

Differential Pressure Controller

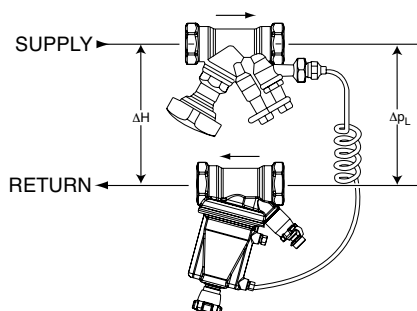
TA Series 793/794



Product Description:

In HVAC systems, differential pressure across control valves varies dramatically. This can lead to modulating control valves working in on-off mode and result in fluctuating room temperatures. Differential pressure controllers stabilize differential pressure and ensure stable and accurate modulating control. They also minimize noise from control valves and simplify balancing.

Used in conjunction with a balancing valve; the TA Series 793/794 Differential Pressure Controller ensures the correct pressure is delivered to the coil and balancing valve. By eliminating pressure changes, the TA Series 793/794 enables the balancing valve to maintain the proper flow rate at the coil and keep the system in balance. The differential pressure controller is capable of stabilizing differential pressure ranges of 1.5-8.7 psi/ 10-60 kPa, 2.9-11.6 psi/20-80 kPa and 5.8-23.3 psi/ 40-160 kPa depending on the controller series, size and spring option. The TA Series 794 has a pressure class of 230 psi / 1600 kPa and a max. differential pressure of 50 psi / 350 kPa. The TA Series 793 has a pressure class of 230 psi / 1600 kPa and a max differential pressure of 36 psi / 250 kPa.



TA Series 793/794

Job/Owner

System No.	
Location	

Contractor

Submitted By	
Date	

Material Specifications:

Body:

TA Series 793: Ametal

TA Series 794: Ductile iron EN-GJS-400-15 (-ASTM A536 Grade 60-40-18, ISO Grade 400-15)

Body Coating:

TA Series 794: Epoxy Coated

Cone & Spindles:

TA Series 793, 794: Ametal

Bonnet:

TA Series 793, 794: Ametal

Seat Seal:

TA Series 793, 794: Plug with EPDM o-ring

Seals:

TA Series 793, 794: EPDM o-ring

Spring:

TA Series 793, 794: Stainless steel

Handwheel:

TA Series 793, 794: Red Polyamide plastic

Membrane:

TA Series 793: HNBR rubber

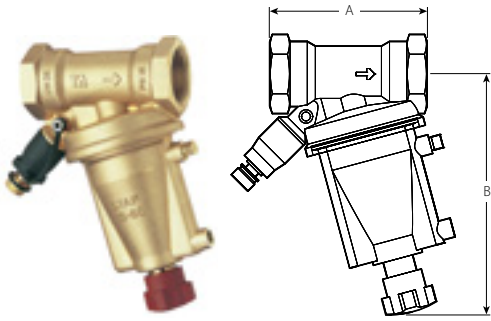
TA Series 794: Reinforced EPDM rubber

Engineer

Spec Section	
Paragraph	
Approved	
Date	

Differential Pressure Controller:

TA Series 793 Threaded End



TA Differential Pressure Controllers come standard with a drain kit, measuring port, transition nipple and adjusting tool. End connection on ½"/15 mm to 2"/50 mm sizes are all female IPS thread only. Sweat ends are not available.

Nominal Size inches mm	Actual Outside Diameter inches mm	Differential Pressure Range psi kPa	A End to End inches mm	A Center to Top inches mm	Approx. Weight Each lbs. kg
½ 15	0.840 21.3	1.45 – 8.70 10 – 60	3.31 84	5.39 137	2.4 1.1
¾ 20	1.050 26.7	1.45 – 8.70 10 – 60	3.58 91	5.47 139	2.6 1.2
1 25	1.315 33.7	1.45 – 8.70 10 – 60	3.66 93	5.55 141	2.9 1.3
1 ¼ 32	1.660 42.4	2.90 – 11.6 20 – 80	5.24 133	7.05 179	5.7 2.6
1 ½ 40	1.900 48.3	2.90 – 11.6 20 – 80	5.32 135	7.13 181	6.4 2.9
2 50	2.375 60.3	2.90 – 11.6 20 – 80	5.39 137	7.36 187	7.7 3.5

Valve Selection Guide:

English Measurements in Pounds per Square Inch and Gallons per Minute

Size inches	D _p (psi)																	
	1.5			2.9			4.4			5.8			7.3			8.7		
	q _{min}	q _{nom}	q _{max}	q _{min}	q _{nom}	q _{max}	q _{min}	q _{nom}	q _{max}	q _{min}	q _{nom}	q _{max}	q _{min}	q _{nom}	q _{max}	q _{min}	q _{nom}	q _{max}
½	0.1	1.4	2.0	0.1	2.0	2.7	0.2	2.4	3.4	0.2	2.8	3.9	0.2	3.1	4.3	0.2	3.4	4.7
¾	0.2	3.1	4.3	0.3	4.3	6.0	0.4	5.3	7.4	0.4	6.1	8.6	0.5	6.8	9.6	0.5	7.4	10.5
1	0.4	5.3	7.7	0.5	7.4	10.7	0.7	9.1	13.2	0.8	10.5	15.2	0.9	11.8	17.0	0.9	12.8	18.6

Size inches	D _p (psi)																				
	2.9			4.4			5.8			7.3			8.7			10.2			11.6		
	q _{min}	q _{nom}	q _{max}	q _{min}	q _{nom}	q _{max}	q _{min}	q _{nom}	q _{max}	q _{min}	q _{nom}	q _{max}	q _{min}	q _{nom}	q _{max}	q _{min}	q _{nom}	q _{max}	q _{min}	q _{nom}	q _{max}
1 ¼	0.8	11.7	16.6	1.0	14.4	20.4	1.2	16.6	23.5	1.3	18.6	26.3	1.4	20.3	28.7	1.5	22.0	31.1	1.6	23.4	33.2
1 ½	1.2	17.6	25.0	1.5	21.6	30.8	1.8	24.8	35.3	2.0	27.9	39.6	2.2	30.4	43.3	2.3	32.9	46.8	2.5	35.1	49.9
2	2.3	33.2	47.6	2.9	40.9	58.6	3.3	46.9	67.3	3.7	52.6	75.5	4.1	57.4	82.4	4.4	62.2	89.3	4.7	66.3	95.2

Metric Measurements in Kilopascals and Liters per Hour

Size mm	D _p (Kpa)																	
	10.0			20.0			30.0			40.0			50.0			60.0		
	q _{min}	q _{nom}	q _{max}	q _{min}	q _{nom}	q _{max}	q _{min}	q _{nom}	q _{max}	q _{min}	q _{nom}	q _{max}	q _{min}	q _{nom}	q _{max}	q _{min}	q _{nom}	q _{max}
15	22	316	443	31	447	626	38	548	767	44	632	885	49	707	990	54	775	1084
20	51	696	980	72	984	1386	88	1205	1698	101	1391	1961	113	1556	2192	124	1704	2401
25	89	1202	1739	125	1699	2460	153	2081	3012	177	2403	3479	198	2687	3889	217	2943	4260

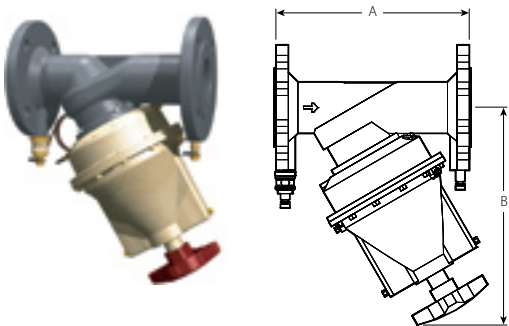
Size mm	D _p (Kpa)																				
	20.0			30.0			40.0			50.0			60.0			70.0			80.0		
	q _{min}	q _{nom}	q _{max}	q _{min}	q _{nom}	q _{max}	q _{min}	q _{nom}	q _{max}	q _{min}	q _{nom}	q _{max}	q _{min}	q _{nom}	q _{max}	q _{min}	q _{nom}	q _{max}	q _{min}	q _{nom}	q _{max}
32	188	2683	3801	230	3286	4656	266	3795	5376	297	4243	6010	325	4648	6584	351	5020	7112	376	5367	7603
40	286	4025	5724	351	4930	7011	405	5692	8095	453	6364	9051	496	6971	9915	535	7530	10709	572	8050	11449
50	537	7603	10912	657	9311	13364	759	10752	15432	849	12021	17253	930	13168	18900	1004	14223	20415	1073	15205	21824

Note: See operating instructions on page 8.

Differential Pressure Controller:

Series 794 Flanged End

(Class 150, ASME/ANSI B16.42)



Nominal Size inches mm	Actual Outside Diameter inches mm	Differential Pressure Range psi kPa	A End to End inches mm	A Center to Top inches mm	Approx. Weight Each lbs. kg
2 1/2 65	2.875 73.0	2.90 – 11.6 20 – 80	11.42 290	16.3 414	46.3 21
3 80	3.500 88.9	2.90 – 11.6 20 – 80	12.21 310	17.17 436	52.9 24
4 100	4.500 114.3	2.90 – 11.6 20 – 80	13.78 350	18.11 460	72.8 33

TA Pressure Differential Controllers come standard with a drain kit, measuring port, transition nipple and adjusting tool. End connections are ANSI Class 150 flanges only; grooved ends are not available.

Valve Selection Guide:

English Measurements in Pounds per Square Inch and Gallons per Minute (Spring Option 1) (2.9 - 11.6 psi / 20 - 80 kPa)

Size inches	D _{pL} (psi)																				
	2.9			4.4			5.8			7.3			8.7			10.2			11.6		
	Q _{min}	Q _{nom}	Q _{max}	Q _{min}	Q _{nom}	Q _{max}	Q _{min}	Q _{nom}	Q _{max}	Q _{min}	Q _{nom}	Q _{max}	Q _{min}	Q _{nom}	Q _{max}	Q _{min}	Q _{nom}	Q _{max}	Q _{min}	Q _{nom}	Q _{max}
2 1/2	2.7	48.8	70.2	3.4	60.1	86.5	3.9	69.0	99.3	4.3	77.4	111.4	4.7	84.5	121.6	5.1	91.5	131.7	5.5	97.5	140.5
3	4.3	74.1	107.3	5.3	91.3	132.2	6.1	104.8	151.7	6.8	117.6	170.2	7.4	128.4	185.9	8.0	139.0	201.2	8.6	148.3	214.6
4	8.6	150.2	214.6	10.6	185.0	264.3	12.1	212.4	303.5	13.6	238.3	340.5	14.9	260.2	371.7	16.1	281.7	402.5	17.2	300.4	429.2

English Measurements in Pounds per Square Inch and Gallons per Minute (Spring Option 2) (5.8 - 23.3 psi / 40 - 161 kPa)

Size inches	D _{pL} (psi)																				
	5.8			7.3			8.7			10.2			11.6			13.1			14.5		
	Q _{min}	Q _{nom}	Q _{max}	Q _{min}	Q _{nom}	Q _{max}	Q _{min}	Q _{nom}	Q _{max}	Q _{min}	Q _{nom}	Q _{max}	Q _{min}	Q _{nom}	Q _{max}	Q _{min}	Q _{nom}	Q _{max}	Q _{min}	Q _{nom}	Q _{max}
2 1/2	3.9	69.0	99.3	4.3	77.4	111.4	4.7	84.5	121.6	5.1	91.5	131.7	5.5	97.5	140.5	5.8	103.7	149.3	6.1	109.1	157.0
3	6.1	104.8	151.7	6.8	117.6	170.2	7.4	128.4	185.9	8.0	139.0	201.2	8.6	148.3	214.6	9.1	157.6	228.1	9.6	165.8	239.9
4	12.1	212.4	303.5	13.6	238.3	340.5	14.9	260.2	371.7	16.1	281.7	402.5	17.2	300.4	429.2	18.2	319.3	456.1	19.2	335.9	479.9

Size mm	D _{pL} (psi)																	
	16.0			17.4			18.9			20.3			21.8			23.3		
	Q _{min}	Q _{nom}	Q _{max}	Q _{min}	Q _{nom}	Q _{max}	Q _{min}	Q _{nom}	Q _{max}	Q _{min}	Q _{nom}	Q _{max}	Q _{min}	Q _{nom}	Q _{max}	Q _{min}	Q _{nom}	Q _{max}
2 1/2	6.4	114.6	165.0	6.7	119.5	172.0	7.0	124.5	179.3	7.2	129.0	185.8	7.5	133.7	192.6	7.7	138.0	198.6
3	10.1	174.1	252.0	10.5	181.6	262.8	11.0	189.3	273.9	11.4	196.1	283.9	11.8	203.3	294.2	12.1	209.7	303.5
4	20.2	352.9	504.1	21.0	368.0	525.7	21.9	383.5	547.9	22.7	397.4	567.8	23.5	411.9	588.4	24.3	424.9	607.0

Valve Selection Guide continued:

Metric Measurements in Kilopascals and Liters per Hour (Spring Option 1) (2.9 - 11.6 psi / 20 - 80 kPa)

Size	Dp _L (kPa)																				
	20.0			30.0			40.0			50.0			60.0			70.0			80.0		
	Q _{min}	Q _{nom}	Q _{max}	Q _{min}	Q _{nom}	Q _{max}	Q _{min}	Q _{nom}	Q _{max}	Q _{min}	Q _{nom}	Q _{max}	Q _{min}	Q _{nom}	Q _{max}	Q _{min}	Q _{nom}	Q _{max}	Q _{min}	Q _{nom}	Q _{max}
65	626	11180	16100	767	13693	19718	885	15811	22768	990	17678	25456	1084	19365	27885	1171	20917	30120	1252	22361	32199
80	984	16994	24597	1205	20813	30125	1391	24033	34785	1556	26870	38891	1704	29435	42603	1841	31793	46016	1968	33988	49193
100	1968	34435	49193	2410	42175	60249	2783	48699	69570	3111	54447	77782	3408	59644	85206	3681	64423	92033	3935	68871	98387

Metric Measurements in Kilopascals and Liters per Hour (Spring Option 2) (5.8 - 23.3 psi / 40 - 161 kPa)

Size	Dp _L (kPa)																				
	40.0			50.0			60.0			70.0			80.0			90.0			100.0		
	Q _{min}	Q _{nom}	Q _{max}	Q _{min}	Q _{nom}	Q _{max}	Q _{min}	Q _{nom}	Q _{max}	Q _{min}	Q _{nom}	Q _{max}	Q _{min}	Q _{nom}	Q _{max}	Q _{min}	Q _{nom}	Q _{max}	Q _{min}	Q _{nom}	Q _{max}
65	885	15811	22768	990	17678	25456	1084	19365	27885	1171	20917	30120	1252	22361	32199	1328	23717	34153	1400	25000	36000
80	1391	24033	34785	1556	26870	38891	1704	29435	42603	1841	31793	46016	1968	33988	49193	2087	36050	52178	2200	38000	55000
100	2783	48699	69570	3111	54447	77782	3408	59644	85206	3681	64423	92033	3935	68871	98387	4174	73049	104355	4400	77000	110000

Size	Dp _L (kPa)																				
	110.0			120.0			130.0			140.0			150.0			160.0					
	Q _{min}	Q _{nom}	Q _{max}	Q _{min}	Q _{nom}	Q _{max}	Q _{min}	Q _{nom}	Q _{max}	Q _{min}	Q _{nom}	Q _{max}	Q _{min}	Q _{nom}	Q _{max}	Q _{min}	Q _{nom}	Q _{max}	Q _{min}	Q _{nom}	Q _{max}
65	1468	26220	37757	1534	27386	39436	1596	28504	41046	1657	29580	42596	1715	30619	44091	1771	31623	45537			
80	2307	39855	57684	2410	41627	60249	2508	43327	62710	2603	44962	65077	2694	46540	67361	2783	48067	69570			
100	4615	80758	115369	4820	84349	120499	5017	87794	125419	5206	91108	130154	5389	94305	134722	5566	97398	139140			

Note: See operating instructions on page 8.

Differential Pressure Controller:

C_v/K_v Values for TA Series 793/794

C_v/K_v values for flow of water at +60°F/-16°C are shown in the table.

Formulas for C_v values

$$\Delta P = Q^2 / C_v^2$$

$$Q = C_v \times \sqrt{\Delta P}$$

Where:

Flow Coefficient	C_v
Q (Flow)	GPM
ΔP (Pressure Drop)	psi

Formulas for K_v values

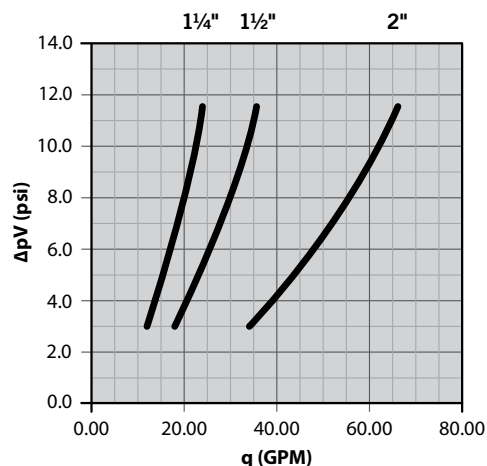
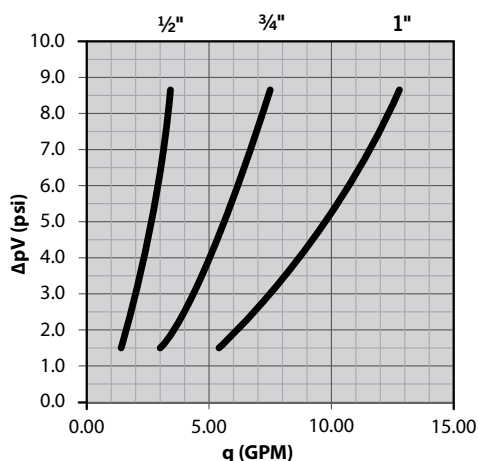
$$\Delta P = Q^2 / K_v$$

$$Q = K_v \times \sqrt{\Delta P}$$

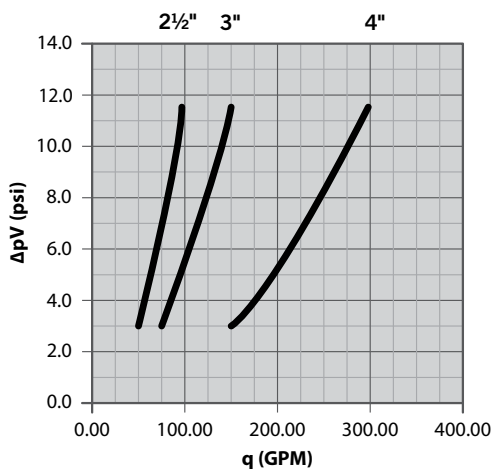
Where:

Flow Factor	K_v
Q (Flow)	m ³ /hr
ΔP (Pressure)	bar

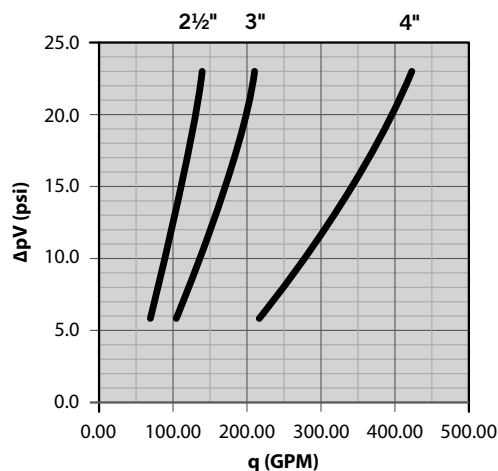
Nominal Size inches mm	C_v/K_v Values		
	Minimum	Nominal	Maximum
½ 15	0.1 0.07	1.1 1.00	1.6 1.40
¾ 20	0.2 0.16	2.5 2.20	3.6 3.10
1 25	0.3 0.28	4.4 3.80	6.3 5.50
1¼ 32	0.5 0.42	6.9 6.00	9.7 8.50
1½ 40	0.7 0.64	10.3 9.00	14.7 12.80
2 50	1.4 1.20	19.5 17.00	28.0 24.40
2½ 65	1.6 1.40	28.6 25.00	41.2 36.00
3 80	2.5 2.20	43.5 38.00	63.0 55.00
4 100	5.0 4.40	88.2 77.00	126.0 110.00



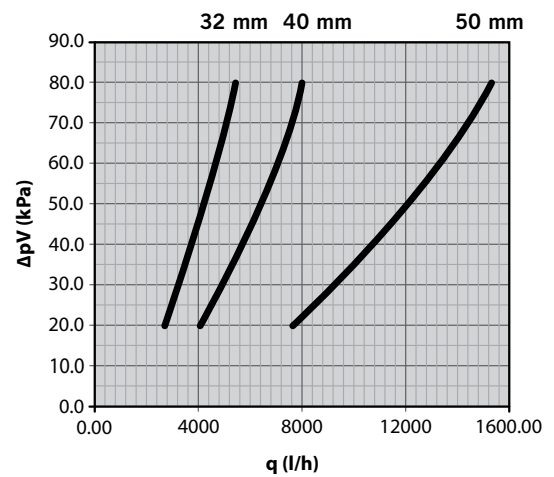
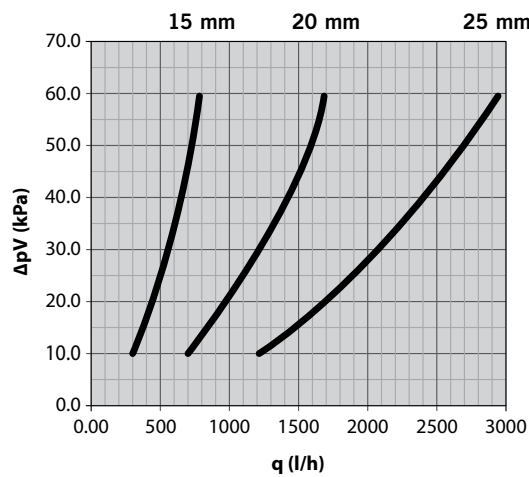
Spring Option 1
(2.9 - 11.6 psi / 20 - 80 kPa)



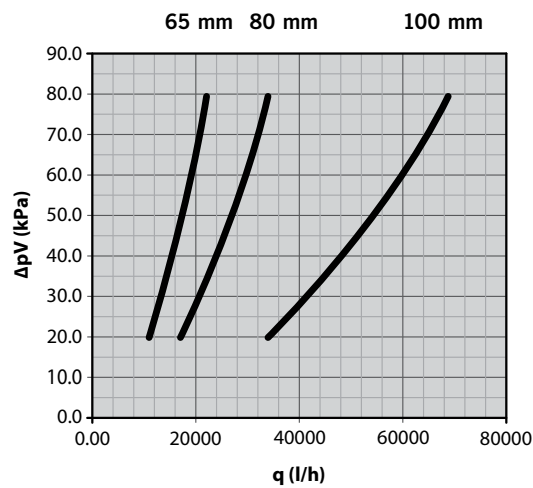
Spring Option 2
(5.8 - 23.3 psi / 40 - 161 kPa)



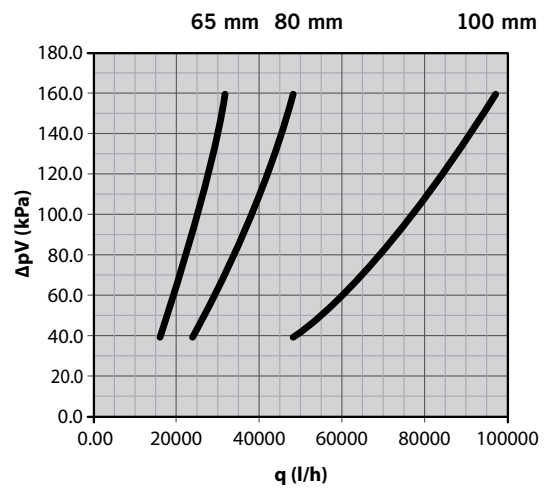
Differential Pressure Controller:



Spring Option 1
(2.9 - 11.6 psi / 20 - 80 kPa)

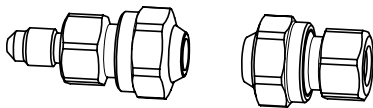


Spring Option 2
(5.8 - 23.3 psi / 40 - 161 kPa)



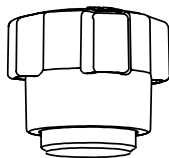
Extension Kit:

Spare Parts For TA Series 793/794

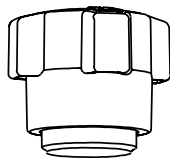


- Capillary Extension Kit for 1/4"
Part Code= K002793001
- Capillary Extension Kit for 6mm
Part Code = K002793000

Handwheels:



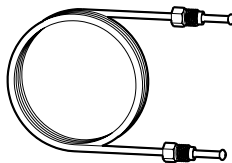
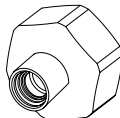
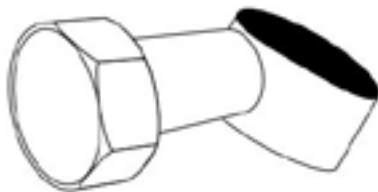
TA Series 793 Plastic
1/2 - 1"



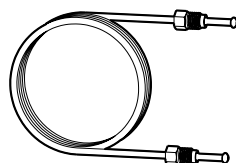
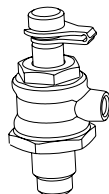
TA Series 793 Plastic
1 1/4 - 2"

Size	Part Code
1/2 - 1"	P004793HDW
1 1/4 - 2"	P012793HDW

The capillary pipe, transition nipple and drain are included with the TA Series 793/794 valves when purchased. These parts are intended as spare parts.



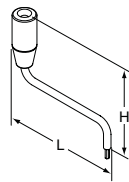
Brass Sizes (1/2 - 2" / 15 - 50 mm)	
Drain Kit Vic	K000786CBV
Transition Nipple	P010793000
Capillary Pipe	P000793001



Ductile Iron Sizes (2 1/2 - 4" / 65 - 100 mm)	
Capillary Tube with Shutoff	P000793002
Capillary Pipe	P000793001

Setting Tool:

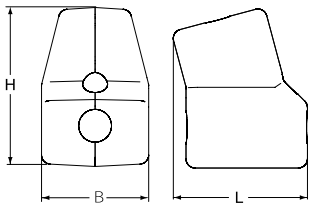
For TA Series 793/794



Differential Pressure Controller	Setting Tool Size	Dimensions inches/mm		Partcode
	mm	L	H	
TA Series 793	3	4.2	3.3	P004793KEY
		107	85	
TA Series 794	5	8.2	2.8	P030794KEY
		207	72	

Prefab Insulation:

TA Series 793



Nominal Size inches mm	Dimensions inches/mm			Part Code
	H	B	L	
1/2 15	6.8 172	4.6 116	5.7 145	P006793INS
3/4 20				
1 25				
1 1/4 32	9.2 234	6.1 154	7.5 191	P012793INS
1 1/2 40				
2 50				

Typical Specifications:

Differential Pressure Control Valves ½" through 2":

Maximum differential pressure is 36 psi / 250 kPa with full body rating of 230 psi / 1600 kPa, maximum temperature is +248°F / +120°C for use in heating and cooling systems only. NPT threaded valve body and bonnet shall be manufactured of Ametal® copper alloy, O-rings, seat seal, and membrane manufactured of HBNR. Shall have adjustable differential control, single pressure temperature port, dead end service shut off capabilities, stainless steel spring, polymide handle, and drain if required by project engineer.

Shall be capable of stabilizing ΔpV ranges of 1.5 - 8.7 psi / 10 - 60 kPa in sizes ¾ - 1"/15 - 25 mm or 2.9 - 11.6 psi / 23 - 80 kPa in sizes 1¼ - 2"/32 - 50 mm, as determined by project engineer or certified TA representative. Supply side valve shall be TA Hydronics style STAD, STAS, STAG, or STAF dependent on system size and connection requirements.

Capillary tube, hose kit, and all connection fittings shall be manufactured by TA Hydronics to ensure proper operation of installed STAP valves. Mechanical contractor and balancing contractor shall be trained on installation, connection, and balancing procedures by certified TA representative.

Differential Pressure Control Valves 2½" through 4":

Maximum differential pressure 51 psi/350 kPa with full body rating of 230 psi / 1600 kPa, maximum temperature is +248°F/ +120°C for use in heating and cooling systems only. ANSI Class 150 flange body to be cast of ductile iron and bonnet shall be manufactured of Ametal® copper alloy, O-rings, seat seal, and membrane manufactured of EPDM. Shall have adjustable differential control, single pressure temperature port, dead end service shut off capabilities, stainless steel spring, polymide handle, and drain if required by project engineer.

Shall be capable of stabilizing ΔpV ranges of 2.9 - 11.6 psi / 20 - 80 kPa for spring option 1 and 5.8 - 23.3 psi / 40 - 160 kPa for spring option 2, as determined by project engineer or certified TA representative. Supply side valve shall be TA Hydronics style STAD, STAS, STAG, or STAF dependant on system size and connection requirements.

Capillary tube, hose kit, and all connection fittings shall be manufactured by TA Hydronics to ensure proper operation of installed STAP valves. Mechanical contractor and balancing contractor shall be trained on installation, connection, and balancing procedures by certified TA representative.

Installation

Reference should always be made to the current TA Hydronics installation/assembly instructions for the product you are installing.

Warranty

Refer to the Warranty section of the current Price List or contact Victaulic for details.

Note

This product shall be manufactured by Victaulic or to Victaulic specifications. All products to be installed in accordance with current TA Hydronics installation/assembly instructions. Victaulic and TA Hydronics reserve the right to change product specifications, designs and standard equipment without notice and without incurring obligations.

Trademarks

Victaulic® is a registered trademark of Victaulic Company.