



INSPIRED

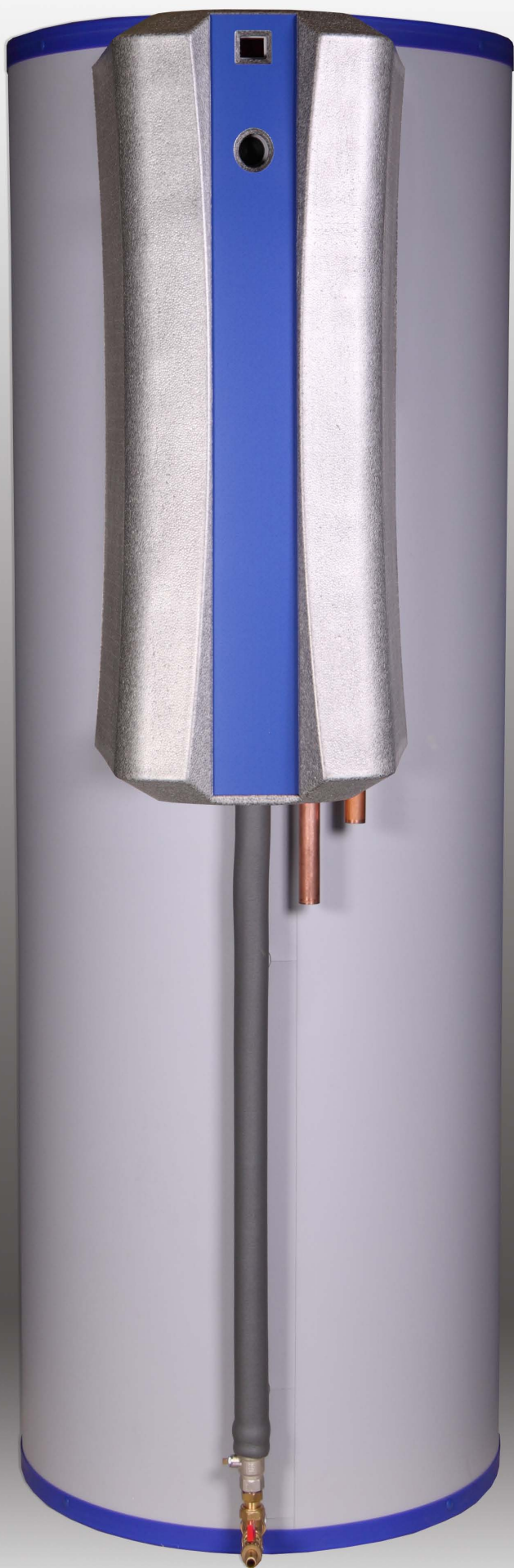
EFFICIENCY

Extreme
Domestic Hot Water
Loading System

TECHNICAL
DOCUMENTATION

Issue 11/09

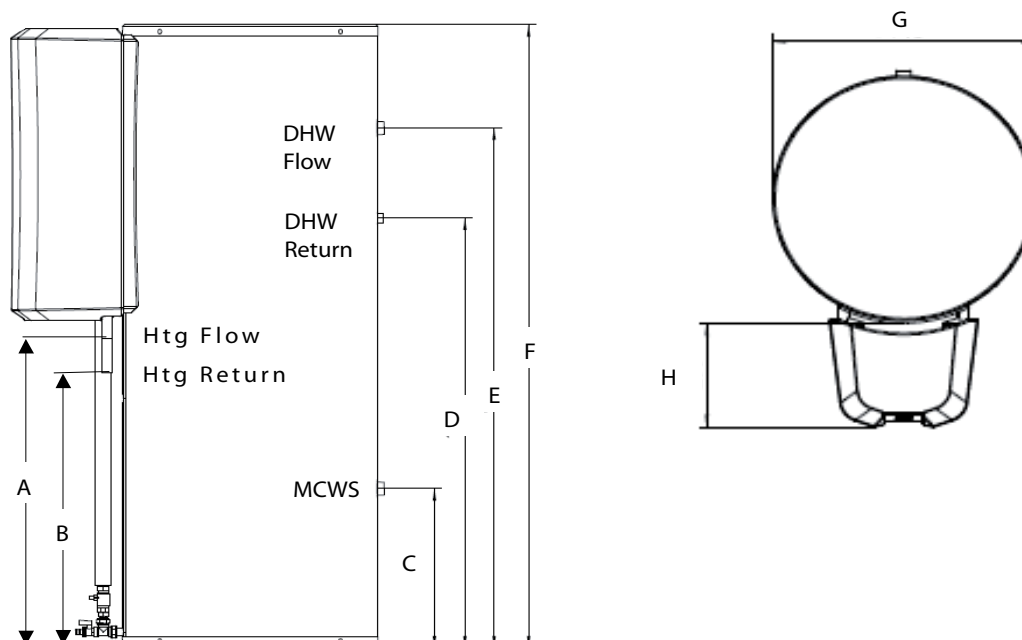




Technical data

Description		Extreme 200	Extreme 300	Extreme 500
Weight (empty)	kg	63	77	98
Max Working pressure	bar	10	10	10
Max Temperature	°C	90	90	90
DHW Flow Connection		1"	1 ¼"	1 ½"
DHW Return Connection		1"	1"	1"
Primary Flow & Return Connections	mm	28	28	28
MCWS Connection		1"	1 ¼"	1 ½"

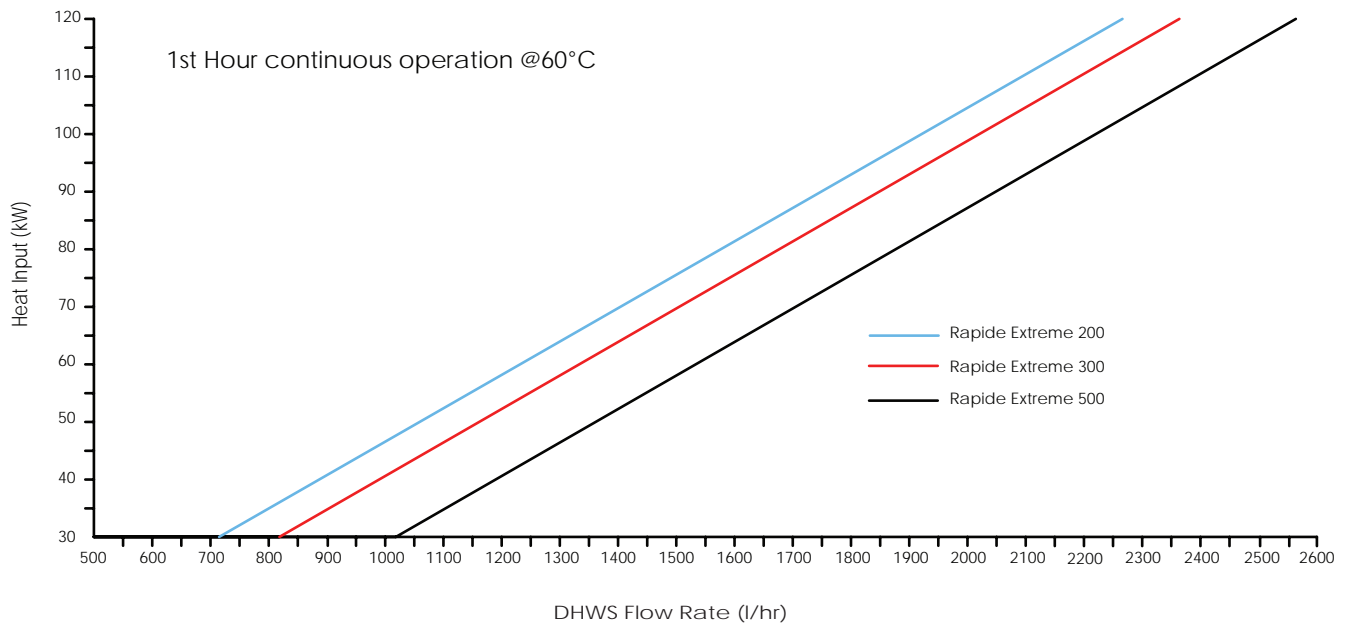
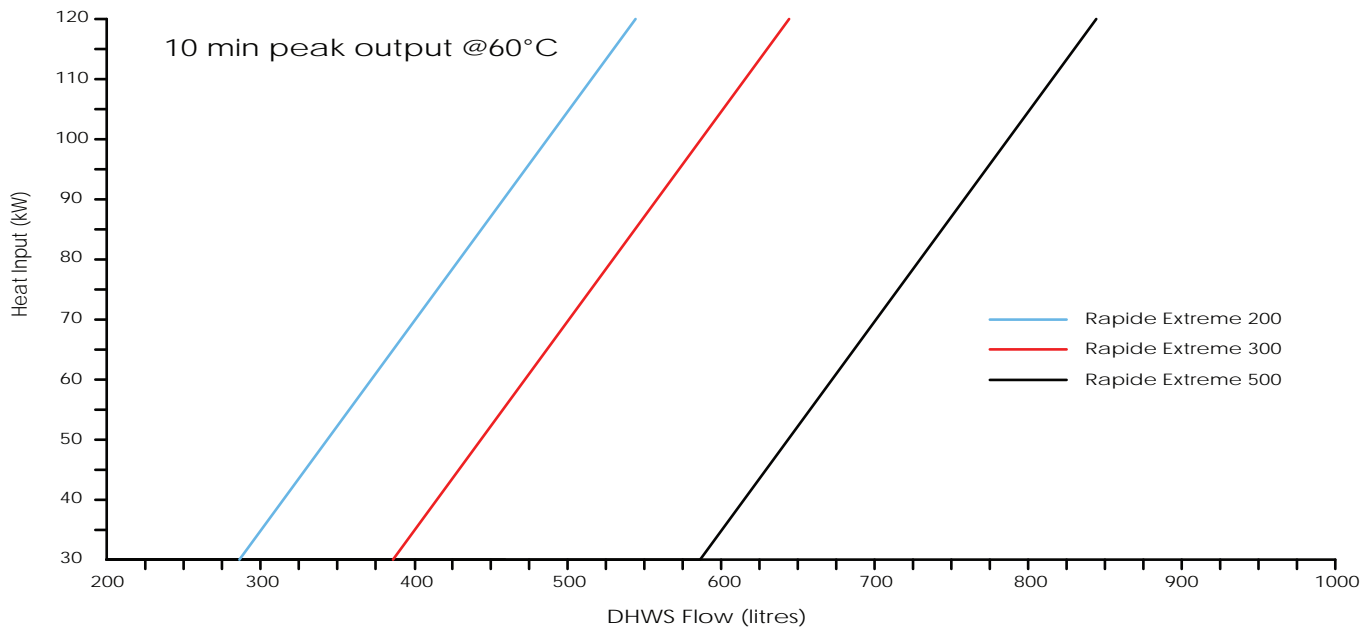
Dimensional data



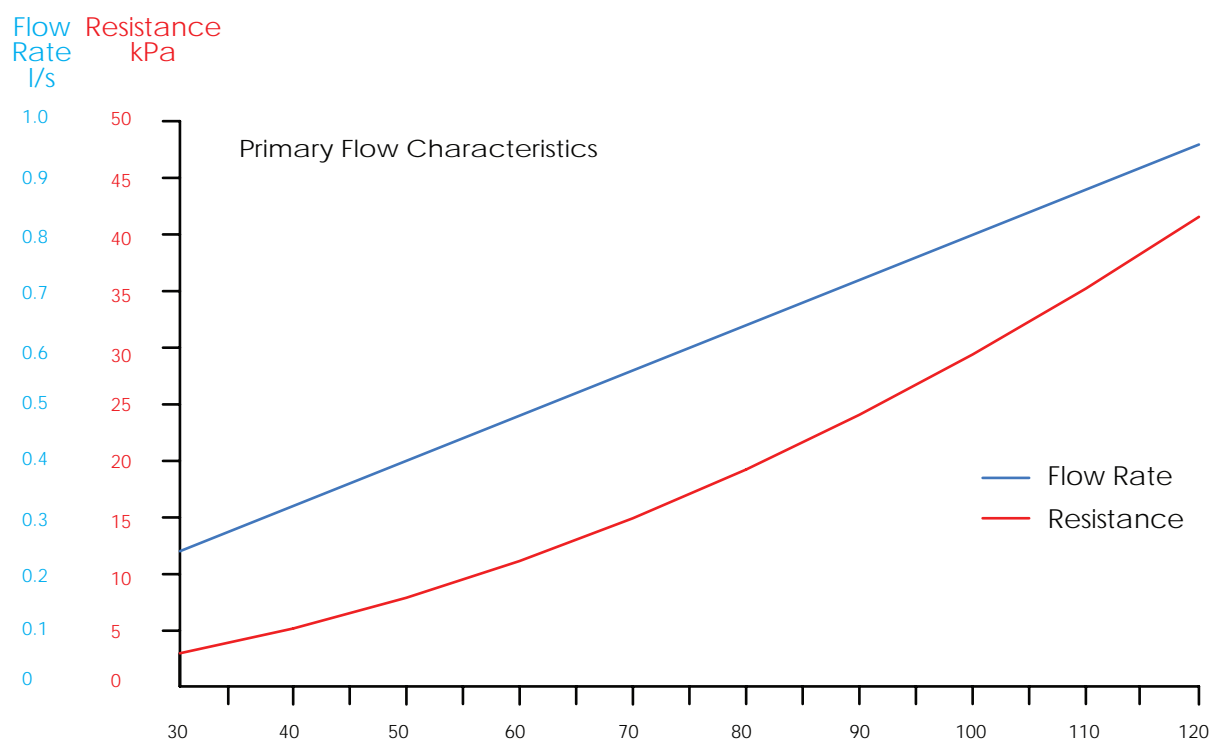
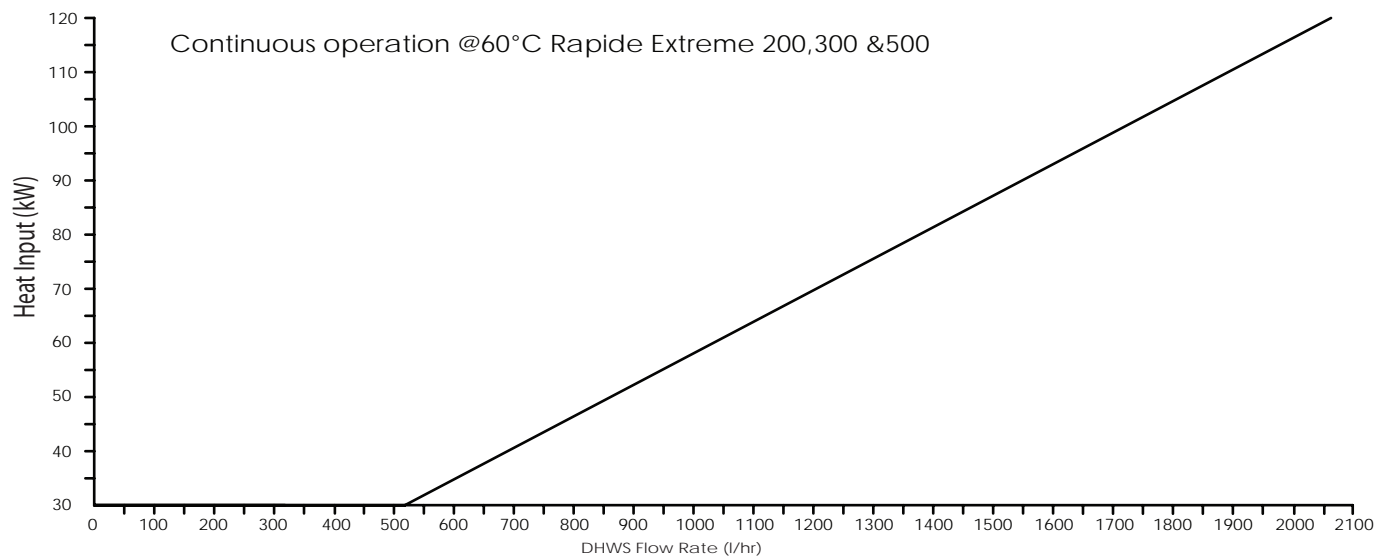
Dimensions	Extreme 200	Extreme 300	Extreme 500
A	380 mm	910 mm	910 mm
B	280 mm	810 mm	810 mm
C	465 mm	465 mm	570 mm
D	735 mm	1260 mm	1265 mm
E	995 mm	1530 mm	1510 mm
F	1305 mm	1830 mm	1810 mm
G	710 mm	710 mm	735 mm
H	300 mm	300 mm	300 mm

Vented diagram shown above, for unvented installation please see G3 unvented installation section.

Flow Characteristics



Flow Characteristics cont'd.



Description.

The Mikrofill Rapide Extreme is a Domestic Hot water generator that combines the advantages of both an instantaneous water heater and a storage system, whilst ensuring that the associated boiler plant operates at its optimum efficiency during Domestic Hot water generation. The Rapide Extreme is suitable for open vented or unvented applications. Based on a stainless steel storage vessel the unit utilises a stainless steel plate heat exchanger to "load" the vessel with water at 60°C, during hot water demand the plate heat exchanger effectively delivers hot water directly to the outlets, so "heat up" is reduced to minutes, and "recovery time" is a thing of the past. The Rapide extreme does not rely on convection within the vessel to transfer heat, the "loading system introduces water at 60°C into the top of the vessel. This drastically reduces the proliferation of Legionella bacilli, and in instances where the associated boiler is of the condensing type the boiler will remain in its condensing mode throughout Domestic Hot Water generation, a situation that is unattainable using conventional coil type hot water cylinders. The Rapide Extreme is supplied fully assembled, prewired and inclusive of charging pump and electronic controller, advanced insulation ensures that the standing losses are reduced to a minimum. The anode free stainless steel vessel carries a 30 year guarantee, whilst maintenance is minimal. The Rapide Extreme is suitable for open vented or unvented applications. See our animation on Mikrofill.com

Advantages

- Domestic Hot Water available at all times
- Very high flow rates available,
- Generates full cylinder of water at 60°C
- Reduces Legionella risks
- Optimises boiler operation.
- Simple installation.
- Low maintenance
- Low standing losses
- 30 year guarantee
- Short payback period

Operation.

The Rapide Extreme utilises a conventional simple storage cylinder, with a cold water feed connection at its lowest point and a hot water draw off connection at its highest point, in addition there is a plate heat exchanger draw off connection situated diametrically opposite to the cold water feed connection, both connections extend within the cylinder, thus reducing the gap between them within cylinder, see diagram. Similarly at the top of the unit there is a plate heat exchanger flow connection diametrically opposite the hot water draw off connection, again the connections are extended within the cylinder, a secondary hot water return connection is situated around midway up the cylinder. The plate heat exchanger draw off is connected to the secondary side of the plate via a bronze "charging" pump, with the secondary flow side of the plate being connected to the connection at the top of the cylinder. The primary connections of the plate are extended outside of the casing and made available for connection to a Mikrofill Ethos condensing boiler or other suitably sized boilers.

Installation

IMPORTANT : PLEASE READ AND UNDERSTAND THESE INSTRUCTIONS BEFORE INSTALLING THE RAPIDE EXTREME HOT WATER LOADING SYSTEM. INCORRECT INSTALLATION MAY INVALIDATE THE GUARANTEE

THE RAPIDE EXTREME MUST BE INSTALLED BY A COMPETENT INSTALLER IN ACCORDANCE WITH BUILDING REGULATION G3 (ENGLAND AND WALES), TECHNICAL STANDARD P3 (SCOTLAND) OR BUILDING REGULATION P5 (NORTHERN IRELAND).

SITING THE RAPIDE EXTREME

The Rapide Extreme must be vertically floor mounted. It can be placed anywhere convenient provided the discharge pipe(s) from its safety valves can be correctly installed. Areas that are subject to freezing must be avoided. Ensure that the floor is of sufficient strength to support the "full" weight of the unit . Pipe runs should be kept as short as possible for maximum economy. Access to associated controls, immersion heaters should be possible for servicing and maintenance of the system.

APPLICATION

The Mikrofill Rapide Extreme is suitable for both open vented (storage tank fed) or unvented applications

Open vented applications

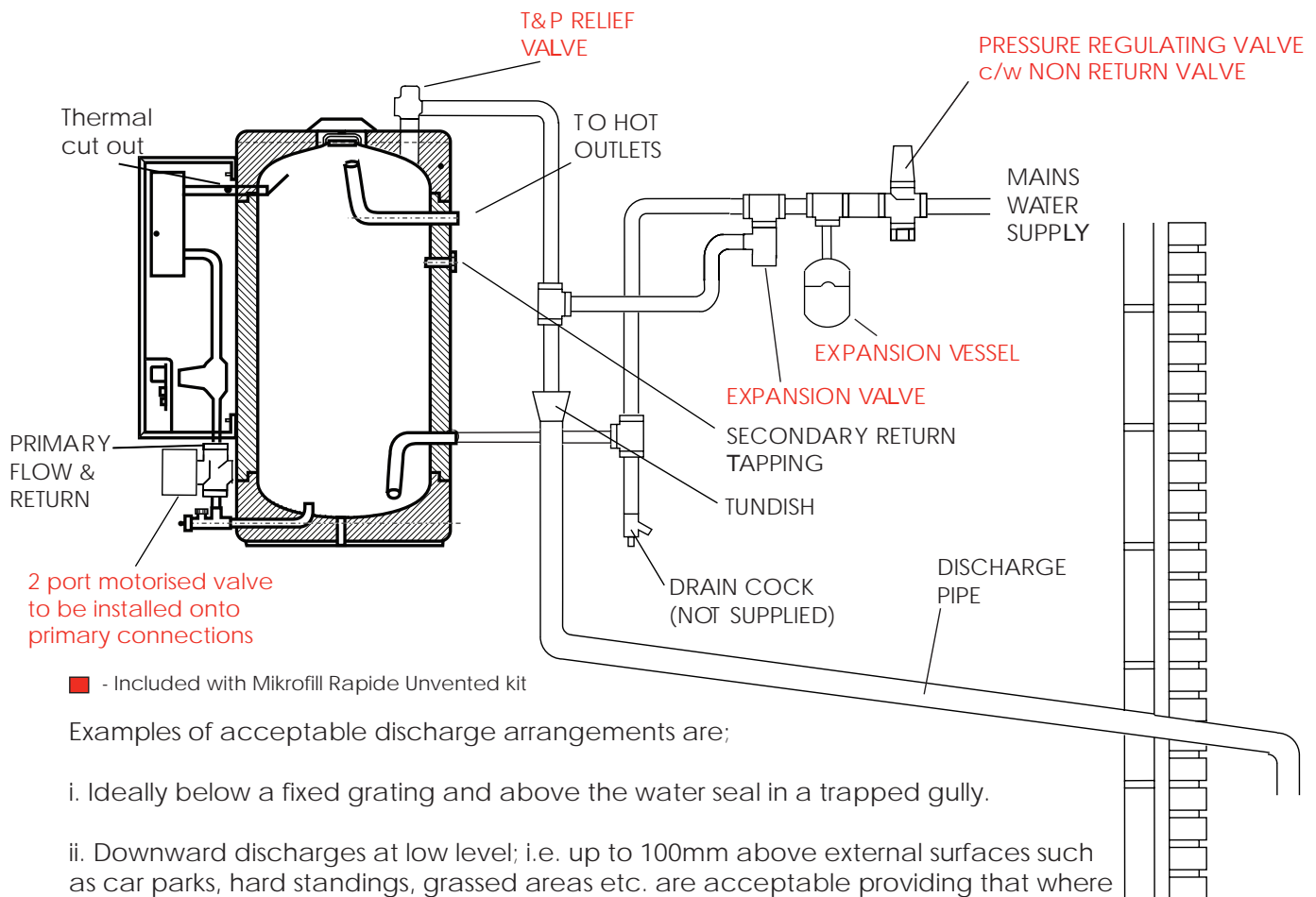
This is the conventional application utilising feed from a storage tank and where the system is open to atmosphere via a vent pipe (usually discharging back into the storage tank). Available pressure is subject to the static head i.e. the height of the storage tank above the Rapide Extreme. In open vented applications it is recommended that the cold water feed pipework and DHW flow pipe are sized according to the Rapide Extreme tapping size to ensure maximum possible flow rates.

WHEN INSTALLING THE RAPIDE EXTREME ONTO A OPEN VENTED SYSTEM WE STRONGLY RECOMMEND THAT A STRAINER/FILTER ARE INSTALLED ON THE DHW RETURN PIPEWORK AND COLD WATER FEED PIPEWORK, FAILURE TO DO SO MAY INVALIDATE THE GUARANTEE.

UNVENTED APPLICATIONS

The Rapide Extreme can be fed directly from the mains supply to the property without the need for separate feed cisterns or vent pipes. It is supplied complete with all its necessary inlet and safety controls, thermal cut out and two port motorised valve.

Schematic installation details for unvented applications



Examples of acceptable discharge arrangements are;

- Ideally below a fixed grating and above the water seal in a trapped gully.
- Downward discharges at low level; i.e. up to 100mm above external surfaces such as car parks, hard standings, grassed areas etc. are acceptable providing that where children may play or otherwise come into contact with discharges a wire cage or similar guard is positioned to prevent contact, whilst maintaining visibility.
- Discharges at high level; e.g. into a metal hopper and metal downpipe with the end of the discharge pipe is clearly visible (tundish visible or not) or onto a roof capable of withstanding high temperature discharges of water and 3m from any plastic guttering systems that would collect such discharges (tundish visible).
- Where a single pipe serves a number of discharges, such as in blocks of flats, the number served should be limited to not more than 6 systems so that any installation discharging can be traced reasonably easily. The single common discharge pipe should be at least one pipe size larger than the largest individual discharge pipe (D2) to be connected. If unvented hot water storage systems are installed where discharges from safety devices may not be apparent i.e. dwellings occupied by blind, infirm or disabled people, consideration should be given to the installation of an electronically operated device to warn when discharge takes place.

Note: The discharge will consist of scalding water and steam. Asphalt, roofing felt and non metallic rainwater goods may be damaged by such discharges.

Worked example of discharge pipe sizing

The example below is for a G1/2 temperature relief valve with a discharge pipe (D2) having 4 No. elbows and length of 7m from the tundish to the point of discharge.

From Table 1:

Maximum resistance allowed for a straight length of 22mm copper discharge pipe (D2) from a G1/2 temperature relief valve is 9.0m.

Subtract the resistance for 4 No. 22mm elbows at 0.8m each = 3.2 m

Therefore the permitted length equates to: 5.8 m

5.8m is less than the actual length of 7m therefore calculate the next largest size.

Maximum resistance allowed for a straight length of 28mm pipe (D2) from a G1/2 temperature relief valve equates to 18m.

Subtract the resistance of 4 No. 28mm elbows at 1.0m each = 4.0 m

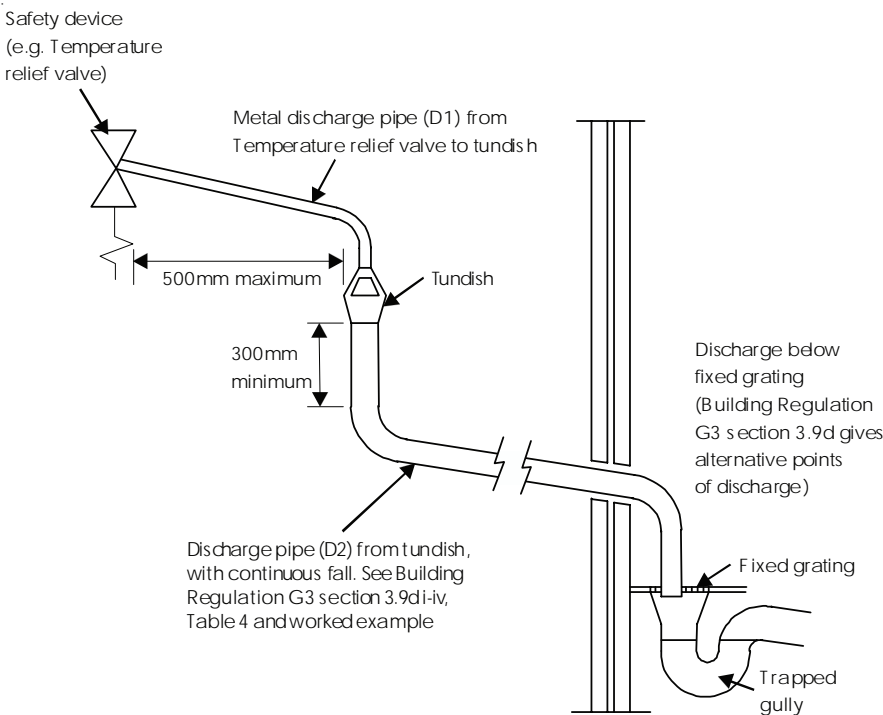
Therefore the maximum permitted length equates to: 14 m

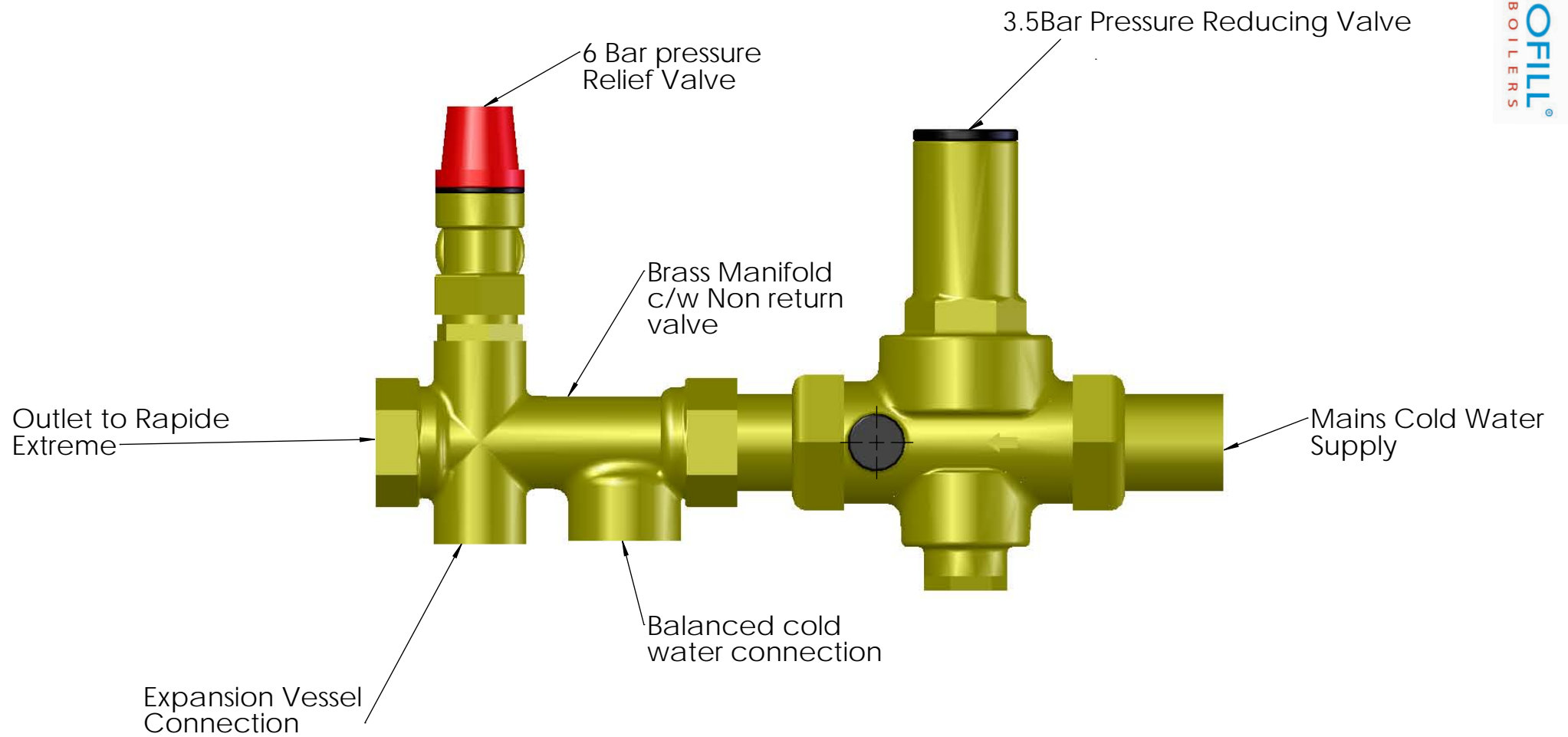
As the actual length is 7m, a 28mm (D2) copper pipe will be satisfactory.

Sizing of copper discharge pipe (D2) for common T & P relief valve sizes

Valve outlet size	Minimum size of discharge pipe D1	Minimum size of discharge pipe D2 from tundish	Maximum resistance allowed, expressed as a length of straight pipe (i.e. no elbows or bends)	Resistance created by each elbow or bend
G1/2	15mm	22mm	up to 9m	0.8m
		28mm	up to 18m	1.0m
		35mm	up to 27m	1.4m
G3/4	22mm	28mm	up to 9m	1.0m
		35mm	up to 18m	1.4m
		42mm	up to 27m	1.7m
G1	28mm	35mm	up to 9m	1.4m
		42mm	up to 18m	1.7m
		54mm	up to 27m	2.3m

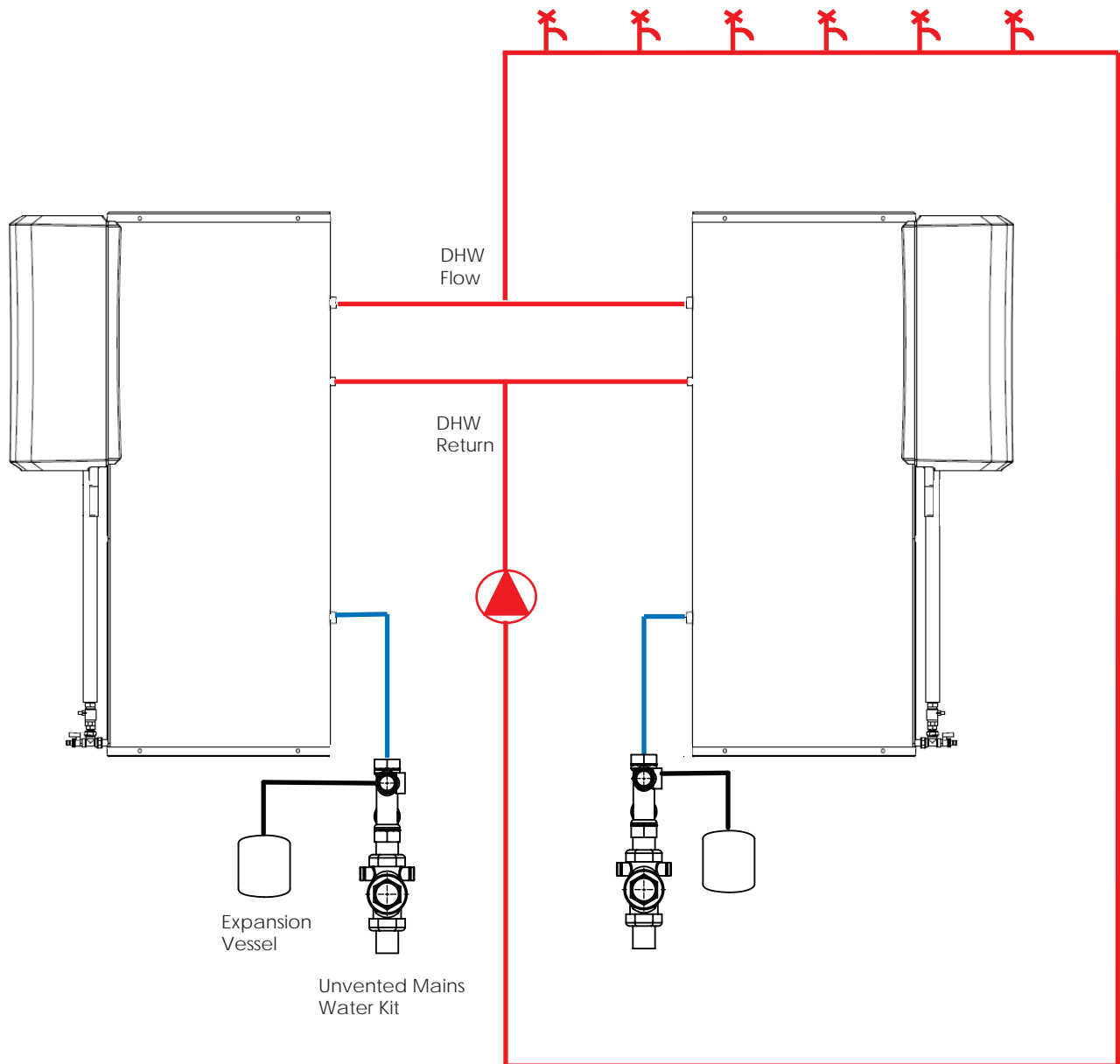
Schematic discharge pipe arrangement





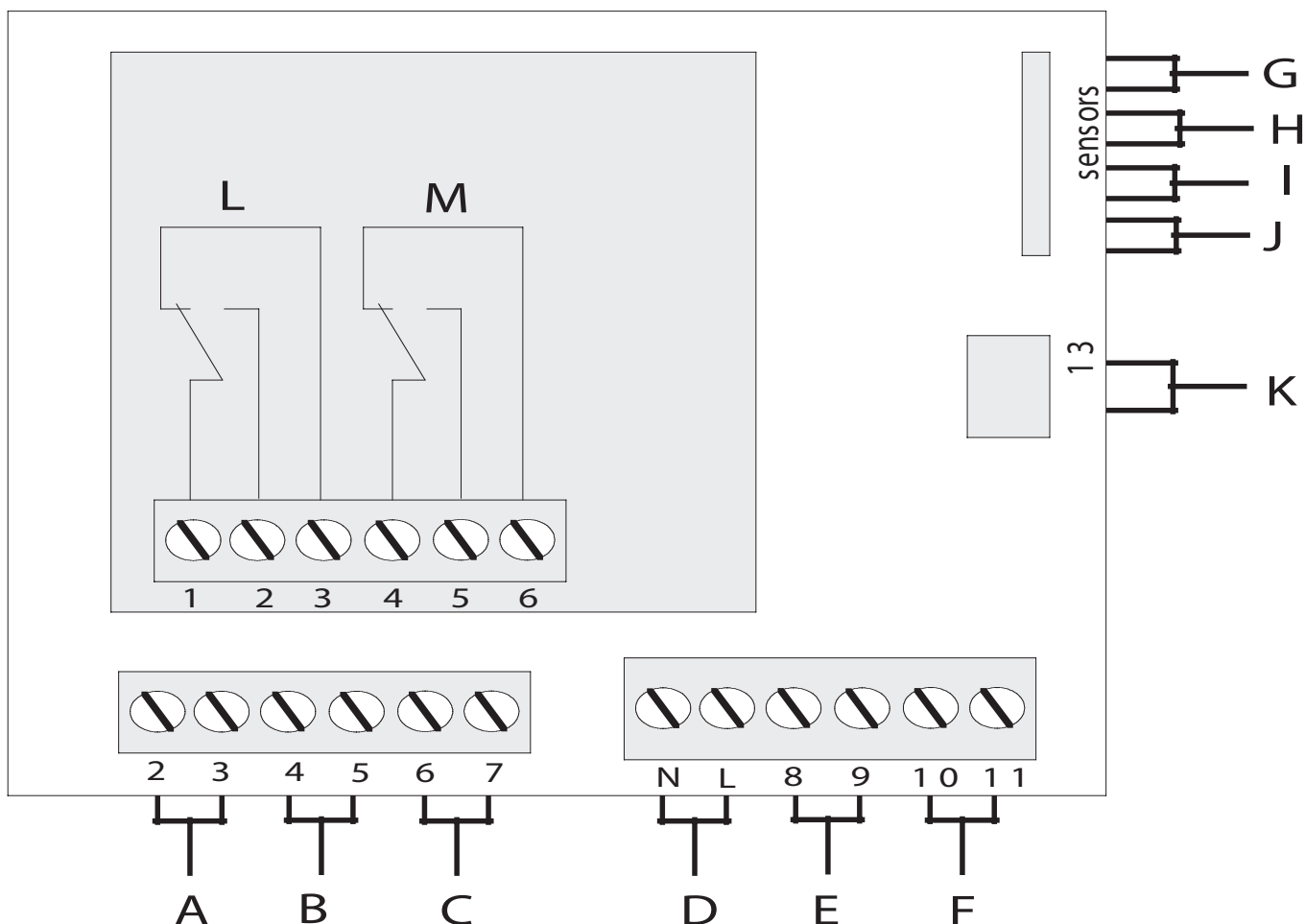
Unvented Kit

Multiple Extreme Installation



Rapide Extremes installed in parallel to ensure equal flow through both units

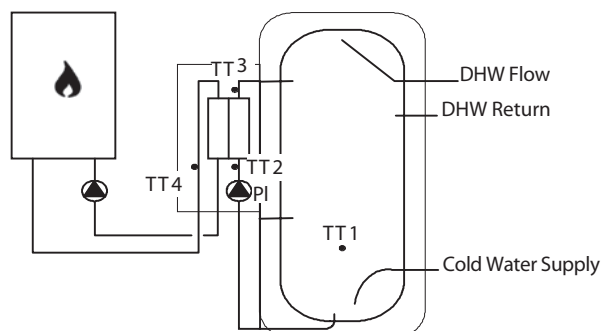
Extreme Wiring Diagram



Connection	Description
A	External Anti Legionella Circuit
B	N/A
C	N/A
D	Electrical Supply 230V
E	Primary Pump Supply 230V 1 Amp
F	N/A
G	TT4 Primary heating supply temperature sensor
H	TT3 Secondary loading temperature sensor
I	TT2 Shut off temperature sensor
J	TT1 Start Temperature sensor
K	Loading pump
L	Boiler Enable Circuit (between 1 & 2)
M	Fault Relay (made on fault between 4&5)

Electrical supply

230 vac
single phase
50Hz
max 100W
(excluding HWS primary pump)



Fault Diagnosis

It is possible to interrogate the Rapide Extreme controller to find sensor readings and fault history to do this you must press and hold the button on the controller for 5 seconds this will then put the controls into diagnosis mode, by pressing the button again you can scroll through the menu of sensor readings, after the sensor readings on the menu previous faults will be displayed. see below for explanation of readings.

Diagnosis	Nr.	Possible Displays
Software (product) Version	S0	0 - 99
Operation Status	D0	OF,nr,nL,hr or hL
T1: Flow sensor temperature	D1	0-99(°C) or -- if there is a sensor fault
T2: Stop sensor temperature	D2	0-99(°C) or -- if there is a sensor fault
T3: Load sensor temperature	D3	0-99(°C) or -- if there is a sensor fault
T4: Primary Htg sensor temperature	D4	0-99(°C) or -- if there is a sensor fault
Loading pump operation	D5	
Boiler output	D6	Only shown if open therm boiler connected
Fault codes	E(1-7)	

Fault	Fault Code	Effect	Priority
TT1 Flow Sensor Fault	01	Loading pump runs with normal speed control. The sensor function is overridden by sensor TT3	3
TT2 Stop Sensor Fault	02	The sensor function is overridden by sensor TT3	4
TT3 Loading Sensor Fault	03	The loading process continues with the loading pump running at 100%. Output to all pumps active with 3min overrun when loading complete	5
TT4 Primary HTG Sensor Fault	04	The loading process is operational. The loading pump will not operate at the minimum primary temperature but will start after a preset time period.	6
Frost Protection Active	05	The loading pump is controlled at a set speed. Primary pump and boiler outputs are activated.	2
Anti legionella programme active for more than 2 hours	06	The programme returns to the normal operation and the fault code is displayed. If terminals 2&3 are closed the fault will not reset.	7
Normal operation programme active for more than 2 hours	07	The fault relay will be activated and the loading process will continue to operate.	1

Maintenance

Due to the high quality material used in the manufacture of this product and the simple construction the Rapide Extreme needs no maintenance and enables an exceptionally long guarantee period.

Included in the unit is a service valve on the loading pipe from the base of the cylinder to the plate heat exchanger, this may only be used when the unit is no longer active. DO NOT CLOSE THE SERVICE VALVE WHILST THE UNIT IS RUNNING.

Inspection and cleaning inside the cylinder,

It is possible to clean out the cylinder using fresh mains cold water if so desired. To carry out this operation isolate and disconnect all water supplies and ensure all electrical supplies are isolated. Run a drain hose from the drain valve to an operating drain, then connect a controlled mains water supply to the unit, drain the unit fully and then slowly supply water to the unit at the rate of drainage. Carry on at this rate until the water running out of the bottom of the cylinder runs clear, then carry out two full fills and drains. Reconnect and re-commission.