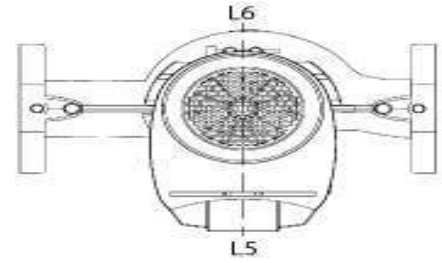
Top view

R: 3.00
[76]



Weight: 75.53 lb [34.26 kg], Units of measure: inches [millimeters]

- Not to scale
- R = minimum lifting clearance required above motor
- Coupling guard and flush line (not shown) are supplied
- Tolerance of ± 0.125 inch (± 3 mm) should be used
- For certified dimensions, please contact your Armstrong representative
- Pump equipped with casing drain plug and $\frac{1}{4}$ inch NPT suction and discharge gauge ports



Connection details

| Connection | Size | Rating | OD | Bolt quantity* | BCD | Bolt size |
|------------|------|----------|------|----------------|------|-----------|
| Inlet | 2 | ANSI-125 | 6.00 | 4 | 4.75 | 0.625 |
| Outlet | 2 | ANSI-125 | 6.00 | 4 | 4.75 | 0.625 |

*Equally spaced straddling centreline

Flow Readout Accuracy

The Design Envelope model selected will provide flow reading on the pump touchscreen & digitally for the BMS. The flow readout will be factory tested to ensure $\pm 5\%$ accuracy.

Special instructions

Reference Motor Specification AES 05007.
UL STD 778 & CSA STD C22.2 no.108 certified

Selected options

Testing: No Test Certification Required
 Seal Environment Accessories: None
 Fused Disconnect: Loose Supply
 Space Heater: No
 Sensorless Bundle: Sensorless control
 Constant flow control
 Constant pressure control
 Flow readout

Design Envelope pumps offer industry-leading efficiency and performance management capabilities for significantly reduced energy consumption. Armstrong has undertaken a multi-year project to transition our pump offering to an integrated design that use Design Envelope Permanent Magnet technology for even greater operating cost savings. In the sizes currently equipped with Design Envelope Permanent Magnet motors, the pumps are also more compact and lighter than our standard Design Envelope pumps.

Please note that depending on the pump sizes, your shipment may include a combination of:

- Design Envelope Permanent Magnet pumps
- Design Envelope Permanent Magnet pumps with IVS controls
- Design Envelope Pumps with Premium efficiency induction motors and IVS controls

DISCONNECT CONFIGURATION

Site electrical input voltage : _____
 Number of 1PH 200-240V motors : 2hp & lower: _____
 Number of 3PH 200-240V motors : 10hp & lower: _____
 Number of 3PH 380-480V motors : 10hp & lower: _____
 Number of 3PH 575-660V motors : 10hp & lower: _____

FUSED DISCONNECT FOR WALL MOUNTING



TECHNICAL DATA

Enclosure: UL/NEEMA 4X rated

Terminals

Number of poles: 3-poles, ground

Terminal size acceptability: Copper conductors only, 75°C, 14-8AWG

Electrical/Environmental

Up to 600V / Up to 60A, 50/60Hz

Minimum short circuit rating: 10kA

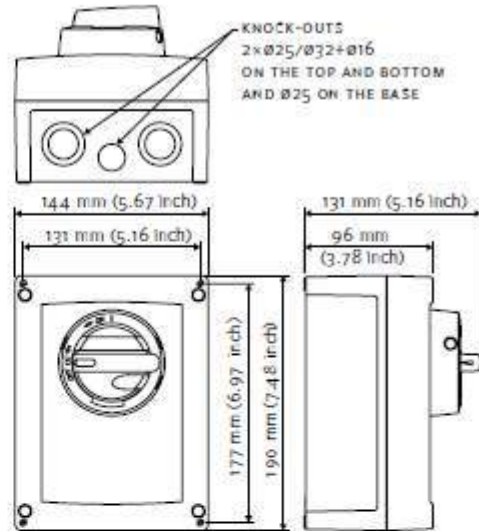
Ambient operating temperature: -10°C to +50°C (+14°F to +122°F)

Ambient storage temperature: -30°C to +65°C (-22°F to +149°F)

ARMSTRONG DISCONNECT SWITCH AND FUSE RATING - 1PH 200-240V INPUT POWER FOR USE WITH DESIGN ENVELOPE PERMANENT MAGNET MOTORS - FRAME 71

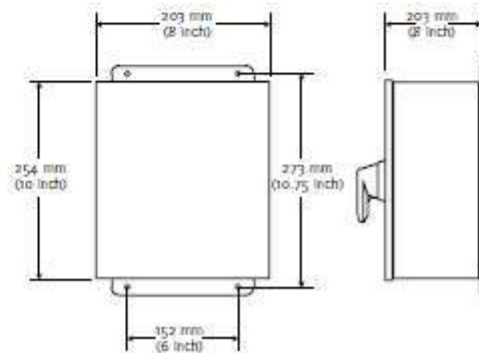
| RATED POWER | | DISCONNECT SWITCH RATING | FUSE RATING | FUSE CLASS TYPES | MAXIMUM DRIVER INPUT CURRENT (A) | |
|-------------|------|--------------------------|-------------|------------------|----------------------------------|---------|
| HP | KW | | | | 200 VAC | 240 VAC |
| 0.33 | 0.25 | 30A | 6A | CC FAST-ACTING | 2.0 | 1.6 |
| 0.5 | 0.37 | | 6A | | 2.6 | 2.0 |
| 0.75 | 0.55 | | 10A | J FAST-ACTING | 3.3 | 2.9 |
| 1 | 0.75 | | 10A | RK1 FAST-ACTING | 4.8 | 4.0 |
| 1.5 | 1.1 | | 15A | | 7.1 | 5.8 |
| 2 | 1.5 | | 20A | | 9.3 | 7.6 |

30A DISCONNECT



Weight: 3.5 lbs (1.6 kg)

60A DISCONNECT



Weight: 9 lbs (4.1 kg)

ARMSTRONG DISCONNECT SWITCH AND FUSE RATING - 3PH 200-240V INPUT POWER FOR USE WITH DESIGN ENVELOPE PERMANENT MAGNET MOTORS - DEPM

| RATED POWER | | DISCONNECT SWITCH RATING | FUSE RATING | FUSE CLASS TYPES | MAXIMUM DRIVER INPUT CURRENT (A) | |
|-------------|------|--------------------------|-------------|------------------|----------------------------------|---------|
| HP | KW | | | | 200 VAC | 240 VAC |
| 1 | 0.75 | 30A | 10A | CC FAST-ACTING | 3.1 | 2.7 |
| 1.5 | 1.1 | | 10A | | 4.2 | 3.7 |
| 2 | 1.5 | | 15A | J FAST-ACTING | 6.0 | 4.8 |
| 3 | 2.2 | | 20A | RK1 FAST-ACTING | 8.8 | 7.2 |
| 5 | 4 | | 30A | | 15.7 | 14.0 |
| 7.5 | 5.5 | 60A | 50A | J FAST-ACTING | 20.7 | 18.5 |
| 10 | 7.5 | | 60A | RK1 FAST-ACTING | 28.1 | 25.1 |

ARMSTRONG DISCONNECT SWITCH AND FUSE RATING - 3PH 200-240V INPUT POWER FOR USE WITH DESIGN ENVELOPE PERMANENT MAGNET MOTORS - DEPM2

| RATED POWER | | DISCONNECT SWITCH RATING | FUSE RATING | FUSE CLASS TYPES | MAXIMUM DRIVER INPUT CURRENT (A) | |
|-------------|-----|--------------------------|-------------|------------------|----------------------------------|---------|
| HP | KW | | | | 200 VAC | 240 VAC |
| 3 | 2.2 | 30A | 20A | CC FAST-ACTING | 7.4 | 6.4 |
| 5.5 | 4 | | 30A | | 14.2 | 12.6 |
| 7.5 | 5.5 | | 30A | | 19.0 | 16.6 |
| 10 | 7.5 | | 30A | | 26.2 | 23.0 |

ARMSTRONG DISCONNECT SWITCH AND FUSE RATING - 3PH 380V-480V INPUT POWER FOR USE WITH DESIGN ENVELOPE PERMANENT MAGNET MOTORS - FRAME 71

| RATED POWER | | DISCONNECT SWITCH RATING | FUSE RATING | FUSE CLASS TYPES | MAXIMUM DRIVER INPUT CURRENT (A) | |
|-------------|------|--------------------------|-------------|------------------|----------------------------------|---------|
| HP | KW | | | | 380 VAC | 480 VAC |
| 0.33 | 0.25 | 30A | 5A | | 1.3 | 0.8 |
| 0.5 | 0.37 | | 5A | | 1.6 | 1.1 |
| 0.75 | 0.55 | | 6A | | 1.9 | 1.5 |
| 1 | 0.75 | | 6A | 2.5 | 2.0 | |
| 1.5 | 1.1 | | 10A | 4.1 | 3.5 | |
| 2 | 1.5 | | 10A | 5.3 | 3.9 | |
| 3 | 2.2 | | 10A | 6.5 | 5.8 | |
| 4 | 3 | | 15A | 6.1 | 4.9 | |
| 5 | 4 | | 20A | 9.2 | 7.1 | |
| 7.5 | 5.5 | | 25A | 12.5 | 8.2 | |
| 10 | 7.5 | | 30A | 18.5 | 14.5 | |

ARMSTRONG DISCONNECT SWITCH AND FUSE RATING - 3PH 380V-480V INPUT POWER FOR USE WITH DESIGN ENVELOPE PERMANENT MAGNET MOTORS - DEPM

| RATED POWER | | DISCONNECT SWITCH RATING | FUSE RATING | FUSE CLASS TYPES | MAXIMUM DRIVER INPUT CURRENT (A) | |
|-------------|------|--------------------------|-------------|------------------|----------------------------------|---------|
| HP | KW | | | | 380 VAC | 480 VAC |
| 1 | 0.75 | 30A | 6A | CC FAST-ACTING | 2.1 | 1.7 |
| 1.5 | 1.1 | | 6A | | 2.8 | 2.3 |
| 2 | 1.5 | | 10A | | 4.8 | 4.1 |
| 3 | 2.2 | | 10A | 6.5 | 5.8 | |
| 4 | 3 | | 15A | 6.1 | 4.9 | |
| 5 | 4 | | 20A | 9.2 | 7.1 | |
| 7.5 | 5.5 | | 25A | 12.5 | 8.2 | |
| 10 | 7.5 | | 30A | 18.5 | 14.5 | |

ARMSTRONG DISCONNECT SWITCH AND FUSE RATING - 3PH 380V-480V INPUT POWER FOR USE WITH DESIGN ENVELOPE PERMANENT MAGNET MOTORS - DEPM2

| RATED POWER | | DISCONNECT SWITCH RATING | FUSE RATING | FUSE CLASS TYPES | MAXIMUM DRIVER INPUT CURRENT (A) | |
|-------------|-----|--------------------------|-------------|------------------|----------------------------------|---------|
| HP | KW | | | | 380 VAC | 480 VAC |
| 3 | 2.2 | 30A | 10A | CC FAST-ACTING | 3.9 | 3.2 |
| 4 | 3 | | 10A | | 5.4 | 4.2 |
| 5.5 | 4 | | 15A | | 7.1 | 5.7 |
| 7.5 | 5.5 | | 15A | | 9.5 | 7.6 |
| 10 | 7.5 | | 25A | | 13.6 | 11.3 |
| 15 | 11 | | 30A | | 18.8 | 15.5 |

ARMSTRONG DISCONNECT SWITCH AND FUSE RATING - 3PH 575-600V INPUT POWER FOR USE WITH DESIGN ENVELOPE PERMANENT MAGNET MOTORS - DEPM MOTORS

| RATED POWER | | DISCONNECT SWITCH RATING | FUSE RATING | FUSE CLASS TYPES | MAXIMUM DRIVER INPUT CURRENT (A) | | |
|-------------|------|--------------------------|-------------|------------------|----------------------------------|---------|-----|
| HP | KW | | | | 575 VAC | 600 VAC | |
| 1 | 0.75 | 30A | 5A | CC FAST-ACTING | 1.6 | 1.3 | |
| 1.5 | 1.1 | | 6A | | 2.2 | 1.8 | |
| 2 | 1.5 | | 8A | | 2.0 | 1.6 | |
| 3 | 2.2 | | 10A | | J FAST-ACTING | 3.4 | 2.8 |
| 5 | 4 | | 20A | | RK1 FAST-ACTING | 5.5 | 4.9 |
| 7.5 | 5.5 | | 25A | | | 7.2 | 6.0 |
| 10 | 7.5 | 30A | | 9.8 | 9.4 | | |

ARMSTRONG DISCONNECT SWITCH AND FUSE RATING - 3PH 575-600V INPUT POWER FOR USE WITH DESIGN ENVELOPE PERMANENT MAGNET MOTORS - DEPM2 MOTORS

| RATED POWER | | DISCONNECT SWITCH RATING | FUSE RATING | FUSE CLASS TYPES | MAXIMUM DRIVER INPUT CURRENT (A) | |
|-------------|------|--------------------------|-------------|------------------|----------------------------------|---------|
| HP | KW | | | | 575 VAC | 600 VAC |
| 1 | 0.75 | 30A | 5A | CC FAST-ACTING | 1.6 | 1.5 |
| 1.5 | 1.1 | | 6A | | 2.1 | 2.0 |
| 2 | 1.5 | | 6A | | 2.6 | 2.6 |
| 3 | 2.2 | | 6A | | 3.5 | 3.2 |
| 5 | 4 | | 15A | | 5.7 | 5.3 |
| 7.5 | 5.5 | | 15A | | 7.5 | 7.4 |
| 10 | 7.5 | 30A | 10.8 | 10.1 | | |

All cabling and must comply with national and local regulations on cable cross-sections and ambient temperature



Product Submittal for XVers™ (Powered by KOR) - Type H Heating Boiler

Models 1007-4007

Date: 3/25/24 Job: Sylvia Mendez Elem. School Location: Berkeley, CA
 Equipment Tags: B-1,2,3,4 Engineer: LPA Design Studios Contractor: _____
 Model: H7-2007 Notes: _____
 Prepared by: HTE Indoor Outdoor

Featuring KOR stainless steel vertical fire-tube heat exchanger with versatile and adaptive controls.

- All models fit through standard doorways
- Up to 95.7% efficiency at full rate
- VERSA IC® modulating controller with 7" color touchscreen display
- Raymote™ Wi-Fi connectivity with data access, logging, alerts and factory assistance
- Fault history with diagnosis in plain English and 3D location shown on touchscreen
- Illuminated display logo on front panel for quick & easy visual of boiler status
- Maximum outlet water temperature: 200°F
- Maximum setpoint: 190°F
- Raypak's Dynamic Protection™ with built-in flow meter, prevents unnecessary cycling and extends the life of your heat exchanger
- Optional HO₂T Track monitors the oxygen level of the flue gas so you can know the overall health of combustion performance
- Cascade up to 8 boilers in sequential or parallel modulation modes
- Certified for stainless steel, PVC, CPVC and Centrotherm® polypropylene venting ^[1]
- Minimum continuous inlet water temperature: 40°F
- Supports variable-speed and/or fixed-speed boiler and system pumps
- Three pump control: system pump, boiler pump, DHW pump
- Modbus RTU BMS, BACnet optional. Single BACnet gateway supports up to 8-unit cascade system
- Indoor/outdoor construction - standard
- Limited 10-year heat exchanger warranty
- Supports primary/secondary and primary piping
- Freeze protection integrated with VERSA IC
- High elevation models available to minimize elevation derate
- SCAQMD rule 1146.2 certified^[2] – Low NOx <20 ppm
- BAAQMD rule 9-7-307.1 certified^[3] – Low NOx <30 ppm
- SJVAPCD rule 4308^[5] propane certified - Low NOx <30 ppm
- 100% factory fire-tested
- Proudly assembled in the USA



[1] Appropriate venting material selection to be based on setpoint and Delta T. Max setpoint for PVC venting is 140°F.

[2] SCAQMD rule 1146.2 certification is only applicable for units up to 2000 MBTUH input.

[3] BAAQMD rule 9-7-307.1 certification is only applicable for units above 2000 MBTUH input.

[4] Energy Star is only applicable for units below 2500 MBTUH input.

[5] SJVAPCD 4308 is only applicable for units below 2000 MBTUH input.



STANDARD PRODUCT

NOTE: Standard features listed below containing a [o] hollow bullet next to their description, can be modified for configured made-to-order product.

| MODEL SIZE | ITEM# (Std. Elevation 0-5,000 ft) | ITEM# (High Elevation 5,001+ ft) |
|----------------|---|---------------------------------------|
| H7-1007 | <input type="checkbox"/> 100-10000783 | <input type="checkbox"/> 100-10000791 |
| H7-1257 | <input type="checkbox"/> 100-10000784 | <input type="checkbox"/> 100-10000792 |
| H7-1507 | <input type="checkbox"/> 100-10000785 | <input type="checkbox"/> 100-10000793 |
| H7-2007 | <input checked="" type="checkbox"/> 100-10000786 | <input type="checkbox"/> 100-10000794 |
| H7-2507 | <input type="checkbox"/> 100-10000787 | <input type="checkbox"/> 100-10000795 |
| H7-3007 | <input type="checkbox"/> 100-10000788 | <input type="checkbox"/> 100-10000796 |
| H7-3507 | <input type="checkbox"/> 100-10000789 | <input type="checkbox"/> 100-10000797 |
| H7-4007 | <input type="checkbox"/> 100-10000790 | <input type="checkbox"/> 100-10000798 |

STANDARD STOCK FEATURES:

Heat Exchanger:

- 316L stainless steel for tubing/fire side components
- 304 stainless steel water inlet/outlet and shell
- ASME H-stamped; 160 PSIG MAWP
- National Board registered
- T&P gauge
- PRV (60 psi)

Gas Type:

- Natural gas

Power: 208V-60Hz Optional

- (1007-2007 models = 120V; 2507-4007 models = 240V)

Control:

- VERSA IC® controller with 7" color touchscreen display
- Raymote™ Wi-Fi connectivity with data access, logging, alerts and factory assistance
- Remote flame sensor
- Ignition module (3-Try)
- Hot surface ignition (HSI)
- C-13 HO₂T track - flue oxygen monitoring
- Cascade up to 8 boilers
- Cascade, parallel or sequential modulation modes
- Cascade interstage delay settings
- Cascade flow offset control
- Fixed manual-reset high limit 200°F
- I-13 High limit, adj. auto-reset, 200°F max
- S-1 Low gas pressure switch, manual-reset
- S-2 High gas pressure switch, manual-reset
- Off-idle-run power switch
- Low water cut off, remote probe
- Flow meter with Dynamic Protection™
- Vent protection using flue gas vent temperature sensor (factory-installed)
- Blocked vent pressure switch
- General alarm - dry contact
- Boiler pump contact (via contactor)

- Three pump control:
 - Boiler pump - via contactor
 - System pump - via pilot duty relay
 - DHW pump - via pilot duty relay
- Condensate trap with blocked condensate switch (standard height of outlet on unit is sufficient for drainage, no additional height is required)
- 2 outlet and 1 inlet water temperature 10kΩ sensor (factory-installed)
- 3 (system, indirect supply, indirect DHW) 10kΩ water temperature sensors (shipped loose)
- Outdoor air sensor (shipped loose)
- Cabinet temperature sensor (manual-reset)

Burner:

- Easily-accessible radially-fired knitted burner

Gas Train:

- Engineered modulating fuel-to-air flow system for precision combustion
- Rich-start ignition system
- Single gas valve body with 2 safety shutoff valves
- Manual shut-off gas valve
- Built-on external sediment trap

Construction:

- Indoor/outdoor construction
- PolyTuf powder-coat finish (No volatile organic compounds)
- Front-accessible junction box and transformer
 - Low voltage terminal strip
 - Easy access for maintenance and troubleshooting
- Rear connections (water, gas, vent, electrical, condensate drain, high-voltage terminal block, pump connections)
- Front accessible combustion air filter
- Combustion air inlet on top of unit
- Design certified ANSI Z21.13/CSA 4.9
- Built-in lifting lugs for rigging
- Built-in flue gas analysis port
- Forklift or pallet jack accessible from front, back and sides
- Seismic anchor-ready base

Vent Options:

- Ready to vent with stainless steel
 - Adapter required for polypropylene, PVC & CPVC (max. setpoint 230°F, 149°F and 194°F, respectively)

MADE-TO-ORDER (CONFIGURED PRODUCT)

NOTE: Features containing a [•] solid bullet in the “Standard Product” section, are also standard on the “Made-to-Order” configurations listed below.

Elevation:

- Std. elevation 0-5,000 ft.
- High elevation 5,001+ ft.

Heat Exchanger:

- ASME pressure relief valve options
 - A-10 30 PSIG
 - A-11 45 PSIG
 - A-12 60 PSIG (standard)
 - A-14 75 PSIG
 - A-16 150 PSIG

Gas Type:

- Fuel
 - Natural gas
 - Propane (minimum grade HD5)

Power:

1PH/3PH Delta/Wye connectivity

- Power supply options for models 1007-2007
 - 120V, 60Hz
 - 208V, 60Hz
 - 240V, 60Hz
 - 480/600V, 60Hz
- Power supply options for models 2507-4007
 - 240V, 60Hz
 - 208V, 60Hz
 - 480/600V, 60Hz

Control:

- Ignition module
 - 3-Try
 - C-6 single-try
- Modbus RTU BMS port
- BMS - Protonode gateway
 - B-85 BACnet IP and BACnet MS/TP
 - Loose
 - Factory-mounted
 - B-86 LonWorks BMS
 - Loose
 - Factory-mounted

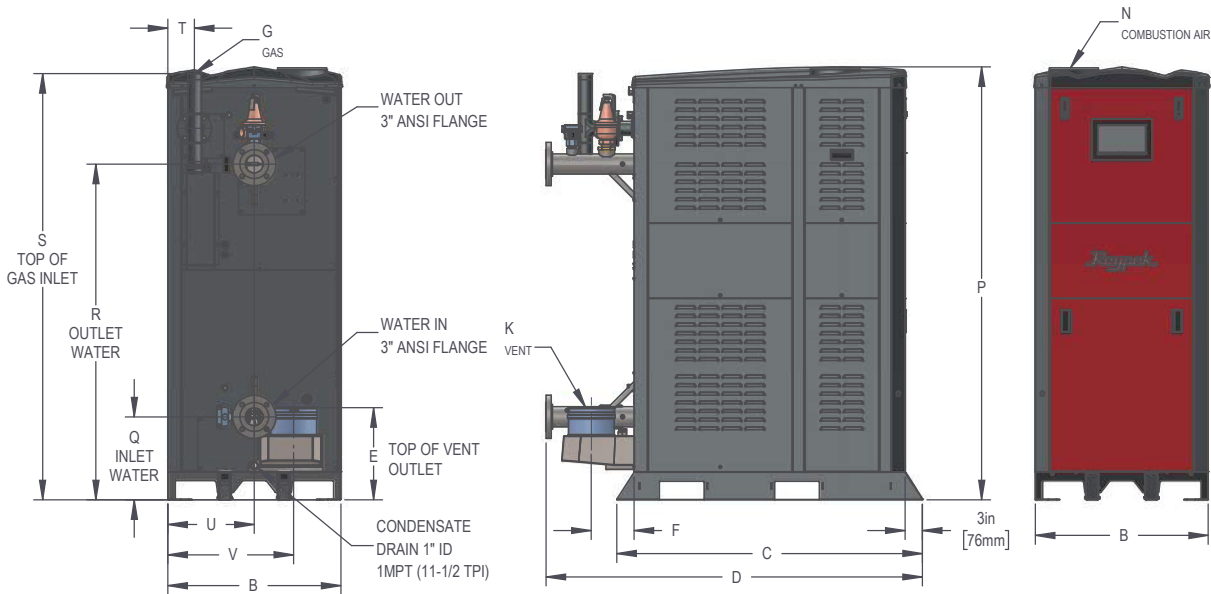
Vent Options:

- D-11 Polypropylene outdoor flue exhaust kit and outdoor vent support (includes D-23, D-26, D-29, D-33 and D-104)
- D-15 Sidewall vent termination cap (Cat IV)
- D-23 Outdoor vent support
- D-26 Centrotherm® polypro vent tee
- D-29 Centrotherm® polypro vent pipe 36"
- D-33 Centrotherm® SS to polypro adapter
- D-37 Motorized combustion air damper
- D-104 Bird guard screen
- D-108 90° vent adapter SS to PVC

Other Options:

- B-31 Sensor well assembly (additional, as needed for indirect piping install, one (1) is supplied with every unit standard)
- B-65 Indirect tank aquastat (100-200°F)
- C-13 HO₂T track - flue oxygen monitoring
- E-5 Alarm with 4" bell. **Note:** Will alarm on any soft or hard lockout
 - Loose
 - Factory-mounted
- E-15 Alarm with buzzer. **Note:** Will alarm on any soft or hard lockout
 - Loose
 - Factory-mounted
- F-1 Flow switch
 - Loose
 - Factory-mounted
- I-5 High limit, adj. manual-reset, 200°F max. (In addition to built-in VERSA manual-reset, to satisfy some local requirements)
 - Loose
 - Factory-mounted
- I-13 High limit, adj. auto-reset, 200°F max. (Does not meet requirements of CSD-1)
 - Loose
 - Factory-mounted

- M-1 Additional safety valve - motorized
 - M-10 Additional safety valve - solenoid
 - M-15 Vent valve (requires M-1 or M-10)
 - P-170 Motorized isolation valve (only for use on variable-primary piping systems)
 - P-171 Suction diffuser
 - Loose
 - Factory-mounted
 - S-1 Low gas pressure switch, manual-reset
 - S-2 High gas pressure switch, manual-reset (Standard for models 2507-4007)
 - Z-12 Condensate treatment kit
 - Z-21 Cabinet latch with key
- External Controller Options
- TempTracker Mod+ Hybrid Digital Controller (for combined condensing and non-condensing boiler systems)
 - B-36 2-4 boilers, OA reset
 - B-37 5-10 boilers, OA reset
 - B-38 11-16 boilers, OA reset
 - B-39* EMS 4-20 mA remote setpoint interface module
 - B-62* BACnet MS/TP interface module (*requires B-36 to B-38)
- Optional Pump (see page 5 for more information)
- _____



| Model (H7-) | MBTU/h (kW) | | Minimum BTU/h (kW) Input | Turn Down | AHRI Thermal / Combustion Efficiency (%) | Dimensions - Inches (mm) | | | | | | | | | | | | | | Shipping Weight lbs. (kg) | Water Content gal. (L) | |
|--|----------------|----------------|--------------------------|-----------|--|--------------------------|--------------|-----------------|------------|-----------|---------------|----------|------------|-------------|-------------|-------------|-------------|------------|-------------|---------------------------|------------------------|-----------|
| | Input | Output | | | | B Width | C Base Depth | D Overall Depth | E | F | G NPT | K Flue Ø | N C/A Ø | P | Q | R | S | T | U | | | V |
| <input type="checkbox"/> 1007 | 999 (293.1) | 952 (279.0) | 100,000 (29.3) | 10:1 | 95.3 / 95.5 | 24 (610) | 44 (1118) | 56.3 (1430) | 16 (406) | 6.1 (155) | 1-1/4 (31.75) | 6 (152) | 6 (152) | 71.6 (1818) | 14.4 (365) | 58.2 (1478) | 73.0 (1853) | 4.9 (124) | 12 (305) | 18.5 (470) | 1,220 (553) | 50 (189) |
| <input type="checkbox"/> 1257 | 1,250 (366.3) | 1,196 (350.5) | 104,000 (30.5) | 12:1 | 95.7 / 96.0 | 26 (660) | 48 (1219) | 60.3 (1531) | 16 (406) | 7.5 (190) | | 8 (203) | 8 (203) | | 14.2 (362) | 58.2 (1478) | 73.1 (1856) | 4.5 (114) | 13 (330) | 20.4 (518) | 1,450 (658) | 65 (246) |
| <input type="checkbox"/> 1507 | 1,500 (439.6) | 1,427 (418.2) | 100,000 (29.3) | 15:1 | 95.1 / 95.3 | 26 (660) | 48 (1219) | 60.3 (1531) | 16 (406) | 7.5 (190) | | 8 (203) | 8 (203) | | 14.2 (362) | 58.2 (1478) | 73.1 (1856) | 4.5 (114) | 13 (330) | 20.4 (518) | 1,450 (658) | 65 (246) |
| <input checked="" type="checkbox"/> 2007 | 1,999 (586.0) | 1,903 (557.8) | 200,000 (58.6) | 10:1 | 95.2 / 95.4 | 30 (762) | 53 (1346) | 65.3 (1659) | 16 (406) | 7.4 (188) | 8 (203) | 8 (203) | 14.4 (366) | 58.2 (1478) | 73.9 (1878) | 4.6 (117) | 15 (381) | 21.8 (554) | 1,720 (780) | 85 (322) | | |
| <input type="checkbox"/> 2507 | 2,499 (732.3) | 2,374 (695.7) | 300,000 (88.0) | 8:1 | 95.0 / 96.2 | 34 (864) | 58 (1473) | 70.3 (1786) | 16.8 (427) | 8.1 (206) | 2.0 (51.0) | 10 (254) | 10 (254) | 74.6 (1894) | 15.2 (385) | 59.0 (1499) | 74.7 (1896) | 5.1 (130) | 17 (432) | 24.9 (632) | 2,050 (930) | 105 (397) |
| <input type="checkbox"/> 3007 | 3,000 (879.2) | 2,862 (838.7) | 300,000 (88.0) | 10:1 | 95.0 / 95.4 | 34 (864) | 58 (1473) | 70.3 (1786) | 16.8 (427) | 8.1 (206) | | 10 (254) | 10 (254) | | 15.2 (385) | 59.0 (1499) | 74.7 (1896) | 5.1 (130) | 17 (432) | 24.9 (632) | 2,050 (930) | 105 (397) |
| <input type="checkbox"/> 3507 | 3,500 (1025.7) | 3,329 (975.6) | 400,000 (117.2) | 9:1 | 95.0 / 95.1 | 34 (864) | 58 (1473) | 70.4 (1788) | 17.1 (434) | 7.9 (200) | | 12 (305) | 12 (305) | | 15.2 (385) | 59.0 (1499) | 74.7 (1896) | 5.3 (135) | 17 (432) | 25.9 (658) | 2,200 (998) | 115 (435) |
| <input type="checkbox"/> 4007 | 4,000 (1172.3) | 3,788 (1110.1) | 400,000 (117.2) | 10:1 | 94.5 / 94.7 | 34 (864) | 58 (1473) | 70.4 (1788) | 17.1 (434) | 7.9 (200) | 12 (305) | 12 (305) | 15.2 (385) | 59.0 (1499) | 74.7 (1896) | 5.3 (135) | 17 (432) | 25.9 (658) | 2,200 (998) | 115 (435) | | |

Clearances - Inches (mm)

| | Front | Rear Indoor | Rear Outdoor | Right | Left | Top Indoor | Top Outdoor | Floor* | Vent Indoor | Vent Outdoor |
|---------------------|----------|-------------|--------------|--------|--------|------------|--------------|--------|-------------|--------------|
| Combustible Minimum | Open | 24 (610) | 12 (305) | 1 (25) | 1 (25) | 0 | Unobstructed | 0 | 1 (25) | Open |
| Minimum Service | 30 (762) | 24 (610) | 24 (610) | 1 (25) | 1 (25) | 24 (610) | Unobstructed | 0 | 1 (25) | Open |

*WARNING: Do not install on carpeting.

NOTE: Heat exchanger is designed to last the entire service life of the boiler, additional service clearance is required for replacement of heat exchanger.

| Model (H7-) | Boiler Current Draw (Amps) | | | | |
|--|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
| | <input type="checkbox"/> 120VAC | <input type="checkbox"/> 208VAC | <input type="checkbox"/> 240VAC | <input type="checkbox"/> 480VAC | <input type="checkbox"/> 600VAC |
| <input type="checkbox"/> 1007 | <10.0 | <6.0 | <5.0 | <3.0 | <2.0 |
| <input type="checkbox"/> 1257 | <10.0 | <6.0 | <5.0 | <3.0 | <2.0 |
| <input type="checkbox"/> 1507 | <10.0 | <6.0 | <5.0 | <3.0 | <2.0 |
| <input checked="" type="checkbox"/> 2007 | <24.0 | <13.0 | <12.0 | <6.0 | <5.0 |
| <input type="checkbox"/> 2507 | | | | | |
| <input type="checkbox"/> 3007 | | | | | |
| <input type="checkbox"/> 3507 | | <32.0 | <29.0 | <15.0 | <12.0 |
| <input type="checkbox"/> 4007 | | | | | |

NOTE: Boiler current only. Does not include pump current.

| Rates of Flow and Pressure Drops | | | | | | | | | | | | | | | | |
|----------------------------------|----------------|----------------|---------------------------|----------------|-------------|----------------|-------------|----------------|-------------|----------------|-------------------------|----------------|------------------------------------|----------------|-------------|----------------|
| Model (H7-) | Input | Output | 20° ΔT | | 30° ΔT | | 40° ΔT | | 60° ΔT | | Min. Flow for Ignition* | | Min. Flow for Full Fire (75°F ΔT)* | | Max. Flow** | |
| | | | GPM (L/min) | ΔP ft.hd (kPa) | GPM (L/min) | ΔP ft.hd (kPa) | GPM (L/min) | ΔP ft.hd (kPa) | GPM (L/min) | ΔP ft.hd (kPa) | GPM (L/min) | ΔP ft.hd (kPa) | GPM (L/min) | ΔP ft.hd (kPa) | GPM (L/min) | ΔP ft.hd (kPa) |
| ☐ 1007 | 999 (293.1) | 952 (279.0) | 95 (360) | 1.91 (5.7) | 65 (246) | 0.85 (2.54) | 48 (181) | 0.43 (1.3) | 32 (121) | 0.22 (0.7) | 14 (53) | 0.1 (0.3) | 29 (110) | 200 (757) | 7.7 (23.0) | |
| ☐ 1257 | 1,250 (366.3) | 1,196 (350.5) | 119 (450) | 2.31 (6.9) | 82 (310) | 0.85 (2.54) | 60 (227) | 0.60 (1.8) | 40 (151) | 0.28 (0.8) | 14 (53) | 0.12 (0.35) | 36 (136) | 240 (908) | 8.6 (25.7) | |
| ☐ 1507 | 1,500 (439.6) | 1,427 (418.2) | 143 (541) | 3.56 (10.6) | 97 (367) | 1.40 (4.2) | 72 (272) | 0.66 (2.0) | 48 (182) | 0.39 (1.2) | 26 (98) | 0.15 (0.4) | 43 (163) | 240 (908) | 8.6 (25.7) | |
| ■ 2007 | 1,999 (586.0) | 1,903 (557.8) | 192 (726) | 3.52 (10.5) | 129 (488) | 1.45 (4.3) | 95 (360) | 1.00 (3.0) | 64 (242) | 0.33 (1.0) | 26 (98) | 0.3 (0.9) | 58 (219) | 240 (908) | 5.5 (16.4) | |
| ☐ 2507 | 2,499 (732.3) | 2,374 (695.7) | 238 (900) | 7.9 (23.6) | 161 (609) | 3.20 (9.5) | 119 (450) | 1.76 (5.3) | 80 (303) | 1 (3.0) | 26 (98) | 0.4 (1.2) | 72 (272) | 240 (908) | 8.2 (24.5) | |
| ☐ 3007 | 3,000 (879.2) | 2,862 (838.7) | 240 ⁽¹⁾ (908) | 8.2 (24.5) | 192 (727) | 5.10 (15.2) | 143 (541) | 2.97 (8.9) | 95 (360) | 1.32 (3.9) | 26 (98) | 0.4 (1.2) | 86 (325) | 240 (908) | 8.2 (24.5) | |
| ☐ 3507 | 3,500 (1025.7) | 3,329 (975.6) | 334 (1264) | 10.51 (31.4) | 224 (848) | 3.65 (10.9) | 167 (632) | 2.10 (6.3) | 111 (420) | 1 (3.0) | 36 (136) | 0.5 (1.5) | 100 (378) | 350 (1324) | 11.5 (34.3) | |
| ☐ 4007 | 4,000 (1172.3) | 3,788 (1110.1) | 350 ⁽²⁾ (1324) | 11.5 (34.3) | 255 (965) | 4.65 (13.9) | 192 (727) | 3.00 (9.0) | 127 (481) | 1.76 (5.3) | 36 (136) | 0.5 (1.5) | 115 (435) | 350 (1324) | 11.5 (34.3) | |

*Minimum flow based on water as a heating medium. Any other medium may require higher minimum flow rates.
 **Maximum flow inside the boiler is based on 10.5 ft per second velocity (14.2 ft. per second for models 3507 and 4007). Maximum velocity in the piping, and pipe sizing, must comply with applicable national, state, provincial and local codes, or regulations having jurisdiction.
 ΔP = Boiler pressure drop (feet of head).
 (1) For model 3007 shown GPM results in 24°F ΔT
 (2) For model 4007 shown GPM results in 22°F ΔT

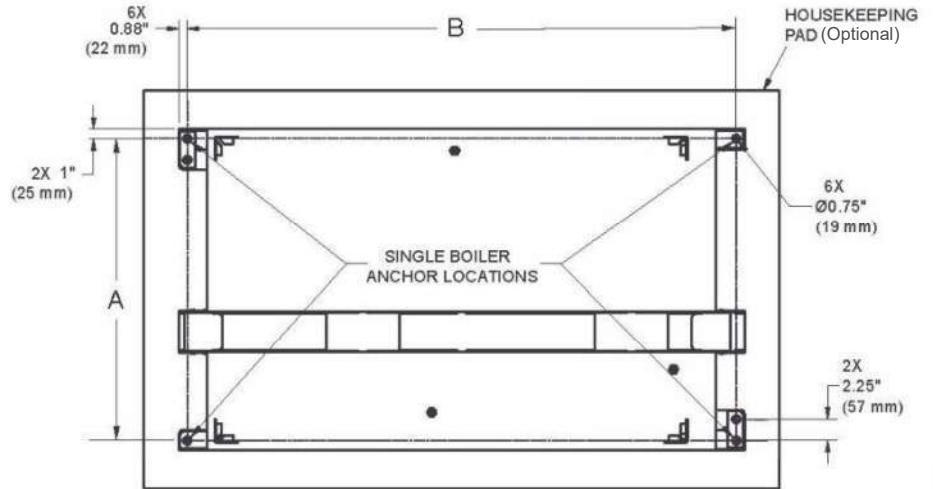
Optional Pump Information

| Model (H7-) | Fixed-Speed Boiler Pump | | | | | | Model (H7-) | Variable-Speed Boiler Pump | | | | | |
|-------------|-------------------------|-----|----------|----------------|-----------|---------|-------------|----------------------------|--------------|------------------------|------------------------|-----------|---------|
| | TACO MDL | HP | Impeller | Amps @115 VAC* | GPM FT/HD | ΔT (°F) | | TACO MDL | HP | Amps @110-240 1PH VAC* | Amps @230-240 1PH VAC* | GPM FT/HD | ΔT (°F) |
| ☐ 1007 | 0012-SF4 | 1/8 | | 1.33 | 49 / 1.5 | 40 | ☐ 1007 | 0034E-F2 | 0.013 - 0.23 | 1.48 | | 50 / 2.0 | 38 |
| ☐ 1257 | 1611 | 1/4 | 4.5 | 6.3 | 76 / 3.0 | 31 | ☐ 1257 | VR15-3 | 0.027 - 0.68 | 5.6 - 2.8 | | 110 / 5.0 | 22 |
| ☐ 1507 | 1611 | 1/4 | 4.5 | 6.3 | 76 / 3.0 | 38 | ☐ 1507 | VR15-3 | 0.027 - 0.68 | 5.6 - 2.8 | | 110 / 5.0 | 26 |
| ■ 2007 | 1630 | 1/2 | 4.9 | 7.0 | 120 / 8.0 | 32 | ■ 2007 | VR15-3 | 0.027 - 0.68 | 5.6 - 2.8 | | 110 / 5.0 | 35 |
| ☐ 2507 | 1630 | 1/2 | 4.9 | 7.0 | 120 / 8.0 | 40 | ☐ 2507 | VR20-3 | 0.035 - 1.09 | 7.2 - 3.6 | | 175 / 7.0 | 28 |
| ☐ 3007 | 1632 | 3/4 | 5.65 | 12.4 | 146 / 10 | 40 | ☐ 3007 | VR20-3 | 0.035 - 1.09 | 7.2 - 3.6 | | 160 / 9.0 | 36 |
| ☐ 3507 | 1634 | 1.0 | 6.15 | 15.8 | 168 / 12 | 40 | ☐ 3507 | VR20-3 | 0.035 - 1.09 | 7.2 - 3.6 | | 170 / 8.0 | 40 |
| ☐ 4007 | 1641 | 2.0 | 6.9 | 23.0 | 200 / 18 | 38 | ☐ 4007 | VR25-3 | 0.054 - 1.5 | | 5.3 | 240 / 10 | 32 |

NOTE: Head (ft) based on 3" - schedule 40 pipe, except model 4007 which is 4" schedule 40 pipe.
 *For primary/secondary operation, boiler pump requires independent leg of voltage with breaker.

Engineered Base

| Model (H7-) | A in. (mm) | B in. (mm) | Operating Weight lbs. (kg) |
|-------------|-------------|-------------|----------------------------|
| □ 1007 | 21.75 (552) | 42.0 (1066) | 1,450 (657) |
| □ 1257 | 23.75 (603) | 46.0 (1168) | 1,700 (771) |
| □ 1507 | 23.75 (603) | 46.0 (1168) | 1,700 (771) |
| ■ 2007 | 27.75 (704) | 51.0 (1295) | 2,100 (952) |
| □ 2507 | 31.75 (806) | 56.0 (1422) | 2,570 (1166) |
| □ 3007 | 31.75 (806) | 56.0 (1422) | 2,570 (1166) |
| □ 3507 | 31.75 (806) | 56.0 (1422) | 2,820 (1279) |
| □ 4007 | 31.75 (806) | 56.0 (1422) | 2,820 (1279) |



Center of Gravity

| Model (H7-) | A in. (mm) | B in. (mm) | C in. (mm) |
|-------------|------------|------------|------------|
| □ 1007 | 29.5 (749) | 37.9 (963) | 12.2 (310) |
| □ 1257/1507 | 31.3 (795) | 33.8 (858) | 14.5 (368) |
| ■ 2007 | 34.4 (874) | 36.1 (917) | 15.2 (386) |
| □ 2507/3007 | 36.6 (930) | 33.5 (851) | 17.2 (437) |
| □ 3507/4007 | 36.0 (914) | 30.0 (762) | 17.5 (444) |

