Quote Reference: SQO080110_2
Quote Name: Martinrea Building Expansion, Ridgetown
Project Name: Martinrea Building Expansion, Ridgetown
Date: 2024-08-20

A | Scope of supply summary

Item No.	Qty	Description	Lead time
1.0	1	**Design Envelope and Commercial Pumps** **Tag: P-1**  **Pumps** Model: Conventional - Constant Speed - 4380 - 2x2x8 - 4p - 5 hp - (Factory Choice Motor) Total System Flow: 115 USgpm System Head: 27 psi Pump Cons: All Bronze; Pump Rating: ANSI-125 Pump/motor run qty: 1 Motor: 5 hp; Enclosure: ODP; Efficiency: NEMA Premium 12.12 Power Supply: 208/3/60 Min. maintained sys. pressure: 10.8 psi Impeller Balancing: Standard (Grade G6.3) Pump Primer: Armstrong Standard Primer Weight: 261 lb [118.39 kg] **Comments**: -for non-overloading curve minimum 5hp motor is required.	
2.0	1	**Design Envelope and Commercial Pumps** **Tag: P-5**  **Pumps** Model: Design Envelope Sensorless 4380 1505-005.0 with Suction Guide and Flo-Trex Valve Total System Flow: 110 USgpm System Head: 45 psi Pump Cons: Low Pressure Ductile Iron; Pump Rating: ANSI-125 Pump/motor run qty: 1 Motor: 5 hp; Enclosure: TEFC; Efficiency: IE5 Power Supply: 575/3/60 Min. maintained sys. pressure: 18 psi IVS Mounting: Integrated IVS Enclosure: UL Type 12/IP55 IVS Orientation: L5 Sensorless Control: Yes Services: Yes,Standard (1 Year Pump Manager Professional Communication Protocol: Default Field Reconfigurable Impeller Balancing: Standard (Grade G6.3) Pump Primer: Armstrong Standard Primer	

A | Scope of supply summary

Item No.	Qty	Description	Lead time
		Options: Fused Disconnect: Loose Supply; Pump Shaft: 316 Stainless Steel; Sensorless Bundle: Sensorless control; Constant flow control; Constant pressure control; Flow readout; Pump Weight: 107.7 lb [48.85 kg] **Accessories** Suction Guide: SG-2515 (516860-034) 26.31 lb [11.93 kg] Flo-Trex Valve: FTV-2.5FA (570200-476) 33 lb [14.97 kg] Weight: 167.01 lb [75.75 kg] **Comments**: -for non-overloading curve minimum 5hp motor is required.	
3.0	1	**Expansion Systems** **Tag: ET-1**  572006-300, Expansion Systems Model: AST-5 Part Number: 572006-300 Tank: 1 off AST-5 Tank Type: Diaphragm Max. working pressure: 150 psi **Options**: Quick Fill Required: Not selected, Weight: 0 lb [0 kg]	
4.0	1	**Expansion Systems** **Tag: ET-2** 572005-097-G, Expansion Systems Model: AX-15V	

A | Scope of supply summary

Item No.	Qty	Description	Lead time
		Part Number: 572005-097-G Tank: 1 off AX-15V Tank Type: Diaphragm Max. working pressure: 150 psi **Options**: Quick Fill Required: Not selected, **Accessories**: with Only Sight Glass; Weight: 42 lb [19.05 kg] 	
5.0	1	**Vortex Air Separator** **Tag: AS** Model: VA-3 Part number: 570289-001 Flowrate: 110 USgpm Pipeline velocity: 8 ft/s Connection size: 3 Inch Connection type: Threaded NPT Certification code: NoCert Max. working pressure: 160 psi Weight: 100 lb [45.36 kg] 	
6.0	1	**975003-701-Air Eliminator AAE-750** **Tag: AAE** Air Eliminator AAE-750 	
7.0	1	**880001-001 - Connectivity Kit (Router with SIM)** **Tag: Connectivity Kit** Default Connectivity Kit w. Pump Manager/SMART Startup. Price is 50% of retail, split off PM/SS tot. Default connectivity kit selected along with Pump Manager / SMART Startup selection. Includes Industrial grade Router and sim card with active data plan for communication between pump(s) and cloud. 	

A | Scope of supply summary

Item No.	Qty	Description	Lead time
		Price displayed for default connectivity kits in the respective quote line is 50% of individual/ additional connectivity kits added to a quote, as these are default kits. The 50% price displayed is split off the total Pump Manager/ SMART Startup price and does not add over and above the actual Pump Manager/ SMART Startup prices to the quote. Notes: -The default or additional connectivity kit line items shall not be deleted from the quote lines. No other connectivity kits shall be shipped as part of the Pump Manager/ SMART Startup packages. -One connectivity kit can handle data transfer for upto 8 pumps in a package, placed in the same room.	
8.0	1	**Smart Startup CA** **Tag: Startup for P-5** SMART Start-up is performed by an Armstrong Design Envelope certified technician. It builds on start-up by connecting the pump(s) to Pump Manager for Active Performance ManagementTM. This: 1) Helps manage the energy performance of the pump and provides system level insights as a baseline for future commissioning 2) Comes with built-in asset management capabilities to enable complete asset life cycle management from day 1 3) Identifies and connects issues with experts who have the right skills and the right parts to ensure maximum asset availability Benefits: · 12 months Comprehensive Additional Warranty that includes parts and labour to mitigate operation risk and maximize equipment and system uptime. 6 months additional warranty from SMART Startup and 6 months additional warranty from Pump Manager registration adds up to the 12 months additional warranty mentioned above. · Setup and activation of Performance Management Service with 1-year Pump Manager Essentials subscription with connectivity kit and data plan to get real-time insights. · Setup and activation of built-in performance optimization software controls (as required) · OEM-verified multi-point tune-up ensure the integrity of the pump's mechanical components and settings for optimal operation, prolonging the pump life and minimizing its life-time	

A | Scope of supply summary

Item No.	Qty	Description	Lead time
		cost. · Firmware upgrade or update (as required). · Comprehensive SMART Start-up report to digitally illustrate proof of equipment start-up. Notes: i. Price is based on labour commitment for the day's work (if labour included). It assumes devices are within the same location and site locations are within 2 hours drive away. Hotel, travel or additional site visits can lead to additional charges, in which case shall be mentioned above as Additional Expenses. ii. Additional warranty is only applicable if pumps are connected to the Pump Manager service and Armstrong labour has been opted in for the SMART Startup service. iii.If default connectivity kit included, price of default connectivity kit shall be half of individual price, split off from Pump Manager line item and displayed as separate line item. The default or additional connectivity kit line items shall not be deleted from the quote lines.	

Submittal

Ref. #: SQO080110_2

close-coupled vertical in-line pump

Model: Series 4380 - 2x2x8 - 4p - 5 hp - (Factory Choice Motor)

Project name:	Martinrea Building Expansion, Ridgetown	**Representative:**	Bahareh Ghahremani
Location:		**Phone number:**	
Date submitted:	8/20/2024 1:21 PM	**e-mail:**	bghahremani@armstrongfluidtechnology.com
Engineer:		**Submitted by:**	Ghahremani, Bahareh

Application design data

Tag number:	P-1	Configuration:	Single
Service:			
Equipment Location:		Fluid:	Potable Water
Qty:	1		
Total system flow:	115 USgpm	Duty flow per pump:	115 USgpm
System head:	27 psi	Viscosity:	31 SSU
Total dissolved solids:	0 ppm	Specific gravity:	1.0000
NPSHR:	2.56 psi	Absorbed Power/BHP:	2.84 hp
%Mtr Safety*:	75.95%	Efficiency at Design:	63.64 %
Outlet velocity:	11 ft/s	Impeller diameter:	7.97 in
PEIcl:	0.96	ERcl:	4
Standby qty:	0	Pump/motor run qty:	1
Load Profile Location:	NA	Building Type:	NA
Climate Zone Type:	NA	Time Period:	8760 (1 Year)

*Motor safety factor above duty point.

Materials of construction

Construction:	All Bronze	Impeller:	Bronze
Rating:	ANSI-125	Casing gasket:	Confined Non-Asbestos Fiber
Connections:	Inlet: 2 in, Outlet: 2 in	Flush line:	Braided Stainless Steel
Casing (volute):	Bronze	Shaft sleeve:	316 Stainless Steel

Mechanical seal data

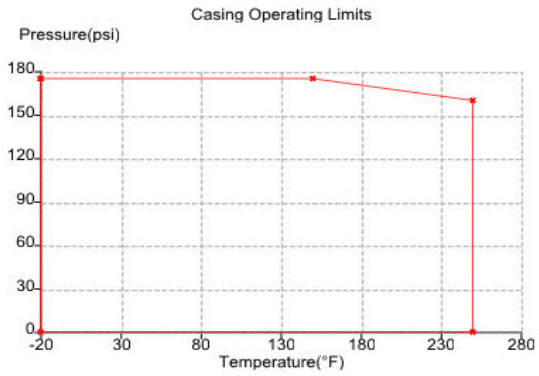
Seal type:	Inside Single Spring	Rotating face:	Resin Bonded Carbon
Manufacturer code:	C-ssc L EPSS 2A	Stationary seat:	Sintered Silicon Carbide
Springs:	Stainless Steel	Secondary seal:	EPDM
Rotating hardware:	Stainless Steel	Maximum total dissolved solids (TDS)*:	2000 PPM

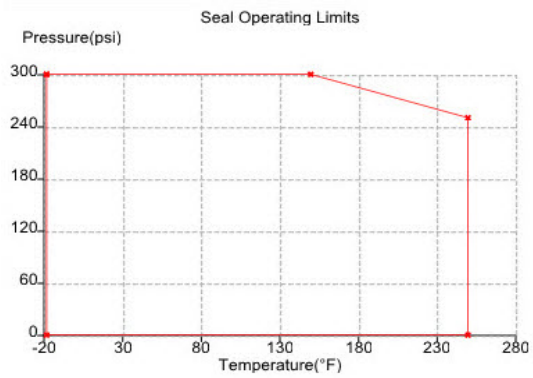
*Note: Please ensure proper seal is selected by inputting Total Dissolved Solids (TDS) in PPM in ADEPT if water quality is poor at site. Also select Flush Line Filter or Cyclone Separator if there are other contaminants in the fluid.

Electrical data

Supplier:	Factory Choice	Insulation class:	Class F Insulation
Frame size:	184JM	Motor type:	Induction
Speed:	1765 rpm	Size:	5 hp
Enclosure:	ODP	Efficiency:	NEMA Premium 12.12
Power supply:	208/3/60		

Operating limits (temperature - pressure)



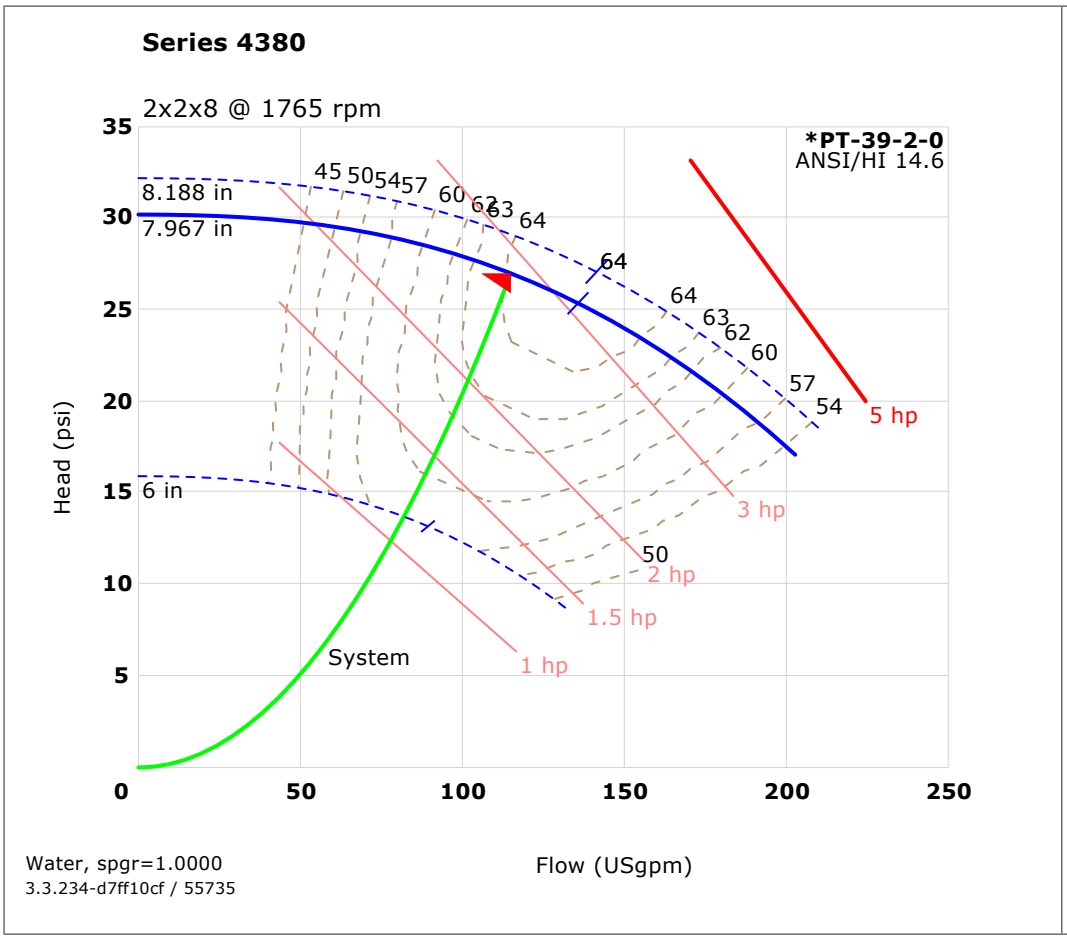


Maximum pressure: 175 psi

Maximum temperature: 250F

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

Performance curve



----Admin Data—-
Tag Num: P-1
Service:
Location:

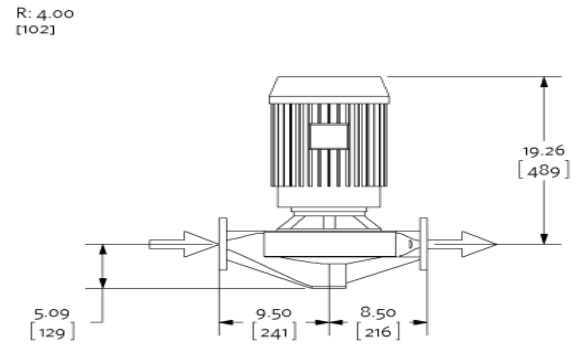
----Motor Data----
Motor Size: 5 hp

----Design Duty Points---
Flow: 115 USgpm
Head: 27 psi
Impeller: 7.97 in

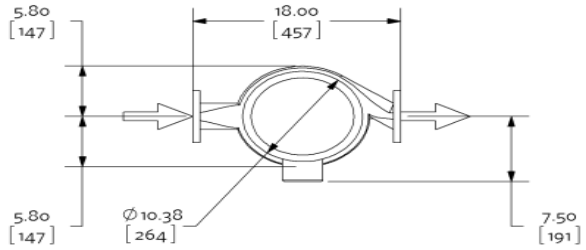
----Performance Data---
- NPSHR: 2.56 psi
- Eff. @ Design: 63.64 %
- Absorbed Power/BHP @ Design: 2.84 hp
- Mtr Capability @ Rated Spd: 5 hp hp
- Motor safety factor: 75.95%
- BEP @ Design Imp: 64.23 % @ 126.94 USgpm
- %maximp.range: 89.94%
- Outlet velocity: 11 ft/s

Dimensional data (not for construction)

Side view



Top view



Inverter motor type: Inverter duty

Weight: 261 lb [118.39 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 ¼ 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

Special instructions

Reference Motor Specification AES 05007.

Impeller Balancing: Standard (Grade G6.3)
Pump Primer: Armstrong Standard Primer

Selected options

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

Submittal

Ref. #: SQO080110_2

Design Envelope Close-Coupled Vertical In-Line Pump

Model: Series Design Envelope Sensorless 4380 1505-005.0 with Suction Guide and Flo-Trex Valve

Project name:	Martinrea Building Expansion, Ridgetown	**Representative:**	
Location:		**Phone number:**	
Date submitted:	8/20/2024 1:21 PM	**e-mail:**	
Engineer:		**Submitted by:**	Ghahremani, Bahareh

Application design data

Tag number:	P-5	Configuration:	Single
Service:			
Equipment Location:		Fluid:	Non-Potable Fluid - Water
Qty:	1		
Total system flow:	110 USgpm	Duty flow per pump:	110 USgpm
System head:	45 psi	Viscosity:	31 SSU
Environment:	Indoors	Specific gravity:	1.0000
Total dissolved solids:	0 ppm	Safety factor % flow:	0 %
Efficiency at Design:	72.3 %	Safety factor % head:	0 %
NPSHR:	5.92 psi	Total Absorbed Power:	3.99 hp
Min. maintained pressure*:	18 psi	Impeller diameter:	4.96 in
Standby qty:	0	Pump/motor run qty:	1
PEIvl:	0.45	ERvl:	55
Outlet velocity:	17.33 ft/s	Load Profile Location:	NA
Climate Zone Type:	NA	Building Type:	NA
Time Period:	8760 (1Year)		
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:	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

Electrical data

Supplier:	Armstrong	Insulation class:	Class F Insulation
Size:	5 hp	Motor type:	Permanent Magnet
Frame size:	IEC90	Efficiency:	IE5
Enclosure:	TEFC	Power supply:	575/3/60
Operating speed @ 100% flow:	3667 rpm	Operating speed @ 50% flow***:	2624 rpm

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

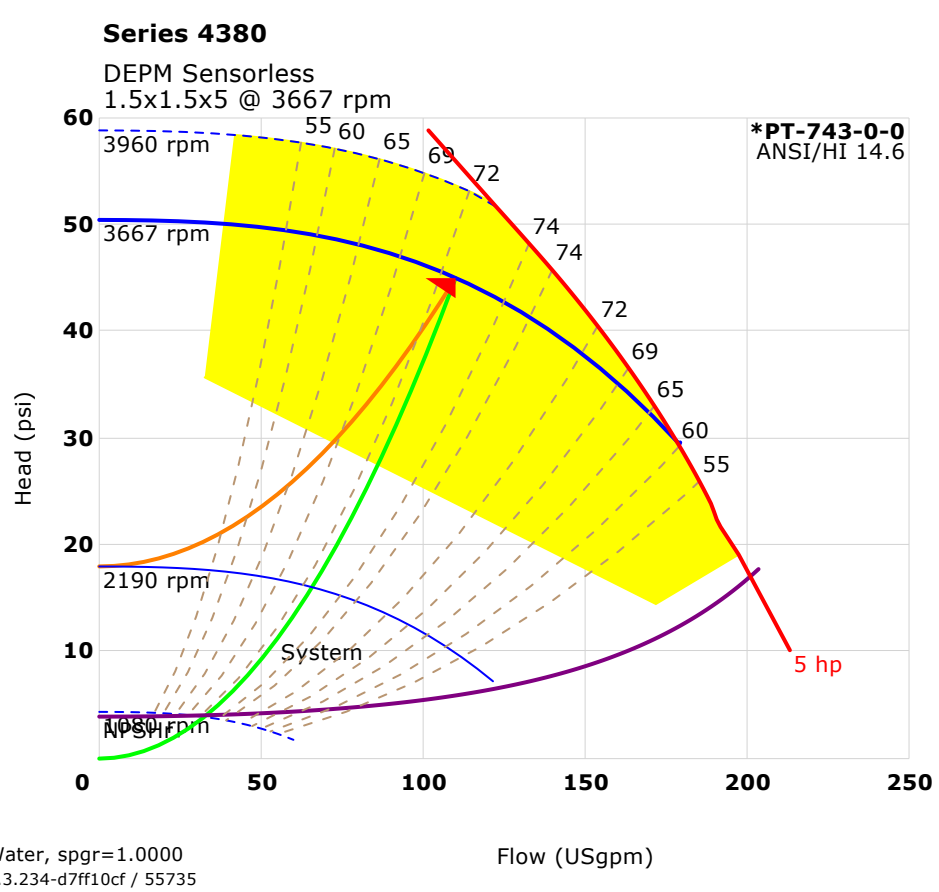
****Note: Please ensure proper seal is selected by inputting Total Dissolved Solids (TDS) in PPM in ADEPT if water quality is poor at site. Also select Flush Line Filter or Cyclone Separator if there are other contaminants in the fluid.

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:	2.19 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
		Harmonic suppression:	Integrated DC link reactor**

(*): If Default - Field reconfigurable is selected, Default from factory will be BACnet MS/TP and can be reconfigured in the field. ** The IVS control is a low harmonic control with a built-in DC link reactor equivalent in performance to a 5% AC line reactor. This does not guarantee performance to any system wide harmonic specification or the costs to meet a system wide specification. If supplied with the system electrical details, Armstrong will run a computer simulation of the system wide harmonics. If system harmonic levels are exceeded, Armstrong can also recommend additional harmonic mitigation and the cost for such mitigation.

Performance curve



Water, spgr=1.0000
3.3.234-d7ff10cf / 55735

--Control Data—

1. Hmax @ 3667 rpm:
NPSHR: 5.92 psi
Intersection Pt: 110 usgpm @ 45 psi
bhp=3.99 hp, eff=72.3 %%, %bepq=86 %%

2. Control (QPC) @ 3372 rpm:
NPSHR: 4.8 psi
Intersection Pt: 96.25 USgpm @ 38.67 psi
bhp=3.04 hp, eff=71.41%, %bepq=81.43%

3. Control (QPC) @ 3076 rpm:
NPSHR: 3.79 psi
Intersection Pt: 81.4 USgpm @ 32.79 psi
bhp=2.23 hp, eff=69.85%, %bepq=75.47%

4. Control (QPC) @ 2781 rpm:
NPSHR: 2.87 psi
Intersection Pt: 64.9 USgpm @ 27.4 psi
bhp=1.55 hp, eff=66.79%, %bepq=66.62%

5. Control (QPC) @ 2486 rpm:
NPSHR: 2.08 psi
Intersection Pt: 45.1 USgpm @ 22.54 psi
bhp=1 hp, eff=59.32%, %bepq=51.75%

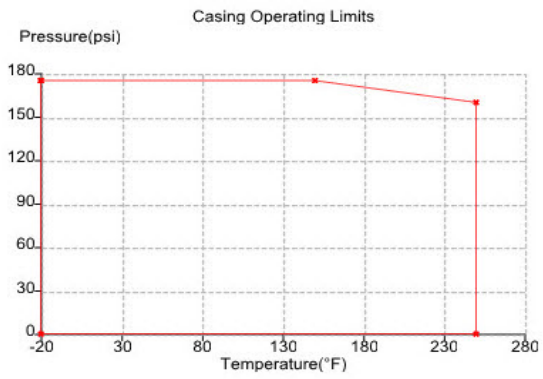
6. Hmin: 18 psi 2190 rpm:
NPSHR: 1.4 psi
Intersection Pt: 0 USgpm @ 18 psi
(Head Q Min) Setting= 40% Hmax

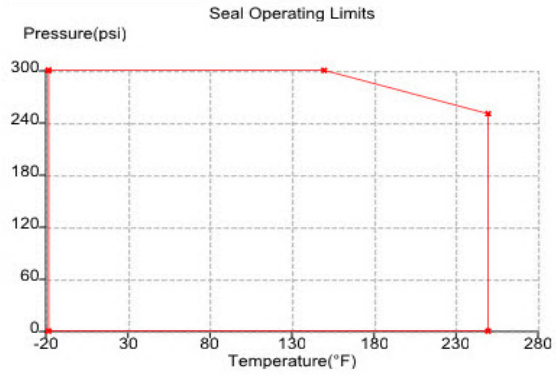
Design envelope pumping unit capability

Operating point	Flow	Head	Efficiency
Full capability at 100% design flow	110 USgpm	53.71 psi	71.1%
Design point	110 USgpm	45 psi	72.3 %
50% average flow (with default load profile)	55 USgpm	24.75 psi	63.74 %

Motor Capability @ Rated Speed	5.07 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		Heating	
Q1:	N/A	Q2:	N/A
H1:	N/A	H2:	N/A
H1 min:	N/A	H2 min:	N/A
Maximum flow:	N/A	Minimum flow:	N/A

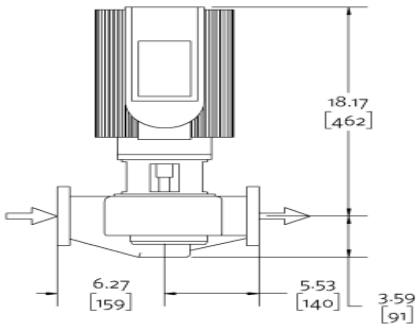
Optional Services

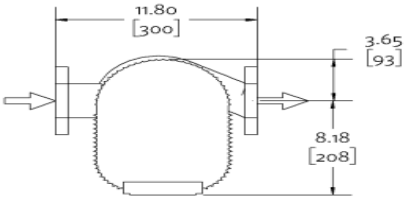
On-site pump commissioning:	Cost not Included	Extended warranty:	No
Pump manager:	Yes,Standard (1 Year Pump Manager Professional	Include spare parts qty:	0

Dimensional data (not for construction)

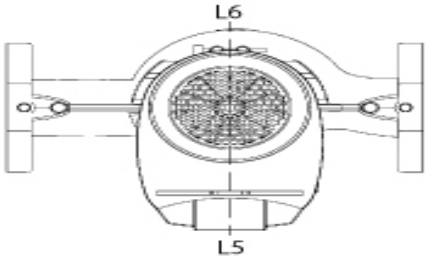
Side view	Top view

R: 3.00
[76]





Weight: 107.7 lb [48.85 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 ¼ 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	4	3.88	0.5
Outlet	1.5	ANSI-125	5.00	4	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 ± 5% accuracy.

Special instructions

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

Impeller Balancing: Standard (Grade G6.3)
Pump Primer: Armstrong Standard Primer

Selected options

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 : _____

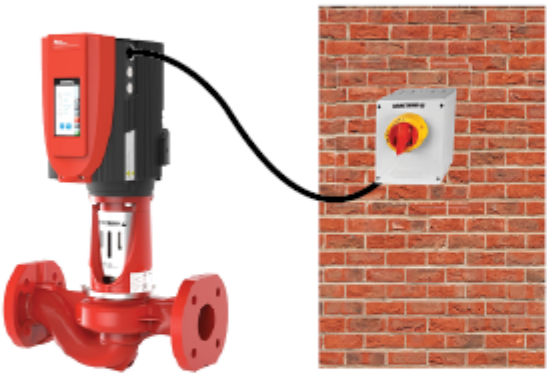
Number of 1PH 200-240V motors : ☐ 2hp & lower: _____

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/NEMA 4X rated

Terminals

Number of poles: 3-poles, ground

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

Electrical/Environmental

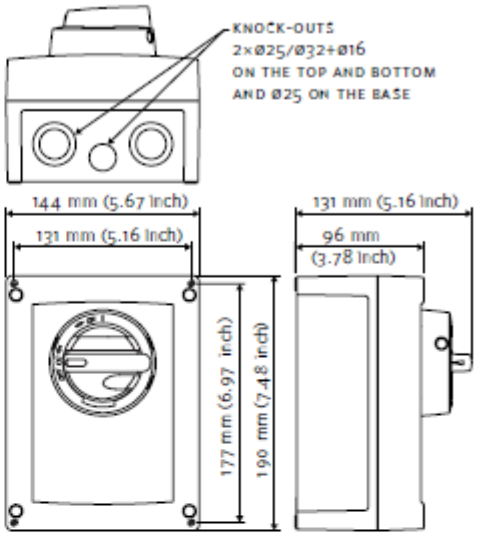
Up to 600V / Up to 60A, 50/60Hz

Minimum short circuit rating: 10kA

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

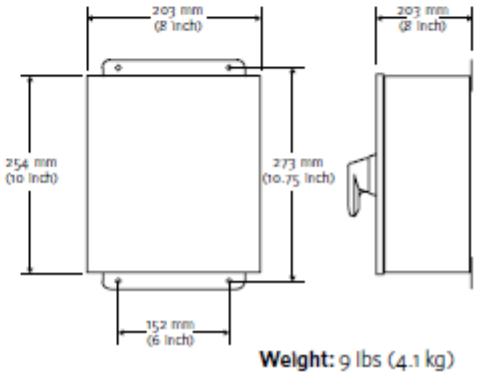
Ambient storage temperature: -30°C to +65°C (-22°F to +149°F)

30A DISCONNECT



Weight: 3.5 lbs (1.6 kg)

60A DISCONNECT



Weight: 9 lbs (4.1 kg)

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 J FAST-ACTING RK1 FAST-ACTING	2.0	1.6
0.5	0.37		6A		2.6	2.0
0.75	0.55		10A		3.3	2.9
1	0.75		10A		4.8	4.0
1.5	1.1		15A		7.1	5.8
2	1.5		20A		9.3	7.6

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 J FAST-ACTING RK1 FAST-ACTING	3.1	2.7
1.5	1.1		10A		4.2	3.7
2	1.5		15A		6.0	4.8
3	2.2		20A		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 J FAST-ACTING RK1 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		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 J FAST-ACTING RK1 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 J FAST-ACTING RK1 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		3.4	2.8
5	4		20A		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 FOI 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

Ref. #: SQO080110_2

Suction guide

Model: SG-2515

Project name:	Martinrea Building Expansion, Ridgetown	**Representative:**	Bahareh Ghahremani
Location:		**Phone number:**	
Date submitted:	8/20/2024 1:21 PM	**e-mail:**	bghahremani@armstrongfluidtechnology.com
Engineer:		**Submitted by:**	Ghahremani, Bahareh

Application design data

Tag	Qty	Model	Pipe Conn.size	Pump Conn.size	Design flowrate	Pressure Drop*	Associated pump
P-5	1	SG-2515	2.5 in	1.5 in	110 USgpm	0.71 ft	Design Envelope Sensorless 4380 1505-005.0

*at design flow

Materials of construction

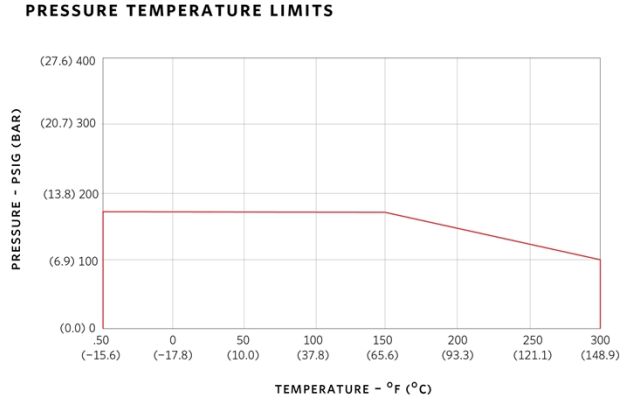
SG-2515

Body:	Cast Iron	Cover gasket:	Synthetic fiber
Guide vanes:	Cast Iron	Strainer:	Stainless Steel,0.188"(5mm)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-2515-Suction Guide-ANSI-125

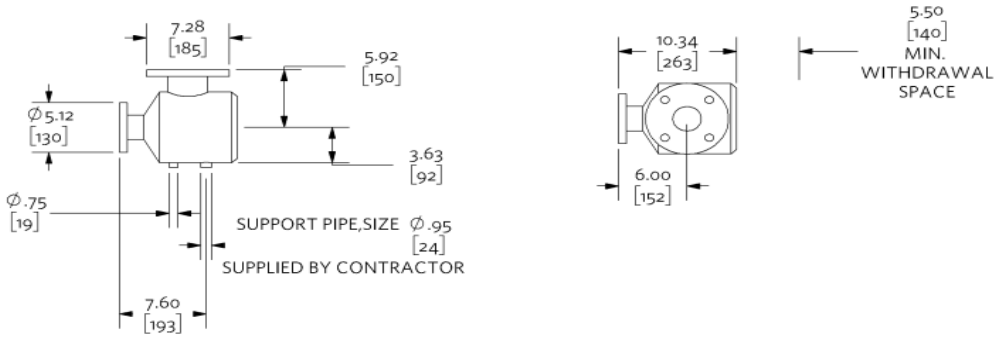


Maximum pressure: 175 psi
Maximum temperature: 300 F

Units are hydrostatically tested to 150% of maximum working pressure

Dimensional data (not for construction)

SG-2515	Weight: 26.31 lb [11.93 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. #: SQO080110_2

Flo-trex valve

Model: FTV-2.5FA-Flo-Trex Valve-ANSI-125-Angle

Project name:	Martinrea Building Expansion, Ridgetown	**Representative:**	Bahareh Ghahremani
Location:		**Phone number:**	
Date submitted:	8/20/2024 1:21 PM	**e-mail:**	bghahremani@armstrongfluidtechnology.com
Engineer:		**Submitted by:**	Ghahremani, Bahareh

Application design data

Tag	Qty	Model	Size Inlet/Outlet	Config	Pipe Type	Design flowrate	Pressure Drop*	Associated pump
P-5	1	FTV-2.5FA	2.5 in	Angle	Flanged	110 USgpm	6.24 ft	Design Envelope Sensorless 4380 1505-005.0

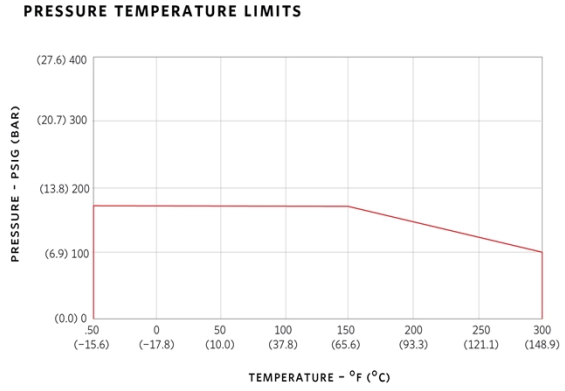
*at design flow

Materials of construction

FTV-2.5FA-Flo-Trex Valve-ANSI-125-Angle			
Body:	Cast Iron	Spring:	304 Stainless Steel
Disc:	EPDM	O rings:	EPDM
Seat:	Cast Bronze	2 metering ports:	Brass
Stem:	304 Stainless Steel	2 drain tappings:	Not Applicable

Operating limits (temperature - pressure)

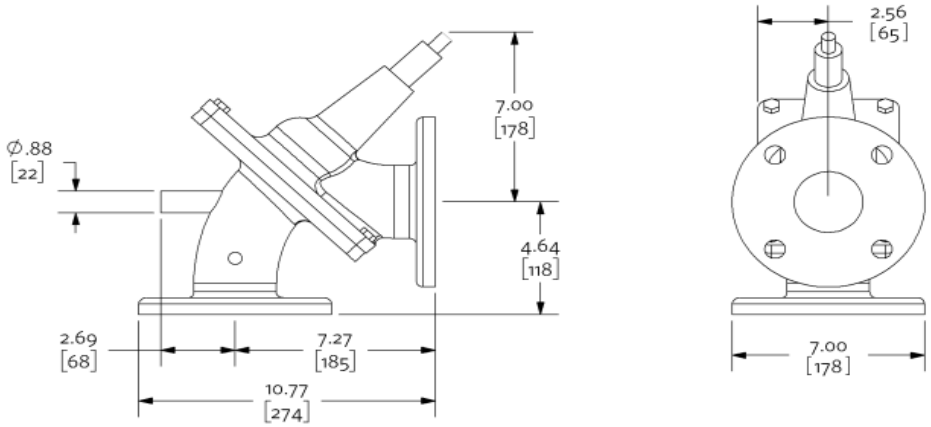
FTV-2.5FA-Flo-Trex Valve-ANSI-125-Angle



Maximum pressure: 175 psi
Maximum temperature: 300 F

Dimensional data (not for construction)

Model: FTV-2.5FA-Flo-Trex Valve-ANSI-125-Angle	Weight: 33 lb [14.97 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. #: SQO080110_2

Product: Expansion

Model: AST-5

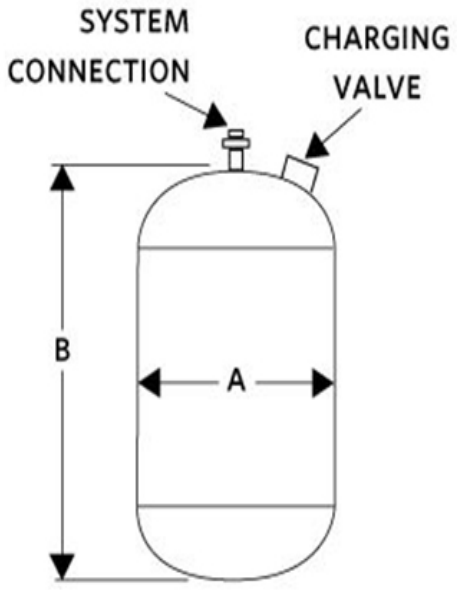
Project name:	Martinrea Building Expansion, Ridgetown	**Representative:**	sazami
Location:		**Phone number:**	
Date submitted:	8/20/2024 1:21 PM	**e-mail:**	bghahremani@armstrongfluidtechnology.com
Engineer:		**Submitted by:**	Ghahremani, Bahareh

System Data			
Tag Num:	ET-1	Service:	
Location:		Qty:	1

Application: N/A

Selected by manual selection therefore no system details available

Expansion Tank			
Tank Model:	AST-5	Max. Working Pres.:	150 psi
Standard factory charge is 40 psi (276 kPa) unless otherwise specified.		· For Domestic Potable Water Systems & Draw down tanks · Designed and constructed per ASME, Section VIII, Division 1.	
Working Temperature:	240˚F (115˚C)	Shell:	Carbon Steel
Working Pressure:	150 psi (1034 kPa)	Liner:	Polypropylene
System Conn.:	Stainless Steel	Fixed Diaphragm:	Butyl-FDA approved



Dimensional Data (in, lb) Not for Construction			
A	**B**	**NPT**	**Weight**

10	14	0.75	0 lb [0 kg]

Submittal

Ref. #: SQO080110_2

Product: Expansion
Model: AX-15V

Project name:	Martinrea Building Expansion, Ridgetown	**Representative:**	sazami
Location:		**Phone number:**	
Date submitted:	8/20/2024 1:21 PM	**e-mail:**	bghahremani@armstrongfluidtechnology.com
Engineer:		**Submitted by:**	Ghahremani, Bahareh

System Data			
Tag Num:	ET-2	Service:	
Location:		Qty:	1

Application: N/A

Selected by manual selection therefore no system details available

AX-V SERIES | PRE-CHARGED (ASME)
EXPANSION TANK | SUBMITTAL

File No: 37.51
Date: JULY 07, 2015
Supersedes: 37.51
Date: NOVEMBER 25, 2014

Job: _____ Representative: _____

_____ Order no.: _____ Date: _____

Engineer: _____ Submitted by: _____ Date: _____

Contractor: _____ Approved by: _____ Date: _____

DATA

Model no. ordered: _____ Qty: _____

Tag no.: _____ Charge pressure: _____ psi/kPa

Standard factory charge is 12 psi (83 kPa) unless otherwise specified.

MATERIALS OF CONSTRUCTION

Shell: Steel

Diaphragm: Heavy duty butyl

MAXIMUM OPERATING CONDITIONS

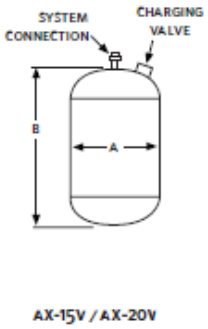
Working temperature: 250°F (121°C)

Working pressure: AXN 80 - AXN 280: 125 psi (862 kPa)
AXN 15 - AXN 60: 150 psi (1034 kPa)

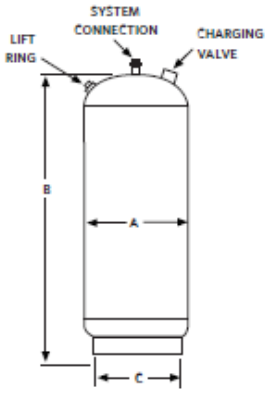
- Not for domestic potable water systems.
- California code sight-glass available upon request.
- Designed and constructed per ASME section VIII, division 1.
- This submittal supercedes 37.51 and 37.50

TYPICAL SPECIFICATION

Furnish and install, as shown on the plans, Armstrong model AX-_____V ASME Pre-charged Diaphragm Expansion Tank, stamped 125 psi (862 kPa) working pressure. Each tank will be supplied with a heavy duty butyl diaphragm. Tank shall be supplied with a ring base, lifting rings, NPT system connection. An air charging valve connection (standard tire valve) shall be provided to facilitate adjusting pre-charge pressure to meet actual system conditions.

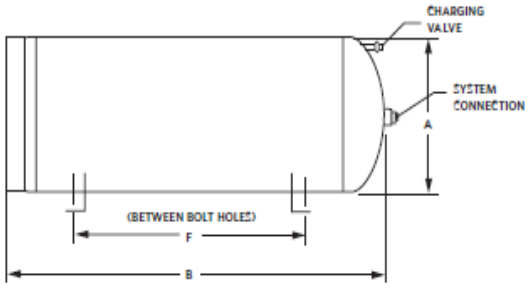


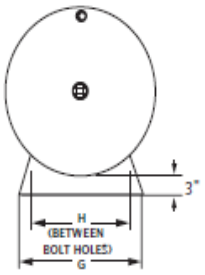
AX-15V / AX-20V



AX-40V / AX-280V

This tank to be mounted vertical or horizontal. For Horizontal mounting saddles can be provided.





MODEL	TANK VOLUME	ACCEPTANCE VOLUME	A	B	C	SYSTEM CONNECTION NPT	SHIPPING WEIGHT	FOR HORIZONTAL INSTALLATION F	G	H	TANK SHIPPING WEIGHT WITH SADDLES
	gal (L)		inches (mm)				lbs (kg)	inches (mm)			lbs (kg)
AX-15V	8.0 (30.3)	6.3 (23.8)	12.00 (305)	19.00 (483)	—	0.75 (19)	42 (20.0)	14.38 (365)	10.00 (254)	8.00 (203)	44 (21.0)
AX-20V	11.0 (41.6)	8.8 (33.3)	12.00 (305)	26.00 (660)	—	0.75 (19)	52 (23.0)	21.13 (537)	10.00 (254)	8.00 (203)	54 (26.0)
AX-40V	25.0 (94.6)	20.2 (76.5)	16.00 (406)	33.00 (838)	14.00 (356)	1.00 (25)	84 (38.0)	26.00 (660)	14.00 (356)	12.00 (305)	93 (45.0)
AX-60V	35.0 (132.5)	28.0 (106.0)	16.00 (406)	45.00 (1143)	14.00 (356)	1.00 (25)	97 (44.0)	36.13 (791)	14.00 (356)	12.00 (305)	106 (51.0)
AX-80V	45.0 (170.3)	36.0 (136.3)	20.00 (508)	38.00 (965)	18.00 (457)	1.00 (25)	148 (67.0)	31.13 (791)	16.00 (406)	14.00 (356)	164 (79.0)
AX-100V	60.0 (227.1)	48.5 (183.6)	20.00 (508)	49.00 (1245)	18.00 (457)	1.00 (25)	175 (79.0)	42.50 (1080)	16.00 (406)	14.00 (356)	191 (92.0)
AX-120V	70.0 (265.0)	56.5 (213.9)	24.00 (610)	46.00 (1168)	22.00 (558)	1.00 (25)	259 (117.0)	31.50 (800)	20.00 (508)	18.00 (457)	278 (133.0)
AX-144V	80.0 (302.8)	65.0 (246.1)	24.00 (610)	49.00 (1245)	22.00 (558)	1.50 (38)	268 (121.0)	33.38 (848)	20.00 (508)	18.00 (457)	287 (138.0)
AX-180V	90.0 (340.7)	73.0 (276.3)	24.00 (610)	52.00 (1321)	22.00 (558)	1.50 (38)	283 (128.0)	37.75 (959)	20.00 (508)	18.00 (457)	302 (145.0)
AX-200V	115.0 (435.3)	93.0 (352.0)	24.00 (610)	66.00 (1676)	22.00 (558)	1.50 (38)	325 (146.0)	51.25 (1302)	20.00 (508)	18.00 (457)	344 (165.0)
AX-240V	140.0 (530.0)	113.5 (429.6)	24.00 (610)	78.00 (1981)	22.00 (558)	1.50 (38)	362 (163.0)	59.50 (1511)	20.00 (508)	18.00 (457)	381 (183.0)
AX-260V	158.0 (598.1)	128.0 (484.5)	30.00 (762)	61.00 (1549)	28.00 (711)	1.50 (38)	591 (266.0)	46.00 (1168)	24.00 (610)	22.00 (559)	651 (312.0)
AX-280V	211.0 (798.7)	171.0 (647.3)	30.00 (762)	79.00 (2700)	28.00 (711)	1.50 (38)	752 (338.0)	64.00 (1626)	24.00 (610)	22.00 (559)	812 (390.0)

Submittal

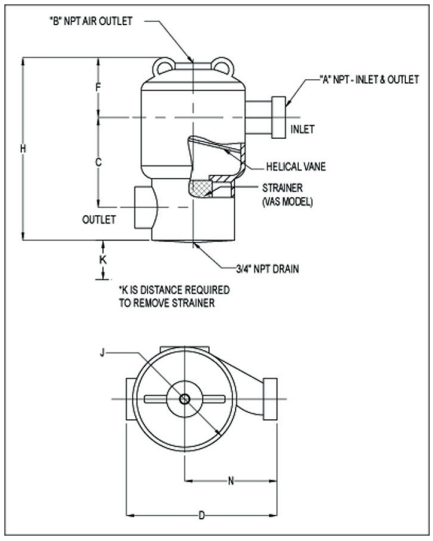
Ref. #: SQO080110_2

Product: VASASME

Model: VA-3

Project name:	Martinrea Building Expansion, Ridgetown	**Representative:**	Bahareh Ghahremani
Location:		**Phone number:**	
Date submitted:	8/20/2024 1:21 PM	**e-mail:**	bghahremani@armstrongfluidtechnology.com
Engineer:		**Submitted by:**	Ghahremani, Bahareh

Technical Data		Materials of Construction	
Max.Working Temperature	350 ˚F	Shell	Cast Iron
Connection Type	Threaded NPT	Gasket	Non-Asbestos
Max.working Pressure	160 psi		



Dimensional Data (in, lb) Not for Construction									
A	B	C	D	E	F	H	J	K	N
3	0.75	9.25	15.5	0	6.15	19	10.7	7.88	9.5

Weight	Flow IN USGPM
100 lb [45.36 kg]	110 USgpm

AUTOMATIC AIR ELIMINATOR | AAE-750 |

SUBMITTAL

File No: 37.511
Date: DECEMBER 13, 2019
Supersedes: 5037.965
Date: NOVEMBER 30, 1997

Job: _____ Representative: _____

_____ Ordered by: _____ Date: _____

Engineer: _____ Submitted by: _____ Date: _____

Contractor: _____ Approved by: _____ Date: _____

MATERIALS OF CONSTRUCTION

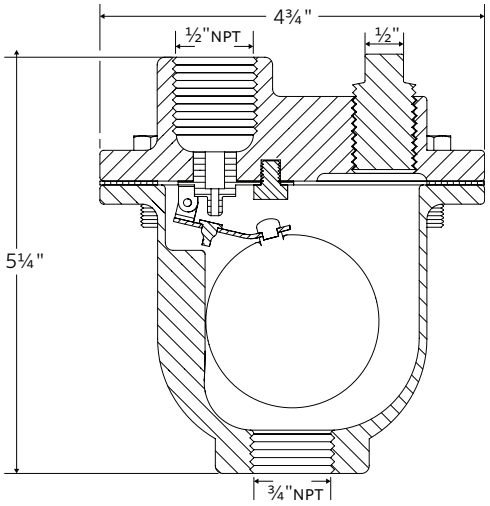
Cover and body	Cast iron A126
Control portion	Stainless steel
Bolts	Carbon steel
Valve seat	Stainless steel

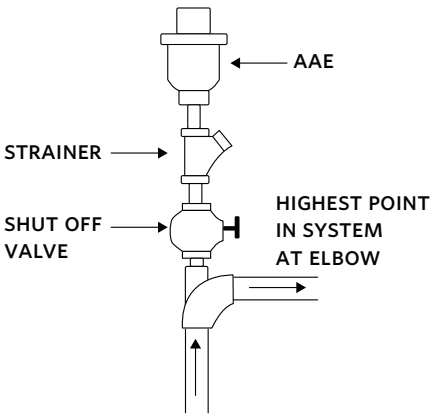
SPECIFICATION

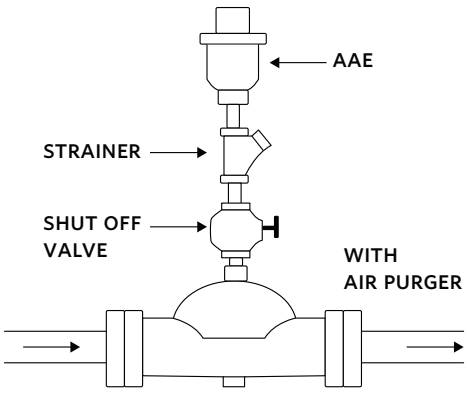
Air Elimination Range	150 psi at 250°F (10.34 bar at 121°C)
	175 psi at 150°F (12.07 bar at 65.5°C)
Weight	5.5 lbs (2.49 kg)

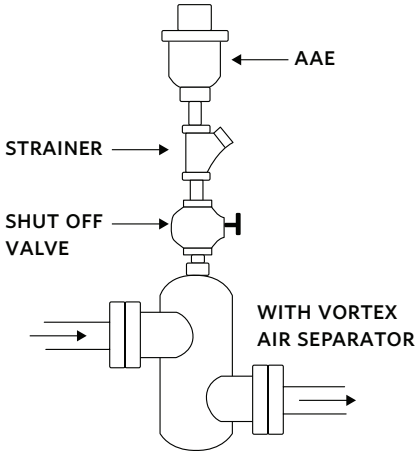
INSTALLATION

1. Install the AAE - 750 in a vertical position with the system connection at 6 o'clock and the air passage to atmosphere at 12 o'clock.
2. The air passage opening at the top must be kept open and not plugged or blocked. It is recommended that a drain tube be installed from this opening to an open drain to prevent water damage in the event the operating mechanism becomes fouled by foreign material.
3. A strainer is recommended (installed as shown) on systems that could contain suspended particles which would affect the proper operation of this vent.









Submittal

Connectivity Kit

4G LTE router / cellular modem	SIM card and data plan included	Accessibility	Multi-platform (web/mobile)
Installation	By a certified Armstrong tech	Security	Secure connection to IBM Watson analytics engine

*Connectivity package includes one Prepaid cellular data plan with nation-wide coverage. Router installation and connection to pumps by certified Armstrong service tech. **Maximum 8 pumps per router. Each router requires an annual subscription. Router coverage range is 30m (100') to a maximum 100m (300') radius unobstructed. Pumps serving a system are within the router coverage perimeter.

Submittal

SMART Start-up

Start-up is defined by ASHRAE as "a set of procedures to be followed in the systematic initial sequencing or energizing of components, devices, equipment, and systems".

SMART Start-up is performed by an Armstrong Design Envelope certified technician. It builds on start-up by connecting the pump-to-Pump Manager for Active Performance Management™. This:

1) Helps manage the energy performance of the pump and provides system level insights as a baseline for future commissioning

2) Comes with built-in asset management capabilities to enable complete asset life cycle management from day 1

3) Identifies and connects issues with experts who have the right skills and the right parts to ensure maximum asset availability

This OEM-certified single site-visit includes:

- ****Comprehensive Additional Warranty with parts and labor coverage for 12 months.**
- **Setup and activation of Performance Management Service with 1-year Pump Manager Essentials subscription and Connectivity kit with data plan to get real-time insights:**
  - On pump performance and diagnostics
  - Alerts when pump(s) are running in manual mode- Pump in Hand.
  - Flow and Load profiles
  - Performance reports on average flow and load profile, energy consumption over time, operation conditions relative to design conditions, flow, and head relationships and 3-dimension pump vibration
- **Setup and activation of built-in performance optimization software controls (as required)**
  - Setting duty point and control signals, as required
  - Control strategy (i.e., Parallel Sensorless, analog or digital I/O)
  - Feature bundle (Dual Season, Protection bundle) set up as per requirements.
  - Establishing local (BACNET, Modbus) integration with the existing Building Automation System, if available
- **Multi-point pump check:**
  - starts up and runs in correct working conditions.
  - alignment, pump rotation, suction, and discharge pressure
  - bleed air from the pump
  - condition of the seal, strainer, drive and impeller
  - vibration metering is within specification.
  - motor or bearing are greased and are within specification.
  - for abnormal noises
  - flash line filters (if applicable) is within specification
  - for voltage and amperage are within specification
  - leaks, abnormal noise, abnormal vibration, and alarms
  - verify that the data trends (Power, Flow, Head, and vibration) are within specification.
- **Firmware upgrade or update as specified.**
- **Comprehensive SMART Start-up report provided upon completion.**

Benefits of SMART Start-up:

- 1 Year of Pump Manager Essentials subscription. All benefits of Pump Manager to the End User apply for SMART Start-up.
- **12-months backed OEM additional warranty on the equipment includes expert support to facilitate faster return of equipment to service. This mitigates operation risk and maximizes equipment and system uptime. 1-Year additional warranty is only applicable if pumps are connected to the Pump Manager service and Armstrong labour has been opted in for the SMART Start-up.
- Failure due to improper installation and operation are not covered under warranty. This OEM start-up of the equipment ensures that it has been started up correctly. It reduces the risk of equipment failure due to improper installation and operation.
- The Comprehensive start-up service report including complete asset information can all be accessed digitally from one place. This information integrates seamlessly with existing Building Automation System, Computerized Maintenance Management Systems, Energy Management Systems. Easy access to this information facilitates faster equipment return to service

Notes:

i. Price is based on labour commitment for the day's work (if labour included). It assumes devices are within the same location and site locations are within 2 hours drive away. Hotel, travel or additional site visits can lead to additional charges, in which case shall be mentioned above as Additional Expenses.
ii. Pump Manager / Online Warranty registration of product comes with 6 months additional warranty entitlement on equipment over and above the standard equipment warranty. (Opting for SMART Commissioning adds another 6 months comprehensive warranty).
iii. 12 months Additional Warranty from SMART Startup and Pump Manager is applicable only if pumps are connected to Pump Manager and Armstrong Labour was included in SMART Start-up.

**Valid for:

HP/kW
0.33-7.5 HP (0.25-5.5 kW)
10-15 HP (7.5-11 kW)
20-40 HP (15-30 kW)
50-75 HP (37-55 kW)