

# RADIATORS - TECHNICAL MANUAL

<b>GENERAL</b>	Page
-Product survey	2
-Approvals & warranty	2
-Specifications	2
-Heat outputs	2
-Powder coating process & colors	2
-Transportation, storing and handling	3
-Packing and loading on pallets	3
-Installation recommendations	4
-Series loop systems	4
-Pedestal mounting	4
<b>Integral</b>	
-Description	5
-Types	6
-Connections	6
-Dimensions	7
-Installation	8-9
-Heat outputs, volume, weight & n-exponent	10-17
-Pressure drop	18
-Colors	19



# PANEL RADIATORS

# GENERAL

## PRODUCT SURVEY

	Integral	Plainor	Compact	Vertical
profiled front (profile 50 mm)	✓	—	✓	✓
flat front	—	✓	—	—
side covers	✓	✓	✓	✓
top grill	✓	✓	✓	—
assembly points	✓	✓	✓	✓
n° connections	6	6	4	4 / 6
supply and return pipes invisible	✓	✓	—	—
thermostatic valve body included	✓	✓	—	—
hangers	✓	✓	✓	✓
assembly packaging	✓	✓	✓	—
bore template	—	—	—	✓

## APPROVALS & WARRANTY

In the manufacturing of the radiators, the highest quality standards are set.

The panel radiator complies with all international standards; it is ISO-certified and conducts internal quality tests that exceed these standards.

The Radiator quality and heat emission outputs have been tested and listed by the following institutes:



This translates to a 10-year warranty, after installation, provided that the proper system pressure and installation procedures are adhered to.

## SPECIFICATIONS

- All radiators are manufactured with cold rolled, high quality steel plate according to DIN 1623 and EN 10130. Thickness of the steel is .05" [1.25 mm.] Some models come standard with a 2" on center (50 mm) left or right rough in connection.
- Test pressure 117 psig [8 bar]
- Working pressure 88 psig [6 bar]



## POWDER COATING PROCESS & COLORS

The surface of the radiator is treated in three stages: a primer coat treatment and 2 separate finishing processes.

As part of the pre-treatment, each radiator is fully degreased. This process ensures optimal bonding of the primer coat. The phosphate coat and the primer offer maximum protection against oxidation. The next step is the rinsing each radiator in a de-mineralized water bath.

the radiators are painted with a process similar to that in a modern automobile factory. The radiators are degreased, phosphate treated, primed (using electrophoretic KTL-bath), and then dried at 390°F (200 °C). Finally, every radiator is painted through an electrostatic powder coating process with epoxy polyesters and enameled at 450°F (230°C) resulting in a brilliance of approximately 70%.

**Standard color is white RAL 9016.**

Other RAL powder coat colors are available at additional cost.

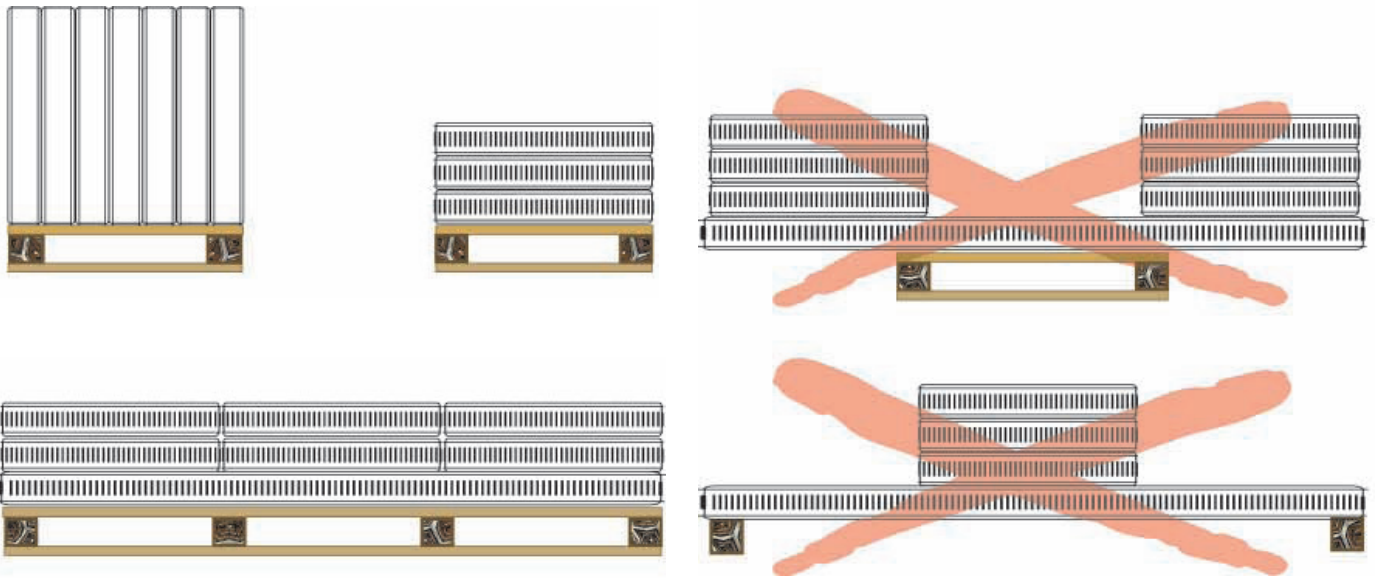
# GENERAL

## TRANSPORTATION / STORING / STACKING

Improper transportation, storing and handling can lead to damage and the possibility of the radiator leaking.

Special care should be taken for long radiators and should not be placed or transported horizontally on pallets or skids that are smaller than the actual radiator itself. Smaller radiators should not be placed or transported on the outer parts of longer radiators as the longer radiators can be damaged and edges bent.

Common sense should be applied in supporting and re-packaging of the radiators.



Do not store the radiators in an exterior environment subject to sun, and weather conditions without protective covering.

If moisture is seen inside the packaging, open and dry.



## PACKAGING & LOADING ON PALLETS

Type	Number per pallet
11	8
21	8
22	8
33	5

The radiators are protected on 4 sides with cardboard, inclusive of corner edge protection and are shrink-wrapped.

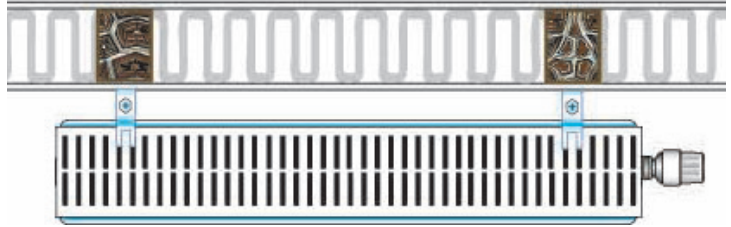
The radiators remain inside their packaging until installation to prevent damage. The entire packaging is recyclable.

## GENERAL

### INSTALLATION RECOMMENDATIONS

When installing a radiator against a sheet rock wall, attach the hangers to the wood studs in the wall whenever possible. Reversible radiators have the convenience of locating the hanger with the studs. Reversible radiators are only available in 21, 22 and 33. Other radiators have fixed dimension for hanger locations. In this event, backing should be provided for proper installation.

**Long radiators are heavy once filled up with water, it is important to make sure the proper amount of hangers are installed to provide support so the radiator does not come off the wall. Human injury and physical damage can occur if the radiator falls off the finished wall.**



### SERIES LOOP SYSTEMS



The panel radiators can also be used in series loop systems with by-pass Multiflex fittings.

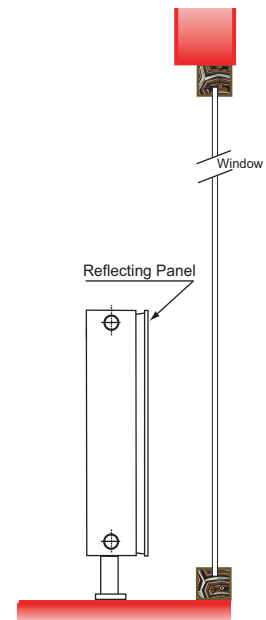
A Multiflex by-pass fitting can also isolate the radiator. This way, a radiator can be removed without interrupting the operation of the heating system. Multiflex fitting can also be installed before the radiators after the rough. This allows for the complete operation of the hydronic system. Now each radiator can be installed after finish painting and easily purged and put into operation without affecting the heating system.

Allow 2" center to center below the radiator to accommodate the Multiflex fitting. The valve insert flow setter, installed at the factory, should be set to its highest setting (6, which is the factory setting) in series loop systems. This allows maximum flow to the system.

**Caution should be exercised in series loop installation for developed lengths of supply & return piping, as well as BTU capacity of the radiators. If questions arise, please contact our technical department.**

### PEDESTAL MOUNTING

In order to prevent excessive heat loss of radiators placed in front of a window, a reflecting panel can be installed between the window and the radiator to improve system efficiency. This accessory is available at additional cost.



# Integral

## DESCRIPTION

### Standard components:

Top grill and side covers are firmly attached to the radiator, yet removable (does not apply for type 10). The front is profiled.

Powder coating process is in correspondence to the DIN 55900 norm and EN 442 (emission free):

- Preparation: degreasing, phosphate layer and rinsing with De-mineralized-water.
- 1st coating process: applying the primer coating according to the cataphoresis process.
- Final coat: according to the epoxy-polyester powder principal.

Standard color is RAL 9016, white. An extensive range RAL-colors are available (at extra charge).

What does the **Integral** name mean? Integrated valve & piping system. Thanks to its design, the supply and return connection is concealed behind the cover and is no longer visible from the side of the radiator.

The supply and return pipes are located at the bottom right (or left if a REV model) and if connected to the wall, provides a clean finish and allows easy cleaning underneath the radiator.

The Cv-adjustable thermostatic valve body, factory installed-1 rotating air vent .  
Connections: 2 -½" BSP female pipe opening at the bottom right ( or left). Heating supply inlet will always be the inside connection to the radiator on the Integra. There are also four other ½" BSP side connections, left and right on the radiator as alternate return connections only. **Integral** radiators are made for two pipe heating systems.

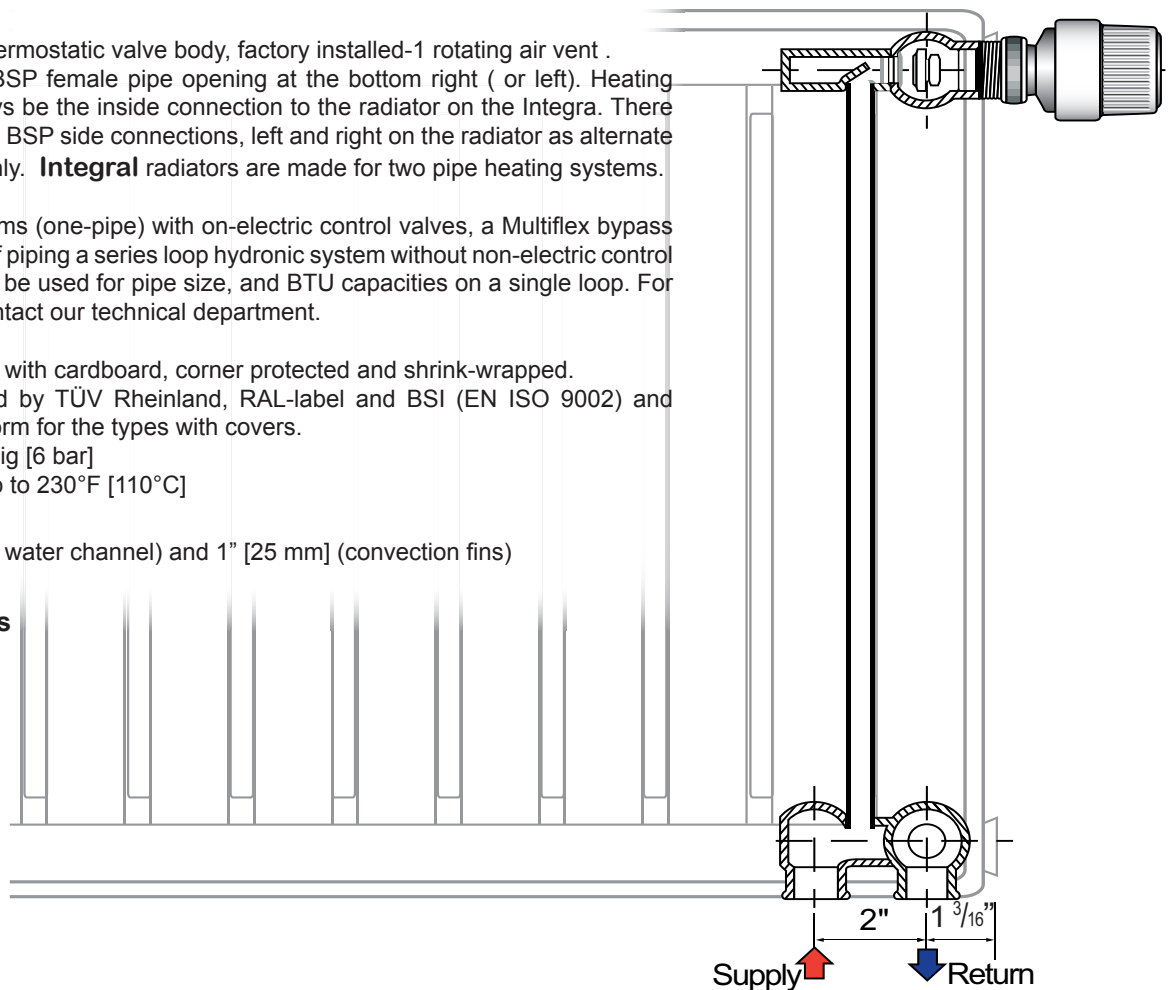
For series loop systems (one-pipe) with on-electric control valves, a Multiflex bypass fitting must be used. If piping a series loop hydronic system without non-electric control valve, caution should be used for pipe size, and BTU capacities on a single loop. For more information, contact our technical department.

Packaging: protected with cardboard, corner protected and shrink-wrapped.  
Quality is guaranteed by TÜV Rheinland, RAL-label and BSI (EN ISO 9002) and meets the BAGUV-norm for the types with covers.

Work pressure: 88 psig [6 bar]  
Medium: hot water up to 230°F [110°C]

Step: 2" [50 mm] (hot water channel) and 1" [25 mm] (convection fins)

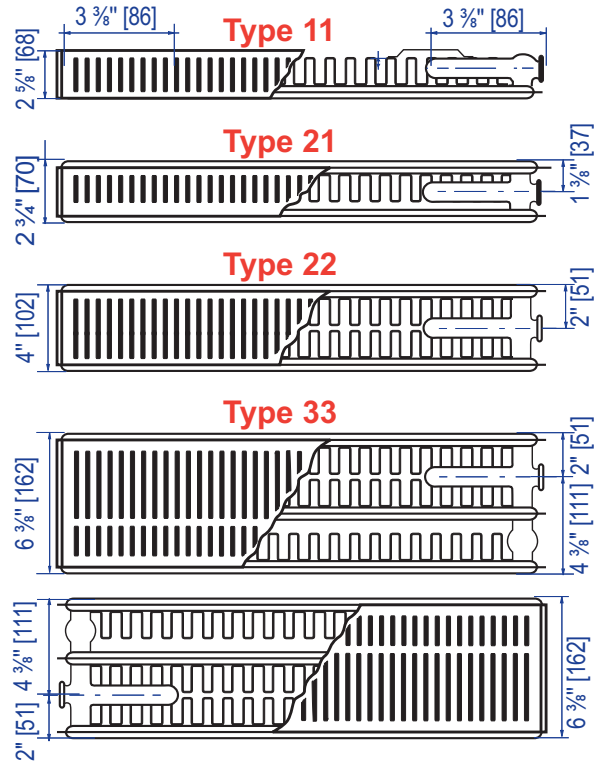
**Warranty: 10 years**



# Integral TYPES

Types 11 - 21 - 22 - 33

Height (inch)	11 3/4"	15 3/4"	19 5/8"	23 5/8"	35 5/8"
Height (mm)	300	400	500	600	900
Width (inch)	15 3/4"	19 5/8"	23 5/8"	27 1/2"	31 1/2"
	35 3/8"	39 3/8"	43 1/4"	47 1/4"	51 1/8"
	55 1/8"	59"	63"	66 7/8"	70 7/8"
	74 3/4"	78 3/4"	86 5/8"	94 1/2"	102 3/8"
Width (mm)	400	500	600	700	800
	900	1000	1100	1200	1300
	1400	1500	1600	1700	1800
	1900	2000	2200	2400	2600
	2800	3000			



Test pressure 118 psig [8 bar]

Work pressure 88psig [6 bar]

Connections 6 x 1/2" BSP

BTU capacity measured in accordance with EN 442 (European standard converted from Watts to BTU's)

Hanging hardware: 4 or 6 welded lugs to received hangers, except for the reversible type 21, 22 and 33

Accessories: 1 stop, 1 rotating air vent, (2 or 3 L-consoles, screws and wall plugs are in the packaging and are inclusive in the price for type 11)

Accessories: Floor standing brackets, screening plate and towel rack + see price-list.

Packaging: solid packaging of cardboard shrink-wrapped with corner guards and edge protection

## CONNECTIONS

Every **Integral** radiator is equipped with 6 connections 1/2" BSP (European threads).

**It is highly recommended that one purchases the required transition pieces from us to receive tapered NPT connections.**

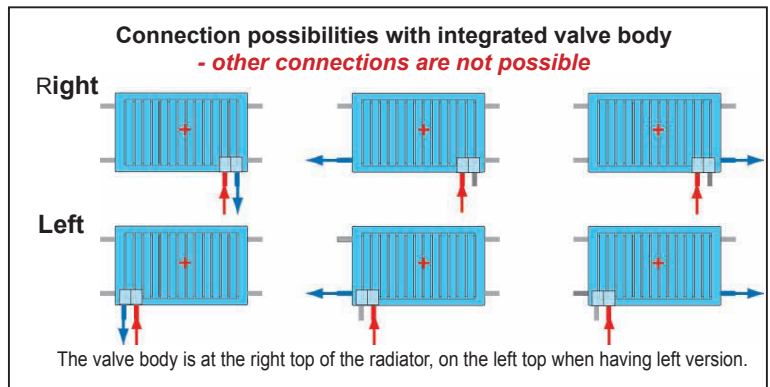
The Kv-adjustable integrated valve insert, the stop and the air vent are installed at the factory. All radiators are equipped with an integrated supply and return on the right hand side of the radiator. This is the standard connection. Left hand radiators available by special order. Please allow 6-8 weeks for special orders.

**Integral** models are also available in Reversible style. With no welded lugs on the radiator, it can be installed in a right or left hand configuration.

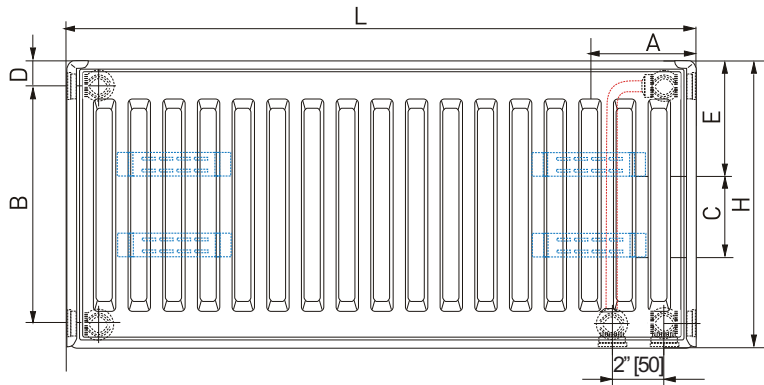
### Please note:

**Reversible radiators are offered in 21, 22, and 33 style only. 21, and 22 rough in dimensions remain the same. If the 33 is reversed, the left hand rough dimension changes as reflected in the dimensions.**

If you have any questions regarding rough in's, please contact the technical department.



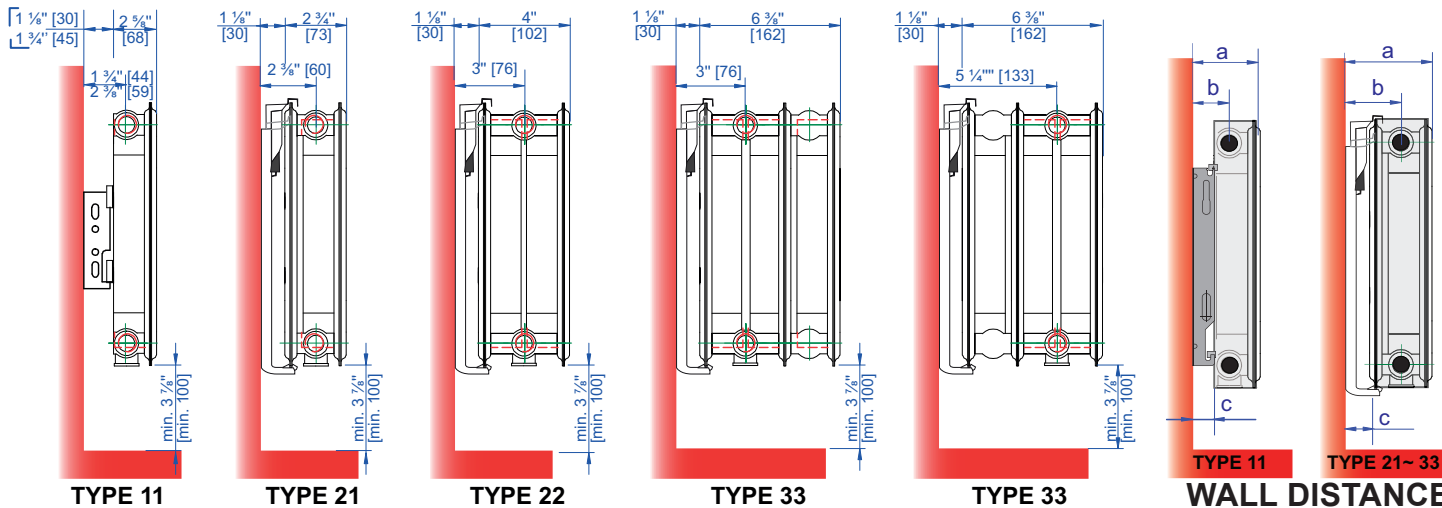
# Integral DIMENSIONS



H		C		B	
inch	mm	inch	mm	inch	mm
11 3/4"	300	3 3/8"	85	9 3/4"	249
15 1/4"	400	7 1/4"	185	13 3/4"	349
19 5/8"	500	11 1/4"	285	17 5/8"	449
23 5/8"	600	15 1/8"	385	21 5/8"	549
<del>27 1/2"</del>	<del>700</del>	<del>19 1/8"</del>	<del>485</del>	<del>25 1/2"</del>	<del>649</del>
31 1/2"	800	23"	585	29 1/2"	749
35 3/8"	900	27"	685	33 3/8"	849

N/A

Type	A		E		D	
	inch	mm	inch	mm	inch	mm
11	4 5/8"	117	4 3/4"	120	1"	26
21	no lugs		4 3/4"	120	1"	26
22			4 3/4"	120	1"	26
33			4 3/4"	120	1"	26



**Note:** Integral reversible Type 21 - 22 - 33 do not have lugs welded on type 11 : right hand connection is standard - left connection is optional

## INSTALLATION

**Type 11 radiators** are equipped with 4 or 6 welded-on hanging lugs at the rear. (6 pieces from L 65" [1650 mm])

The wall hangers are of the type MCW angular bracket - equipped with an acoustic lining in Nylon. The radiators can be supported without the hanger or other attachments visible.

**Type 21, 22 and 33**, the wall hangers are of the type HKD.

The number of hangers used on a radiator depends of the length and weight of the radiator.

Pedestal mounts are available for any type of Integral radiator.



Floor stand covers



radiators with welded lugs



reversible Type 21, 22 and 33

type	a		b		c	
	inch	mm	inch	mm	inch	mm
<b>11</b> narrow assembly	3 7/8"	98	1 3/4"	44	1 1/8"	30
<b>11</b> wide assembly	4 1/2"	113	2 3/8"	59	1 3/4"	45
<b>21</b>	3 7/8"	100	2 3/8"	60	1 1/8"	30
<b>22</b>	5 1/4"	132	3"	76	1 1/8"	30
<b>33</b> right connection	7 1/2"	192	3"	76	1 1/8"	30
<b>33</b> left connection	7 1/2"	192	5 1/4"	133	1 1/8"	30

## Radiator Installation

**IMPORTANT INFORMATION**

**PLEASE READ THROUGH THE ENTIRE INSTALLATION INSTRUCTIONS BEFORE STARTING INSTALLATION**

- This product is for use with hydronic heating systems connected to boilers or oxygen dead hydraulic systems with system separation. This product should never be installed with open systems.
- This radiator should be inspected for damage before installing on the wall. This product is provided for heating professionals and related trades.
- Please do not lift the radiator by the top grille or side panel as cosmetic damage can occur.
- Please note that style 11 radiators are right hand connection only unless special ordered left hand.
- The connections on all opening of the radiator are ½" BSP connections; please consult the Hydronic Alternatives radiator accessory sheet for appropriate BSP to FPT, Pex or copper connections.

**PACK CONTENTS**

1 x radiator	2 x chrome blanking plugs
2 x wall brackets (unassembled)	1 x air bleed key
1 x air bleeder	4 x bracket buffers (11 series only)
1 x integrated valve	

**INSTALLATION INSTRUCTIONS**

**Step 1**

Remove packaging and visibly inspect the radiator for damage before installing. Note that type 21, 22 and 33 are reversible and will have hangers installed in the packaging and will require assembly. (Please refer to page (2) of this document for assembly instructions). Type 11 radiators are right hand configuration only unless special ordered. There is an accessory pack which includes the Integrated Valve, Air Bleeder, (2) Chrome Plugs and mounting hardware located inside the packaging at the bottom of the radiator that will need to be installed. If you receive a radiator with a "Red Dot" on the outer packaging, the hangers will come preassembled separately with Integrated Valve, Air Bleeder & Chrome Plugs already installed on the radiator requiring tightening only. The cardboard, polyethylene and corner protectors are all recyclable.

**Step 2**

Select your desired installation location and check that there are no water pipes or electrical wires behind the location where the holes need to be made for the radiator hanger. Note the hangers can be fastened to existing wood studs or lagged into masonry walls using appropriate anchors. If wall studs cannot be used, backing should be roughed behind the finish wall to support the weight of the radiator. Please note that the bottom of the radiator should be at least 4" above the finish floor for sufficient airflow and ease of making your supply and return connections.

**Step 3**

Once the hangers have been assembled and mounted on the wall, position the radiator on the floor directly in front of the wall hangers. Carefully lift the radiator into position, once the radiator is firmly set into the bottom channel with the plastic insulator snap the spring clip so that the ears connect in between the grille spaces. Once the spring clip has snapped into position the supply and return connections can be safely made. If the spring clip is not properly engaged the possibility of the radiator coming loose from the wall could occur. Make sure the spring clip on the hanger assembly is properly engaged before proceeding with the heating system connections.

**Step 4**

Now that the radiator is firmly attached to the wall, the supply and return connections can begin. Please note that all connections on our radiators are BSP or parallel thread. Consult the Radiator Accessory price sheet to select the appropriate BSP to North American thread connections. Transition fittings are available for ½" copper, ½" female iron pipe and ¾", ½" and ⅝" PE RT or Pex pipe. If a series/one pipe installation is desired please select an angle or straight "H" fitting with the desired connections mentioned above. When connecting radiators in a series loop confirm that your pipe size is appropriate to support the BTU capacity and that your pump will be able to overcome the total dynamic head of the pressure drop through the piping, radiator and connection fittings. Please note for through the floor installations protection against direct sunlight for PE RT or Pex tubing should be taken. UV degradation can occur over time and premature failure of the piping can occur. In the radiator Accessory price sheet we provide part # HRDB 50 floor escutcheon and pipe covers which are UV resistant.



PAN RAD INSTALL 2016

### Step 5

Once the radiator is connected to your heating system air must be removed from the unit. Each radiator is provided with a coin vent. If the radiator is installed with a home run manifold system then purging can take place at the manifold. If piped with copper or steel, provision to purge the radiators should be made or it will be difficult to remove the air which will impact the performance of the system.

### Step 6

Note that the integral valve installed to receive the non-electric thermostat has a built in flow setter. You will notice embossed in the side of the integrated valve at the top right or left of the radiator the numbers 1 through 6. These are defined flow positions with 1 being the least amount of flow and 6 the most. If you use a non-electric thermostat it will be self-regulating and position 6 should be used. #6 is the default position and sometimes during the installation of the non-electric thermostat the position can get changed. Please verify that position #6 is set before installing your thermostat. If you want to balance the flow of the system then devices to measure flow should be installed on the return side.

### Step 7

Check all connections for leaks. Remember leaks cause fresh water to be added to the system and will cause corrosion. Also, small leaks will deteriorate the powder coat finish of the product.

### Step 8

Note: It is highly recommended that a non-electric thermostat be installed to protect the radiator against excessive surface temperature. The introduction of the non-electric thermostatic head enhances the overall quality of the product providing a higher level of comfort and the ability to control the temperature at each radiator location which will save on your overall energy use. We highly recommend the installation of this device.



### Hanger Assembly

#### Step 1

Remove the hangers and top clips from the radiator packaging.

#### Step 2

Assemble the hangers by sliding the top clip into the vertical rail and secure with the spring provided. Note that the spring is directional and the larger side of the spring attaches to the top clip.

### Integrated Valve, Air Bleeder & Chrome plug (2) Installation

#### Step 1

Remove the Integrated Valve, Air Bleeder & Chrome plugs from the radiator packaging.

#### Step 2

Install the Integrated Valve in the radiator at the top on the same side where the 2" on center bottom connections are located.

#### Step 3

Install the Air Bleeder on the opposite side of the radiator at the top directly across from the Integrated Valve.

#### Step 4

Install the chrome plugs (2) in the lower side ports.

#### Note:

All connections are ½" BSP and radiator fittings have O-rings. Overtightening is not necessary, damage can occur to the O-rings.

### CARE AFTER INSTALLATION

To clean the radiator, use warm soapy water and a soft cloth. Chemical or abrasive cleaners should not be used. Radiator brushes are available to remove dust buildup on the convective fins only a horsehair brush should be used.

## Integral characteristics of type 11

Height		Width		Heat emissions		Weight		Volume		n
mm	inch	mm	inch	Watt 75/65/20°C	BTU 200/160/68°F	kg	lbs	liter	gallon	exponent
300	11 3/4"	400	15 3/4"	209	946	4.09	9.02	0.11	0.03	1.305
		500	19 5/8"	262	1182	5.02	11.07	0.27	0.07	1.305
		600	23 3/8"	314	1419	5.73	12.63	0.53	0.14	1.305
		700	27 1/2"	366	1655	6.45	14.22	0.88	0.23	1.305
		800	31 1/2"	419	1891	7.22	15.92	1.26	0.33	1.305
		900	35 3/8"	471	2128	7.94	17.50	1.58	0.42	1.305
		1000	39 3/8"	523	2364	8.66	19.09	1.76	0.46	1.305
		1100	43 1/4"	576	2601	9.38	20.68	1.93	0.51	1.305
		1200	47 1/4"	628	2837	10.10	22.27	2.11	0.56	1.305
		1300	51 1/8"	680	3074	10.82	23.85	2.28	0.60	1.305
		1400	55 1/8"	733	3310	11.54	25.44	2.46	0.65	1.305
		1500	59"	785	3546	12.31	27.14	2.63	0.70	1.305
		1600	63"	837	3783	13.03	28.73	2.81	0.74	1.305
		1700	66 7/8"	890	4019	13.85	30.53	2.98	0.79	1.305
1800	70 7/8"	942	4256	14.60	32.19	3.16	0.83	1.305		
400	15 3/4"	400	15 3/4"	266	1201	5.47	12.06	0.87	0.23	1.301
		500	19 5/8"	333	1501	6.42	14.15	1.09	0.29	1.301
		600	23 3/8"	399	1802	7.38	16.27	1.30	0.34	1.301
		700	27 1/2"	466	2102	8.33	18.36	1.52	0.40	1.301
		800	31 1/2"	532	2402	9.33	20.57	1.74	0.46	1.301
		900	35 3/8"	599	2702	10.29	22.69	1.95	0.52	1.301
		1000	39 3/8"	665	3003	11.24	24.78	2.17	0.57	1.301
		1100	43 1/4"	732	3303	12.20	26.90	2.39	0.63	1.301
		1200	47 1/4"	798	3603	13.15	28.99	2.60	0.69	1.301
		1300	51 1/8"	865	3903	14.10	31.09	2.82	0.75	1.301
		1400	55 1/8"	931	4204	15.06	33.20	3.04	0.80	1.301
		1500	59"	998	4504	16.06	35.41	3.26	0.86	1.301
		1600	63"	1064	4804	17.02	37.52	3.47	0.92	1.301
		1700	66 7/8"	1131	5105	18.07	39.84	3.69	0.97	1.301
1800	70 7/8"	1197	5405	19.10	42.11	3.91	1.03	1.301		
500	19 5/8"	400	15 3/4"	319	1437	6.75	14.88	1.06	0.28	1.297
		500	19 5/8"	398	1796	7.96	17.55	1.33	0.35	1.297
		600	23 3/8"	478	2156	9.17	20.22	1.59	0.42	1.297
		700	27 1/2"	558	2515	10.39	22.91	1.86	0.49	1.297
		800	31 1/2"	637	2874	11.65	25.68	2.12	0.56	1.297
		900	35 3/8"	717	3233	12.86	28.35	2.39	0.63	1.297
		1000	39 3/8"	797	3593	14.07	31.02	2.65	0.70	1.297
		1100	43 1/4"	876	3952	15.28	33.69	2.92	0.77	1.297
		1200	47 1/4"	956	4311	16.49	36.35	3.18	0.84	1.297
		1300	51 1/8"	1036	4671	17.70	39.02	3.45	0.91	1.297
		1400	55 1/8"	1115	5030	18.91	41.69	3.71	0.98	1.297
		1500	59"	1195	5389	20.17	44.47	3.98	1.05	1.297
		1600	63"	1275	5748	21.38	47.13	4.24	1.12	1.297
		1700	66 7/8"	1354	6108	22.81	50.29	4.51	1.19	1.297
1800	70 7/8"	1434	6467	24.05	53.02	4.77	1.26	1.297		

# Integral

## characteristics of type 11

Height		Width		Heat emissions		Weight		Volume		n
mm	inch	mm	inch	Watt 75/65/20°C	BTU 200/160/68°F	kg	lbs	liter	gallon	exponent
600	23 3/8"	400	15 3/4"	369	1662	8.10	17.86	1.24	0.33	1.293
		500	19 5/8"	461	2078	9.58	21.12	1.55	0.41	1.293
		600	23 3/8"	553	2493	11.06	24.38	1.86	0.49	1.293
		700	27 1/2"	646	2909	12.54	27.65	2.17	0.57	1.293
		800	31 1/2"	738	3324	14.07	31.02	2.48	0.66	1.293
		900	35 3/8"	830	3740	15.55	34.28	2.79	0.74	1.293
		1000	39 3/8"	922	4156	17.02	37.52	3.10	0.82	1.293
		1100	43 1/4"	1014	4571	18.50	40.79	3.41	0.90	1.293
		1200	47 1/4"	1107	4987	19.98	44.05	3.72	0.98	1.293
		1300	51 1/8"	1199	5402	21.46	47.31	4.03	1.06	1.293
		1400	55 1/8"	1291	5818	22.94	50.57	4.34	1.15	1.293
		1500	59"	1383	6233	24.47	53.95	4.65	1.23	1.293
		1600	63"	1476	6649	25.95	57.21	4.96	1.31	1.293
		1700	66 7/8"	1568	7064	27.71	61.09	5.27	1.39	1.293
1800	70 7/8"	1660	7480	29.22	64.42	5.58	1.47	1.293		
700	27 1/2"	<del>400</del>	<del>15 3/4"</del>	<del>584</del>	<del>2640</del>	<del>9.50</del>	<del>20.94</del>	<del>2.75</del>	<del>0.73</del>	<del>1.310</del>
		<del>500</del>	<del>19 5/8"</del>	<del>730</del>	<del>3301</del>	<del>11.20</del>	<del>24.69</del>	<del>3.44</del>	<del>0.91</del>	<del>1.310</del>
		<del>600</del>	<del>23 3/8"</del>	<del>876</del>	<del>3961</del>	<del>12.90</del>	<del>28.44</del>	<del>4.12</del>	<del>1.09</del>	<del>1.310</del>
		<del>700</del>	<del>27 1/2"</del>	<del>1022</del>	<del>4621</del>	<del>14.50</del>	<del>31.97</del>	<del>4.81</del>	<del>1.27</del>	<del>1.310</del>
		<del>800</del>	<del>31 1/2"</del>	<del>1168</del>	<del>5281</del>	<del>16.30</del>	<del>35.94</del>	<del>5.50</del>	<del>1.45</del>	<del>1.310</del>
		<del>900</del>	<del>35 3/8"</del>	<del>1314</del>	<del>5941</del>	<del>18.00</del>	<del>39.68</del>	<del>6.18</del>	<del>1.63</del>	<del>1.310</del>
		<del>1000</del>	<del>39 3/8"</del>	<del>1460</del>	<del>6601</del>	<del>19.70</del>	<del>43.43</del>	<del>6.87</del>	<del>1.81</del>	<del>1.310</del>
		<del>1100</del>	<del>43 1/4"</del>	<del>1606</del>	<del>7261</del>	<del>21.40</del>	<del>47.18</del>	<del>7.56</del>	<del>2.00</del>	<del>1.310</del>
		<del>1200</del>	<del>47 1/4"</del>	<del>1751</del>	<del>7921</del>	<del>23.10</del>	<del>50.93</del>	<del>8.24</del>	<del>2.18</del>	<del>1.310</del>
		<del>1300</del>	<del>51 1/8"</del>	<del>1897</del>	<del>8581</del>	<del>24.80</del>	<del>54.67</del>	<del>8.93</del>	<del>2.36</del>	<del>1.310</del>
		<del>1400</del>	<del>55 1/8"</del>	<del>2043</del>	<del>9242</del>	<del>26.40</del>	<del>58.20</del>	<del>9.62</del>	<del>2.54</del>	<del>1.310</del>
		<del>1500</del>	<del>59"</del>	<del>2189</del>	<del>9902</del>	<del>28.10</del>	<del>61.95</del>	<del>10.31</del>	<del>2.72</del>	<del>1.310</del>
		<del>1600</del>	<del>63"</del>	<del>2335</del>	<del>10562</del>	<del>29.80</del>	<del>65.70</del>	<del>10.99</del>	<del>2.90</del>	<del>1.310</del>
		<del>1700</del>	<del>66 7/8"</del>	<del>2481</del>	<del>11222</del>	<del>31.50</del>	<del>69.45</del>	<del>11.68</del>	<del>3.09</del>	<del>1.310</del>
<del>1800</del>	<del>70 7/8"</del>	<del>2627</del>	<del>11882</del>	<del>33.20</del>	<del>73.19</del>	<del>12.37</del>	<del>3.27</del>	<del>1.310</del>		
900	35 3/8"	400	15 3/4"	512	2303	10.44	23.02	1.79	0.47	1.280
		500	19 5/8"	641	2878	13.56	29.89	2.24	0.59	1.280
		600	23 3/8"	769	3454	15.69	34.59	2.68	0.71	1.280
		700	27 1/2"	897	4030	17.82	39.29	3.13	0.83	1.280
		800	31 1/2"	1025	4606	20.00	44.09	3.58	0.94	1.280
		900	35 3/8"	1153	5181	22.14	48.81	4.02	1.06	1.280
		1000	39 3/8"	1281	5757	24.27	53.51	4.47	1.18	1.280
		1100	43 1/4"	1409	6333	26.40	58.20	4.92	1.30	1.280
		1200	47 1/4"	1537	6908	28.53	62.90	5.36	1.42	1.280
		1300	51 1/8"	1665	7484	30.66	67.59	5.81	1.54	1.280
		1400	55 1/8"	1793	8060	32.79	72.29	6.26	1.65	1.280
		1500	59"	1922	8635	34.97	77.10	6.71	1.77	1.280
		1600	63"	2050	9211	37.10	81.79	7.15	1.89	1.280
		1700	66 7/8"	2178	9787	39.73	87.59	7.60	2.01	1.280
1800	70 7/8"	2306	10362	41.89	92.35	8.05	2.13	1.280		

# Integral characteristics of type 21

Height		Width		Heat emissions		Weight		Volume		n
mm	inch	mm	inch	Watt 75/65/20°C	BTU 200/160/68°F	kg	lbs	liter	gallon	exponent
300	11 3/4"	400	15 3/4"	305	1382	6.34	13.98	1.38	0.36	1.315
		500	19 7/8"	381	1727	7.57	16.69	1.72	0.45	1.315
		600	23 5/8"	458	2073	8.81	19.42	2.06	0.55	1.315
		700	27 1/2"	534	2418	10.04	22.13	2.41	0.64	1.315
		800	31 1/2"	610	2764	11.33	24.98	2.75	0.73	1.315
		900	35 3/8"	687	3109	12.57	27.71	3.10	0.82	1.315
		1000	39 3/8"	763	3455	13.80	30.42	3.44	0.91	1.315
		1100	43 1/4"	839	3800	15.04	33.16	3.78	1.00	1.315
		1200	47 1/4"	916	4146	16.27	35.87	4.13	1.09	1.315
		1300	51 1/8"	992	4491	17.51	38.60	4.47	1.18	1.315
		1400	55 1/8"	1068	4836	18.75	41.34	4.82	1.27	1.315
		1500	59"	1144	5182	20.03	44.16	5.16	1.36	1.315
		1600	63"	1221	5527	21.27	46.89	5.50	1.45	1.315
		1700	66 7/8"	1297	5873	22.61	49.85	5.85	1.54	1.315
		1800	70 7/8"	1373	6218	23.87	52.62	6.19	1.64	1.315
		1900	74 3/4"	1450	6564	25.11	55.36	6.54	1.73	1.315
		2000	78 3/4"	1526	6909	26.40	58.20	6.88	1.82	1.315
		2200	86 7/8"	1678	7600	28.87	63.65	7.57	2.00	1.315
		2400	94 1/2"	1831	8291	31.34	69.09	8.26	2.18	1.315
		2600	102 3/8"	1984	8982	33.96	74.87	8.94	2.36	1.315
2800	110 1/4"	2136	9673	36.44	80.34	9.63	2.54	1.315		
3000	118 1/2"	2289	10364	38.91	85.78	10.32	2.73	1.315		
400	15 3/4"	400	15 3/4"	386	1748	8.20	18.08	1.69	0.45	1.314
		500	19 7/8"	483	2185	9.85	21.72	2.11	0.56	1.314
		600	23 5/8"	579	2622	11.49	25.33	2.53	0.67	1.314
		700	27 1/2"	676	3059	13.13	28.95	2.95	0.78	1.314
		800	31 1/2"	772	3496	14.82	32.67	3.38	0.89	1.314
		900	35 3/8"	869	3933	16.46	36.29	3.80	1.00	1.314
		1000	39 3/8"	965	4370	18.11	39.93	4.22	1.11	1.314
		1100	43 1/4"	1062	4807	19.75	43.54	4.64	1.23	1.314
		1200	47 1/4"	1158	5244	21.39	47.16	5.06	1.34	1.314
		1300	51 1/8"	1255	5680	23.03	50.77	5.49	1.45	1.314
		1400	55 1/8"	1351	6117	24.67	54.39	5.91	1.56	1.314
		1500	59"	1448	6554	26.37	58.14	6.33	1.67	1.314
		1600	63"	1544	6991	28.01	61.75	6.75	1.78	1.314
		1700	66 7/8"	1641	7428	29.75	65.59	7.17	1.90	1.314
		1800	70 7/8"	1738	7865	31.47	69.38	7.60	2.01	1.314
		1900	74 3/4"	1834	8302	33.11	73.00	8.02	2.12	1.314
		2000	78 3/4"	1931	8739	34.80	76.72	8.44	2.23	1.314
		2200	86 7/8"	2124	9613	38.08	83.95	9.28	2.45	1.314
		2400	94 1/2"	2317	10487	41.37	91.21	10.13	2.68	1.314
		2600	102 3/8"	2510	11361	44.85	98.88	10.97	2.90	1.314
2800	110 1/4"	2703	12235	48.13	106.11	11.82	3.12	1.314		
3000	118 1/8"	2896	13109	51.42	113.36	12.66	3.34	1.314		
500	19 3/8"	400	15 3/4"	462	2093	10.30	22.71	2.06	0.54	1.313
		500	19 7/8"	578	2616	12.40	27.34	2.58	0.68	1.313
		600	23 5/8"	694	3139	14.50	31.97	3.09	0.82	1.313
		700	27 1/2"	809	3662	16.60	36.60	3.61	0.95	1.313
		800	31 1/2"	925	4185	18.75	41.34	4.12	1.09	1.313
		900	35 3/8"	1040	4708	20.85	45.97	4.64	1.22	1.313
		1000	39 3/8"	1156	5231	22.95	50.60	5.15	1.36	1.313
		1100	43 1/4"	1272	5755	25.04	55.20	5.67	1.50	1.313
		1200	47 1/4"	1387	6278	27.14	59.83	6.18	1.63	1.313
		1300	51 1/8"	1503	6801	29.24	64.46	6.70	1.77	1.313
		1400	55 1/8"	1618	7324	31.34	69.09	7.21	1.90	1.313
		1500	59"	1734	7847	33.49	73.83	7.73	2.04	1.313
		1600	63"	1850	8370	35.59	78.46	8.24	2.18	1.313
		1700	66 7/8"	1965	8893	37.91	83.58	8.76	2.31	1.313
		1800	70 7/8"	2081	9417	40.03	88.25	9.27	2.45	1.313
		1900	74 3/4"	2196	9940	42.13	92.88	9.79	2.58	1.313
		2000	78 3/4"	2312	10463	44.28	97.62	10.30	2.72	1.313
		2200	86 7/8"	2543	11509	48.48	106.88	11.33	2.99	1.313
		2400	94 1/2"	2774	12555	52.68	116.14	12.36	3.27	1.313
		2600	102 3/8"	3006	13602	57.15	125.99	13.39	3.54	1.313
2800	110 1/4"	3237	14648	61.35	135.25	14.42	3.81	1.313		
3000	118 1/8"	3468	15694	65.54	144.49	15.45	4.08	1.313		

# Integral characteristics of type 21

Height		Width		Heat emissions		Weight		Volume		n
mm	inch	mm	inch	Watt 75/65/20°C	BTU 200/160/68°F	kg	lbs	liter	gallon	exponent
600	23 3/8"	400	15 3/4"	535	2420	12.48	27.51	2.41	0.64	1.311
		500	19 7/8"	669	3025	15.05	33.18	3.01	0.80	1.311
		600	23 5/8"	802	3630	17.63	38.87	3.61	0.95	1.311
		700	27 1/2"	936	4235	20.21	44.56	4.21	1.11	1.311
		800	31 1/2"	1070	4841	22.84	50.35	4.82	1.27	1.311
		900	35 3/8"	1204	5446	25.41	56.02	5.42	1.43	1.311
		1000	39 3/8"	1337	6051	27.99	61.71	6.02	1.59	1.311
		1100	43 1/4"	1471	6656	30.57	67.40	6.62	1.75	1.311
		1200	47 1/4"	1605	7261	33.15	73.08	7.22	1.91	1.311
		1300	51 1/8"	1739	7866	35.72	78.75	7.83	2.07	1.311
		1400	55 1/8"	1872	8471	38.30	84.44	8.43	2.23	1.311
		1500	59"	2006	9076	40.93	90.24	9.03	2.39	1.311
		1600	63"	2140	9681	43.51	95.92	9.63	2.54	1.311
		1700	66 7/8"	2274	10286	46.37	102.23	10.23	2.70	1.311
		1800	70 7/8"	2407	10891	48.97	107.96	10.84	2.86	1.311
		1900	74 3/4"	2541	11496	51.55	113.65	11.44	3.02	1.311
		2000	78 3/4"	2675	12101	54.18	119.45	12.04	3.18	1.311
		2200	86 7/8"	2942	13311	59.33	130.80	13.24	3.50	1.311
		2400	94 1/2"	3210	14522	64.49	142.18	14.45	3.82	1.311
		2600	102 3/8"	3477	15732	69.98	154.28	15.65	4.13	1.311
2800	110 1/4"	3745	16942	75.13	165.63	16.86	4.45	1.311		
3000	118 1/2"	4012	18152	80.29	177.01	18.06	4.77	1.311		
700	27 1/2"	<del>400</del>	<del>15 3/4"</del>	<del>584</del>	<del>2640</del>	<del>14.53</del>	<del>32.03</del>	<del>2.75</del>	<del>0.73</del>	<del>1.310</del>
		<del>500</del>	<del>19 7/8"</del>	<del>730</del>	<del>3301</del>	<del>17.47</del>	<del>38.51</del>	<del>3.44</del>	<del>0.91</del>	<del>1.310</del>
		<del>600</del>	<del>23 5/8"</del>	<del>876</del>	<del>3961</del>	<del>20.41</del>	<del>45.00</del>	<del>4.12</del>	<del>1.09</del>	<del>1.310</del>
		<del>700</del>	<del>27 1/2"</del>	<del>1022</del>	<del>4621</del>	<del>23.35</del>	<del>51.48</del>	<del>4.81</del>	<del>1.27</del>	<del>1.310</del>
		<del>800</del>	<del>31 1/2"</del>	<del>1168</del>	<del>5281</del>	<del>26.35</del>	<del>58.09</del>	<del>5.50</del>	<del>1.45</del>	<del>1.310</del>
		<del>900</del>	<del>35 3/8"</del>	<del>1314</del>	<del>5941</del>	<del>29.29</del>	<del>64.57</del>	<del>6.18</del>	<del>1.63</del>	<del>1.310</del>
		<del>1000</del>	<del>39 3/8"</del>	<del>1460</del>	<del>6601</del>	<del>32.23</del>	<del>71.05</del>	<del>6.87</del>	<del>1.81</del>	<del>1.310</del>
		<del>1100</del>	<del>43 1/4"</del>	<del>1606</del>	<del>7261</del>	<del>35.17</del>	<del>77.54</del>	<del>7.56</del>	<del>2.00</del>	<del>1.310</del>
		<del>1200</del>	<del>47 1/4"</del>	<del>1751</del>	<del>7921</del>	<del>38.11</del>	<del>84.02</del>	<del>8.24</del>	<del>2.18</del>	<del>1.310</del>
		<del>1300</del>	<del>51 1/4"</del>	<del>1897</del>	<del>8581</del>	<del>41.05</del>	<del>90.50</del>	<del>8.93</del>	<del>2.36</del>	<del>1.310</del>
		<del>1400</del>	<del>55 1/4"</del>	<del>2043</del>	<del>9241</del>	<del>43.99</del>	<del>96.98</del>	<del>9.62</del>	<del>2.54</del>	<del>1.310</del>
		<del>1500</del>	<del>59"</del>	<del>2189</del>	<del>9902</del>	<del>46.93</del>	<del>103.46</del>	<del>10.31</del>	<del>2.72</del>	<del>1.310</del>
		<del>1600</del>	<del>63"</del>	<del>2335</del>	<del>10562</del>	<del>49.87</del>	<del>109.94</del>	<del>10.99</del>	<del>2.90</del>	<del>1.310</del>
		<del>1700</del>	<del>66 7/8"</del>	<del>2481</del>	<del>11222</del>	<del>52.81</del>	<del>116.43</del>	<del>11.68</del>	<del>3.09</del>	<del>1.310</del>
		<del>1800</del>	<del>70 7/8"</del>	<del>2627</del>	<del>11882</del>	<del>55.75</del>	<del>122.91</del>	<del>12.37</del>	<del>3.27</del>	<del>1.310</del>
		<del>1900</del>	<del>74 3/4"</del>	<del>2773</del>	<del>12542</del>	<del>58.69</del>	<del>129.39</del>	<del>13.05</del>	<del>3.45</del>	<del>1.310</del>
		<del>2000</del>	<del>78 3/4"</del>	<del>2919</del>	<del>13202</del>	<del>61.63</del>	<del>135.87</del>	<del>13.74</del>	<del>3.63</del>	<del>1.310</del>
		<del>2200</del>	<del>86 7/8"</del>	<del>3211</del>	<del>14522</del>	<del>67.51</del>	<del>148.83</del>	<del>15.11</del>	<del>3.99</del>	<del>1.310</del>
		<del>2400</del>	<del>94 1/2"</del>	<del>3503</del>	<del>15843</del>	<del>73.39</del>	<del>161.80</del>	<del>16.49</del>	<del>4.36</del>	<del>1.310</del>
		<del>2600</del>	<del>102 3/8"</del>	<del>3795</del>	<del>17163</del>	<del>79.27</del>	<del>174.76</del>	<del>17.86</del>	<del>4.72</del>	<del>1.310</del>
<del>2800</del>	<del>110 1/4"</del>	<del>4087</del>	<del>18483</del>	<del>85.15</del>	<del>187.72</del>	<del>19.24</del>	<del>5.08</del>	<del>1.310</del>		
<del>3000</del>	<del>118 1/2"</del>	<del>4379</del>	<del>19803</del>	<del>91.03</del>	<del>200.69</del>	<del>20.61</del>	<del>5.44</del>	<del>1.310</del>		
900	35 3/8"	400	15 3/4"	707	3195	16.70	36.82	3.55	0.94	1.307
		500	19 7/8"	884	3993	21.37	47.11	4.44	1.17	1.307
		600	23 5/8"	1060	4792	25.07	55.27	5.32	1.41	1.307
		700	27 1/2"	1237	5591	28.76	63.40	6.21	1.64	1.307
		800	31 1/2"	1414	6389	32.51	71.67	7.10	1.87	1.307
		900	35 3/8"	1590	7188	36.20	79.81	7.98	2.11	1.307
		1000	39 3/8"	1767	7987	39.90	87.96	8.87	2.34	1.307
		1100	43 1/4"	1944	8786	43.59	96.10	9.76	2.58	1.307
		1200	47 1/4"	2120	9584	47.28	104.23	10.64	2.81	1.307
		1300	51 1/8"	2297	10383	50.98	112.39	11.53	3.05	1.307
		1400	55 1/8"	2474	11182	54.67	120.53	12.42	3.28	1.307
		1500	59"	2651	11980	58.42	128.79	13.31	3.51	1.307
		1600	63"	2827	12779	62.11	136.93	14.19	3.75	1.307
		1700	66 7/8"	3004	13578	66.30	146.17	15.08	3.98	1.307
		1800	70 7/8"	3181	14376	70.02	154.37	15.97	4.22	1.307
		1900	74 3/4"	3357	15175	73.71	162.50	16.85	4.45	1.307
		2000	78 3/4"	3534	15974	77.46	170.77	17.74	4.69	1.307
		2200	86 7/8"	3887	17571	84.85	187.06	19.51	5.16	1.307
		2400	94 1/2"	4241	19168	92.24	203.35	21.29	5.62	1.307
		2600	102 3/8"	4594	20766	100.17	220.84	23.06	6.09	1.307
2800	110 1/4"	4948	22363	107.56	237.13	24.84	6.56	1.307		
3000	118 1/2"	5301	23960	114.94	253.40	26.61	7.03	1.307		

# Integral

## characteristics of type 22

Height		Width		Heat emissions		Weight		Volume		n
mm	inch	mm	inch	Watt 75/65/20°C	BTU 200/160/68°F	kg	lbs	liter	gallon	exponent
300	11 3/4"	400	15 3/4"	391	1796	7.18	15.83	1.38	0.36	1.316
		500	19 7/8"	489	2245	8.54	18.83	1.72	0.45	1.316
		600	23 5/8"	587	2694	9.89	21.80	2.06	0.55	1.316
		700	27 1/2"	685	3144	11.24	24.78	2.41	0.64	1.316
		800	31 1/2"	782	3593	12.66	27.91	2.75	0.73	1.316
		900	35 3/8"	880	4042	14.01	30.89	3.10	0.82	1.316
		1000	39 3/8"	978	4491	15.37	33.89	3.44	0.91	1.316
		1100	43 3/4"	1076	4940	16.72	36.86	3.78	1.00	1.316
		1200	47 1/4"	1174	5389	18.08	39.86	4.13	1.09	1.316
		1300	51 1/8"	1272	5838	19.43	42.84	4.47	1.18	1.316
		1400	55 1/8"	1369	6287	20.79	45.83	4.82	1.27	1.316
		1500	59"	1467	6736	22.20	48.94	5.16	1.36	1.316
		1600	63"	1565	7185	23.55	51.92	5.50	1.45	1.316
		1700	66 7/8"	1663	7634	25.01	55.14	5.85	1.54	1.316
		1800	70 7/8"	1761	8083	26.39	58.18	6.19	1.64	1.316
		1900	74 3/4"	1858	8532	27.75	61.18	6.54	1.73	1.316
		2000	78 3/4"	1956	8982	29.16	64.29	6.88	1.82	1.316
		2200	86 7/8"	2152	9880	31.87	70.26	7.57	2.00	1.316
		2400	94 1/2"	2347	10778	34.58	76.24	8.26	2.18	1.316
		2600	102 3/8"	2543	11676	37.45	82.56	8.94	2.36	1.316
2800	110 1/4"	2739	12574	40.16	88.54	9.63	2.54	1.316		
3000	118 1/8"	2934	13472	42.87	94.51	10.32	2.73	1.316		
400	15 3/4"	400	15 3/4"	492	2260	9.32	20.55	1.71	0.45	1.319
		500	19 7/8"	615	2825	11.14	24.56	2.14	0.56	1.319
		600	23 5/8"	738	3390	12.96	28.57	2.56	0.68	1.319
		700	27 1/2"	861	3955	14.79	32.61	2.99	0.79	1.319
		800	31 1/2"	984	4520	16.67	36.75	3.42	0.90	1.319
		900	35 3/8"	1107	5085	18.49	40.76	3.84	1.02	1.319
		1000	39 3/8"	1230	5650	20.31	44.78	4.27	1.13	1.319
		1100	43 3/4"	1353	6214	22.14	48.81	4.70	1.24	1.319
		1200	47 1/4"	1477	6779	23.96	52.82	5.12	1.35	1.319
		1300	51 1/8"	1600	7344	25.78	56.84	5.55	1.47	1.319
		1400	55 1/8"	1723	7909	27.61	60.87	5.98	1.58	1.319
		1500	59"	1846	8474	29.49	65.01	6.41	1.69	1.319
		1600	63"	1969	9039	31.31	69.03	6.83	1.80	1.319
		1700	66 7/8"	2092	9604	33.23	73.26	7.26	1.92	1.319
		1800	70 7/8"	2215	10169	35.13	77.45	7.69	2.03	1.319
		1900	74 3/4"	2338	10734	36.95	81.46	8.11	2.14	1.319
		2000	78 3/4"	2461	11299	38.83	85.61	8.54	2.26	1.319
		2200	86 7/8"	2707	12429	42.48	93.65	9.39	2.48	1.319
		2400	94 1/2"	2953	13559	46.12	101.68	10.25	2.71	1.319
		2600	102 3/8"	3199	14689	49.98	110.19	11.10	2.93	1.319
2800	110 1/4"	3445	15819	53.62	118.21	11.96	3.16	1.319		
3000	118 1/8"	3691	16949	57.27	126.26	12.81	3.38	1.319		
500	19 3/8"	400	15 3/4"	590	2705	11.65	25.68	2.08	0.55	1.322
		500	19 7/8"	738	3381	13.98	30.82	2.60	0.69	1.322
		600	23 5/8"	886	4057	16.32	35.98	3.12	0.82	1.322
		700	27 1/2"	1033	4733	18.65	41.12	3.64	0.96	1.322
		800	31 1/2"	1181	5409	21.04	46.39	4.16	1.10	1.322
		900	35 3/8"	1328	6085	23.38	51.54	4.68	1.24	1.322
		1000	39 3/8"	1476	6762	25.71	56.68	5.20	1.37	1.322
		1100	43 3/4"	1623	7438	28.05	61.84	5.72	1.51	1.322
		1200	47 1/4"	1771	8114	30.38	66.98	6.24	1.65	1.322
		1300	51 1/8"	1919	8790	32.72	72.14	6.76	1.79	1.322
		1400	55 1/8"	2066	9466	35.05	77.27	7.28	1.92	1.322
		1500	59"	2214	10142	37.45	82.56	7.80	2.06	1.322
		1600	63"	2361	10819	39.78	87.70	8.32	2.20	1.322
		1700	66 7/8"	2509	11495	42.33	93.32	8.84	2.34	1.322
		1800	70 7/8"	2657	12171	44.69	98.52	9.36	2.47	1.322
		1900	74 3/4"	2804	12847	47.03	103.68	9.88	2.61	1.322
		2000	78 3/4"	2952	13523	49.42	108.95	10.40	2.75	1.322
		2200	86 7/8"	3247	14876	54.09	119.25	11.44	3.02	1.322
		2400	94 1/2"	3542	16228	58.76	129.54	12.48	3.30	1.322
		2600	102 3/8"	3837	17580	63.71	140.46	13.52	3.57	1.322
2800	110 1/4"	4132	18933	68.37	150.73	14.56	3.85	1.322		
3000	118 1/8"	4428	20285	73.04	161.03	15.60	4.12	1.322		





# Integral characteristics of type 33

Height		Width		Heat emissions		Weight		Volume		n
mm	inch	mm	inch	Watt 75/65/20°C	BTU 200/160/68°F	kg	lbs	liter	gallon	exponent
600	23 3/8"	400	15 3/4"	972	4405	20.52	45.24	3.59	0.95	1.321
		500	19 7/8"	1215	5507	24.80	54.67	4.49	1.18	1.321
		600	23 5/8"	1458	6608	29.09	64.13	5.38	1.42	1.321
		700	27 1/2"	1701	7709	33.37	73.57	6.28	1.66	1.321
		800	31 1/2"	1944	8811	37.77	83.27	7.18	1.90	1.321
		900	35 3/8"	2187	9912	42.06	92.73	8.07	2.13	1.321
		1000	39 3/8"	2429	11013	46.34	102.16	8.97	2.37	1.321
		1100	43 1/4"	2672	12115	50.63	111.62	9.87	2.61	1.321
		1200	47 1/4"	2915	13216	54.92	121.08	10.76	2.84	1.321
		1300	51 1/8"	3158	14317	59.20	130.51	11.66	3.08	1.321
		1400	55 1/8"	3401	15419	63.49	139.97	12.56	3.32	1.321
		1500	59"	3644	16520	67.88	149.65	13.46	3.55	1.321
		1600	63"	3887	17621	72.17	159.11	14.35	3.79	1.321
		1700	66 7/8"	4130	18723	76.74	169.18	15.25	4.03	1.321
1800	70 7/8"	4373	19824	81.05	178.68	16.15	4.27	1.321		
700	N/A 27 1/2"	400	15 3/4"	1039	4713	23.66	52.16	4.36	1.15	1.323
		500	19 7/8"	1299	5892	28.57	62.99	5.45	1.44	1.323
		600	23 5/8"	1559	7070	33.48	73.81	6.54	1.73	1.323
		700	27 1/2"	1819	8248	38.39	84.64	7.63	2.02	1.323
		800	31 1/2"	2079	9427	43.41	95.70	8.72	2.30	1.323
		900	35 3/8"	2338	10605	48.32	106.53	9.81	2.59	1.323
		1000	39 3/8"	2598	11783	53.23	117.35	10.90	2.88	1.323
		1100	43 1/4"	2858	12962	58.13	128.15	11.99	3.17	1.323
		1200	47 1/4"	3118	14140	63.04	138.98	13.08	3.46	1.323
		1300	51 1/2"	3378	15318	67.95	149.80	14.17	3.74	1.323
		1400	55 1/8"	3637	16497	72.86	160.63	15.26	4.03	1.323
		1500	59"	3897	17675	77.77	171.45	16.35	4.32	1.323
		1600	63"	4157	18853	82.68	182.28	17.44	4.61	1.323
		1700	66 7/8"	4417	20032	87.58	193.08	18.53	4.90	1.323
1800	70 7/8"	4677	21210	92.49	203.91	19.62	5.18	1.323		
900	35 3/8"	400	15 3/4"	1317	5978	29.34	64.68	5.27	1.39	1.327
		500	19 7/8"	1646	7472	35.56	78.40	6.59	1.74	1.327
		600	23 5/8"	1975	8967	41.78	92.11	7.90	2.09	1.327
		700	27 1/2"	2304	10461	48.01	105.84	9.22	2.44	1.327
		800	31 1/2"	2634	11955	54.34	119.80	10.54	2.78	1.327
		900	35 3/8"	2963	13450	60.56	133.51	11.85	3.13	1.327
		1000	39 3/8"	3292	14944	66.78	147.22	13.17	3.48	1.327
		1100	43 1/4"	3621	16439	73.01	160.96	14.49	3.83	1.327
		1200	47 1/4"	3950	17933	79.23	174.67	15.80	4.17	1.327
		1300	51 1/8"	4280	19428	85.45	188.39	17.12	4.52	1.327
		1400	55 1/8"	4609	20922	91.67	202.10	18.44	4.87	1.327
		1500	59"	4938	22417	98.01	216.08	19.76	5.22	1.327
		1600	63"	5267	23911	104.23	229.79	21.07	5.57	1.327
		1700	66 7/8"	5596	25405	110.95	244.60	22.39	5.91	1.327
1800	70 7/8"	5926	26900	117.20	258.38	23.71	6.26	1.327		

# Integral

## Pressure drop with alternate connections

