Combined Balancing and Control Valves
TA Series 7FP

08.53

Product Description:

Pressure independent combined balancing and control valves with independent EQM (Equal Percentage Value) characteristics.

These innovative pressure independent balancing and control valves for heating and cooling systems, also known as FUSION P, combine the key hydronic functions of control and balancing in one valve. Adjustable max. flow and inherent independent EQM characteristics allow correct valve sizing and optimum system controllability. The measuring points enable accurate measurement of flow, differential pressure, temperature and available differential pressure.

- **Adjustable max. flow**
  Adjustable C_v/K_v technology allows setting to design flow
- **Independent, inherent EQM characteristic**
  Proper EQM valve characteristic and high authority for all settings
- **Self-sealing measuring points**
  Simple and accurate measurement for balancing, trouble shooting and power measurement
- **Actuators**
  Valves and actuators are supplied together to ensure optimum control and simplified selection

Material Specifications:

1 ¼ – 2" / 32-50 mm:

Valve Body: AMETAL®

Valve Plug: AMETAL®

Seat Seal: EPDM/Stainless steel UNS S30100

Spindle Seal: EPDM O-ring

O-rings: EPDM

Valve Insert: AMETAL®/PPS/PTFE

Δp Insert: Stainless steel/PPS

Membrane: HNBR

Springs: Stainless steel UNS S30100

Spindle: Stainless steel UNS S30100

2 ½ – 6" / 65-150 mm:

Valve Body: Ductile iron EN-GJS-400

O-rings: EPDM

Valve Plug: Stainless Steel UNS S30300

Seat Seals: EPDM/Stainless Steel UNS S30300

Plug mechanisms: Stainless Steel and Brass

Membrane: EPDM

Δp spring: Stainless steel. 6" / 150 mm painted steel

Screws and nuts: Stainless Steel

Job/Owner

System No.	
Location	

Contractor

Submitted By	
Date	

Engineer

Spec Section	
Paragraph	
Approved	
Date	

08.53 7617 Rev. C Updated 04/2016

Technical description:

Application:
Heating and cooling systems

Functions:
Control (EQM)
Differential pressure control
Pre-setting (max. flow)
Measuring (ΔH, T, q)
Shut-off (for isolation during system maintenance)
Flushing

Dimension:
1 ¼ – 6" / 32-150 mm

Pressure rating:
1 ¼ – 2" / 32-50 mm: 230 psi / 1600 kPa / 16 Bar
2 ½ – 6" / 65-150 mm: 365 psi / 2500 kPa / 25 bar

Differential pressure (ΔpV):
Max. differential pressure:
1 ¼ – 2" / 32-50 mm: 116 psi / 800 kPa = 8 bar
2 ½ – 6" / 65-150 mm: 116 psi / 800 kPa = 8 bar
Min. differential pressure:
1 ¼ – 2" / 32-50 mm: 2 psi / 15 kPa = 0,15 bar
2 ½ – 3" / 65-80 mm: 4 psi / 25 kPa = 0,25 bar
4 – 5" / 100-125 mm: 4 psi / 30 kPa = 0,30 bar
6" / 150 mm: 6 psi / 40 kPa = 0,40 bar

(Valid for position 10, fully open. Other positions will require lower differential pressure, check with the software TA Select)

Recommended flow range:
The flow (qmax) can be set within the range gpm / l/h:

1 ¼" / 32 mm: 4.5 – 18.9 / 1030 – 4300
1 ½" / 40 mm: 5.4 – 16.9 / 1230 – 6100
2" / 50 mm: 13.8 – 48.0 / 3130 – 10900
2 ½" / 65 mm: 41.4 – 106.6 / 9400 – 24200
3" / 80 mm: 59.9 – 162 / 13600 – 36800
4" / 100 mm: 122.4 – 299.4 / 27800 – 68000
5" / 125 mm: 200.8 – 528.4 / 45600 – 120000
6" / 150 mm: 343.9 – 911.4 / 78100 – 207000

Lift:
.79" / 20 mm

Leakage rate:
Tight sealing up to max. differential pressure

Characteristics:
Independent EQM

Temperature:
Max. working temperature: +250°F / +121°C
Min. working temperature: -4°F / -20°C

Media:
Water or neutral fluids, water-glycol mixtures

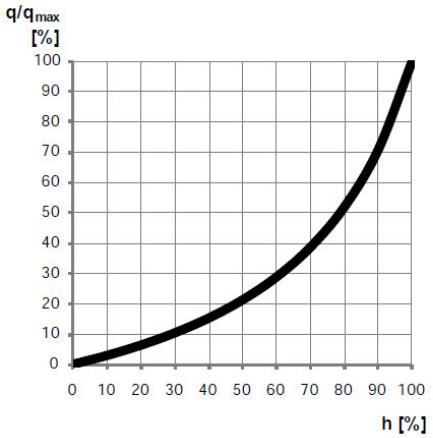
Marking:
1 ¼ – 2" / 32-50 mm: TAH, IMI, DN, PN, DR, serial No and flow direction arrow

2 ½ – 6" / 65-150 mm: TAH, IMI, DN, PN, Cv/Kv, Tmin/max, serial number, valve body material and flow direction arrow, label

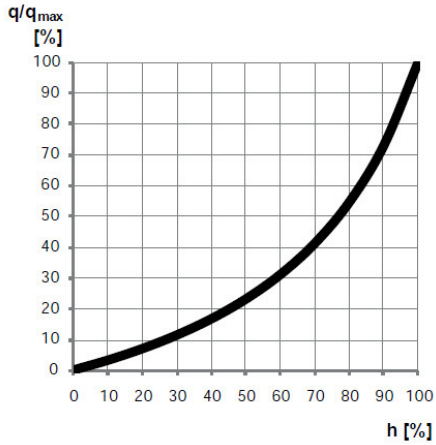
Surface treatment:
1 ¼ – 2" / 32-50 mm: Non treated
2 ½ – 6" / 65-150 mm: Electrophoretic painting

Connection:
1 ¼ – 2" / 32-50 mm: Female thread NPT
2 ½ – 6" / 65-150 mm: ANSI Class 150 flanges

Valve characteristics:



1¼ - 2" / 32-50 mm

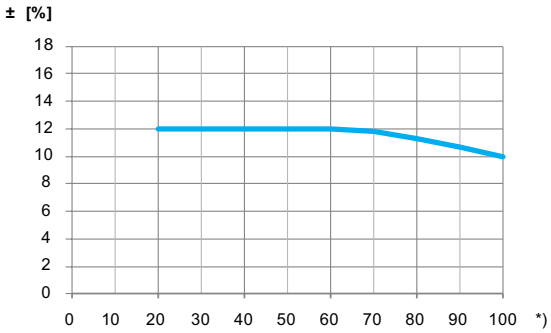


2½ - 6" / 65-150 mm

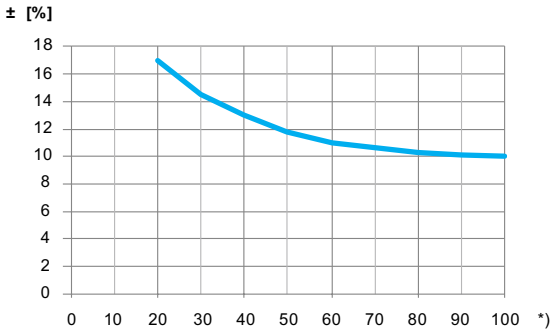
Nominal valve characteristic for all recommended settings.

Measuring accuracy:

Maximum flow deviation at different settings



1¼ - 2" / 32-50 mm



2½ - 6" / 65-150 mm

*) Setting (%) of fully open valve.

Correction factors:

The flow calculations are valid for water (+68°F/+20°C). For other liquids with approximately the same viscosity as water (≤20 cSt = 3°E=100S.U.); it is only necessary to compensate for the specific density. However, at low temperatures, the viscosity increases and laminar flow may occur in the valves.

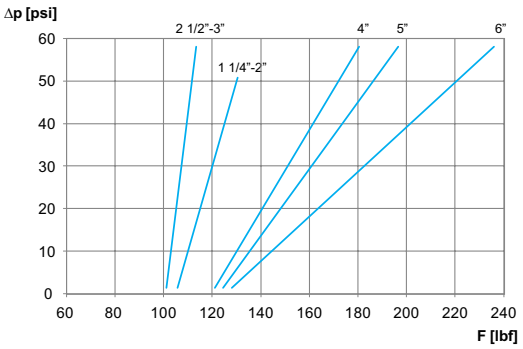
This causes a flow deviation that increases with small valves, low settings and low differential pressures. Correction for this deviation can be made with the software TA Select or directly in TA Hydronics balancing instruments.

Noise:

In order to avoid noise in the installation the valve must be correctly installed and the water de-aerated.

Closing Force:

Necessary force (F) to close the valve versus the differential pressure (ΔpV), up to max. ΔpV.



q_{max} values:

Important: All values are provisional and may be subject to change.

Size inches mm	Position – gpm / l/h									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
1 ¼ 32	3.9 880	4.5 1030	5.4 1220	6.4 1450	7.7 1750	9.7 2200	11.4 2580	13.9 3150	16.6 3770	18.9 4300
1 ½ 40	4.4 1010	5.4 1230	6.8 1540	8.5 1930	10.6 2410	13.1 2980	16.4 3720	19.9 4520	23.3 5300	16.9 6100
2 50	11.4 2580	13.8 3130	16.5 3750	19.6 4450	24.0 5450	28.2 6400	33.2 7550	38.1 8650	44.0 10000	48.0 10900

q_{max} = gpm / l/h at each setting and fully open valve plug.

1 ¼ – 2" / 32-50 mm: Recommended setting range 2–10.

Size inches mm	Position – gpm / l/h									
	5.5	**6**	**6.5**	**7**	**7.5**	**8**	**8.5**	**9**	**9.5**	**10**
2 ½ 65	21.4 4850	25.9 5880	30.4 6900	36.1 8190	41.4 9400	50.2 11400	59.9 13600	70.0 15900	85.9 19500	106.5 24200
3 80	29.3 6650	36.3 8150	41.4 9400	48.9 11100	59.9 13600	71.3 16200	85.4 19400	104.8 23800	129.9 29500	162.0 36800
4 100	61.6 14000	73.1 16600	86.7 19700	103.0 23400	122.4 27800	144.9 32900	173.9 39500	202.5 46000	248.8 56500	299.4 68000
5 125	101.3 23000	121.5 27600	145.3 33000	173.0 39300	200.8 45600	242.6 55100	293.2 66600	354.9 80600	433.7 98500	528.4 120000
6 150	177.0 40200	209.1 47500	247.4 56200	291.5 66200	343.9 78100	413.0 93800	497.5 113000	603.2 137000	748.5 170000	911.4 207000

q_{max} = gpm / l/h at each setting and fully open valve plug.

2 ½ – 6" / 65-150 mm: Recommended setting range 7.5–10.

Actuators:
A wide range of high performance proportional actuators are available (e.g. 24V, 115V, fail safe) to provide accurate modulating or 3-point control, when used together with combined control and balancing valves. See “Selection tables” below.

For more details on actuators, see related technical leaflet “TA-MC Actuators” or contact Victaulic.

Selection tables:
Valves and actuators are supplied together ensuring optimum control and simplified selection.

The codes in the selection tables are for different sets of valve size (Inches/mm) and type of actuator. All fail safe and non-fail safe sets are able to close off (or fail safe open) against 0–max.

ΔpV (50 – 58 psi / 350 – 400 kPa)

Valve with Actuator

Victaulic Actuator Code:			M	N	P	Q/U	R/V
			TA-MC55/24	TA-MC55/115	TA-MC55Y	TA-MC100/160	TA-MC100/160
	Input signal: [1]		3-point or on/off with or without Adapter	3-point or on/off	0-10V, 4-20mA with or without Adapter	0(2)-10 VDC / 0(4)-20 mA and 3-point or on/off	0(2)-10 VDC / 0(4)-20 mA and 3-point or on/off
	Output signal: [1]		0-10 VDC	0-10 VDC	0-10 VDC	0-10 VDC (0(4)-20 mA)	0-10 VDC (0(4)-20 mA) [2]
	Supply voltage:		24 V	115 V	24 V	24 V	115 V
	Fail safe:		No	No	No	No	No
Inches mm	psi PN	Flow Range gpm m3/h					
1 ¼ 32	230 16	3.9 - 18.9 0.9 - 4.3	V0127FP00M	V0127FP00N	V0127FP00P	V0127FP00Q	V0127FP00R
1 ½ 40	230 16	4.4 - 26.9 1.0 - 6.1	V0147FP00M	V0147FP00N	V0147FP00P	V0147FP00Q	V0147FP00R
2 50	230 16	11.4 - 48.0 2.6 - 10.9	V0207FP00M	V0207FP00N	V0207FP00P	V0207FP00Q	V0207FP00R
2 ½ 65	360 25	41.8 - 111.0 9.4 - 25.2	V0247FP00M	V0247FP00N	V0247FP00P	V0247FP00Q	V0247FP00R
3 80	360 25	63.8 - 170.4 14.5 - 38.7	V0307FP00M	V0307FP00N	V0307FP00P	V0307FP00Q	V0307FP00R
4 100	360 25	118.4 - 315.2 26.9 - 71.6	–	–	–	V0407FP00Q	V0407FP00R
5 125	360 25	200.0 - 532.7 45.4 - 121.0	–	–	–	V0507FP00Q	V0507FP00R
6 150	360 25	330.2 - 880.6 75.0 - 200.0	–	–	–	V0607FP00U	V0607FP00V

Important: All values are provisional and may be subject to change. Please check the website for up-to-date information.

[1] Invertable input and output signal.

[2] Output signal: 0(4)-20 mA on request (accessory), please contact Victaulic.

[3] TA-MC160 required for sets with 6" / 150 mm only.

1 ¼ – 2" / 32-50 mm: Female threaded NPT

2 ½ – 6" / 65-150 mm: Flanged (ANSI Class 150)

Valve with fail safe actuators

Victaulic Actuator Code:			S	T
			TA-MC100 FSE	TA-MC100 FSR
	Input signal:		0(2)-10 VDC / 0(4)-20 mA and 3-point	0(2)-10 VDC / 0(4)-20 mA and 3-point
	Output signal:		0(2)-10 VDC 0(4)-20 mA	0(2)-10 VDC 0(4)-20 mA
	Supply voltage:		24 V	24 V
	Fail safe:		Extending (closing)	Retracting (opening)
Inches mm	psi PN	Flow Range gpm m3/h		
1 ¼ 32	230 16	3.9 - 18.9 0.9 - 4.3	V0127FP00S	V0127FP00T
1 ½ 40	230 16	4.4 - 26.9 1.0 - 6.1	V0147FP00S	V0147FP00T
2 50	230 16	11.4 - 48.0 2.6 - 10.9	V0207FP00S	V0207FP00T
2 ½ 65	360 25	41.8 - 111.0 9.4 - 25.2	V0247FP00S	V0247FP00T
3 80	360 25	63.8 - 170.4 14.5 - 38.7	V0307FP00S	V0307FP00T
4 100	360 25	118.4 - 315.2 26.9 - 71.6	V0407FP00S	V0407FP00T
5 125	360 25	200.0 - 532.7 45.4 - 121.0	V0507FP00S	V0507FP00T

Important: All values are provisional and may be subject to change. Please check the website for up-to-date information.

[4] For 6" / 150 mm with fail safe actuator, please contact Victaulic.

1 ¼ – 2" / 32-50 mm: Female threaded NPT

2 ½" – 6" / 65-150 mm: Flanged (ANSI Class 150)

FSE – Fail Safe Extended: Valve fails closed

FSR – Fail Safe Retracted: Valve fails open

With fail safe actuators

Selection tables – individual components

The valve and actuator sets detailed previously ensure optimum control and simplified selection and are therefore the recommended option. Under certain circumstances however, for example when delivery to site is required on different dates, the individual set components may be ordered using the following table:

TA Series 7FP Valve Only	
Size Inches mm	**Victaulic Part Code**
1 ¼ 32	V0127FP000
1 ½ 40	V0147FP000
2 50	V0207FP000
2 ½ 65	V0247FP000
3 80	V0307FP000
4 100	V0407FP000
5 125	V0507FP000
6 150	V0607FP000

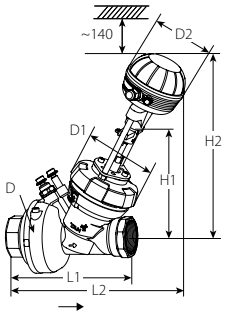
TA Series 7FP Actuator Only

Size Inches mm	Actuator	**TA Actuator Nomenclature**	**Suppy Voltage**	**Input Signal Option**	**Victaulic Part Code**
1 ¼ – 2 32 – 50	M	TA-MC55/24	24 V AC/DC	3-point or on/off	P0127FC00M
2 ½ – 3 65 – 80				3-point or on/off with Adapter	P0247FC00M
1 ¼ – 2 32 – 50	N	TA-MC55/115	115 V AC	3 point or on/off	P0127FC00N
2 ½ – 3 65 – 80				3 point or on/off with Adapter	P0247FC00N
1 ¼ – 2 32 – 50	P	TA-MC55/Y	24 V AC/DC	0-10V; 4-20mA	P0127FC00P
2 ½ – 3 65 – 80				0-10V; 4-20mA with Adapter	P0247FC00P
1 ¼ – 2 32 – 50	Q	TA-MC100/24	24 V AC/DC	0-10V; 4-20mA; 3 point or on/off	P0127FC00Q
2 ½ – 5 65 – 125				0-10V; 4-20mA; 3 point or on/off with Adapter	P0247FC00Q
1 ¼ – 2 32 – 50	R	TA-MC100/115	115 V AC	0-10V; 4-20mA; 3 point or on/off	P0127FC00R
2 ½ – 5 65 – 125				0-10V; 4-20mA; 3 point or on/off with Adapter	P0247FC00R
1 ¼ – 2 32 – 50	S	TA-MC100FSE/24	24 V AC/DC	0-10V; 4-20mA; 3 point or on/off	P0127FC00S
2 ½ – 5 65 – 125				0-10V; 4-20mA; 3 point or on/off with Adapter	P0247FC00S
1 ½ – 2 40 – 50	T	TA-MC100FSR/24	24 V AC/DC	0-10V; 4-20mA; 3 point or on/off	P0127FC00T
2 ½ – 5 65 – 125				0-10V; 4-20mA; 3 point or on/off with Adapter	P0247FC00T
6 150	U	TA-MC160/24	24 V AC/DC	0-10V; 4-20mA; 3 point or on/off with Adapter	P0607FC00U
6 150	V	TA-MC160/115	115 V AC	0-10V; 4-20mA; 3 point or on/off with Adapter	P0607FC00V

Articles

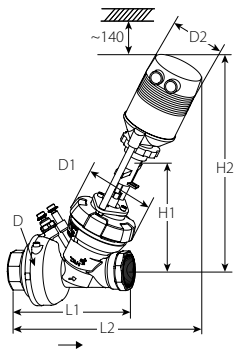
1 ¼ – 2" / 32-50 mm Female threads

3-point, 24 V (TA-MC55/24), 115 V (TA-MC55/115), 0(2)-10 VDC / 0(4)-20 mA 24V (TA-MC55Y)



Inches mm	D	D1	D2	L1	L2	H1	H2	lbs. kg
230 psi / 16 bar								
1 ¼ 32	5.1 130	5.0 128	4.3 109	8.4 213	13.1 333	7.3 186	12.8 326	18 8.0
1 ½ 40	5.1 130	5.0 128	4.3 109	8.6 218	13.0 332	7.3 186	12.8 326	18 8.0
2 50	5.1 130	5.0 128	4.3 109	8.9 226	13.4 340	7.5 190	12.9 330	19 8.5

0(2)-10 VDC / 0(4)-20 mA and 3-point, 24 V (TA-MC100/24) [5], 3-point 115 V (TA-MC100/115) [6]



Inches mm	D	D1	D2	L1	L2	H1	H2	lbs. kg
230 psi / 16 bar								
1 ¼ 32	5.1 130	5.0 128	4.1 103	8.4 213	14.9 380	7.3 186	15.6 398	20 9.0
1 ½ 40	5.1 130	5.0 128	4.1 103	8.6 218	14.9 380	7.3 186	15.6 398	20 9.0
2 50	5.1 130	5.0 128	4.1 103	8.9 226	15.1 384	7.5 190	15.8 402	21 9.5

[5] Height to the spindle top (for threaded valves).

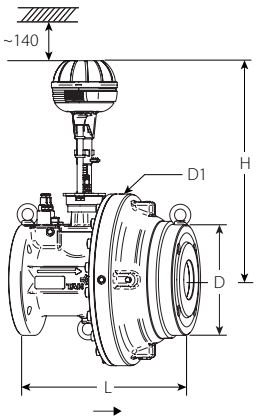
[6] Actuators with additional functionalities, such as position switches, output signal 0(4)-20 mA, see related technical leaflet "TA-MC Actuators".

→ = Flow direction

Actuators in all sets are sized for actuation up to max. ΔpV.

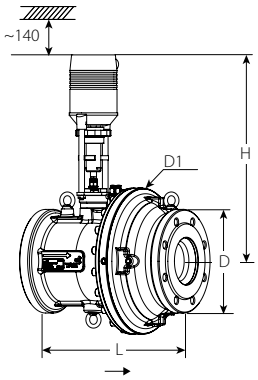
Valve and actuator are individually packaged for easy handling on site.

3-point, 24 V (TA-MC55/24), 115 V (TA-MC55/115), 0(2)-10 VDC / 0(4)-20 mA 24V (TA-MC55Y)



Inches mm	D	D1	L	H	lbs. kg
365 psi / 25 bar					
2 ½ 65	7.3 185	11.4 290	11.4 290	13.3 339	104 47
3 80	7.9 200	11.4 290	12.2 310	13.3 339	119 54

Articles



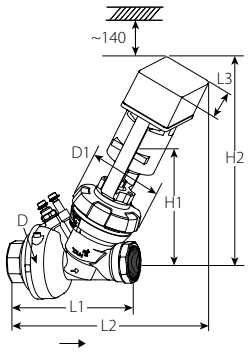
0(2)-10 VDC / 0(4)-20 mA and 3-point, 24 V (TA-MC100/24), 115 V (TA-MC100/115), 24 V (TA-MC160/24), 115 V (TA-MC160/115)

Inches mm	D	D1	L	H	lbs. kg
365 psi / 25 bar					
2 ½ 65	7.3 185	11.4 290	11.4 290	17.2 438	106 48
3 80	7.9 200	11.4 290	12.2 310	17.2 438	121 55
4 100	9.2 235	12.2 310	13.8 350	17.2 438	137 62
5 125	10.6 270	13.5 344	15.7 400	17.2 438	187 85
6 150	11.8 300	14.9 380	18.9 480	21.0 533	267 121

Articles – Fail-safe, extending (closing) or Fail-safe, Retracting (opening)

1¼ – 2" / 32-50 mm With Female threads

0(2)-10 VDC / 0(4)-20 mA and 3-point, 24 V (TA-MC100FSE/24), (TA-MC100FSR/24)

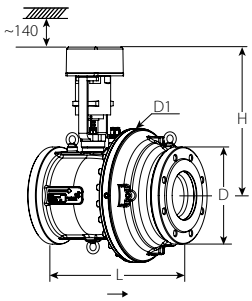


Inches mm	D	D1	L1	L2	L3	H1[5]	H2	lbs. kg
230 psi / 16 bar								
1 ¼ 32	5.1 130	5.0 128	8.4 213	14.9 379	5.6 141	7.3 186	14.0 356	21.0 9.3
1 ½ 40	5.1 130	5.0 128	8.6 218	14.9 379	5.6 141	7.3 186	14.0 356	21.0 9.3
2 50	5.1 130	5.0 128	8.9 226	15.1 383	5.6 141	7.5 190	14.2 360	22.0 9.8

[5] Height to the spindle top (for threaded valves).

2½ – 6" / 65-150 mm With Flanges

0(2)-10 VDC / 0(4)-20 mA and 3-point, 24 V (TA-MC100FSE/24), (TA-MC100FSR/24)



Inches mm	D	D1	L	H	lbs. kg
365 psi / 25 bar					
2 ½ 65	7.3 185	11.4 290	11.4 290	15.0 382	106 48
3 80	7.9 200	11.4 290	12.2 310	15.0 382	121 55
4 100	9.6 235	12.2 310	13.8 350	15.0 382	137 62
5 125	10.6 270	13.5 344	15.7 400	15.0 382	187 85

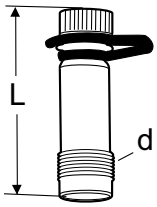
DN 150 with fail safe actuator, please contact TA Hydronics.

→ = Flow direction

Actuators in all sets are sized for actuation up to max. ΔpV.

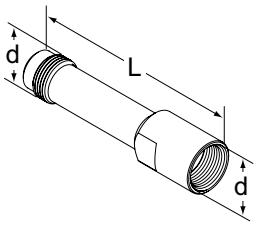
Valve and actuator are individually packaged for easy handling on site.

Accessories:



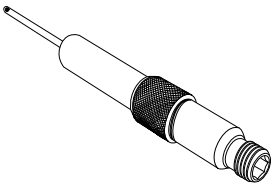
Measuring Points
For 2 ½ - 6" / 65-150 mm sizes

d mm	L Inches mm	Victaulic Part Code
M14x1	1.7 44	K000740011
M14x1	4.1 103	K000740010



Extension for measuring point M14x1
Suitable when insulation is used for 2 ½ - 6" / 65-150 mm sizes

d mm	L Inches mm	Victaulic Part Code
M14x1	2.8 71	K000740008

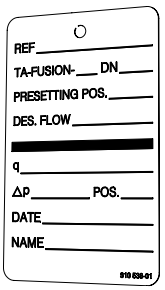


Measuring Point
2.4"/60 mm extensions can be installed without draining of the system for all dimensions

L Inches mm	Victaulic Part Code
2.4 60	K000740012

Tamper proof ring
For locking of set

For DN Inches mm	Victaulic Part Code
1 ¼ - 2 32-50	P0007FCRNG



Identification tag

Victaulic Part Code
P0007FCTAG

Insulation
See related insulation instruction under “Products & Solutions” on www.tahydronics.com

Actuators accessories
See related technical leaflet “TA-MC Actuators”

Adapter
Actuator to body mounting adapter

Victaulic Part Code
P0247FCADP

Typical Specifications:

PRESSURE INDEPENDENT BALANCING AND CONTROL VALVES:

Series 7FP – TA-FUS1ON – P 1¼ to 6"/32 – 150 mm
Designed for simple and accurate measurement for balancing, differential pressure control, trouble shooting, and power measurement in heating and cooling systems. Valve shall allow for adjustable flow settings, with valve and actuators supplied together ensuring optimum control performance. 1 ¼ – 2"/32 – 50 mm valves shall be suitable for working pressures to 230 psi/1600 kPa (PN 16) and water temperature range of –4°F through +250°F/–20°C through +120°C. 2 ½ – 6"/65 – 150 mm valves shall be suitable for working pressures to 365 psi/2500 kPa (PN 25) and water temperature range of –4°F through +250°F/–20°C through +120°C.

1. 1¼ to 2"/32 to 50 mm: Valve shall consist of an Ametal® (dezincification resistant alloy) body and valve plug, EPDM spindle seal and O-rings, with seat seal of EPDM/stainless steel. The valve shall include stainless steel springs and spindles, with an Ametal® / PPS / PTFE valve insert, HNBR membrane, and Δp insert of stainless steel / PPS.
2. 2½ to 6"/65 to 150 mm: Valve shall consist of a ductile iron body and stainless steel valve plug, EPDM O-rings, with seat seal of EPDM/stainless steel. The valve shall include stainless steel Δp spring (painted steel for 6"/150 mm size), with stainless steel and brass plug mechanisms, EPDM membrane, and stainless steel screws and nuts.

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. Victaulic recommends 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.
AMETAL is a dezincification resistant brass alloy and a registered trademark of TA Hydronics.

