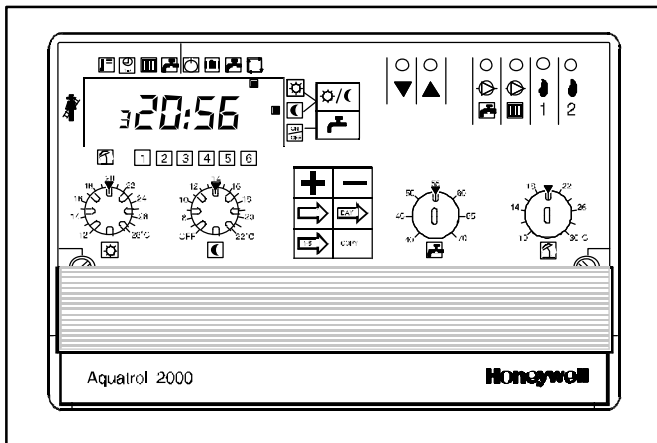


## AQ2000

### OPTIMISER/COMPENSATOR CONTROLLER

#### PRODUCT DATA



The Aquatrol 2000 controller is the central component for a single zone low pressure hot water heating system. It provides self adaptive heating curve, optimum start/stop operation, sequence control of two boilers, outside air compensated mixed water control using a 3-port motorised valve and pump, and domestic hot water control using a valve and/or pump.

A wide range of compatible sensors, a remote unit, valves and actuators complement the control system.

## FEATURES

- Digital control technology with easy-to understand analogue installation adjustments
- Outside compensated control of low pressure hot water heating system
- Multiple system applications
- Automatic system recognition from connected sensors
- Fixed or self-adaptive heating curve (with optional space sensor)
- Optimum Start/Stop (with optional space sensor) or Boost on start-up (without space sensor)
- Room temperature compensation (with optional space sensor)
- Heating time programme offering switching between comfort and economy operation up to 6 times per day, independently for each day of the week (selectable economy off is also available)
- Manual override switch
- Domestic Hot Water Service (DHWS) time programme offering up to 6 switching points per day, independently for each day of the week
- Frost protection of the pipework, hot water cylinder and the building fabric (with optional space sensor)
- Automatic summer heating mode changeover (user adjustable)
- Automatic heating shutdown under minimal load conditions
- Soft start to help prevent pipe expansion noise
- Service switch to assist installer on start-up and technician during service
- Intelligent pump control with energy efficient pump overrun
- Built-in user programme
- System temperature and parameter inquiry
- Optional remote unit providing space temperature sensing, space temperature adjustment, comfort/economy override switch and 3-hour comfort extension button with confirmation LED
- Optional space sensor
- Holiday mode with programmable 1 to 99 day holiday period and dynamic countdown display
- Automatic, DHWS only, Holiday or Standby operation
- Minimum boiler flow temperature
- Control of one, or two boilers in sequence with automatic lead boiler rotation
- LED's indicate control output status
- Tamperproof facility available on cover

## SPECIFICATIONS

|                            |                                                                                                                                      |
|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| Supply voltage             | : 230 V~, +10% -15%, 50 Hz                                                                                                           |
| Power                      | : 8 W                                                                                                                                |
| Consumption                |                                                                                                                                      |
| Relay ratings              | : Pumps and boilers:<br>3 A, 230 V~ @ 0.6 pf - 400,000 operations<br>Mixing valve:<br>0.25 A, 230 V~ @ 0.4 pf - 1,000,000 operations |
| Sensor accuracy            | : Water sensors: 20°C to 90°C ±2 K<br>Outside sensor: -20°C to +20°C ±2 K<br>Room sensor: 10°C to 25°C ±0.5 K                        |
| Ambient temperature rating | : 0 to 50°C                                                                                                                          |

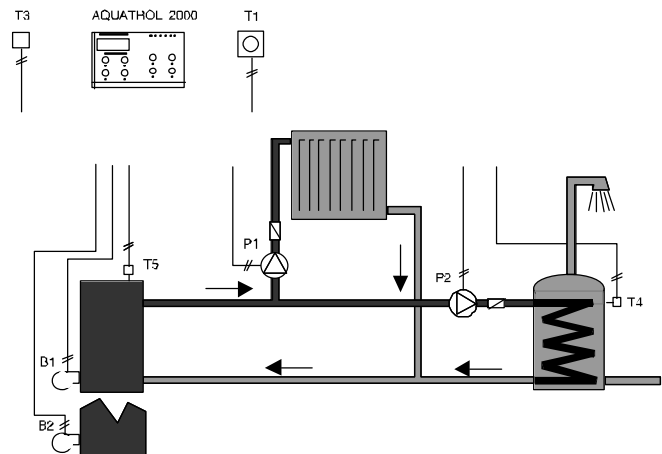
|                               |                                                                                     |
|-------------------------------|-------------------------------------------------------------------------------------|
| Humidity rating               | : 0 to 90% rh (non-condensing)                                                      |
| Storage/shipping temperature  | : -30°C to +70°C                                                                    |
| Electromagnetic compatibility | : Emissions to EN55014<br>Susceptibility to EN50082-1                               |
| Protection class              | : IP40 (with base fitted and when installed to EN60529)                             |
| Dimensions (w x h x d)        | : 144 x 96 x 105 mm (with standard base)<br>144 x 153 x 109 mm (with wiring centre) |
| Panel cut-out (w x h)         | : 138 x 92 mm                                                                       |
| Weight                        | : 600 g                                                                             |

## BASIC SYSTEMS

### System 1

Boiler control for radiator systems

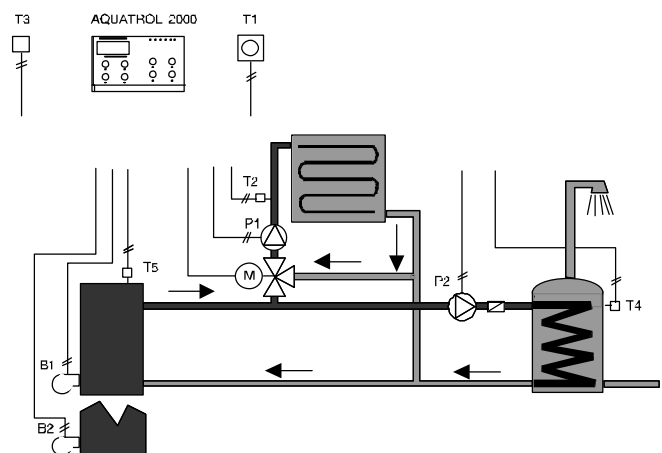
- ☐ DHWS priority control when DHWS sensor connected.
- ☐ Optimisation and self-learning heating curve when optional space sensor or remote unit connected.
- ☐ One or two boiler control in sequence.



### System 2

Boiler and mixing valve control for radiator or underfloor heating systems

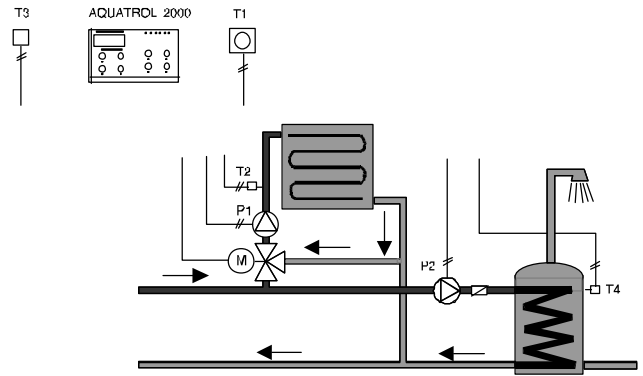
- ☐ Versatile DHWS control when sensor connected. Separate or combined operation available. Combined can be shifting priority or parallel operation. (see DHWS Operation on page 3)
- ☐ Optimisation and self-learning heating curve when optional space sensor or remote unit connected.
- ☐ One or two boiler control in sequence.
- ☐ Continuous temperature boiler loop



### System 3

Mixed flow control for radiator or underfloor heating systems.

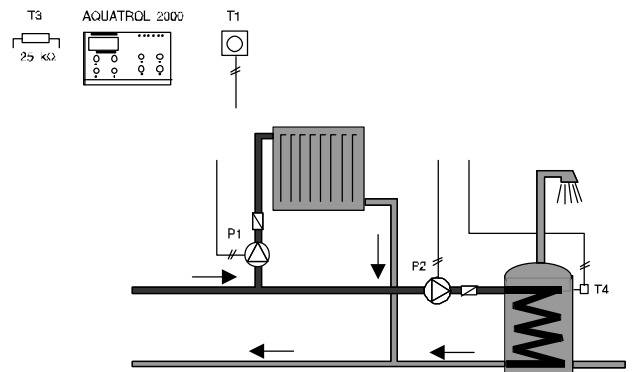
- ☐ DHWS separate when DHWS sensor connected.
- ☐ Optimisation and self-learning heating curve when optional space sensor or remote unit connected.



### System 4

Optimiser control for systems with existing controls and requiring optimisation only.

- ☐ DHWS separate when DHWS sensor connected.



### Key

P1 = Heating pump

P2 = DHWS pump

B1 = Boiler 1

B2 = Boiler 2

T1 = Space sensor/Remote Unit

T2 = Mixed flow water sensor

T3 = Outside sensor

T4 = DHWS sensor

T5 = Boiler water sensor

M = Motor/Actuator

## DHWS OPERATION

### Separate DHWS

The DHWS operation is completely independent and has no effect on the demand for heat from the boiler(s). This is useful when DHWS is being supplied from a separate heat source. The DHWS output is active when the DHWS temperature falls 5 K below the DHWS setpoint.

### Combined DHWS

There are three variants for combined DHWS; DHWS priority, shifting priority and parallel operation. In all three cases a demand for DHWS occurs when the DHWS temperature falls 5 K below the DHWS setpoint.

#### 1. DHWS Priority

In heating circuits with no mixing valve (and no mixed flow temperature sensor), the DHWS has priority over the heating.

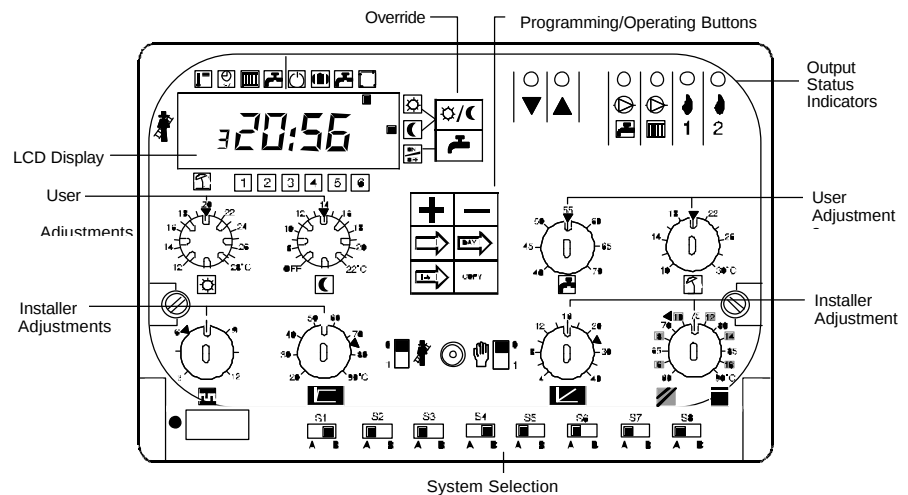
#### 2. DHWS Shifting Priority

In heating circuits with a mixing valve where the boiler temperature is less than 10 K above the DHWS setpoint the mixing valve will be closed giving DHWS priority. If there is extra heat available and the boiler temperature is more than 20 K above the DHWS setpoint, the mixing valve will be controlled at the calculated setpoint. The mixed water temperature setpoint is reduced when the boiler temperature lies between these two values.

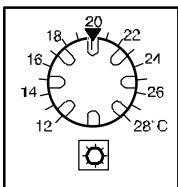
#### 3. DHWS Parallel

In heating circuits with a mixing valve the heating circuit will operate normally during a demand for DHWS.

## CONTROLLER FEATURES

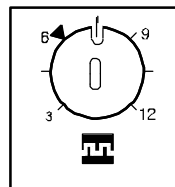


### Comfort Setpoint



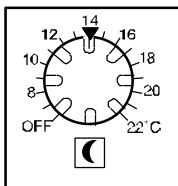
The desired space Comfort temperature can be set within the range 12 to 28°C.

### Cycle Rate Adjustment



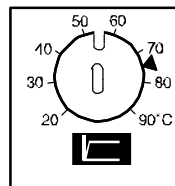
The cycle rate adjustment allows the cycle rate as recommended by the boiler manufacturer to be set directly on the controller.

### Economy Setpoint



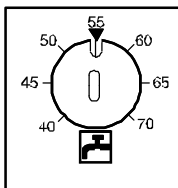
The desired Economy temperature can be set within the range 8 to 22°C. Economy OFF can be selected by turning the knob to the OFF position.

### Boiler/Mixed Flow Temperature High Limit



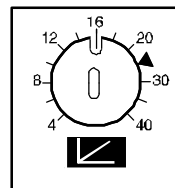
The flow temperature high limit can be set within the range 20 to 90°C and this will act on T5 (boiler temperature) or T2 (mixed flow temperature) depending on the system selected.

### Domestic Hot Water Setpoint



The DHWS temperature can be set within the range 40 to 70°C.

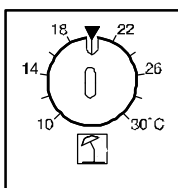
### Heating Curve Ratio Adjustment



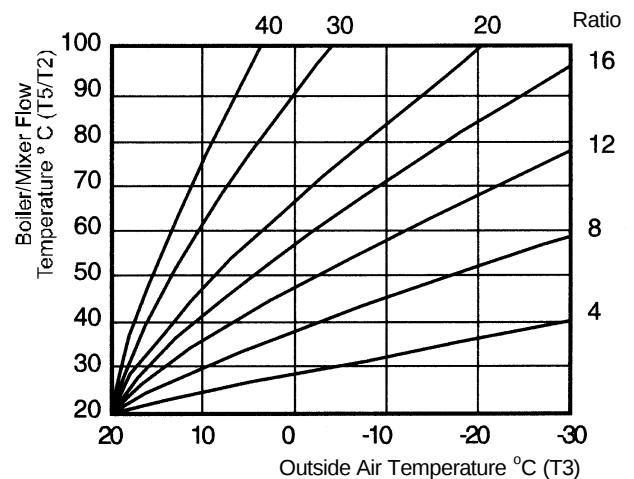
If a fixed value of the heating curve ratio is required then this value can be set within the range 4 to 40 using this potentiometer.

To determine the heating curve required refer to the graph displayed below.

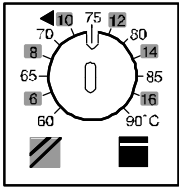
### Automatic Summer/Winter Changeover Temperature Setpoint



This can be set within the range 10 to 30°C. When the average daily outdoor temperature is above the automatic Summer/Winter setpoint the heating will be turned off.

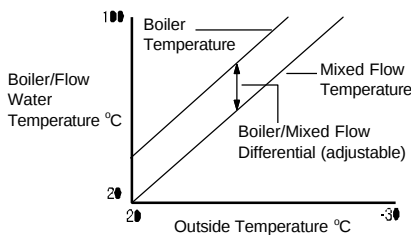


## Boiler temperature Setpoint Adjustment



The Boiler Setpoint operates in a different manner depending on the position of System Selector Switch S8.

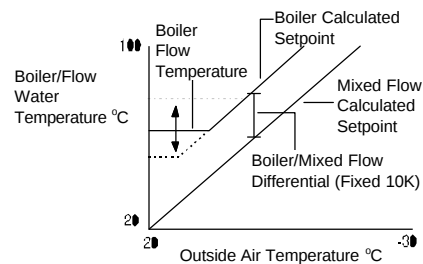
### Boiler/Mixed Flow Differential (Switch S8 in position A)



A boiler/mixed flow differential of between 6 and 16 K can be set using the Boiler Setpoint knob.

The boiler calculated setpoint will be the mixed flow calculated setpoint plus the set differential.

### Boiler Minimum Flow Temperature (Switch S8 in position B)



A boiler minimum flow temperature setpoint of between 60 and 90°C can be set using the Boiler Setpoint knob. When the controller is in automatic mode the boiler low limit will be active from the beginning of the first comfort period to the end of the last comfort period each day.

## System Selection

System selection is achieved in two manners:

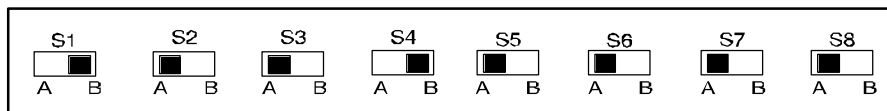
- ☐ Automatic System Selection
- ☐ System Selector Switches

## Automatic System Selection

- ☐ If a mixed flow water sensor (T2) is connected, the controller assumes that a mixing valve is present.
- ☐ If a Remote Unit and/or a Space Sensor (T1) is present the controller activates the space temperature compensation, the self-adaptive heating curve and the optimum Start/Stop.
- ☐ If a DHWS sensor (T4) is present then combined or separate temperature control of the DHWS will be available. If no DHWS sensor (T4) is present only time control is available on the DHWS output.

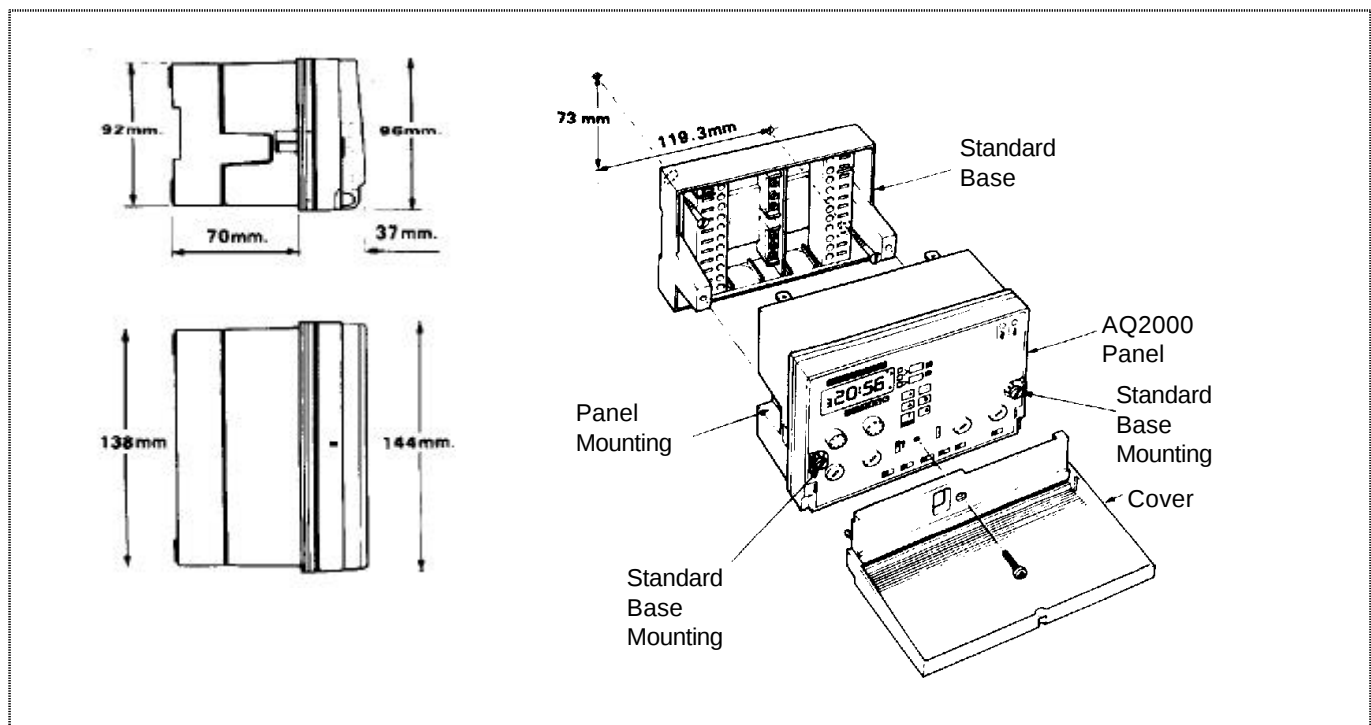
Automatic system detection takes place during the first minute after powering the controller.

## System Selection Switches



| Switch | Description         | Position A              | Position B          |
|--------|---------------------|-------------------------|---------------------|
| S1     | Actuator speed      | 1 minute                | 4 minute            |
| S2     | DHWS type           | combined                | separate            |
| S3     | DHWS programme      | programmed              | continuous          |
| S4     | DHWS operation      | priority operation      | parallel            |
| S5     | Boilers             | one                     | two                 |
| S6     | Type of heating     | radiator                | underfloor          |
| S7     | Adaptive heat curve | yes                     | no                  |
| S8     | Boiler setpoint     | boiler/mixed flow diff. | boiler minimum flow |

## DIMENSIONS AND MOUNTING



### Surface Mounting

The Aquatrol 2000 controller can be surface mounted in either a control panel or directly on the wall.

### Panel Mounting

The controller can be panel mounted in a control panel door and features integral panel mounting clips for ease of installation.

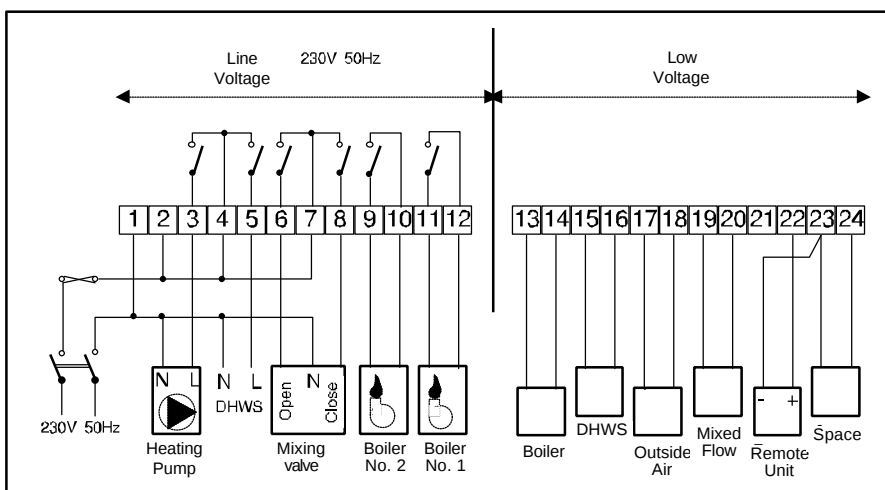
### Tamperproofing

The controller can be made tamperproof, if required, by inserting a wire link through the hole in the front clear cover and the front housing at the top centre of the front panel and twisting or crimping to fix the front panel permanently shut, thus preventing unauthorised adjustment.

### Wall Mounting using Wiring Centre (Optional)

For wall mounting the optional Wiring Centre K42007745-005 can be used for protection and termination of electrical conduits, MICC cable or Pirelli FP200 cable with suitable adaptors.

## Electrical Connections for a Typical Aquaplan System

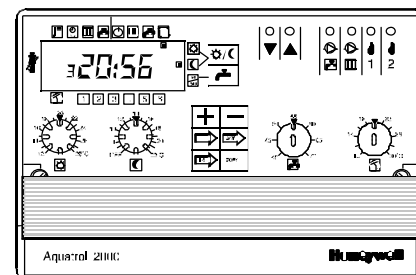


### Important

1. The installer must be a trained engineer
2. Disconnect the power supply before beginning installation

## CONTROLLER ORDERING SPECIFICATION

Ordering specification: W6060C1067 with English literature  
 W6060C1083 with French literature  
 W6060C1091 with Italian literature



## OTHER SYSTEM COMPONENTS (to be ordered separately)

### Outside Temperature Sensor T7043E

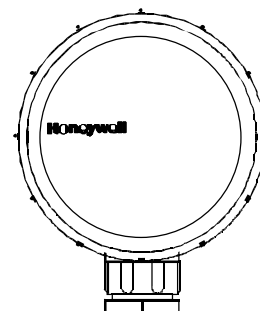
#### Application

The Outside Temperature Sensor consists of a thermistor element housed in a tough plastic case. It is mounted outside the building providing a temperature input signal to the controller.

**Ordering Specification:**  
 T7043E1008

#### Specifications

Sensing range : -30 to +40°C  
 Sensor : NTS type 10 kΩ @ 25°C  
 Enclosure : Plastic with integral Pg11 fitting  
 Dimensions : 72 Ø x 45 mm



### Flow Temperature Sensor T7044C

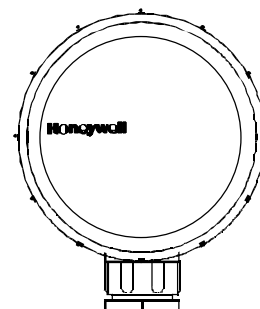
#### Application

The T7044C Strap-on Flow Water Temperature Sensor consists of a thermistor sensing element housed in a tough plastic case. It is strapped to the flow water pipe providing a temperature input signal to the controller.

**Ordering Specification:**  
 T7044C1002

#### Specifications

Sensing range : 0 to 115°C  
 Sensor : NTS type 10 kΩ @ 25°C  
 Enclosure : Plastic with integral Pg11 fitting  
 Dimensions : 72 Ø x 48 mm



### Flow Temperature Sensor T7043F

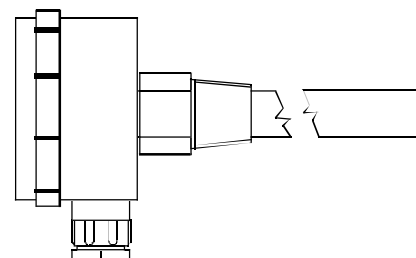
#### Application

The T7043F Immersion Flow Water Temperature Sensor consists of a thermistor sensing element housed in an immersion pocket. It should be mounted on a bend on the flow water pipe providing a temperature input signal to the controller.

**Ordering Specification:**

#### Specifications

Sensing range : 0 to 115°C  
 Sensor : NTS type 10 kΩ @ 25°C  
 Enclosure : Plastic with integral Pg11 fitting  
 Housing dimensions : 72 Ø x 45 mm  
 Well : ½" BSPT x 100 mm



### Insertion Thermostat T7106A

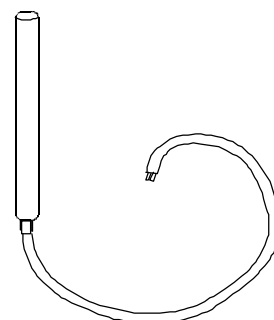
#### Application

The T7106A Insertion Flow Water Temperature Sensor consists of a thermistor sensing element encapsulated in a metal casing. It can be inserted in a well to provide a temperature input signal to the controller.

**Ordering Specification:**  
 T7106A1001

#### Specifications

Sensing range : 0 to +105°C  
 Maximum ambient : 105°C  
 Sensor : NTS type 10 kΩ @ 25°C  
 Dimensions : 6 Ø x 60 mm  
 Wire dimensions : 4 mm dia. x 1.5 m  
 Wire rating : -30 to +105°  
 Insertion well : 6 mm Ø x 60 mm



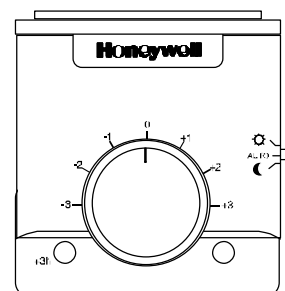
## Remote Unit T8102B

### Application

The Remote Unit provides a space temperature sensor input signal to the AQ2000 for space temperature compensation and to enable the optimisation and adaptive ratio to function. Remote adjustment of the setpoint is also possible and an override switch gives the possibility of selecting permanent comfort or economy settings. A "party" button allows a three hour comfort extension to be selected.

### Specifications

|                     |                                 |
|---------------------|---------------------------------|
| Sensor              | : NTC type 10 k $\Omega$ @ 25°C |
| Housing             | : White plastic                 |
| Weight              | : 70 g                          |
| Dimensions          | : 70 x 75 x 31 mm (w x h x d)   |
| Setpoint adjustment | : $\pm 3$ K                     |



**Ordering Specification:** T8102B1001 with English literature  
T8102B1050 with French literature  
T8102B1068 with Italian literature

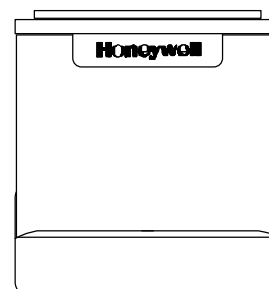
## Space Sensor T8102B

### Application

The Space Sensor provides a space temperature sensor input signal to AQ2000 for space temperature compensation and to enable the optimisation and adaptive ratio to function. The Space Sensor can be used in conjunction with the Remote Unit for added flexibility.

### Specifications

|            |                                 |
|------------|---------------------------------|
| Sensor     | : NTS type 10 k $\Omega$ @ 25°C |
| Housing    | : White Plastic                 |
| Weight     | : 70g                           |
| Dimensions | : 70 x 75 x 31 mm (w x h x d)   |



### Ordering Specification:

T8102B1027

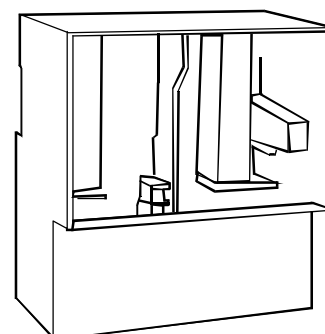
## Wiring Centre K42007745-005

### Application

The Wiring Centre is an essential component when mounting the controller on a wall. It provides a number of conduit entries through the bottom, back and sides. In addition, it provides extra terminals to link multiple incoming cables such as line, neutral and earth.

### Specifications

|               |                                                                            |
|---------------|----------------------------------------------------------------------------|
| Housing       | : White plastic                                                            |
| Cable entries | : 17 x 19 mm conduit entries (9 bottom, 3 right side, 1 left side, 4 back) |
| Dimensions    | : 144 x 154 x 72 mm (w x h x d)                                            |



### Ordering Specification:

K42007745-005

## RELATED LITERATURE

|                             |                                              |
|-----------------------------|----------------------------------------------|
| Application Manual          | UK1C 0002 in English                         |
| Installation and user Guide | 42008356-001 in English                      |
|                             | 42008356-002 in French                       |
|                             | 42008356-003 in Italian (check availability) |

**Honeywell**

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United Kingdom

Helping You Control Your World