

ENGINEERING  
TOMORROW



North America

# Hydronic Specialties Controls Catalog & Application Guide

Radiant Heating & Cooling, Snow/Ice Melt Controls,  
Heat Exchanger Control Solutions & more...

**Choose**

your application &  
find the Danfoss  
solution that fits  
your needs.

[heating.danfoss.us](http://heating.danfoss.us)

# New **Application Focused** Catalog Makes It **Easier** to Find the Products You Need!

Danfoss makes it easier than ever to find the correct solution for your heating or cooling application. Simply find the application that fits your HVAC system needs and look for the corresponding color coded tabs throughout the catalog. This catalog also includes application drawing examples of typical applications for each of the sections.

New Application and Product Based Sections Include:

- **2-Way Control & Mixing**
- **3-Way Mixing & Diverting**
- **4-Way Mixing**
- **Actuators for Rotary Mixing Valves**
- **Set Point Controls**
- **Boiler Return Protection, Solid Fuel & Solar Controls**
- **Injection Mixing**
- **Thermostats**
- **Snow Melt Controls**
- **Balancing**

Danfoss has been manufacturing quality comfort control solutions for over 80 years. Our wide variety of products help to accurately control your hydronic system, leading to increased system efficiency, occupant comfort, and maximized energy savings.



To learn more about our products please visit our website.

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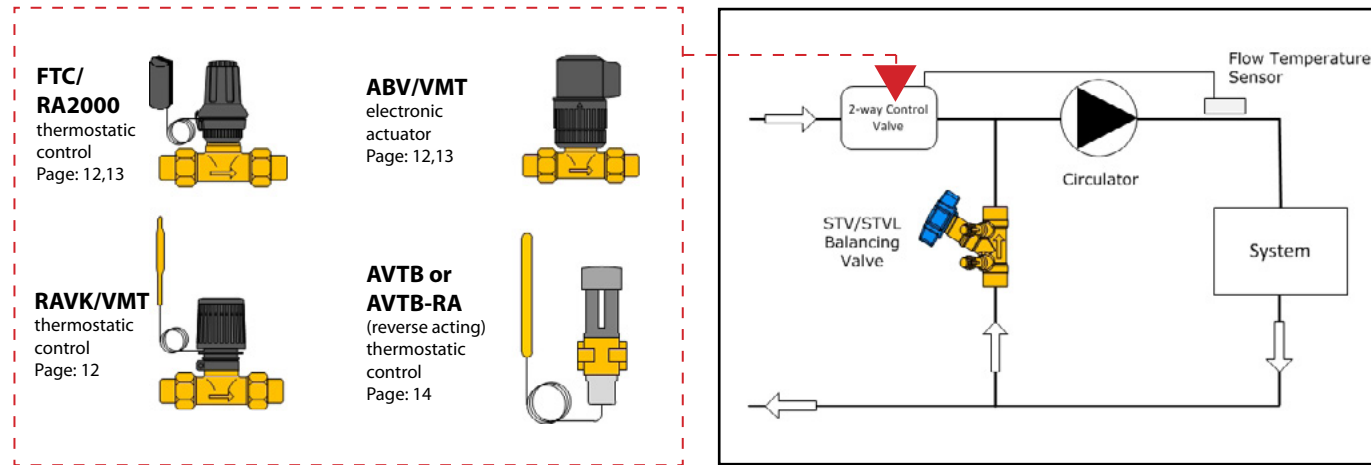


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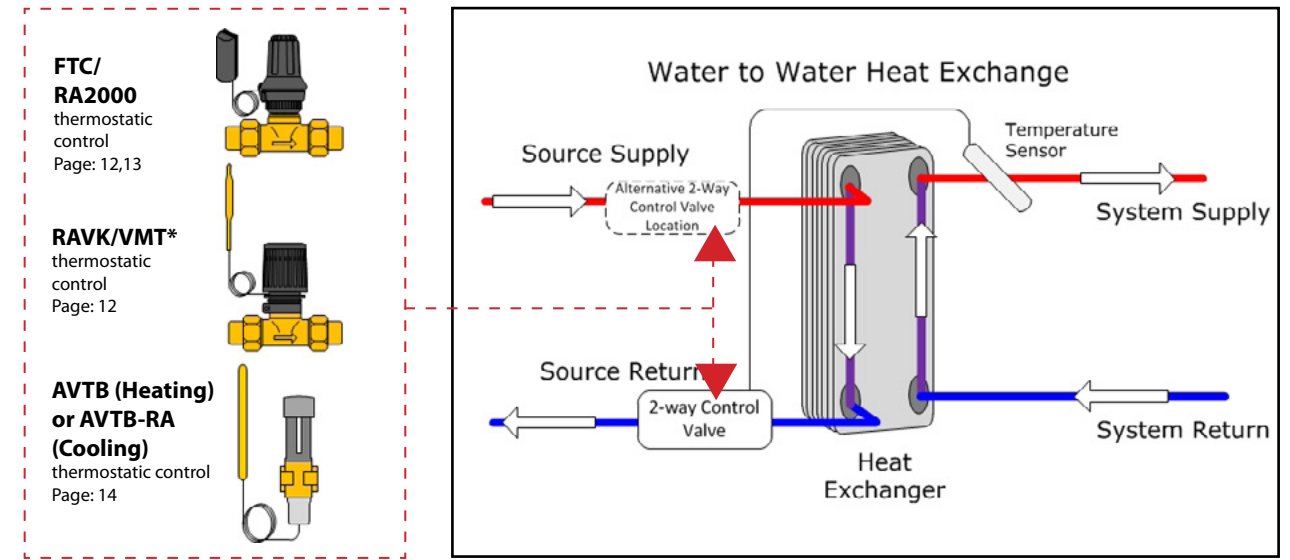
## 2-Way Thermostatic or Electronic Injection Mixing Controls

Typical piping schematic showing two-way injection mixing allows for flow temperature control of secondary circuits.



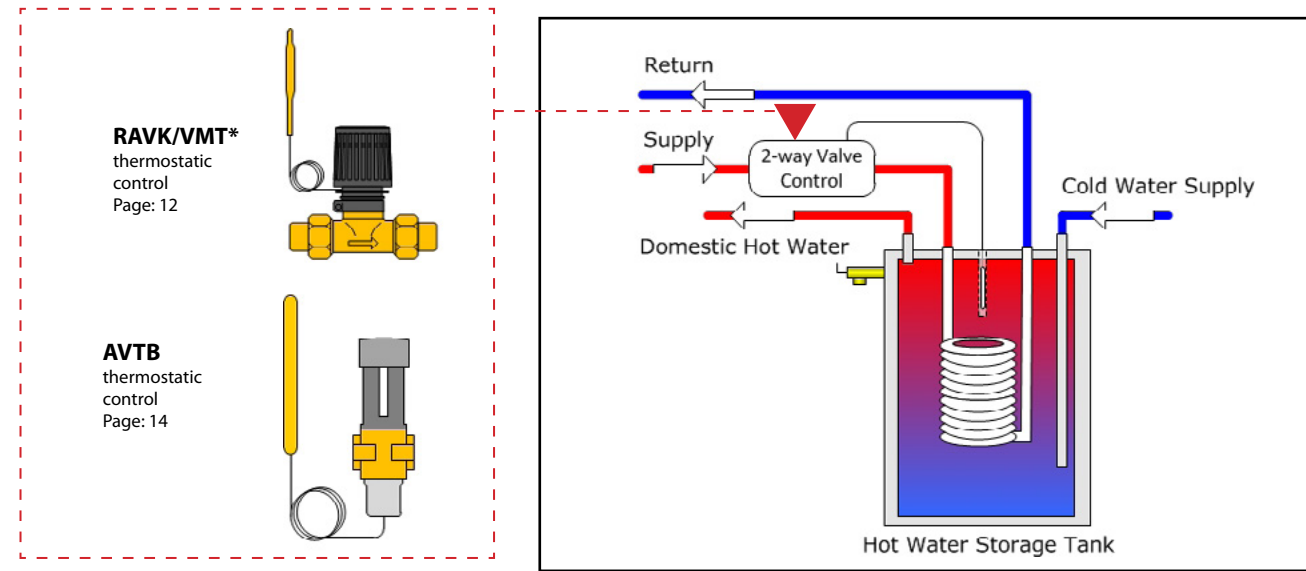
## 2-Way Plate Heat Exchanger Controls

Control of secondary temperature for heating, snow/ice melt and domestic hot water. Cooling application not shown. \*See alternative TWA (24V) option in Thermostatic Radiator Valve Catalog.



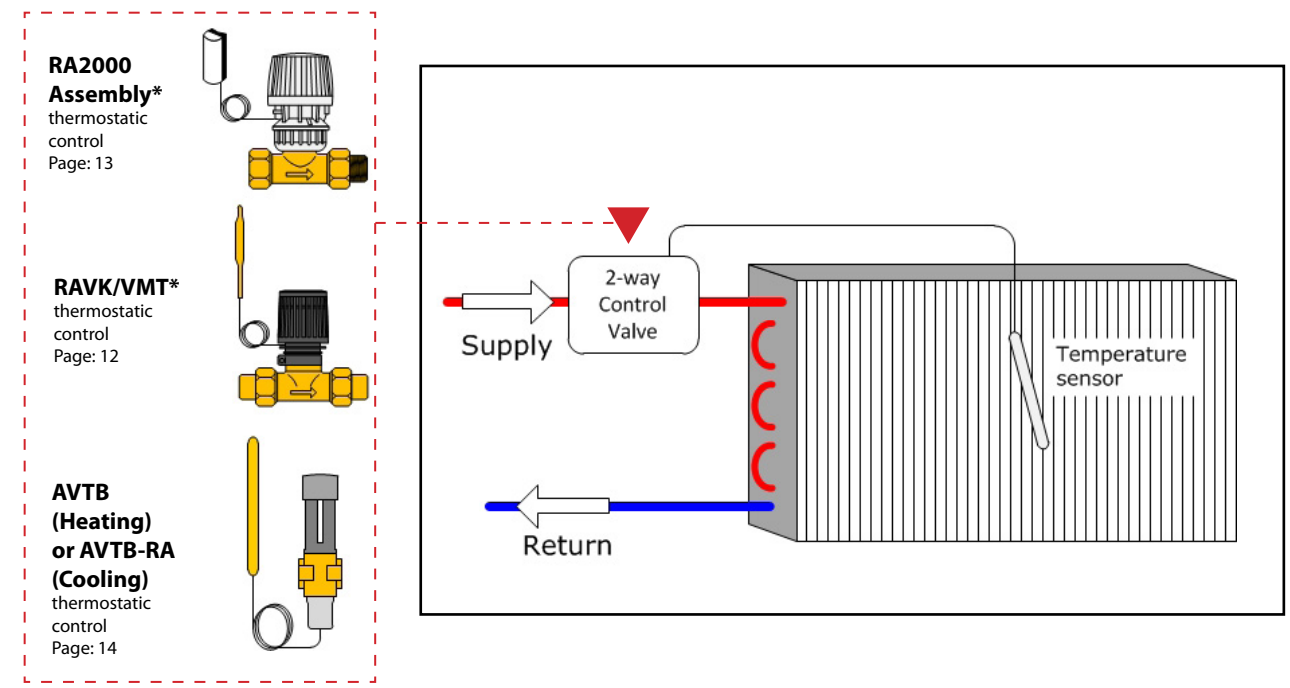
## 2-Way Thermostatic or Electronic Domestic Hot Water Controls

Typical piping schematic showing two-way control of domestic hot water storage tanks. \*See alternative TWA (24V) option in Thermostatic Radiator Valve Catalog.



## 2-Way Water to Air Heat Exchanger Controls

Two-way thermostatic control of discharge air temperature from an air handler. \*See alternative TWA (24V) option in Thermostatic Radiator Valve Catalog.



2-WAY INJECTION MIXING

2-WAY PLATE HEAT EXCHANGER CONTROLS

2-WAY DOMESTIC HOT WATER CONTROLS

2-WAY WATER TO AIR HEAT EXCHANGER CONTROLS

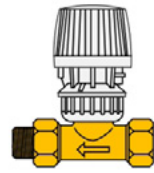
# Application Drawings

## 2-Way Single Loop Thermostatic Radiator Valve Controls

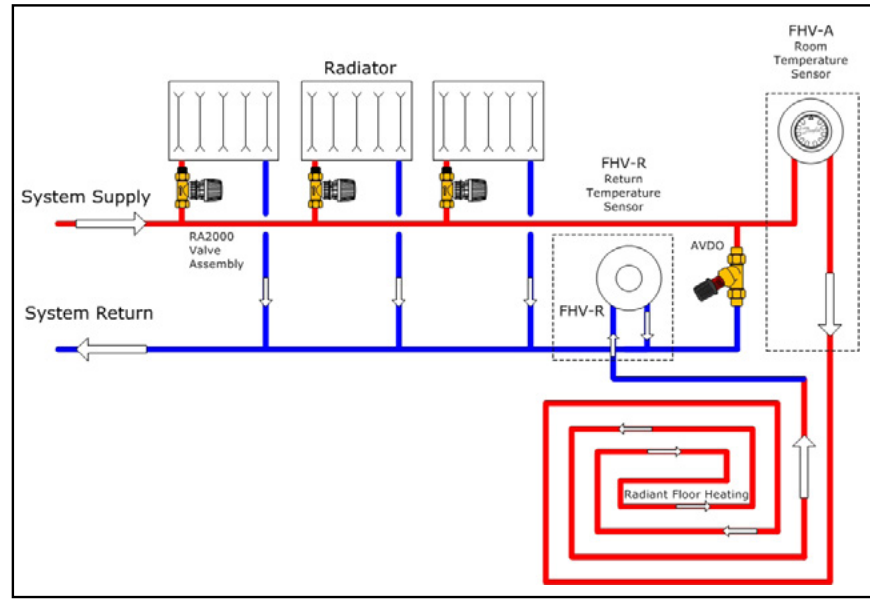
FHV regulating valves provide temperature control of individual under-floor heated rooms and systems using floor heating in conjunction with radiators. \*See Thermostatic Radiator Valve catalog for further information on RA2000 and AVDO.

2-WAY SINGLE LOOP THERMOSTATIC RADIATOR VALVE CONTROLS

**RA2000 Assembly\***  
thermostatic control  
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**FHV-A, FHV-R**  
single loop control valves  
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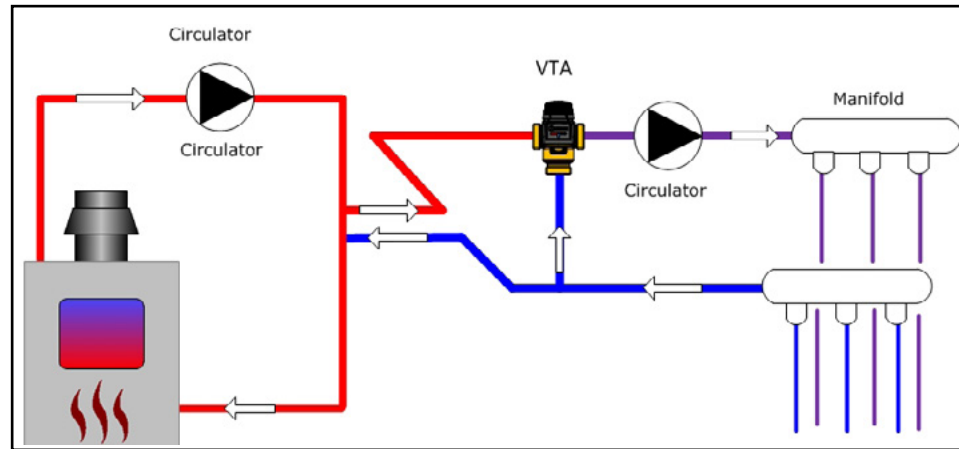
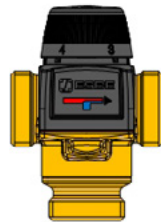


## 3-Way Thermostatic Mixing Controls

Typical piping schematic for temperature control of water feeding radiant floor circuits.

3-WAY THERMOSTATIC MIXING CONTROLS

**VTA THERMOSTATIC MIXING VALVE**  
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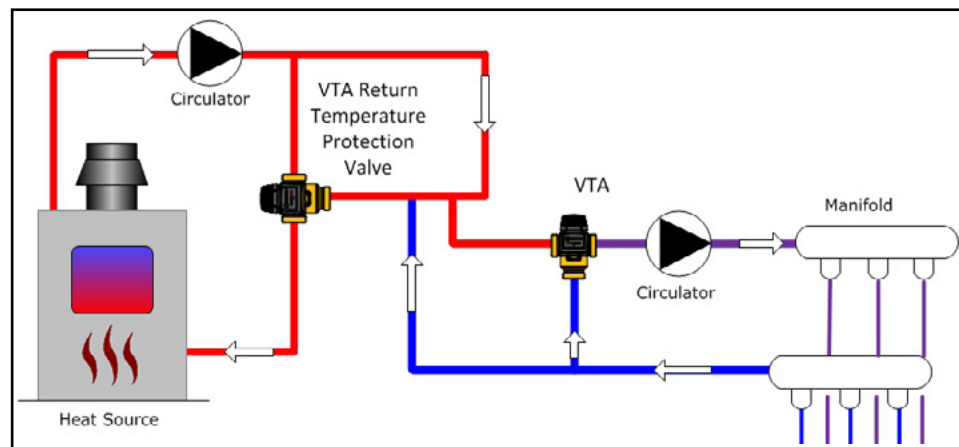
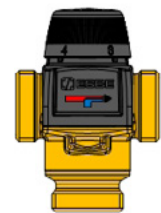


## 3-Way Return Water Temperature Control & Mixing

Typical piping schematic for temperature control of water feeding radiant floor circuits and minimum return temperature protection for the heat source.

3-WAY RETURN WATER TEMP. CONTROL & MIXING

**VTA THERMOSTATIC MIXING VALVE**  
Page: 15-16



## 3-Way Mixing with Setpoint Control

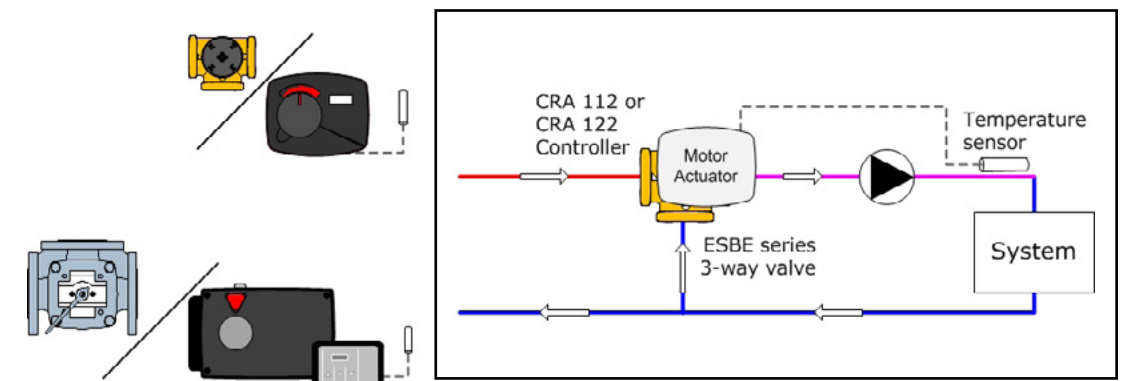
Typical piping schematic for electronic temperature control provides a fixed temperature for radiant floor circuits or snow/ice melt. \*CRA 112/122 can control up to two unique temperature setpoints based on external input signal.

**VRG SERIES**  
Page: 15

**CRA112\***  
Setpoint Control  
Page: 19

**TYPE F SERIES**  
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**CRA122\***  
Setpoint Control  
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## 3-Way Diverting with Setpoint Control

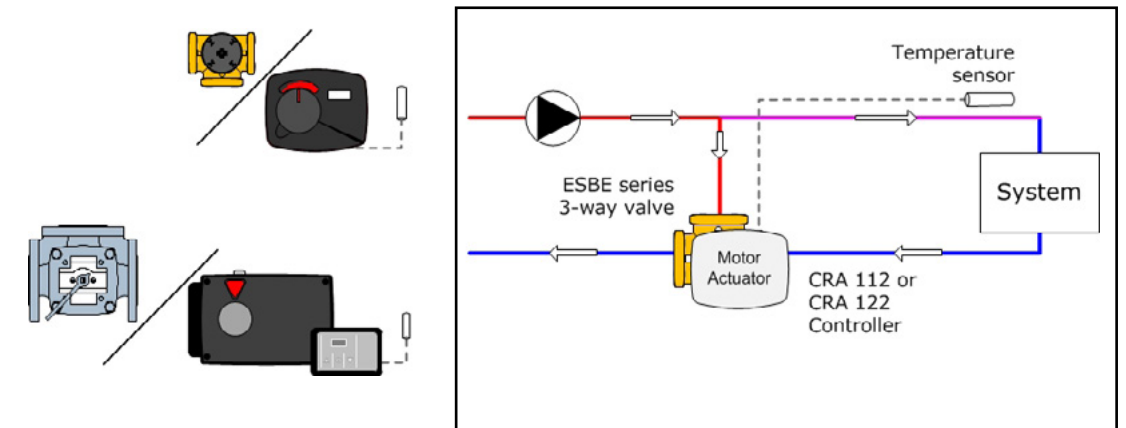
Typical piping schematic for electronic temperature control provides a fixed space or discharge temperature for a variety of uses such as air handlers. Alternate sensor location allows for return temperature protection to heat source. \*CRA 112/122 can control up to two unique temperature setpoints based on external input signal.

**VRG SERIES**  
Page: 15

**CRA112\***  
Setpoint Control  
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**TYPE F SERIES**  
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**CRA122\***  
Setpoint Control  
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## 3-Way Mixing or Diverting

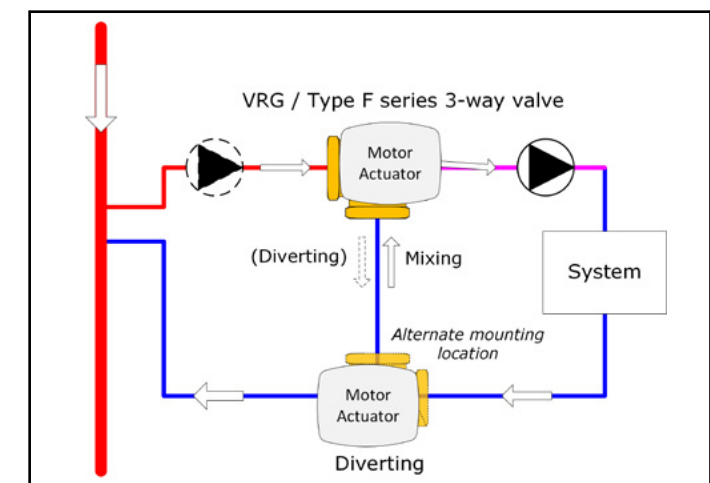
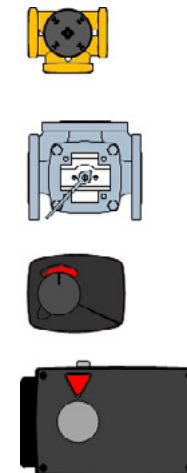
Typical primary/secondary piping schematic.

**ESBE VRG SERIES**  
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**TYPE F SERIES**  
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**ARA 600 SERIES**  
Page: 18

**SERIES 90**  
Page: 18



3-WAY MIXING WITH SETPOINT CONTROL

3-WAY DIVERTING WITH SETPOINT CONTROL

3-WAY MIXING OR DIVERTING

### 4-Way Mixing with Setpoint Control

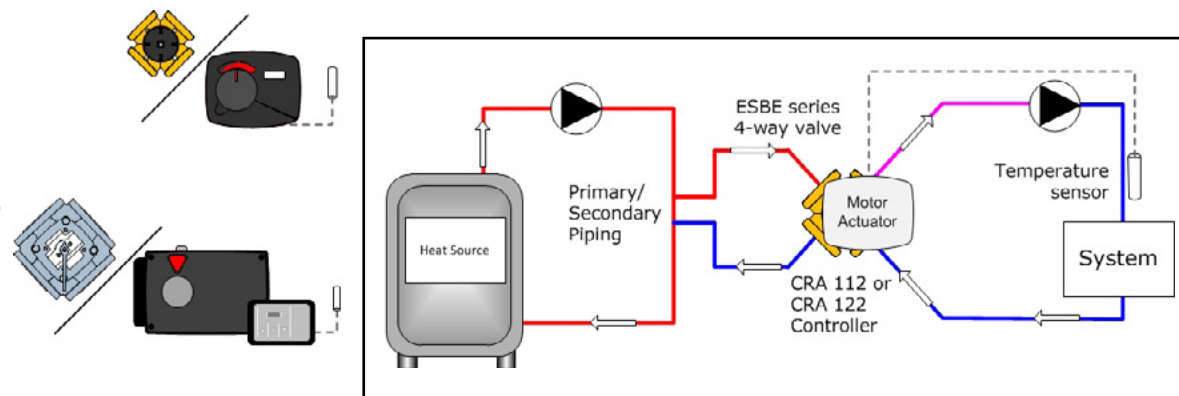
Typical 4-way motorized valve for use with radiant floor heating. For use with outdoor reset use ARA600 or Series 90 actuators.

**VRG SERIES**  
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**CRA112**  
Setpoint Control  
Page: 19

**TYPE F SERIES**  
Page: 17

**CRA122**  
Setpoint Control  
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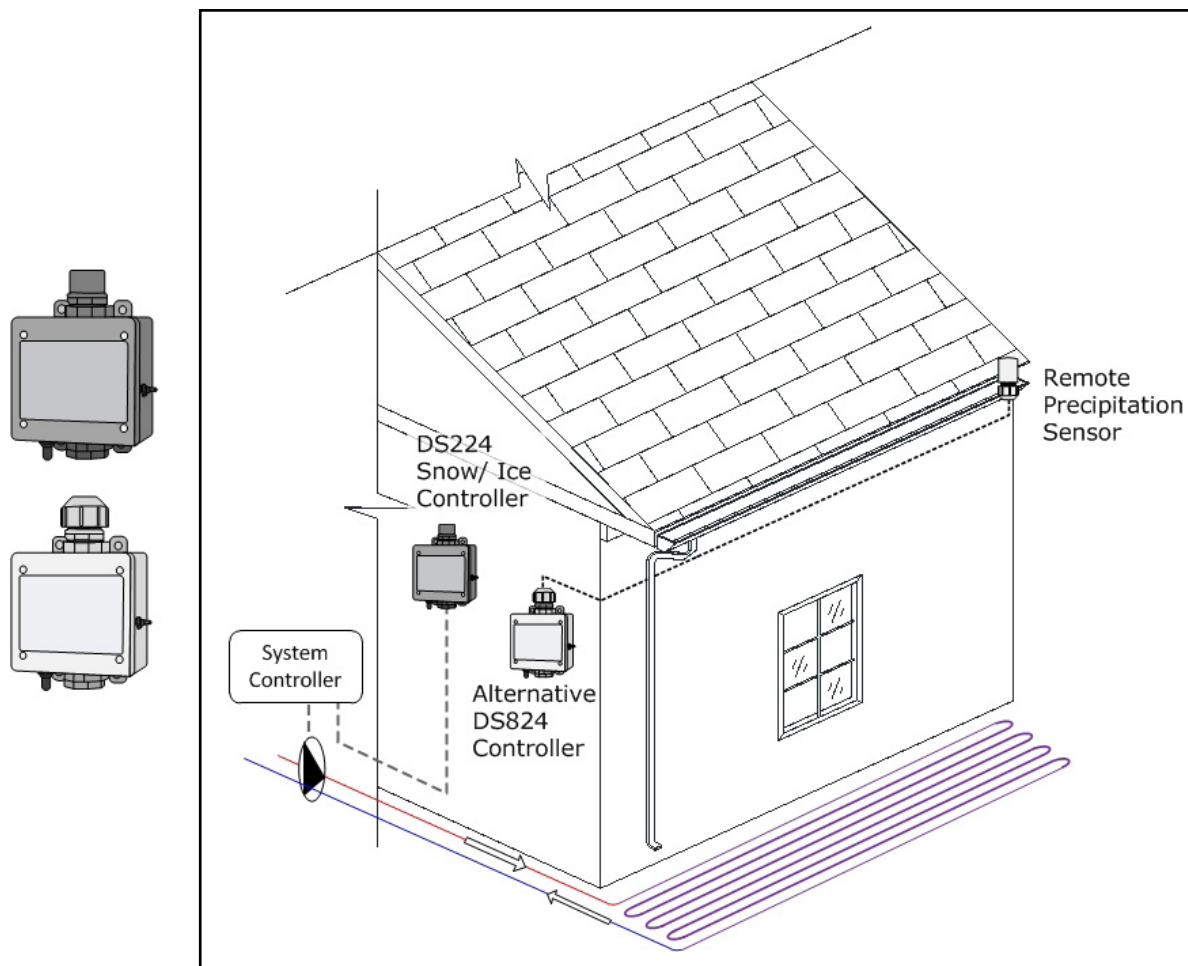


### Snow & Ice Melt - 1 Zone Activation Controller

Economical control of single zone snow/ice melt systems.

**DS224**  
Snow/Ice  
Controller  
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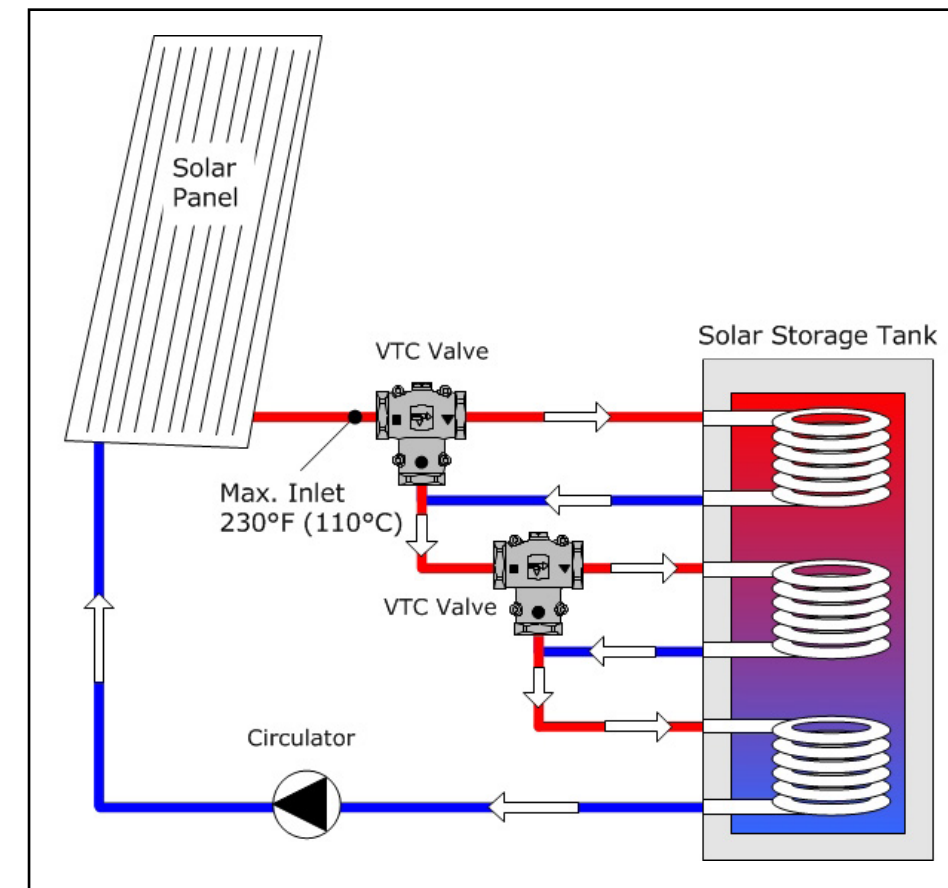
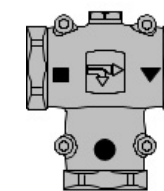
**DS824**  
Snow/Ice  
Controller  
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### Solar & Solid Fuel Boiler Specialties

Efficient charging of storage tanks through solar heating provides maximum output and low tank stratification.

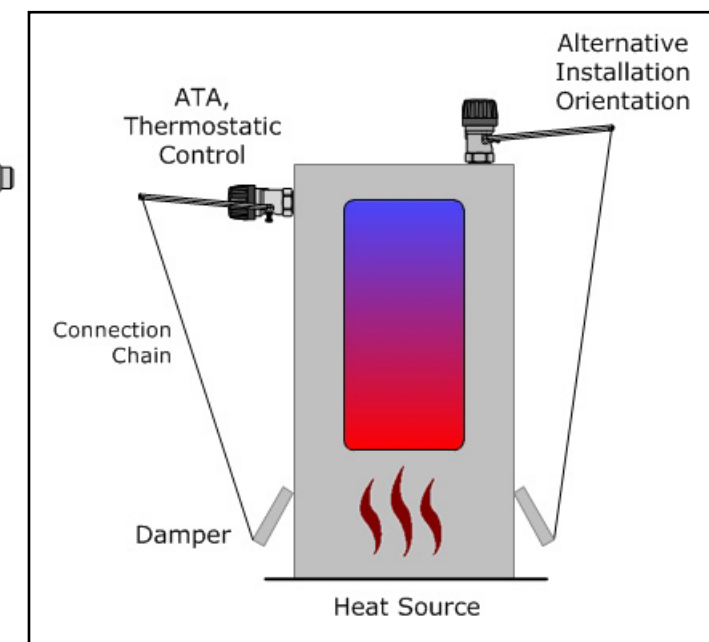
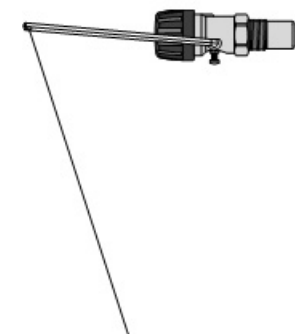
**VTC**  
Thermic Valve  
Page: 16



### Thermostatic Damper Control Regulator

ATA draft regulator maintains or regulates the water temperature of solid fuel boilers.

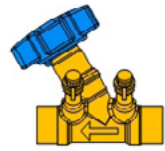
**ATA**  
Draft Regulator  
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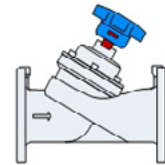
## Circuit Balancing Valves

Manual balancing of hydronic heating and cooling circuits. \*See Thermostatic Radiator Valve Catalog for additional options.

**STV/STVL**  
Balancing Valve  
Page: 22



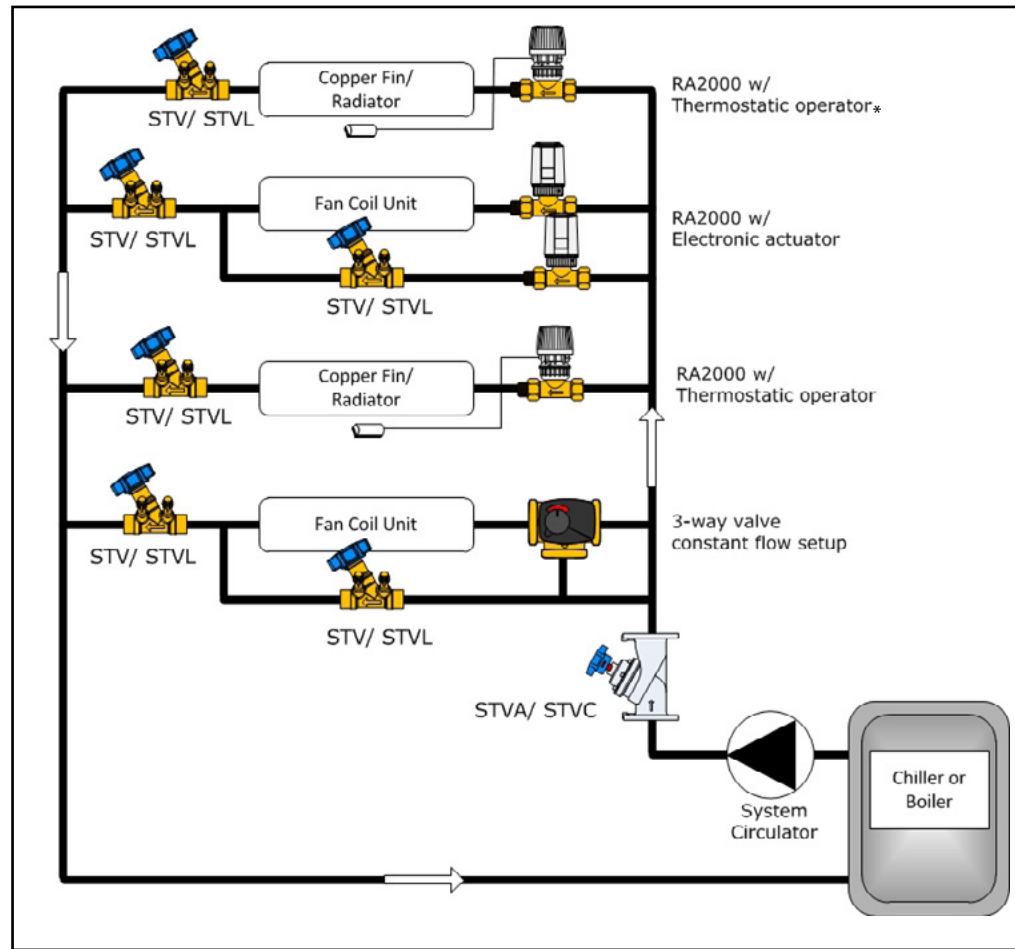
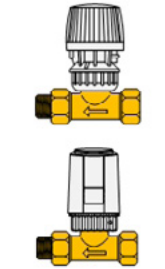
**STVA/STVC**  
Balancing Valve  
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**3-WAY VRG/ARA**  
3-Way Valve & Proportional Actuator  
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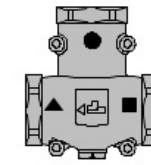
**RA2000\***  
with Thermostatic Operator or Electronic Actuator  
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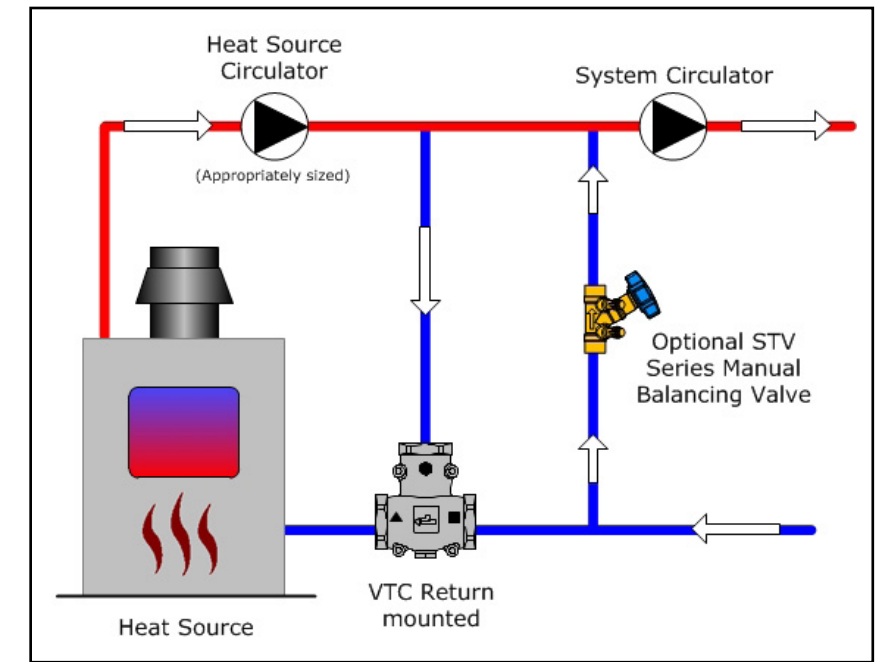
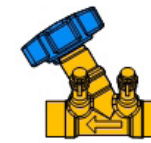
## Boiler Water Return Temperature Protection on Converted Gravity Heating Systems

Automatically maintains a minimum return water temperature (various temperature settings available).

**VTC**  
Thermic Valve  
Page: 16



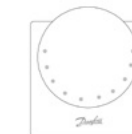
**STV Series**  
Manual Balancing Valve  
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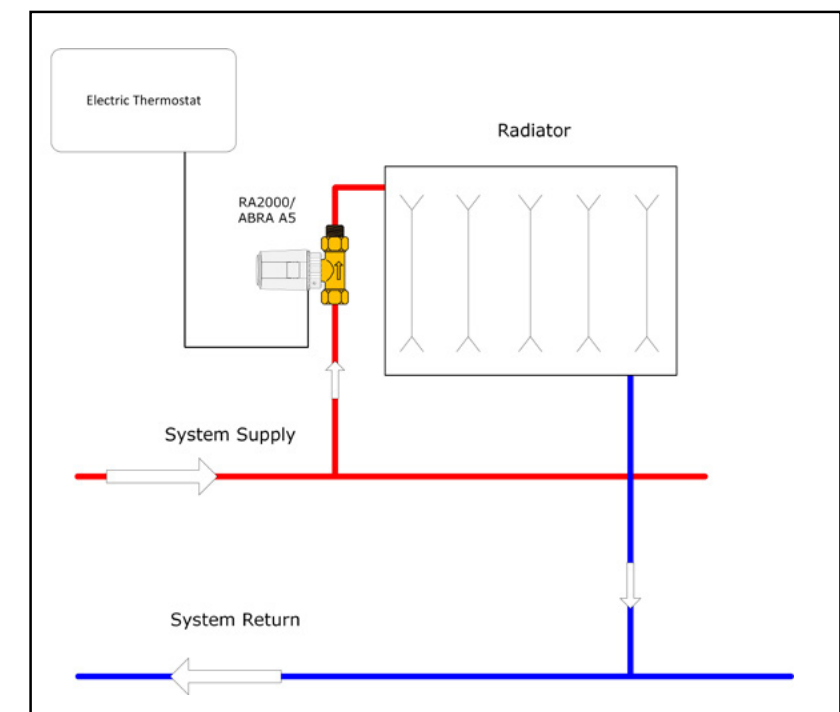
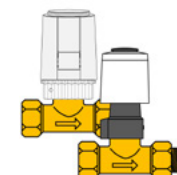
## Zoning with Electronic Room Thermostats

Choose from a variety of analog, digital, or programmable electronic thermostats with either ambient temperature sensing or ambient temperature plus floor temperature sensing. \*See website for additional RA2000 valves.

**RMT**  
Thermostat  
Page: 21



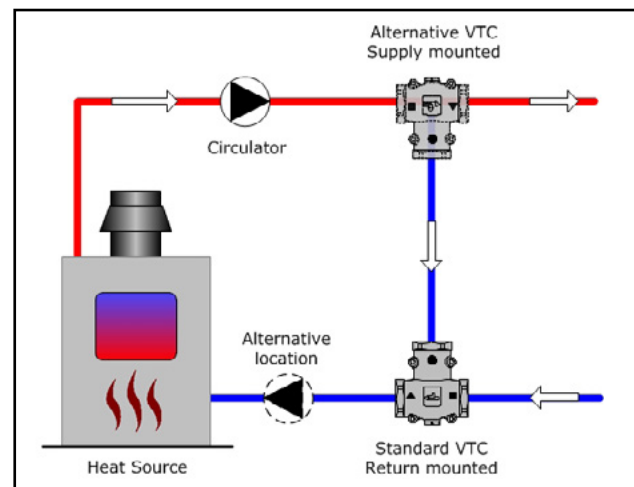
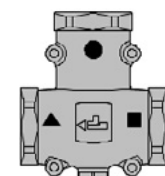
**RA2000/ABRA A5 or RA2000/TWA-A\***  
Valve & actuator  
Page 13



## Boiler Water Return Temperature Protection

Automatically maintains a minimum return water temperature (various temperature settings available).

**VTC**  
Thermic Valve  
Page: 16



**RAVK** is a self-acting thermostatic operator used to control temperatures in small hot-water cylinders (i.e. storage tanks) or heat exchangers in hydronic hot water systems.

RAVK	Code No.	Type	Temperature Range	Required Valve Body	Capillary Length	View Online
	003L3530	Thermostatic	50° - 86°F (10° - 30°C)	VMT or KOVM	6 ft. 6 in. (2 m)	
	013U8063		77° - 149°F (25° - 65°C)			
	003L3531		95° - 167°F (35° - 75°C)			
	017-4370	½" Brass Sensor Well for RAVK				

**VMT** is a 2-way seated valve, used primarily for heating systems. The valve can be combined with thermostatic element RAVK, ABV, TWA-V or RA2000 wall mount operators.

VMT	Code No.	Description				View Online	
		Connection		Cv	Design		Application
		Size	Type				
	065F0102	1/2"	Solder	1.8	Straight Union	RAVK, ABV, TWA-V*, RA2000* Wall Mount Operators	
	065F0104	3/4"		2.7			
	065F8960	1/2"		3.3			
	065F8961	3/4"		5.9			
	065F1242	1"		NPT (M)			9.4

\*(065F0102 or 065F0104 only).

**KOVM** mixing valve bodies are designed to maintain room temperature by controlling hot (or chilled) water flow through radiators, fans, convectors, etc. Due to the KOVM's unique bypass design, a constant system flow is achieved regardless of the room's heating (or cooling) requirements, therefore system pressures and flow rates are automatically kept constant without the need for pressure controlled bypass valves. (Not suitable for diverting applications)

KOVM	Code No.	Connection			Design	For use with	View Online
		Size	Type	Cv			
			013U3017	1/2"			
013U301501	Comp.						
013U302001			2.34				

**FTC** is a self-acting thermostatic sensor used for flow temperature control of floor heating and radiator heating systems. The water temperature is measured by a surface sensor, which is easily mounted on the pipe by means of a strip (enclosed with the product). The snap-lock connector of the sensor element secures a firm connection to the valve. Closes on rising sensor temperature. Maximum ambient temp. 150° F (65° C). Maximum flow temp. 250° F (120° C). Capillary tube length 0 to 6.5' (0 - 2.0 m).

FTC	Code No.	Description			View Online
		Type	Temperature Range	Required Valve Body	
	013G5081	Self Acting Thermostatic Operator c/w 6' (2 m) capillary and strap on sensor. Celsius temperature scale on dial.	59° - 122°F (15° - 50°C)	RA 2000 or RA-C	
	013G5080		95° - 158°F (35° - 70°C)		

**RA 2000** valve bodies are designed to meet the demands of the residential, commercial and industrial sectors.

RA 2000	Code No.	Description				View Online
		Connection		Design	Application	
		Size	Type			
	013G8013	1/2"	FPT x MPT Union Tailpiece	Side Mount Angle	1.6	
	013G8018	3/4"			2.1	
	013G8023	1"			2.8	
	013G8030	1-1/4"			2.8	
	013G8015	1/2"	FPT x MPT Union Tailpiece	Straight	1.6	
	013G8020	3/4"			2.7	
	013G8025	1"			2.8	
	013G8032	1-1/4"			2.8	
	013G8014	1/2"	FPT x MPT Union Tailpiece	Angle	1.6	
	013G8019	3/4"			2.7	
	013G8024	1"			2.8	
	013G8031	1-1/4"			2.8	
	013G8042	1/2"	Solder Union	Straight	1.6	
	013G8044	3/4"			2.7	

**RA-C** valves, together with Danfoss self-acting and electronic controllers, make up a perfect combination for control of cooling and heating circuits. RA-C is a normally open valve. In an application with FEK or FED controllers, RA-C valves open when room temperature rises above set point. The RA-C valves have four possible pre-settings, ensuring the correct water flow to each circuit.



RA-C	Code No.	Conn. Size	Presettings: Cv Value				Water Temp.	View Online
			1	2	3	N		
	013G3094	1/2"	0.35	0.64	0.88	1.05	50° - 248°F (10° - 120°C)	
	013G3096	3/4"	0.94	1.29	1.99	3.04		
	013U0496	1/2"	Nut					
	013U8608		Tailpiece - Female Solder					
	013U0476		Tailpiece - Male Threaded					
	013U0499	3/4"	Nut					
	013U8609		Tailpiece - Female Solder					
	013U0479		Tailpiece - Male Threaded					

**Note:** Separate nut and tailpiece (threaded or solder) required (2 sets per valve).



**ABV** is a thermo-hydraulic actuator for two point control used to control floor temperature, floor heating systems, hot-water service systems, zone valves and district heating systems. Adjustable flow limitation and manual operation. Maximum ambient temperature 140°F (60°C).

ABV	Code No.	Description			View Online
		Type	Model	Required Valve Body	
	082F0002	NO	ABV Actuator 24VAC 9.0 VA	VMT or KOVM	
	082F0052	NC			


**AVTB** direct acting proportional controllers are used to regulate the temperature of water in heating applications. AVTB valves closes on a rise in sensor temperature.

AVTB	Code No.	Model	Connection		Cap. Length	Temperature Range	View Online
			Size (FNPT)	Cv			
	003N6032	AVTB 15	1/2"	2.2	6' 6" (2.0 m)	32°-86°F (0°-30°C)	
	003N6252					70°-140°F (20°-60°C)	
	003N6272					125°-190°F (50°-90°C)	
	003N7032	AVTB 20	3/4"	4.0		32°-86°F (0°-30°C)	
	003N7252					70°-140°F (20°-60°C)	
	003N7272					125°-190°F (50°-90°C)	
	003N8032	AVTB 25	1"	6.4	32°-86°F (0°-30°C)		
	003N8252				70°-140°F (20°-60°C)		
	003N8272				125°-190°F (50°-90°C)		


**AVTB-RA** reverse acting proportional controllers are used to regulate the temperature of water in cooling applications. AVTB-RA valves opens on a rise in sensor temperature.

AVTB - RA	Code No.	Model	Connection		Cap. Length	Temperature Range	View Online
			Size (FNPT)	Cv			
	003N6032RA	AVTB-RA 15	1/2"	2.2	6' 6" (2.0 m)	32° - 86°F (0° - 30°C)	
	003N6252RA					77° - 149°F (25° - 65°C)	
	003N6272RA					122° - 194°F (50° - 90°C)	
	003N7032RA	AVTB-RA 20	3/4"	4.0		32° - 86°F (0° - 30°C)	
	003N7252RA					77° - 149°F (25° - 65°C)	
	003N7272RA					122° - 194°F (50° - 90°C)	
	003N8032RA	AVTB-RA 25	1"	6.4	32° - 86°F (0° - 30°C)		
	003N8252RA				77° - 149°F (25° - 65°C)		
	003N8272RA				122° - 194°F (50° - 90°C)		


**AVTB-RA Sensor Pockets**

	AVTBWELL	Sensor Pocket, max. pressure 341 Psi, L = 8.7" (25 bar / 220 mm)	3/4" NPT, Brass for 0.7" sensor
	003N0053		3/4" NPT, Stainless Steel for 0.7" sensor


**ESBE Series VRG130** is a range of compact, low leakage mixing valves. For easy manual operation the valves are equipped with non-slip knobs and end stops for an operational angle of 90°. The valve position scale can be turned over and rotated allowing many different mounting positions. Together with ARA600 and Series 90 actuators, the VRG valves are easily automated and have excellent regulating accuracy due to the unique valve to actuator interface. \*Note: If 90 series actuators are used on valves 2" and below, mounting kit 193B1616 must be used.

ESBE VRG	Code No.	Description				View Online	
		Connection		Cv	Body		Series
		Size	Type				
	193B1500	1/2"	FNPT	2.9	3 Way DZR Brass	VRG 131	
	193B1501	3/4"		4.7			
	193B1502	3/4"		7.3			
	193B1503	1"		7.3			
	193B1504	1"		11.7			
	193B1505	1-1/4"		18.7			
	193B1506	1-1/2"		29.3			
	193B1507	2"		46.8			

**ESBE Type F 3-way valves** are ideal for mixing or diverting applications in heating and cooling systems. The required system temperature is obtained by adding a suitable portion of return water to the boiler flow. The mixing proportions are adjusted manually or, in automatically controlled applications, by means of an actuator (driven from a reset controller or DDC system). The scale is graduated on both sides and can be turned, allowing a choice of mounting positions.

ESBE Type F	Code No.	Description				View Online	
		Connection		Cv	Body		Reference
		Size	Type				
	065B8960	2-1/2"	ANSI Flange	75	3 Way Cast Iron	3 F 65-50	
	065B8961	2-1/2"		105		3 F 65	
	065B8962	3"		175		3 F 80	
	065B8963	4"		265		3 F 100	
	065B8964	5"		325		3 F 125	
	065B8965	6"		465		3 F 150	

**ESBE VTA Series Lead Free Thermostatic Mixing Valves** The VTA Series replaces Series 20 & 30MR styles of valves and are designed for Point of Source in domestic hot water distribution systems and/or regulation of supply in hydronic heating systems.

Female NPT Connection (For Open & Closed Loop)	Code No.	Description			View Online	
		Connection		Cv		Temperature Range
		Size	Type			
	065B8868LF	3/4"	Female NPT	1.9	70° - 110°F (20° - 45°C)	
	065B8869LF	3/4"		1.9	85° - 120°F (30° - 49°C)	
	065B8870LF	3/4"		1.9	95° - 140°F (35° - 60°C)	
	065B8871LF	3/4"		1.9	85° - 160°F (30° - 70°C)	
	31622111LF	1"		4.1	85° - 120°F (30° - 49°C)	
	31622011LF	1"		4.1	95° - 140°F (35° - 60°C)	



Solder & CPVC Connections <small>(*For Closed Loop Only. Not for installation in domestic hot water.)</small>	Valve Body		+	Required Tailpieces		View Online
	Code No.	Cv		Temperature Range	Code No.	
	065B8877LF	1.9	85° - 120°F (30° - 49°C)	065B8901	½" solder tailpcs	
	065B8878LF	1.9	95° - 140°F (35° - 60°C)	065B8892	¾" solder tailpcs	
	065B8872LF*	1.9	85° - 160°F (30° - 70°C)	065B8898	¾" CPVC	

**Note:** Union valve bodies and tailpiece kits for ESBE VTA series of valves with solder and CPVC connections are ordered separately. If the CPVC tailpieces are used with the union valve body, always follow the pipe manufacturer's instructions.

**Example:** Requirement: 85° - 120°F (30° - 49°C) Temperature Range, ¾" Solder connections: Order one (1) 065B8877LF union valve body and one (1) 065B8892 solder tailpiece kit.

**ESBE VTA 570 3-Way Thermostatic Mixing or Diverting Valve** (Closed Loop, Not for Potable Water) The VTA 570 can be utilized in a mixing or diverting application for hydronic closed looped systems. Typically, this thermostatic control is used as a non-electric alternative for a 2-pipe changeover diverting application.

VTA 570	Code No.		Connection		Cv	Temperature Range	View Online
	Valve Body	Required Tailpiece Kit	Size	Type			
	31700100	+	065B8892	¾"	5.2	50° - 86°F (10° - 30°C)	
	31700200	+	065B8892			Union x (¾" F.) solder	

**ESBE VTC511 Thermostatic Valves** are used to protect boilers from low return temperatures and to efficiently load accumulation tanks. \*Required thermostats ordered separately. Order one valve body and one thermostat to assemble a complete valve.

VTC Valves	Code No.	Series	Description			View Online	
			Connection	Cv	Valve Housing		
			Size	Type			
	193B1701	VTC511	1-1/4"	FNPT	16.2	Cast Iron	

VTC Thermostats	Code No.	Series	Description	Opening Temperature	Typical Piping
	193B1702	VTC511	Thermostat	122°F (50°C)	Return
	193B1703	VTC511	Thermostat	131°F (55°C)	Return
	193B1704	VTC511	Thermostat	140°F (60°C)	Return
	193B1709	VTC511	Thermostat	149°F (65°C)	Supply
	193B1705	VTC511	Thermostat	158°F (70°C)	Supply
	193B1706	VTC511	Thermostat	167°F (75°C)	Supply

**ESBE Series VRG140 4 Way Mixing Valve** is a range of compact, low leakage mixing valves. For easy manual operation the valves are equipped with non-slip knobs and end stops for an operational angle of 90°. The valve position scale can be turned over and rotated allowing many different mounting positions. Together with ARA600 and Series 90 actuators, the VRG valves are easily automated and have excellent regulating accuracy due to the unique valve to actuator interface.

ESBE VRG	Code No.	Description				View Online	
		Connection		Cv	Body		Series
		Size	Type				
	193B1531	3/4"	FNPT	4.7	4 Way DZR Brass	VRG 141	
	193B1532	3/4"		7.3			
	193B1533	1"		11.7			
	193B1534	1-1/4"		18.7			
	193B1535	1-1/2"		29.3			
	193B1536	2"		46.8			
	193B1537	3/4"	Solder	2.9			
	193B1538	1"		7.3			
	193B1539	1 1/4"		13.9			

**ESBE Type F 4-way valves** are designed for use in commercial or residential heating & cooling systems, to control & distribute water or non-corrosive liquids to different zones. The ESBE four-way valve features a double mixing function. When hot water from the boiler is mixed with the return water, the temperature of the returned water rises (higher than can be achieved with a 3-way valve), reducing the risk of condensation & assuring a longer boiler life. The mixing proportions can be adjusted manually, or in automatically controlled applications, by means of a control actuator. The scale is graduated on both sides & can be turned, allowing a choice of mounting positions.

ESBE Type F	Code No.	Description				View Online	
		Connection		Cv	Body		Reference
		Size	Type				
	065B6150	2"	DIN Flange	75	4 Way Cast Iron	4 F 50	
	065B6165	2-1/2"		105		4 F 65	
	065B6180	3"		175		4 F 80	
	065B6200	4"		265		4 F 100	
	065B6225	5"		325		4 F 125	
	065B6250	6"		465		4 F 150	

**DIN Flange & Gaskets** Sets for use with ESBE "F" Series 4-way mixing valves.

DIN Flanges / Gaskets	Code No.	Size	Description
	065F8950	2"	DIN Flange (Four Flanges Required per 4 Way Valve)
	082F8961	2-1/2"	
	082F8962	3"	
	082F8963	4"	
	082F8964	5"	
	082F8965	6"	Gasket for DIN Flange (Four Gaskets Required per 4 Way Valve)
	065F8951	2"	
	082F8966	2-1/2"	
	082F8967	3"	
	082F8968	4"	
	082F8969	5"	
	082F8970	6"	

**ESBE ARA600 Series** are compact actuators for operating ESBE mixing valves up to 2". The actuators have an operating range of 90° and can easily be manually operated. Actuators are supplied with mounting kits for ESBE rotary valves.

ARA Actuator	Control Input	Code No.	Series	Running Time for 90° @ 60 Hz (seconds)	Internal Auxiliary Switch	Torque in. lb. (Nm)	Designed for Use With	View Online
	<b>3 Point (Floating) 24VAC.</b> Recommended for mixing & diverting applications.	193B1600	ARA663	96	No	53 (6)	ESBE Valves up to 2"	
		193B1601	ARA644	24	Yes			
		193B1602	ARA654	48				
		193B1603	ARA664	96				
	<b>2 Point 24VAC.</b> Recommended for diverting applications. Can be wired as 3 Point.	193B1604	ARA638	12	Yes	26 (3)	ESBE Valves up to 1 1/4"	
		193B1605	ARA648	24		53 (6)	ESBE Valves up to 2"	
	<b>Proportional 24V AC/DC.</b> Recommended for mixing & diverting applications. Includes internal wiring terminal. Signal: Proportional, 0-10Vdc, 2-10Vdc, 0-20mA, 4-20mA	193B1606	ARA639 (cable included, no pre-wire)	15 / 30 / 60 / 120	No	53 (6)	ESBE Valves up to 2"	
193B1607			ARA659 (wire whip, pre-wired)	45 / 120				

**ESBE 90 Series** are direct mount, compact actuators designed to operate 3 and 4-way ESBE mixing valves. The actuators are reversible and their rotation can be set between 15° and 180°.

**NOTE:** If using with VRG style valves, must use mounting kit 193B1616 below.

ESBE Series 90 Actuators	Code No.	Series	Volt.	Operation	Running Time for 90° @ 60 Hz (seconds)	Torque in. lb. (Nm)	Designed for Use With	View Online
	065F8952	91EM	24 V	Floating (3 point)	12	45 (5)	Valves up to 2" only	
	065F8953	92EM		Floating (3 point) c/w aux. switch	50	135 (15)	All ESBE Valve Sizes	
	065F8959	92-2EM			100			
	065F8954	93EM			240			
	065F8955	92P	Proportional (0-10 V, 2-10 V, 0-20 mA, 4-20 mA)	60 / 90 / 120	Max. Differential pressure drop: 1 1/2" - 2": 8 psi, 2 1/2" - 6": 5 psi			

\* 91EM recommended for diverting applications only due to short running time.

VRG Mounting Kit	Code No.	Description
	193B1616	Series 90 Actuator to VRG Valve Body Mounting Kit

**ESBE ARC/ARD Series High Torque Actuators** are rotary low voltage motorized actuators that provide a 90° operating range of rotation. This series of actuators is suitable for assembly to ESBE series 3F and 4F valves that range from 2" to 6" in size and alternatively applied as damper actuators. **Mounting kit included for assembly to ESBE valve or damper.**

ARC/ARD Actuators 24VAC/24VDC	Code No.	Series	Input Signal	Internal Auxiliary Switch	Running Time for 90° (sec.)	Torque in. lb. (Nm)	Designed for Use With	View Online
	12201100	ARC363	2-point, ON/OFF Floating (3 point)	No	150	265 (30)	ESBE Type F valves 2" and larger	
	12200200	ARC368	0(2)...10VDC 0(4)...20mA	Yes				
	12241200	ARD257	2-point, ON/OFF	No	75	177 (20)		
	12260200	ARD269	0(2)...10VDC		20, spring return			
			0(4)...20mA		150			

**ESBE CRA SET POINT CONTROLS** (with digital display)

CRA complete control packages include actuator, sensor (4.9 ft/1.5 m) and controller. Optional 16 ft/5 m sensor can be ordered separately.

CRA Set Point Controls	Code No.	Series	Power Supply	Signal	Display	Run Time (90° @ 60 Hz)	Designed for Use With	View Online
	12720212	CRA112	24V	Floating (3 point)	°F and °C	25 seconds	ESBE Valves (up to 2" only)	
	12742212	CRA122				Selectable 12/25/50/200/398 seconds	ESBE Valves (All Sizes)	

**ESBE ATA draft regulator** is a self contained thermostatic expansion control device intended to regulate the temperature of solid fuel boilers without requiring any electrical installation or complicated linkage. The thermostatic control head senses the boiler temperature and regulates the air damper position, controlling combustion air flow.

ESBE ATA	Code No.	Conn. Size	Lifting Force	Lifting Stroke	Chain Length	Regulating Range	View Online
	065B8900	3/4" NPT	2.2 Pound-force (10N)	2.2 (55 mm)	5.25 ft. (1.6 m)	95° - 203°F (35° - 95°C)	

**FHV-R** provides temperature control of under floor heating circuits, using a return temperature limiting valve fitted with a type FJVR sensor element. FHV-R is used in applications where a desired floor temperature is required (e.g. a bathroom where a constant warm floor is preferred regardless of room temperature to ensure comfort and to quickly dry water on the floor). Set includes wall enclosure box, front cover, bleed key and valve (return temperature limiter) with air vent. An FJVR sensor is required for controlling the return temperature. Also required are two union nuts and tailpieces per control. When the FHV-R is used for controlling floor heating, the heated floor area should not be more than 100 sq.ft. (10 m2).

FHV-R	Code No.	Model	Description	View Online
	<b>003L1000</b>	FHV-R	Single Zone Return Temperature Sensing Control Valve	
	<b>013U0496</b>	For FHV-R control valve (Order two nuts & two tailpieces per control valve)	1/2" Union Nut	
	<b>013U8608</b>		1/2" Solder Female Tailpiece	
	<b>013U0476</b>		1/2" Male Threaded Tailpiece	
	<b>003L1040</b>	FJVR	Return Temperature Limiter Sensor. Setting range: 50° - 122°F (10° - 50°C)	
	<b>003L1070</b>		Return Temperature Limiter Sensor. Setting range: 50° - 176°F (10° - 80°C)	

**FHV-A** enables room temperature control via a pre-settable thermostatic valve fitted with a type RA 2000 sensor element. Set includes wall enclosure box, front cover, bleed key and pre-settable valve with air vent. A type RA 2000 sensor element is required for controlling the room temperature. Also required are two union nuts and tailpieces per control. **NOTE:** If using the FHV-A for room temperature control, the flow temperature should not be permitted to exceed the maximum recommended by the flooring manufacturer.

FHV-A	Code No.	Model	Description	View Online
	<b>003L1001</b>	FHV-A	Single Zone Ambient Room Temperature Control Valve	
	<b>013U0496</b>	For FHV-R control valves (Order two nuts & two tailpieces per control valve)	1/2" Union Nut	
	<b>013U8608</b>		1/2" Solder Female Tailpiece	
	<b>013U0476</b>		1/2" Male Threaded Tailpiece	
	<b>013G8250</b>	RA 2000	Room Temperature Operator	

**RMT (Mechanical Only)** mechanical room thermostats are for use on 24V heating systems. Built-in ambient temperature sensor.

RMT	Code No.	Model No.	Operating Voltage	Switching Voltage	Scale	Night Set Back	View Online
	<b>087N1196</b>	RMT-24	24 VAC	24 VAC	°C	No	

**ECONOMY SNOW/ICE MELT CONTROLS**

The **DS-224/824** are primarily designed for hydronic pavement snow melting applications. The units can be powered from a 24VAC/VDC source.

DS Series	Code No.	Model	Power Supply	Mounting	Relay	Ambient Temp.	Temp. Sensor	Precipitation Sensor	View Online
	<b>088L3041</b>	<b>DS-224</b>	24VAC or DC	Rigid conduit or surface	Single 30A, Dry contact	-40° - 185°F (-40° - 85°C)	Integrated	Integrated	
	<b>088L3042</b>	<b>DS-824</b>						Remote, 10ft (3m)	

## Numerical Code Number Listing

**STV (THREADED) / STVL (SOLDER)** provide a high level of balancing accuracy using an easy to adjust wheel with a digital display. Valves include memory stop and dual differential pressure read out ports as standard equipment.

STV/STVL	Code No.	Connection		Cv	Valve Body Material	View Online
		Size	Type			
	065F8965	1/2"	NPT	4.1	Brass	
	065F896501		Solder			
	065F8966	3/4"	NPT	5.9		
	065F896601		Solder			
	065F8967	1"	NPT	10.2		
	065F896701		Solder			
	065F8968	1-1/4"	NPT	15.2		
	065F896801		Solder			
	065F8969	1-1/2"	NPT	22.6		
	065F896901		Solder			
	065F8970	2"	NPT	36.5		
	065F897001		Solder			

**STVA (FLANGED)** provide a high level of balancing accuracy using an easy to adjust wheel with a digital display. Valves include memory stop and dual differential pressure read out ports as standard equipment.

STVA	Code No.	Connection		Cv	Valve Body Material	View Online
		Size	Type			
	065F8971	2-1/2"	Flanged (ANSI 125)  (Flanges not supplied)	108	Cast Iron	
	065F8972	3"		128		
	065F8973	4"		220		
	065F8974	5"		349		
	065F8975	6"		493		

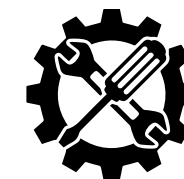
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003L1000	20	2.07
003L1001	20	2.00
003L1040	20	0.34
003L1070	20	0.34
003L3530	12	0.89
003L3531	12	0.89
003N0053	14	0.45
003N6032	14	3.76
003N6032RA	14	3.76
003N6252	14	3.71
003N6252RA	14	3.71
003N6272	14	3.72
003N6272RA	14	3.72
003N7032	14	3.83
003N7032RA	14	3.83
003N7252	14	3.78
003N7252RA	14	3.78
003N7272	14	3.80
003N7272RA	14	3.80
003N8032	14	4.11
003N8032RA	14	4.11
003N8252	14	4.08
003N8252RA	14	4.08
003N8272	14	4.11
003N8272RA	14	4.11
013G3094	13	0.49
013G3096	13	0.98
013G5080	12	0.71
013G5081	12	0.75
013G8013	13	0.91
013G8014	13	0.65
013G8015	13	0.67
013G8018	13	0.67
013G8019	13	0.65
013G8020	13	0.67
013G8023	13	1.56
013G8024	13	1.39
013G8025	13	1.55
013G8030	13	2.17
013G8031	13	2.00
013G8032	13	2.22
013G8042	13	0.79

Code No.	Page	Approx. Weight (lbs.)
013G8044	13	1.11
013G8250	20	2.00
013U0476	13, 20	0.12
013U0479	13	0.20
013U0496	13, 20	0.07
013U0499	13	0.12
013U301501	12	1.62
013U3017	12	1.41
013U302001	12	1.59
013U8063	12	0.89
013U8608	13, 20	0.06
013U8609	13	0.09
017-4370	12	0.23
065B6150	17	23.10
065B6165	17	26.25
065B6180	17	36.30
065B6200	17	50.16
065B6225	17	70.51
065B6250	17	98.69
065B8868LF	15	1.19
065B8869LF	15	1.25
065B8870LF	15	1.19
065B8871LF	15	1.19
065B8872LF	16	1.19
065B8877LF	16	1.16
065B8878LF	16	1.23
065B8892	16	0.66
065B8898	16	0.44
065B8900	19	1.01
065B8901	16	0.44
065B8960	15	29.66
065B8961	15	30.40
065B8962	15	38.50
065B8963	15	62.37
065B8964	15	75.06
065B8965	15	97.02
065F0102	12	0.80
065F0104	12	1.21
065F1242	12	2.17
065F8950	17	3.34
065F8951	17	0.09
065F8952	18	2.05

Code No.	Page	Approx. Weight (lbs.)
065F8953	18	1.91
065F8954	18	1.91
065F8955	18	2.33
065F8959	18	2.29
065F8960	12	1.06
065F8961	12	1.28
065F8965	22	1.23
065F896501	22	1.17
065F8966	22	1.28
065F896601	22	1.32
065F8967	22	1.89
065F896701	22	1.91
065F8968	22	2.51
065F896801	22	2.64
065F8969	22	3.17
065F896901	22	3.30
065F8970	22	5.46
065F897001	22	5.06
065F8971	22	31.55
065F8972	22	44.00
065F8973	22	64.77
065F8974	22	88.00
065F8975	22	110.00
082F0002	13	0.66
082F0052	13	0.67
082F8961	17	4.18
082F8962	17	6.56
082F8963	17	7.30
082F8964	17	9.55
082F8965	17	10.19
082F8966	17	0.02
082F8967	17	0.02
082F8968	17	0.04
082F8969	17	0.04
082F8970	17	0.04
087N1196	21	0.30
088L3041	21	1.89
088L3042	21	0.53
12220200	19	n/a
12201100	19	n/a
12241200	19	n/a
12260200	19	n/a

Code No.	Page	Approx. Weight (lbs.)
12720212	13	2.73
12742212	13	1.9
193B1500	15	1.10
193B1501	15	1.65
193B1502	15	1.65
193B1503	15	1.72
193B1504	15	1.63
193B1505	15	2.49
193B1506	15	3.83
193B1532	17	1.65
193B1533	17	1.76
193B1534	17	2.62
193B1535	17	4.44
193B1536	17	5.59
193B1537	17	0.97
193B1538	17	1.28
193B1539	17	1.94
193B1600	18	1.01
193B1601	18	1.36
193B1602	18	1.36
193B1603	18	1.36
193B1604	18	1.36
193B1605	18	1.36
193B1606	18	1.36
193B1607	18	1.36
193B1616	18	0.48
193B1701	16	2.46
193B1702	16	0.09
193B1703	16	0.09
193B1704	16	0.09
193B1705	16	0.09
193B1706	16	0.09
193B1709	16	0.09
31622011LF	15	2.15
31622111LF	15	2.15
31700100	16	1.50
31700200	16	1.89
AVTBWELL	14	0.53

NUMERICAL CODE NUMBER LISTING



### ONLINE SUPPORT

For help with technical support including literature, videos, FAQs and more visit: <http://bit.ly/HydronicTechSupport>  
 For general conditions of sale and warranty visit: <http://bit.ly/HydronicConditionsandWarranty>

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