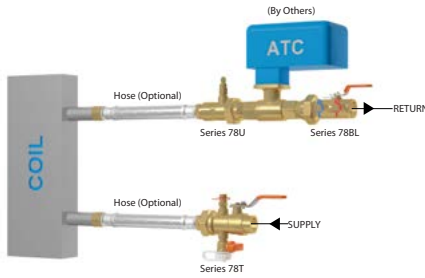


# Series 78T/78U Manual Koil-Kit™ Coil Pack with TA Series 78BL Balancing Ball Valve



## 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 with sweat ends and without hoses includes:
    - (1) Series 78T Ball Valve Union Combination – Sweat x Sweat
    - (1) Series 78U Union Port Fitting – Sweat x Male Union
    - (1) TA Series 78BL Balancing Ball Valve – Sweat x Sweat
  - KOIL-KIT™ Coil Pack with threaded ends and without hoses includes:
    - (1) Series 78T Ball Valve Union Combination – Female x Female
    - (1) Series 78U Union Port Fitting – Female x Male Union
    - (1) TA Series 78BL Balancing Ball Valve – Female x Female
  - KOIL-KIT™ Coil Pack with threaded ends and 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) TA Series 78BL Balancing Ball Valve – Female 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

### TA Series 78BL Balancing Ball Valve

**Body and End Face:** AMETAL® DZR brass alloy

**O-Rings:** EPDM suitable for service with propylene and ethylene glycol mixtures up to 50% by volume in water

**Blowout Proof Stem:** Stainless steel

**Ball:** Stainless steel

**Ball Seats:** Polytetrafluoroethylene (PTFE).

**Indexing Handle with Adjustable Memory Stop:** Zinc-plated carbon steel with a vinyl dip

**Positioning Pin and Dial Scale:** UNS S30400

**Fixed Connection:** Female NPT or sweat

#### NOTE

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

### Coil Hose

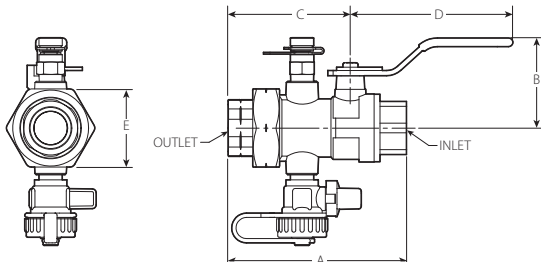
**Hose:** Braided stainless steel

**Core:** EPDM polymer with stainless ferrules

**End Material:** CW617 brass

## 4.0 DIMENSIONS

### Series 78T Ball Valve Union Combination



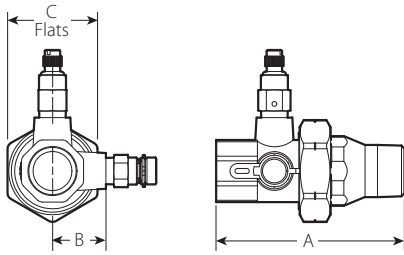
Size				Dimensions					Weight	
Nominal Inlet x Outlet inches DN	x	Outlet DN	Actual Outside Diameter		A Sweat or Female Threaded End inches mm	B inches mm	C inches mm	D inches mm	E inches mm	Approx. (Each) lb kg
			Inlet inches mm	Outlet inches mm						
1/2 DN15	x	1/2 DN15	0.840 21.3	x 0.840 21.3	4.10 105	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 Sweat or 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
		3.87 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
		4.03 102	1.08 27	1.81 46	1.1 0.5
		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
		4.36 111	1.46 37	2.63 67	1.9 0.9
		4.36 111	1.46 37	2.63 67	1.9 0.9
		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
		4.19 106	1.46 37	2.63 67	2.2 1.0
		4.19 106	1.46 37	2.63 67	2.3 1.0
		4.40 112	1.46 37	2.63 67	2.3 1.0
		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
		4.47 114	1.76 45	3.26 83	3.1 1.4
		4.47 114	1.76 45	3.26 83	3.2 1.5
		4.47 114	1.76 45	3.26 83	3.2 1.5
		4.47 114	1.76 45	3.26 83	3.2 1.5

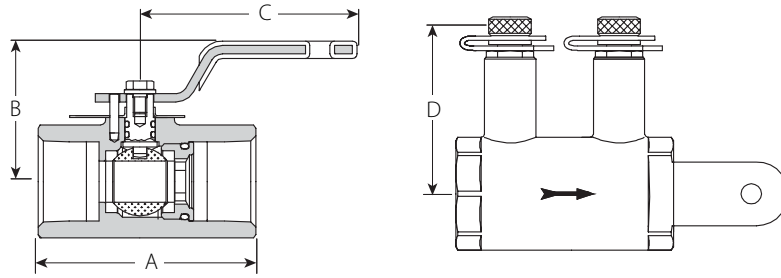
**NOTE**

- 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

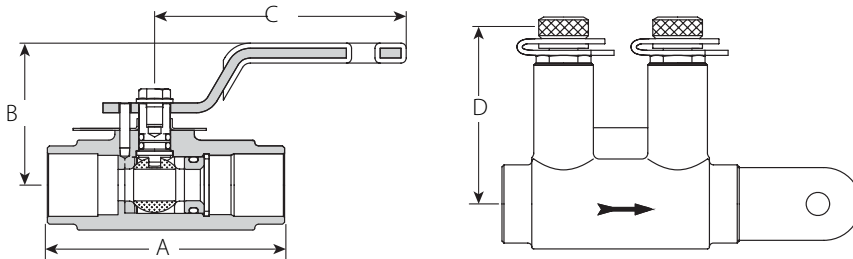
### TA Series 78BL Balancing Ball Valve

#### Female NPT



Body Size inches DN	Dimensions				Full Open C <sub>v</sub> K <sub>v</sub>	Flow Range GPM L/H	Weight
	A inches mm	B inches mm	C inches mm	D inches mm			Approximate (Each) lb kg
1/2 DN50	2.38 60	1.50 38	2.50 64	1.88 48	2.83 2.45	0.38 - 5.30 86.3 - 1204	0.6 0.3
3/4 DN20	2.50 64	1.63 41	2.50 64	2.00 51	6.67 5.77	0.94 - 12.48 213 - 2834	0.8 0.4
1 DN125	3.13 79	2.00 51	4.00 102	2.13 54	10.32 8.93	1.56 - 19.30 354 - 4383	1.3 0.6
1 1/4 DN32	3.38 86	2.25 57	4.00 102	2.25 57	16.31 14.11	2.11 - 30.50 479 - 6927	2.0 0.9
1 1/2 DN40	3.63 92	2.50 64	4.75 121	2.38 60	24.30 21.02	2.68 - 45.40 609 - 10310	2.8 1.3
2 DN50	4.13 105	2.75 70	4.75 121	2.63 67	45.30 39.18	6.18 - 85.00 1404 - 19304	4.4 2.0

#### Sweat



Body Size inches DN	Dimensions				Full Open C <sub>v</sub> K <sub>v</sub>	Flow Range GPM L/H	Weight
	A inches mm	B inches mm	C inches mm	D inches mm			Approximate (Each) lb kg
1/2 DN50	2.38 60	1.50 38	2.50 64	1.75 44	2.74 2.37	0.36 - 5.13 81.8 - 1165	0.5 0.2
3/4 DN20	3.13 79	1.63 41	2.50 64	1.88 48	6.21 5.37	1.07 - 11.61 243 - 2637	0.7 0.3
1 DN125	3.63 92	2.00 51	4.00 102	2.13 54	10.29 8.90	1.24 - 19.20 282 - 4360	1.2 0.5
1 1/4 DN32	4.00 102	2.25 57	4.00 102	2.25 57	16.38 14.17	2.20 - 30.60 500 - 6949	1.7 0.7
1 1/2 DN40	4.63 117	2.50 64	4.75 121	2.38 60	23.80 20.59	2.61 - 44.60 593 - 10129	2.4 1.1
2 DN50	5.50 140	2.75 70	4.75 121	2.63 67	44.60 38.58	6.30 - 83.00 1431 - 18849	3.9 1.6

### 4.3 OPTIONAL PARTS

#### Coil Hose (Optional)



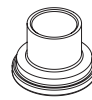
Size inches DN		Inlet Options		Rated Pressure psi kPa	Minimum Bend Radius inches mm	Nominal Length inches mm	Weight
		A Male End Thread	B NPSM MNPT Swivel Union				Approx. (Each) lb kg
1/2 DN15	x	1/2 NPT	1/2	375 2585	2.6 66.7	24 610	0.5 0.2
3/4 DN20	x	3/4 NPT	3/4	300 2068	4.5 114.3	24 610	1.0 0.5
1 DN25	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

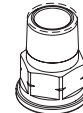
#### Series 78T/78U Union Tailpieces (Optional)



Female Tailpiece



Sweat Tailpiece



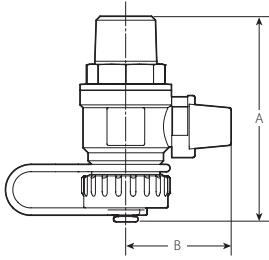
Male Tailpiece

Size Nominal inches			Victaulic Part Code		
			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.

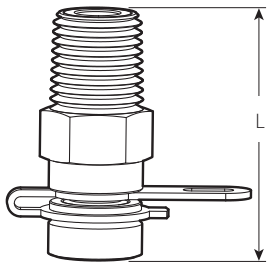


Size	Dimensions		Part Code
	A	B	
NPT	inches	inches	
	mm	mm	
¼	2.04	1.37	P-002-78Y-DRN
6	52	35	
½	2.74	1.53	P-004-78Y-DRN
13	70	39	

## 4.6 OPTIONAL PARTS

### Probe Port (Optional)

For Series 78T

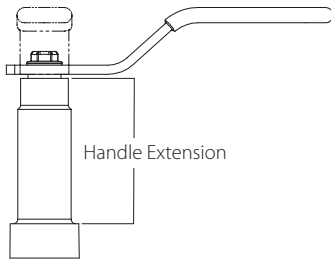


Connection Size	Dimensions	Part Code
	L	
	inches	
	mm	
¼ NPT	1.55	P-002-78Y-PTP
	39	

## 4.7 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

## 4.8 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	Sweat Cv Kv
½ DN15	0.840 21.3	10.4 9.0	7.5 6.5
¾ DN20	1.050 26.9	20.4 17.7	17.0 14.7
1 DN25	1.315 33.7	39.4 34.1	34.0 29.4
1 ¼ DN32	1.660 42.4	63.2 54.6	54.9 47.5
1 ½ DN40	1.900 48.3	98.4 85.1	85.5 74.0
2 DN50	2.375 60.3	169.3 146.4	149.7 129.5

### Series 78U Union Port Fitting

Size		Flow Coefficient (Fully Open)	
Nominal inches DN	Actual Outside Diameter inches mm	Threaded Cv Kv	Sweat Cv Kv
½ DN15	0.840 21.3	9.8 6.1	6.1 5.3
¾ DN20	1.050 26.9	21.2 17.2	17.3 14.9
1 DN25	1.315 33.7	41.4 35.2	35.3 30.4
1 ¼ DN32	1.660 42.4	76.0 6.2	61.0 52.6
1 ½ DN40	1.900 48.3	103.0 6.8	82.7 71.3
2 DN50	2.375 60.3	159.5 137.9	127.9 110.3

### 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	24 600	3.5 3.0	3.4 3.0
¾ DN20	1.050 26.9	24 600	10.0 8.7	9.6 8.3
1 DN25	1.315 33.7	24 600	18.9 16.3	18.3 15.8
1 ¼ DN32	1.660 42.4	24 600	33.0 28.4	32.6 28.1
1 ½ DN40	1.900 48.3	24 600	63.1 54.4	60.2 51.9
2 DN50	2.375 60.3	24 600	114.6 98.8	Not Recommended

## 5.1 PERFORMANCE

### TA Series 78BL Balancing Ball Valve

#### Sizing

When  $\Delta p$  and design flow is known, calculate the Cv by using the formula provided. Select the valve size so the setting will be approximately 75% of total opening.

$$Cv = 1.52 \frac{q}{\sqrt{\Delta p}} \quad q \text{ in GPM, } \Delta p \text{ in ft WG}$$

$$Cv = \frac{q}{\sqrt{\Delta p}} \quad q \text{ in GPM, } \Delta p \text{ in psi}$$

#### Cv Versus Handle Position Table - Threaded

Handle Position	Average Cv					
	½"	¾"	1"	1 ¼"	1 ½"	2"
0	0.00	0.00	0.00	0.00	0.00	0.00
1	0.00	0.03	0.03	0.03	0.00	0.06
2	0.03	0.12	0.18	0.16	0.17	0.60
3	0.08	0.23	0.36	0.45	0.51	1.34
4	0.14	0.32	0.58	0.74	0.95	2.33
5	0.21	0.50	0.83	1.13	1.43	3.30
7.5	0.43	0.92	1.54	2.21	3.03	6.45
10	0.71	1.63	2.54	3.80	5.41	11.13
12.5	1.10	2.61	3.90	5.95	8.91	17.77
15	1.63	3.76	5.73	8.65	13.02	26.12
17.5	2.58	5.89	8.86	13.25	20.14	40.36
20	2.83	6.67	10.32	16.31	24.27	45.31

#### Cv Versus Handle Position Table - Sweat

Handle Position	Average Cv					
	½"	¾"	1"	1 ¼"	1 ½"	2"
0	0.00	0.00	0.00	0.00	0.00	0.00
1	0.00	0.06	0.00	0.02	0.06	0.11
2	0.03	0.17	0.09	0.18	0.13	0.69
3	0.07	0.29	0.25	0.47	0.44	1.45
4	0.13	0.42	0.48	0.79	0.88	2.35
5	0.19	0.57	0.66	1.18	1.40	3.37
7.5	0.37	1.00	1.29	2.26	2.97	6.36
10	0.58	1.62	2.29	3.84	5.34	11.03
12.5	0.93	2.59	3.56	5.97	8.88	17.67
15	1.50	3.77	5.30	8.68	13.02	25.01
17.5	2.51	5.93	7.80	12.84	20.37	36.52
20	2.74	6.21	10.29	16.38	23.78	44.63

## 5.2 PART CODES

Kit Description	Nominal Kit Size	Expected Control Valve Size (Series 78U Outlet Size)	Victaulic Part Code	
			Without PT Ports and Handle Extensions	With PT Ports and Handle Extensions <sup>1</sup>
78T Sweat x Sweat, 78U Sweat x Male Union, 78BL Sweat x Sweat without hoses	1/2	1/2	K00A7995FA	K00A7995K0
	3/4	1/2	K00A7995FB	K00A7995K1
	3/4	3/4	K00A7995FC	K00A7995K2
	1	1/2	K00A7995FD	K00A7995K3
	1	3/4	K00A7995FE	K00A7995K4
	1	1	K00A7995FF	K00A7995K5
	1 1/4	1 1/4	K00A7995FG	K00A7995LF
	1 1/2	1 1/2	K00A7995FH	K00A7995LH
78T Fem x Fem, 78U Fem x Male Union, 78BL Fem x Fem without hoses	2	2	K00A7995FI	K00A7995LI
	1/2	1/2	K00A7995FJ	K00A7995LJ
	3/4	1/2	K00A799DZH	K00A7995LK
	3/4	3/4	K00A7995FK	K00A7995LL
	1	1/2	K00A7995FL	K00A7995LM
	1	3/4	K00A7995FM	K00A7995LN
	1	1	K00A7995FN	K00A7995LO
	1 1/4	1 1/4	K00A7995FO	K00A7995LP
78T Fem x Fem w/2' Male x Male Union Hose, 78U Fem x Male Union w/2' Male x Male Union Hose, 78BL Fem x Fem	1 1/2	1 1/2	K00A7995FP	K00A7995LQ
	2	2	K00A7995FQ	K00A7995LR
	1/2	1/2	K00A7995FR	K00A7995LS
	1/2	3/4	K00A7995FS	K00A7995LT
	3/4	3/4	K00A7995FT	K00A7995LU
	1	1/2	K00A7995FU	K00A7995LV
	1	3/4	K00A7995FV	K00A7995LW
	1	1	K00A7995FW	K00A7995LX
1 1/4	1 1/4	K00A7995FX	K00A7995LY	
1 1/2	1 1/2	K00A7995FY	K00A7995LZ	
2	2	K00A7995FZ	K00A7995L0	

<sup>1</sup> Series 78BL balancing ball valve does not include PT ports or handle extensions.

## 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

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

[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.

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