



# T104 Controls/V110 Valve Bodies

## THERMOSTATIC RADIATOR VALVES

### SPECIFICATION DATA

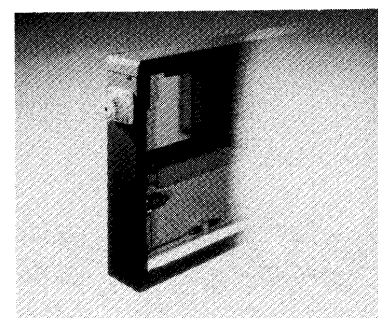
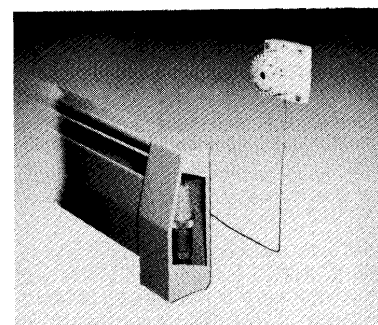
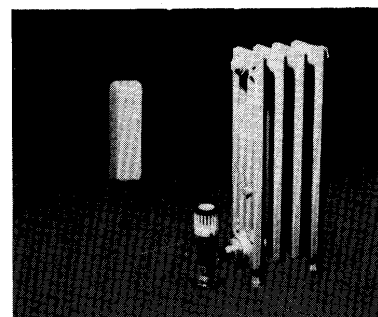
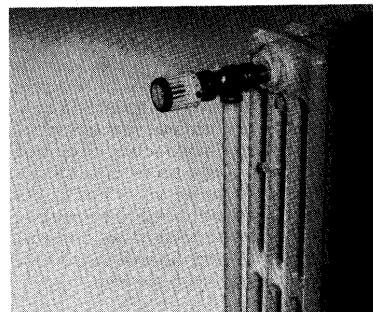
Thermostatic Radiator Valves provide individual control of radiators, convectors or baseboard heating units. They can be used to control a single unit, room or zone. Energy savings are realized because the valve automatically shuts off the flow of heat when the temperature setting is reached. This eliminates wasteful and uncomfortable heating. Installation is simple and low cost.

#### TYPICAL SPECIFICATION - VALVE BODIES

The valve body shall be a V110F horizontal angle, or V110E vertical angle or V110D straight pattern, of nickel plated brass (1-1/4" unplated). The valve shall be suitable for hot water and two pipe steam systems. The valve shall be designed to open and close automatically according to room temperature when a T104 series control is mounted on the valve body. The valve shall have all working parts in a cartridge, which shall incorporate two O-ring seals, a seat disc of EPDM and a stainless steel spring. The cartridge shall also be able to be removed and replaced while under full system pressure, through use of an MT110C cartridge changing tool. Valve should conform to the performance requirements of ASHRAE Standard 102-1989, (Methods of Testing Nonelectric, Nonpneumatic Thermostatic Radiator Valves).

#### TYPICAL SPECIFICATION - THERMOSTATIC CONTROLS

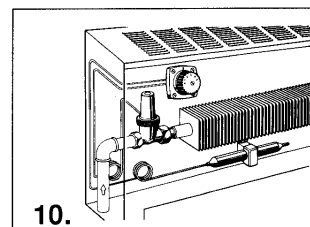
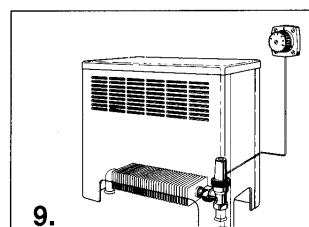
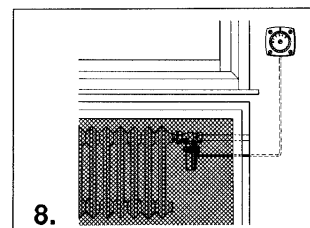
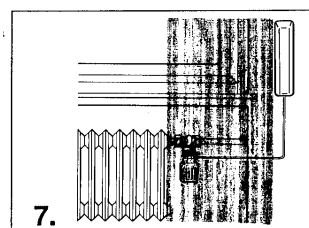
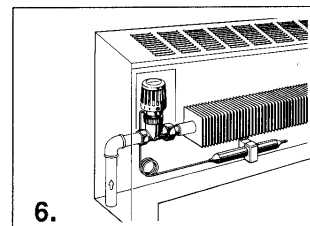
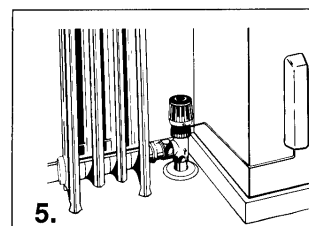
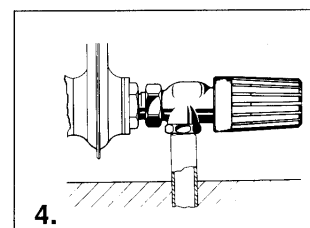
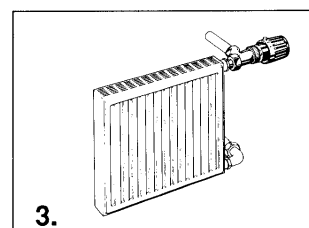
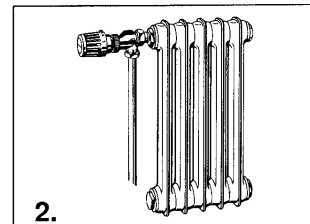
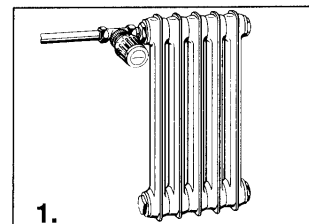
The thermostatic control shall be a T104A,B,C,F or V model. The control shall have an integral temperature sensor (T104A,V) or remote sensor (T104B,C,F) and a set point dial which can be adjusted to control room temperature within a range of 59-77°F (15-25°C) or greater. (The control shall also have a positive shutoff setting.) Actuator should conform to the performance requirements of ASHRAE Standard 102-1989, (Methods of Testing Nonelectric, Nonpneumatic Thermostatic Radiator Valves).



**T100V CONTROLS/V100 VALVE BODIES****Typical Installations**

1. **Radiator with T104A control** mounted on V110D straight pattern valve body. The control head should be mounted horizontally in a position where the air circulation around the unit is not obstructed.
2. **Radiator with T104A control** mounted on V110F horizontal angle pattern valve body. The control is mounted horizontally to prevent air heated by the hot supply pipe from affecting the internal sensor. It is the most common replacement of hand valves.
3. **Radiator with T104A control** mounted on V110F horizontal angle pattern valve body. Horizontal mounting of the control is required to keep the internal sensor away from heat influences. Unobstructed air circulation around the control head is also required for accurate regulation.
4. **Radiator with T104V control** mounted on V110F horizontal angle pattern valve body. This control has a vandal resistant housing and locks to the valve body when installed. Because the sensor is internal, the control must be mounted horizontally, with unobstructed air circulation around the control head.
5. **Radiator with T104F control** mounted on V110E angle pattern valve body. As illustrated, the radiator was originally installed close to a corner, or in an alcove, precluding use of a horizontally mounted control. Because the control must be mounted vertically, a T1 00F remote sensor model is required, with the sensor mounted on a nearby wall where air circulation is unobstructed.
6. **Convactor with T104F control** mounted on V110D straight pattern valve body. Because the control is mounted inside an enclosure, a control with remote sensor must be used. The sensor is installed a minimum of 3" beneath the heating coils in the cold air return. The set point dial may be adjusted through a small access door.
7. **Radiator with T104F control** mounted on V110D straight valve body. Because air circulation around the valve body is obstructed by a curtain, a control with remote sensor must be used. The sensor is installed on a nearby wall to sense representative room temperature.
8. **Radiator with T1048 control** mounted on V110D straight pattern valve body. Because the valve is installed within an enclosure and does not have easy access, a remote sensor and set point control is required. The remote sensor/set point must be mounted on a nearby wall where air circulation is unobstructed and access is adequate. Mounting on a hot cabinet would cause false sensing.
9. **Convactor cabinet with T1048 control** mounted on V110E angle pattern valve body. Because the valve is installed within an enclosure and does not have easy access, a remote sensor and set point control is required. The remote sensor/set point must be mounted on a nearby wall where air circulation is unobstructed and access is adequate.

10. **Convactor with T104C control** mounted on V110D straight pattern valve body. Because the valve is installed within an enclosure and does not have easy access, a remote sensor and set point type control is required. When the set point dial is to be mounted on the hot convactor cover, the sensor must be separate from the dial. The sensor is mounted a minimum of 3" beneath the heating coils in the cold air return.



## ORDERING INFORMATION

Thermostatic Controls	
Model #	Description
T104A1040	Direct mount, internal sensor
T10481038	Remote mount, 6'8" capillary
T10481046	Remote mount, 16' capillary
T104C1036	Remote mount, double capillaries
T104F1512	Direct mount, remote sensor
T104V1422	Direct mount, vandal resistant

Valve Bodies - straight		
Model #	Size	Tailpiece
V110D1000	1/2"	Threaded
V110D1008	3/4"	
V110D1016	1"	
V110D1024	1-1/4"	
V110D5001	1/2"	Sweat
V110D5009	3/4"	
V110D5017	1"	

Valve Bodies - angle		
Model #	Size	Tailpiece
V110E1004	1/2"	Threaded
V110E1012	3/4"	
V110E1020	1"	
V110E1028	1-1/4"	
V110E5005	1/2"	Sweat
V110E5013	3/4"	

Valve Bodies - horizontal angle		
Model #	Size	Tailpiece
V110F1002	1/2"	Threaded
V110F1010	3/4"	
V110F1018	1"	
V110F1026	1-1/4"	
V110F5003	1/2"	Sweat
V110F5011	3/4"	

## DIMENSIONS

V110D		
Size	A	Cmax
1/2"	3-3/4	4-3/4
3/4"	4-1/8	4-3/4
1"	4-15/16	4-3/4
1-1/4"	5-7/8	5

V110E			
Size	A	B	Cmax
1/2"	2-9/16	1	4-3/4
3/4"	2-5/8	1-1/8	4-3/4
1"	3	1-5/16	4-3/4
1-1/4"	3-5/8	1-11/16	5

V110F			
Size	A	B	Cmax
1/2"	2-1/4	1	5-1/8
3/4"	2-9/16	1-1/8	5-1/4
1"	2-15/16	1-3/16	5-1/4
1-1/4"	3-1/2	2-3/16	5-1/4

Capacities		
Size	Hot water Cv factor	Steam Btu/hr
1/2"	4.6	127,000
3/4"	5.8	162,000
1"	7.0	193,000
1-1/4"	7.0	193,000

Temperature Reference Guide										
°F	43	46	48	54	61	64	68	72	75	79
T104A T104F	*				1	2	•	4	5	
T104V	*	1		2	3		4	5		6
T104B T104C	*				1	2	3	4	5	
°C	6	8	9	12	16	18	20	22	24	26

## ACCESSORIES



**G111A1019  
Coverplate**—flexible plastic,  
2-3/4" O.D. for covering mounting  
hole.



**A110C1004  
Manual shutoff cap**—for V110  
valve bodies.



**G111B1053  
Bulb Guard**—for T104F and  
T104C sensors.



**NPT/Sweat Adapters**  
1/2" size—Q110A1005  
3/4" size—Q110A1013  
1" size—Q110A1021



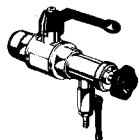
**MT110D1019  
Service Socket**—for removing  
V110 cartridges.



**Strainer Inserts**—for V110 valve  
bodies on steam systems.  
1/2" size—Q110D1045  
3/4" size—Q110D1053

**MT110C1011**

**Cartridge Changer**—tool for  
removing V110 cartridges  
while in-line, under pressure.  
This device allows service or  
replacement of the working  
parts of the valve in minutes  
without shutting down the  
system.



**202814  
Locking Cap**

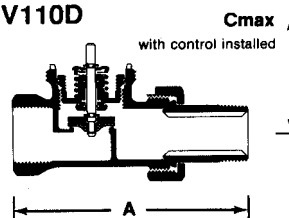


**P110V1003  
Locking Ring**

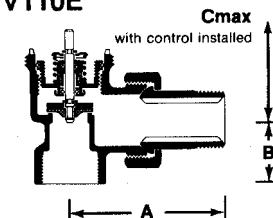


**CA110A1016  
Replacement  
Cartridge**

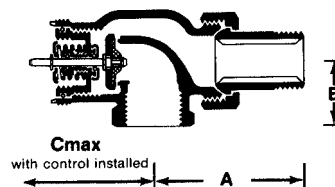
**V110D**



**V110E**



**V110F**



# THERMOSTATIC RADIATOR VALVES

## DESCRIPTION

Thermostatic radiator valves replace manual valves on radiators and convectors to provide automatic temperature control of each unit, space or zone.

They are nonelectric, and require no outside source of power. T104 series controls are mounted on V11 O series valve bodies, for control of two pipe steam or hot water systems. Such systems are defined as having separate supply and return piping. Special controls are available for 1-pipe steam systems.

## VALVE BODY SPECIFICATIONS

V11 O series valves are constructed of nickel plated brass (except 1-1/4" size), with all seals and working parts contained in a replaceable cartridge. The valve stem is sealed by two O-rings, with a seat disc made of EPDM material. The valve opening spring is of stainless steel and is located outside the water (or steam) filled space to insure reliability. The entire working portion of the valve can be replaced with the system under pressure using the MT11 OC cartridge changing tool. Sizes available: 1/2", 3/4", 1", 1-1/4".

**Connections:** inlet internally threaded outlet with union and threaded tailpiece or outlet with union and sweat tailpiece.

**Maximum temperature:** 248°F (120°C)

### Maximum pressure:

Water: 150 psi

Steam: 15 psi

**Maximum differential:** 17 psi

V110D straight pattern valve body, especially for baseboards and straight runs where manual valves were not originally installed.

V110E angle pattern valve body, normally used where installation space is tight. Used with T1048,C and F model controls.

V110F horizontal angle pattern valve body, sized to replace most manual valves with minimum piping changes. Normally used with T104A and T104V controls to conform to horizontal mounting requirements.

## CONTROL SPECIFICATIONS

T104 series thermostats are used with V110 valve bodies to control radiators, convectors, or baseboard heating units. Each control is self powered and requires no electrical connections. T104 thermostats are made up of a sensor, setpoint dial and valve actuator. These three components may be contained in one unit, or connected by capillary tubes. Setpoint dials show guidemarks (1-5) and shut off completely when turned fully clockwise (0).

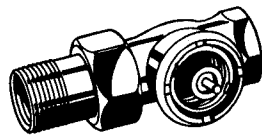
**T104A** control is self-contained, having the temperature sensor, setpoint dial and valve actuator contained in one unit. It is mounted on the valve body, and must be positioned horizontally for accurate temperature regulation. This control cannot be used inside enclosures or where air flow around the sensor is restricted. Range 43-83°F (6-28°C).

**T104B** control with combined remote set point and sensor is normally mounted on a wall, connected by a capillary tube (6'8" or 16' length) to an actuator mounted on the valve body. Range 48-83°F (9-28°C).

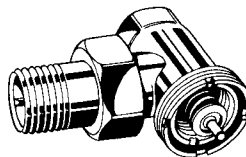
**T104C** control with remote set point and remote sensor is normally mounted with the set point dial on the outside shell of a heating cabinet, with the sensor mounted beneath the heating coils in the cold air return. Connecting capillaries are 4'6" length. Range 48-83°F (9-28°C).

**T104F** control with remote sensor is mounted on the valve body with the sensor mounted beneath the heating coils in the cold air return, or on a nearby wall. Capillary length is 6'8". Range 43-83°F (6-28°C).

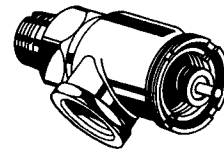
**T104V** self-contained control has rugged, vandal resistant construction. The set point dial is internal, with reset by removal and replacement of locking cap only. The control is mounted on the valve body, and must be positioned horizontally for accurate temperature regulation. This control cannot be used inside enclosures or where air flow around the internal sensor is restricted. Range 43-79°F (6-26°C). Factory set at 68°F (20°C).



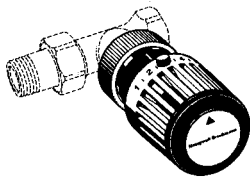
V110D



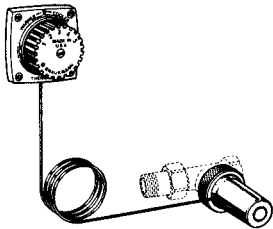
V110E



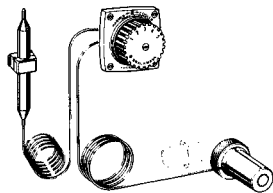
V110F



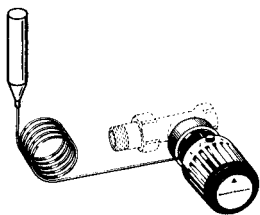
T104A



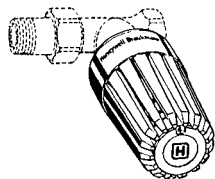
T104B



T104C



T104F



T104V



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