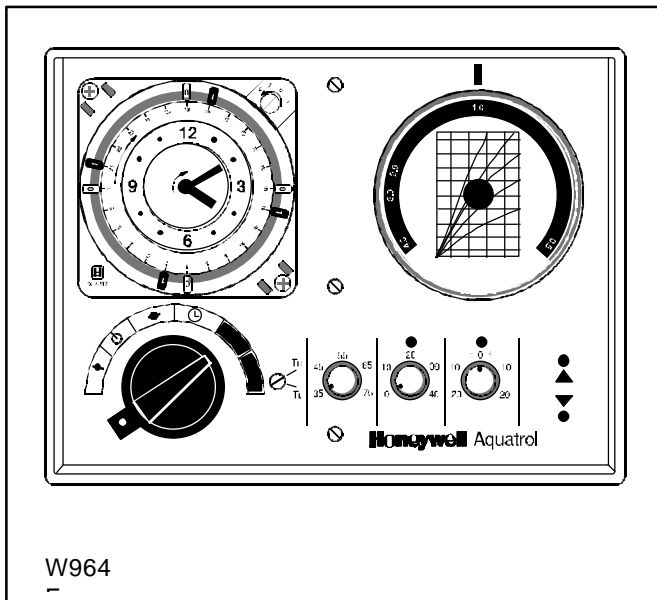


Aquatrol

W964

OUTSIDE TEMPERATURE COMPENSATED CONTROLLER

PRODUCT DATA



FEATURES

- Proportional + Integral control action for accurate offset-free control with either 1 minute or 4 minute actuators
- Universal model can be set for either modulating or ON-OFF control (W964F only)
- Adjustable boiler differential in ON-OFF mode (W964F only)
- Version available with selectable High or Low Limit for district heat or underfloor heating applications (W964E only)
- Version available with Pump Relay for additional energy saving (W964J only)
- Version available with Summer/Winter changeover switch for applications requiring domestic hot water production in summer (W964H only)
- Socket provided for the installation of a quartz time switch for night setback energy saving
- 24-hour or 7-day quartz time switches, with battery back-up, available factory fitted or as an accessory for field installation
- Detachable sub-base for simplified wiring access
- Clear plastic cover with the possibility for tamperproofing
- LED's indicate controller output status
- Mode selection switch including manual override
- Large clear ratio setting dial with compensation ratio graph
- Easy-to-understand analogue installation adjustments

DESCRIPTION

The W964 is a range of Aquatrol outside temperature compensated controllers designed for use in a wide range of domestic and small commercial buildings. The controllers feature Proportional plus Integral control action for accurate control and the elimination of the setpoint offset normally associated with proportional control systems.

A wide range of system components is available to compliment the Aquatrols in providing high performance control systems for single and multi-family dwellings with either radiator or underfloor heating.

The Aquatrol range is simple to install and commission and the controller can either be wall mounted or fitted into a control panel.

SPECIFICATIONS

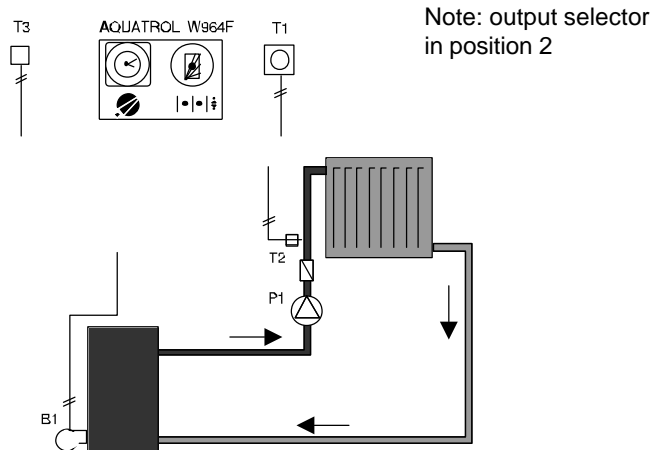
Supply voltage	: 230 V, 120 V and 24 V versions (see Ordering Specification page 7)	Flow temperature range	: 20 to 110°C
Power consumption	: Maximum 25 VA (includes 5 VA for the Aquatrol controller and up to 20 VA when using the internal transformer to operate a 24 V~ actuator)	Flow temperature limit range	: 35 to 75°C (W964E only)
Supply fuse	: 160 mA - 230 V versions (5Ø x 20 mm) 250 mA - 24 V & 120 V versions	ON-OFF differential range	: 4 to 16 K (W964F only)
Output fuse	: 1 A glass cartridge (5Ø x 20 mm)	Suitable motor timing	: selectable 1 or 4 minute
Output relay rating	: 0.1 A max, 230 V~ - 3 position mode 2.0 A max, 230 V~ - 2 position mode (W964F only)	Parallel shift range	: ± 20 K
Summer/Winter switch rating	: 0.5 A max, 230 V~ (W964H only)	Flow temperature set-back range	: 0 to 40 K
Pump Relay rating	: 0.5 A max, 230 V~ (W964J only)	Operating temperature limits	: 0 to 50°C
Control form	: Proportional + Integral	Relative humidity limits	: 0 to 90% rh
Compensation ratio range	: 0.5 to 4.0	Shipping temperature limits	: -40 to +55°C
Outside temperature range	: -30 to 20°C	Shipping weight	: 1.8 kg
		Conduit entries	: 10 x 21 mm diameter; 3 in top, 3 in bottom and 4 in back of sub-base

BASIC SYSTEMS

ON-OFF control for radiator heating

Basic direct boiler control for standard radiator/convector hydronic heating systems for multi-family dwellings or small commercial buildings.

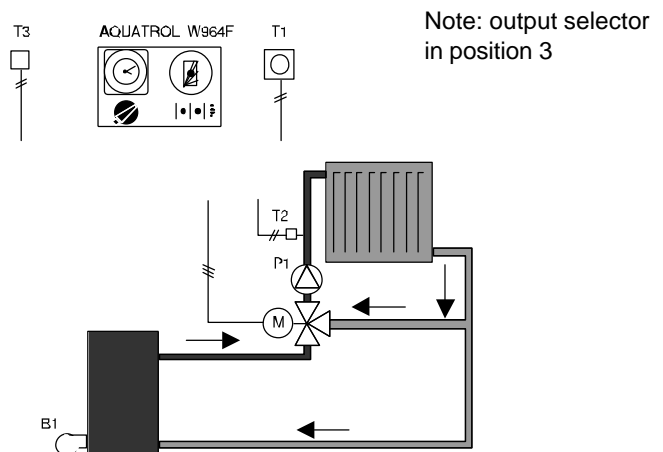
- Based on the W964F Universal Aquatrol controller
- Efficient ON-OFF boiler control with adjustable differential to suit the type and capacity of the boiler



Mixing valve control for radiator heating

Modulating control of the flow water temperature in standard radiator/convector heating systems using an actuator and 3- or 4-way valve combination.

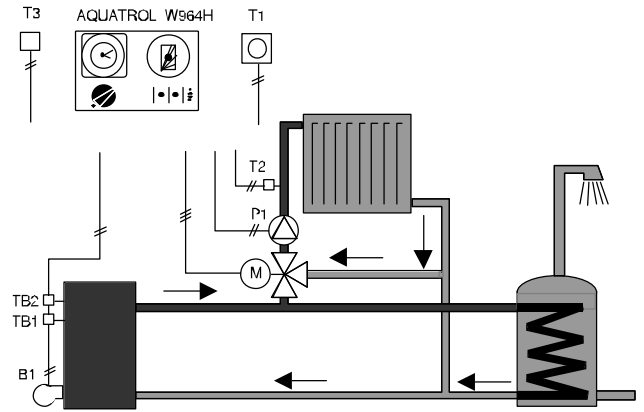
- Based on the W964F Universal Aquatrol controller
- Selectable control performance for use with either 1 or 4 minute valve actuators
- A wide range of 3- and 4-way rotary and 3-way linear valve/actuators available for all applications



Mixing valve control for radiator heating with Summer/Winter Aquastat changeover

Modulating control of the flow water temperature in standard radiator/convector heating systems using an actuator and 3- or 4-way valve combination. Summer/Winter changeover for systems with domestic hot water production.

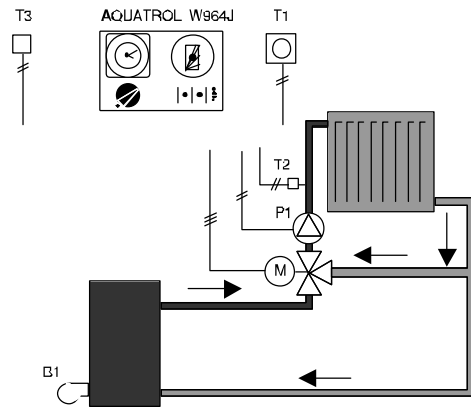
- Based on the W964H Aquatrol controller
- Selectable control performance for use with either 1 or 4 minute valve actuators
- A wide range of 3- and 4-way rotary and 3-way linear valve/actuators available for all applications
- Valve Stop position on function switch changes over Aquastats and isolates the pump



Mixing valve control for radiator heating with pump control

Modulating control of the flow water temperature in standard radiator/convector heating systems using an actuator and 3- or 4-way valve combination. The pump is switched off during setback periods.

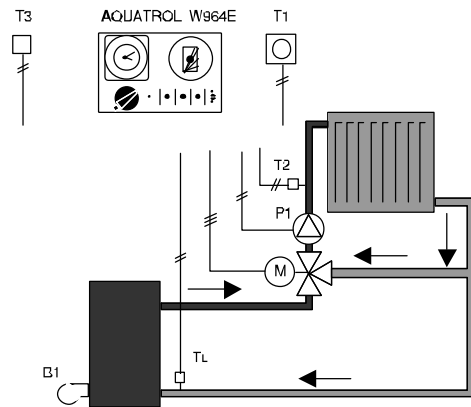
- Based on the W964J Aquatrol controller
- Selectable control performance for use with either 1 or 4 minute valve actuators
- A wide range of 3- and 4-way rotary and 3-way linear actuators available for all applications
- The pump relay switches the pump off during setback periods



Mixing valve control for radiator heating with electronic low limit

Modulating control of the flow water temperature in radiator heating systems using an actuator and 3- or 4-way valve combination.

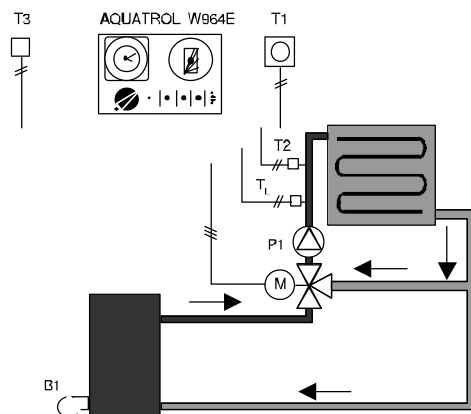
- Based on the W964E Aquatrol controller
- Selectable control performance for use with either 1 or 4 minute valve actuators
- A wide range of 3- and 4-way rotary and 3-way linear valve/actuators available for all applications
- Adjustable electronic low limit to keep the return water temperature high



Mixing valve control for underfloor heating with electronic high limit

Modulating control of the flow water temperature in underfloor heating systems using an actuator and 3- or 4-way valve combination.

- Based on the W964E Aquatrol controller
- Selectable control performance for use with either 1 or 4 minute valve actuators
- A wide range of 3- and 4-way rotary and 3-way linear valve/actuators available for all applications
- Adjustable electronic high limit to restrict the maximum floor temperature



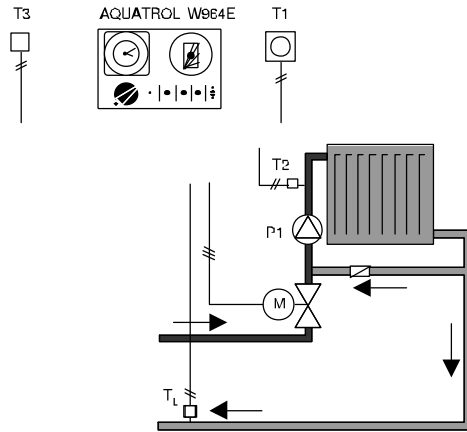
Modulating control for direct district heat radiator systems

Modulating control of the flow water temperature in direct district heating systems using an actuator and 2-way valve combination.

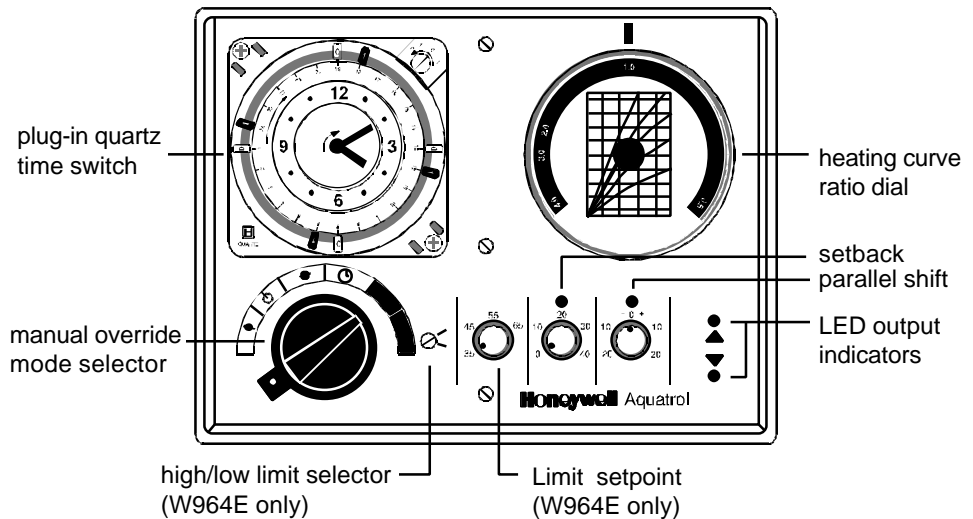
- Based on the W964E Aquatrol controller
- Selectable control performance for use with either 1 or 4 minute valve actuators
- A wide range of 2-way linear valve/actuators available for all applications
- Adjustable electronic high limit to keep the return water temperature low

Key

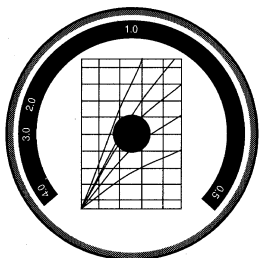
- | | |
|-----------------------------------|-------------------------------|
| P1 = Heating Pump | T3 = Outside sensor |
| B1 = Boiler | T _L = Limit sensor |
| T1 = Space Sensor/
Remote Unit | M = Motor/Actuator |
| T2 = Mixed flow water sensor | |



CONTROLLER FEATURES



Heating Curve Ratio Adjustment

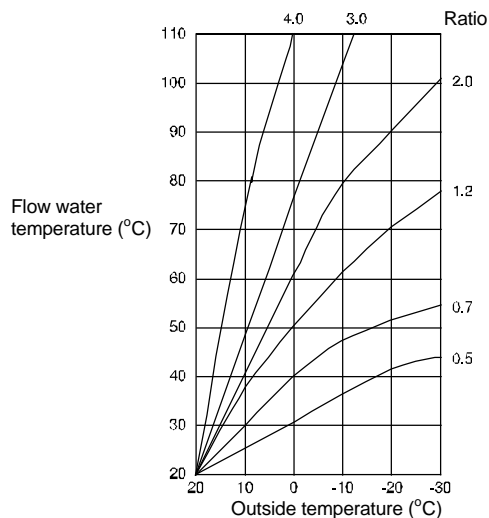


The Heating Curve Ratio dial allows the installer to select the appropriate heating curve for the particular installation.

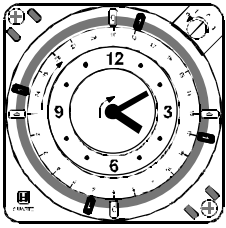
A selection of typical ratio curves can be found in the graph opposite and for reference purposes a copy of this graph can be found printed on the Heating Curve Adjustment Dial.

The appropriate ratio must be selected depending upon the type of installation, the insulation standards of the building and its geographic location.

A quick reference guide to assist in selecting an appropriate ratio can be found in the W964 system installation booklet EN1R8101.



Plug-in Quartz Time Switch

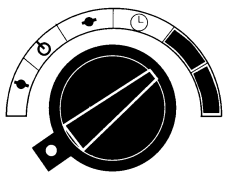


A socket is provided on the front panel of the W964 controller for the inclusion of a plug-in time switch.

The time switch is used to change the controller from the normal day comfort setpoint to the night setback or economy setpoint.

Quartz time switches are available in either 24-hour or 7-day versions and a range of digital electronic time switches is also available.

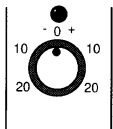
Manual Override/Mode Selector



The Manual Override/Mode Selector switch can be used to select the following:

- Valve closed
- Valve stopped
- Valve open
- Automatic operation
- Constant comfort setpoint
- Constant economy setpoint

Parallel Shift Adjustment

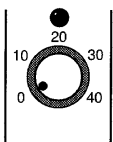


After the heating curve has been selected and fine tuned, the inside temperature will remain constant no matter what the outside temperature is.

This temperature may not be the actual required space temperature, the Parallel Shift adjustment can then be used to achieve the desired temperature.

The Parallel Shift adjustment can be used to increase or decrease the comfort flow water temperature by 20 K.

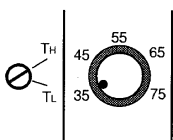
Setback Adjustment



The Setback adjustment can be used to determine the amount of reduction in the flow water temperature when the plug-in time switch selects setback operation.

The amount of setback can be adjusted for 0 to 40 K.

Limit Setpoint (W964E only)



The W964E Aquatrol controller incorporates a selectable high or low limit function.

The type of limit function is selected by a screwdriver selector switch and the limit setpoint can be adjusted from 35 to 75°C.

Space Temperature Compensation

An additional, optional feature on all Aquatrol systems is that it is possible to compensate for heat gains and losses in the space where a sensor is installed.

This sensor (T7160A) also gives automatic morning boost by allowing increased heat input to the space during the warm-up period. It is also possible to raise or lower the space temperature by up to 6 K, using the integral setpoint adjustment on the sensor to achieve comfort conditions.

Motor Timing

The Proportional + Integral control form of the Aquatrol controllers ensures that they will maintain acceptable performance over a wide range of system conditions and with a variety of components such as sensors and actuators.

However, a degree of fine tuning is possible using the motor speed selector switch located on the Aquatrol circuit board.

This enables the controller output to be matched to either a 1 minute or a 4 minute motor for optimum performance.

Details of the ideal motor timing and the correct speed setting can be found in the Aquatrol system installation booklet EN1R8101.

Summer/Winter Changeover Contacts (W964H only)

The W964H Aquatrol controller has Summer/Winter changeover contacts - an energy saving feature.

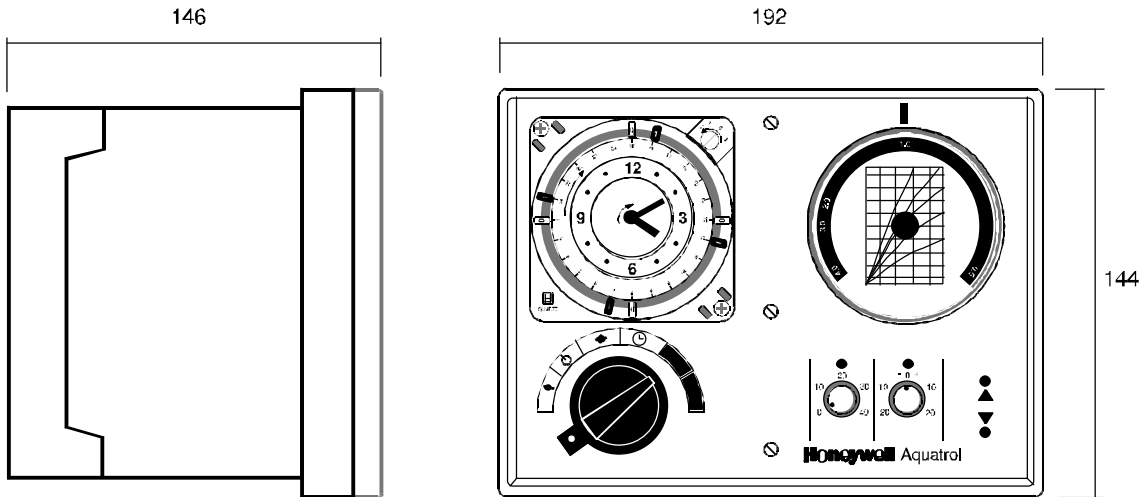
In the summer months the function switch on the Aquatrol controller is set to the VALVE CLOSED position. This automatically closes down the heating plant and switches from a Winter Aquastat to a Summer Aquastat. The Summer Aquastat controls the temperature of domestic hot water

Auxiliary Pump Control

The W964J Aquatrol controller provides control of the system pump via an auxiliary pump relay.

The pump is switched off during periods of setback operation, resulting in energy savings.

DIMENSIONS AND MOUNTING



All dimensions in millimetres

Surface Mounting

W964 Aquatrol panels can be surface mounted either in a control panel or directly on the wall. The wiring can be completed in the sub-base before the controller is mounted.

Panel Mounting

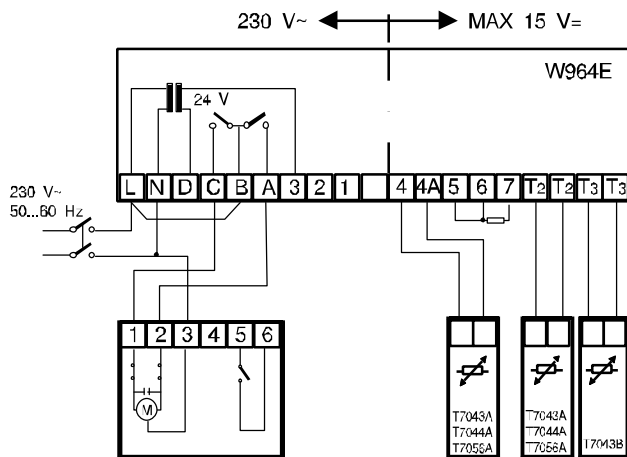
The controller can be panel mounted using the panel mounting clips provided. The panel cut-out dimension is 186 x 138 mm.

Tamperproofing

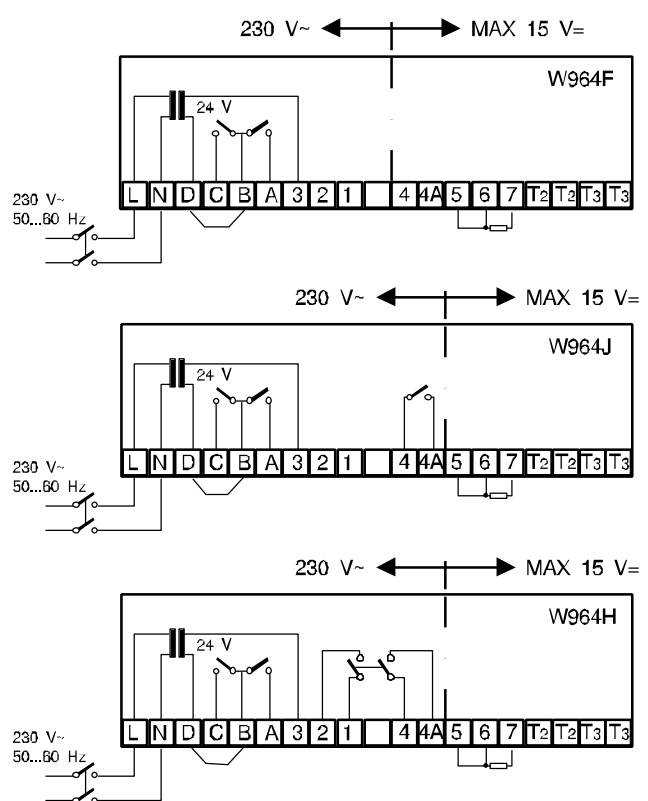
A removable peg on the Manual Override/Mode Selector switch deters unauthorised operation of the switch.

WIRING

Typical Aquatrol system wiring diagram



Internal schematics



IMPORTANT

1. This product should be installed by a competent electrician
2. Disconnect the power supply before beginning installation
3. For complete wiring details see Aquatrol Application Manual EN7R0010

ORDERING SPECIFICATION

Model	Description	Supply Voltage	Time Switch
W964E1012	Aquatrol with High/Low limit	230 V~, 50...60 Hz	None
W964F1003	Universal Aquatrol	230 V~, 50...60 Hz	None
W964F1011	Universal Aquatrol	230 V~, 50...60 Hz	24 hr.
W964F1029	Universal Aquatrol	230 V~, 50...60 Hz	7-day
W964F1037	Universal Aquatrol	120 V~, 60 Hz	7-day
W964F1045	3-position Aquatrol	24 V~, 60 Hz	None
W964F1052	3-position Aquatrol	120 V~, 60 Hz	None
W964H1001	Aquatrol with Summer/Winter switch	230 V~, 50...60 Hz	None
W964J1008	Aquatrol with Pump Relay	230 V~, 50...60 Hz	None
W964J1016	Aquatrol with Pump Relay	230 V~, 50...60 Hz	24 hr.

SYSTEM COMPONENTS

Outside Temperature Sensor T7043B

Application

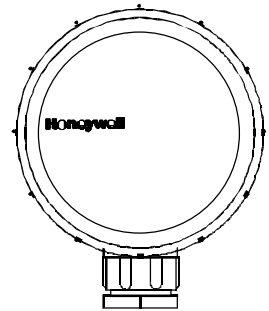
The Outside Temperature Sensor consists of a thermistor element housed in a tough plastic case. It is mounted outside the building providing a temperature input signal to the controller.

Ordering Specification:

T7043B1013

Specifications

Sensing range : -30 to +35°C
 Sensor : Thermistor 680 Ω @ 25°C
 Enclosure : Plastic with integral Pg11 fitting
 Dimensions : 72 Ø x 45 mm



Flow Temperature Sensor T7044A

Application

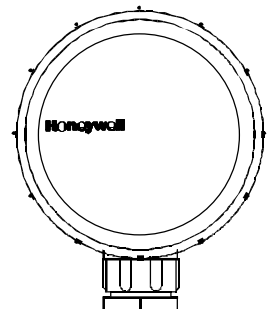
The T7044A Strap-on Flow Water Temperature Sensor consists of a thermistor sensing element housed in a tough plastic case. It is strapped to the flow water pipe providing a temperature input signal to the controller.

Ordering Specification:

T7044A1014

Specifications

Sensing range : 0 to 115°C
 Sensor : Thermistor 4100 Ω @ 25°C
 Enclosure : Plastic with integral Pg11 fitting
 Dimensions : 72 Ø x 48 mm



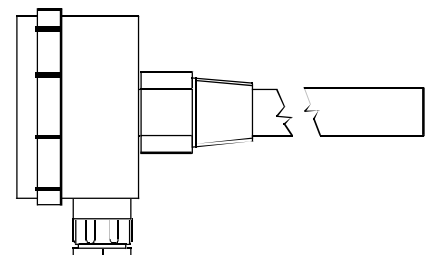
Flow Temperature Sensor T7043A

Application

The T7043A 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

Specifications

Sensing range : 0 to 110°C
 Sensor : Thermistor 4100 Ω @ 25°C
 Enclosure : Plastic with integral Pg11 fitting
 Housing dimensions : 72 Ø x 45 mm
 Well : ½" BSPT x 100 mm



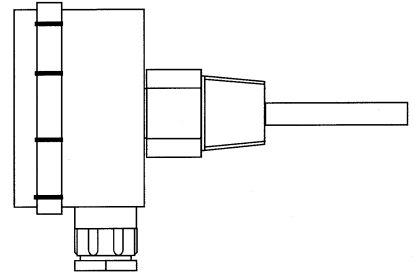
Fast Response Sensor T7056A

Application

The T7056A Fast Response Flow Water Temperature Sensor consists of a thermistor sensing element housed in an immersion pocket. It is ideal for District Heat applications. It should be mounted on a bend on the flow water pipe providing a temperature input signal to the controller

Specifications

- Sensing range : 0 to 110°C
- Sensor : Thermistor 4100 Ω @ 25°C
- Enclosure : Plastic with integral Pg11 fitting
- Housing dimensions : 72 Ø x 45 mm



Ordering Specification

Model	Well
T7056A1043	½" BSPT x 45 mm
T7056A1050	½" BSPT x 125 mm
T7056A1069	½" BSPT x 200 mm

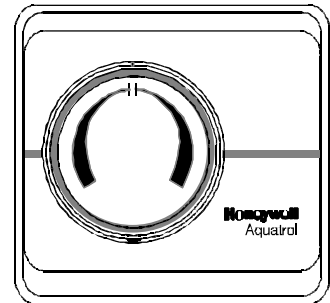
Room Compensation Sensor T7160A

Application

The T7160A Room compensation sensor can be used in conjunction with an Aquatrol panel to compensate for the effects of heat gains and losses in the space. The sensor also provides remote adjustment of the setpoint.

Specifications

- Sensing range : Nominally 10 to 30°C
- Calibration point : 20°C ± 1°C (when set-point is in mid position)
- Adjustment range : ± 6 K (room temperature)
- Sensor : Thermistor
- Enclosure : Plastic
- Housing dimensions : 83 x 79 x 45 mm

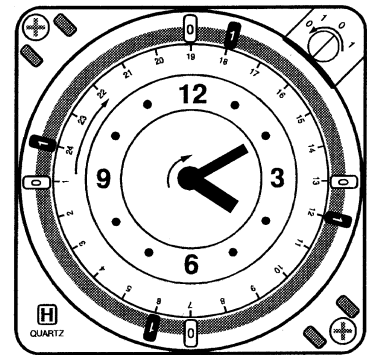


Ordering Specification:
T7160A1004

ACCESSORIES

Time Switches

Model	Type	Program
R42003611-005	Analogue Quartz	24-hour
R42003611-006	Analogue Quartz	7-day
R42003611-007	Digital	7-day



RELATED LITERATURE

- W964 Application Manual - EN7R0010
- W964 Installation Instructions - EN1R8101

Honeywell

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