

TDS 160303

RANGE

150 - 1430kW

# RS TURBOFLOW

## PLATE HEAT EXCHANGERS

**16 Models: P020, P040, P080, P100,  
P125, P250, P300, P450, P650**

For DHW and district heating

For chilled water, pool and sea water

For combined heat & power

For instantaneous demand

Brazed heat exchangers also available



# EXPRESSO

RANGE 30-700kW PHE / 300-6000lts VESSEL

## PACKAGED PLATE HEAT EXCHANGER WITH BUFFER STORAGE

Efficient and hygienic - Compact design

Rapid heat recovery

Constant legionella protection

"Mini Espresso" available for large  
domestic/small commercial applications



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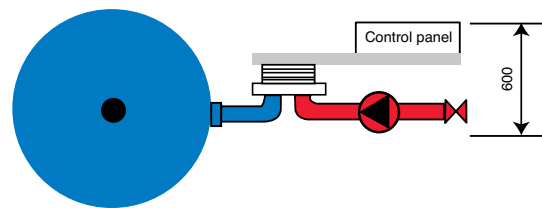
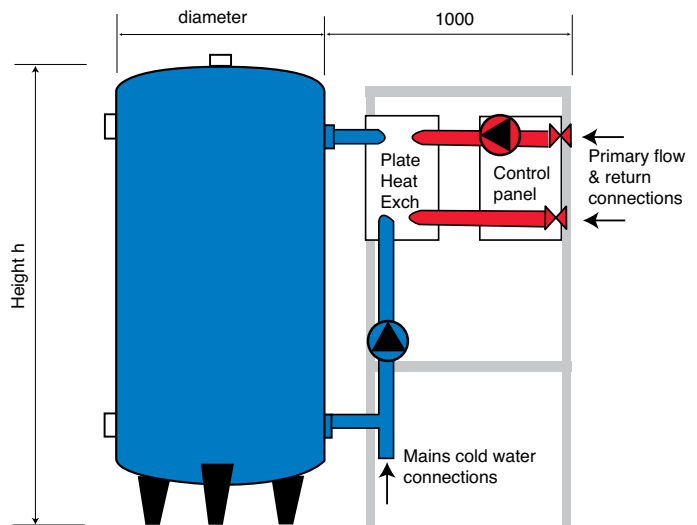
# EXPRESSO

## PACKAGED PLATE HEAT EXCHANGER WITH BUFFER STORAGE

### CONNECTIONS

| DHW Output in Litres/hour  |                         |                     |                  |              |                       |
|--|-------------------------|---------------------|------------------|--------------|-----------------------|
| Secondary connections on C20 Buffer Vessel and TURBOFLOW package |                         |                     |                  |              |                       |
| model  | secondary flow & return | secondary cold feed | spare connection | vessel drain | primary flow & return |
| 300 litres   | 32mm                    | 32mm                | 32mm             | 20mm         | 32mm                  |
| 500 litres   | 32mm                    | 32mm                | 32mm             | 20mm         | 32mm                  |
| 750 litres   | 32mm                    | 32mm <td 32mm       | 20mm             | 32mm         |                       |
| 1000 litres  | 32mm                    | 32mm                | 32mm             | 20mm         | 32mm                  |

Connections may vary on 1500 litre & 2000 litre vessels



### PERFORMANCE

| STORAGE INPUT kW | Peak DHW Output in 10 mins |      |      |      |      |      | DHW Output in 1hr |       |       |       |       |       | Recovery time in minutes |     |     |      |      |      |
|------------------|----------------------------|------|------|------|------|------|-------------------|-------|-------|-------|-------|-------|--------------------------|-----|-----|------|------|------|
|                  | 300                        | 500  | 750  | 1000 | 1500 | 2000 | 300               | 500   | 750   | 1000  | 1500  | 2000  | 300                      | 500 | 700 | 1000 | 1500 | 2000 |
| 30               | 354                        | 534  | 759  | 984  | 1434 | 1884 | 774               | 954   | 1170  | 1395  | 1845  | 2295  | 36                       | 60  | 89  | 120  | 180  | 240  |
| 50               | 414                        | 594  | 819  | 1044 | 1494 | 1944 | 1134              | 1314  | 1539  | 1764  | 2214  | 2664  | 21                       | 35  | 52  | 70   | 105  | 140  |
| 75               | 486                        | 666  | 891  | 1116 | 1566 | 2016 | 1566              | 1746  | 1971  | 2196  | 2646  | 3096  | 14                       | 23  | 35  | 46   | 69   | 92   |
| 100              | 558                        | 738  | 963  | 1188 | 1638 | 2088 | 1998              | 2178  | 2403  | 2628  | 3078  | 3528  | 11                       | 18  | 26  | 35   | 53   | 70   |
| 150              | 696                        | 876  | 1101 | 1326 | 1776 | 2226 | 2826              | 3006  | 3231  | 3456  | 3906  | 4356  | 8                        | 12  | 18  | 24   | 36   | 48   |
| 200              | 846                        | 1026 | 1251 | 1476 | 1926 | 2376 | 3726              | 3906  | 4131  | 4356  | 4806  | 5256  | 6                        | 9   | 14  | 18   | 27   | 36   |
| 250              | 984                        | 1164 | 1389 | 1614 | 2064 | 2514 | 4554              | 4734  | 4959  | 5184  | 5634  | 6084  | 5                        | 8   | 11  | 14   | 21   | 28   |
| 300              | 1128                       | 1308 | 1533 | 1758 | 2208 | 2658 | 5418              | 5598  | 5823  | 6048  | 6498  | 6948  | 4                        | 6   | 9   | 12   | 18   | 24   |
| 350              | 1272                       | 1452 | 1677 | 1902 | 2352 | 2802 | 6282              | 6462  | 6687  | 6912  | 7362  | 7812  | 3                        | 5   | 8   | 10   | 15   | 20   |
| 400              | 1416                       | 1596 | 1821 | 2046 | 2496 | 2946 | 7146              | 7326  | 7551  | 7776  | 8226  | 8676  | 3                        | 5   | 7   | 9    | 14   | 18   |
| 700              | 2280                       | 2460 | 2685 | 2910 | 3369 | 3810 | 12330             | 12510 | 12735 | 12960 | 13410 | 13860 | 2                        | 3   | 4   | 5    | 8    | 10   |

### SPECIFICATION

- One AISI 316L stainless steel TURBOFLOW plate heat exchanger, working pressure 10BARS,
- One C20 vertical AISI 316L stainless steel buffer vessel, working pressure 8BARS and complete with high grade polyurethane foam insulation and hard finish polyester jacket,
- One control & limit thermostat; one Master Control Panel with pump overload protection & BMS enable & lock-out facilities,
- One enamel painted package on a steel frame and pipework including the following,
- One set of buffer vessel mountings with one temperature & pressure relief valve, one high output automatic air eliminator, one anti-vacuum plug, one drain valve & one thermometer,
- One primary pump/flow pack with isolating valves,
- One secondary pump/flow pack with isolating valves & pressure relief valve,
- One secondary distribution pump/flow pack with isolating valves, non-return valve & thermometer.

### OPTIONS & DELIVERY DETAILS

- One duplex primary pump flow pack with sequence control within the Master Control Panel,
  - One primary 3-way valve control,
  - One primary solenoid dead shut-off valve operating in conjunction with the high temperature limit
- PLEASE NOTE THAT THE PACKAGE IS COMPLETED & TESTED AT THE ATLANTIC WORKS, then split for delivery and site access (see separate dimensions) into the following elements :-
- One C20 buffer vessel with mountings,
  - One frame with TURBOFLOW & Master Control Panel with mechanical & electrical connections,
  - One secondary distribution pump/flow pack (loose with trailing wires) from the Master Control Panel.

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# Selecting EXPRESS'O PACKAGES

In many buildings, peak DHW occurs infrequently and for 10 minutes or less. At other times, base demand is much lower-

See DHW daily demand and table A.

The X Express'o package, with 3 seconds reaction, can meet peak demand by using its storage and by borrowing space heating boilerplant.

Take a Tourist 3-star Hotel with space heating load of 150kW, 46 bedrooms - bath/shower/basin, kitchen -4 sinks, ablutions - 4 basins.

## Peak Demand Calculations (using CIBSE B4)

|                  |              |            |
|------------------|--------------|------------|
| 46 x bath/shower | x 12 =       | 552        |
| 4 x sink         | x 22 =       | 88         |
| 46 x basin       | x 5 =        | 230        |
| 4 x basin        | x 5 =        | 20         |
|                  | <b>total</b> | <b>890</b> |

**total: 890 demand units**  
**= 2.4 l/s from Table B4.20**  
**PEAK 10 minute demand =**  
**2.4 x 60 x 10 = 1,440 litres at 60°C.**

## PRACTICAL DEMAND UNITS

|                  |     |
|------------------|-----|
| Basin (spray)    | 1.5 |
| Basin (tap)      | 5   |
| Bath (private)   | 12  |
| Bath (luxury)    | 25  |
| Shower (private) | 5   |
| Shower (luxury)  | 12  |
| Sink (15mm tap)  | 11  |
| Sink (20 mm tap) | 22  |

From EXPRESS'O performance table, 5 packages are possible:-  
 400kW/300L, 350kW/500L, 300kW/750L, 200kW/1000L, 30kW/1500L

## Pattern of hot water demand

| TABLE A<br>Type of building | %<br>base/peak<br>hot water<br>demand |
|-----------------------------|---------------------------------------|
| Swimming pools              | 100                                   |
| Leisure centres             | 100                                   |
| Conference hotels           | 50                                    |
| Deluxe hotels               | 50                                    |
| Tourist hotels              | 30                                    |
| Guest Houses                | 30                                    |
| Hospital wards              | 30                                    |
| Elderly persons home        | 30                                    |
| Restaurants                 | 30                                    |
| Schools                     | 10                                    |
| Deluxe apartments           | 10                                    |
| Deluxe houses               | 10                                    |
| Apartments                  | 0                                     |
| Houses                      | 0                                     |
| Offices                     | 0                                     |

Now calculate MAXIMUM HOURLY DEMAND

= PEAK DEMAND for 10 minutes + BASE DEMAND for 50 minutes

Using Table A, Max Hourly Demand = 1,440 + 1,440 x 0.3 x 5 = 3600ltrs

From EXPRESS'O performance table, 6 packages are possible:-  
 200kW/300L, 200kW/500L, 200kW/750L, 200kW/1000L,  
 150kW/1500L, 150kW/2000

As both PEAK DEMAND & MAXIMUM HOURLY DEMAND must be met, 6 packages remain possible:- 400kW/300L, 350kW/750L, 300kW/750L, 200kW/1000L, 150kW/1500L, 150kW/2000L.

Selection relates to space heating boiler power of 150kW; 40% can be borrowed for 10 minutes for DHW = 0.4 x 150 = 60 kW.

Most economic selection will probably be EXPRESS'O 200kW/1000L and boilerplant equal to :-

|               |                               |
|---------------|-------------------------------|
| Space heating | = 150kW                       |
| EXPRESS'O     | = 140kW (60kW borrowed)       |
| Total         | = 290kW (+ margin if desired) |

## Simultaneous Demand Data For Design

| Demand Units | 0    | 50   | 100  | 150  | 200  | 250  | 300  | 350  | 400  | 450  | 500  | 550  | 600  | 650  | 700  | 750  | 800  | 850  | 900  | 950  |
|--------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 0            | 0.0  | 0.3  | 0.5  | 0.6  | 0.8  | 0.9  | 1.0  | 1.2  | 1.3  | 1.4  | 1.5  | 1.6  | 1.7  | 1.9  | 2.0  | 2.1  | 2.2  | 2.3  | 2.4  | 2.5  |
| 1000         | 2.6  | 2.7  | 2.8  | 2.9  | 3.0  | 3.1  | 3.2  | 3.3  | 3.4  | 3.5  | 3.6  | 3.7  | 3.8  | 3.9  | 4.0  | 4.1  | 4.2  | 4.3  | 4.4  | 4.5  |
| 2000         | 4.6  | 4.7  | 4.8  | 4.9  | 5.0  | 5.1  | 5.1  | 5.2  | 5.3  | 5.4  | 5.5  | 5.6  | 5.7  | 5.8  | 5.9  | 6.0  | 6.1  | 6.2  | 6.3  | 6.4  |
| 3000         | 6.4  | 6.5  | 6.6  | 6.7  | 6.8  | 6.9  | 7.0  | 7.1  | 7.2  | 7.3  | 7.4  | 7.4  | 7.5  | 7.6  | 7.7  | 7.8  | 7.9  | 8.0  | 8.1  | 8.2  |
| 4000         | 8.3  | 8.3  | 8.4  | 8.5  | 8.6  | 8.7  | 8.8  | 8.9  | 9.0  | 9.1  | 9.1  | 9.2  | 9.3  | 9.4  | 9.5  | 9.6  | 9.7  | 9.8  | 9.8  | 9.9  |
| 5000         | 10.0 | 10.1 | 10.2 | 10.3 | 10.4 | 10.5 | 10.5 | 10.6 | 10.7 | 10.8 | 10.9 | 11.0 | 11.1 | 11.2 | 11.2 | 11.3 | 11.4 | 11.5 | 11.6 | 11.7 |

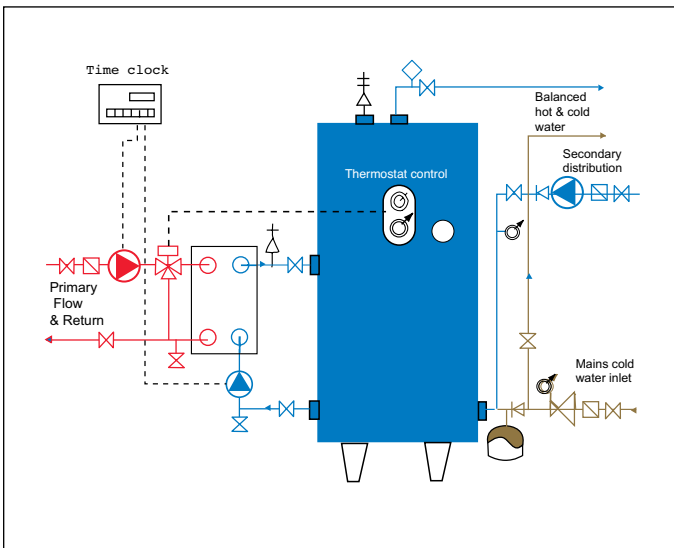
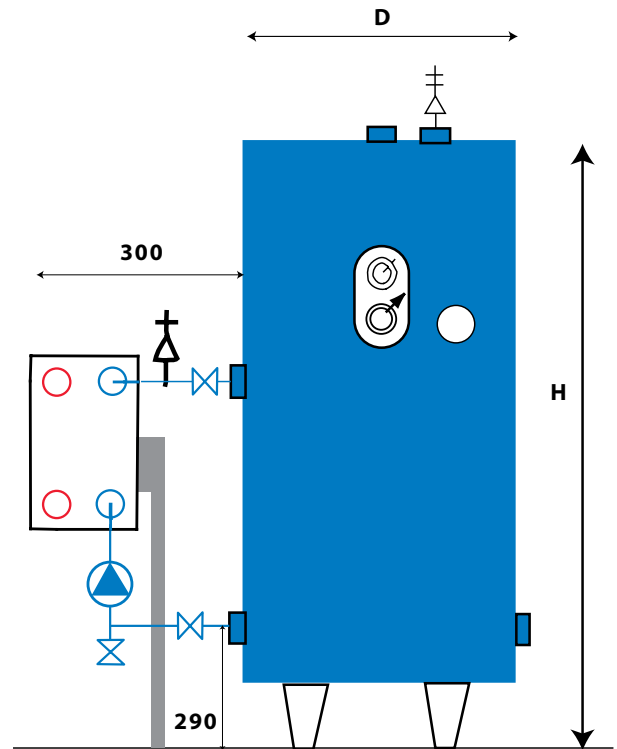
Source: CIBSE Guide B4.20 Design demand (Litres/second)

# MX MINI-EXPRESSO

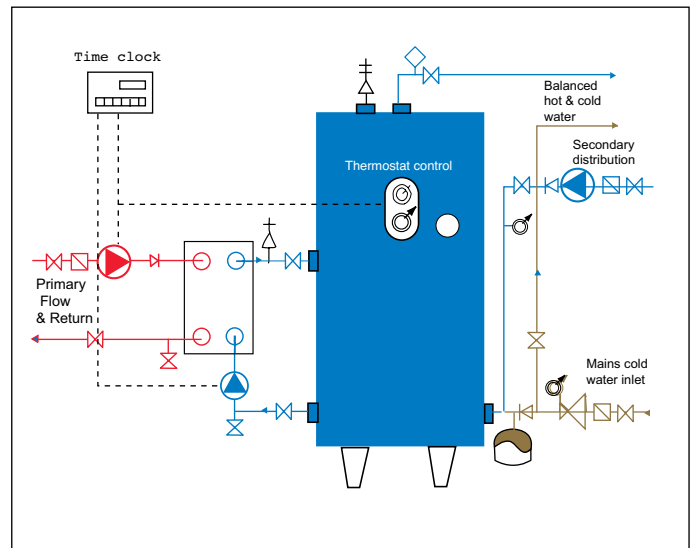
PLATE HEAT EXCHANGER WITH BUFFER STORAGE FOR LARGE DOMESTIC & SMALL COMMERCIAL APPLICATIONS

## PERFORMANCE

| DHW Output in Litres/hour   |      |      |      |      |      |
|---|------|------|------|------|------|
| Primary at 80°C, Secondary at 60°C  |      |      |      |      |      |
| STORAGE   | 200  | 300  | 500  | 750  | 1000 |
| INPUT kW  |      |      |      |      |      |
| 30  | 684  | 774  | 954  | 1170 | 1395 |
| 50  | 1044 | 1134 | 1314 | 1539 | 1764 |
| 70  | 1404 | 1494 | 1674 | 1908 | 2133 |
| 90  | 1764 | 1854 | 2034 | 2277 | 2502 |
| Domestic Performance - based on number of bathrooms with standard fittings - for luxury bathrooms multiply by 3 |      |      |      |      |      |
| STORAGE   | 200  | 300  | 500  | 750  | 1000 |
| INPUT kW  |      |      |      |      |      |
| 30  | 3    | 4    | 5    | 7    | 9    |
| 50  | 4    | 5    | 6    | 8    | 10   |
| 70  | 5    | 6    | 7    | 9    | 11   |
| 90  | 6    | 7    | 8    | 9    | 12   |



Pump Control from in-built thermostat



Diverting valve control from in built thermostat

## SPECIFICATION

- One AISI 316L stainless steel TURBOFLOW plate heat exchanger, working pressure 10BARS.
- One C20 vertical AISI 316L stainless steel buffer vessel, working pressure 8BARS and complete with high grade polyurethane foam insulation to class ASTM D 1692 & rigid polyester jacket,
- One mini control panel (on C20-200 & C20-300 vessels) with built-in control & limit thermostats, temperature control knob and thermometer. On larger vessels - 500 to 1000 litres - there are combined control and limit thermostats and a thermometer inserted in the vessel or supplied loose.
- One set of buffer vessel mountings with one temperature & pressure relief valve, one automatic air eliminator, one anti-vacuum plug, one drain valve.
- One secondary pump/flow pack with isolating valves, 6BAR pressure relief valve and drain valve

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