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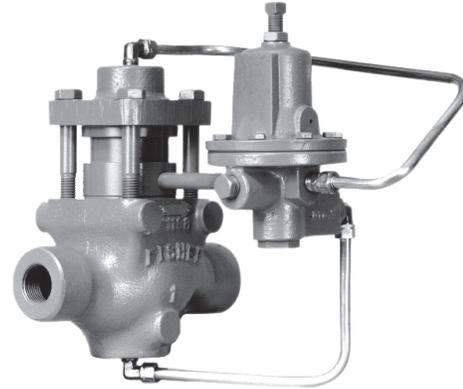
Type 92W Liquid Regulator

Introduction

The Type 92W pressure-reducing regulator for liquid service includes either a Type 6492H or a Type 6492L pilot (Figure 1). This reliable, dependable regulator uses time-proven design concepts.

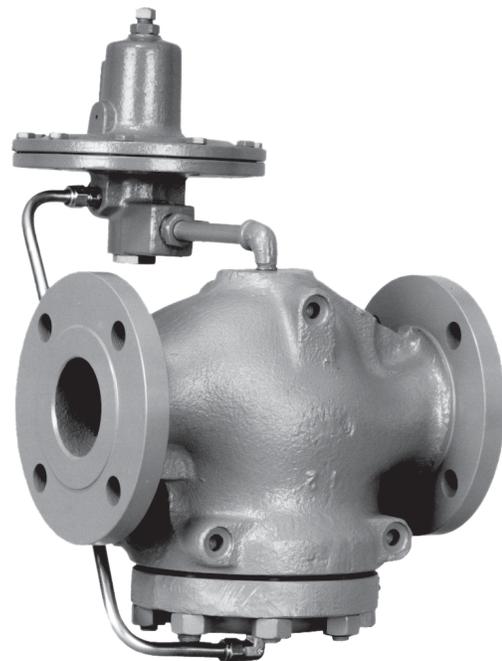
Features

- **Good Shutoff for Low Downstream Build-up**—Type 92W main valve and Types 6492H and 6492L pilots use machine-lapped seating surfaces, a time-proven design which minimizes seat leakage when the downstream demand is zero and the regulator is shutoff.
- **Resistance to Piping Stresses**—Steel constructions are available to help resist piping stresses.
- **Ease of Installation**—Compact construction reduces installation space requirements. Supply pressure to the pilot is supplied from the inlet side of the main valve through factory-piped tubing; with a standard pilot, this means no separate pilot supply pressure is required.
- **Increased Sensitivity to Downstream Pressure Changes**—Friction-reducing bellows seal on the pilot stem and large pilot diaphragm areas yield good sensitivity.
- **Ease of Pilot Maintenance**—Pilot valve plug and seat can be removed for inspection or maintenance without disassembling piping connections and without removing the diaphragm. Pilot inlet screen is easily removed with the seating parts for inspection and cleaning. Diaphragm can be removed without disturbing the seating parts.
- **Application Flexibility**—Pilot with optional tapped spring case is available for use either with an air loading regulator for remote adjustment of outlet pressure setting or, when all compression is removed from the pilot control spring, with a solenoid or switching valve for on-off service.



W4086-3

1 NPT STEEL MAIN VALVE
WITH TYPE 6492H PILOT



W4088-1

NPS 3 / DN 80 FLANGED CAST IRON
MAIN VALVE WITH TYPE 6492L PILOT

Figure 1. Typical Constructions

Type 92W

Specifications

This section lists the specifications for the Type 92W regulator. Factory specifications are stamped on the nameplate fastened on the regulator at the factory.

Body Sizes and End Connection Styles

BODY SIZE, NPS / DN	END CONNECTION STYLE AND RATING ⁽¹⁾	
	Cast Iron Body	Steel Body
1, 1-1/2 and 2	NPT	NPT
1, 1-1/2, 2, 2-1/2, 3 and 4 / 25, 40, 50, 65, 80 and 100	ANSI CL125 FF and CL250 RF Flanged	ANSI CL150 RF, CL300 RF and CL600 RF Flanged

Maximum Inlet and Pilot Supply Pressure⁽¹⁾

Cast Iron Main Valve and Pilot: 250 psig / 17.2 bar or body rating limit, whichever is lower
Steel Main Valve and Pilot: 300 psig / 20.7 bar or body rating limit, whichever is lower

Maximum Differential Pressure⁽¹⁾

150 psig / 10.3 bar or body rating limit, whichever is lower

Minimum Differential Pressure⁽¹⁾

20 psig / 1.4 bar

Outlet (Control) Pressure Ranges

See Table 1

Maximum Outlet Pressures⁽¹⁾

See Table 2

Maximum Allowable Loading Pressure For Pilot With Tapped Spring Case

Combination of pilot control spring setting and spring case loading pressure cannot exceed:
 150 psig / 10.3 bar for Type 6492H pilots or
 25 psig / 1.7 bar for Type 6492L pilots

Droop

10% of outlet pressure setting

Typical Regulating Capacities

See Table 3 and Capacity Information section

Main Valve Port Diameters and Flow Coefficients

BODY SIZE		PORT DIAMETER		Regulating C_v	Wide-Open C_v	K_m
NPS	DN	In.	mm			
1	25	7/8	22	10	11	0.62
1-1/2	40	1-1/8	29	20	22	
2	50	1-29/64	37	35	39	
2-1/2	65	1-5/8	41	48	53	0.71
3	80	2-1/16	52	66	73	
4	100	2-3/8	60	78	86	

Maximum Material Temperature Capabilities⁽¹⁾

Cast Iron Main Valve and Pilot: 406°F / 208°C
Steel Main Valve and Pilot: 500°F / 260°C

Pressure Registration

External through downstream control line

Downstream Control Line Connection

NPS 1, 1-1/2 and 2 / DN 25, 40 and 50

Main Valve Sizes: 1/4 NPT in main valve cylinder spacer

NPS 2-1/2, 3 and 4 / DN 65, 80 and 100

Main Valve Sizes: 1/4 NPT in pilot body

Pilot Spring Case Vent

Standard: 1/8 in. / 3.2 mm drilled hole

Optional: 1/4 NPT internal tapping for pressure loading or on-off service

Approximate Weights

BODY SIZE		END CONNECTION	APPROXIMATE WEIGHT	
NPS	DN		Lbs	kg
1	25	NPT or Flanged NPT or Flanged	32	15
	40		44	20
2	50	NPT Flanged	55	25
			67	30
2-1/2	65	Flanged Flanged Flanged	90	41
			115	52
			165	75

Construction Materials

Main Valve

Body and Body Flange: Cast iron or steel

Valve Plug: Heat-treated 17-4PH Stainless steel

Cage: Cast iron

Spiral Wound Gasket: 316L Stainless steel and Graphite

Spring, Lower Stem, Retaining Ring, Bolting and

Cylinder Spacer: Steel or Plated steel

Body and Cylinder Gaskets: Copper

Pistons, Seat Ring and Cylinders: Heat-treated 416 Stainless steel

Piston Ring(s): Polytetrafluoroethylene (PTFE)

Piston Ring Retainer(s): 302 Stainless steel

Stem Seal: PTFE/Glass

Pilot

Body and Spring Case: Cast iron or Steel

Seat Ring and Stem: Heat-treated

416 Stainless steel

Bellows and Bellows Retainer: Brass

Plug, Plug Guide, Plug Spring, Diaphragms, Bleed

Restriction and Inlet Screen: Stainless steel

Diaphragm Gasket: Flexible Graphite

Control Spring, Upper Spring Seat, Adjusting

Screw, Bolting, Pipe Plug, Reducing Brushing and

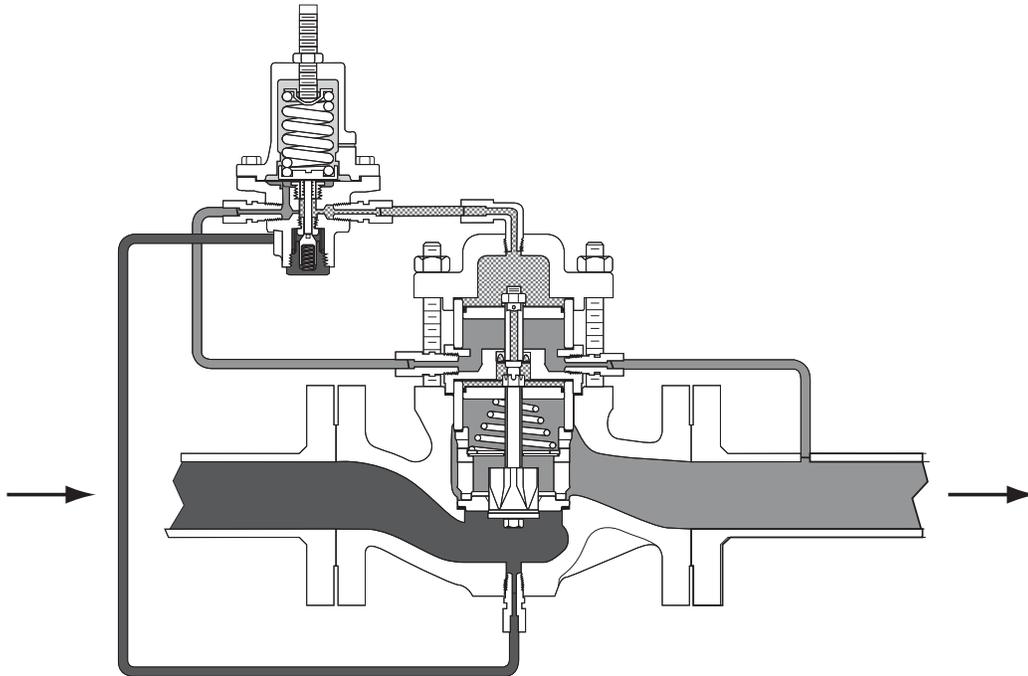
Diaphragm Plate (if used): Steel

Tubing: Copper

Fittings: Brass

Pipe Plug: Steel

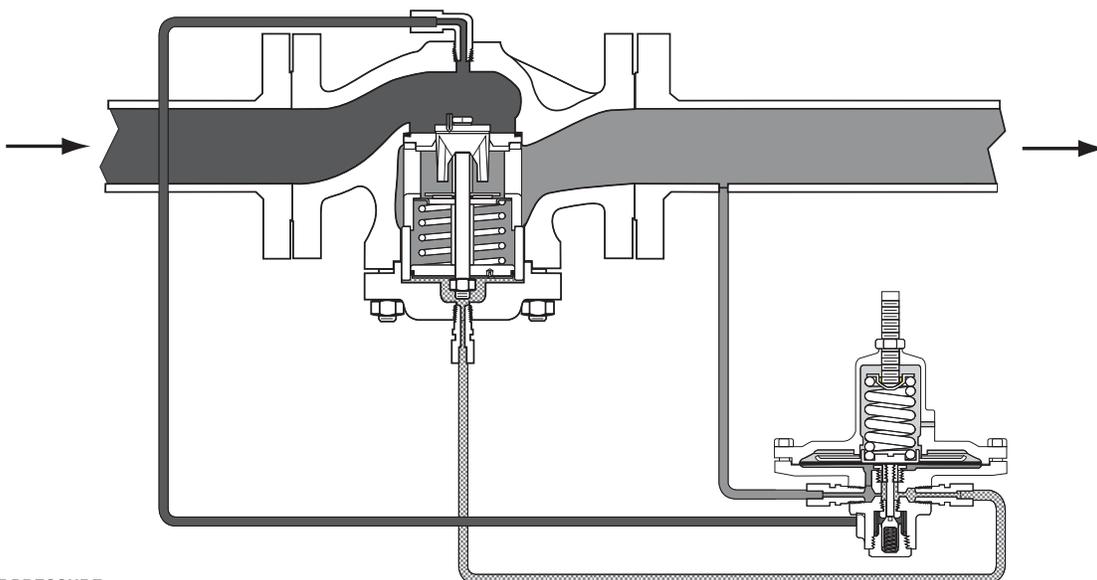
1. Pressure/temperature limits in this Bulletin, and any applicable code or standard limitations, must not be exceeded.



W4087-1

- INLET PRESSURE
- OUTLET PRESSURE
- ATMOSPHERIC PRESSURE
- LOADING PRESSURE

NPS 1, 1-1/2 OR 2 MAIN VALVE WITH TYPE 6492H PILOT



W4324-1

- INLET PRESSURE
- OUTLET PRESSURE
- ATMOSPHERIC PRESSURE
- LOADING PRESSURE

NPS 2-1/2, 3 OR 4 / DN 65, 80 OR 100 MAIN VALVE WITH TYPE 6492L PILOT

Figure 2. Operational Schematics for Standard-Pilot Constructions

Type 92W

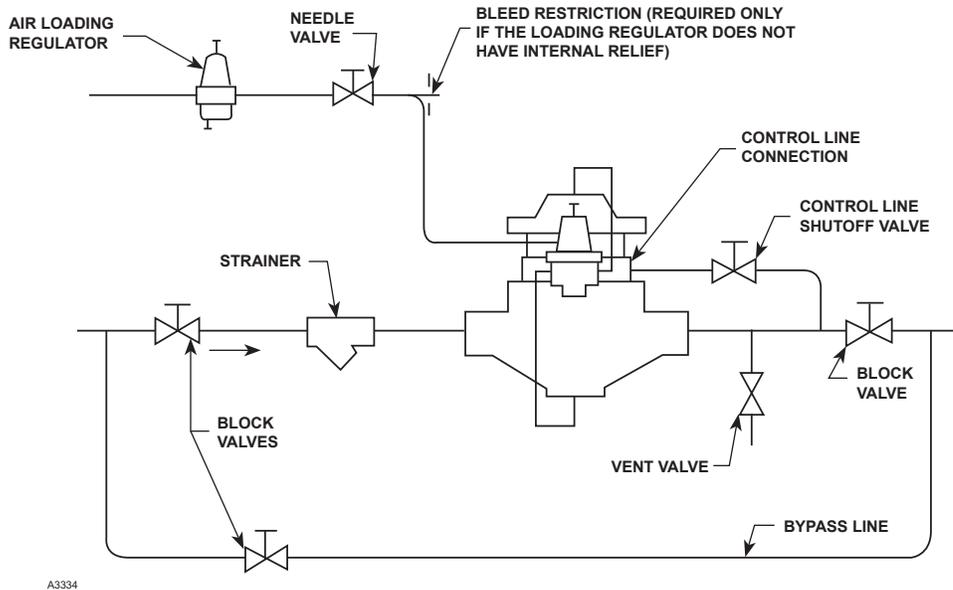


Figure 3. Typical Pressure-Loaded Pilot Installation

Principle of Operation

Pilot supply pressure is piped from the main valve inlet (Figure 2) to the pilot inlet connection. Downstream pressure registers on the main valve pistons through the downstream control line and then on the pilot diaphragm.

When increased downstream demand lowers the downstream pressure to a value below the setting of the pilot control spring, this spring forces the pilot valve plug open to increase the loading pressure on the main valve pistons. At the same time, the increased demand lowers the downstream pressure on the main valve piston(s). This opens the main valve plug, increasing flow to the downstream system to satisfy the increased demand and to restore downstream pressure to the setting of the pilot control spring.

Decreased downstream demand increases the downstream pressure registered on the pilot diaphragm. The increased pressure overcomes the

force of the pilot control spring and allows the pilot valve plug spring to close the pilot valve plug. As the pilot valve plug closes, excess loading pressure bleeds to the downstream system through the pilot bleed restriction. At the same time, decreased downstream demand increases the downstream pressure registered on the main valve piston(s). This allows the main valve spring to close the main valve plug, reducing flow to the downstream system in response to the decreased demand.

With a pilot for pressure-loaded service (Figure 3), the operation is the same as for a standard pilot except that the pilot control spring force on the pilot valve plug is aided by pneumatic pressure from the loading device. With a pilot for on-off service, the only force acting on top of the pilot diaphragm is pneumatic pressure provided by the solenoid or switching valve.

Table 1. Outlet (Control) Pressure Ranges

OUTLET (CONTROL) PRESSURE RANGE				PILOT SPRING PART NUMBER	PILOT SPRING COLOR CODE
Type 6492L Pilot		Type 6492H Pilot			
psig	bar	psig	bar		
2 to 6	0.14 to 0.41	10 to 30	0.69 to 2.1	1E395627022	Yellow
5 to 15	0.34 to 1.0	25 to 75	1.7 to 5.2	1D745527142	Green
13 to 25	0.90 to 1.7	70 to 150	4.8 to 10.3	1E395727192	Red

Table 2. Maximum Outlet Pressures

PILOT TYPE	MAXIMUM OPERATING OUTLET PRESSURE	MAXIMUM EMERGENCY OUTLET PRESSURE (IF EXCEEDED, PRESSURE VESSEL INTEGRITY MAY NOT BE RETAINED AND PERSONAL INJURY OR PROPERTY DAMAGE COULD RESULT)	
		Cast iron Main Valve and Pilot Body	Steel Main Valve and Pilot Body
With Type 6492H Pilot	150 psig / 10.3 bar	250 psig / 17.2 bar or main valve body rating limit, whichever is lower	300 psig / 20.7 bar or main valve body rating limit, whichever is lower
With Type 6492L Pilot	25 psig / 1.7 bar	100 psig / 6.9 bar	100 psig / 6.9 bar

Table 3. Flow Capacities in U.S. Gallons per Minute (l/min)⁽¹⁾ of Water

OUTLET PRESSURE SETTING (STANDARD PILOT) OR COMBINATION OF SETTING PLUS LOADING PRESSURE (OPTIONAL PILOT) ⁽²⁾		PILOT TYPE NUMBER	INLET PRESSURE ⁽²⁾		MAIN VALVE BODY SIZE, NPS / DN											
					1 / 25				1-1/2 / 40				2 / 50			
					Minimum		Maximum		Minimum		Maximum		Minimum		Maximum	
psig	bar	psig	bar	gal/min	l/min	gal/min	l/min	gal/min	l/min	gal/min	l/min	gal/min	l/min	gal/min	l/min	
10	0.69	6492H or 6492L	30	2.1	2.2	8.33	45	170	4.5	17.0	89	337	8.9	33.7	160	606
			60	4.1	3.5	13.2	67	254	7.1	26.9	140	530	14	53.0	230	871
			160	11.0	6.1	23.1	100	379	12	45.4	210	795	24	90.8	360	1363
20	1.4	6492H or 6492L	40	2.8	2.2	8.33	45	170	4.5	17.0	89	337	8.9	33.7	160	606
			70	4.8	2.5	9.46	67	254	7.1	26.9	130	492	14	53.0	230	871
			170	11.7	6.1	23.1	110	416	12	45.4	210	795	24	90.8	370	1400
50	3.4	6492H	70	4.8	2.2	8.33	45	170	4.5	17.0	89	337	8.9	33.7	160	606
			100	6.9	3.5	13.2	67	254	7.1	26.9	130	492	14	53.0	230	871
			130	9.0	4.5	17.0	89	337	8.9	33.7	180	681	18	68.1	310	1173
			150	10.3	5.0	18.9	100	379	10	37.9	200	757	20	75.7	350	1325
			200	13.8	6.1	23.1	110	416	12	45.4	230	871	24	90.8	400	1514
80	5.5	6492H	100	6.9	2.2	8.33	45	170	4.5	17.0	89	337	8.9	33.7	160	606
			130	9.0	3.5	13.2	67	254	7.1	26.9	130	492	14	53.0	230	871
			160	11.0	4.5	17.0	89	337	8.9	33.7	180	681	18	68.1	310	1173
			200	13.8	5.5	20.8	110	416	11	41.6	220	833	22	83.3	380	1438
			230	15.9	6.1	23.1	120	454	12	45.4	240	908	24	90.8	430	1628
100	6.9	6492H	120	8.3	2.2	8.33	45	170	4.5	17.0	89	337	8.9	33.7	160	606
			150	10.3	3.5	13.2	67	254	7.1	26.9	130	492	14	53.0	230	871
			200	13.8	5.0	18.9	100	379	10	37.9	200	757	20	75.7	350	1325
			250	17.2	6.1	23.1	120	454	12	45.4	240	908	24	90.8	430	1628
150	10.3	6492H	170	11.7	2.2	8.33	45	170	4.5	17.0	89	337	8.9	33.7	160	606
			200	13.8	3.5	13.2	67	254	7.1	26.9	130	492	14	53.0	230	871
			250	17.2	5.0	18.9	100	379	10	37.9	200	757	20	75.7	350	1325
			300	20.7	6.1	23.1	120	454	12	45.4	240	908	24	90.8	430	1628

1. If capacities are desired on m³/hr, multiply U.S. GPM by 0.2271.

2. Values shown do not consider the maximum effective pressure drop. The maximum effective pressure drop should be checked for each set of specific application conditions, where $\Delta P_{eff} = K_{vm} P_{1abs}$. Choked flow will occur if the maximum effective pressure drop is exceeded.

- continued -

Type 92W

Table 3. Flow Capacities in U.S. Gallons per Minute (l/min)⁽¹⁾ of Water (continued)

OUTLET PRESSURE SETTING (STANDARD PILOT) OR COMBINATION OF SETTING PLUS LOADING PRESSURE (OPTIONAL PILOT) ⁽²⁾		PILOT TYPE NUMBER	INLET PRESSURE ⁽²⁾		MAIN VALVE BODY SIZE, NPS / DN											
					2-1/2 / 65				3 / 80				4 / 100			
					Minimum		Maximum		Minimum		Maximum		Minimum		Maximum	
psig	bar	psig	bar	gal/ min	l/min	gal/ min	l/min	gal/ min	l/min	gal/ min	l/min	gal/ min	l/min	gal/ min	l/min	
10	0.69	6492H or 6492L	30	2.1	11	41.6	210	795	16	60.6	300	1136	----	----	----	----
			60	4.1	18	68.1	340	1287	25	94.6	470	1779	28	106	550	2082
			160	11.0	31	117	530	2006	43	163	730	2763	49	185	860	3255
20	1.4	6492H or 6492L	40	2.8	11	41.6	210	795	16	60.6	300	1136	18	68.1	350	1325
			70	4.8	18	68.1	340	1287	25	94.6	470	1779	28	106	550	2082
			170	11.7	31	117	550	2082	43	163	750	2839	49	185	890	3369
50	3.4	6492H	70	4.8	11	41.6	210	795	16	60.6	300	1136	18	68.1	350	1325
			100	6.9	18	68.1	340	1287	25	94.6	470	1779	28	106	550	2082
			130	9.0	22	83.3	430	1628	31	117	590	2233	36	136	700	2650
			150	10.3	25	94.6	480	1817	35	132	660	2498	40	151	780	2952
80	5.5	6492H	200	13.8	31	117	590	2233	43	163	810	3066	49	185	960	3634
			100	6.9	11	41.6	210	795	16	60.6	300	1136	18	68.1	350	1325
			130	9.0	18	68.1	340	1287	25	94.6	470	1779	28	106	550	2082
			160	11.0	22	83.3	430	1628	31	117	590	2233	36	136	700	2650
100	6.9	6492H	200	13.8	27	102	230	871	38	144	720	2725	44	167	850	3217
			230	15.9	31	117	590	2233	43	163	810	3066	49	185	960	3634
			120	8.3	11	41.6	210	795	16	60.6	300	1136	18	68.1	350	1325
			150	10.3	18	68.1	340	1287	25	94.6	470	1779	28	106	550	2082
150	10.3	6492H	200	13.8	25	94.6	480	1817	35	132	660	2498	40	151	780	2952
			250	17.2	31	117	590	2233	43	163	810	3066	49	185	960	3634
			170	11.7	11	41.6	210	795	16	60.6	300	1136	18	68.1	350	1325
			200	13.8	18	68.1	340	1287	25	94.6	470	1779	28	106	550	2082

1. If capacities are desired on m³/hr, multiply U.S. GPM by 0.2271.

2. Values shown do not consider the maximum effective pressure drop. The maximum effective pressure drop should be checked for each set of specific application conditions, where $\Delta P_{eff} = K_m P_{1abs}$. Choked flow will occur if the maximum effective pressure drop is exceeded.

Installation

The Type 92W regulator should be installed and used in accordance with governmental codes and regulations. Although this regulator minimizes leakage under shutoff conditions, downstream overpressure protection must be provided by the user. The pressure and temperature limitations in the specifications table must be observed and the downstream equipment protected.

A Type 92W regulator may be installed in any orientation, but to obtain maximum flow capacities in some instances, outlet piping will have to be swaged up above the given body size. Liquid pressure control systems should be designed using good engineering practices to eliminate quick starting or stopping of the flow stream, which can produce water hammer.

A downstream control line is required but is not furnished with the Type 92W regulator. Additionally, an adjustable loading pressure regulator and loading pressure piping are required for pressure-loading pilot regulators, while an on-off or solenoid valve is required for on-off pilot regulators.

Capacity Information

Table 3 gives maximum and minimum regulating capacities in U.S. gallons per minute of water (multiply

by 0.2271 to convert to cubic meters per hour of water). To determine regulating capacities at pressure settings not given in Table 3 or to determine wide-open capacities for relief sizing at any inlet pressure, use the Catalog 10 liquid sizing procedures in conjunction with the appropriate liquid sizing coefficients (C_v and K_m). Convert to cubic meters per hour according to the preceding paragraph if necessary.

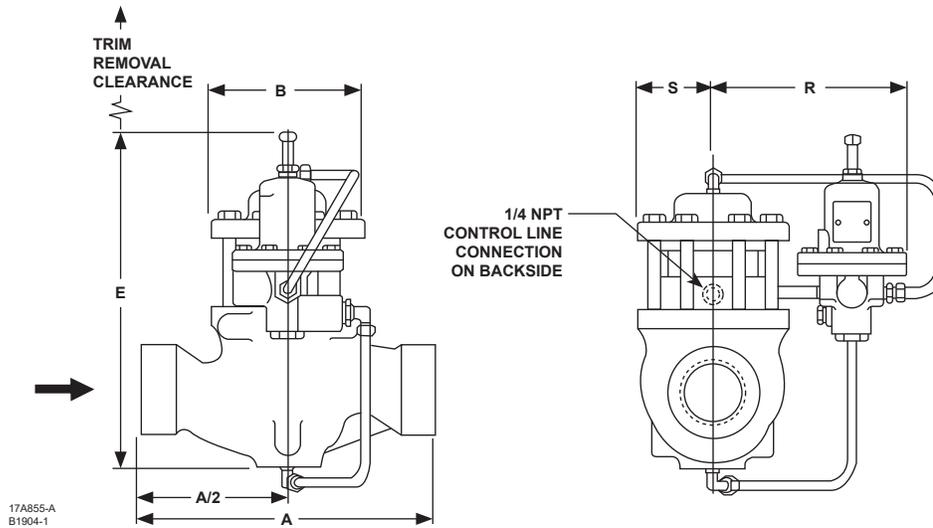
Ordering Information

When ordering, specify:

- Temperature range
- Inlet pressure range (maximum, normal, minimum)
- Outlet pressure setting
- Flow rate range (maximum, normal, minimum)
- Body size

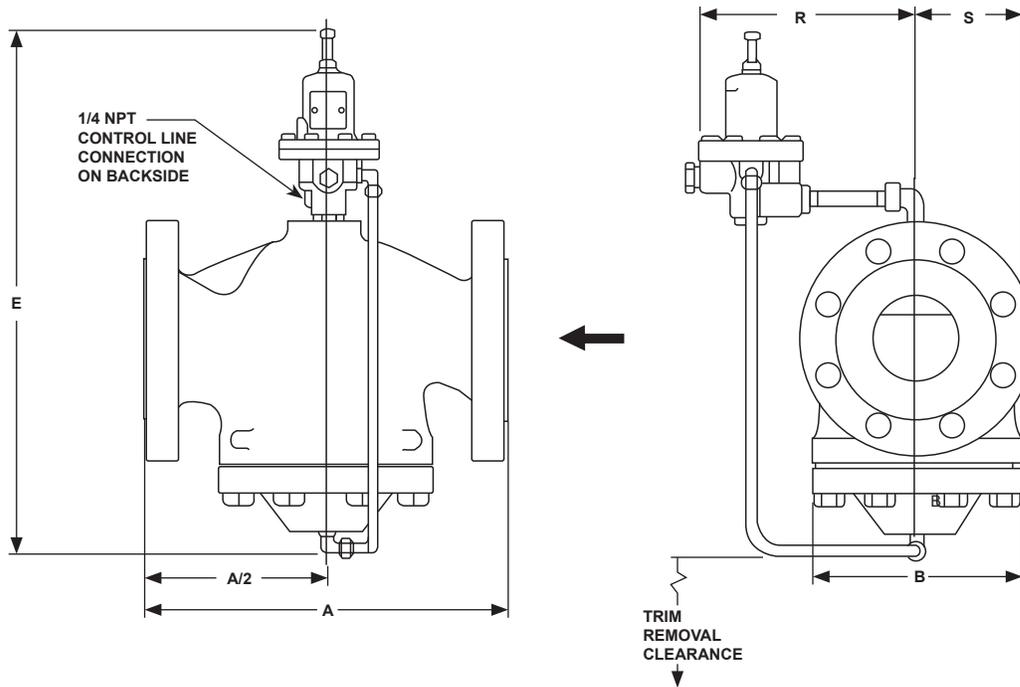
Refer to the Specifications on page 2. Review the descriptions to the right of each specification, and specify the desired choice wherever there is a selection to be made. If not otherwise specified, the pilot control spring is factory-set at the approximate mid-range.

Be sure to specify the type of regulator desired (standard pilot or pilot with optional tapped spring case). Refer to separate bulletins for information on loading regulators for use with pressure-loaded pilots.



17A855-A
B1904-1

NPS 1, 1-1/2 OR 2 MAIN VALVE BODY



NPS 2-1/2, 3 OR 4 / DN 65, 80 OR 100 MAIN VALVE BODY

Figure 4. Dimensions

Table 4. Dimension

MAIN VALVE BODY SIZE		A								B		E (MAXIMUM)		R				S		TRIM REMOVAL CLEARANCE	
		NPT		CL125 FF or CL150 RF Flanged		CL250 RF or CL300 RF Flanged		CL600 RF Flanged						Type 6492H Pilot		Type 6492L Pilot					
NPS	DN	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm
1	25	8.25	210	7.25	184	7.75	197	8.25	210	3.88	98.6	11.69	297	8.50	216	9.88	251	1.94	49.3		
1-1/2	40	9.88	251	8.75	222	9.25	235	9.88	251	5.38	137	12.19	310	8.81	224	10.19	259	2.69	68.3	2.75	69.8
2	50	11.25	286	10.00	254	10.50	267	11.25	286	5.88	149	13.00	330	9.06	230	10.44	265	2.94	74.7		
2-1/2	65	----	----	10.88	276	11.50	292	12.25	311	6.56	167	17.19	437	8.75	222	10.12	257	3.28	83.3	3.12	79.2
3	80	----	----	11.75	298	12.50	317	13.25	337	7.38	187	18.25	464	8.75	222	10.12	257	3.69	93.7	3.12	79.2
4	100	----	----	13.88	353	14.50	368	15.50	394	8.62	219	20.44	519	10.38	264	11.75	298	4.31	109	5.00	127

Type 92W

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