



AquaTech Pressmain

HEATING & CHILLED SYSTEM PRESSURISATION UNITS



AQUAPACK 'ET' SERIES

STANDARD FEATURES:

- Boiler ratings up to 5000kW @ 82°C
- System contents up to 50,000 litres
- Temperature range up to 120°C (when using intermediate cooling vessel)
- Cold fill pressure 1.2 bar to 3.0 bar (ET45) or 3.0 bar to 7.0 bar (ET90)
- Reliable 2000Plus Microprocessor/transducer control
- Boiler / Chiller safety interlock relay
- Audible alarm with mute & reset operates on high & low pressure
- Expansion vessels - tested to BS6144 - max working pressure 10 bar
- Twin pump models with duty/standby pumps & automatic alternation of duty pump to even wear
- Enhanced models are fully compatible with Building Management Systems
- Fluid category 3 (water supply regulations 1999)
- Built to latest CE requirements and in accordance with ISO9001

OPTIONAL FEATURES:

- C1 cabinet unit enclosing pumps, break tank and controls (can be floor or wall mounted)
- Leak detection via frequency of starts alarm

SPECIFICATION FOR AQUAPACK PRESSURISATION UNITS FOR HEATING & CHILLED WATER APPLICATIONS

GENERAL

The Aquapack 'ET' Series pressurisation unit is designed to maintain a minimum set pressure in a sealed heating or chilled water system. Once the system has been initially filled via a quick filling loop, should the pressure fall below the cold fill pressure the unit operates automatically to restore that pressure. If high or low-pressure conditions should occur the boiler/chiller operation can be interrupted via the volt-free contacts provided. The unit is used in conjunction with a suitably sized expansion vessel from our 'Aquatank' range of replaceable diaphragm vessels tested to BS6144. All packaged equipment is manufactured in accordance with ISO9001 quality assurance procedures.

STANDARD SPECIFICATION

AquaTech 'ET' series, heating or chilled water pressurisation unit. Suitable for cold fill pressures up to 3.0 bar/45psi 'ET45' and 7.0 bar/98psi with 'ET90' model. Controlled by AquaTech 2020Plus micro-processor controller with pressure transducer for long-term reliability and accuracy, non-volatile EPROM memory and data logging function. Fully packaged unit incorporating; single or twin pressurisation pumps, (auto change-over to even wear with twin pump models); Solid state pump drives with thermal overload protection; Automatic periodic pump pulsing to prevent pump seizure; Combined high/low system pressure cut-out relay volt-free contact; RS232 or 422/485 serial communications port; 18-litre mains water break-tank with 15mm float valve having a type 'AA' air gap to Water Supply Regulations 1999; Fascia controls to provide indicating lights for each pump condition or status, run, hand, off, auto; "User friendly" Fascia keypad to enter & set operational parameters, reset alarm & mute; "Plain English" 2 Line LCD illuminated display. Automatic cut-out and reset on tank low water level to prevent pump from dry running, 8 BMS Volt free relay connections, Fascia lights for pump tripped condition.

All controls contained within a powder coated sheet steel dust and damp proof enclosure to IP54, with interlocking door isolator.

Optional "C1" cabinet models have all controls and interconnecting piping and wiring contained within the cabinet.

"2ET45" Electrical supply: Single Phase, 240 Volt AC, 50Hz, 6 Amp; Max power: 0.74kW

QUICK SELECTION

- Example:** 4 storey building with 400 kW boiler power running at a temperature of 80°C Flow and 70°C Return. The plantroom is on the ground floor.
- From chart 1;** 'Superimposed' pressure at 80°C is 0.2 bar.
- From chart 2;** Static height is taken as 4 storeys at 3 metres per floor = 12 metres = 1.2 bar. Plus superimposed pressure of 0.2 bar (from chart 1) equals 1.4 bar, which is our low pressure alarm point. Add 0.2 bar for support pump start, plus 0.2 bar for duty pump start, plus 0.2 bar for duty pump stop. therefore cold fill pressure = 1.2 + 0.2 + 0.2 + 0.2 + 0.2 = 2.0 bar.
- From chart 3;** Cross reference 400 kW boiler power (assuming 10 litres per kW for system content) with 2.0 bar cold fill pressure, gives pressurisation unit model '1ET45' or '2ET45' (twin pump)
- From chart 4;** Cross reference 400 kW with boiler flow temperature of 82°C gives expansion vessel size 500VR.
- Model selected:** Aquapack 1ET45, or 2ET45 for twin pump unit, complete with 500VR expansion vessel.

CHART 1
EXPANSION & SAFETY PARAMETERS FOR HEATING PRESSURISATION UNITS

| FLOW TEMPERATURE °C | EXPANSION PERCENTAGE % | SUPERIMPOSED PRESSURE BAR | |
|---------------------|------------------------|---------------------------|------|
| 40 | 0.78 | 0.2 | LTHW |
| 50 | 1.21 | 0.2 | |
| 60 | 1.71 | 0.2 | |
| 70 | 2.28 | 0.2 | |
| 80 | 2.91 | 0.2 | |
| 90 | 3.60 | 0.2 | MTHW |
| 100 | 4.35 | 0.3 | |
| 105 | 4.77 | 0.6 | |
| 110 | 5.15 | 0.9 | |
| 115 | 5.62 | 1.3 | HTHW |
| 120 | 6.01 | 1.7 | |
| 125 | 6.52 | 2.2 | |
| 130 | 7.00 | 2.7 | |
| 135 | 7.50 | 3.2 | |
| 140 | 8.00 | 3.7 | |
| 145 | 8.53 | 4.4 | |
| 150 | 9.06 | 5.1 | |

CHART 2
PRESSURE SETTINGS CHART FOR HEATING SYSTEM PRESSURISATION EQUIPMENT

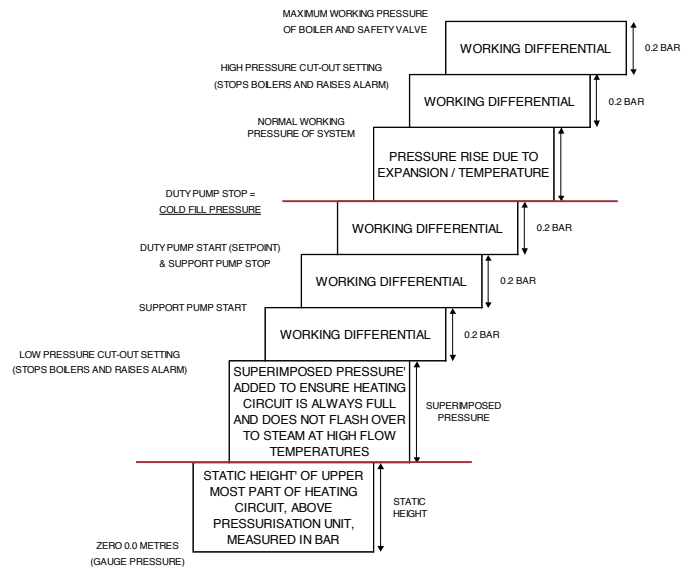
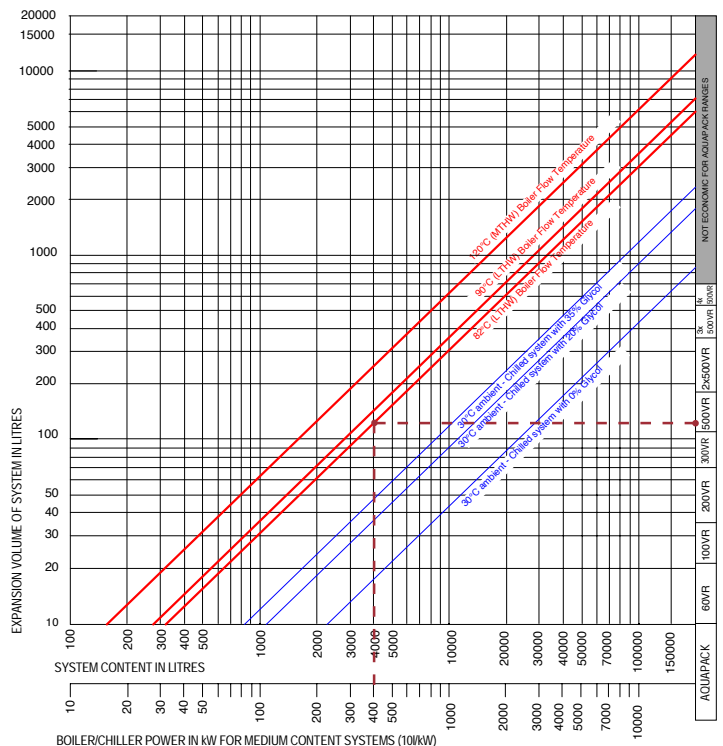
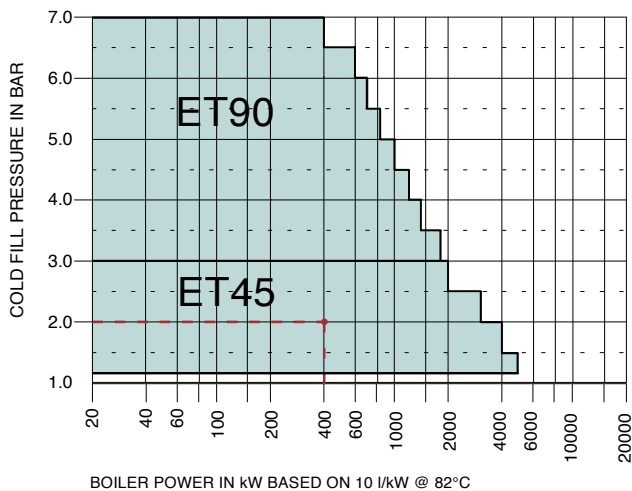


CHART 4
EXPANSION VESSEL SELECTION

CHART 3
PRESSURISATION UNIT SELECTION



‘ET’ PRESSURISATION UNIT TYPES

Having selected the model required for your project, below are various different model types to choose from:-

| AQUAPACK MODEL REFERENCES | | | | | |
|-----------------------------------------------------------------|--------------------------------------------------------------|---------------------------------------|----------------------------------------------|--------------------------------------------------------------|-------------------------------------|
| 1 OR 2 | ET | XX | -Y- | ZZZ | -E |
| 1 = SINGLE PUMP | SEALED SYSTEM PRESSURISATION UNIT, MICROPROCESSOR CONTROLLED | 45 = COLD FILL PRESSURES 1.2 TO 3 BAR | BLANK = LOOSE EXPANSION VESSELS | VESSEL SIZE WHEN PACKAGED ON A BASE (I.E. P, C1 & C2 MODELS) | BLANK = STANDARD CONTROLS SPEC |
| 2 = TWIN PUMP | | 90 = COLD FILL PRESSURES 3 TO 7 BAR | P = PACKAGED ON BASE WITH EXPANSION VESSELS | | E = ENHANCED CONTROLS SPEC. FOR BMS |
| TWIN PUMP UNITS OFFER 100% STANDBY WITH AUTOMATIC DUTY ROTATION | | SEE SELECTION CHART 3 | C1 = CABINETISED CONTROLS & PUMP/S | SEE SELECTION CHART 4 | SEE PAGE 2 |
| | | | C2 = FULL CABINET INCLUDING EXPANSION VESSEL | | |

2ET45-P-500-E



Twin pump packaged unit with 500VR expansion vessel all on base

2ET45-C1-E



Twin pumps with controls & breaktank in cabinet. Supplied with loose expansion vessels or all on base

FASCIA DISPLAYS & BMS OUTPUTS

OPERATIONAL DATA DISPLAY:

- System Pressure
- System Status Including Warnings
- Alarms With Type of Fault
- Pump/s Tripped
- Transducer Fault
- Boiler/s Cut-out

INFORMATION DISPLAYS:

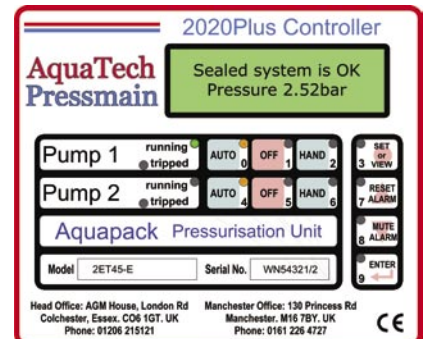
- Hours Run for Each Pump
- Hours Elapsed Since Last Service
- Parameter Settings Display
- High Pressure Cut-out Setting
- Pump Stop (Cold Fill Pressure)
- Low Pressure Cut-out Setting
- Support Pump Delay Time

***WARNING DISPLAYS:**

- High Pressure Approach
- Low Pressure Approach
- High Water Level Approach
- Low Water Level Approach
- Servicing Reminder

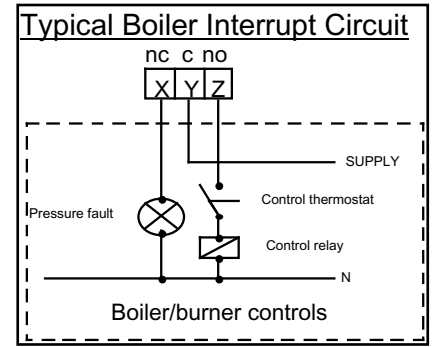
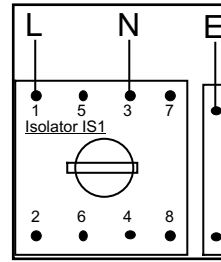
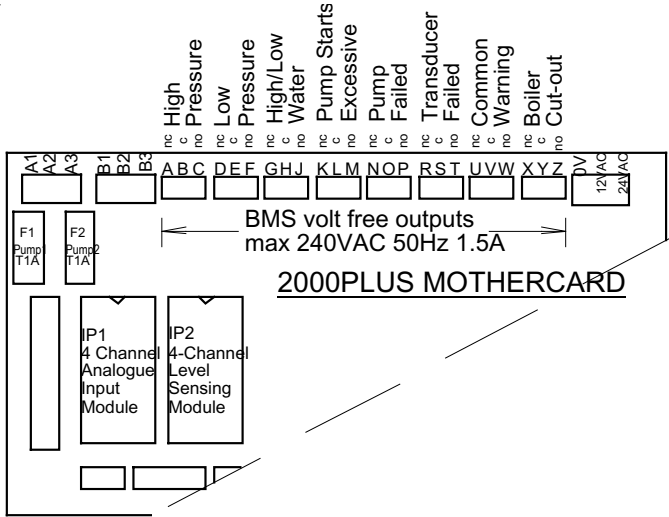
BMS VOLT FREE RELAY CONNECTIONS

- High System Pressure
- Low System Pressure
- Low/High Water Level
- Excessive Frequency of Start/Demand
- Pump Tripped/Failed
- Transducer Fault
- Common Warning Signal for all Warning Displays*
- Boiler/Chiller Cut-out



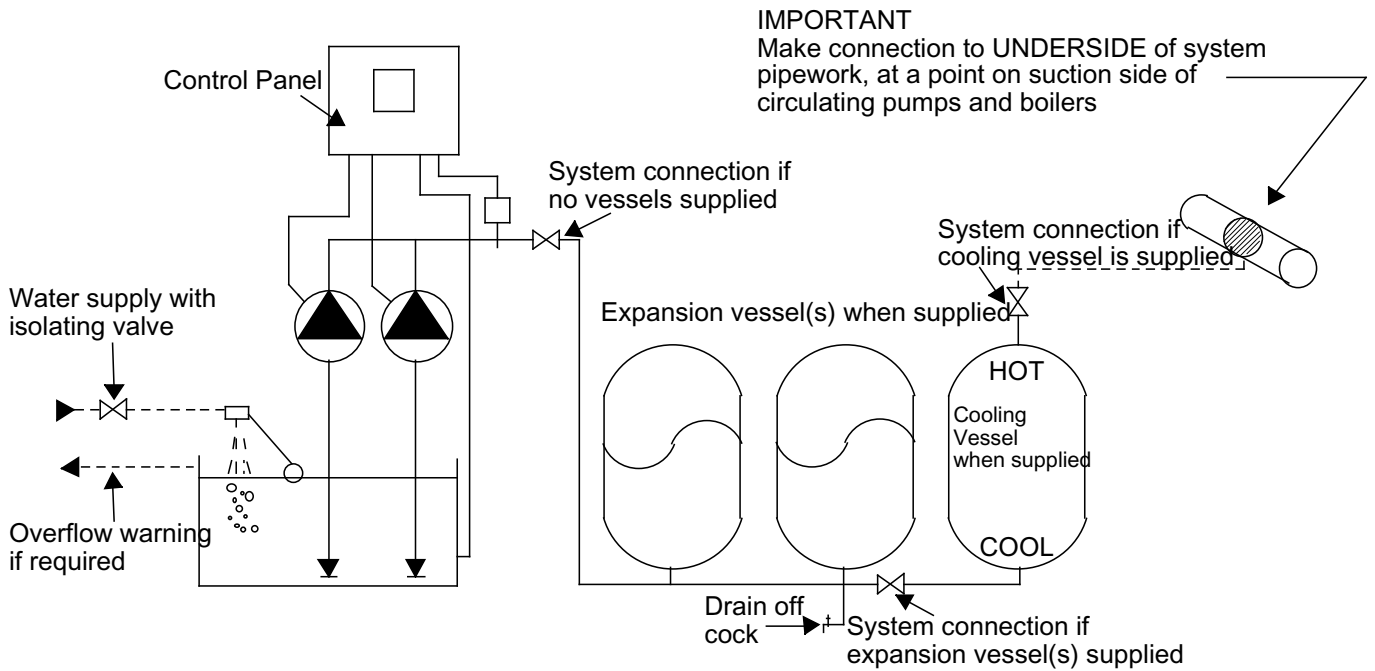
Note: Standard control specification includes fascia keypad & LCD display with information & warning displays as above (excluding water level alarms & pump/s tripped), plus boiler / chiller volt free relay connection only.

ELECTRICAL CONNECTIONS (ENHANCED UNIT)



WIRING BY CUSTOMER

TYPICAL SCHEMATIC LAYOUT DIAGRAM FOR 'ET' SERIES

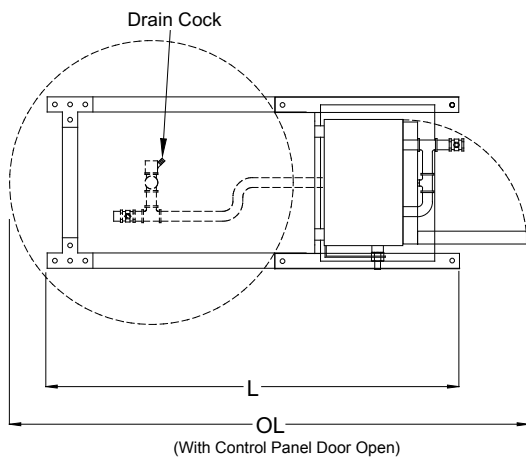
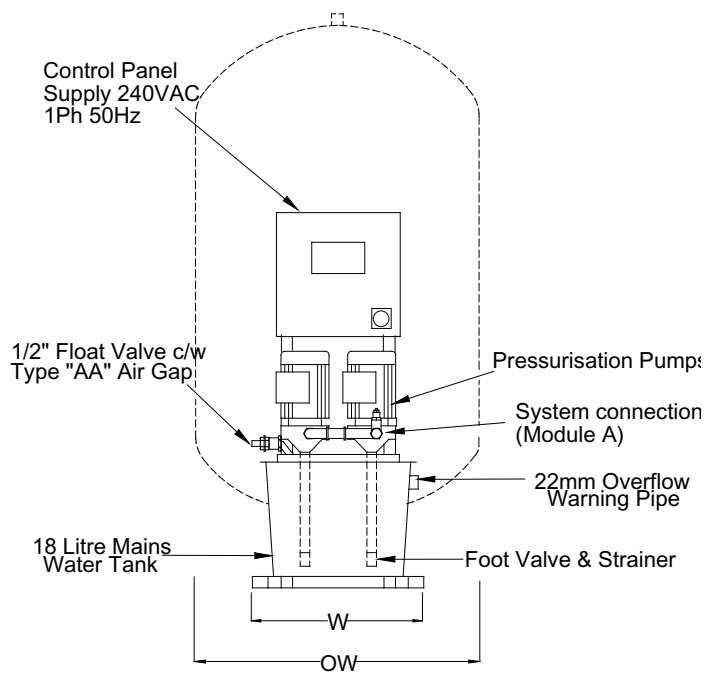
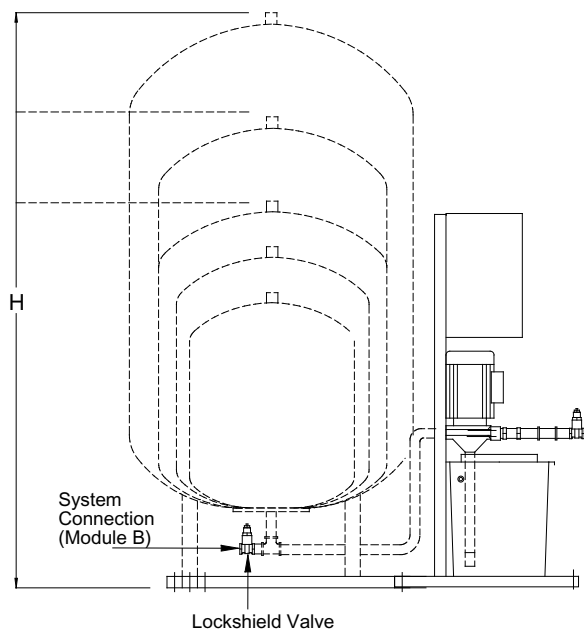


----- Installer to provide

WORK REQUIRED ON SITE

- Bolt baseplate to plinth
- Fit float valve into tank in the best position to suit conditions and provide type 'AA' air gap if required.
- Connect 1/2" BSP (15mm) mains water supply.
- Provide and fit 3/4" BSP (22mm) overflow pipe from break tank to suitable drain.
- Wire single phase control supply onto terminals provided and boiler/chiller thermostat control circuits onto boiler/chiller relay within the control panel.
- Connect AQUAPACK unit to system as installation instructions.

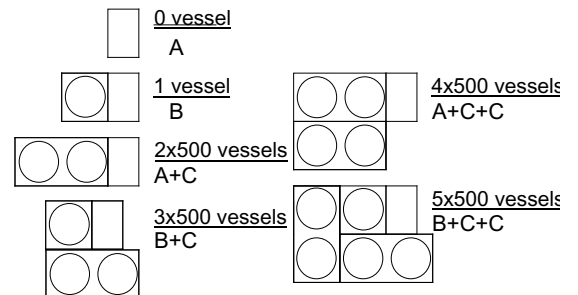
AQUAPACK 'ET' 2020PLUS SERIES PACKAGED UNIT DIMENSIONS



- MODULE A = Pump & Controls Unit Only, For Use With Module C or Free Standing Vessels (see page 8)
- MODULE B = Pump & Controls Unit With 1 Expansion Vessel
- MODULE C = 2 x 500 Litre Expansion Vessels



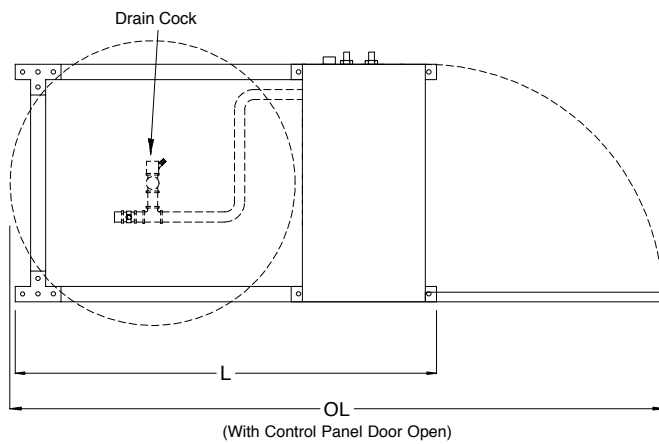
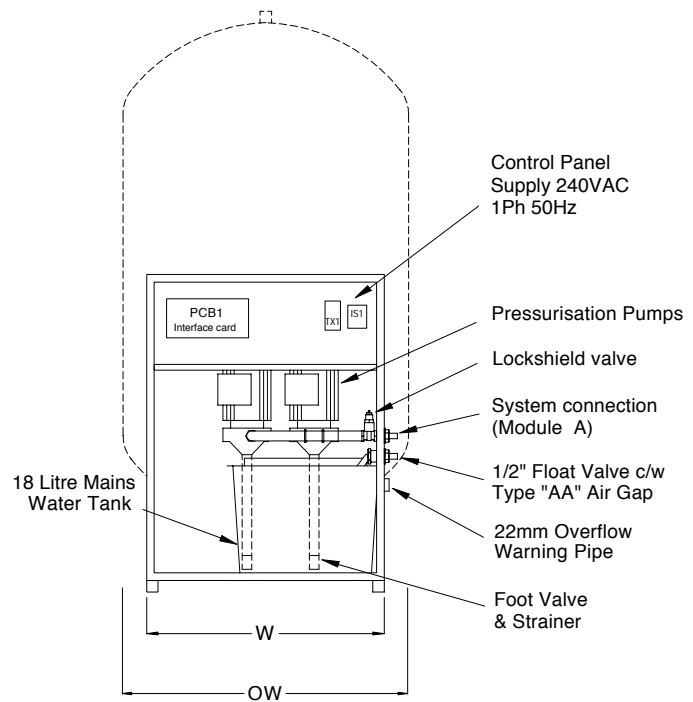
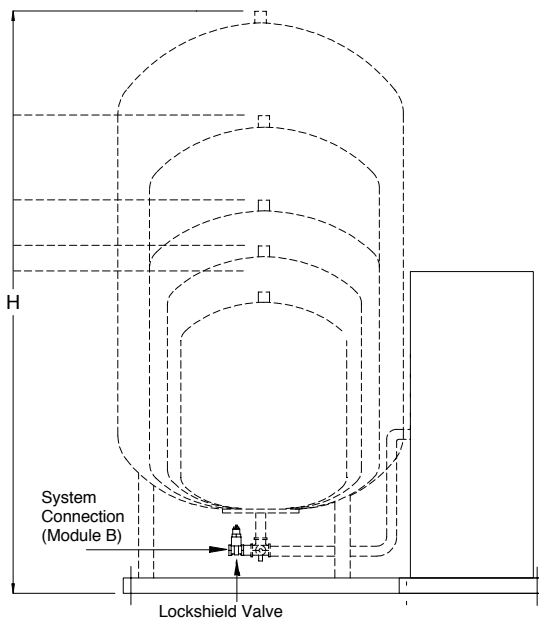
POSSIBLE CONFIGURATION OF VESSELS



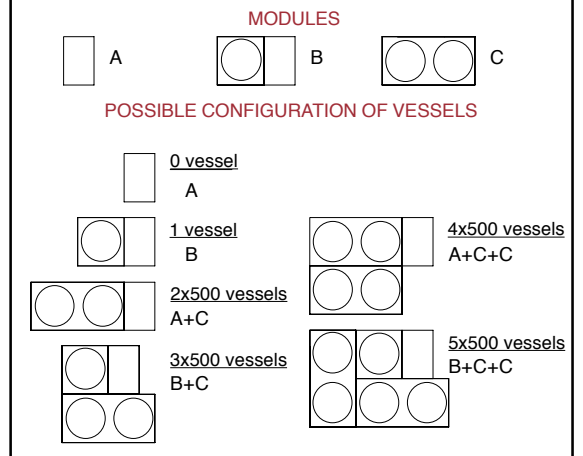
| Model Reference | No. of Vessels | Module | Base | | Overall Max. | | | System Connection | Weight Kg. | | | |
|--------------------------------------------|----------------|-----------|-----------------------------------------|------|--------------|---------|------|-------------------|------------|---------|--------|-----|
| | | | L | W | OL | OW | H | | | | | |
| Pump & Controls Module Only (loose vessel) | 0 | A | 480 | 450 | 670 | 450 | 1025 | ½" BSP | 50 | | | |
| 1ET45 2ET45 1ET90 2ET90 | -P-60 | 1 x 60 | (refer to individual module dimensions) | 1100 | 450 | 1290 | 450 | 1025 | 1" BSP | 78 | | |
| | -P-100 | 1 x 100 | | | | 1290 | 485 | 1025 | 1" BSP | 95 | | |
| | -P-200 | 1 x 200 | | | | 1300 | 640 | 1025 | 1" BSP | 110 | | |
| | -P-300 | 1 x 300 | | | | 1300 | 640 | 1320 | 1" BSP | 125 | | |
| | -P-500 | 1 x 500 | | | | 1100 | 450 | 1400 | 745 | 1520 | 1" BSP | 150 |
| | -P-2-500 | 2 x 500 | | | | A + C | 2270 | 745 | 1520 | 1¼" BSP | 220 | |
| | -P-3-500 | 3 x 500 | | | | B + C | 1600 | 1490 | 1520 | 1½" BSP | 320 | |
| | -P-4-500 | A + C + C | 2270 | 1490 | 1520 | 1½" BSP | 390 | | | | | |
| | -P-5-500 | B + C + C | 2350 | 1490 | 1520 | 1½" BSP | 418 | | | | | |
| 2 x 500 (vessels only) | 2 x 500 | C | 1600 | 620 | 1600 | 745 | 1520 | - | 170 | | | |

All dimensions in mm unless stated otherwise

AQUAPACK 'ET' 2020PLUS SERIES C1 UNIT DIMENSIONS



MODULE A = Pump & Controls Unit Only, For Use With Module C or Free Standing Vessels (see page 8)
 MODULE B = Pump & Controls Unit With 1 Expansion Vessel
 MODULE C = 2 x 500 Litre Expansion Vessels



| Model Reference | No. of Vessels | Module | Base | | Overall Max. | | | System Connection | Weight Kg. | |
|--------------------------------------------------|----------------|-----------|-----------|-----------------------------------------|--------------|------|------|-------------------|------------|-----|
| | | | L | W | OL | OW | H | | | |
| Pump & Controls Module in Cabinet (loose vessel) | 0 | A | 380 | 620 | 980 | 620 | 840 | ½" BSP | 50 | |
| 1ET45 2ET45 1ET90 2ET90 | -C1-60 | 1 x 60 | B | 1100 | 620 | 1390 | 620 | 840 | 1" BSP | 78 |
| | -C1-100 | 1 x 100 | B | 1100 | 620 | 1460 | 620 | 885 | 1" BSP | 95 |
| | -C1-200 | 1 x 200 | B | 1100 | 620 | 1620 | 640 | 1020 | 1" BSP | 110 |
| | -C1-300 | 1 x 300 | B | 1100 | 620 | 1620 | 640 | 1320 | 1" BSP | 125 |
| | -C1-500 | 1 x 500 | B | 1100 | 620 | 1720 | 745 | 1520 | 1" BSP | 150 |
| | -C1-2-500 | 2 x 500 | A + C | (refer to individual module dimensions) | | 2580 | 745 | 1520 | 1¼" BSP | 220 |
| | -C1-3-500 | 3 x 500 | B + C | | | 1720 | 1490 | 1520 | 1½ BSP | 320 |
| | -C1-4-500 | 4 x 500 | A + C + C | | | 2580 | 1490 | 1520 | 1½ BSP | 390 |
| -C1-5-500 | 5 x 500 | B + C + C | 2470 | | | 1490 | 1520 | 1½ BSP | 418 | |
| 2 x 500 (vessels only) | 2 x 500 | C | 1600 | | | 620 | 1600 | 745 | 1520 | - |

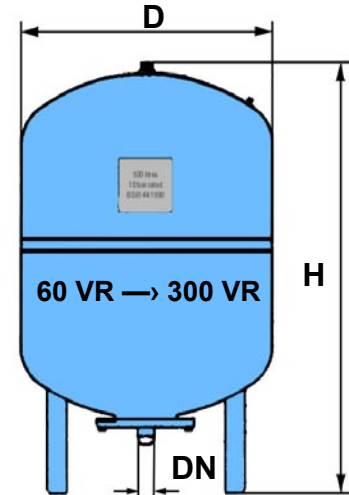
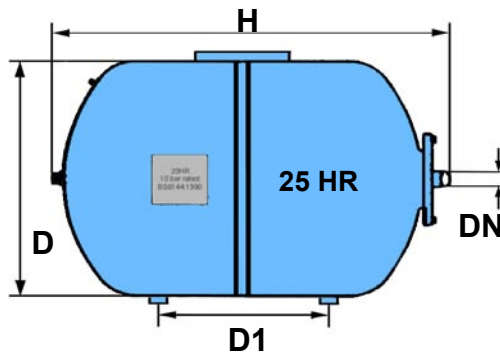
All dimensions in mm unless stated otherwise

EXPANSION VESSEL DIMENSIONS (WHEN SUPPLIED LOOSE)

AQUATANK 'VR' Series:

The diaphragm vessels for special applications; Meets or exceeds EC norms for pressure vessels 97/23/EC; Max working pressure: 10 bar; Vessel Material: Steel RSt 37-2.; All vessel parts in contact with water are coated against corrosion; Diaphragm: Made of special high quality rubber material; Filling Valve: Schraeder-valve-type; Surface Treatment: Blue, durable powder coating finish.

| Type | 25 HR | 60 VR | 100 VR | 200 VR | 300 VR |
|---------------------------|-------|-------|--------|--------|--------|
| Nominal Content –litres | 25 | 60 | 100 | 200 | 300 |
| D mm | 295 | 409 | 480 | 634 | 634 |
| D1 mm | 228 | - | - | - | - |
| H mm | 485 | 740 | 840 | 980 | 1280 |
| Water Connection DN BSP | 1" | 1" | 1" | 1 ¼" | 1 ¼" |
| Dry Weight Kg | 5.6 | 25 | 32 | 50 | 55 |
| Max. working Pressure-bar | 10 | 10 | 10 | 10 | 10 |



| CONSTRUCTION STANDARDS FOR AQUAPACK ET SERIES | | | |
|-----------------------------------------------|----------------------------|-------------------------------------|----------------------------|
| ITEM | MODEL/SERIES | STANDARD/CLASS | REMARKS |
| Quality System | Manufacturing | ISO 9001: 1994 | Cert No. FM33090 |
| Wiring Standards | | BSEN 60204: Part 1:1998 | |
| Machinery Directive | | European Directive 89/392/EEC: 1994 | |
| EMC Directive | | European Directive 89/336/EEC: 1992 | |
| Mains Water Breaktank | 18 Litres Nominal Capacity | | WRC Approved |
| Mains Float Valve | | BS1212 part 2 | 0.5" Type 'AA' Air Gap |
| Pipework | Release Nylon Tubing | | |
| Pipe Fittings | | TUV 9205-8323-501 | |
| Pumps | P4 (ET45) / P7 (ET90) | | 240v, 1 ph, 50hz |
| Pump Motors | P4 (ET45) / P7 (ET90) | TEFC IP44, Class F Insulation | Thermal Overload Protected |
| Control Cabinet | P & C1 | IP54 | |
| Interlocked Door Isolator | LA2 & LA3 | BS, UL, CSA, VDE, IEC | |
| Microprocessor Enhanced | 2000+ Mothercard | 89/336/EEC | |
| Transducer Control | 392 | SS/Ceramic | 8 Bar Max. Test Pressure |

The information in this specification is correct at time of issue; as AquaTech Pressmain design and development programmes are continuous, we reserve the right to make any changes to this specification without prior notice.



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Leaders in the design, manufacture and assembly of packaged fluid pumping equipment and control systems.
Applications: Cold Water Supply; Fire Fighting; Heating & Chilled System Pressurisation; Tank Level Monitoring.