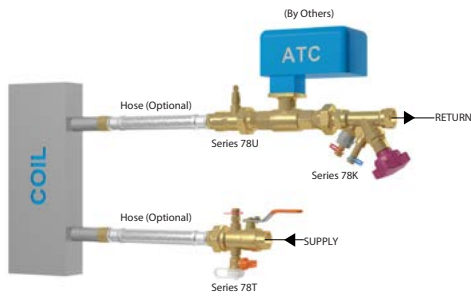


# Series 78T/78U Manual Koil-Kit™ Coil Pack with Series 78K Union Inlet Globe Style Valve



## 1.0 PRODUCT DESCRIPTION

### Available Sizes

- ½ – 2”/DN15 – DN50

### Maximum Working Pressure

- Up to 300 psi/2068 kPa/21 bar

### NOTE

- The coil pack's maximum working pressure is equivalent to the pressure rating of the hose used on it.

### Operating Temperature Range

- Up to 230°F/110°C

### Function

- Provides simplified coil circuit installation that meets optimal hydronic system design requirements

### Application

- Hot and cold water, including treated and untreated water systems
- This KOIL-KIT™ Coil Pack is available with or without hoses
  - KOIL-KIT™ Coil Pack without hoses includes:
    - (1) Series 78T Ball Valve Union Combination – Female x Female
    - (1) Series 78U Union Port Fitting – Female x Male Union
    - (1) Series 78K Balancing Valve – Male Union x Female
  - KOIL-KIT™ Coil Pack with hoses includes:
    - (1) Series 78T Ball Valve Union Combination – Female x Female with 2' Male x Male Union Hose
    - (1) Series 78U Union Port Fitting – Female x Male Union with 2' Male x Male Union Hose
    - (1) Series 78K Balancing Valve – Male Union x Female

### NOTE

- The Series 78T includes a PT port and a blow-down valve. The Series 78U includes a PT port and a manual air vent.

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

System No.		Location	
Submitted By		Date	

Spec Section		Paragraph	
Approved		Date	

## 2.0 CERTIFICATION/LISTINGS

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Product designed and manufactured under the Victaulic Quality Management System, as certified by LPCB in accordance with ISO-9001:2008.

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## 3.0 SPECIFICATIONS – MATERIAL

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### Series 78T Ball Valve Union Combination

**Body:** Dezincification resistant (DZR) brass alloy

**Union:** DZR brass with EPDM O-ring

**Tailpiece:** DZR brass

**Packing and Seats:** Polytetrafluoroethylene (PTFE)

**Packing Nut:** Brass

**Handle:** Steel with vinyl grip

### Series 78U Union Port Fitting

**Body:** DZR brass alloy

**Union:** DZR brass with EPDM O-ring

**Seals:** EPDM O-ring

**Tailpiece:** DZR brass

### Series 78K Balancing Valve

**Body:** AMETAL® DZR brass alloy

**Trim (Bonnet, Stem and Restriction Cone):** DZR brass

**Union:** DZR brass with EPDM O-ring

**Tailpiece & Adapter:** DZR brass

**Seat:** DZR brass

**Seat Seal:** EPDM

**Stem Seal:** EPDM

**Probe Seal:** EPDM

**Handwheel:** Red polyamide plastic

**Allen wrench sizes:** 3 mm memory ½ – 2"

#### NOTE

- AMETAL® is the dezincification-resistant brass alloy of IMI TA.

### Coil Hose

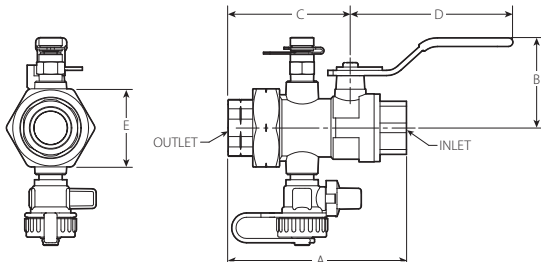
**Hose:** Braided stainless steel

**Core:** EPDM polymer with stainless ferrules

**End Material:** CW617 brass

## 4.0 DIMENSIONS

### Series 78T Ball Valve Union Combination



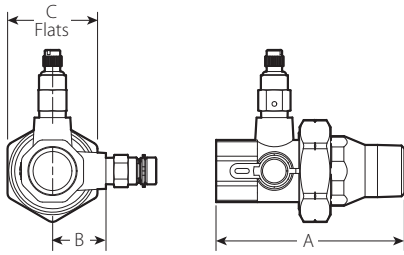
Size			Dimensions					Weight			
Nominal Inlet x Outlet inches DN		Actual Outside Diameter Inlet x Outlet inches mm	A Female Threaded End inches mm	B inches mm	C inches mm	D inches mm	E inches mm	Approx. (Each) lb kg			
1/2 DN15	x	1/2 DN15	0.840 21.3	x	0.840 21.3	4.10 105	1.90 49	2.80 71	4.00 100	1.50 37	1.4 0.6
3/4 DN20	x	3/4 DN20	1.050 26.9	x	1.050 26.9	4.40 112	2.00 51	2.90 73	4.00 100	1.80 46	1.7 0.8
1 DN25	x	1 DN25	1.315 33.7	x	1.315 33.7	5.00 126	2.20 55	3.30 84	5.30 135	1.80 46	2.1 1.0
1 1/4 DN32	x	1 1/4 DN32	1.660 42.4	x	1.660 42.4	5.40 136	2.40 60	3.50 89	5.30 135	2.60 67	3.5 1.6
1 1/2 DN40	x	1 1/2 DN40	1.900 48.3	x	1.900 48.3	6.10 155	2.80 71	3.90 99	5.90 151	2.60 67	4.9 2.2
2 DN50	x	2 DN50	2.375 60.3	x	2.375 60.3	6.90 174	3.00 77	4.10 104	5.90 151	3.30 83	7.3 3.3

**NOTE**

- Optional tailpieces may be ordered for reductions and for changing end configurations from sweat to threaded or threaded to sweat. If needed, specify optional tailpiece when ordering.

## 4.1 DIMENSIONS

### Series 78U Union Port Fitting



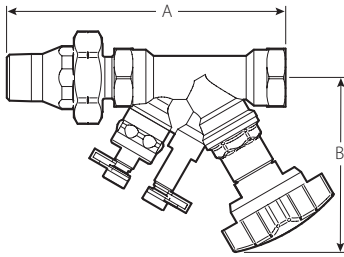
Size		Dimensions			Weight		
Nominal Inlet x Outlet inches DN	Actual Outside Diameter Inlet x Outlet inches mm	A Female Threaded End inches mm	B inches mm	C inches mm	Approx. (Each) lb kg		
1/2 DN15 x 1/2 DN15	0.840 x 0.840 21.3 x 21.3	3.48 89	0.84 21	1.46 37	0.7 0.3		
3/4 DN20 x 1/2 DN15	1.050 x 0.840 26.9 x 21.3	3.87 98	1.08 27	1.81 46	1.0 0.5		
		3/4 DN20	1.050 26.9	3.87 98	1.08 27	1.81 46	0.9 0.4
1 DN25 x 1/2 DN15	1.315 x 0.840 33.7 x 21.3	4.03 102	1.08 27	1.81 46	1.0 0.5		
		3/4 DN20	1.050 26.9	4.03 102	1.08 27	1.81 46	1.1 0.5
		1 DN25	1.315 33.7	4.14 105	1.08 27	1.81 46	1.1 0.5
1 1/4 DN32 x 1/2 DN15	1.660 x 0.840 33.7 x 21.3	4.36 111	1.46 37	2.63 67	1.9 0.9		
		3/4 DN20	1.050 26.9	4.36 111	1.46 37	2.63 67	1.9 0.9
		1 DN25	1.315 33.7	4.36 111	1.46 37	2.63 67	1.9 0.9
		1 1/4 DN32	1.660 42.4	4.19 106	1.46 37	2.63 67	2.1 1.0
1 1/2 DN40 x 3/4 DN20	1.900 x 1.050 48.3 x 26.9	4.19 106	1.46 37	2.63 67	2.2 1.0		
		1 DN25	1.315 33.7	4.19 106	1.46 37	2.63 67	2.2 1.0
		1 1/4 DN32	1.660 42.4	4.19 106	1.46 37	2.63 67	2.3 1.0
		1 1/2 DN40	1.900 48.3	4.40 112	1.46 37	2.63 67	2.3 1.0
		2 DN50	2.375 60.3	4.47 114	1.76 45	3.26 83	3.1 1.4
2 DN50 x 1 DN25	2.375 x 1.315 60.3 x 33.7	4.47 114	1.76 45	3.26 83	3.1 1.4		
		1 1/4 DN32	1.660 42.4	4.47 114	1.76 45	3.26 83	3.1 1.4
		1 1/2 DN40	1.900 48.3	4.47 114	1.76 45	3.26 83	3.2 1.5
		2 DN50	2.375 60.3	4.47 114	1.76 45	3.26 83	3.2 1.5
		2 DN50	2.375 60.3	2.375 60.3	4.47 114	1.76 45	3.26 83

**NOTE**

- Optional tailpieces may be ordered for reductions and for changing end configurations from sweat to threaded or threaded to sweat. If needed, specify optional tailpiece when ordering.

## 4.2 DIMENSIONS

### Series 78K Balancing Valve



Size		Actual Outside Diameter		Dimensions		Weight
Nominal MPT Union	x FPT Valve	MPT Union	x FPT Valve	A End to End	B Center to End	Approx. (Each)
inches DN		inches mm		inches mm	inches mm	lb kg
1/2 DN15	x 1/2 DN15	0.840 21.3	x 0.840 21.3	5.75	4.00	1.7
				146	102	0.8
				5.94	4.00	1.8
				151	102	0.8
				6.27	4.50	2.7
				159	114	1.2
3/4 DN20	x 3/4 DN20	1.050 26.9	x 1.050 26.9	5.99	4.00	2.3
				152	102	1.0
				6.81	4.50	2.2
				173	114	1.0
				7.66	4.75	5.0
1 DN25	x 1 DN25	1.315 33.7	x 1.315 33.7	7.70	5.30	4.0
				186	135	1.8
				7.83	4.31	2.0
				199	109	1.3
				7.66	4.75	5.2
1 1/4 DN32	x 1 1/4 DN32	1.660 42.4	x 1.660 42.4	8.18	4.72	5.5
				208	120	2.5
				8.21	4.75	3.6
				209	121	1.6
				8.91	4.75	7.5
1 1/2 DN40	x 1 1/2 DN40	1.900 48.3	x 1.900 48.3	9.00	4.75	7.2
				229	121	3.3
				9.02	4.75	5.3
				229	121	2.4
				9.02	4.75	5.3
2 DN50	x 2 DN50	2.375 60.3	x 2.375 60.3	8.86	4.75	7.2
				225	121	3.3

### 4.3 OPTIONAL PARTS

#### Coil Hose (Optional)



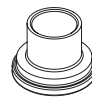
Size inches DN	Inlet Options		Rated Pressure psi kPa	Minimum Bend Radius inches mm	Nominal Length inches mm	Weight
	A Male End Thread	B NPSM MNPT Swivel Union				Approx. (Each) lb kg
1/2 DN15	x 1/2 NPT	1/2	375 2585	2.6 66.7	24 610	0.5 0.2
3/4 DN20	x 3/4 NPT	3/4	300 2068	4.5 114.3	24 610	1.0 0.5
1 DN25	x 1 NPT	1	300 2068	5.5 139.7	24 610	1.5 0.7
1 1/4 DN32	x 1 1/4 NPT	1 1/4	225 1550	6.8 171.5	24 610	2.0 0.9
1 1/2 DN40	x 1 1/2 NPT	1 1/2	150 1034	8.4 212.7	24 610	4.4 2.0
2 DN50	x 2 NPT	2	150 1034	11.3 285.8	24 610	4.8 2.2

### 4.4 OPTIONAL PARTS

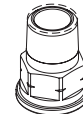
#### Series 78T/78U/78K Union Tailpieces (Optional)



Female Tailpiece



Sweat Tailpiece



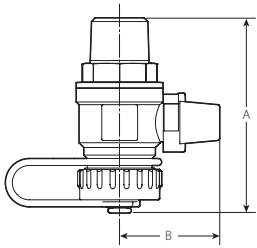
Male Tailpiece

Size		Victaulic Part Code		
Nominal inches		Female Tailpiece	Sweat Tailpiece	Male Tailpiece
1/2	x 1/2	P00478Y304	P00478Y504	P00478U404
3/4	x 1/2	P00678Y304	P00678Y504	P00678U404
	3/4	P00678Y306	P00678Y506	P00678U406
1	x 1/2	P00678Y304	P00678Y504	P00678U404
	3/4	P00678Y306	P00678Y506	P00678U406
	1	P00678Y310	P00678Y510	P00678U410
1 1/4	x 1/2	-	-	P01278U404
	3/4	P01278Y306	P01278Y506	P01278U406
	1	P01278Y310	P01278Y510	P01278U410
	1 1/4	P01278Y312	P01278Y512	P01278U412
1 1/2	x 1/2	-	-	P01278U404
	3/4	P01278Y306	P01278Y506	P01278U406
	1	P01278Y310	P01278Y510	P01278U410
	1 1/4	P91278Y312	P01278Y512	P01278U412
	1 1/2	P01278Y314	P01278Y514	P01278U414
2	x 1	-	-	P02078U410
	1 1/4	P02078Y312	P01278Y512	P02078U412
	1 1/2	P02078Y314	P01278Y514	P02078U414
	2	P02078Y320	P02078Y520	P02078U420

## 4.5 OPTIONAL PARTS

### Hose End Drain Valve (Optional)

A hose end drain valve is factory-installed on the Series 78T. This product can also be mounted on the Series 78U or provided loose for other piping needs.

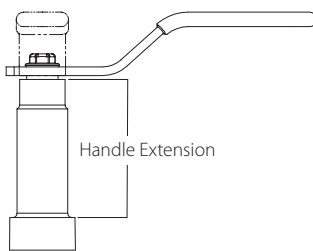


Size NPT inches mm	Dimensions		Part Code
	A inches mm	B inches mm	
1/4 6	2.04 52	1.37 35	P-002-78Y-DRN
1/2 13	2.74 70	1.53 39	P-004-78Y-DRN

## 4.6 OPTIONAL PARTS

### Handle Extension (Optional)

For Series 78T



Valve Inlet Size	Victaulic Part Code	
	2" Handle Extension	4" Handle Extension
1/2 - 3/4	P00478Y2HL	P00478Y4HL
1 - 1 1/4"	P01278Y2HL	P01278Y4HL
1 1/2 - 2"	P02078Y2HL	P02078Y4HL

## 4.7 OPTIONAL PARTS

### Air Vent

A manual air vent is factory-installed on the Series 78U. This product can also be mounted on the Series 78T or provided loose for other piping needs.



Connection size	Part Code
1/4 NPT	P-002-78U-MAV

## 5.0 PERFORMANCE

Cv/Kv values for flow of water at +60°F/+16°C are shown in the table.

### Formulas for Cv and Kv values

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

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

Where:

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

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

Flow Coefficient	Cv	Kv
Q (Flow)	GPM	m <sup>3</sup> /hr
ΔP (Pressure Drop)	psi	bar

### Series 78T Ball Valve Union Combination

Size		Flow Coefficient (Fully Open)	
Nominal inches DN	Actual Outside Diameter inches mm	Threaded	
		Cv	Kv
½ DN15	0.840 21.3	10.4 9.0	
¾ DN20	1.050 26.9	20.4 17.7	
1 DN25	1.315 33.7	39.4 34.1	
1 ¼ DN32	1.660 42.4	63.2 54.6	
1 ½ DN40	1.900 48.3	98.4 85.1	
2 DN50	2.375 60.3	169.3 146.4	

### Series 78U Union Port Fitting

Size		Flow Coefficient (Fully Open)	
Nominal inches DN	Actual Outside Diameter inches mm	Threaded	
		Cv	Kv
½ DN15	0.840 21.3	9.8 6.1	
¾ DN20	1.050 26.9	21.2 17.2	
1 DN25	1.315 33.7	41.4 35.2	
1 ¼ DN32	1.660 42.4	76.0 6.2	
1 ½ DN40	1.900 48.3	103.0 6.8	
2 DN50	2.375 60.3	159.5 137.9	

### Coil Hose

Size		Nominal Length inches mm	Flow Coefficient (Fully Open)	
Nominal inches DN	Actual Outside Diameter inches mm		Straight Form Cv Kv	90° Bend Cv Kv
½ DN15	0.840 21.3	24	3.5	3.4
		600	3.0	3.0
¾ DN20	1.050 26.9	24	10.0	9.6
		600	8.7	8.3
1 DN25	1.315 33.7	24	18.9	18.3
		600	16.3	15.8
1 ¼ DN32	1.660 42.4	24	33.0	32.6
		600	28.4	28.1
1 ½ DN40	1.900 48.3	24	63.1	60.2
		600	54.4	51.9
2 DN50	2.375 60.3	24	114.6	
		600	98.8	Not Recommended



## 5.1 PERFORMANCE

### Series 78K Balancing Valve

#### Valve Selection Guide

Size		Flow Data		
Nominal inches DN	Actual Outside Diameter inches mm	Absolute Min Flow GPM LPM	Nominal Range of Flow GPM LPM	Absolute Max Flow GPM LPM
½ DN15	0.840 21.3	0.1 0.5	0.6 – 2.8 2.3 – 10.6	8.6 32.6
¾ DN20	1.050 26.9	0.4 1.5	2.0 – 6.0 7.6 – 22.7	20.0 76.0
1 DN25	1.315 33.7	0.5 1.7	3.9 – 10.0 14.8 – 37.9	30.0 114.0
1 ¼ DN32	1.660 42.4	0.9 3.3	5.0 – 15.0 18.9 – 56.8	48.0 182.0
1 ½ DN40	1.900 48.3	1.3 4.9	6.6 – 20.0 25.0 – 75.7	66.0 250.0
2 DN50	2.375 60.3	2.0 7.6	12.6 – 36.0 47.7 – 136.0	110.0 416.0

#### NOTES

- Balancing valves should be sized in accordance with the GPM/LPM flows (and not in relation to pipeline size). Sizing balancing valves based on the minimum or maximum flow rates is not recommended. Valves should be sized using the nominal flow rate only. The Minimum Flow is calculated from the minimum open setting of the valve and a minimum pressure drop 1 Ft. WG (= 3 kPa). The Nominal Flow is calculated from the maximum open setting of the valve and the minimum recommended pressure drop, 2 Ft. WG (= 6 kPa). The Maximum Flow is calculated from the maximum open setting of the valve and the maximum pressure drop, 20 Ft. WG (= 60 kPa). A computer program, TA-Select, is available for calculation of valve handwheel pre-set position and other applications.
- For information regarding Allen Wrench sizes see the Material Specifications section on page 3.
- Measuring Accuracy:** The hand wheel zero position is calibrated and must not be changed. Valves have an accuracy of flow measurement of 2% to 3% when used within their recommended flow range and installed in accordance with the figure below.
- For the most accurate results, a Series 734 TA SCOPE or Series 73M CMI should be used. However, any differential pressure meter may be used.



The illustration relates to the accuracy of differential pressure measurement and is not an installation requirement.

## 5.2 PERFORMANCE

### Series 78K Balancing Valve

#### Cv Values for Various Handle Settings

The values below may be used when calculating and sizing a piping system.

No. of Turns	Cv Values for Sizes Listed Below <sup>3</sup>					
	½"	¾"	1"	1 ¼"	1 ½"	2"
0.50	0.15	0.59	0.70	1.32	2.03	2.97
1.00	0.25	0.88	1.19	2.20	3.83	4.87
1.50	0.36	1.38	2.44	3.60	5.34	8.35
2.00	0.66	2.20	4.20	5.40	7.08	13.60
2.50	1.02	3.24	6.15	8.24	10.20	18.80
3.00	1.60	4.49	8.00	11.00	14.60	24.90
3.50	2.30	5.51	9.28	13.70	18.60	30.70
4.00 <sup>4</sup>	2.92	6.61	10.09	16.50	22.30	38.00

<sup>3</sup> Cv = GPM at a ΔP of 1 psi/7 kPa through the valve at any given setting. 1 psi = 2.31 ft of H<sub>2</sub>O.

<sup>4</sup> Full open valve.

### 5.3 CORRECTION FACTORS

For liquids other than water, the flow values from the balancing wheel can be adjusted as follows:

Divide the flow rate by the square root of the specific gravity.

$$\text{Actual Flow} = \frac{q_{\text{CBI}}}{\sqrt{SG}}$$

This applies to liquids having, on the whole, the same viscosity as water, i.e. most water/glycol mixtures and water/brine solutions at room temperature. At low temperatures, the viscosity increases and laminar flow may occur in certain valves. The risk increases with small valves, low settings and low differential pressures.

A computer program (Hy-Select) is available for calculation of pre-setting values and other applications. When the flow setting is verified or changed to the final setting, the memory stop should be set. Contact Victaulic for further information.

When  $\Delta p$  and the design flow rate are known, use the formula shown to calculate the  $C_v$  value.

$$C_v = 1.52 \frac{q}{\sqrt{\Delta p}}$$

q in GPM,  $\Delta p$  in Ft. of  $H_2O$

$$C_v = \frac{q}{\sqrt{\Delta p}}$$

q in GPM,  $\Delta p$  in psi

A computer program, Hy-Select, is available from Victaulic for calculation of pre-setting values and other applications.

### 5.4 PART CODES

Kit Description	Nominal Kit Size	Expected Control Valve Size (Series 78U Outlet and Valve Size Inlet)	Victaulic Part Code	
			Without PT Port and Handle Extensions	With PT Ports and Handle Extensions
78T Fem x Fem, 78U Fem x Male Union, 78K Male Union x Fem without hoses	1/2	1/2	K00A799DKA	K000799O21
	3/4	1/2	K000799085	K000799O17
	3/4	3/4	K000799FAT	K000799EV4
	1	1/2	K000799683	K000799O18
	1	3/4	K000799N17	K000799O22
	1	1	K000799908	K00A7995JY
	1 1/4	1 1/4	K000799909	K00A7995JZ
	1 1/2	1 1/2	K00A799D27	K000799EW1
2	2	K000799910	K00A799AER	
78T Fem x Fem w/2' Male x Male Union Hose, 78U Fem x Male Union w/2' Male x Male Union Hose, 78K Male Union x Fem	1/2	1/2	K000799531	K00A7995J0
	3/4	1/2	K000799212	K000799I43
	3/4	3/4	K000799205	K00A7995J2
	1	1/2	K000799532	K00A7995J3
	1	3/4	K000799530	K000799G25
	1	1	K000799AO4	K00A7995J4
	1 1/4	1 1/4	K000799ET4	K00A7995J5
	1 1/2	1 1/2	K00A799A5J	K00A7995J6
2	2	K00A799BJ1	K00A7995J7	

## 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 786/787/788/789 and Series 78K](#)

[I-KOIL-KIT: Victaulic KOIL-KIT™ Coil Pack Installation and Maintenance Instructions](#)

### 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](http://www.victaulic.com)

### Warranty

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

### Trademarks

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