

ARMSTRONG SUBMITTAL DATA

FOR

CMS Elon/Hawk/Polo Ridge Relief Elementary School

Charlotte, NC

Mechanical Engineer: Optima Engineering
Mechanical Contractor: Superior Mechanical Systems

Date: 5/14/2022
Revision: 1
Submitted By: Adam Parker, Insight Partners
Equipment Type: Hydronic Pumps, Suction Guides, Triple Duty Valves
Specification Section: 232123

Submittal Comment Responses:

Hydronic Pumps (232123):

- **(Verify Shaft Grounding Rings provided for pumps)**
 - Shaft Grounding Rings are typically provided on VFD-fed motors to protect from bearing damage by discharging shaft voltage, diverting harmful current away from the bearings. Shaft grounding rings are provided on all VFD-fed pumps – BCWP-1, BCWP-2, BHWP-1 & BHWP-2.
- **(Verify coupling guard on base mounted pumps complies with specifications)**
 - Coupling guards on all base-mounted split-coupled Armstrong pumps comply with the specifications in section 232123-2.4.D.
- **(Provide drain pan on all base mounted pumps per detail 8/M501)**
 - Drain pans have been added to pumps BHWP-1 & BHWP-2 to comply with drain pans on all base mounted pumps.
- **(Verify Warranty Requirements comply with specifications)**
 - Insight Partners verifies that warranties comply with specifications section 232123-1.5.
- **(Verify operating temperature at 160F)**
 - All Armstrong pumps in this submittal are rated for water operating temperatures up to 225F.
- **(Provide Premium Efficiency Motor as specified)**
 - All motors for pumps BCWP-1, BCWP-2, BHWP-1, BHWP-2, CWP-1, and CWP are provided as premium efficiency motors complying with IEEE 112 polyphase motor requirements and specification section 230513-2.4. Single phase motors for pumps HWP-1 & HWP-2 are in compliance with specification section 230513-2.5.
- **(Bronze start up strainer specified for Pump Suction Guides)**
 - The material of construction for this temporary component of the suction guides is believed to be proprietary to one of the three approved manufacturers. The start-up strainers are to be removed once the system is started up and are respectfully provided as galvanized steel construction.
- **(Coordinate motor power requirements)**
 - Mechanical Contractor to coordinate power requirement deviations for pumps BHWP-1 & BHWP-2 to 7.5 HP from scheduled 5 HP and pumps HWP-1 & HWP-2 to 1.5 HP from scheduled 1 HP.

Submittal Scope

Pumps, Suction Guides & Triple Duty Valves (Spec. Section: 232123)

To: Superior Mechanical Systems, Inc.
 Attn: Ben Wyke

Date: May 12, 2022

Project Name: CMS Elon/Hawk/Polo
 Charlotte, NC

Engineer: Optima Engineering
 Charlotte, North Carolina

| LI# | Product | Description |
|-----|---------------------------------------|---|
| 1 | Armstrong – Pumps | <p>(QTY 2) Base-Mounted End Suction Pumps Model: Series 4030 Pump Size: 5x4x10 Tagged: BCWP-1 & BCWP-2 485 GPM @ 90' TDH 480/3/60 20 HP Premium Efficient 1800 RPM ODP Motor Drain Pan Included</p> <p>(QTY 2) Base-Mounted End Suction Pumps Model: Series 4030 Pump Size: 3x1.5x10 Tagged: BHWP-1 & BHWP-2 98 GPM @ 90' TDH 480/3/60 7.5 HP Premium Efficient 1800 RPM ODP Motor Drain Pan Included</p> <p>(QTY 2) Base-Mounted End Suction Pumps Model: Series 4030 Pump Size: 5x4x8 Tagged: CWP-1 & CWP-2 485 GPM @ 35' TDH 480/3/60 7.5 HP Premium Efficient 1800 RPM ODP Motor Drain Pan Included</p> <p>(QTY 2) Vertical Inline Split-Coupled Pumps Model: Series 4360 Pump Size: 3D Tagged: HWP-1 & HWP-2 98 GPM @ 25' TDH 115/1/60 1.5 HP 1800 RPM ODP Motor</p> |
| 2 | Armstrong – Suction Guides | <p>(QTY 2) 6" x 5" Suction Guide for Pumps BCWP-1 & BCWP-2 (QTY 2) 4" x 3" Suction Guide for Pumps BHWP-1 & BHWP-2 (QTY 2) 6" x 5" Suction Guide for Pumps CWP-1 & CWP-2</p> |
| 3 | Armstrong – Triple Duty Valves | <p>(QTY 2) 6" Triple Duty Valve for Pumps BCWP-1 & BCWP-2 (QTY 2) 3" Triple Duty Valve for Pumps BHWP-1 & BHWP-2 (QTY 2) 6" Triple Duty Valve for Pumps CWP-1 & CWP-2 (QTY 2) 3" Triple Duty Valve for Pumps HWP-1 & HWP-2</p> |

Submittal

Ref. #: SQJPE002336_1

close-coupled vertical in-line 4360 pump

Model: Series 4360 - 3D - 4p - 1.5 hp - (Factory Choice Motor) with Flo-Trex Valve

| | |
|--|---------------------------------------|
| Project name: CMS Elon | Representative: Parth Upadhyay |
| Location: | Phone number: |
| Date submitted: 3/27/2022 6:44 PM | e-mail: parth@insightusa.com |
| Engineer: | Submitted by: Upadhyay, Parth |

Application design data

| | | | |
|-------------------------|-----------------|------------------------|---------------------------|
| Tag number: | HWP-1 & HWP-2 | Configuration: | Single |
| Service: | Boiler Loop | Suction pressure: | 0 ft |
| Location: | Mechanical Room | Fluid: | Non-Potable Fluid - Water |
| Qty: | 2 | Operating temperature: | 60 °F |
| Total system flow: | 98 USgpm | Duty flow per pump: | 98 USgpm |
| System head: | 25 ft | Viscosity: | 31 SSU |
| Total dissolved solids: | 0 ppm | Specific gravity: | 1.0000 |
| NPSHR: | 13.84 ft | Absorbed Power/BHP: | 1.03 hp |
| %Mtr Safety*: | 45.89% | Efficiency at Design: | 60.17 % |
| Outlet velocity: | 4.25 ft/s | Impeller diameter: | 5.5 in |
| PEIcl: | 0.989615028 | ERcl: | 1.038497206 |
| Standby qty: | 0 | Pump/motor run qty: | 1 |

*Motor safety factor above duty point.

Materials of construction

| | | | |
|------------------|---------------------------|----------------|-----------------------------|
| Construction: | Bronze Fitted | Impeller: | Bronze |
| Rating: | ANSI-125 | Casing gasket: | Confined Non-Asbestos Fiber |
| Connections: | Inlet: 3 in, Outlet: 3 in | Flush line: | Braided Stainless Steel |
| Casing (volute): | Cast Iron | Shaft sleeve: | 316 Stainless Steel |

Mechanical seal data

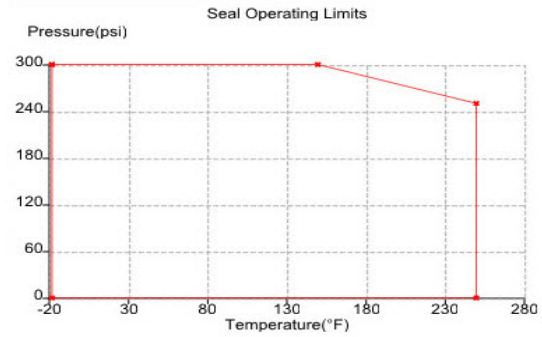
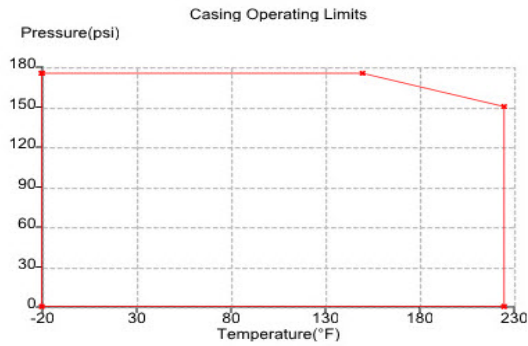
| | | | |
|--------------------|----------------------|--|--------------------------|
| Seal type: | Inside Single Spring | Rotating face: | Resin Bonded Carbon |
| Manufacturer code: | C-ssc L EPSS 2A | Stationary seat: | Sintered Silicon Carbide |
| Springs: | Stainless Steel | Secondary seal: | EPDM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

*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.

Electrical data

| | | | |
|---------------|----------------|-------------------|--------------------|
| Supplier: | Factory Choice | Insulation class: | Class B Insulation |
| Frame size: | 145JM | Motor type: | Induction |
| Speed: | 1760 rpm | Size: | 1.5 hp |
| Enclosure: | ODP | Efficiency: | Std |
| Power supply: | 115/1/60 | | |

Operating limits (temperature - pressure)

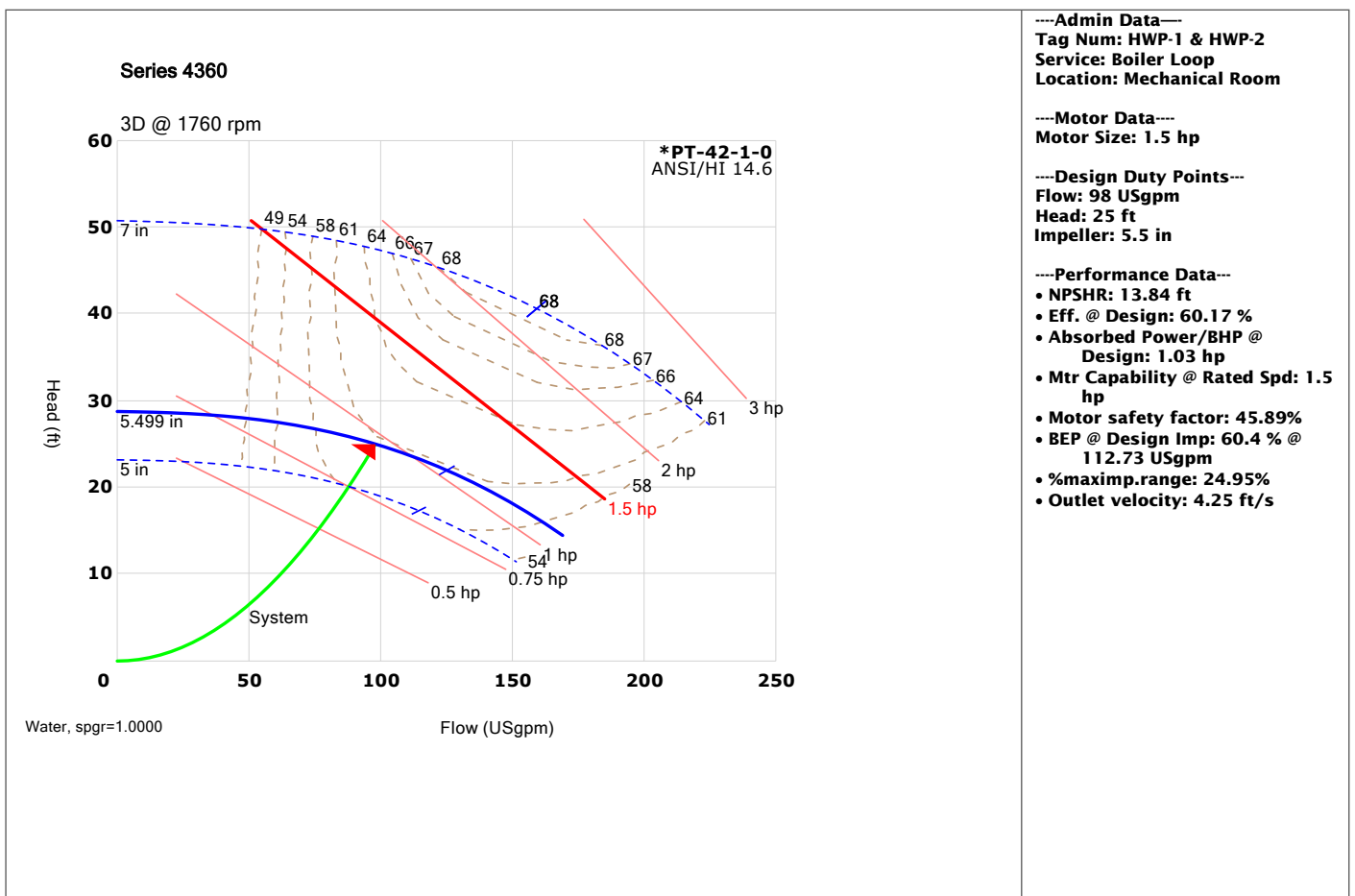


Maximum pressure: 175psi

Maximum temperature: 225F

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

Performance curve

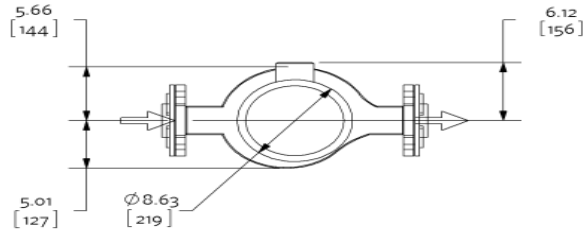
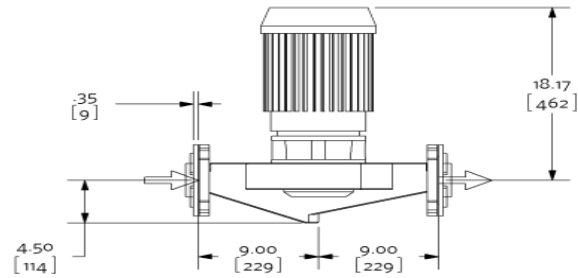


Dimensional data (not for construction)

Side view

Top view

R:3.00
[76]



Weight: 175 lb [79.38 kg], Units of measure: inches [millimeters]

- Not to scale
- 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 | Type |
|------------|------|--------|--------|
| Inlet | 3 | NPT | Female |
| Outlet | 3 | NPT | Female |

Special instructions

Reference Motor Specification AES 05007.

This selection is non-compliant with sensorless quadratic curve control, but will indicate flow and pressure, and can operate in constant pressure and constant flow modes when flow is less than best efficiency point flow at that speed. Pump (Factory Choice Motor)

Selected options

Testing: No Test Certification Required
 Seal Environment Accessories: None
 Pre-Wired Control Bridge: No
 Space Heater: No
 Motor Thermistor: No Thermistors
 Wye-Delta Starting: No

Submittal

Ref. #: SQJPE002336_1

Flo-trex valve

Model: FTV-3FS-Flo-Trex Valve-ANSI-125-Straight

| | |
|--|---------------------------------------|
| Project name: CMS Elon | Representative: Parth Upadhyay |
| Location: | Phone number: |
| Date submitted: 3/27/2022 6:44 PM | e-mail: parth@insightusa.com |
| Engineer: | Submitted by: Upadhyay, Parth |

Application design data

| Tag | Qty | Model | Size Inlet/Outlet | Config | Pipe Type | Design flowrate | Pressure Drop* | Associated pump |
|---------------|-----|---------|-------------------|----------|-----------|-----------------|----------------|--|
| HWP-1 & HWP-2 | 2 | FTV-3FS | 3 in | Straight | Flanged | 98 USgpm | 3 ft | 4360 - 3D - 4p - 1.5 hp - (Factory Choice Motor) |

*at design flow

Materials of construction

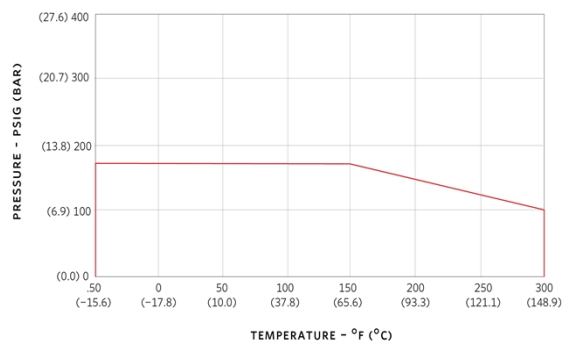
FTV-3FS-Flo-Trex Valve-ANSI-125-Straight

| | | | |
|-------|---------------------|-------------------|--|
| Body: | Cast Iron | Spring: | 302 Stainless Steel |
| Disc: | Brass | O rings: | BUNA N |
| Seat: | EPDM | 2 metering ports: | NPT Brass Body with EPT Check and Gasketed Cap |
| Stem: | 416 Stainless Steel | 2 drain tappings: | 1/4in with Brass Plug |

Operating limits (temperature - pressure)

FTV-3FS-Flo-Trex Valve-ANSI-125-Straight

PRESSURE TEMPERATURE LIMITS



Maximum pressure: 175 psi
Maximum temperature: 300 F

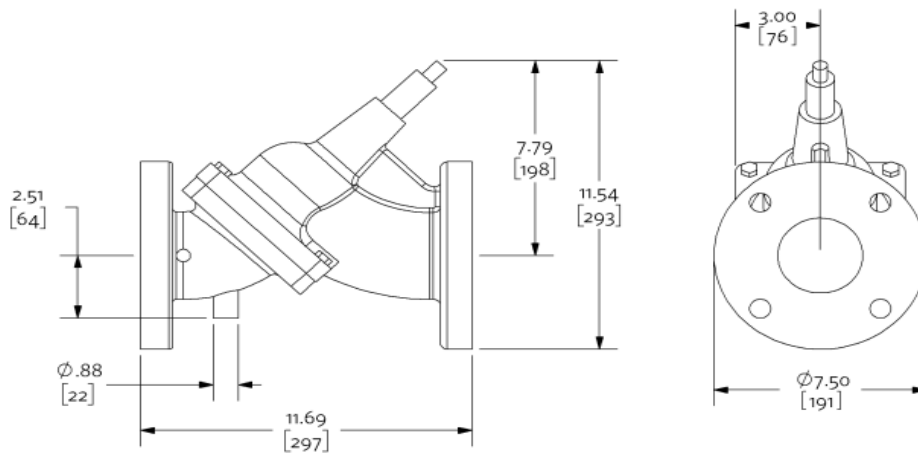
Dimensional data (not for construction)

Model: FTV-3FS-Flo-Trex Valve-ANSI-125-Straight

Weight: 39 lb [17.69 kg]

Side view

Front view



Not to scale

Units of measure: inches [millimeters]

Tolerance of +/- 0.125 inch (+/- 3 mm) should be used

For certified dimensions, please contact your Armstrong representative

Submittal

Ref. #: SQJPE002336_1

long-coupled horizontal base-mounted end suction pump

Model: Series 4030 - 5x4x10 - 4p - 20 hp - (Factory Choice Motor) with Suction Guide and Flo-Trex Valve

| | |
|--|---------------------------------------|
| Project name: CMS Elon | Representative: Parth Upadhyay |
| Location: | Phone number: |
| Date submitted: 3/27/2022 6:44 PM | e-mail: parth@insightusa.com |
| Engineer: | Submitted by: Upadhyay, Parth |

Application design data

| | | | |
|-------------------------|--------------------|------------------------|---------------------------|
| Tag number: | BCWP-1 & BCWP-2 | Configuration: | Single |
| Service: | Chilled Water Loop | Suction pressure: | 0 ft |
| Location: | Mechanical Room | Fluid: | Non-Potable Fluid - Water |
| Qty: | 2 | Operating temperature: | 60 °F |
| Total system flow: | 485 USgpm | Duty flow per pump: | 485 USgpm |
| System head: | 90 ft | Viscosity: | 31 SSU |
| Total dissolved solids: | 0 ppm | Specific gravity: | 1.0000 |
| NPSHR: | 9.44 ft | Absorbed Power/BHP: | 13.98 hp |
| %Mtr Safety*: | 43.01% | Efficiency at Design: | 78.82 % |
| Outlet velocity: | 12.22 ft/s | Impeller diameter: | 9.53 in |
| PEIcl: | 0.937627751 | ERcl: | 6.237224935 |
| Standby qty: | 0 | Pump/motor run qty: | 1 |

*Motor safety factor above duty point.

Materials of construction

| | | | |
|------------------|---------------------------------|--------------------|-----------------------------|
| Construction: | Bronze Fitted | Impeller: | Bronze |
| Rating: | ANSI-125 | Pump shaft: | Carbon Steel |
| Connections: | Inlet: 5 in, Outlet: 4 in | Shaft sleeve:ea | 304 SS |
| Casing (volute): | Cast Iron, E-coated | Flexible coupling: | Duraflex coupling |
| Bearings: | Anti-Friction Grease Lubricated | Casing gasket: | Confined Non-Asbestos Fiber |
| Drip pan: | Yes | | |

Mechanical seal data

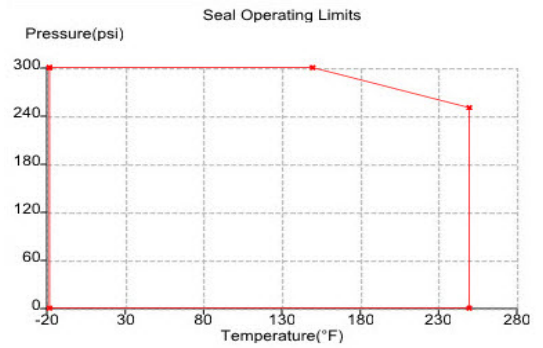
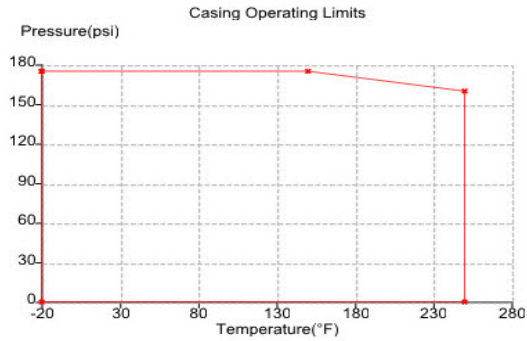
| | | | |
|--------------------|----------------------|--|--------------------------|
| Seal type: | Inside Single Spring | Rotating face: | Resin Bonded Carbon |
| Manufacturer code: | C-ssc L EPSS 2A | Stationary seat: | Sintered Silicon Carbide |
| Springs: | Stainless Steel | Secondary seal: | EPDM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

*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.

Electrical data

| | | | |
|---------------|----------------|-------------------|--------------------|
| Supplier: | Factory Choice | Insulation class: | Class F Insulation |
| Frame size: | 256TC | Motor type: | Induction |
| Speed: | 1780 rpm | Size: | 20 hp |
| Enclosure: | ODP | Efficiency: | NEMA Premium 12.12 |
| Power supply: | 480/3/60 | | |

Operating limits (temperature - pressure)

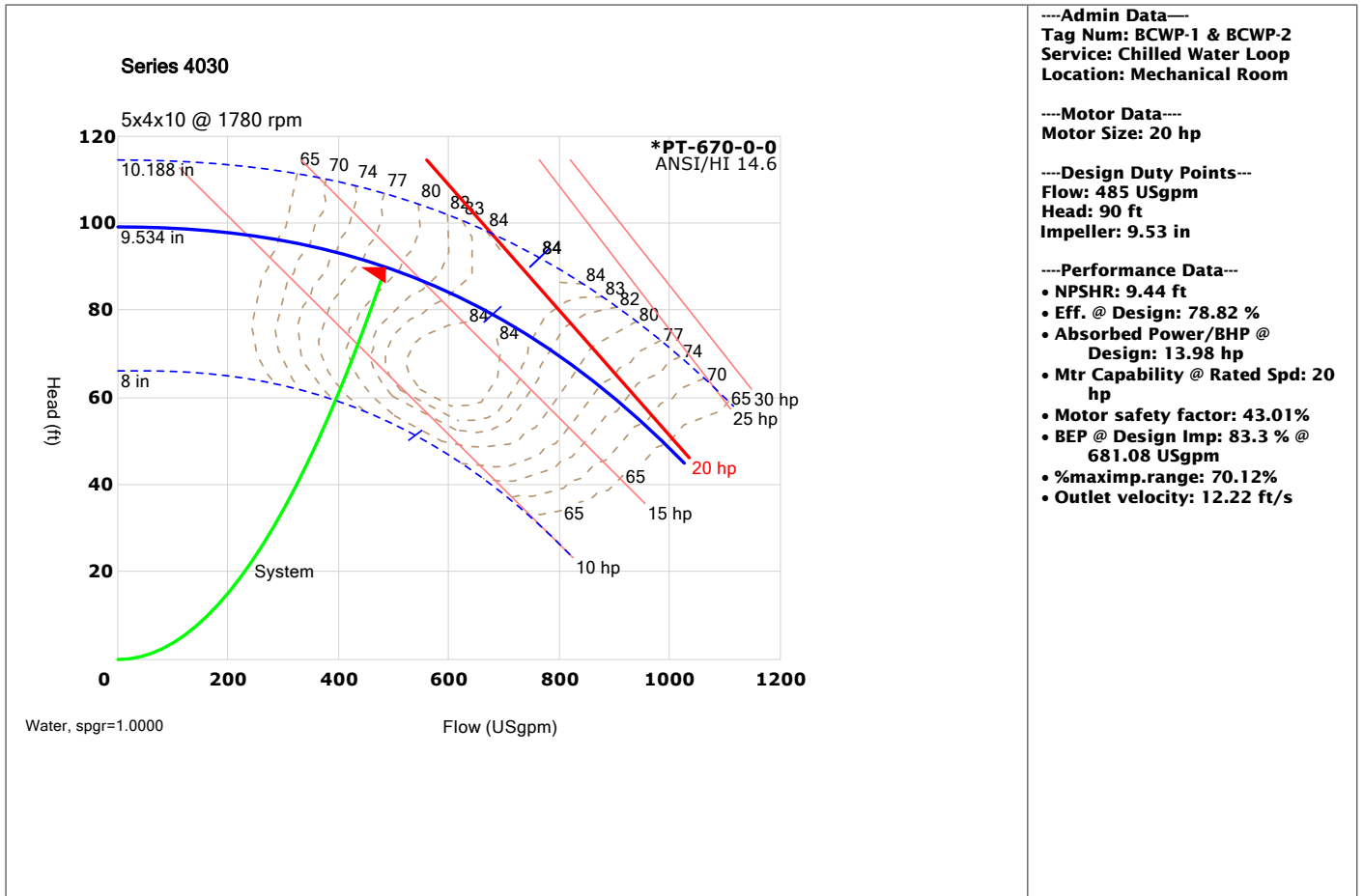


Maximum pressure: 175 psi

Maximum temperature: 250 F

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

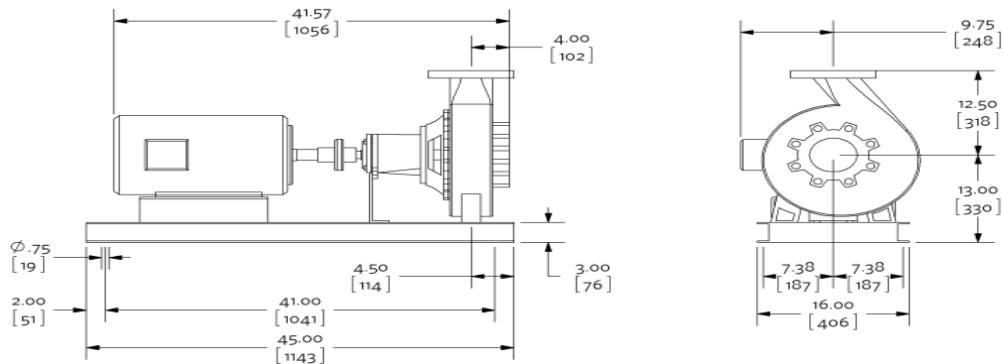
Performance curve



Dimensional data (not for construction)

Side view

Top view



Inverter motor type: Inverter duty

Weight: 564 lb [255.83 kg], Units of measure: inches [millimeters]

- Not to scale
- 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 | 5 | ANSI-125 | 10.00 | 8 | 8.50 | 0.75 |
| Outlet | 4 | ANSI-125 | 9.00 | 8 | 7.50 | 0.625 |

*Equally spaced straddling centreline

Special instructions

Reference Motor Specification AES 05007.

Selected options

Testing: No Test Certification Required
 Seal Environment Accessories: None
 Couplings: Duraflex coupling
 Space Heater: No
 Motor Thermistor: No Thermistors
 Wye-Delta Starting: No
 Drip Pan: Yes
 Bearing Current Handling: Armstrong Choice Shaft Ground

Submittal

Ref. #: SQJPE002336_1

Suction guide

Model: SG-65

| | |
|--|---------------------------------------|
| Project name: CMS Elon | Representative: Parth Upadhyay |
| Location: | Phone number: |
| Date submitted: 3/27/2022 6:44 PM | e-mail: parth@insightusa.com |
| Engineer: | Submitted by: Upadhyay, Parth |

Application design data

| Tag | Qty | Model | Pipe Conn.size | Pump Conn.size | Design flowrate | Pressure Drop* | Associated pump |
|-----------------|-----|-------|----------------|----------------|-----------------|----------------|---|
| BCWP-1 & BCWP-2 | 2 | SG-65 | 6 in | 5 in | 485 USgpm | 1.67 ft | 4030 - 5x4x10 - 4p - 20 hp - (Factory Choice Motor) |

*at design flow

Materials of construction

SG-65

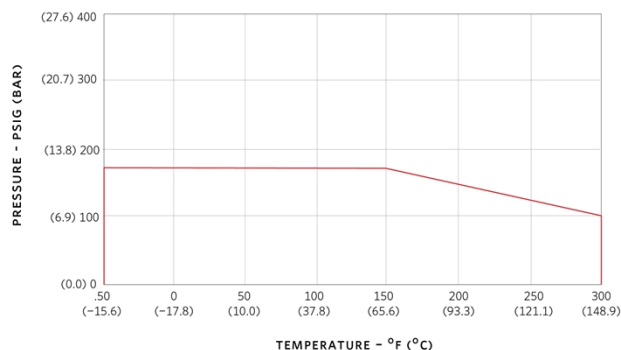
| | | | |
|--------------|-----------|---------------------|------------------------------------|
| Body: | Cast iron | Cover gasket: | Synthetic fiber |
| Guide vanes: | Cast iron | Strainer: | Stainless Steel, 0.125"(3mm)Perf.. |
| Cover plate: | Cast iron | Start-up strainer*: | Fine Mesh Galvanized Steel |

*Remove start up strainer after 24 hours of pump operation

Operating limits (temperature - pressure)

SG-65-Suction Guide-ANSI-125

PRESSURE TEMPERATURE LIMITS



Maximum pressure: 175 psi
Maximum temperature: 300 F

Units are hydrostatically tested to 150% of maximum working pressure

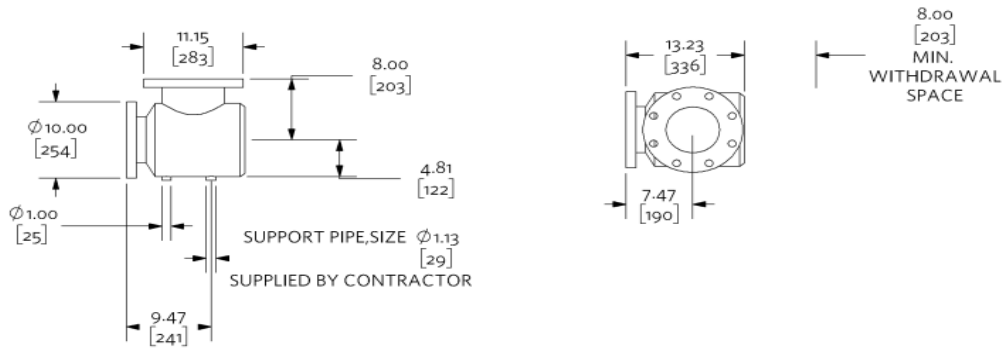
Dimensional data (not for construction)

SG-65

Weight: 103 lb [46.72 kg]

Side view

Top view



Not to scale

Units of measure: inches [millimeters]

Tolerance of +/- 0.125 inch (+/- 3 mm) should be used

For certified dimensions, please contact your Armstrong representative

Submittal

Ref. #: SQJPE002336_1

Flo-trex valve

Model: FTV-6FS-Flo-Trex Valve-ANSI-125-Straight

| | |
|--|---------------------------------------|
| Project name: CMS Elon | Representative: Parth Upadhyay |
| Location: | Phone number: |
| Date submitted: 3/27/2022 6:44 PM | e-mail: parth@insightusa.com |
| Engineer: | Submitted by: Upadhyay, Parth |

Application design data

| Tag | Qty | Model | Size Inlet/Outlet | Config | Pipe Type | Design flowrate | Pressure Drop* | Associated pump |
|-------------------|-----|---------|-------------------|----------|-----------|-----------------|----------------|---|
| BCWP -1 & BCWP -2 | 2 | FTV-6FS | 6 in | Straight | Flanged | 485 USgpm | 2.84 ft | 4030 - 5x4x10 - 4p - 20 hp - (Factory Choice Motor) |

*at design flow

Materials of construction

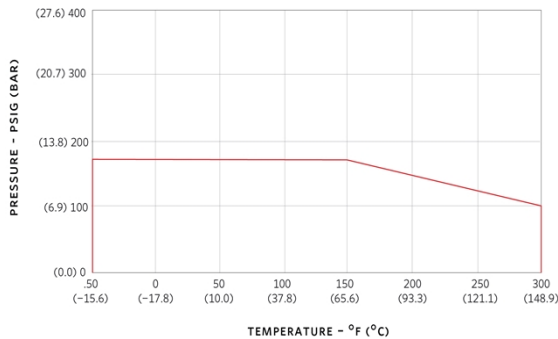
FTV-6FS-Flo-Trex Valve-ANSI-125-Straight

| | | | |
|-------|---------------------|-------------------|--|
| Body: | Cast Iron | Spring: | 302 Stainless Steel |
| Disc: | Brass | O rings: | BUNA N |
| Seat: | EPDM | 2 metering ports: | NPT Brass Body with EPT Check and Gasketed Cap |
| Stem: | 416 Stainless Steel | 2 drain tappings: | 1/4in with Brass Plug |

Operating limits (temperature - pressure)

FTV-6FS-Flo-Trex Valve-ANSI-125-Straight

PRESSURE TEMPERATURE LIMITS



Maximum pressure: 175 psi
Maximum temperature: 300 F



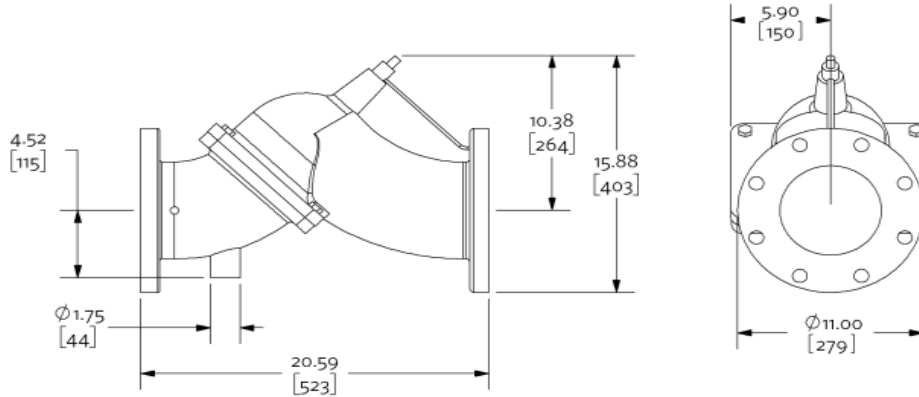
Dimensional data (not for construction)

Model: FTV-6FS-Flo-Trex Valve-ANSI-125-Straight

Weight: 167 lb [75.75 kg]

Side view

Front view



Not to scale

Units of measure: inches [millimeters]

Tolerance of +/- 0.125 inch (+/- 3 mm) should be used

For certified dimensions, please contact your Armstrong representative

Submittal

Ref. #: SQJPE002336_1

long-coupled horizontal base-mounted end suction pump

Model: Series 4030 - 3x1.5x10 - 4p - 7.5 hp - (Factory Choice Motor) with Suction Guide and Flo-Trex Valve

Project name: CMS Elon
Location:
Date submitted: 3/27/2022 6:44 PM
Engineer:
Representative: Parth Upadhyay
Phone number:
e-mail: parth@insightusa.com
Submitted by: Upadhyay, Parth

Application design data

| | | | |
|-------------------------|-----------------|------------------------|---------------------------|
| Tag number: | BHWP-1 & BHWP-2 | Configuration: | Single |
| Service: | Hot Water Loop | Suction pressure: | 0 ft |
| Location: | Mechanical Room | Fluid: | Non-Potable Fluid - Water |
| Qty: | 2 | Operating temperature: | 60 °F |
| Total system flow: | 98 USgpm | Duty flow per pump: | 98 USgpm |
| System head: | 90 ft | Viscosity: | 31 SSU |
| Total dissolved solids: | 0 ppm | Specific gravity: | 1.0000 |
| NPSHR: | 4.29 ft | Absorbed Power/BHP: | 3.93 hp |
| %Mtr Safety*: | 90.73% | Efficiency at Design: | 56.64 % |
| Outlet velocity: | 15.44 ft/s | Impeller diameter: | 9.47 in |
| PEIcl: | 0.889026959 | ERcl: | 11.09730414 |
| Standby qty: | 0 | Pump/motor run qty: | 1 |

*Motor safety factor above duty point.

Materials of construction

| | | | |
|------------------|---------------------------------|--------------------|-----------------------------|
| Construction: | Bronze Fitted | Impeller: | Bronze |
| Rating: | ANSI-125 | Pump shaft: | Carbon Steel |
| Connections: | Inlet: 3 in, Outlet: 1.5 in | Shaft sleeve:ea | 304 SS |
| Casing (volute): | Cast Iron, E-coated | Flexible coupling: | Duraflex coupling |
| Bearings: | Anti-Friction Grease Lubricated | Casing gasket: | Confined Non-Asbestos Fiber |
| Drip pan: | No | | |

Mechanical seal data

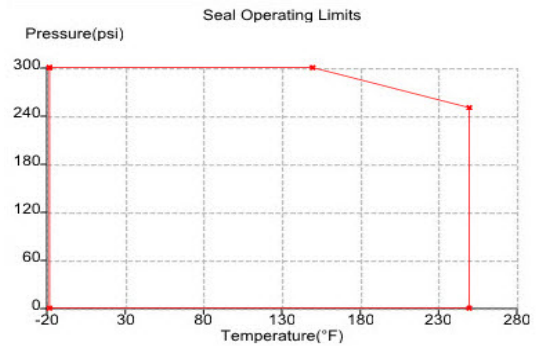
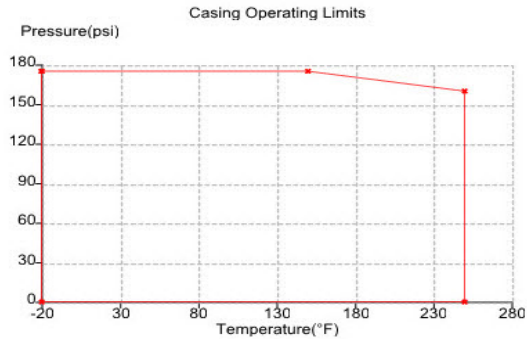
| | | | |
|--------------------|----------------------|--|--------------------------|
| Seal type: | Inside Single Spring | Rotating face: | Resin Bonded Carbon |
| Manufacturer code: | C-ssc L EPSS 2A | Stationary seat: | Sintered Silicon Carbide |
| Springs: | Stainless Steel | Secondary seal: | EPDM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

*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.

Electrical data

| | | | |
|---------------|----------------|-------------------|--------------------|
| Supplier: | Factory Choice | Insulation class: | Class F Insulation |
| Frame size: | 213TC | Motor type: | Induction |
| Speed: | 1765 rpm | Size: | 7.5 hp |
| Enclosure: | ODP | Efficiency: | NEMA Premium 12.12 |
| Power supply: | 480/3/60 | | |

Operating limits (temperature - pressure)

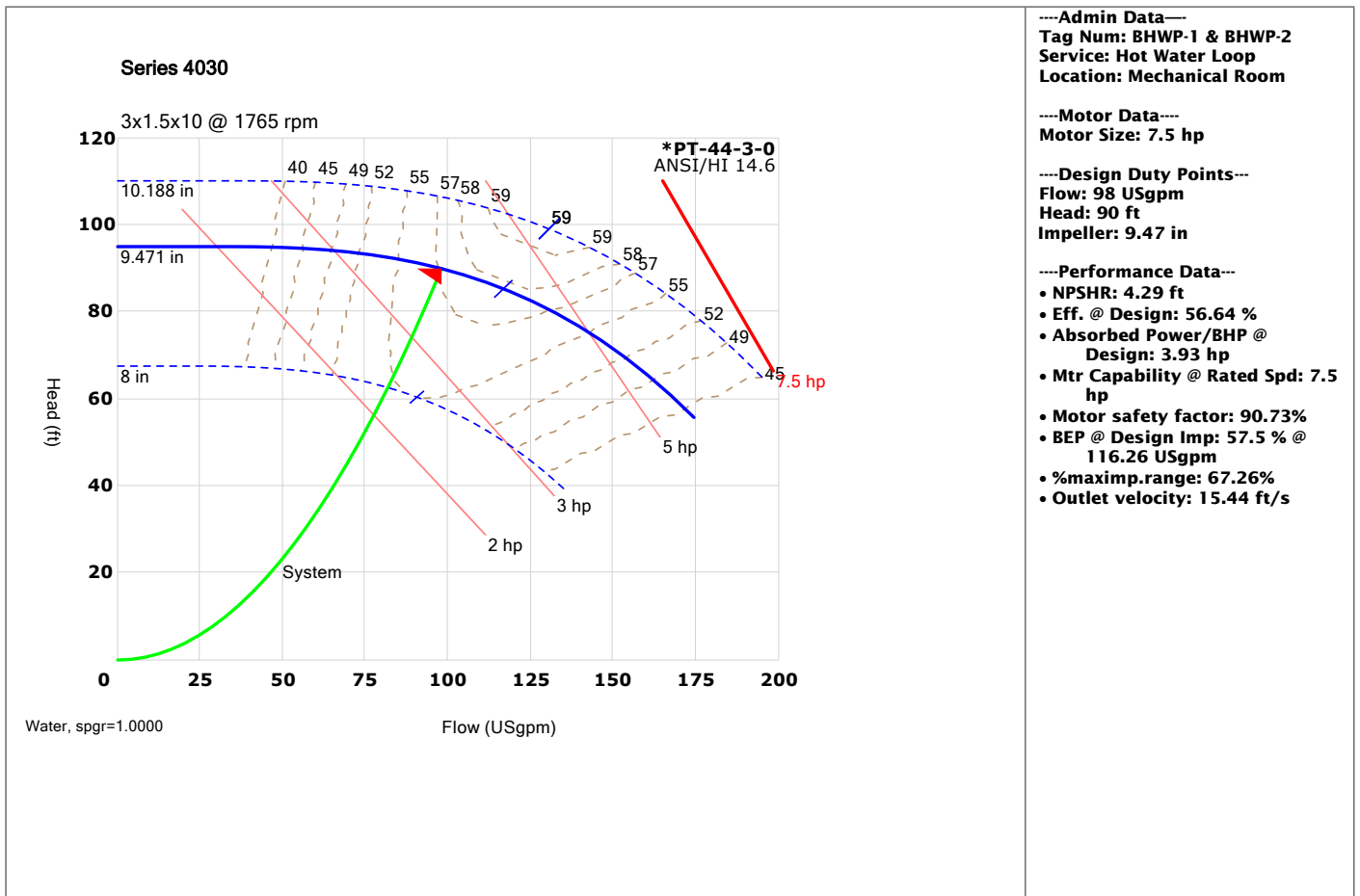


Maximum pressure: 175 psi

Maximum temperature: 250 F

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

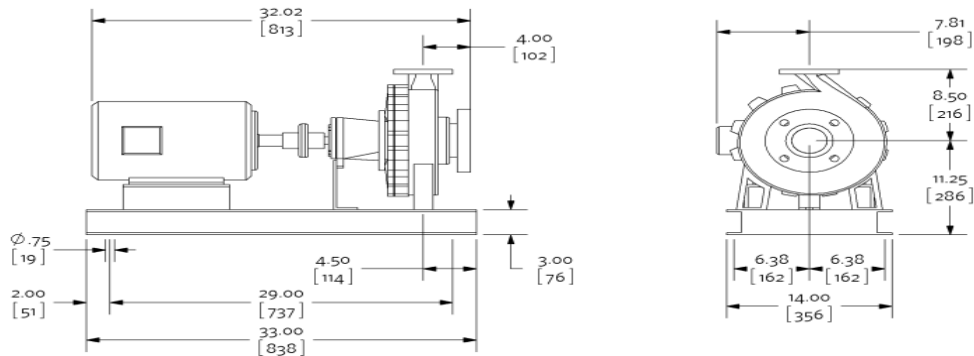
Performance curve



Dimensional data (not for construction)

Side view

Top view



Inverter motor type: Inverter duty

Weight: 294 lb [133.36 kg], Units of measure: inches [millimeters]

- Not to scale
- 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 | 3 | ANSI-125 | 7.50 | 4 | 6.00 | 0.625 |
| Outlet | 1.5 | ANSI-125 | 5.00 | 4 | 3.88 | 0.5 |

*Equally spaced straddling centreline

Special instructions

Reference Motor Specification AES 05007.

Selected options

Testing: No Test Certification Required
 Seal Environment Accessories: None
 Couplings: Duraflex coupling
 Space Heater: No
 Motor Thermistor: No Thermistors
 Wye-Delta Starting: No
 Drip Pan: Yes
 Bearing Current Handling: Armstrong Choice Shaft Ground

Submittal

Ref. #: SQJPE002336_1

Suction guide

Model: SG-43

| | |
|--|---------------------------------------|
| Project name: CMS Elon | Representative: Parth Upadhyay |
| Location: | Phone number: |
| Date submitted: 3/27/2022 6:44 PM | e-mail: parth@insightusa.com |
| Engineer: | Submitted by: Upadhyay, Parth |

Application design data

| Tag | Qty | Model | Pipe Conn.size | Pump Conn.size | Design flowrate | Pressure Drop* | Associated pump |
|-----------------|-----|-------|----------------|----------------|-----------------|----------------|--|
| BHWP-1 & BHWP-2 | 2 | SG-43 | 4 in | 3 in | 98 USgpm | 0.4 ft | 4030 - 3x1.5x10 - 4p - 7.5 hp - (Factory Choice Motor) |

*at design flow

Materials of construction

SG-43

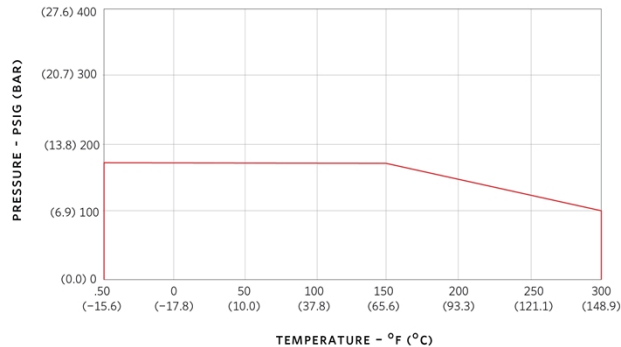
| | | | |
|--------------|-----------|---------------------|------------------------------------|
| Body: | Cast iron | Cover gasket: | Synthetic fiber |
| Guide vanes: | Cast iron | Strainer: | Stainless Steel, 0.125"(3mm)Perf.. |
| Cover plate: | Cast iron | Start-up strainer*: | Fine Mesh Galvanized Steel |

*Remove start up strainer after 24 hours of pump operation

Operating limits (temperature - pressure)

SG-43-Suction Guide-ANSI-125

PRESSURE TEMPERATURE LIMITS



Maximum pressure: 175 psi
Maximum temperature: 300 F

Units are hydrostatically tested to 150% of maximum working pressure

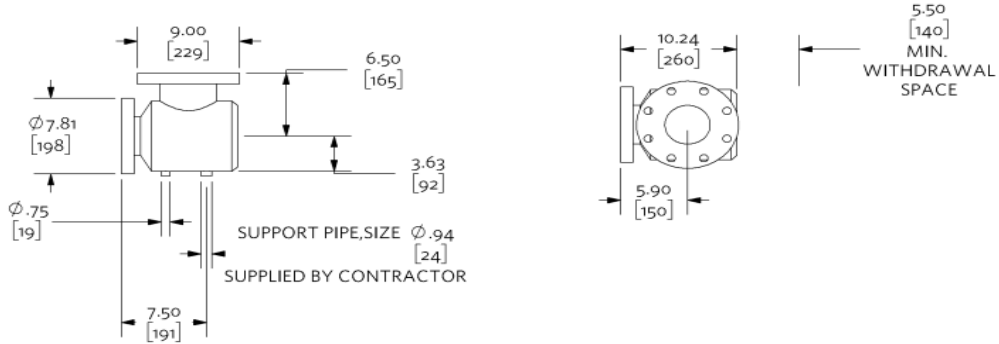
Dimensional data (not for construction)

SG-43

Weight: 52 lb [23.59 kg]

Side view

Top view



Not to scale

Units of measure: inches [millimeters]

Tolerance of +/- 0.125 inch (+/- 3 mm) should be used

For certified dimensions, please contact your Armstrong representative

Submittal

Ref. #: SQJPE002336_1

Flo-trex valve

Model: FTV-3FS-Flo-Trex Valve-ANSI-125-Straight

| | |
|--|---------------------------------------|
| Project name: CMS Elon | Representative: Parth Upadhyay |
| Location: | Phone number: |
| Date submitted: 3/27/2022 6:44 PM | e-mail: parth@insightusa.com |
| Engineer: | Submitted by: Upadhyay, Parth |

Application design data

| Tag | Qty | Model | Size Inlet/Outlet | Config | Pipe Type | Design flowrate | Pressure Drop* | Associated pump |
|-------------------|-----|---------|-------------------|----------|-----------|-----------------|----------------|--|
| BHWP -1 & BHWP -2 | 2 | FTV-3FS | 3 in | Straight | Flanged | 98 USgpm | 3 ft | 4030 - 3x1.5x10 - 4p - 7.5 hp - (Factory Choice Motor) |

*at design flow

Materials of construction

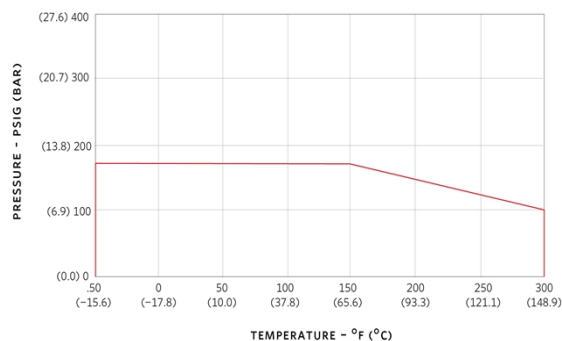
FTV-3FS-Flo-Trex Valve-ANSI-125-Straight

| | | | |
|-------|---------------------|-------------------|--|
| Body: | Cast Iron | Spring: | 302 Stainless Steel |
| Disc: | Brass | O rings: | BUNA N |
| Seat: | EPDM | 2 metering ports: | NPT Brass Body with EPT Check and Gasketed Cap |
| Stem: | 416 Stainless Steel | 2 drain tappings: | 1/4in with Brass Plug |

Operating limits (temperature - pressure)

FTV-3FS-Flo-Trex Valve-ANSI-125-Straight

PRESSURE TEMPERATURE LIMITS



Maximum pressure: 175 psi
Maximum temperature: 300 F

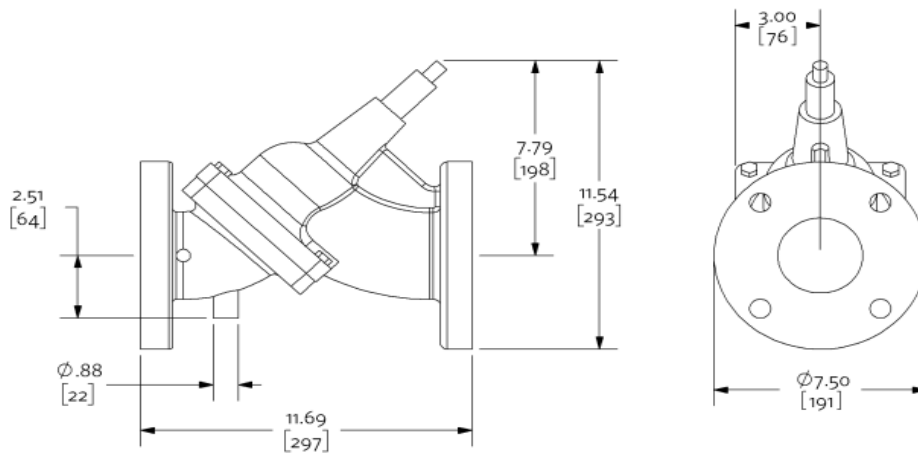
Dimensional data (not for construction)

Model: FTV-3FS-Flo-Trex Valve-ANSI-125-Straight

Weight: 39 lb [17.69 kg]

Side view

Front view



Not to scale

Units of measure: inches [millimeters]

Tolerance of +/- 0.125 inch (+/- 3 mm) should be used

For certified dimensions, please contact your Armstrong representative

Submittal

Ref. #: SQJPE002336_1

long-coupled horizontal base-mounted end suction pump

Model: Series 4030 - 5x4x8 - 4p - 7.5 hp - (Factory Choice Motor) with Suction Guide and Flo-Trex Valve

Project name: CMS Elon
Representative: Parth Upadhyay
Location:
Phone number:
Date submitted: 3/27/2022 6:44 PM
e-mail: parth@insightusa.com
Engineer:
Submitted by: Upadhyay, Parth

Application design data

| | | | |
|-------------------------|-----------------|------------------------|---------------------------|
| Tag number: | CWP-1 & CWP-2 | Configuration: | Single |
| Service: | Chiller Loop | Suction pressure: | 0 ft |
| Location: | Mechanical Room | Fluid: | Non-Potable Fluid - Water |
| Qty: | 2 | Operating temperature: | 60 °F |
| Total system flow: | 485 USgpm | Duty flow per pump: | 485 USgpm |
| System head: | 35 ft | Viscosity: | 31 SSU |
| Total dissolved solids: | 0 ppm | Specific gravity: | 1.0000 |
| NPSHR: | 9.69 ft | Absorbed Power/BHP: | 5.23 hp |
| %Mtr Safety*: | 43.37% | Efficiency at Design: | 81.95 % |
| Outlet velocity: | 12.22 ft/s | Impeller diameter: | 6.82 in |
| PEIcl: | 0.961852396 | ERcl: | 3.814760405 |
| Standby qty: | 0 | Pump/motor run qty: | 1 |

*Motor safety factor above duty point.

Materials of construction

| | | | |
|------------------|---------------------------------|--------------------|-----------------------------|
| Construction: | Bronze Fitted | Impeller: | Bronze |
| Rating: | ANSI-125 | Pump shaft: | Carbon Steel |
| Connections: | Inlet: 5 in, Outlet: 4 in | Shaft sleeve:ea | 304 SS |
| Casing (volute): | Cast Iron, E-coated | Flexible coupling: | Sureflex |
| Bearings: | Anti-Friction Grease Lubricated | Casing gasket: | Confined Non-Asbestos Fiber |
| Drip pan: | Yes | | |

Mechanical seal data

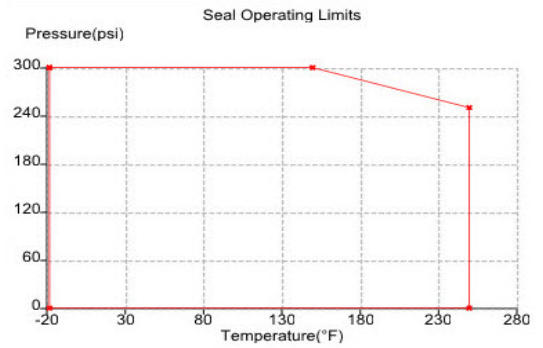
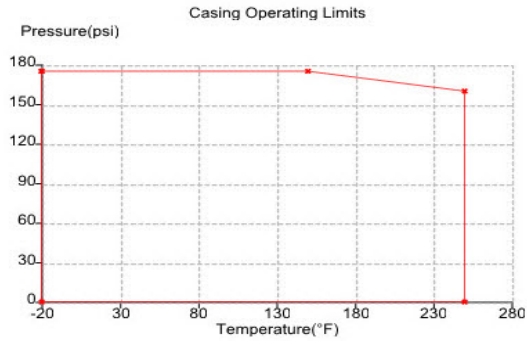
| | | | |
|--------------------|----------------------|--|--------------------------|
| Seal type: | Inside Single Spring | Rotating face: | Resin Bonded Carbon |
| Manufacturer code: | C-ssc L EPSS 2A | Stationary seat: | Sintered Silicon Carbide |
| Springs: | Stainless Steel | Secondary seal: | EPDM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

*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.

Electrical data

| | | | |
|---------------|----------------|-------------------|--------------------|
| Supplier: | Factory Choice | Insulation class: | Class F Insulation |
| Frame size: | 213TC | Motor type: | Induction |
| Speed: | 1770 rpm | Size: | 7.5 hp |
| Enclosure: | ODP | Efficiency: | NEMA Premium 12.12 |
| Power supply: | 460/3/60 | | |

Operating limits (temperature - pressure)

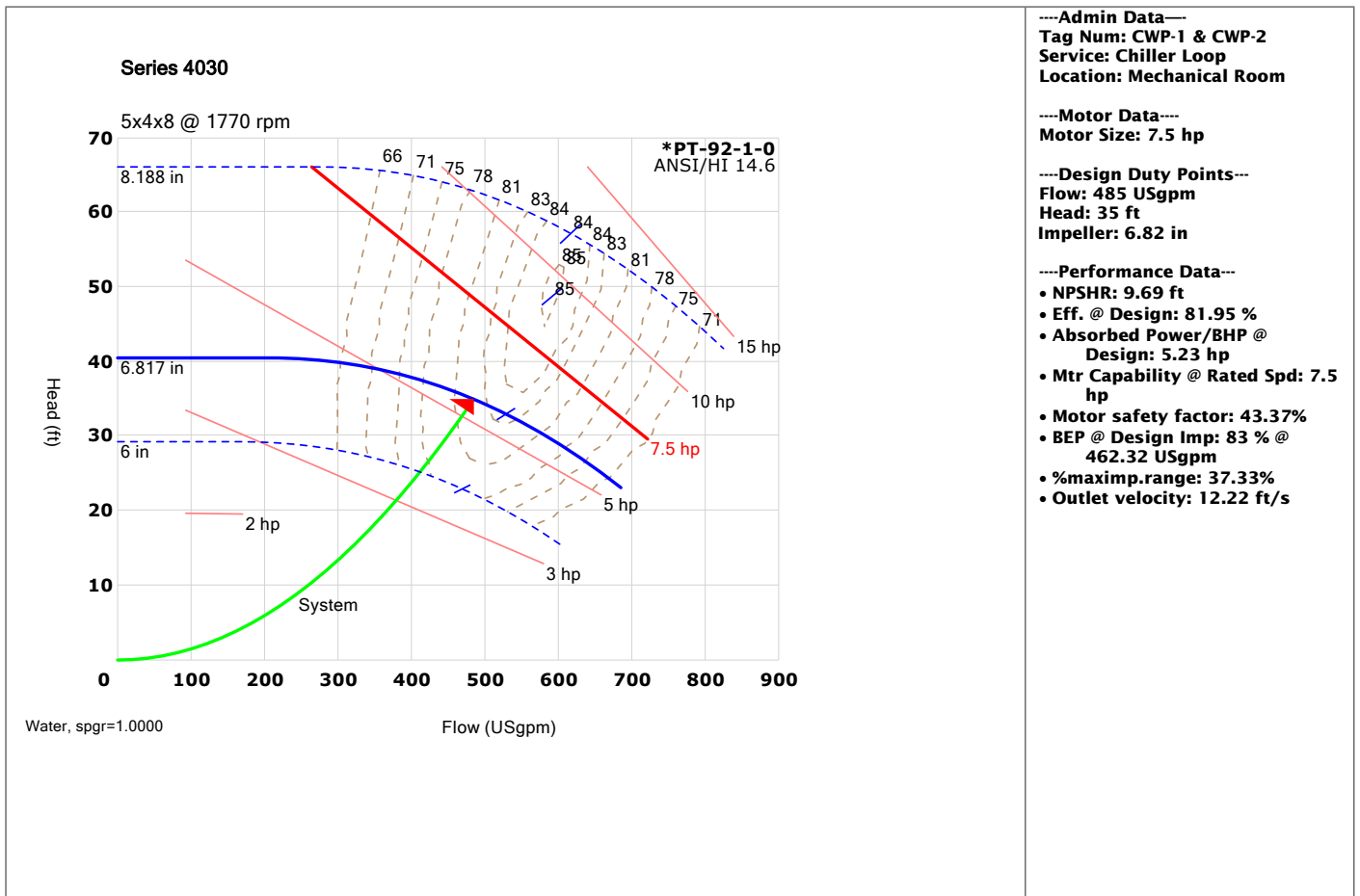


Maximum pressure: 175 psi

Maximum temperature: 250 F

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

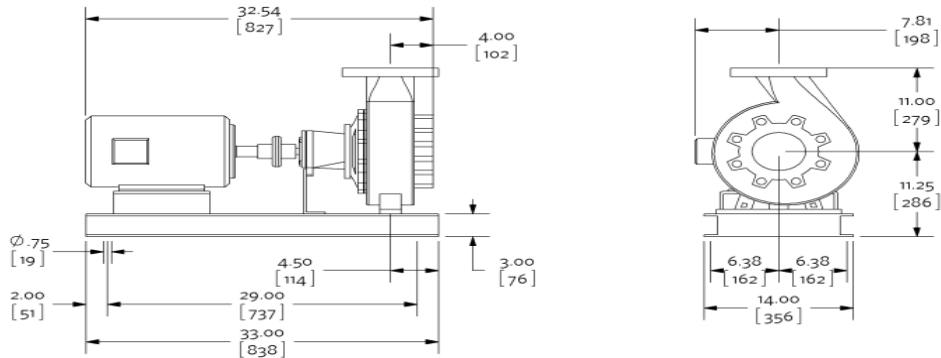
Performance curve



Dimensional data (not for construction)

Side view

Top view



Inverter motor type: Inverter duty

Weight: 322 lb [146.06 kg], Units of measure: inches [millimeters]

- Not to scale
- 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 | 5 | ANSI-125 | 10.00 | 8 | 8.50 | 0.75 |
| Outlet | 4 | ANSI-125 | 9.00 | 8 | 7.50 | 0.625 |

*Equally spaced straddling centreline

Special instructions

Reference Motor Specification AES 05007.

Selected options

Testing: No Test Certification Required
 Seal Environment Accessories: None
 Couplings: Sureflex
 Space Heater: No
 Motor Thermistor: No Thermistors
 Wye-Delta Starting: No
 Drip Pan: Yes

Submittal

Ref. #: SQJPE002336_1

Suction guide

Model: SG-65

| | |
|--|---------------------------------------|
| Project name: CMS Elon | Representative: Parth Upadhyay |
| Location: | Phone number: |
| Date submitted: 3/27/2022 6:44 PM | e-mail: parth@insightusa.com |
| Engineer: | Submitted by: Upadhyay, Parth |

Application design data

| Tag | Qty | Model | Pipe Conn.size | Pump Conn.size | Design flowrate | Pressure Drop* | Associated pump |
|---------------|-----|-------|----------------|----------------|-----------------|----------------|---|
| CWP-1 & CWP-2 | 2 | SG-65 | 6 in | 5 in | 485 USgpm | 1.61 ft | 4030 - 5x4x8 - 4p - 7.5 hp - (Factory Choice Motor) |

*at design flow

Materials of construction

SG-65

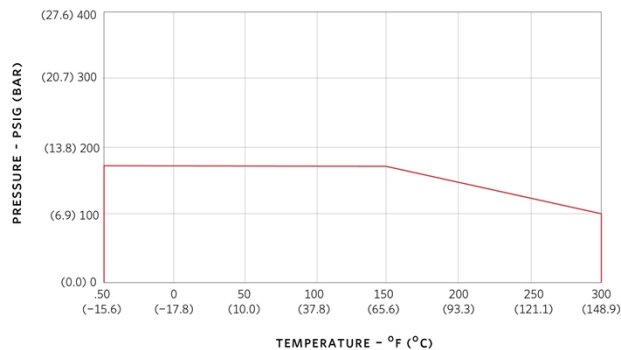
| | | | |
|--------------|-----------|---------------------|------------------------------------|
| Body: | Cast iron | Cover gasket: | Synthetic fiber |
| Guide vanes: | Cast iron | Strainer: | Stainless Steel, 0.125"(3mm)Perf.. |
| Cover plate: | Cast iron | Start-up strainer*: | Fine Mesh Galvanized Steel |

*Remove start up strainer after 24 hours of pump operation

Operating limits (temperature - pressure)

SG-65-Suction Guide-ANSI-125

PRESSURE TEMPERATURE LIMITS



Maximum pressure: 175 psi
Maximum temperature: 300 F

Units are hydrostatically tested to 150% of maximum working pressure

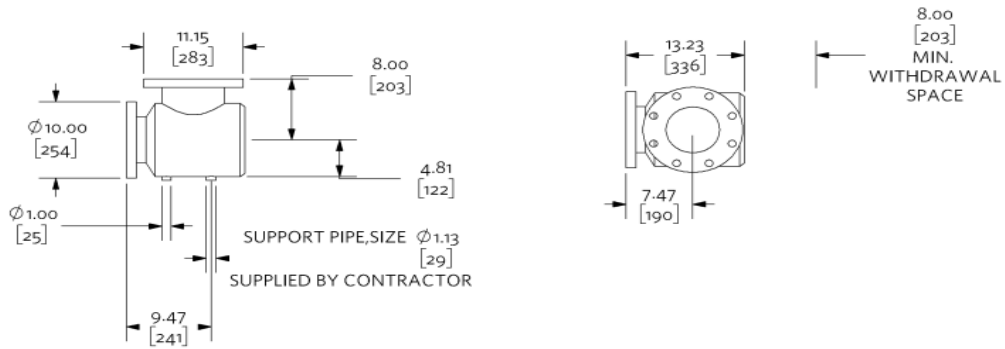
Dimensional data (not for construction)

SG-65

Weight: 103 lb [46.72 kg]

Side view

Top view



Not to scale

Units of measure: inches [millimeters]

Tolerance of +/- 0.125 inch (+/- 3 mm) should be used

For certified dimensions, please contact your Armstrong representative

Submittal

Ref. #: SQJPE002336_1

Flo-trex valve

Model: FTV-6FS-Flo-Trex Valve-ANSI-125-Straight

| | |
|--|---------------------------------------|
| Project name: CMS Elon | Representative: Parth Upadhyay |
| Location: | Phone number: |
| Date submitted: 3/27/2022 6:44 PM | e-mail: parth@insightusa.com |
| Engineer: | Submitted by: Upadhyay, Parth |

Application design data

| Tag | Qty | Model | Size Inlet/Outlet | Config | Pipe Type | Design flowrate | Pressure Drop* | Associated pump |
|---------------|-----|---------|-------------------|----------|-----------|-----------------|----------------|---|
| CWP-1 & CWP-2 | 2 | FTV-6FS | 6 in | Straight | Flanged | 485 USgpm | 2.81 ft | 4030 - 5x4x8 - 4p - 7.5 hp - (Factory Choice Motor) |

*at design flow

Materials of construction

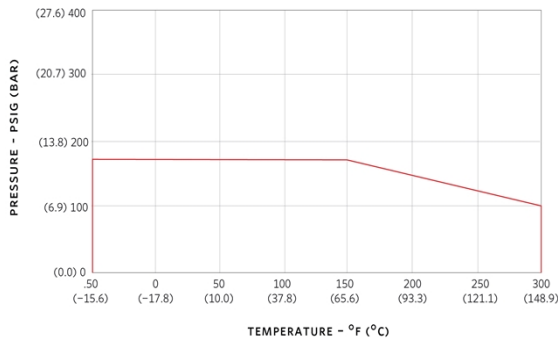
FTV-6FS-Flo-Trex Valve-ANSI-125-Straight

| | | | |
|-------|---------------------|-------------------|--|
| Body: | Cast Iron | Spring: | 302 Stainless Steel |
| Disc: | Brass | O rings: | BUNA N |
| Seat: | EPDM | 2 metering ports: | NPT Brass Body with EPT Check and Gasketed Cap |
| Stem: | 416 Stainless Steel | 2 drain tappings: | 1/4in with Brass Plug |

Operating limits (temperature - pressure)

FTV-6FS-Flo-Trex Valve-ANSI-125-Straight

PRESSURE TEMPERATURE LIMITS



Maximum pressure: 175 psi
Maximum temperature: 300 F



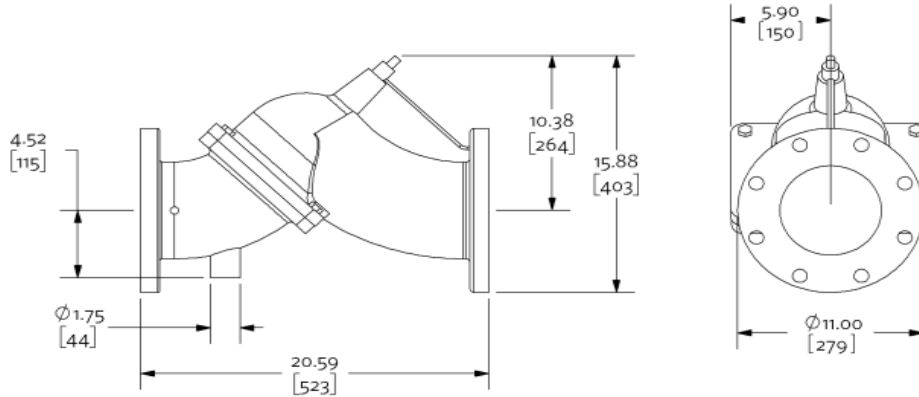
Dimensional data (not for construction)

Model: FTV-6FS-Flo-Trex Valve-ANSI-125-Straight

Weight: 167 lb [75.75 kg]

Side view

Front view



Not to scale

Units of measure: inches [millimeters]

Tolerance of +/- 0.125 inch (+/- 3 mm) should be used

For certified dimensions, please contact your Armstrong representative