HT Breeze Instantaneous Water Heaters

Rycroft

HEATING THE WORLD'S WATER

HT Breeze Instantaneous Water Heaters

THE HT BREEZE INSTANTANEOUS WATER HEATER PROVIDES AN ECONOMIC AND EASY TO USE SOLUTION FOR PROVIDING HOT WATER. WHEN THE PACKAGE IS INSTALLED AND SWITCHED ON, THE SIMPLE TO USE CONTROLLER WILL RUN THE APPROPRIATE NUMBER OF PUMPS AND CONTROL AT 60°C. THE FACTORY DEFAULT SETTINGS WILL SUIT 95% OF APPLICATIONS WITHOUT FURTHER ADJUSTMENT. THESE DEFAULT SETTINGS ARE FREELY ADJUSTABLE AND ARE AS FOLLOWS.

Default Settings

- 24-Hour Operation.
- Set Temperature.
- Time Display.
- Number of pumps fitted.
- Auto pump changeover on a timed basis.
- High temperature cut out (manual reset).
- Low temperature alarm.
- PID settings.
- Pump run on times.

Additional Settings

- Seven day calendar (two timed periods per day).
- Boost facility to activate the heater when in an OFF timed period.
- Low temperature boost facility.
- Actuator output curve and speed adjustment.
- Night setback and pasteurisation feature.

Benefits

- Ideal for retrofit applications where access is limited or upgrading of existing calorifiers is required.
- Hot water produced as required.
- Reduce the risk from legionnaires disease by reducing the hot water storage requirements.
- Very compact design utilizing the benefits of plate heat exchangers.
- Building Management System compatibility.
- Small area required for servicing.
- Negligible standing losses.
- Quick heat up and rapid response.
- Can be designed to be extended for future changes in demand.
- Vented and unvented applications.
- Complete packaged unit ready for immediate use.
- Electrically self protecting pumps.

Combined Space/Water Heating Systems

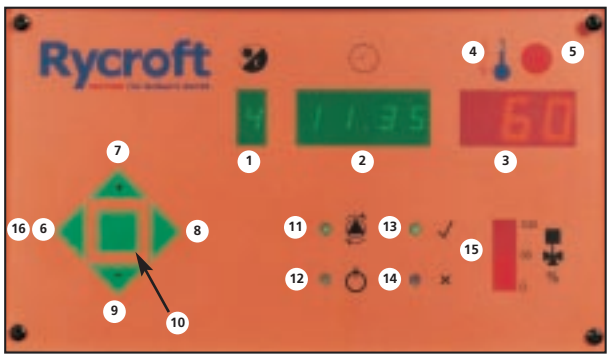
Where the peak demand exceeds the available boiler power for water heating, installation techniques may resolve the problem. For example on a primary circuit, the HT Breeze must be the first piece of equipment to be fed from the boiler. Under peak demand conditions, the boiler power can be directed to the HT Breeze at the expense of the space heating demand.

Generally for installations where the boiler capacity is insufficient to meet the demand, a buffer vessel is connected in parallel with the HT Breeze.

Rycroft have developed a range of buffer vessels specifically designed to match the HT Breeze. Both vented and unvented options are available and can be skid mounted to provide a complete hot water package.

Controller Features

- Large, clearly visible display of day, time, temperature and status.
- Process variable re-transmission.
- Remote set point adjustment.
- Remote enable/disable.
- Volt free change over fault contact.
- Displayed alarm messages.
- Runs to default settings on start up.
- Bar graph valve output indication.
- Three term modulating control (PID).
- Time boost facility.
- Dual primary pump (duty/standby plus auto change over) shunt and secondary re-circulation pump control.



1. Doy/Mode Display
2. Time/Alarm Display
3. Temperature/Parameter Display
4. High Temperature Alarm Indicator
5. Reset Pushbutton
6. Step Left Pushbutton
7. Value Increase Pushbutton
8. Step Right Pushbutton
9. Value Decrease Pushbutton
10. Mode Select Pushbutton
11. Pump Energised Indicator
12. Power On Indicator
13. System Healthy Indicator
14. System Fault Indicator
15. Valve Position Bar Display
16. On/Off Switch

Operation

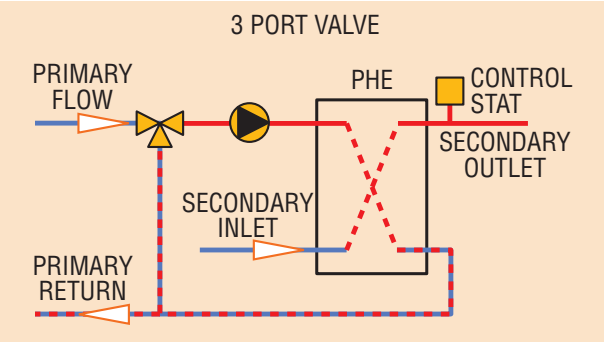
The HT Breeze comprises of a Supapac Plate Heat Exchanger, either a 3-port or 4-port control valve, primary pump, temperature sensor and PID controller all mounted on a skid base.

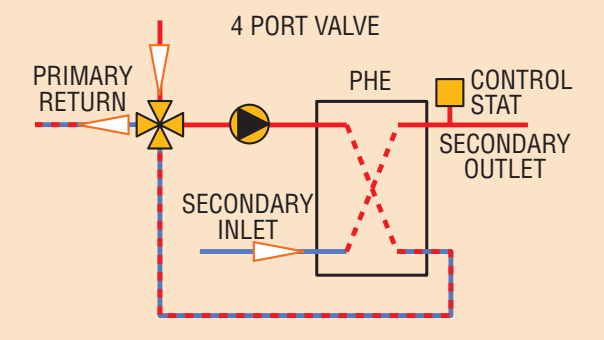
The motorized 3 or 4 port control valve allows rapid adjustment of the primary heat input to match changes in secondary hot water demand.

The HT Breeze requires no insulation and the design ensures that the outlet temperature does not fall below the set point (60°C default but can be adjusted to suit customer requirements) and consequently reduces the risk of legionnaires disease.

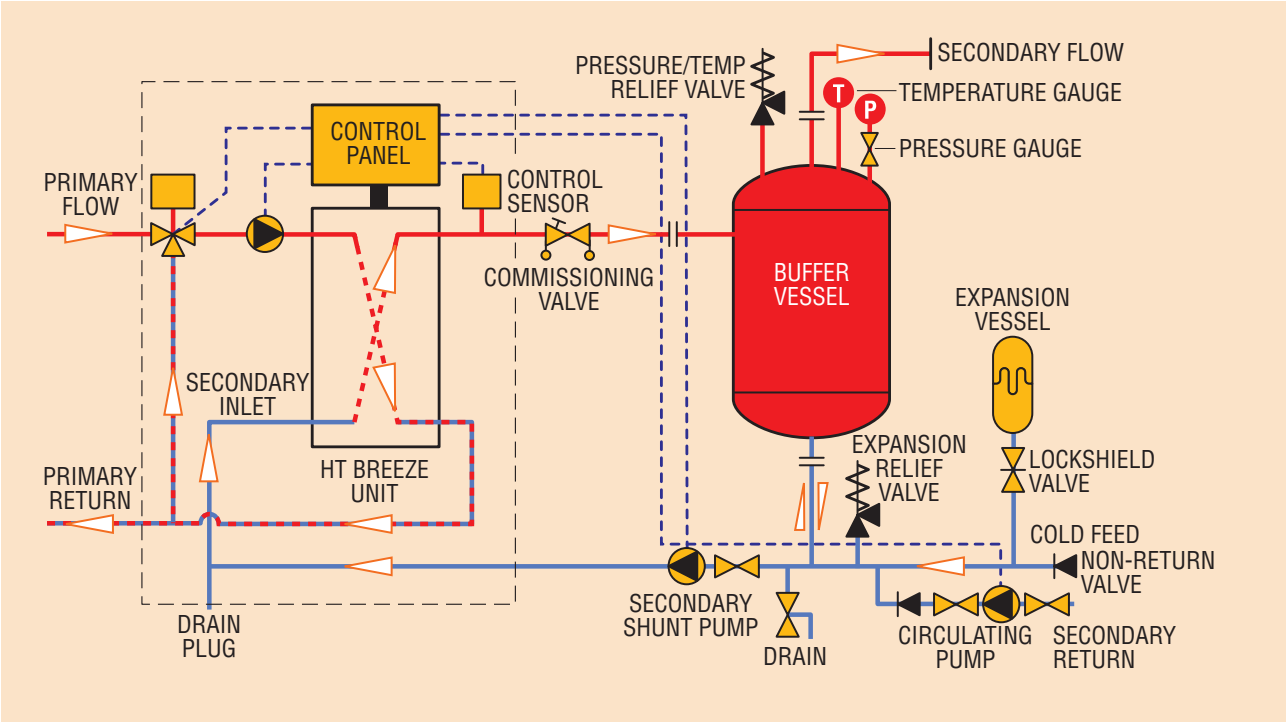
Providing the class of accommodation and details of the number and type of fixtures are known, Rycroft will be pleased to recommend the optimum size of HT Breeze.

Schematic Diagram





Typical Schematic for Unvented HT Breeze/Buffer Application



Sizing and Selection of a Stand Alone HT Breeze

To size the HT Breeze use the following demand factors:

Facility	Private Hand Basin	Public Hand Basin	Shower	Bath	Slop Sink	Bar Sink	Kitchen Sink	Washing Machine	Laboratory Sink	Dish Washer
Hospital	1	2	4	4	4		10	10	3	10
Hotel and Residential Hall	1	2	4	4	4	12	10	10		10
School	0.5	3	10	–	3		10	3	3	10
Sports Centre/ Barracks	0.5	2	10	–	3	12	10	–	–	10
Restaurant	0.5	4	–	–	12	12	19	–	–	10
University	0.5	3	10	–	3	–	10	–	3	10
Offices	0.5	3	3	–	3	–	10	–	3	10
Factory	0.5	3	4	–	3	–	10	–	3	10
Apartments	1	–	4	4	3	–	3	3	–	2

Sizing Considerations

Careful consideration must be given to the sizing of stand alone instantaneous water heaters. Standard demand units incorporate a degree of diversification that would be inappropriate for continuous use applications. For continuous applications a more desirable method of sizing is to complete a fixture count and allocate an appropriate flow for each fitting. It should also be noted that shower demands for schools, sports centres and universities should only be used for medium to large installations. Please refer to our design department for further information.

The minimum secondary circuit volume for a stand alone HT Breeze should not be less than the figures shown in the sizing table on this page.

This is to prevent nuisance high limit trips, which could occur if the secondary volume is not enough to keep the plate heat exchanger cool whilst the control valve closes when there is no demand for hot water.

It is recommended that a secondary return line should always be used with the HT Breeze for the same reason.

Example

Using the above table for a 173 bed hospital ward with showers, hand basins and sinks.

42 Single Person Showers	=	42 x 4	=	168
55 Private Hand Basins	=	55 x 1	=	55
9 Public Hand Basins	=	9 x 2	=	18
3 Slop Sinks	=	3 x 4	=	12
15 Baths	=	15 x 4	=	60
Total Demand Units			=	313

The shower factors are based upon intermittent use. Where certain activities may result in all showers operating together please contact our sales department for advice.

The correctly sized HT Breeze can now be selected from the sizing table below. In this example a CP-B250 should be selected.

Sizing Table

HT Breeze Model	Maximum Demand Unit	Max Continuous Duty @ 60°C (litres/sec)	Boiler Power (kw)	Min Secondary Volume (litres)
CP-B25	15	0.25	52	45
CP-B50	23	0.50	105	75
CP-B75	45	0.75	157	85
CP-B100	70	1.00	209	125
CP-B125	90	1.25	261	135
CP-B150	130	1.50	313	150
CP-B200	210	2.00	418	200
CP-B250	320	2.50	522	250
CP-B300	480	3.00	627	300
CP-B350	640	3.50	732	350
CP-B400	820	4.00	836	400
CP-B450	1050	4.50	935	450
CP-B500	1300	5.00	1040	500

Sizing and Selection of a HT Breeze and Buffer Vessel

To size the HT Breeze use the following demand factors:

Facility	Private Hand Basin	Public Hand Basin	Shower	Bath	Slop Sink	Bar Sink	Kitchen Sink	Washing Machine	Lab Sink	Dish Washer	Load Factor
Hospital	10	15	70	60	50	–	80	100	40	150	0.7
Hotel and Residential Hall	10	15	50	50	50	100	80	100	–	150	0.5
School	5	20	180	–	40	–	80	40	40	150	0.8
Sports Centre/ Barracks	5	15	220	–	40	100	80	–	–	100	1
Restaurant	5	25	–	–	100	100	140	–	–	150	1
University	5	20	220	–	40	–	80	–	40	150	0.8
Offices	5	10	180	–	40	–	40	–	40	100	1
Factory	5	20	120	–	50	–	80	–	40	100	1
Apartments	5	–	50	50	40	–	20	40	–	20	0.7

Example

Using the above table for a 173 bed hospital ward with showers, hand basins and sinks.

42 Single Person Showers	=	42 x 70	= 2940
55 Private Hand Basins	=	55 x 10	= 550
9 Public Hand Basins	=	9 x 15	= 135
3 Slop Sinks	=	3 x 50	= 150
15 Baths	=	15 x 60	= 900
Total Volume			= 4675
Load Factor from above table			= 0.7
TOTAL DEMAND RATE	= 4675 x 0.7		= 3273 litres/hr

The HT Breeze and buffer vessel combination should be sized as follows:

The buffer vessel capacity should be 25% of the hourly demand. Therefore the required storage capacity = 3273 x 0.25 = 818 litres. The nearest standard buffer vessels sizes are 800 and 900 litres. It is recommended to go up in sizes, therefore use a 900 litre buffer.

The HT Breeze can be selected as follows:

The continuous hourly demand = 3273 litre.

Kw = flow (l/s) x specific heat of water x temp difference (°C)

Therefore the required kW rating = $\frac{3273}{3600}$ x 4.187 x (60-10)

= 190.3 kW

Using the sizing table on the previous page.

The nearest standard HT Breeze = CP-B100 rated at 209 kW.

The sizes shown in the sizing table represent the standard range of HT Breeze units. These are available with both single head and dual head primary pumps. The following pages describe the full range of models available.

Standard buffer vessels are available in the following sizes:

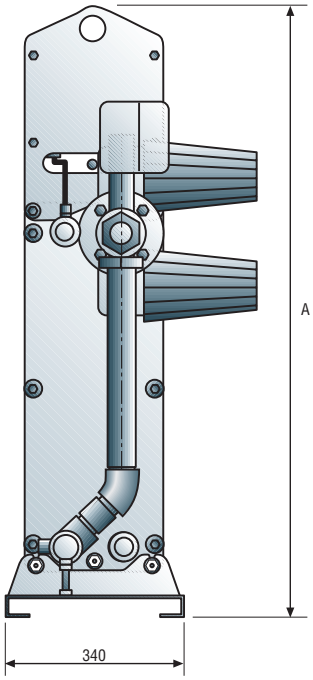
440 ltr	800 ltr	1200 ltr	1800 ltr
550 ltr	900 ltr	1350 ltr	2000 ltr
700 ltr	1000 ltr	1500 ltr	2300 ltr

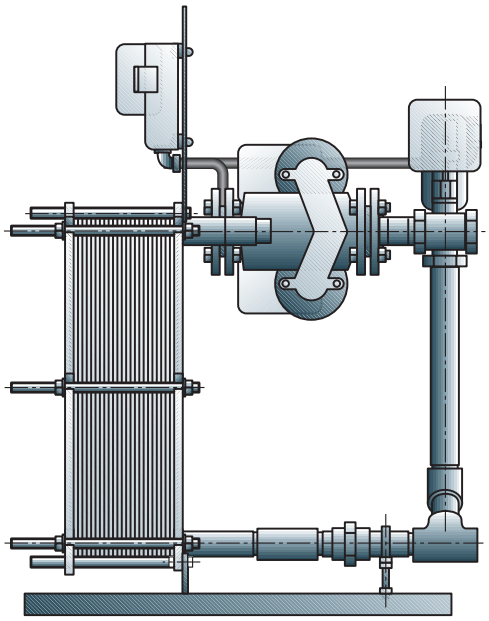
For larger capacities please refer to the Storage Calorifier catalogue

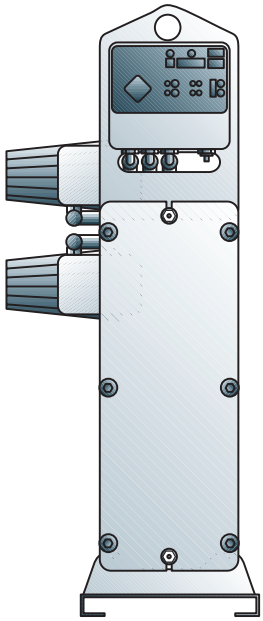
A HT Breeze and buffer vessel is used when water demand is not constant but high flow rates occur frequently. Storing hot water in the buffer vessel for peak demands reduces boiler power.

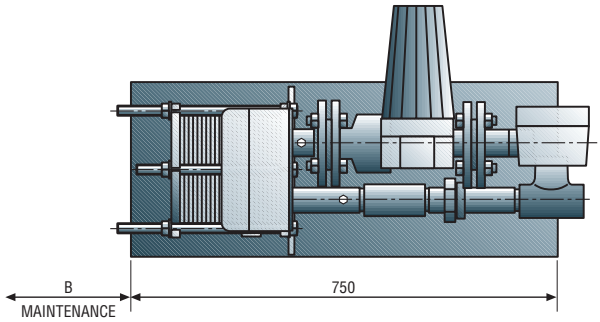
When enquiring please specify the required working or design pressure of the system to enable Rycroft to optimise the copper cylinder thickness to suit your requirements. Both Vented and Unvented packages are available. Please contact our technical department for further assistance.

HT Breeze fitted with Dual Head Pump









Materials

DHW wetted parts	– Stainless Steel
Frame	– Powder Coated Carbon Steel
Controller	– Polycarbonate Enclosure

Supply

230 Volts, single phase
400 Volts, three phase

Dimensions

	A	B
CP-B25 to CP-B250	1115	450
CP-B300 to CP-B500	1240	550

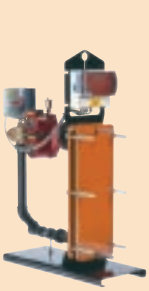
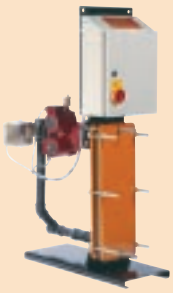
3-way Valve

Primary Temperature	– 120°C Max
Primary Pressure	– 10 Barg
Secondary Temperature	– 90°C Max
Secondary Pressure	– 10 Barg

4-way Valve

Primary Temperature	– 120°C Max
Primary Pressure	– 6 Barg
Secondary Temperature	– 90°C Max
Secondary Pressure	– 6 Barg

HT Breeze – Available Models

Model Number	A 230 Volts 1 phase Supply Fused Protection 3 Way Valve	B 230 Volts 1 phase Supply Fused Protection 4 Way Valve	C 230 Volts 1 phase Supply O/Load protection 3 Way Valve	D 230 Volts 1 phase Supply O/Load protection 4 Way Valve	E 415 Volts 3 phase Supply O/Load protection 3 Way Valve	F 415 Volts 3 phase Supply O/Load protection 4 Way Valve
						
CP-B25	✓	✓	✓	✓	✓	✓
CP-B50	✓	✓	✓	✓	✓	✓
CP-B75	✓	✓	✓	✓	✓	✓
CP-B100	✓	✓	✓	✓	✓	✓
CP-B125	✓	✓	✓	✓	✓	✓
CP-B150	✓	✓	✓	✓	✓	✓
CP-B200	✓	✓	✓	✓	✓	✓
CP-B250	✓	✓	✓	✓	✓	✓
CP-B300	✓	✓	✓	✓	✓	✓
CP-B350	✓	✓	✓	✓	✓	✓
CP-B400	✓	✓	✓	✓	✓	✓
CP-B450	✘	✘	✓	✓	✓	✓
CP-B500	✘	✘	✓	✓	✓	✓

All models are available with either single head or dual head primary pumps

The standard models have been designed to produce secondary water at 60°C from a cold feed of 10°C using a primary flow temperature of 82°C. Temperatures outside these parameters normally only require a modified plate pack arrangement and Rycroft would be pleased to design this to meet your requirements. Please contact our technical department for further assistance.

Ordering Information

Requirements	Example
Select the required model number using the sizing information	CP-B100
Determine the primary pump requirement Single or Dual Head (S or D)	D
Determine the power supply, control valve type and method of pump protection and choose the option from the above table (A to F)	A
Order using the assembled model number	CP-B100DA

ie: HT Breeze fitted with a 230V single phase Dual Primary Pump protected via a 5A fuse and controlled using a 3 way valve and actuator. Producing 1 litre/sec of secondary hot water at 60°C utilizing a cold feed temperature of 10°C and a primary flow temperature of 82°C.

- SUPAPAC Plate Heat Exchangers
- Shell and Tube Heat Exchangers
- HT Breeze Instantaneous Water Heaters
- MAXIMISER Semi-Storage Calorifiers
- Calorifiers/Cylinders
- Unvented Packages
- Pressurisation
- Electric Water Heaters
- Rycroft Process Solutions
- Rycroft Building Services Solutions

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