

**QUANTUM & QUANTUM PLUS
(Version 2 – 2010)**

Pressurisation Sets

Quantum & Quantum Plus Pressurisation Units

The Dutypoint Quantum range is a fully automatic heating / chiller system pressurisation device, and is suitable for the water management in all domestic and commercial heating and cooling systems. It is supplied as a fully commissioned unit and should require no "on site" commissioning.

1 Installation

All Dutypoint products should be installed by a competent person with regard to the relevant requirements of the Health and Safety Regulations, Building Regulations, IEE Regulations, Water Supply (water fittings) Regulations, Water Bye-laws (Scotland) and any other local bye-laws or planning requirements.

The Dutypoint Quantum is intended for floor mounting: the unit should be situated in such a position as to enable the liquid crystal display to be easily read.

1.1 Mains/boosted cold water supply

The Dutypoint Quantum is designed to be connected directly to the mains cold water supply, or a boosted cold water supply, the unit is supplied complete with all necessary isolating valves, but an inlet water isolating valve is recommended. The water inlet is 15mm compression and should be connected to the mains cold water supply by 15mm copper tube or equivalent approved plastic pipework. If the Dutypoint Quantum is sited some distance from the mains cold water supply it may be advisable to install a single check valve adjacent to the mains cold water supply.

To reduce the pressure drop on very long supply routes then 22mm supply pipework is recommended.

1.2 Connection to the system

The Dutypoint Quantum is connected to the heating/chiller system by way of the 1 5mm outlet valve, the pipework from the unit should be made in 15mm copper or similarly approved plastic pipework. A suitably sized expansion vessel should be incorporated into the system at this point. Please refer to typical installation diagram on page 3. If you require any assistance regarding vessel sizing please contact our technical sales department. The final connection into the heating/chiller system should be sized accordingly, recommendations are shown below:

Vessel size up to 100L ½" (15mm) expansion pipework.

Vessel size up to 300L ¾" (22mm) expansion pipework

Vessel size up to 1000L 1" (28mm) expansion pipework.

For vessel sizes in excess of 1 000L capacity please contact our technical sales department.

IMPORTANT NOTE

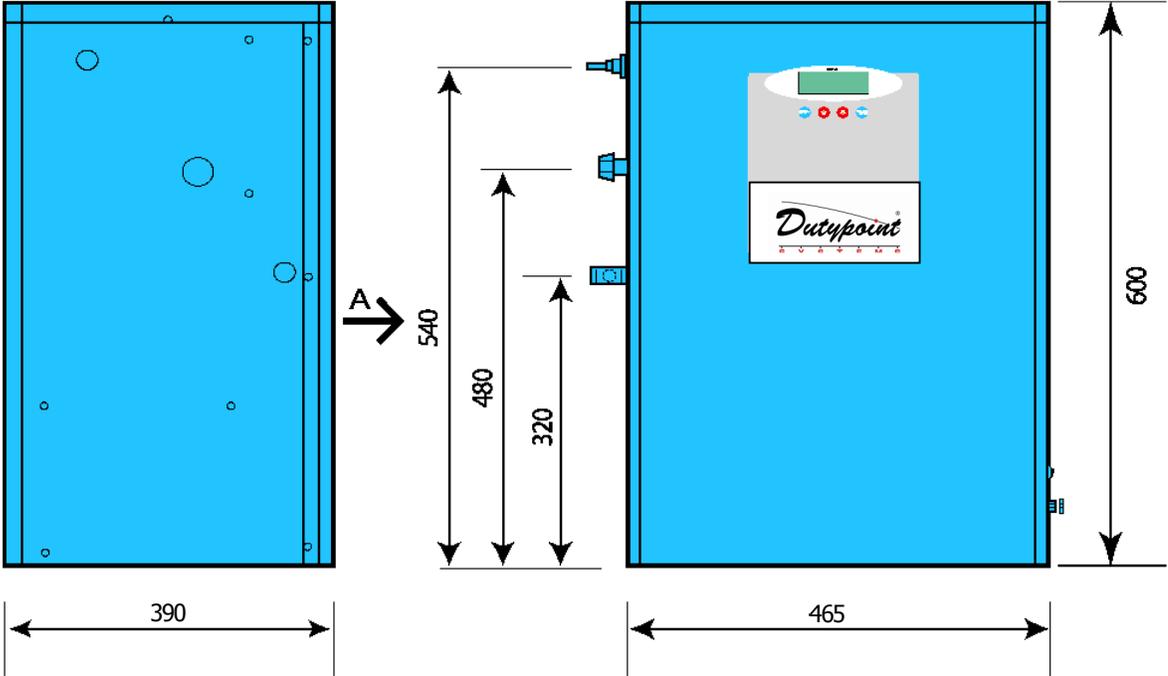
The expansion vessel nitrogen/air charge must be set at the same pressure as the cold fill pressure of the system.*

* When the installed height of the expansion vessel is different to that of the Dutypoint Quantum set then please contact our service department who will advise on the nitrogen/air charge.

1.3 Overflow connection

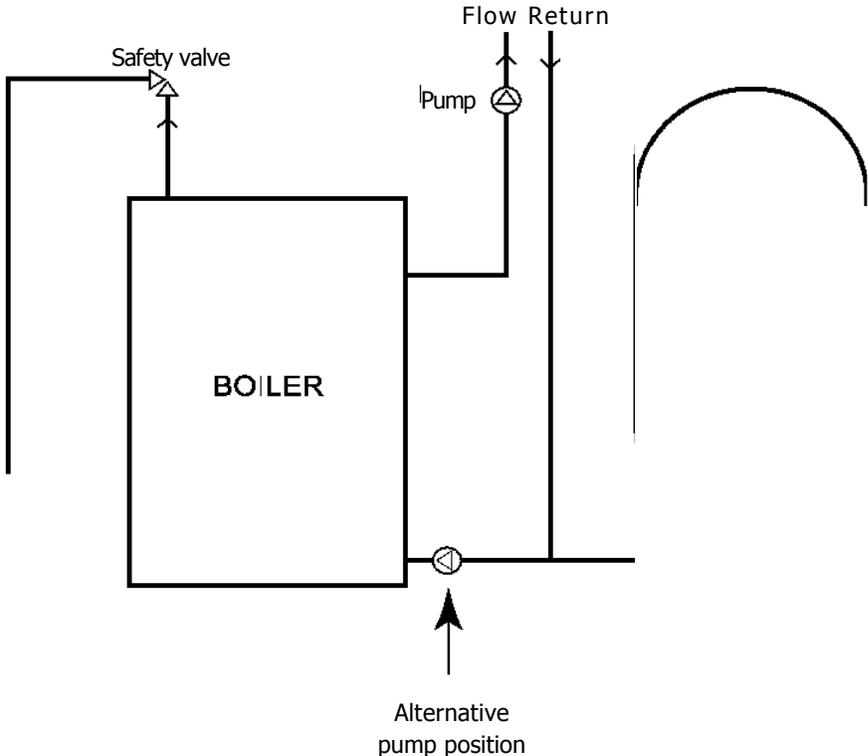
The Quantum is supplied with a ¾" bsp plastic overflow (warning pipe) connection which should be led to a drain and be visible at point of discharge, DUTYPOINT SYSTEMS cannot accept any responsibility for flood damage caused by failure to connect the overflow.

Dimensions



View on arrow 'A'

Typical installation diagram



The expansion vessel is usually connected on the inlet side of the pump on the system return. For systems exceeding 90°C contact our technical department for advice.

2 Electrical connections

The Dutypoint Quantum requires a permanent 230V 50Hz 1 phase supply rated at 6 amp. The unit is internally fused at 5 amp (see electrical installation diagram).

The Quantum also incorporates two BMS relays offering volt free contacts for the remote indication of high or low pressure conditions within the heating/chiller system. These relays are also independently fused at 5 amp to protect the Dutypoint Quantum from external electrical faults. A further volt free relay is included in the unit, this is to interlock the boiler or chiller control circuits. Should either of the alarm relays operate then the relay will shut down the boiler or chiller, indication of any alarm situation will be indicated on the display. The relays are suitable for use on control voltages up to 250V.

Once the Dutypoint Quantum has been correctly connected the unit is ready for use. Ensure that the unit has an adequate water supply and the service valves are open. Check for water leaks. Although every Maxi unit is factory tested it is still advisable to vent the pump(s) before operation. This is achieved by slackening the brass plug (1 4mm A/F).situated on the pump housing, until all air is eliminated. Switch on electrical supply to the unit and the illuminated on/off switch to the lower right hand side of the unit and the unit will start to pressurise the system. When the system has achieved the set pressure, the unit will stop Filling, and go to standby.

Important note, Dutypoint Quantum pressurisation units are not designed to fill systems from empty, they are only capable of "top up" and pressurisation. The system should be filled by other means in compliance with the water regulations.

Electrical data

Supply: 230V1ph 6amp

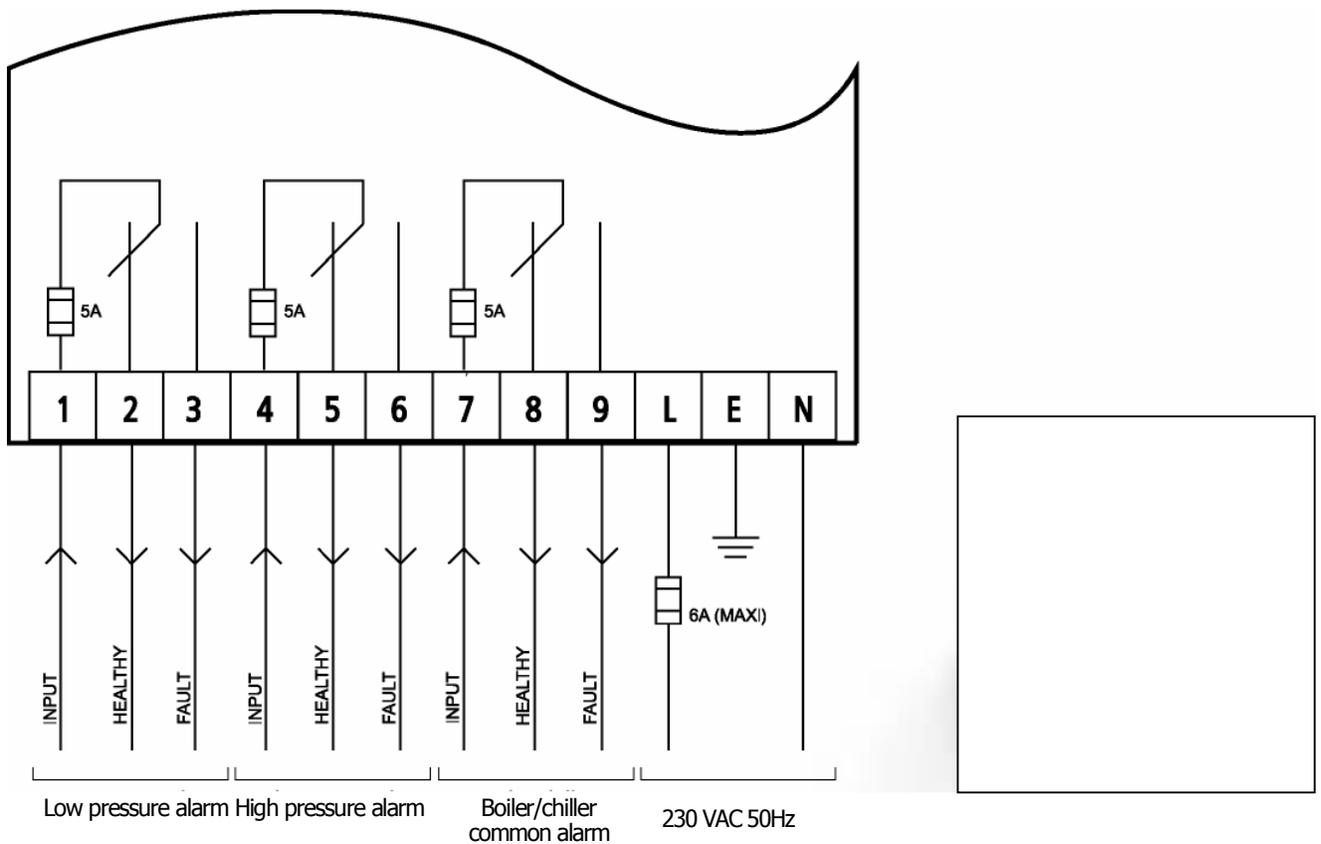
Full load current: 2.5 amp Start current: 4.5 amp

Fuse rating: 6 amp

BMS relays and boiler/chiller relays: volt free contacts rated at 250VAC at 5 amp

All relays are independently fused at 5 amp

2.1 Electrical diagram



3 Keypad function



System Data Button

This button operates a scroll function normally for information only. When in the service mode, it allows selection of particular setting parameters.



Button - used when in service mode to increase parameter values



Button - used when in service mode to decrease parameter values



Service Mode

A multi-function button that, when in operational mode, is used to mute alarm conditions.

In normal mode the keypad buttons are for information only and do not affect any of the parameters preset in the service mode.

(For information on service mode see section 8,page12)

4 Status Display

4.1 Pressure Correct

The Dutypoint Quantum continuously monitors the system pressure, when the system pressure is within the set parameters the unit will show **Pressure Correct** on the LCD display

4.2 Hours run /water usage

This is accessed by scrolling the  system data button.

4.3 Hours run / water usage reset

This is achieved by depressing the   buttons simultaneously.

5 Alarm conditions

Please note the Dutypoint Quantum is a factory pre-commissioned product, should you require to change any of the preset parameters - please see "Settings".

5.1 Low water level alarm

The Dutypoint Quantum continuously monitors the water level in the feed tank. If this falls to below an acceptable level then the unit will operate a safety shut down. When water level is reinstated the unit will automatically reset.

5.2 Optional system failure/leak alert

The Dutypoint Quantum can differentiate between normal system fill rates and excessive water demand usually due to a severe system leakage. If this situation occurs the Quantum will shut down, and issue a leak alert warning showing 'System Failure' on the LCD. This alert must be reset manually, by switching off the Quantum and switching back on. If the leak has been rectified the unit will operate as normal.

In some cases it may be required to disable or enable the leak alert facility.

To disable/enable the leak alert press and hold the  service button until the display shows 'Service mode' on the LCD display. Use the  system data button to scroll through the settings to leak alert and enable / disable using the  or  buttons

5.3 High or low pressure alarms

If, for any reason the system water pressure reaches a high or low condition, as determined by the preset parameters the LCD will show the alarm message, the relevant BMS relay will operate and the Boiler/chiller control relay will shut down the boiler or chiller. When normal operating pressure is resumed the unit will automatically reset,

5.4 Pump failure

The Dutypoint Quantum can also determine whether a pump has developed a fault. This is achieved by monitoring the system pressure and if an increase in pressure is not sensed in a set period of time it will stop operation of that pump and the "pump failure" message will appear on the LCD. If the Quantum Plus is used, it will automatically change to the remaining pump, and a pump failure message will be displayed.

5.5 Frequent use alarm

This alarm is to assist in diagnosing any leaks that may be present in the heating (or cooling system). If in any 24 hr period the Quantum operates more than a preset limit i.e. 5, then a frequent use alarm will show, (the operation of the system will not be affected, this function is for information only).

5.6 Frequent use reset

This is achieved by switching the power supply to the unit off and on again.

6 Fault diagnosis

System faults will be apparent from the alarm message displayed. The Quantum itself has a full self-diagnostic microprocessor unit which continually self-checks the operation. If an internal fault is diagnosed then the fault will be displayed on the screen, e.g. sensor failure.

Fault conditions

Fault indications	Cause	Remedies
Low water level	No water in tank	Reinstate water supply to tank
Sensor failure	Possible sensor fault	1. Switch unit off and back on, if sensor failure does not reappear on the display see note 2. If sensor failure does reappear check sensors are connected to the printed circuit board correctly. If the problem persists ring our service department.
	Incoming voltage instability	2. If this occurs switch the unit off and back on, the unit should then operate as normal. If this fault appears on a regular basis then a mains electrical filter (anti surge device) is required. Ring our service department for advice.
Low pressure alarm	System pressure low	Check system for leaks. Switch unit off and back on to reinstate. Check Low Alarm setting.
High pressure alarm	System pressure high	Reduce pressure in system and check expansion vessel air charge/size. Check High Alarm setting.
System failure	Possible excess water leak on the system	Check system for leaks, then switch unit off and back on to reinstate.
Pump failure	Possible pump fault	Switch unit off and back on to reinstate, if pump does not operate when required replace pump. If pump operates, dry run setting may need to be increased.
Frequent use alarm	Possible persistent leak on system	If the unit operates more than the set value in a 24hr period the unit will bring up the frequent use alarm, this will not stop the unit from operating but indicates that there may be a small leak on the system. Switch the unit off and back on to reinstate. Investigate possible leak.

The Dutypoint Quantum and Quantum Plus have been designed such that most apparent 'faults' can be remedied on site, if in doubt ring our service department on 01452 300592

7 Manual override

In the unlikely event of a sensor failure the unit may give incorrect readings and could cause alarm conditions. If this occurs, a manual override can be employed by depressing the and the service mode buttons simultaneously for 3 seconds; thus reinstating the BMS relays in the unit. Before operating the manual override you must ensure there is sufficient pressure in the system. The manual override must not be employed if the unit has shown a flood alarm condition or, if there is insufficient pressure in the system.

8 Audible alarm mute

If the Dutypoint Quantum does indicate a fault, an audible alarm will sound. This can be muted by depressing  the service mode button.

9 Service Mode (adjusting settings)

The settings can be adjusted on site as follows:

9.1 Press and hold the  service mode button for approx 8 seconds

9.2 The display will indicate that you are now in the service mode

9.3 Use the  system data button to scroll through the settings, each setting can be adjusted by use of the   buttons.

9.4 After adjusting the settings, the unit will return to its normal operating mode approximately 30 seconds after release of the buttons.

10 Menu Functions

- Cold fill pressure - this is the required pressure of the system when the system is cold
- Alarm low - the pressure at which the low pressure alarm relay will operate. Usually set 0.6 - 0.7 bar below the cold fill pressure.
- Alarm high - the pressure at which the high pressure alarm relay will operate. Usually set 0.2 bar below the system safety valve setting.
- Usage - for information on water used in the system, no setting required - please note, to zero the usage, the   buttons need to be pressed simultaneously for 3 seconds.
- Dry run - this function affects the flood protection facility, the longer the dry run setting (which is calculated in minutes) the less responsive the flood protection, set at 0.00 to disable pump failure.
- Delay Off - this setting allows adjustment (to prevent over or under shoot) of the fill pressure - increasing time prevents under shoot, decreasing time prevents over shoot.
- Frequent use - this setting warns of frequent use which would indicate a system leak and will show a warning message if in any 24hr period the unit operates in excess of the frequent use setting.
- Delay on - This setting delays the filling of the system, this is used to overcome the effects of the initial suction caused when pumps start.
- Contrast adjust - alters the contrast of the LCD display.
- Disable audible alarm - turns off the audible sounder.
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- Fault log - Logs the last five faults
 - MP - Low mains water pressure
 - LP - Low system pressure alarm
 - HP - High system pressure alarm
 - SF - Sensor failure
 - DR - Leak alert due to no increase in pressure while filling
 - FS - Leak Alert due to drop in pressure while filling

11 Maintenance

Dutypoint Quantum - The filter which is housed in the inlet ball valve to the pump should be checked and cleaned annually.

EXPANSION VESSELS - Charge pressure should be checked annually, when the system is cold the air charge must be equal to the cold fill pressure of the EFD.

AVW – Quantum & Quantum Plus
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