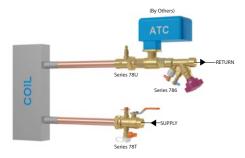
Series 78T/78U Manual Koil-Kit[™] Coil Pack with TA Series 786H Sweat Globe Style Valve





1.0 PRODUCT DESCRIPTION

Available Sizes

• ¹/₂ - 2"/DN15 - DN50

Maximum Working Pressure

• 400 psi/2758 kPa/27.6 bar

Operating Temperature Range

• -4°F to +230°F/-20°C to +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 includes:
 - (1) Series 78T Ball Valve Union Combination Sweat x Sweat
 - (1) Series 78U Union Port Fitting Sweat x Male Union
 - (1) TA Series 786H Balancing Valve Sweat x Sweat

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.

2.0 CERTIFICATION/LISTINGS

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

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

System No.	Location	Spec Section	Paragraph	
Submitted By	Date	Approved	Date	

victaulic.com



3.0 SPECIFICATIONS – MATERIAL

Series 78T Ball Valve Union Combination
Body: Dezincification resistant (DZR) brass alloy
Union: DZR brass with EPDM O-ring
Tailpiece: DZR brass
Stem: Brass
Stem O-Ring Seals: EPDM
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 alloy

TA Series 786H Balancing Valve Valve Body and Bonnet: AMETAL® DZR brass alloy Sealing (Body/Bonnet): EPDM O-ring Valve Plug: AMETAL® Seat Seal: EPDM O-ring Spindle: AMETAL® Slip Washer: Polytetrafluoroethylene (PTFE) Spindle Seal: EPDM O-ring Spring: Stainless steel Hand Wheel: Polyamide and TPE Measuring Points: AMETAL® Measuring Point Seals: EPDM Measuring Point Caps: Polyamide and TPE NOTE

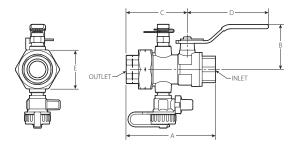
• AMETAL® is the dezincification-resistant brass alloy of IMI TA.





4.0 **DIMENSIONS**

Series 78T Ball Valve Union Combination



	Size						Dimensions				Weight
N Inlet	lomir x	al Outlet	Actua Dia Inlet	al Ou ame x	ter	A Sweat	в	с	D	Е	Approx. (Each)
i	inche	S	ir	nche	S	inches	inches	inches	inches	inches	lb
	DN			mm		mm	mm	mm	mm	mm	kg
1/2		1/2	0.840		0.840	4.10	1.90	2.80	4.00	1.50	1.4
DN15	х	DN15	21.3	Х	21.3	105	49	71	100	37	0.6
3⁄4		3⁄4	1.050		1.050	4.40	2.00	2.90	4.00	1.80	1.7
DN20	х	DN20	26.9	Х	26.9	112	51	73	100	46	0.8
1		1	1.315	~	1.315	5.00	2.20	3.30	5.30	1.80	2.1
DN25	х	DN25	33.7	Х	33.7	126	55	84	135	46	1.0
1 1⁄4		1 1⁄4	1.660		1.660	5.40	2.40	3.50	5.30	2.60	3.5
DN32	х	DN32	42.4	Х	42.4	136	60	89	135	67	1.6
1 1⁄2		1 1⁄2	1.900		1.900	6.10	2.80	3.90	5.90	2.60	4.9
DN40	х	DN40	48.3	Х	48.3	155	71	99	151	67	2.2
2		2	2.375		2.375	6.90	3.00	4.10	5.90	3.30	7.3
DN50	х	DN50	60.3	Х	60.3	174	77	104	151	83	3.3

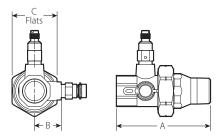
NOTE

• 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



		Si	ze				Dimensions		Weight
No	omir	al		al Oı iame	ıtside ter	Α			
Inlet	x	Outlet	Inlet	Х	Outlet	Sweat	В	С	Approx. (Each)
ir	nche DN	S	i	nche mm		inches mm	inches mm	inches mm	lb kg
1/2		1/2	0.840		0.840	3.48	0.84	1.46	0.7
DN15	х	DN15	21.3	х	21.3	89	21	37	0.3
3⁄4		1/2	1.050		0.840	3.87	1.08	1.81	1.0
DN20	х	DN15	26.9	х	21.3	98	27	46	0.5
	-	3⁄4	1	-	1.050	3.87	1.08	1.81	0.9
		DN20			26.9	98	27	46	0.4
1		1/2	1.315		0.840	4.03	1.08	1.81	1.0
DN25	х	DN15	33.7	Х	21.3	102	27	46	0.5
	_	3⁄4]	_	1.050	4.03	1.08	1.81	1.1
		DN20			26.9	102	27	46	0.5
		1			1.315	4.14	1.08	1.81	1.1
		DN25			33.7	105	27	46	0.5
1 1⁄4	v	1/2	1.660	v	0.840	4.36	1.46	2.63	1.9
DN32	x	DN15	33.7	X	21.3	111	37	67	0.9
		3⁄4			1.050	4.36	1.46	2.63	1.9
	_	DN20		_	26.9	111	37	67	0.9
		1			1.315	4.36	1.46	2.63	1.9
	_	DN25		_	33.7	111	37	67	0.9
		1 1⁄4			1.660	4.19	1.46	2.63	2.1
		DN32			42.4	106	37	67	1.0
1 ½	х	3⁄4	1.900	х	1.050	4.19	1.46	2.63	2.2
DN40	^	DN20	48.3	^	26.9	106	37	67	1
		1			1.315	4.19	1.46	2.63	2.2
	_	DN25	-	_	33.7	106	37	67	1.0
		1 1⁄4			1.660	4.19	1.46	2.63	2.3
	_	DN32	-	-	42.4	106	37	67	1.0
		1 1/2			1.900	4.40	1.46	2.63	2.3
		DN40			48.3	112	37	67	1.0
2	х	1	2.375	х	1.315	4.47	1.76	3.26	3.1
DN50		DN25	60.3		33.7	114	45	83	1.4
		1 1/4			1.660	4.47	1.76	3.26	3.1
	-	DN32	-	-	42.4	114	45	83	1.4
		1½			1.900	4.47	1.76	3.26	3.2
	-	DN40	-	-	48.3	114	45	83	1.5
		2			2.375	4.47	1.76	3.26	3.2
		DN50			60.3	114	45	83	1.5

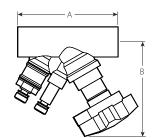
NOTE

• 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 786H Balancing Valve



	Size	Dime	nsions	Weight	
Nominal	Actual Outside Diameter	A End to End	B Center to Top	Approx. (Each)	
inches	inches	inches	inches	lb	
DN	mm	mm	mm	kg	
1/2	0.840	3.54	3.94	1.4	
DN15	21.3	90	100	0.6	
3⁄4	1.050	3.82	3.94	1.4	
DN20	26.9	97	100	0.6	
1	1.315	4.33	4.13	1.9	
DN25	33.7	110	105	0.9	
1 1⁄4	1.660	4.88	4.13	2.4	
DN32	42.4	124	105	1.1	
1 1/2	1.900	5.12	4.72	3.1	
DN40	48.3	130	120	1.4	
2	2.375	6.08	4.72	4.5	
DN50	60.3	154	120	2.0	

4.3 OPTIONAL PARTS

Series 78T/78U Union Tailpieces (Optional)





Female Tailpiece

Sweat Tailpiece

Male Tailpiece

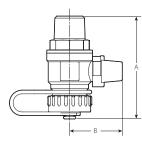
Size Nominal				Victaulic Part Code	
	inches	s	Female Tailpiece	Sweat Tailpiece	Male Tailpiece
1⁄2	х	1/2	P00478Y304	P00478Y504	P00478U404
3⁄4	х	1/2	P00678Y304	P00678Y504	P00678U404
		3⁄4	P00678Y306	P00678Y506	P00678U406
1	х	1/2	P00678Y304	P00678Y504	P00678U404
	_	3⁄4	P00678Y306	P00678Y506	P00678U406
		1	P00678Y310	P00678Y510	P00678U410
1 1⁄4	1¼ X	1/2	_	_	P01278U404
		3⁄4	P01278Y306	P01278Y506	P01278U406
	_	1	P01278Y310	P01278Y510	P01278U410
		1 1⁄4	P01278Y312	P01278Y512	P01278U412
1 ½	х	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	х	1	_	_	P02078U410
		1 1⁄4	P02078Y312	P01278Y512	P02078U412
		1 1⁄2	P02078Y314	P01278Y514	P02078U414
	_	2	P02078Y320	P02078Y520	P02078U420



4.4 OPTIONAL PARTS

Hose End Drain Valve (Optional)

A hose end drain valve is factory-installed on the Series 78T.

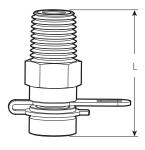


Size	Dime	Dimensions	
NPT	Α	В	
inches	inches	inches	
mm	mm	mm	Part Code
1⁄4	2.04	1.37	P-002-78Y-DRN
6	52	35	F-002-761-DRN
1/2	2.74	1.53	P-004-78Y-DRN
13	70	39	P-004-761-DRN

4.5 OPTIONAL PARTS

Probe Port (Optional)

For Series 78T and Series 78U



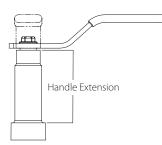
		Dimensions	
		L	
Co	nnection	inches	
	Size	mm	Part Code
	¼ NPT	1.55 39	P-002-78Y-PTP



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 ¼"	P01278Y2HL	P01278Y4HL	
1 ½ – 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:	Flow Coefficient
$Q=Cv\times\sqrt{\Delta}P$	$Q=Kv\times\sqrt{\Delta}P$		Q (Flow)

Flow Coefficient	Gv	Kv
Q (Flow)	GPM	m³/hr
∆P (Pressure Drop)	psi	bar

Series 78T Ball Valve Union Combination

Si	ze	Flow Coefficient (Fully Open)
Nominal	Actual Outside Diameter	Sweat
inches	inches	Cv
DN	mm	Kv
1/2	0.840	7.5
DN15	21.3	6.5
3/4	1.050	17.0
DN20	26.9	14.7
1	1.315	34.0
DN25	33.7	29.4
1 1⁄4	1.660	54.9
DN32	42.4	47.5
1 1⁄2	1.900	85.5
DN40	48.3	74.0
2	2.375	149.7
DN50	60.3	129.5

Series 78U Union Port Fitting

Size		Flow Coefficient (Fully Open)	
Nominal	Actual Outside Diameter	Sweat	
inches	inches	Cv	
DN	mm	Kv	
1/2	0.840	6.1	
DN15	21.3	5.3	
3⁄4	1.050	17.3	
DN20	26.9	14.9	
1	1.315	35.3	
DN25	33.7	30.4	
1 1⁄4	1.660	61.0	
DN32	42.4	52.6	
1 1⁄2	1.900	82.7	
DN40	48.3	71.3	
2	2.375	127.9	
DN50	60.3	110.3	



5.1 PERFORMANCE

TA Series 786H Balancing Valve

Valve Selection Guide

Size		Flow Data				
Nominal	Actual Outside Diameter	Absolute Min Flow	Nominal Range of Flow	Absolute Max Flow		
inches	inches	GPM	GPM	GPM		
DN	mm	LPM	LPM	LPM		
1/2	0.840	0.1	0.6 – 2.8	8.6		
DN15	21.3	0.5	2.3 – 10.6	32.6		
3/4	1.050	0.4	2.0 - 6.0	20.0		
DN20	26.9	1.5	7.6 – 22.7	76.0		
1	1.315	0.5	3.9 – 10.0	30.0		
DN25	33.7	1.7	14.8 – 37.9	114.0		
1 1⁄4	1.660	0.9	5.0 – 15.0	48.0		
DN32	42.4	3.3	18.9 – 56.8	182.0		
1 1/2	1.900	1.3	6.6 – 20.0	66.0		
DN40	48.3	4.9	25.0 – 75.7	250.0		
2	2.375	2.0	12.6 – 36.0	110.0		
DN50	60.3	7.6	47.7 – 136.0	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

TA Series 786H Balancing Valve

Cv Values for Various Handle Settings

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

	C _v Values for Sizes listed below ¹					
No. of Turns	1/2"	3⁄4"	1"	1 1⁄4"	1 1⁄2"	2"
0.50	0.157	0.616	0.693	1.38	2.19	3.03
1.00	0.261	0.903	1.19	2.42	3.93	4.74
1.50	0.401	1.41	2.46	3.88	5.48	7.82
2.00	0.714	2.25	4.21	6.03	7.23	13.2
2.50	1.08	3.13	6.08	8.98	10.6	18.3
3.00	1.69	4.29	7.69	11.4	14.8	24.9
3.50	2.39	5.21	9.01	13.8	18.7	31.2
4.00 ²	2.96	6.23	9.93	16.4	22.3	37.3

 1 C_v = GPM at a ΔP of 1 psi/7 kPa) through the valve at any given setting. 1 psi = 2.31 ft. of H_2O

² 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.

Actual Flow = $\frac{q_{Calculated}}{\sqrt{s_G}}$

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 Δp 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, Δp in Ft. of H₂O

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

q in GPM, ∆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

	Nominal Kit Size	Expected Control Valve Size (Series 78U Outlet and Valve Size Inlet)	Balancing Valve Size	Without Customer-Supplied ATC Valve	
Kit Description				Without PT Ports and Handle Extensions	With PT Ports and Handle Extensions
				Victaulic Part Code	
	1/2	1/2	1/2	K000799P51	K00A799A4J
	3⁄4	1/2	1⁄2	K000799462	K00A7998TB
	3⁄4	1/2	3⁄4	K000799EV5	K00A7998TC
	3⁄4	3⁄4	3⁄4	K000799206	K00A7995JI
	1	1/2	1/2	K00A7998U0	K00A7998TD
	1	1/2	1	K000799C15	K00A7998TE
78T Sweat x Sweat, 78U Sweat x Male Union, 786H Sweat x Sweat without 2' hoses attached	1	3/4	3⁄4	K00A7998U1	K00A7998TF
	1	3⁄4	1	K000799B93	K00A7998TG
	1	1	1	K00A799BSX	K00A7995JJ
	1 1⁄4	3⁄4	1 1⁄4	K00A7998U2	K00A7998TH
	1 1⁄4	1 1⁄4	1 1⁄4	K000799EV6	K00A7995JK
	1 1/2	1 1⁄4	1 1/2	K00A7998U6	K00A7998TI
	1 1/2	1 1⁄2	1 1⁄2	K000799Y70	K00A799A4M
	2	1 1⁄2	2	K00A7998U7	K00A7998TJ
	2	2	2	K000799P53	K00A7995JL



6.0 NOTIFICATIONS



- 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 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

Warranty

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

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