

Victaulic® Control Valve

TA Series 7SM



1.0 PRODUCT DESCRIPTION

Available Sizes

- ¾" – 5"/DN20 – DN80

Maximum Working Pressure

- ¾" – 2"/DN20 – DN50: 363 psi/2503 kPa/25 bar
- 2½" – 5"/DN65 – DN80: 270 psi/1862 kPa/19 bar

Differential Pressure

- Maximum differential pressure (ΔpV_{max}): 58 psi/400 kPa/4 bar
- Maximum closing pressure: 87 psi/600 kPa/6 bar

NOTE

- ΔpV_{max} = The maximum allowed pressure drop over the valve to fulfill all stated performances.

Flow Range

- Nominal flow rates (q_{nom}):
 - ¾" / DN20: 8.2 GPM
 - 1" / DN25: 11.7 GPM
 - 1¼" / DN32: 19.9 GPM
 - 1½" / DN40: 33.8 GPM
 - 2" / DN50: 58 GPM
 - 2½" / DN65: 125.5 GPM
 - 3" / DN80: 187 GPM
 - 4" / DN100: 307 GPM
 - 5": 485 GPM
- Minimum controllable flows: 0.5% q_{nom}

Operating Temperature Range

- +14°F to +230°F/-10°C to +110°C
- Operating environment: +32°F to +122°F/0°C to +50°C (5-95% RH, non-condensing)
- Storage environment: -4°F to +158°F/-20°C to +70°C (5-95% RH, non-condensing)

Application

- Heating (hot water) and cooling systems

ALWAYS REFER TO ANY NOTIFICATIONS AT THE END OF THIS DOCUMENT REGARDING PRODUCT INSTALLATION, MAINTENANCE OR SUPPORT.

1.0 PRODUCT DESCRIPTION (CONTINUED)

Function

- Control (Flow, power, position)
 - Pre-Setting (Max/min flow; Max power; Max/min position)
 - Reading (Flow, power, time, temperature, position)
 - Manual override mode (via IMI TA HyTune app)
 - Valve blockage protection
 - Valve clogging detection
 - Fail-safe position
 - Diagnostic
 - Logging
 - Delayed start-up
-

2.0 CERTIFICATION/LISTINGS

Not applicable. Contact Victaulic for more information.

3.0 SPECIFICATIONS – MATERIAL

TA Series 7SM Control Valve

Sizes ¾" – 2"/DN20 – DN50

Valve Body: AMETAL®

Valve Insert: AMETAL®

Valve Plug: AMETAL® and PTFE

Spindle: Stainless steel

Spindle Seal: EPDM O-ring

Internal Plastic Parts: Polyphenylene sulfide (PPS)

Springs: Stainless steel

O-Rings: EPDM

Temperature Housing: AMETAL®

Sizes 2 ½" – 5"/DN65 – DN80

Valve Body: Ductile iron EN-GJS-400-15

Valve Insert: Ductile iron EN-GJS-400-15 and brass

Valve Plug: Stainless steel and EPDM O-ring

Valve Seat: Stainless steel

Spindle: Stainless steel

Spindle Seal: EPDM

Springs: Stainless steel

O-Rings: EPDM

SmartBox

Cover: Polycarbonate (PC)/ABS

Housing: PC/ABS, TPE

Actuators

Sizes ¾" – 2"/DN20 – DN50

Cover: Polybutylene terephthalate (PBT)

Housing: PA GF40

Swiveling Nut: Nickel-plated brass

Sizes 2 ½" – 5"/DN65 – DN80

Cover: Polybutylene terephthalate (PBT)

Bracket: Aluminum

Cables: Halogen-free

NOTE

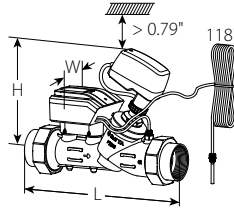
- AMETAL® is the dezincification resistant alloy of IMI Hydronic Engineering.

4.0 DIMENSIONS

TA Series 7SM Control Valve

Including Temperature Housing

Female Union Ends



| Size | | | | | Weight |
|-------------------------|--|-------------------|-------------------|-------------------|----------------------------|
| Nominal inches DN | Actual Outside Diameter inches mm | L inches mm | H inches mm | W inches mm | Approx. (Each) lb kg |
| 3/4 DN20 | 1.050 26.9 | 8.91 226 | 6.85 174 | 3.82 97 | 3.5 1.6 |
| 1 DN25 | 1.315 33.7 | 9.48 241 | 6.85 174 | 3.82 97 | 4.0 1.8 |
| 1 1/4 DN32 | 1.660 42.4 | 10.31 262 | 7.83 199 | 3.82 97 | 4.6 2.1 |
| 1 1/2 DN40 | 1.900 48.3 | 11.10 282 | 7.79 198 | 3.82 97 | 6.6 3.0 |
| 2 DN50 | 2.375 60.3 | 11.93 303 | 7.79 198 | 3.82 97 | 8.6 3.9 |

NOTE

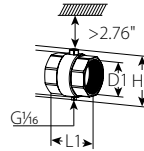
- = Flow direction

4.1 DIMENSIONS

Temperature Housing with Temperature Pocket

Included with TA Series 7SM Control Valve

Female Thread NPT According to ANSI/ASME B1.20.1-1983



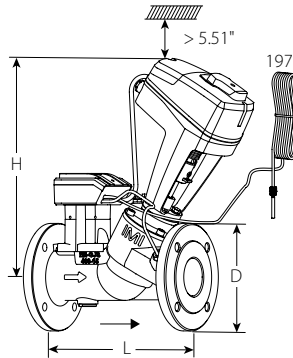
| Size | | Dimensions | | D1 Thread Size |
|-------------------------|---|--------------------|--------------------|-------------------|
| Nominal inches DN | Actual Outside Diameter inches mm | L1 inches mm | H1 inches mm | |
| 3/4 DN20 | 1.050 26.9 | 2.17 55 | 2.20 56 | 3/4 NPT |
| 1 DN25 | 1.315 33.7 | 2.52 64 | 2.40 61 | 1 NPT |
| 1 1/4 DN32 | 1.660 42.4 | 2.60 66 | 2.76 70 | 1 1/4 NPT |
| 1 1/2 DN40 | 1.900 48.3 | 2.64 67 | 2.99 76 | 1 1/2 NPT |
| 2 DN50 | 2.375 60.3 | 2.68 68 | 3.50 89 | 2 NPT |

4.2 DIMENSIONS

TA Series 7SM Control Valve

Including Thermowell (Free space > 2.75"/70 mm is required above the temperature pocket)

Flanges According to ASME/ANSI B16.42 Class 150



| Size | | Number of Bolt Holes | Dimensions | | | Weight |
|-------------------------|---|----------------------|-------------------|-------------------|-------------------|--------------------------------|
| Nominal inches DN | Actual Outside Diameter inches mm | | D inches mm | L inches mm | H inches mm | Approximate (Each) lb kg |
| 2½ | 2.875 73.0 | 4 | 7.09 180 | 11.42 290 | 14.84 377 | 36.3 16.5 |
| 3 DN80 | 3.500 88.9 | 4 | 7.48 190 | 12.20 310 | 14.96 380 | 40.9 18.6 |
| 4 DN100 | 4.500 114.3 | 8 | 9.06 230 | 13.78 350 | 17.24 438 | 63.9 29.0 |
| 5 | 5.563 141.3 | 8 | 10.04 255 | 15.75 400 | 17.48 444 | 77.2 35.0 |

NOTE

- → = Flow direction

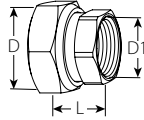
4.3 DIMENSIONS

Connections

With Female Thread NPT

Threads According to ANSI/ASME B1.20.1-1983

Swiveling Nut: Brass/AMETAL®



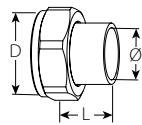
| Size | | Dimensions | | Thread Size |
|-------------------------|---|--------------------------------|--|-------------|
| Nominal inches DN | Actual Outside Diameter inches mm | L ¹ inches mm | | |
| ¾ DN20 | 1.050 26.9 | 0.71 18 | | ½ NPT |
| ¾ DN20 | 1.050 26.9 | 0.91 23 | | ¾ NPT |
| 1 DN25 | 1.315 33.7 | 1.06 27 | | ¾ NPT |
| 1 DN25 | 1.315 33.7 | 1.06 27 | | 1 NPT |
| 1 ¼ DN32 | 1.660 42.4 | 1.06 27 | | 1 NPT |
| 1 ¼ DN32 | 1.660 42.4 | 1.22 31 | | 1 ¼ NPT |
| 1 ½ DN40 | 1.900 48.3 | 1.18 30 | | 1 NPT |
| 1 ½ DN40 | 1.900 48.3 | 1.26 32 | | 1 ½ NPT |
| 2 DN50 | 2.375 60.3 | 1.26 32 | | 1 ½ NPT |
| 2 DN50 | 2.375 60.3 | 1.26 32 | | 2 NPT |

¹ Fitting length (From the gasket surface to the end of the connection)

Soldering Connection

According to ANSI/ASME B16.18

Swiveling Nut: Brass



| Size | | Dimensions | |
|-------------------------|---|------------------------|--------------------------------|
| Nominal inches DN | Actual Outside Diameter inches mm | Pipe Ø inches mm | L ¹ inches mm |
| ¾ DN20 | 1.050 26.9 | 0.88 22 | 0.87 22 |
| 1 DN25 | 1.315 33.7 | 1.13 29 | 1.02 26 |
| 1 ¼ DN32 | 1.660 42.4 | 1.38 35 | 1.10 28 |
| 1 ½ DN40 | 1.900 48.3 | 1.63 41 | 1.22 31 |
| 2 DN50 | 2.375 60.3 | 2.13 54 | 1.50 38 |

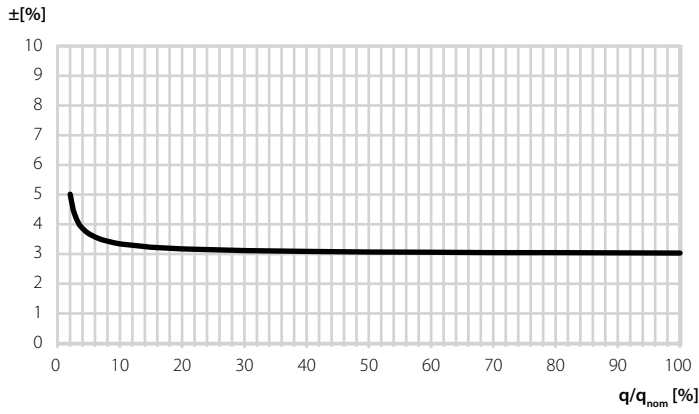
¹ Fitting length (From the gasket surface to the end of the connection)

5.0 PERFORMANCE

7SM Female Union

| Size | | Flow Characteristics |
|-------------------------|--|-----------------------------|
| Nominal inches DN | Actual Outside Diameter inches mm | Full Open C_v K_v |
| 3/4 DN20 | 1.050 26.9 | 3.64 3.15 |
| 1 DN25 | 1.315 33.7 | 5.03 4.35 |
| 1 1/4 DN32 | 1.660 42.4 | 8.44 7.30 |
| 1 1/2 DN40 | 1.900 48.3 | 14.30 12.37 |
| 2 DN50 | 2.375 60.3 | 24.50 21.19 |

Flow Accuracy



5.1 PERFORMANCE

7SM Flange

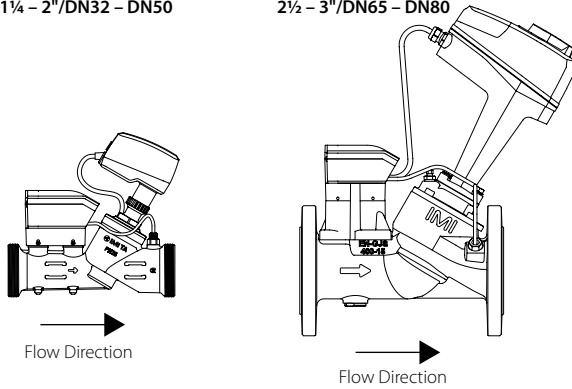
| Size | | Flow Characteristics |
|-------------------------|--|-----------------------------|
| Nominal inches DN | Actual Outside Diameter inches mm | Full Open C_v K_v |
| 2½ | 2.875 73.0 | 56.60 48.96 |
| 3 DN80 | 3.500 88.9 | 84.40 73.01 |
| 4 DN100 | 4.500 114.3 | 139.00 120.24 |
| 5 | 5.563 141.3 | 220.00 190.30 |

Installation

Flow Direction

1¼ – 2"/DN32 – DN50

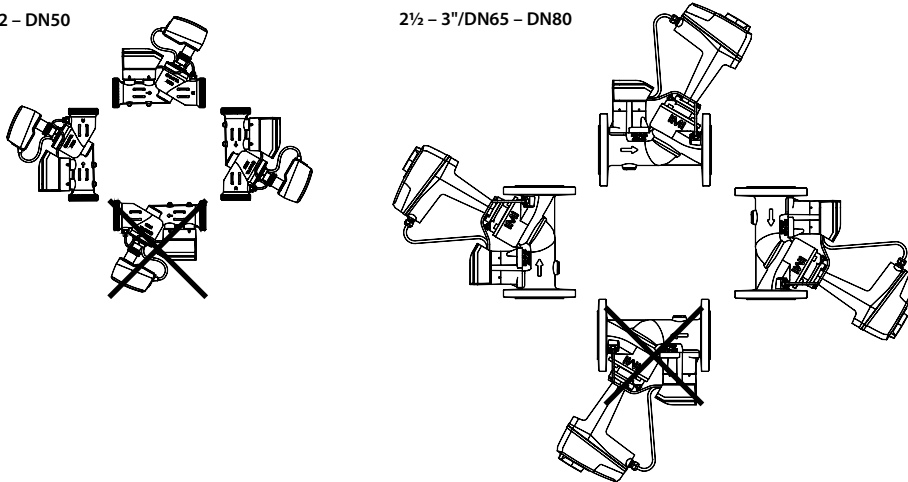
2½ – 3"/DN65 – DN80



Orientation

1¼ – 2"/DN32 – DN50

2½ – 3"/DN65 – DN80



5.1 PERFORMANCE (CONTINUED)

Installation

Component Spacing

1¼ - 2"/DN32 - DN50

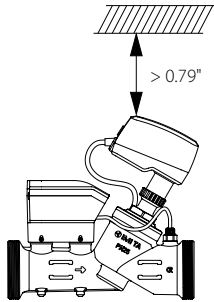


2½ - 3"/DN65 - DN80

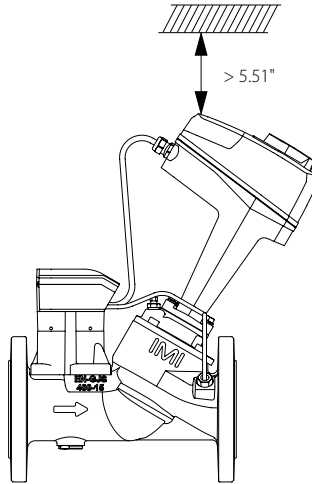


Actuator Service Clearance

1¼ - 2"/DN32 - DN50



2½ - 3"/DN65 - DN80



5.2 PERFORMANCE

Actuator Signal Requirements

Input Signal

By BACnet/Modbus or Analog signal.

Analog in VDC or mA, selectable by jumper in the SmartBox;

0(2)-10 VDC, Ri 47 k Ω .

Adjustable sensitivity 0.1-0.5 VDC.

0.33 Hz low pass filter.

0(4)-20 mA Ri 500 Ω .

Proportional:

0-10, 10-0, 2-10 or 10-2 VDC.

0-20, 20-0, 4-20 or 20-4 mA.

Proportional split-range:

0-5, 5-0, 5-10 or 10-5 VDC.

0-4.5, 4.5-0, 5.5-10 or 10-5.5 VDC.

2-6, 6-2, 6-10 or 10-6 VDC.

0-10, 10-0, 10-20 or 20-10 mA.

4-12, 12-4, 12-20 or 20-12 mA.

Proportional dual-range (for change-over):

0-3.3 / 6.7-10 VDC,

10-6.7 / 3.3-0 VDC,

2-4.7 / 7.3-10 VDC or

10-7.3 / 4.7-2 VDC.

Default setting: Proportional 0-10 VDC.

Output Signal

BACnet/Modbus

0(2)-10 VDC, max. 8 mA, min. 1.25 k Ω .

Enclosure Class: IP54 (According to EN 60529)

Protection Class: (According to EN 61140) III (SELV)

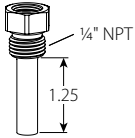
5.3 PERFORMANCE

Accessories

Thermowell

Included in TA Series 7SM, sizes 2 ½ – 3"/DN65 – DN80

For mounting directly on pipe. Free space > 2.76"/70 mm is required above the thermowell.

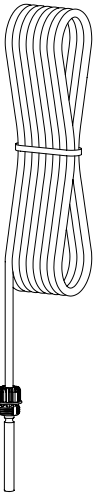


| Size | Part Code |
|----------|------------|
| 1/4" NPT | P0007SMTEM |

Temperature Sensor

Included in TA Series 7SM

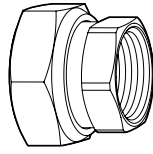
9.84 ft/3 m with sizes 1 ¼ – 2"/DN32 – DN50; 16.40 ft/5 m with sizes 2 ½ – 3"/DN65 – DN80



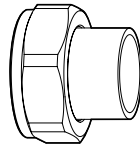
| Length ft m | Part Code |
|-------------------|------------|
| 9.8 3 | P0007SMS3M |
| 16.4 5 | P0007SMS5M |

5.3 PERFORMANCE (CONTINUED)

Tailpieces



Female NPT



Sweat

| Size | Female NPT | Sweat |
|--------------------|------------|---------------|
| ¾" | P0067CPF06 | P0067CPS06 |
| ¾" Gasket | P0067CPGSK | P0067CPGSK |
| 1" | P0107CPF10 | P010&CPS10 |
| 1" Gasket | P0107CPGSK | P0107CPGSK |
| 1 ¼" | P0127CPF12 | P0127CPS12 |
| Reducer 1 ¼" as 1" | P0127CPF10 | Not Available |
| 1 ¼" Gasket | P0127CPGSK | P0127CPGSK |
| 1 ½" | P0147MPF14 | P0147MPS14 |
| 1 ½" Gasket | P0147MPGSK | P0147MPGSK |
| 2" | P0207MPF20 | P0207MPS20 |
| Reducer 2" as 1 ½" | P0207MPF14 | Not Available |
| 2" Gasket | P0207MPGSK | P0207MPGSK |

6.0 NOTIFICATIONS

⚠ WARNING



- Read and understand all instructions before attempting to install, remove, adjust, or maintain any Victaulic piping products.
- Depressurize and drain the piping system before attempting to install, remove, adjust, or maintain any Victaulic piping products.
- Wear safety glasses, hardhat, and foot protection.

Failure to follow these instructions could result in death or serious personal injury and property damage.

7.0 REFERENCE MATERIALS

[08.16: Victaulic Balancing Valves - TA Series 786H/787H/788/789 and Series 78KH](#)

[08.29: Victaulic Differential Pressure Controller - TA Series 793/794](#)

[08.30: Victaulic KOIL-KIT™ Coil Pack](#)

[08.34: Victaulic Automatic Balancing Valves - Series 76T, 76B, 76K, 76V & 76G](#)

[08.37: Victaulic Compact Pressure Independent Balancing and Control Valve \(Compact P\) - TA Series 7CP](#)

[08.38: Victaulic TBV Terminal Balancing and Control Valves - Series TC & Series TCM](#)

[08.46: Victaulic Differential pressure Controller - TA Series 7PR](#)

[08.47: Victaulic Compact Differential Pressure Control TA Series 7DA](#)

[08.50: Victaulic Balancing Valve TA Series 78BL](#)

[08.55: Victaulic Pressure Independent Balancing and Modulating Control Valve - TA Series 7MP](#)

[08.57: Victaulic Differential Pressure Relief Valve TA Series 782](#)

User Responsibility for Product Selection and Suitability

Each user bears final responsibility for making a determination as to the suitability of Victaulic products for a particular end-use application, in accordance with industry standards and project specifications, and the applicable building codes and related regulations as well as Victaulic performance, maintenance, safety, and warning instructions. Nothing in this or any other document, nor any verbal recommendation, advice, or opinion from any Victaulic employee, shall be deemed to alter, vary, supersede, or waive any provision of Victaulic Company's standard conditions of sale, installation guide, or this disclaimer.

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Note

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

Installation

Reference should always be made to the current IMI TA installation/assembly instructions for the product you are installing. For coupling and strainer installation, reference should always be made to the [I-100 Victaulic Field Installation Handbook](#) for the product you are installing. Handbooks are included with each shipment of Victaulic products for complete installation and assembly data, and are available in PDF format on our website at www.victaulic.com

Warranty

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

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