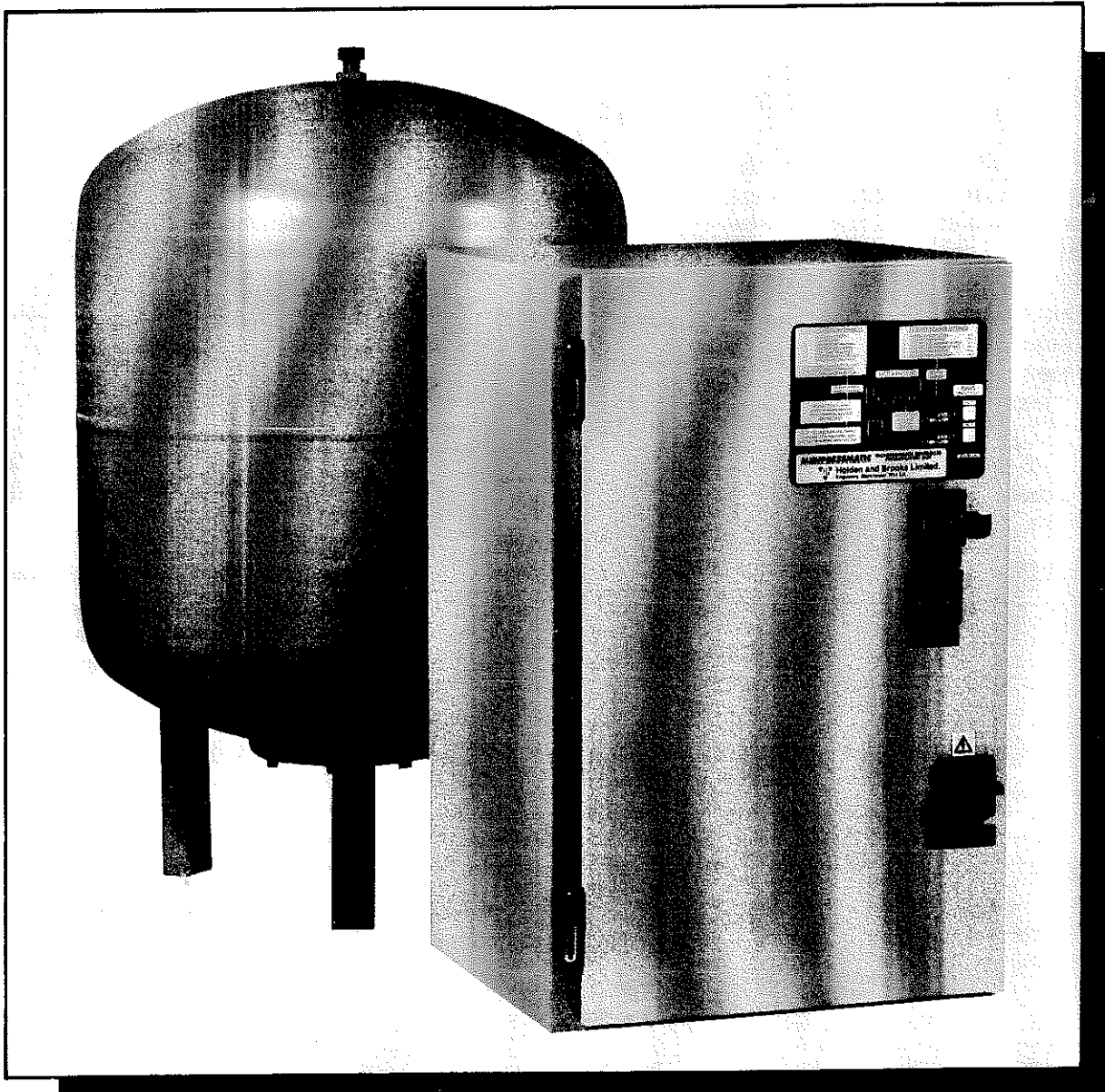




# Midi Pressmatic

Sealed System Pressurisation Sets for  
L.P.H.W./ M.P.H.W. and Chilled Water Duties.



## Holden and Brooke Limited

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## Introduction

Totally reliable, simple yet sophisticated, the Midi Pressmatic offers a straightforward solution to all LPHW, MPHW and Chilled Water sealed system pressurisation and make up applications.

The Midi can be programmed to ensure that transient system pressure conditions can safely be ignored. This prevents unnecessary fill pump and/or alarm operation.

The Midi Pressmatic complies with the following;  
The Water Research Centre's Water Supply Byelaws 1989 Edition.  
BS 7074 1989.  
Health and Safety Executive Guidance Note PM-5C, M and E3.

## BMS Compatibility

Apart from the volt free contacts mentioned below, the Midi Pressmatic can "talk" to BMS when fitted with the optional serial link. Using RS422 Protocol, an operator of a central terminal would be able to access such information as program settings, alarm conditions operating and the actual system pressure.

## Options

Single Pump Unit (Model 04)  
Run/Standby Pump Unit (Model 08)  
Low Head Fill Pump (up to 3.0 Bar)  
High Head Fill Pump (up to 6.0 Bar)

## Optional Extras

Break tank low level alarm, complete with warning light and volt free contacts to indicate same to a BMS.  
Pump hours run meter(s).  
Safety valve.  
Fully packaged unit with baseplate.  
Serial link.

## Specification

This is for a single pump Model 04 set. Standby pump version model 08 in brackets.

The system pressure will be maintained between safe limits by a Midi Pressmatic comprising:-

1. Stove enamelled steel enclosure with hinged lockable door having interlocked isolator.
2. Break Tank with close fitting lid, ball valve, Type 'A' air gap, overflow and suction strainer.
3. One(two) number fill pump(s) with cage motor and bronze body fitted with suction and discharge isolating valves. (Pumps arranged for auto changeover on fall in pressure or pump tripped). Motor(s) protected by miniature circuit breakers.

4. System isolating valve to enable commissioning of the set prior to opening up the system.
5. A pressure transducer

The set will be controlled by a programmable microprocessor which will, on demand, indicate the following on the fascia:-

System working pressure (normally displayed).  
Cold fill pressure setting.  
High pressure alarm setting.  
Low pressure alarm setting.  
Minimum pump running time.  
(Delay between pump starts).

will indicate the following alarm conditions:-

High system pressure.  
Low system pressure.  
System leakage (frequent pump starting).  
Transducer failed.  
Running and tripped lights for each pump and a power on light to be fitted.  
The duty pump will be alternated after each cycle.  
Undervoltage protection provided.

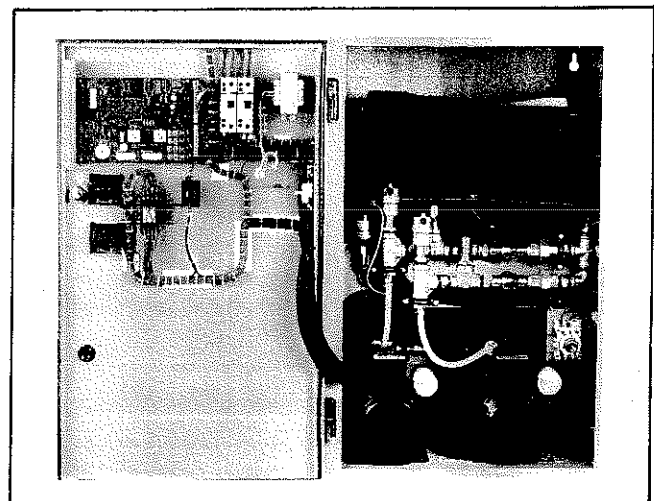
Volt free contacts will be fitted to indicate remotely the following:-

1. High pressure alarm.
2. Low pressure alarm.
3. No.1 pump tripped.
4. No.2 pump tripped.)
5. Break tank low level(optional).

## Expansion Vessels

Holden and Brooke Type DE expansion vessels are supplied with the Midi Pressmatic to provide a complete package. The 18DE size is supplied packaged with the unit and has a non-replaceable membrane. The 60, 100, 200, 300 and 500DE sizes are free standing and have replaceable EPDM bags. We supply flexible pressure hose and fittings to enable easy and quick installation. All vessels are suitable for pressures up to 10 Bar and are rated up to 6.0 Bar when BS4814 applies. Larger size vessels, up to 5000L can be supplied. See leaflet 1610/J2.

## Internal View



## Anti Gravity Vessels

These are used on systems with return temperatures above 100°C to prevent heat damage to the expansion vessel. We use good commercial quality black steel vessels or, where M and E3 applies, BS5500 Cat 3 grade vessels.

$$\text{AG vessel size} = \text{System content} \times (\text{CE} - 0.044)$$

## Warning

The Midi Pressmatic must not be used to introduce water treatment to the system. No part of the set, expansion vessel or interconnecting pipework is to be lagged.

## Information Required to Size Expansion Vessels

Static head from the set to the highest point of system - PF(bar).

Flow temperature  $t_f$ .

Water content (litres). If unknown, allow 12 litre per kW of boiler or chiller power.

Total boiler or chiller kW.

Pressure rating of weakest component in system - adjusted to the level of the set - LWP(bar).

Residual pump head at the LWP point. If this point is very close to the pressurisation set, it can be assumed to be negligible. The calculation below does so.

## Sizing Expansion Vessels

Holden and Brooke can supply DOS software called Influx 2 to size vessels. Otherwise, the manual method is as follows:-

$$\text{Vessel size} = \frac{\text{System water content} \times \text{CE}}{\text{Vessel acceptance factor}} \quad (1)$$

Where

$$\text{Vessel acceptance factor} = \frac{\text{LWP(A)} - \text{PF(A)}}{\text{LWP(A)}}$$

Where (A) = absolute

So, the method comprises firstly calculating the V.A.F. and then substituting it into equation (1) to derive a number. Then pick the next available larger vessel.

1. For chilled water systems, use the  $C_E$  at the maximum ambient temperatures.
2. When glycol is added, the  $C_E$  increases. See figure 3.
3. For MTHW systems, the  $P_F$  is the sum of the static head plus the anti flash margin (figure 2) at the flow temperature.
4. The VAF is limited by the vessel design to 0.7. Use this figure if your VAF result exceeds it.

## Technical Data

Maximum system flow temperature	120°C
Electrical Supply	240/1ph/50hz or 220/1ph/60hz
Fuse rating	7 Amp
FLC	Low Head 2.0A High Head 2.3A
Motor Power	0.30kW 0.37kW
Starting Current	12 Amp 15 Amp

Table 1

Flow Temp. °C	Temp/Power Factor Y
20	.00012
25	.00015
30	.00018
35	.00023
38	.00027
60	.00036
80	.00046
82	.00050
85	.00057
90	.00060
95	.00063
100	.00066
105	.00066
110	.00072
115	.00081
120	.00094

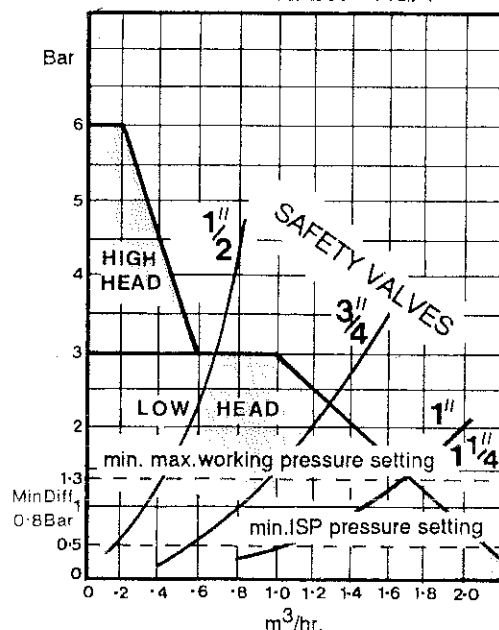
Table 2.

Flow Resistance in bar/m For Steel Pipe

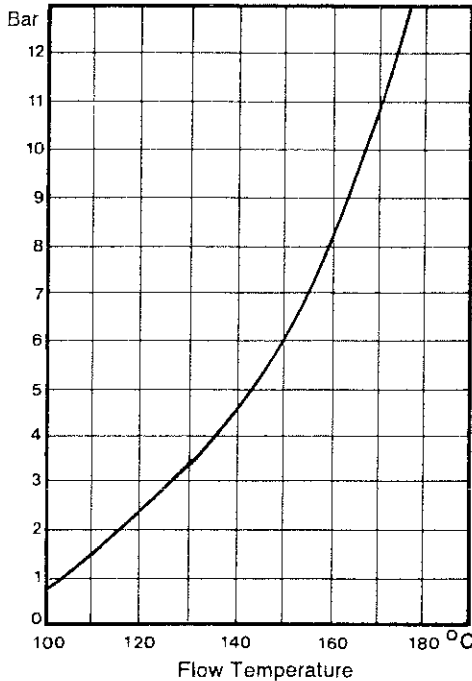
Flow Rate F.R. m <sup>3</sup> /h	Pipe Size N/Bore in mm			
	12	20	25	32
0.5	.005	.002	-	-
1.0	.022	.007	.001	-
1.5	.043	.013	.004	-
2.0	-	.02	.007	.002

Flow Rate(m<sup>3</sup>/hr) = Boiler Rating(kw) x Y  
where Y is obtained from Table 1.

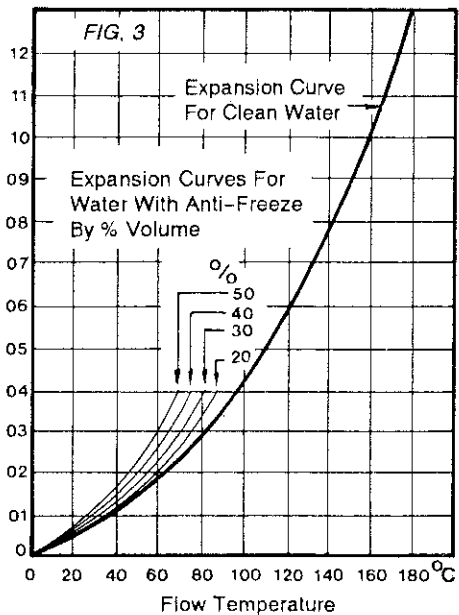
## PUMP AND SAFETY VALVE SELECTION CHART FIG. 1



**ANTI-FLASH MARGIN** FIG. 2



**COEFFICIENT OF EXPANSION CE.**



**Sizing the Fill Pump**

To ensure a safe installation the fill pump has to be sufficiently rated to cope with the maximum system contraction rate.

**To Select the Pump:**

Find the Y factor using the flow temperature and Table 1.

Multiply the totalled installed kW by the Y rating. The result is a flow rate in m<sup>3</sup>/hr.

Knowing the static head (PF) and the flow rate, select a pump from Figure 1. Ignore the safety valve curve. If the duty point is beyond the capability of the fill pump, contact your local Holden and Brooke office.

**Connection Requirements:**

We recommend that the cold feed line be connected on the inlet side of the circulating pump but not directly on to the suction. The feed line size should be large enough to allow free flow to and from the set. We recommend using the following calculation:

Determine Y factor from Table 1.

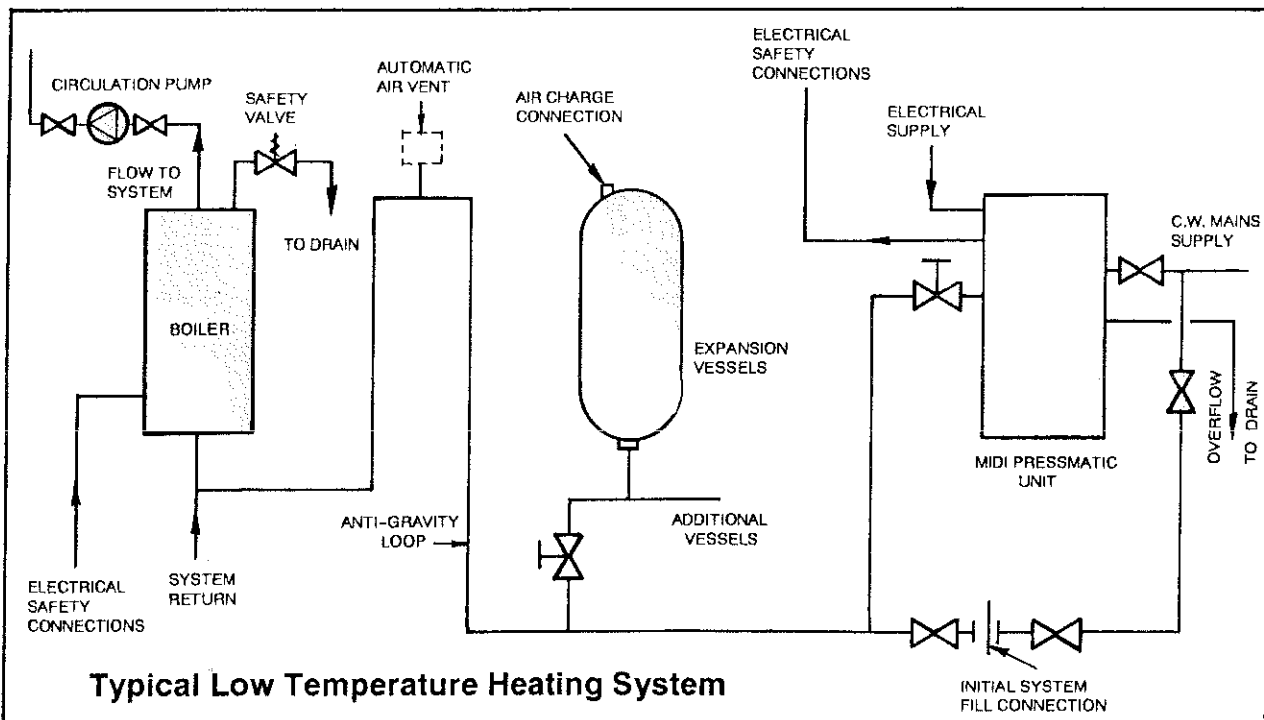
Multiply Y factor by total installed kW to obtain flowrate. Determine flow resistance (per metre) of pipework from Table 2.

Multiply resistance rate by pipe length to obtain total resistance.

The number should be less than 0.14 Bar for a successful installation.

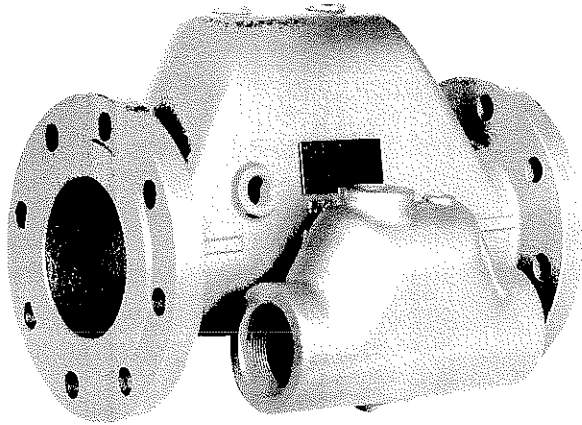
**Safety Valve Sizing.**

This may be fitted as an option to protect the system. Calculate the flowrate and determine the PF as for the fill pump above. Select the correct valve from Figure 1.

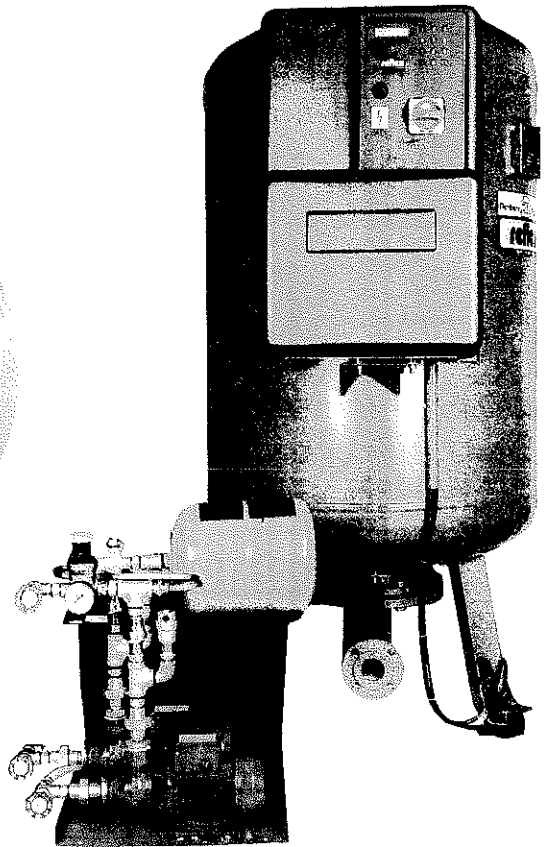


**Typical Low Temperature Heating System**

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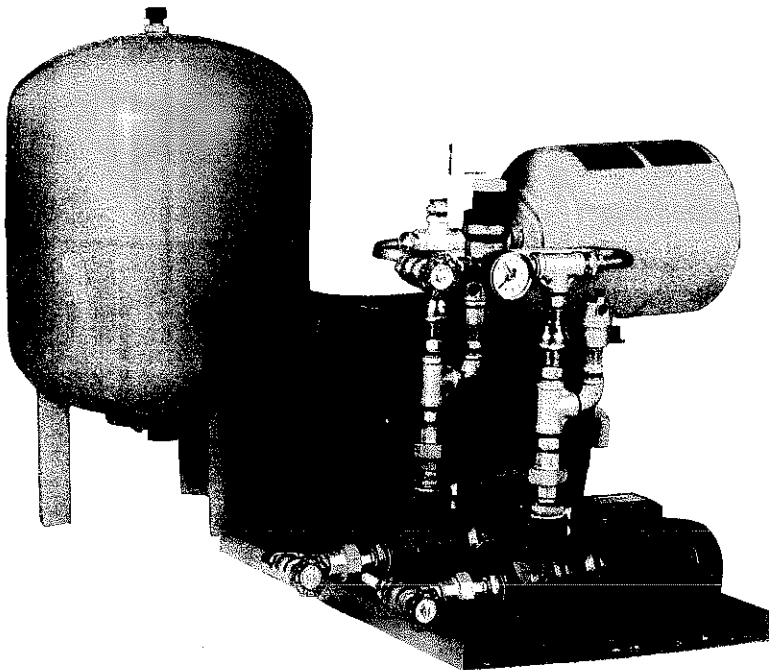
**Air Separators**



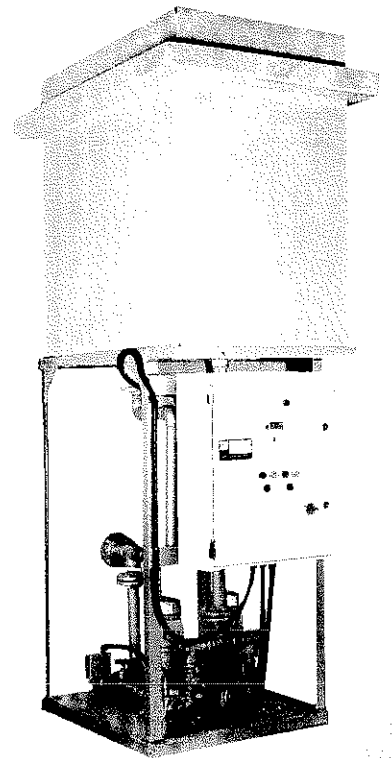
**Reflexomat and Fill Tank Unit**



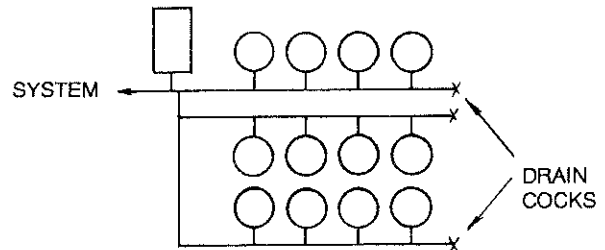
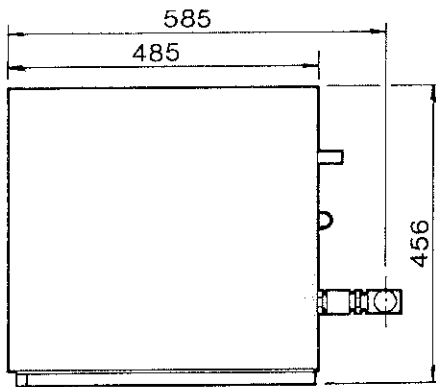
Other products from the Holden and Brooke range of sealed system equipment.



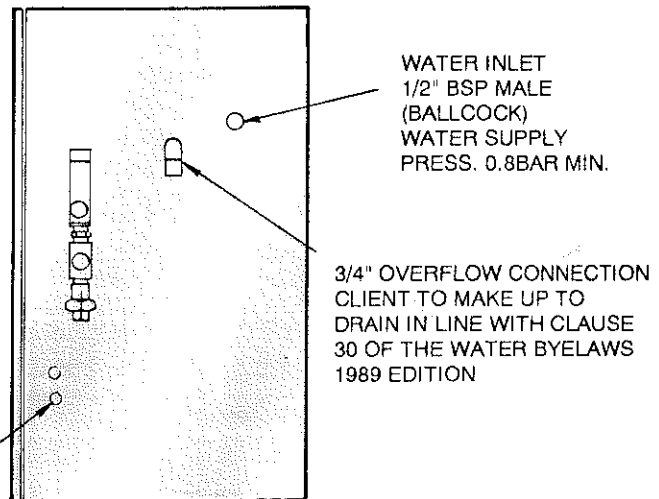
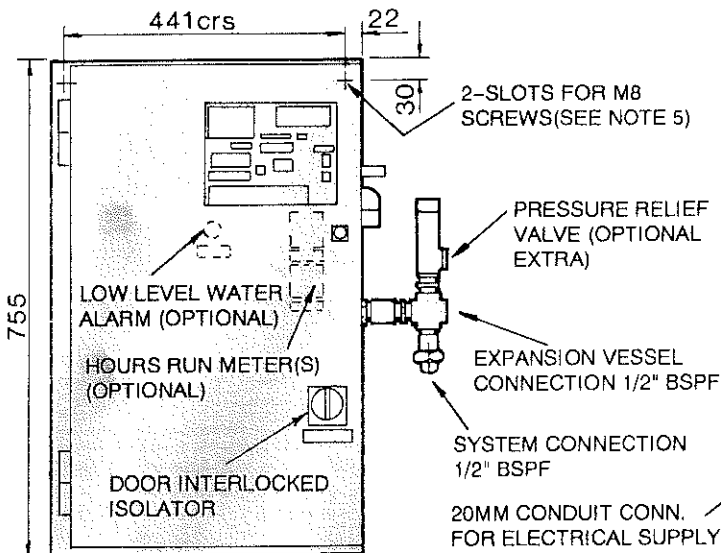
**Mini Pressmatic Set**



**Modupress Set**

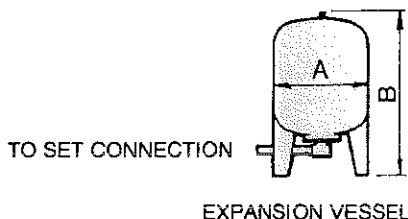
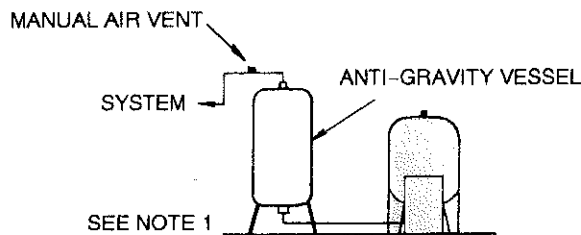


VESSELS CAN BE ARRANGED IN SERIES UP TO A MAXIMUM OF FOUR 500 LITRE VESSELS PER LEG. FURTHER LEGS SHOULD BE ARRANGED IN PARALLEL AND POSITIONED TO SUIT FLOOR SPACE AVAILABLE. WHEN 4 OR MORE VESSELS ARE USED THE MANIFOLD LEG(S) SHOULD BE 25 N/B. A DRAIN COCK MUST ALWAYS BE FITTED ON THE END OF EACH LEG.



PRESSURISATION UNIT WEIGHT (KG)			
ONE PUMP	TWO PUMPS		
FULL OF WATER	EMPTY	FULL OF WATER	EMPTY
90	60	115	85

INITIAL SYSTEM PRESSURE 0-6 BAR (dependent on pump size)  
 MAXIMUM ALLOWABLE SYSTEM PRESSURE 10 BAR (dependent on initial system pressure)



EXPANSION VESSEL		
LITRES	A	B
18	280	355
60	409	680
100	480	740
200	634	940
300	634	1110
500	740	1320

EXPANSION VESSEL		
VESSEL SIZE LITRES	WEIGHT (kg) EACH	
	FULL OF WATER	EMPTY
18	28	15
60	61	19
100	96	26
200	183	43
300	258	48
500	429	79

NOTES:

- IF AN ANTI-GRAVITY VESSEL IS SUPPLIED THE SET MUST BE CONNECTED TO THE BOTTOM VESSEL PORT AND THE SYSTEM TO THE TOP.
- NO PART OF THE SET, ANTI-GRAVITY VESSEL OR CONNECTION PIPE IS TO BE LAGGED.
- UNDER NO CIRCUMSTANCES MUST WATER TREATMENT BE INTRODUCED TO THE SYSTEM VIA THE BREAK TANK EXCEPT WHEN A DE-MINERALISED WATER SET IS SUPPLIED. THIS SHOULD BE CONNECTED TO THE BREAK TANK BALLCOCK.
- ALL VESSELS ARE SUPPLIED LOOSE. THE 18 LITRE VESSEL IS NOT FREE STANDING AND MUST BE AFFIXED TO AN ADJACENT WALL OR SUPPORT COLUMN.
- SET CAN BE EITHER FLOOR MOUNTED OR 'HUNG' ON A WALL USING THE 'KEYHOLE' SLOTS PROVIDED ON THE BACK OF THE ENCLOSURE.

Note: Improvements in general design and modifications in detail will be embodied for the benefit of clients as and when introduced; consequently this specification is subject to alteration, as may be necessary, without notice.

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