



Emech[®]

DIGITAL CONTROL VALVES



Emech® Digital Control Valves



Emech® is digital hardware that is faster, simpler, and smarter with one goal in mind: unparalleled performance in industrial applications. Emech® digital control valves are available for steam/water and hot/cold water industrial service. The unique range of Emech® multi-patented ceramic disc/stainless steel disc rotary 3 port mixing when combined with the Emech® digital actuator delivers superior closed-loop performance in terms of speed, precision and reduced mechanical wear when compared to traditional mixing and control valve systems.

The mixing valve system is a highly optimized temperature control system with patented valve disc system, swirl mixing action, high speed in valve sensing, with embedded PID control of a 100% duty cycle rated stepper motor digital actuator.

A series of 2 port flow control valves are also available, which when combined with the Emech® actuator and sensing technology forms a system providing superior temperature control to a range of industry standard processes, through its high speed and software configurable control dynamics.

Actuator Features

- Electric Stepper Motor Control
- 100% Duty Cycle rated for continuous control
- Planetary lifetime lubricated, low backlash gearbox
- High speed 1.3 second quarter-turn response
- Precise positioning achieving 0.03° valve seat placement
- Software configurable PID control for individual application loop tuning and special modes via RS232
- Two operating modes: Stand alone control via onboard keypad or Remote control via external 4-20mA
- 4-20mA input and output ports
- Additional auxiliary switch control available
- Epoxy powder-coated aluminum NEMA 4 enclosure
- Two sizes:
 - G12 model 310 in.lb torque: 24vDC 3.5 Amp
 - G13 model 885 in.lb torque: 24vDC 5 Amp

Valve Features:

- One piece rotary spindle design
- Top entry maintenance and simple seals/o-rings
- Pressure rated to 145psi, designed to ASME B16.34
- Mechanical valve mounting to ISO5211,5210

Primary Markets Include:

- Food Manufacturing Industries
- Pharmaceutical Manufacturing Industries
- General Process Industries

High Speed Accuracy, Increase in Productivity

Decrease production downtime, improve product consistency and boost revenue.

Emech® Digital Control Valves are specifically designed to instantly respond accurately. Emech®'s response time is incredibly rapid which directly affects productivity. The technology of Emech® simply achieves more in less time, increasing productivity while lowering utility and maintenance cost. Emech®'s superior valve performance allows manufacturers to run their plans closer to constraints, thereby increasing production and yield.

Maintenance Friendly

Featuring a CF8M/316 stainless steel valve body along with ceramic or nickel chrome stainless steel action discs and "simple" valve seals design kits, the Emech® system is built to resist corrosion and minimize wear while providing maximum performance.

Emech® is manufactured to meet the highest possible standards, every Emech® system is designed, built and tested to provide reliable service with minimal maintenance.

Designs, materials, weights and performance ratings are approximate and subject to change without notice. Visit armstronginternational.com for up-to-date information.

Emech® Digital Control Valves



- Manual Over-Ride Handle standard (not shown)
- Lockable Security feature

- Local Keypad or mA loop “Set Value” capability
- LCD Display “Set Value and “Process Value”, Degrees F or C or valve position
- Hinged magnetic latching and lockable display cover
- Error signal indication

Push button “soft start” electronics

- Epoxy powder coated aluminium enclosure with stainless steel fasteners
- Corrosion resistant finish
- O-ring enclosure seals and energized cup shaft seal
- NEMA 4 (IP65)

Graduated visual indicator on shaft coupling

Separate Terminal Enclosure, sealed from the electronics enclosure

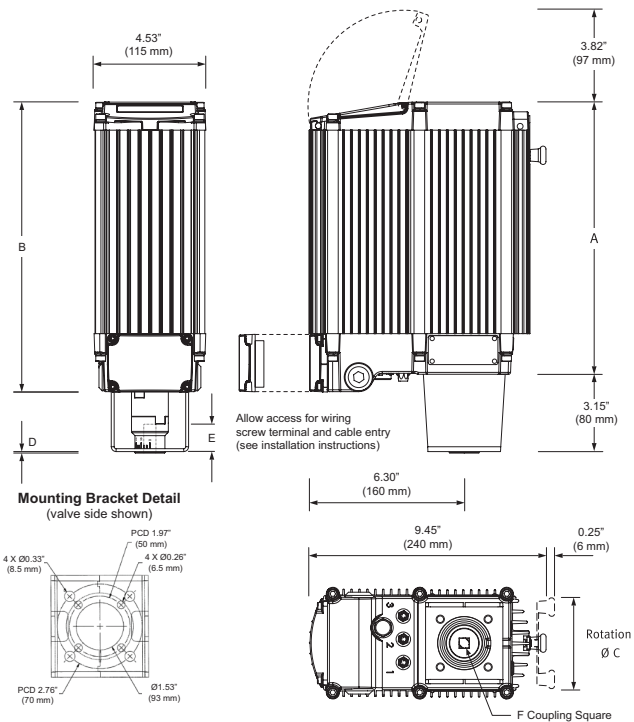
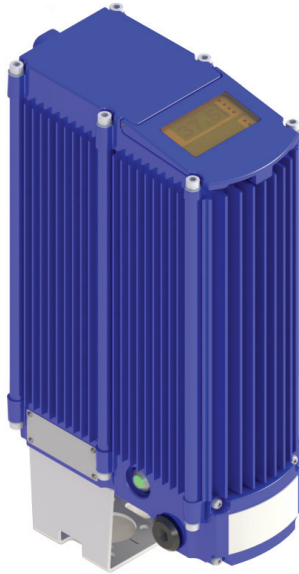
- mA loop input/output terminals
- 24Vdc power terminals
- Common ‘blade’ mini-fuse + spare
- Self retaining screws
- Integrated Overvoltage protection

Internationally patented “shear action” valve seat design and “mix+sense” technology

Integrated “In Valve” high-speed temperature sensor

Valve constructed from CF8M (316) stainless steel

Designs, materials, weights and performance ratings are approximate and subject to change without notice. Visit armstronginternational.com for up-to-date information.

Digital Actuators - Model G1


G12 is a 310 in.lb torque: 24vDC 3.5 Amp.

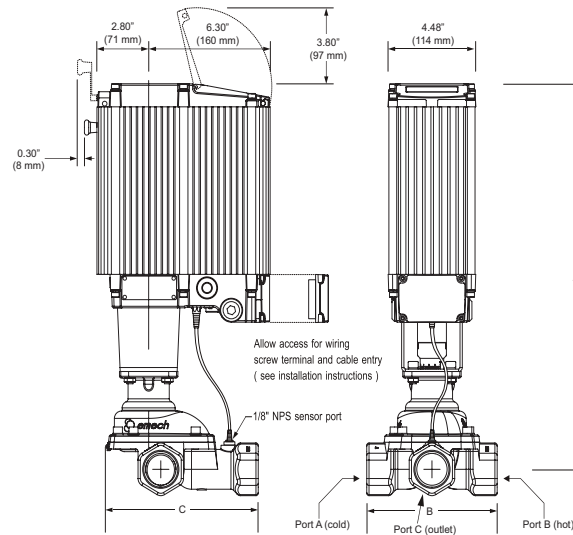
G13 is a 885 in.lb torque: 24vDC 5.0 Amp.

Dimensions												
Model	A		B		C		D		E		F	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
G12	11.02	280.00	11.81	300.00	3.54	90.00	0.04	1.00	1.12	28.5	0.4 x 0.4	10 x 10
G13	13.31	338.00	14.09	358.00	7.09	180.00	0.04	1.00	1.12	28.5	0.55 x 0.55	14 x 14

Feature	Emech® Actuator	Pneumatic Actuator/Positioner
Speed : 90 degree in 1.2 seconds	✓	✓
Accuracy : 0.03 degrees resolution	✓	X
Actuator configurable: Torque, Speed, Stroke	✓	X
Closed Loop configurability	✓	X
No 'Sticktion'- Direct Motion Control	✓	X
Single source power requirement	✓	X
Local control and configuration	✓	X

The Emech® Digital Stepper Motor Actuator can be mounted on industry standard rotary control valves.
The Emech® actuator can bring improvement and performance to other ranges of rotary control valves in temperature applications where the Emech® sensor can also be deployed in flow control applications.

Hot/Cold Water Mixing Systems – Model EXXW



Dimensions						
Model	A		B		C	
	in	mm	in	mm	in	mm
E20W	17.60	447.00	4.72	119.00	5.43	137.90
E25W	17.90	454.60	4.72	119.00	6.42	163.00
E40W	19.10	485.10	6.77	172.00	7.83	198.90
E50W	22.20	563.90	8.66	220.00	10.67	271.00

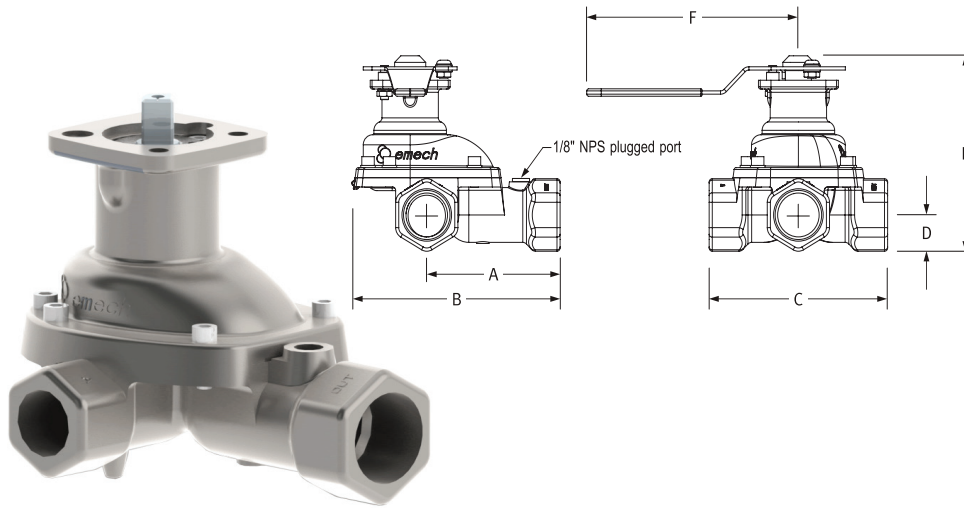
Flow Capacity (gpm)													
Model	Port Connection Sizes (NPT) Inlets x Outlets	Pressure Drop (psi)										Nominal Min. Flow*	C _v
		5	10	15	20	25	30	35	40	45	50		
E20W	3/4" x 1"	18	26	31	36	40	44	48	51	54	57	0.9	8.1
E25W	1" x 1-1/4"	28	40	49	56	63	69	74	80	84	89	4.0	12.6
E40W	1-1/2" x 1-1/2"	44	62	76	88	98	108	116	124	132	139	6.0	19.6
E50W	2" x 2-1/2"	107	151	185	213	239	261	282	302	320	337	20.0	47.5

Flow Capacity (lpm)													
Model	Port Connection Sizes (NPT) Inlets x Outlets	Pressure Drop (bar)										Nominal Min. Flow*	K _v
		0.3	0.7	1.0	1.4	1.7	2.1	2.4	2.8	3.1	3.4		
E20W	3/4" x 1"	68	98	117	136	151	167	182	193	204	216	4.0	7.0
E25W	1" x 1-1/4"	106	151	185	212	238	261	280	303	318	337	18.0	11.0
E40W	1-1/2" x 1-1/2"	167	235	288	333	371	409	439	469	500	526	26.0	17.0
E50W	2" x 2-1/2"	405	572	700	806	905	988	1,067	1,143	1,211	1,276	70.0	41.0

*The nominal recommended Min. Flow is described as:

- The minimum flow at which temperature control can be readily achieved for the given valve size with the Actuator set at STANDARD control gain setting.
- Contact the factory for applications where flow conditions are lower than those stated above.

Designs, materials, weights and performance ratings are approximate and subject to change without notice. Visit armstronginternational.com for up-to-date information.

Hot/Cold Water Mixing Valves - Model F3


Dimensions												
Model	A		B		C		D		E		F	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
F3020	3.58	90.93	5.43	137.92	4.72	119.89	0.91	23.11	5.20	132.08	6.50	165.10
F3025	4.25	107.95	6.42	163.07	4.72	119.89	1.14	28.96	5.71	145.03	6.50	165.10
F3040	5.16	131.06	7.83	198.88	6.77	171.96	1.30	33.02	7.09	180.09	8.03	203.96
F3050	7.01	178.05	10.67	271.02	8.66	219.96	1.89	48.01	8.39	213.11	8.03	203.96

Flow Capacity (gpm)													
Model	Port Connection Sizes (NPT) Inlets x Outlets	Pressure Drop (psi)										Nominal Min. Flow*	C _v
		5	10	15	20	25	30	35	40	45	50		
F3020	3/4" x 1"	18	26	31	36	40	44	48	51	54	57	0.9	8.1
F3025	1" x 1-1/4"	28	40	49	56	63	69	74	80	84	89	4.0	12.5
F3040	1-1/2" x 1-1/2"	44	62	76	88	98	108	116	124	132	139	6.0	19.6
F3050	2" x 2-1/2"	107	151	185	213	239	261	282	302	320	337	20.0	47.5

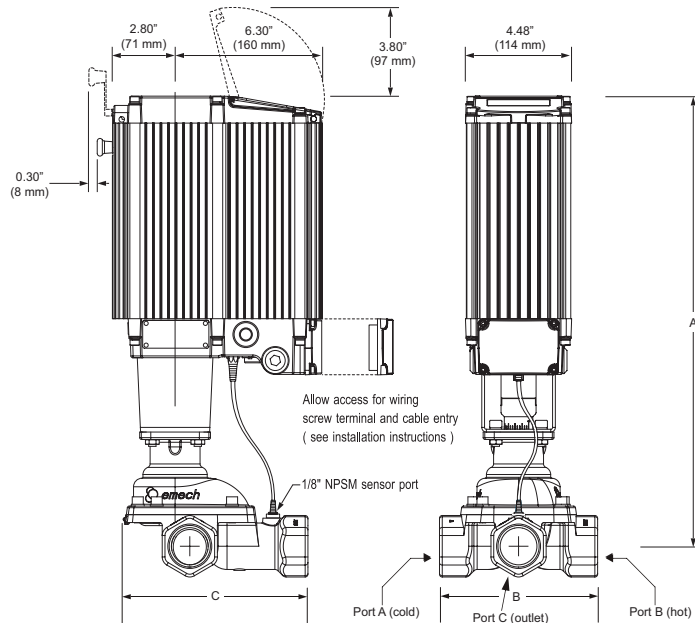
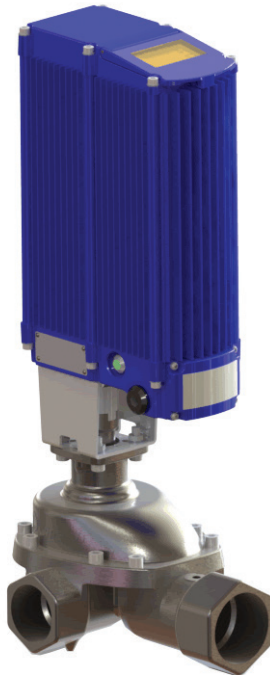
Flow Capacity (lpm)													
Model	Port Connection Sizes (NPT) Inlets x Outlets	Pressure Drop (bar)										Nominal Min. Flow*	K _v
		0.3	0.7	1.0	1.4	1.7	2.1	2.4	2.8	3.1	3.4		
F3020	3/4" x 1"	68	98	117	136	151	167	182	193	204	216	4.0	7.0
F3025	1" x 1-1/4"	106	151	185	212	238	261	280	303	318	337	18.0	10.9
F3040	1-1/2" x 1-1/2"	167	235	288	333	371	409	439	469	500	526	26.0	17.0
F3050	2" x 2-1/2"	405	572	700	806	905	988	1,067	1,143	1,211	1,276	70.0	41.3

*The nominal recommended Min. Flow is described as:

- The minimum flow at which temperature control can be readily achieved for the given valve size with the Actuator set at STANDARD control gain setting.
- Contact the factory for applications where flow conditions are lower than those stated above.

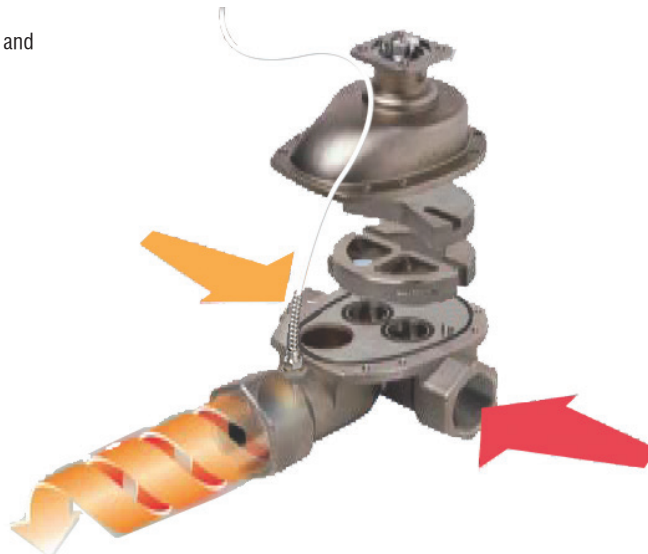
Designs, materials, weights and performance ratings are approximate and subject to change without notice. Visit armstronginternational.com for up-to-date information.

Steam/Water Mixing Valves - Model EXXS

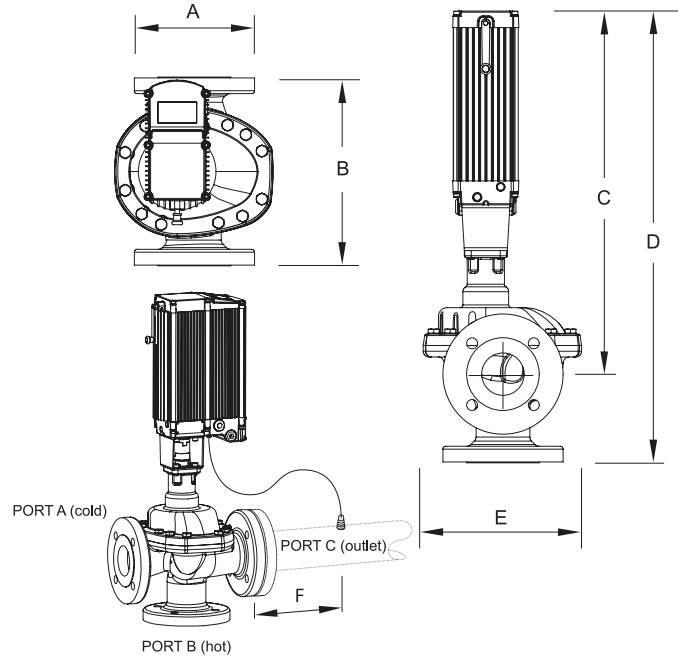


Dimensions						
Model	A		B		C	
	in	mm	in	mm	in	mm
E25S	17.90	454.60	4.72	119.00	6.42	163.00
E40S	19.10	485.10	6.77	172.00	7.83	198.90
E50S	22.20	563.90	8.66	220.00	10.67	271.00

- Steam/Water mixing systems utilize Stainless Steel disc sets and CRPTFE based seals technology.
- Direct steam inject is a specialty.
- Consult factory for sizing and installation details.



Designs, materials, weights and performance ratings are approximate and subject to change without notice. Visit armstronginternational.com for up-to-date information.

Hot/Cold Water Mixing Valves - Model E80WR


Dimensions												
Model	A		B		C		D		E		F	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
E80WR	7.5	190.0	13.0	330.0	24.9	633.0	31.2	792.0	11.0	280.0	12.0	305.0

- E80WR allows Port A and Port B to be interchanged. Refer to Armstrong IOM.
- E80WR valve does not use ceramic discs.
- E80WR valve comes with a pipe mounted temperature sensor.
- Refer to E80WR data-sheet for full specifications.
- Contact Armstrong for larger capacity mixing valves.

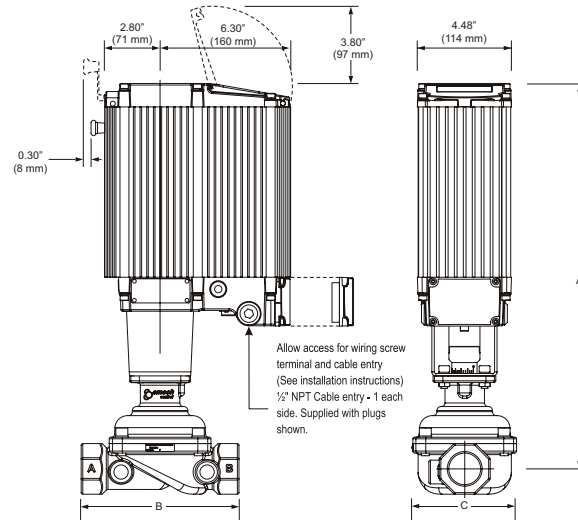
Flow Capacity (gpm)													
Model	Port Connection Sizes (NPT) Inlets x Outlets	Pressure Drop (psi)										Nominal Min. Flow*	C _v
		5	10	15	20	25	30	35	40	45	50		
E80WR	3" x 3" (ASME B16.5 Class 150 Flanges)	322	455	558	644	720	789	852	911	966	1018	53	144
		Pressure Drop (bar)											
		1,219	1,722	2,112	2,437	2,726	2,987	3,225	3,449	3,657	3,854	11.7	124.56

*The nominal recommended Min. Flow is described as:

- The minimum flow at which temperature control can be readily achieved for the given valve size with the Actuator set at STANDARD control gain setting.
- Contact the factory for applications where flow conditions are lower than those stated above.

Designs, materials, weights and performance ratings are approximate and subject to change without notice. Visit armstronginternational.com for up-to-date information.

Flow Control Valves - Model EXXF

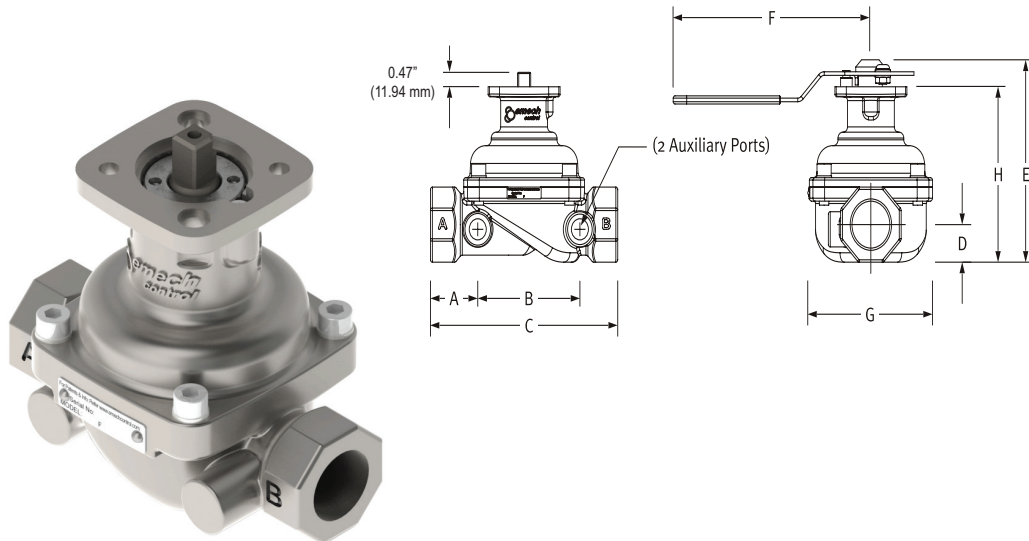


Dimensions						
Model	A		B		C	
	in	mm	in	mm	in	mm
E20F	17.50	444.50	2.72	69.08	3.03	76.96
E25F	17.90	454.60	5.85	148.59	3.90	99.06
E40F	18.90	480.60	7.85	199.40	5.12	130.05
E50F	21.90	556.30	9.84	249.94	6.42	163.07

Flow Capacity (gpm)												
Model	Port Connection Sizes (NPT) Inlets x Outlets	Pressure Drop (psi)										C _v
		5	10	15	20	25	30	35	40	45	50	
E20F	3/4" x 3/4"	36	51	63	72	81	89	96	102	109	115	16.2
E25F	1" x 1"	62	88	108	125	140	153	165	176	187	197	27.9
E40F	1-1/2" x 1-1/2"	103	145	178	205	230	251	272	290	308	325	45.9
E50F	2" x 2"	185	262	321	370	414	454	490	524	555	585	82.8

Flow Capacity (lpm)												
Model	Port Connection Sizes (NPT) Inlets x Outlets	Pressure Drop (bar)										K _v
		0.3	0.7	1.0	1.4	1.7	2.1	2.4	2.8	3.1	3.4	
E20F	3/4" x 3/4"	136	193	238	272	306	336	363	386	412	435	14.1
E25F	1" x 1"	234	333	408	473	529	579	624	666	707	745	24.3
E40F	1-1/2" x 1-1/2"	389	548	673	776	870	950	1,029	1,097	1,165	1,230	42.5
E50F	2" x 2"	700	991	1,215	1,400	1,567	1,718	1,854	1,983	2,100	2,214	72.0

Designs, materials, weights and performance ratings are approximate and subject to change without notice. Visit armstronginternational.com for up-to-date information.

Flow Control Valves - Model F2


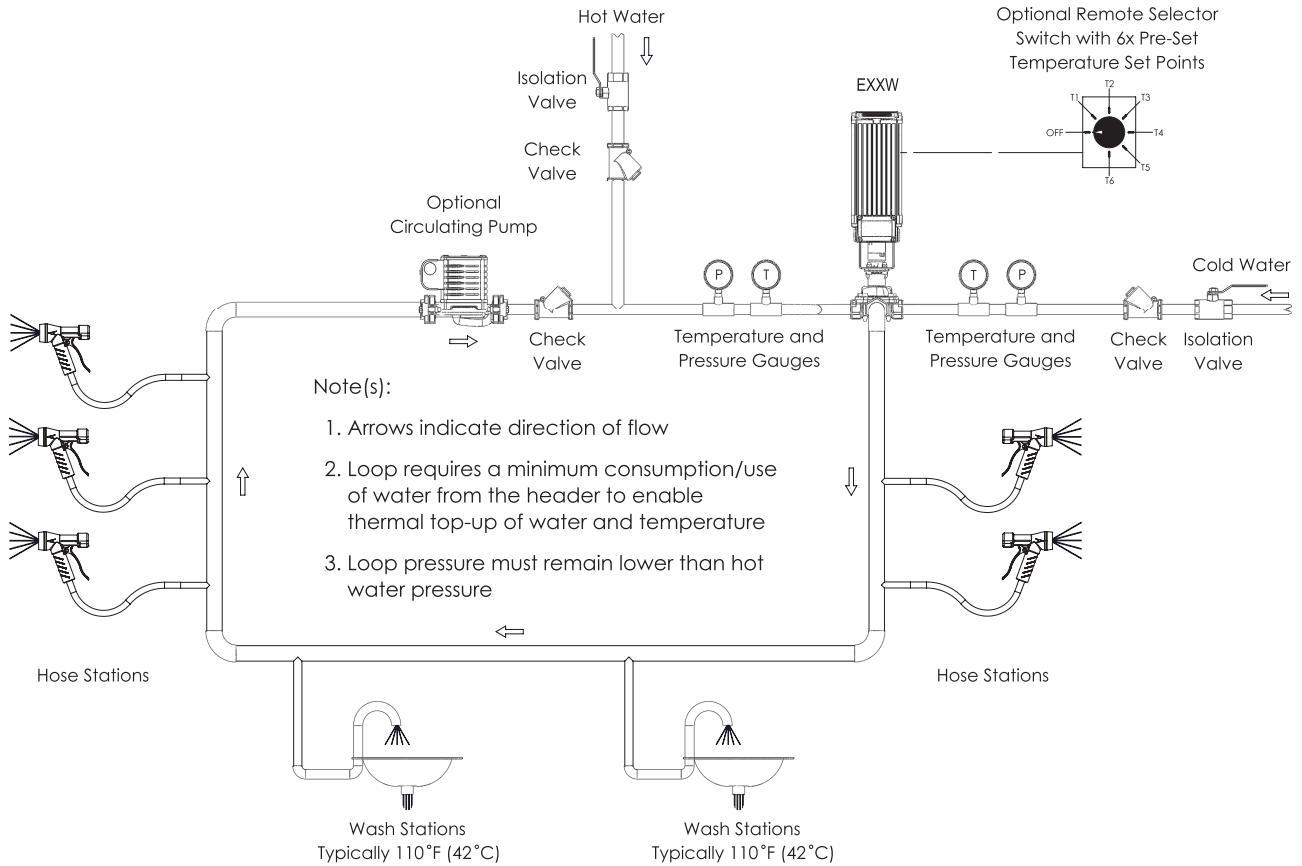
Dimensions																
Model	A		B		C		D		E		F		G		H	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
F2020	1.30	33.10	2.50	63.50	2.72	69.10	0.71	18.10	4.92	125.00	6.58	167.10	3.03	77.10	4.02	102.10
F2025	1.38	35.60	3.35	83.40	5.85	148.60	0.87	22.10	5.35	135.90	6.58	167.10	3.90	99.10	4.49	114.00
F2040	2.06	53.30	4.25	109.20	7.85	199.40	1.26	32.10	6.81	173.00	8.07	205.00	5.12	130.00	5.87	149.10
F2050	2.32	58.40	5.50	137.80	9.84	249.90	1.54	39.10	7.64	194.10	8.07	205.00	6.42	163.10	6.77	172.00

Flow Capacity (gpm)													
Model	Port Connection Sizes (NPT) Inlets x Outlets	Pressure Drop (psi)											C _v
		5	10	15	20	25	30	35	40	45	50		
F2020	3/4" x 3/4"	36	51	63	72	81	89	96	102	109	115		16.2
F2025	1" x 1"	62	88	108	125	140	153	165	176	187	197		27.9
F2040	1-1/2" x 1-1/2"	109	155	189	219	245	268	289	309	328	346		48.9
F2050	2" x 2"	185	262	321	370	414	454	490	524	555	585		82.8

Flow Capacity (gpm)													
Model	Port Connection Sizes (NPT) Inlets x Outlets	Pressure Drop (bar)										K _v	
		0.3	0.7	1.0	1.4	1.7	2.1	2.4	2.8	3.1	3.4		
F2020	3/4" x 3/4"	136	193	238	272	306	336	363	386	412	435		14.1
F2025	1" x 1"	234	333	408	473	529	579	624	666	707	745		24.3
F2040	1-1/2" x 1-1/2"	389	548	673	776	870	950	1,029	1,097	1,165	1,230		42.5
F2050	2" x 2"	700	991	1,215	1,400	1,567	1,718	1,854	1,983	2,100	2,214		72.0

Flow Control valves can be mounted on a range of Rotary Actuators from other manufacturers, Consult Factory.

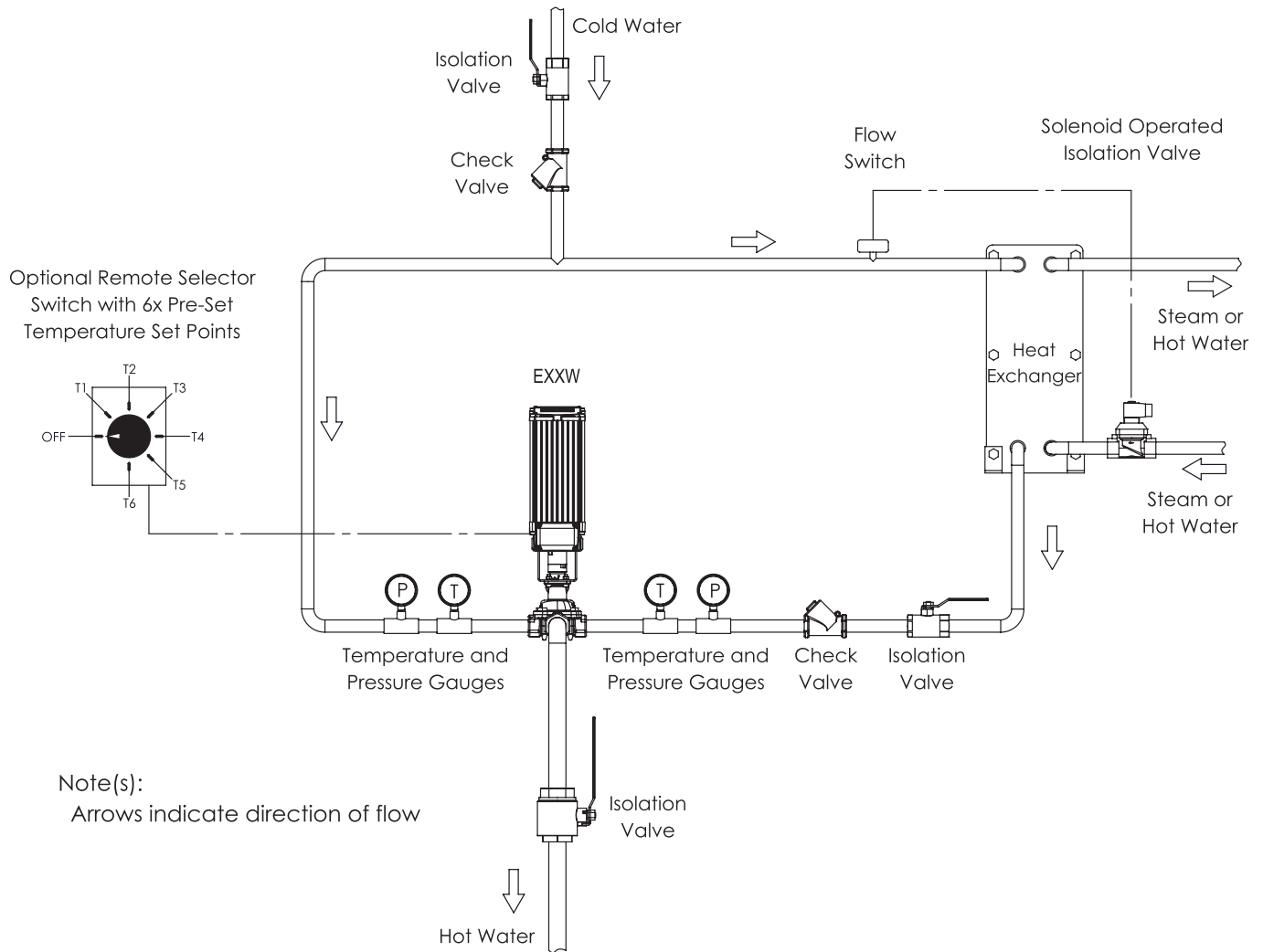
Application Examples



Pumped Recirculating Industrial Hot Water Header with Emech® Hot/Cold Water Mixing System - Model F3

Disclaimer: This diagram is for general discussion purposes only. It is NOT intended as a design document. The information is solely intended to provide a general understanding of the subject matter.

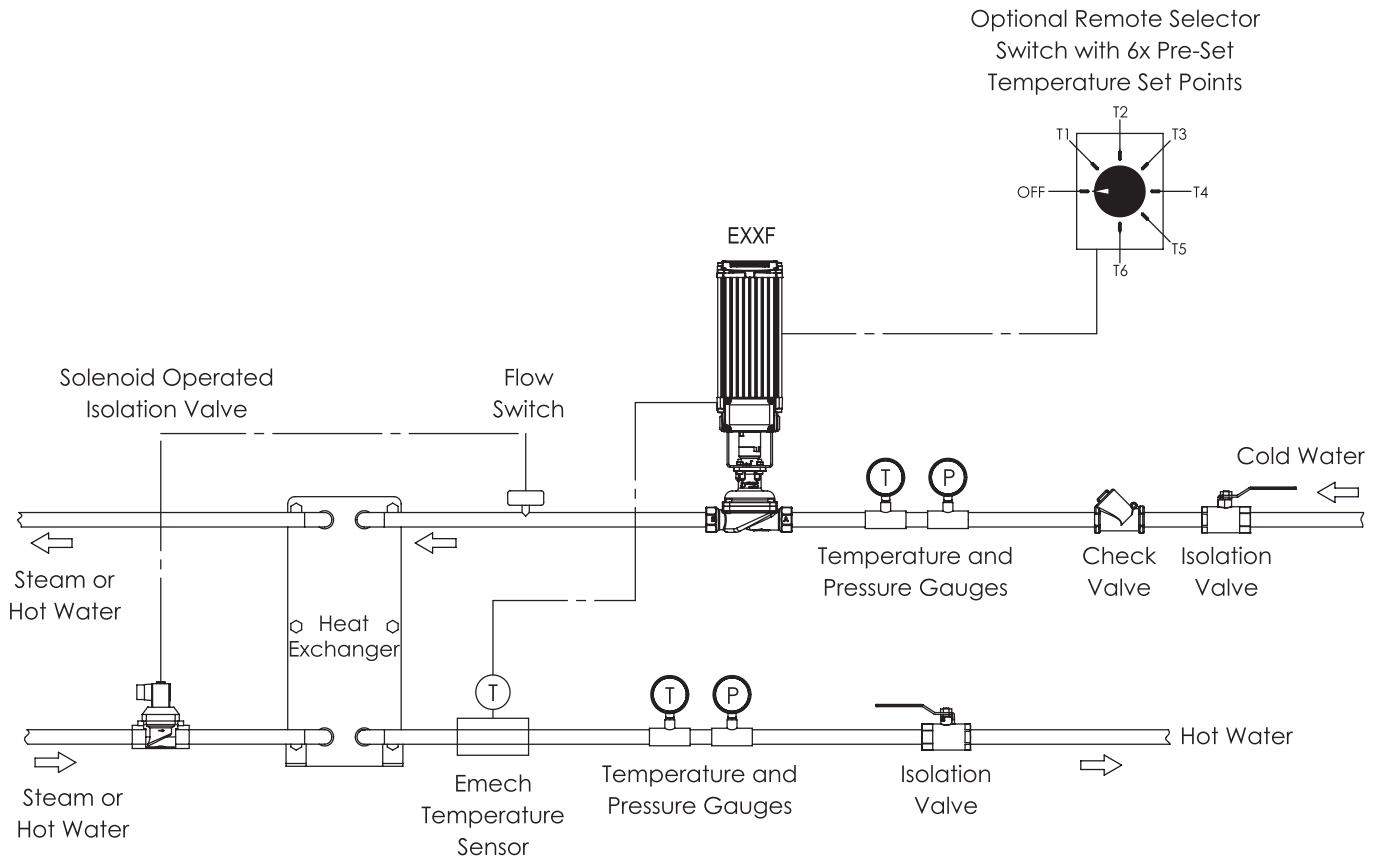
Application Examples



Emech® Hot/Cold Water Mixing System - Model F3 with Heat Exchanger

Disclaimer: This diagram is for general discussion purposes only. It is NOT intended as a design document. The information is solely intended to provide a general understanding of the subject matter.

Application Examples



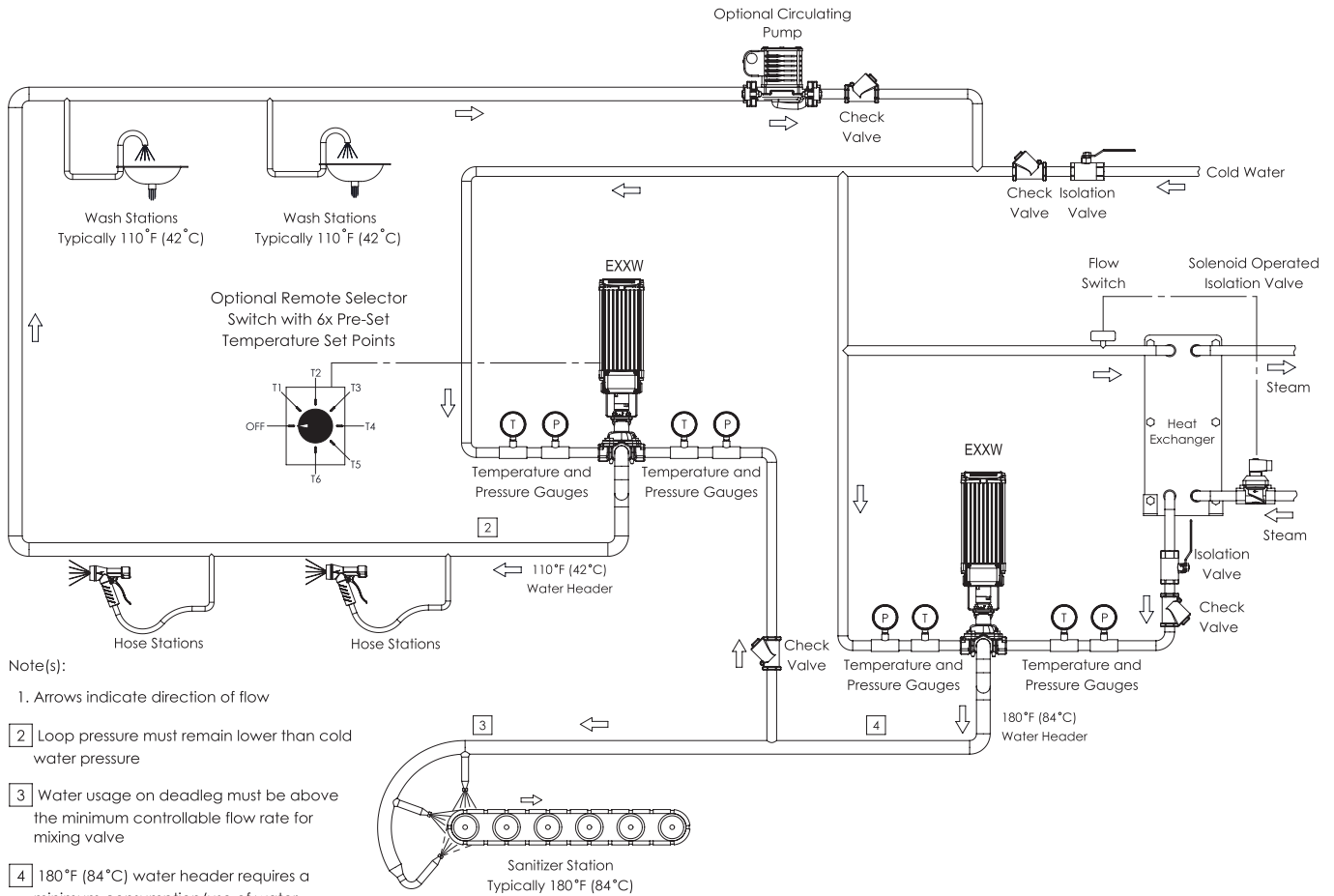
Note(s):

Arrows indicate direction of flow

Emech® Flow Control System - Model F2 with Heat Exchanger

Disclaimer: This diagram is for general discussion purposes only. It is NOT intended as a design document. The information is solely intended to provide a general understanding of the subject matter.

Application Examples



Cascade Industrial Hot Water Headers of Different Temperature Set Points with Emech® Hot/Cold Mixing System - Model F3

Disclaimer: This diagram is for general discussion purposes only. It is NOT intended as a design document. The information is solely intended to provide a general understanding of the subject matter.



INTELLIGENT SOLUTIONS IN STEAM, AIR AND HOT WATER

Armstrong International

North America • Latin America • India • Europe / Middle East / Africa • China • Pacific Rim

armstronginternational.com