2 DESCRIPTION OF SYSTEM COMPONENTS

Buderus Panel Radiators

Buderus “Solidoflux N” panel radiators are manufactured from .049” (1.25 mm) thick steel panels. They consist of water-filled steel welded radiative panels with convector channels mounted on the back. These layers are combined and arranged into three basic models: Model 11 (2.5” thick), Model 22 (4” thick) and Model 33 (6” thick).

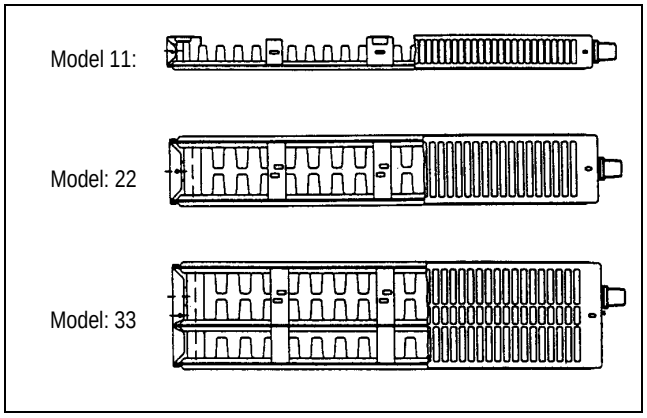


Figure 1: Top View of Radiator Models 11, 22, and 33.

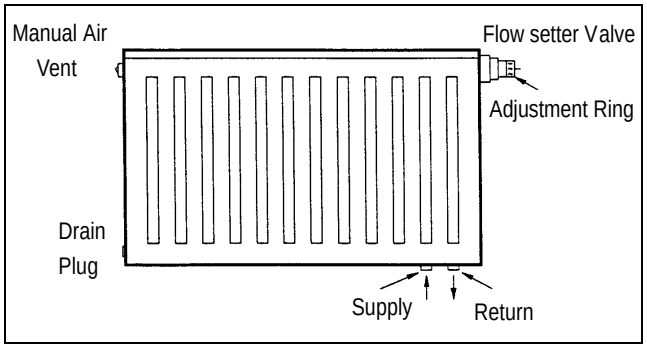


Figure 2: Front View of a right hand Buderus Panel Radiator.

Standard equipment with each radiator include bottom piping connections, built-in manual air vent, a drain plug and a flow setter (control) valve (Fig. 2).

Stocking models have the flow setter (control) valve and piping connections on the right side. Radiators with tappings and control valve mounted on the left side are available upon request with a 4 to 6 week leadtime.

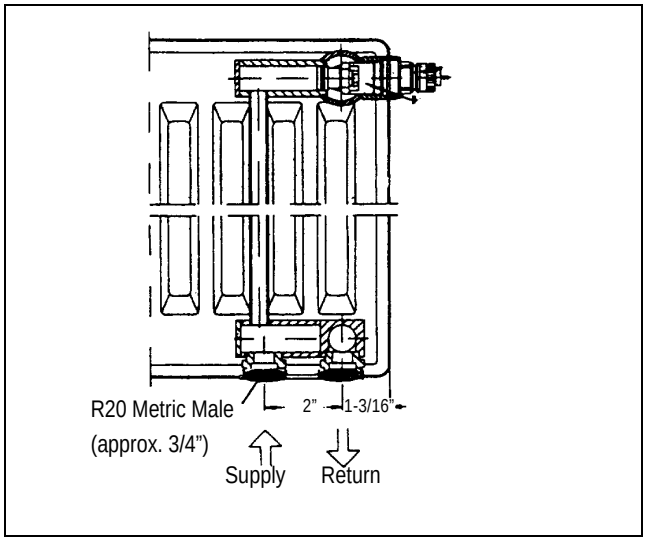


Figure 3: Front Internal View: Radiator Piping Connections.

Piping Connections

Each stocking radiator has 20 mm (approx. 3/4”) metric male tappings on the bottom right side. Figure 3 shows supply and return connections. These connections can NOT be reversed. Buderus Hydronic Systems can supply compression fittings for 1/2” copper pipe as well as for 12 mm, 16 mm and 5/8” PEX tubing.

DESCRIPTION OF SYSTEM COMPONENTS 2

Flow setter valv e

Each radiator is equipped with a flow setter valve mounted in the panel on the right side (Fig. 4). This valve consists of two integral components for temperature control and flow balancing.

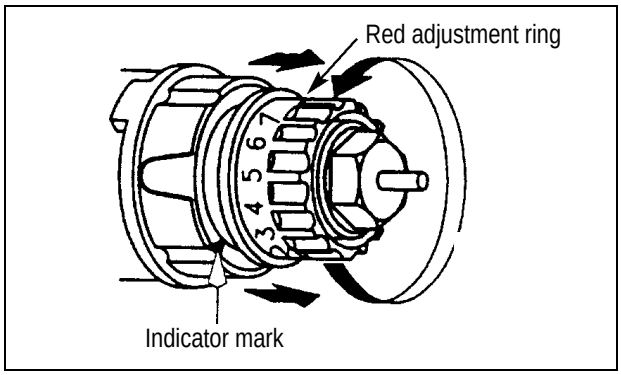
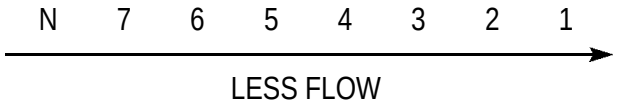


Figure 4: Flow Setter Valve.



Temperature Control:
A thermostatic control head can be mounted on the flow setter valve and through its capillary expansion controls the flow rate and therefore the heat output of the panel. A moveable, spring-loaded seat assembly inside the flow setter valve regulates the water flow through thermostatic action of the control head. This head is required for individual temperature control at each radiator.

Flow Balancing:
Flow balancing is done by adjustment of the numbered ring (marked 1-7, N) on the flow setter valve and lining the desired setting up with the dimple in the threads adjacent to this ring. Turning of the ring internally changes the cross sectional area available for water flow. The N marking indicates a fully opened setting; the 1 marking indicates nearly full restriction. The Pressure Drop Diagram on page 31 shows the pressure drop across the radiator as a function of the flow rate and setting on the flow setter.

Air vent and drain plug

Each radiator is equipped with a manual air vent (1/2") and removable drain plug (3/4") for draining the radiator. A flat head screwdriver is needed to open the air vent.

2 DESCRIPTION OF SYSTEM COMPONENTS

Available models

Stocking models (all right-hand connections):

Models 11 and 22: Height: 14”, 20” and 24”.
Length: 16”, 24”, 36”, 48”, 59” and 71”.

Output ratings: 800 to 2,400 Btu/hr per linear foot at 180˚F average water temperature.

Additional available sizes (left or right hand connections with 4 to 6 week leadtime):

Models 11,22: Height: 14”, 20”, 24”, and 36”.
Length: 79”, 91”, 102”, and 118”.

Models 33: Height: 14”, 20”, 24”, and 36”.
Length: 16”, 24”, 36”, 48”, 59”, 71”, 79”, 91”, 102”, and 118”.

Output ratings: up to 5,000 Btu/hr per linear foot for
the 36” high Model 33 at 180˚F average water temperature.

Chapter 4 has detailed radiator output ratings, weights and water capacities in tabular and graphical form.

Radiator Accessories

Buderus Hydronic Systems Inc. offers a variety of accessories for installation and control of the radiators for different piping arrangements.

Mounting Brackets

Buderus Hydronic Systems Inc. supplies brackets for floor or wall mounting of the radiators. Model 11 radiators can only be mounted on a wall. Rough-in instructions and mounting guidelines are presented in Chapter 3. Screws are not provided for securing brackets to the wall. Specify height and radiator model when ordering brackets.

Compression Fittings

Compression Fittings are available from Buderus Hydronic Systems in sets of 2. See Table 1. These fittings are normally secured to the piping connections on the radiator. When diverter valves are used, the compression fittings mount on the diverter valve.

Table 1: Available Compression Fittings for various pipe and PEX tubing sizes.

Pipe Size and Style	BHS Order No.
1/2" copper	6198924
5/8" PEX tubing	1646851
12 x 2 mm	1016870
16 x 2 mm (1/2" PEX)	7132
20 x 2 mm	80007152

Diverter Valves

Straight (Part No. 1016311) and angled (Part No. 1016312) diverter valves are available from Buderus Hydronic Systems for use in one-pipe systems (Fig. 5). Shut-offs are located on the supply and return branches to the radiator, isolating the radiator from the piping system.

Installation Considerations:

1. The valve mounts directly to the supply and return of the radiator. The compression fittings connect now to the diverter valve connections.
2. Allow 5" floor clearance below the radiator for the straight diverter valve; 4" for the angled diverter valve.
3. Due to its projection towards the mounting wall, the angled diverter valve CANNOT be used on Model 11 radiators unless a small recess is cut into the wall.

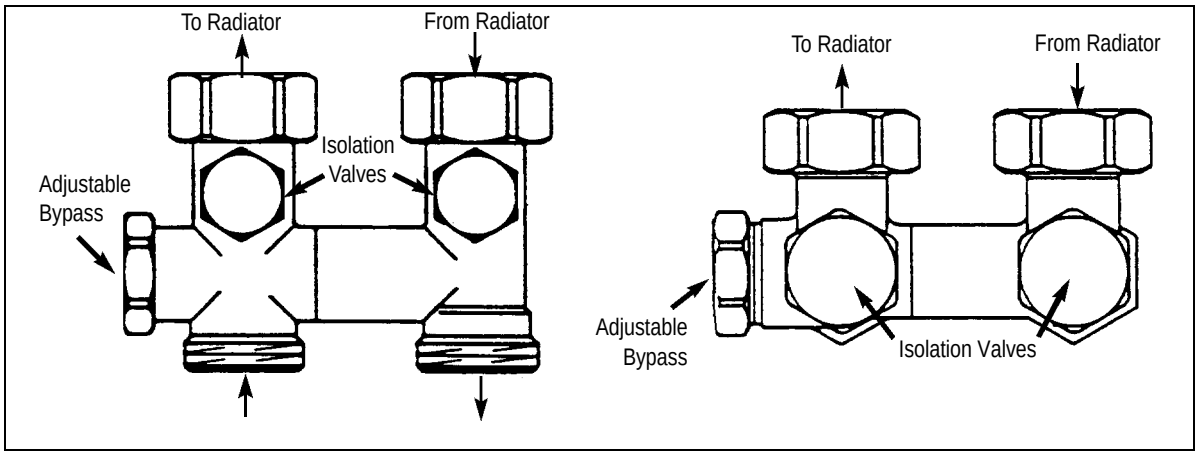


Figure 5: Straight and Angled Diverter Valves.

Each diverter valve is factory set for 35% flow through the radiator and 65% through the bypass. Other flow percentages are easily set according to the diagrams (Fig. 6). To adjust the bypass, turn the bypass spindle clockwise to fully closed. Then open the bypass spindle the desired number of turns from the fully closed position. Refer to the chart "Pressure Drop for One-Pipe System with Diverter Valves" on page 30 for detailed pressure drop information when using diverter valves in one-pipe systems.

Thermostatic Sensor Head

A thermostatic sensor head is easily installed on the flow setter valve. This feature permits the ultimate in zone control as it makes each radiator its own zone. The temperature is set individually at each radiator. A low "frost" setting allows water flow to prevent potential freeze-up, provided a circulator is operating.

The sensor indicator numbers correspond to the following approximate temperatures:

*	1	2	3	4	5
40	57	63	68	73	79

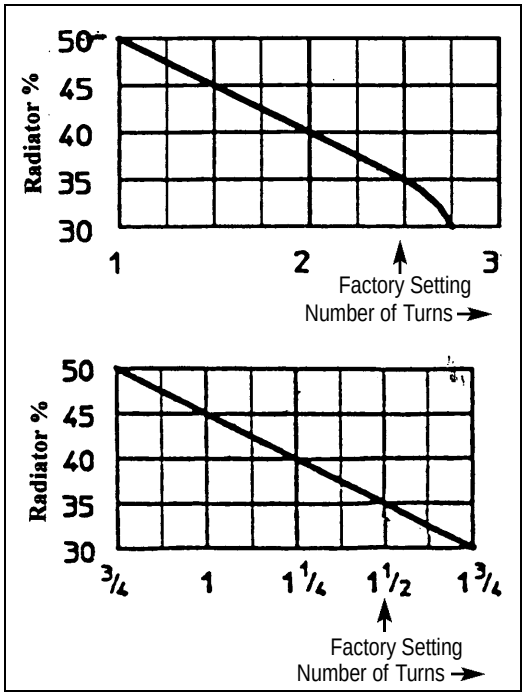


Figure 6: Radiator Flow Adjustment Curves: Straight and Angled Diverter Valves.

2 DESCRIPTION OF SYSTEM COMPONENTS

Buderus Towel Racks

The “Standard Style” towel racks consist of a 1-1/4" x 1-1/4" square channel steel frame with 1" round horizontal steel tubing precision welded in the interior. Four 1/2" tappings are available on the bottom of the towel rack for supply and return. A 1/2" tapping for an air vent is located near the top. The offset from the wall is 4".The towel rack is secured to the wall with two lag mounts inserted between any two adjacent tubes; a foot mount near the bottom ensures proper vertical positioning. See page 12 for rough-in instructions.

The "Tubotherm" towel racks are attractively designed with a vertical frame of two 2-3/4" round pipes connected horizontally with 1" curved round steel tubing. The wall offset is 5-3/4". Four 1/2" tappings are located on the bottom of the “Tubotherm” towel rack. Two plugs are provided for unused tappings. A 1/2" tapping for an air vent is located out of sight near the top. See page 13 for rough-in instructions.

All towel racks have a powder baked-on enamel white coating. Supply and return tappings are reversible. Openings are provided in the towel rack to hang towels. Complete wall mounting hardware and a manual air vent is supplied with each towel rack.

Piping accessories available from Buderus Hydronic Systems, Inc. for a clean, finished installation include:

1. Chrome plated straight thermostatic valve.	Part No. 013 G8015
2. Chrome plated angled thermostatic valve.	Part No. 013 G8013
3. Chrome plated 90˚ return elbow.	Part No. 3L0143

The straight or angled valve allow installation of a thermostatic sensor head for local temperature control when installed in either the supply or return piping. The return elbow allows bringing the piping horizontally out of the wall for a clean, finished appearance.

Installation Guidelines:

1. Maintain a minimum floor clearance of 6" to 8" when using the straight or angled thermostatic valve.

2. Provide blocking in the wall 6" to 12" high for the full width of the towel rack near the top. The bottom of the towel rack is kept in place with an adjustable wall spacer. Provide blocking here also.

3. The lag mounts and wall spacer insert between any adjacent pair of tubes.

DESCRIPTION OF SYSTEM COMPONENTS 2

"Standard Style" Models and Output Ratings in Btu/hr

	"Standard Style" Towel Rack Heights		
Width (W)	30"	47"	71"
19-3/4"	1750	2570	3757
23-5/8"	**2058**	**3024**	4460
29-1/2"	2515	3703	5512
39-1/2"	3276	4833	7270

"Tubotherm" Models and Output Ratings in Btu/hr

	"Tubotherm" Towel Rack Heights		
Width (W)	30"	51-1/2"	73"
20"	2164	3460	4775
23-3/4"	**2491**	3959	5443
29-3/4"	2986	4706	6447
39-1/2"	3832	6096	8396

Models in bold are stock items; additional sizes available with 8 to 10 week lead time.
Output ratings are based on an average water temperature of 180˚F.

Bench Radiators

Bench radiators consist of 1" round, precision welded steel tubing placed next to each other forming a horizontal shelf. Four to seven shelves stack on top of each other to form a bench radiator. Floor mounting hardware is shipped with each bench radiator. Two 1/2" bottom tappings are provided for supply and return. The floor clearance to the bottom of a bench radiator is adjustable from 7-3/4" to 12-3/4". The height of the bench radiator itself ranges from 7" for the 4 shelf models to 12-1/2" for the 7 shelf models. See page 14 for rough-in instructions.

Available Models and Output Ratings in Btu/hr

Length	Width	4 Shelves	5 Shelves	6 Shelves	7 Shelves
5'	5-3/4"	4,080	4,850	5,630	6,200
	7-1/4"	**4,900**	5,820	6,750	7,600
	8-3/4"	5,740	6,840	7,860	9,200
6'	5-3/4"	4,840	5,750	6,670	7,400
	7-14"	5,830	6,940	8,040	9,100
	8-3/4"	6,840	8,140	9,360	10,900
8'	5-3/4"	6,660	7,920	9,180	10,200
	7-1/4"	7,900	9,400	10,900	12,300
	8-3/4"	9,270	11,000	12,800	14,800
10'	5-3/4"	7,950	9,440	10,900	12,100
	7-1/4"	9,350	11,100	12,900	14,500
	8-3/4"	11,000	13,100	15,200	17,600

Models in bold are stock items; additional sizes available with 8 to 10 week lead time.
Output ratings are based on an average water temperature of 180˚F.