

ENGINEERING
TOMORROW

Danfoss

ESBE VTA Series Lead-Free Thermostatic Mixing Valves Datasheet

Keep **water temperatures safe** in point of source applications with **thermostatic mixing valves.**



Low maintenance, easy-to-install thermostatic mixing valves (TMV) are designed to protect against accidental scalding, & increase amounts of available hot water.

HIGH

Temperatures within source reduce growth of Legionella while safeguarding against scalding.

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Applications:



The compact ESBE VTA series are lead-free (LF) thermostatic mixing valves (TMV) designed for point of source in domestic hot water distribution systems and/or regulation of supply in hydronic heating systems. The series of LF valves meet the NSF/ANSI 372 standards for 'lead free' requirements.

The VTA series of valve replaces the legacy 20 Series and 30MR Series of valves. The VTA Series are available in four temperature ranges:

- 85 to 120°F (30 to 49°C) (Domestic/ Hydronic)
- 95 to 140°F (35 to 60°C) (Domestic/ Hydronic)
- 70 to 110°F (20 to 45°C) (Hydronic)
- 85 to 160°F (30 to 70°C) (Hydronic)

As a point of source for domestic hot water application, the thermostatic control within the VTA valve accommodates increased water

temperature at the source while maintaining appropriate water temperatures out to the fixtures. With a higher temperature at the source, the installation benefits of the VTA series include:

- Additional volume of domestic hot water to the fixtures at an appropriate regulated temperature
- Preventative measures to reduce growth of Legionella by maintaining a high temperature within the source & safeguarding against scalding down stream

In the event there is a cold-water supply failure, the hot water supply closes automatically.

The angle flow pattern of the ESBE VTA series tmvs combine high quality performance with remarkable ease of installation and servicing.

Specifications:

- Conforms to ASSE-1017*
* Ranges 85°-120°F & 95°-140°F only
- Anti-scald function
- Designed for mixing purposes
- Long life and easy maintenance
- Quiet operation
- Compact design and lightweight snap-on cover for dirt protection and to prevent unauthorized adjustment or tampering
- Cover label for recording setting information including recorded outlet temperature and date installed
- Available connections:
 - Threaded body (FNPT)
 - Solder (Union connection)
 - CPVC (Union connection)
- Maximum working pressure: 150 psi (10 bar) / CPVC: 80 psi (5.5 bar)
- Maximum differential pressure between hot and cold ports: 44 psi (3 bar)
- Maximum system differential pressure between outlet and inlet ports: 72 psi (5 bar)
- Maximum hot water inlet temperature: 194°F (90°C)
- Minimum required flow for proper temperature regulation:
 - All valves except 1" NPT: 0.9 GPM
 - 1" NPT valve size: 2.0 GPM
- Up to a 50% glycol mixture for closed loop hydronic system

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Ordering Information:

Valve Connection Type	Valve Size	Temperature Range	Cv	Code No.
Female NPT	¾"	70° to 110°F (20° to 45°C)	1.9	065B8868LF
	¾"	85° to 120°F (30° to 49°C)	1.9	065B8869LF
	¾"	95° to 140°F (35° to 60°C)	1.9	065B8870LF
	¾"	85° to 160°F (30° to 70°C)	1.9	065B8871LF
	1"	85° to 120°F (30° to 49°C)	4.1	31622111LF
	1"	95° to 140°F (35° to 60°C)	4.1	31622011LF
Union Solder & CPVC <small>(Requires tailpiece kits, sold separately. See below.)</small>	-	85° to 120°F (30° to 49°C)	1.9	065B8877LF
	-	95° to 140°F (35° to 60°C)	1.9	065B8878LF
	-	85° to 160°F (30° to 70°C)	1.9	065B8872LF
Accessories	Size	Description		Code No.
Tailpiece Kits <small>(for Solder & CPVC)</small>	½"	solder tailpieces		065B8901
	¾"	solder tailpieces		065B8892
	¾"	CPVC (follow pipe manufacturers instructions)		065B8898

	Spare Parts			
	Item No.	Description	Temperature Range	Code No.
	1	Cap for All Except 1" NPT	-	065B8846
	1-5	Repair Kit for All Except 1" NPT	70° to 110°F (20° to 45°C)	065B8842
			85° to 120°F (30° to 49°C)	065B8843
			95° to 140°F (35° to 60°C)	065B8844
		Repair Kit for 1" NPT	85° to 120°F (30° to 49°C)	37101600
			95° to 140°F (35° to 60°C)	37101400

Temperature Setting:

VTA series of tmvs will provide a mixed water temperature according to the following table. The outlet temp. stated are approximate, based on the given hot water supply temp. & a cold water supply of 50°F (10°C). For other cold water temp. correct the outlet temp. by 1°F for every 10°F (or 1°C for every 10°C) deviation from 50°F (10°C), up or down.

Hot Water Temp.	70° - 110°F (20° to 45°C)						85° - 120°F (30° - 49°C)						95° - 140°F (35° - 60°C)					
	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
120°F (49°C)	67(19)	74(23)	81(27)	87(31)	94(34)	109(43)	80(27)	90(32)	97(36)	102(39)	107(42)	115(46)	95(35)	106(41)	115(46)	119(48)	120(49)	120(49)
140°F (60°C)	68(20)	75(24)	82(28)	90(32)	97(36)	113(45)	81(27)	91(33)	99(37)	104(40)	109(43)	117(47)	97(36)	108(42)	117(47)	126(52)	133(56)	140(60)
160°F (70°C)	69(21)	76(24)	84(29)	92(33)	100(38)	118(48)	82(28)	93(34)	100(38)	106(41)	112(44)	118(48)	99(37)	109(43)	118(48)	127(53)	135(57)	145(63)
180°F (82°C)	70(21)	77(25)	86(30)	95(35)	102(39)	122(50)	82(28)	95(35)	102(39)	108(42)	114(46)	120(49)	100(38)	111(44)	120(49)	129(54)	136(58)	149(65)

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Flow Pattern & Capacity:

	<p>Pattern:</p> <p>The VTA series provides a mixing flow pattern for both a domestic hot water (DHW) application and for hydronic heating systems. If a diverting flow pattern is required refer to the VTA572 datasheet located on heating.danfoss.us (Code No.31700200).</p>																																	
<p>Flow vs. Pressure Drop for VTA Series</p> <table border="1"> <caption>Approximate data points from the Flow vs. Pressure Drop graph</caption> <thead> <tr> <th>Pressure drop (psi)</th> <th>Flow (Gpm Water) - 1" NPT Cv 4.1</th> <th>Flow (Gpm Water) - All others Cv 1.9</th> </tr> </thead> <tbody> <tr> <td>0.6</td> <td>3.5</td> <td>1.2</td> </tr> <tr> <td>1.0</td> <td>4.5</td> <td>1.6</td> </tr> <tr> <td>2.0</td> <td>6.0</td> <td>2.2</td> </tr> <tr> <td>4.0</td> <td>8.5</td> <td>3.2</td> </tr> <tr> <td>6.0</td> <td>10.5</td> <td>3.8</td> </tr> <tr> <td>8.0</td> <td>12.0</td> <td>4.2</td> </tr> <tr> <td>10.0</td> <td>13.5</td> <td>4.5</td> </tr> <tr> <td>20.0</td> <td>18.0</td> <td>6.0</td> </tr> <tr> <td>40.0</td> <td>24.0</td> <td>8.0</td> </tr> <tr> <td>60.0</td> <td>28.0</td> <td>9.5</td> </tr> </tbody> </table>	Pressure drop (psi)	Flow (Gpm Water) - 1" NPT Cv 4.1	Flow (Gpm Water) - All others Cv 1.9	0.6	3.5	1.2	1.0	4.5	1.6	2.0	6.0	2.2	4.0	8.5	3.2	6.0	10.5	3.8	8.0	12.0	4.2	10.0	13.5	4.5	20.0	18.0	6.0	40.0	24.0	8.0	60.0	28.0	9.5	<p>Capacity:</p> <p>The flow rate through the VTA series valve at any given pressure drop can be determined from the capacity diagram.</p>
Pressure drop (psi)	Flow (Gpm Water) - 1" NPT Cv 4.1	Flow (Gpm Water) - All others Cv 1.9																																
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Domestic Hot Water Sizing:

For domestic hot water systems the VTA series can be sized based on the number of fixture units the valve will supply.

Valve selection process:

1. Determine the type and number of fixtures to be supplied by the mixing valve.
2. Assign fixture units from Table 1 for each fixture type.
3. Add the total number of fixture units.
4. Confirm the mixing valve has sufficient capacity from Table 2.

Example:

A residential home with 2-1/2 baths (3 bathroom sinks and 2 baths or **7 fixture units**), kitchen (1 kitchen sink and a dish washer or **3 fixture units**), and a clothes washer (**2 fixture units**). Hot water supply from the water heater is $\frac{3}{4}$ ". The total is **12 fixture units**.

Table 1. Fixture Units

Bathroom sink	1
Kitchen Sink	2
Bath	2
Shower	2
Clothes Washer	2
Dish Washer	1

Table 2. VTA Series Capacity

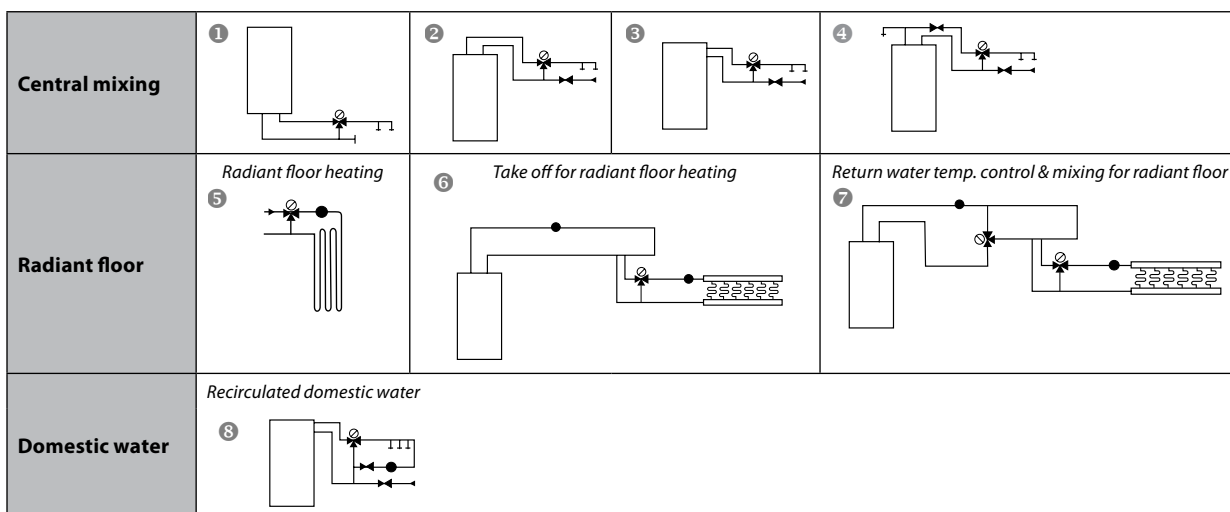
Valve Size	Max. Fixture Units
All except 1" NPT	16
1" NPT	30

Note: Certain fixtures such as hot tubs, roman tubs or spa showers may require a high volume of hot water. The VTA series may not be capable of providing sufficient hot water to these fixtures.

Typical Piping:

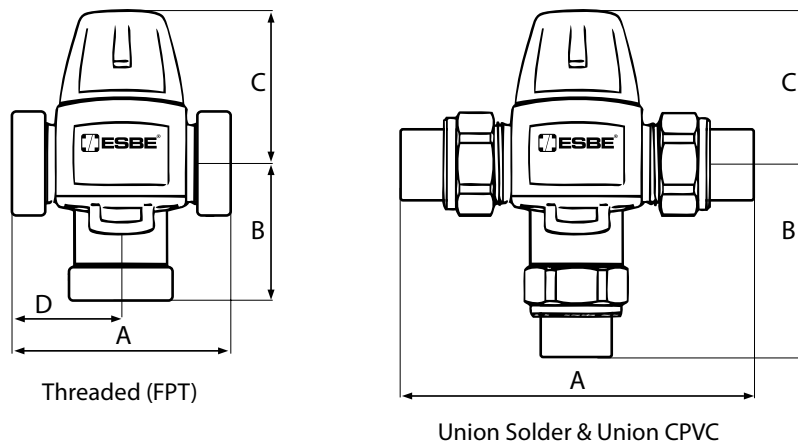
VTA series of tmvs can be used to safely supply domestic hot water in residential, commercial, institutional, and industrial installations.

The VTA series are also well suited for use in hydronic heating systems requiring a reduced hot water temperature such as in radiant heating systems, heat pumps, and solar heating systems.



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Dimensions & Weights:



Description	Dimensions, in (mm)				Weight lbs (kg)
	A	B	C	D	
union valve w/ 1/2" solder tailpcs	4.1" (104)	2.3" (59)	2.1" (53)	2.0" (52)	1.7 (0.8)
union valve w/ 3/4" solder tailpcs	4.8" (122)	2.7" (69)	2.1" (53)	2.4" (61)	1.7 (0.8)
union valve w/ 3/4" CPVC	4.7" (119)	2.6" (66)	2.1" (53)	2.4" (83)	1.5 (0.7)
3/4" valve female NPT connections	2.8" (71)	1.7" (43)	2.1" (53)	1.4" (36)	1.1 (0.5)
1" valve female NPT connections	3.75" (95)	2.5" (63)	2.4" (61)	1.9" (48)	2 (0.95)

Typical Specification:

A Thermostatic Mixing Valve shall be installed on the outlet of the water heater for the distribution of tempered water to the fixtures. The thermostatic mixing valve shall have an internal self regulating element housed within a brass lead free constructed valve body. The valve shall have a protective plastic body cover and snap-on cap to prevent unauthorized tampering. The valve shall be an ESBE VTA thermostatic mixing valve series.

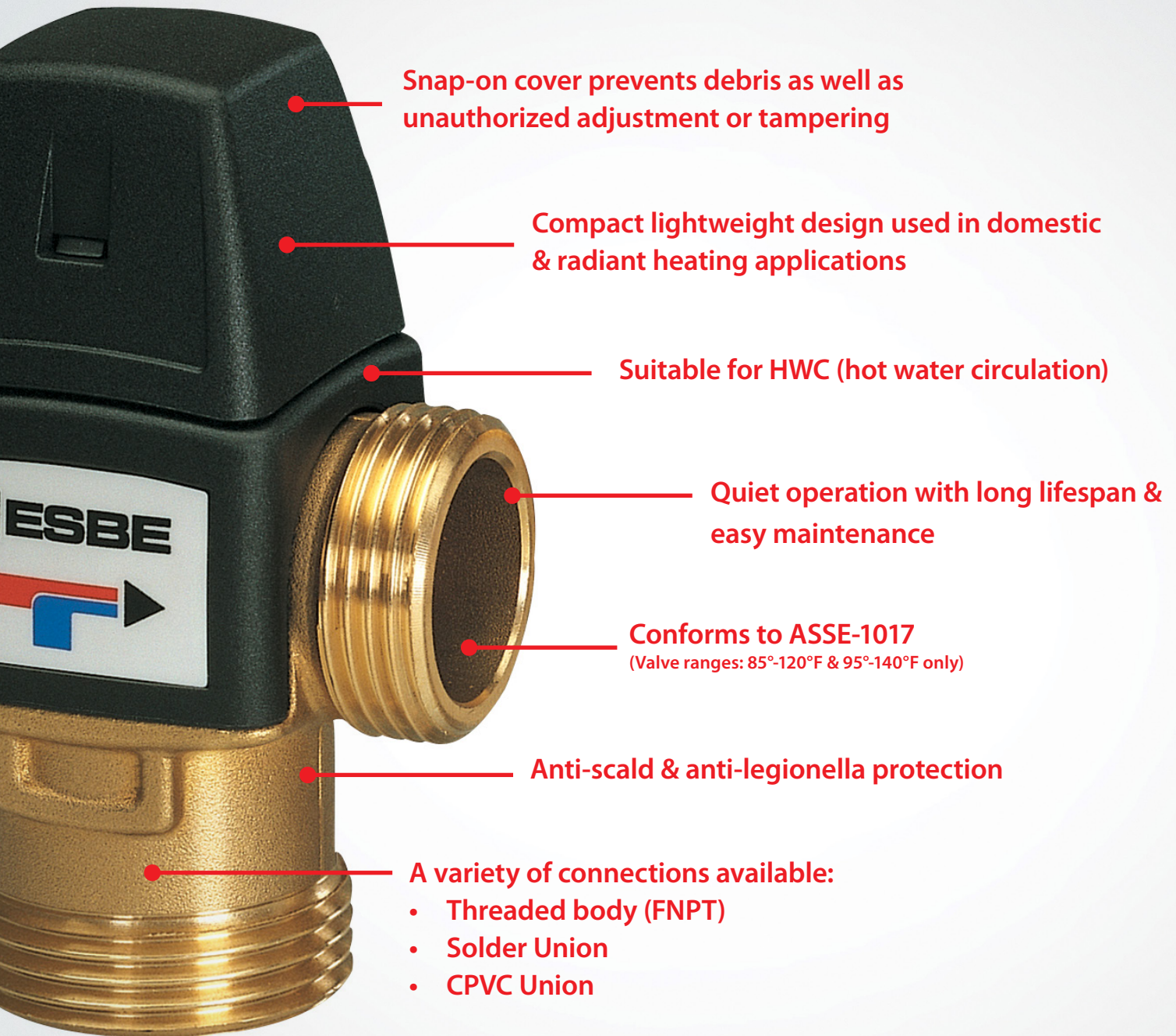
A Thermostatic Mixing Valve for hydronic heating applications shall be installed prior to the circulator for the system or zone. The thermostatic mixing valve shall have an internal self regulating element housed within a brass lead free constructed valve body. The valve shall have a protective plastic body cover and snap-on cap to prevent unauthorized tampering. The valve shall be an ESBE VTA series thermostatic mixing valve series.

Learn how VTA thermostatic mixing valves helped provide **year-round comfort & reduced water temperatures** for offices in New York City.

Read the Interchurch Center case story: bit.ly/Interchurch



VTA Series **Features:**



Snap-on cover prevents debris as well as unauthorized adjustment or tampering

Compact lightweight design used in domestic & radiant heating applications

Suitable for HWC (hot water circulation)

Quiet operation with long lifespan & easy maintenance

Conforms to ASSE-1017
(Valve ranges: 85°-120°F & 95°-140°F only)

Anti-scald & anti-legionella protection

A variety of connections available:

- Threaded body (FNPT)
- Solder Union
- CPVC Union