

The Pactrol "Weather Watcher" automatically adjusts the amount of heat stored in an off-peak heating installation in response to changes in the weather. It can be used in conjunction with a suitable load-switching contactor to control storage heaters, fan-assisted storage radiators, electricaire or floorwarming in new and existing installations with off-peak white meter supplies.

### Description

The "Weather Watcher" consists of a heating controller and an outdoor sensor. The controller switches the heating on via a suitable contactor, for part of the off-peak hours, ranging from 100% (maximum stored heat) down to 0%.

The percentage depends upon the control setting and the outside temperature, as shown in the diagram below. (Fig 1)

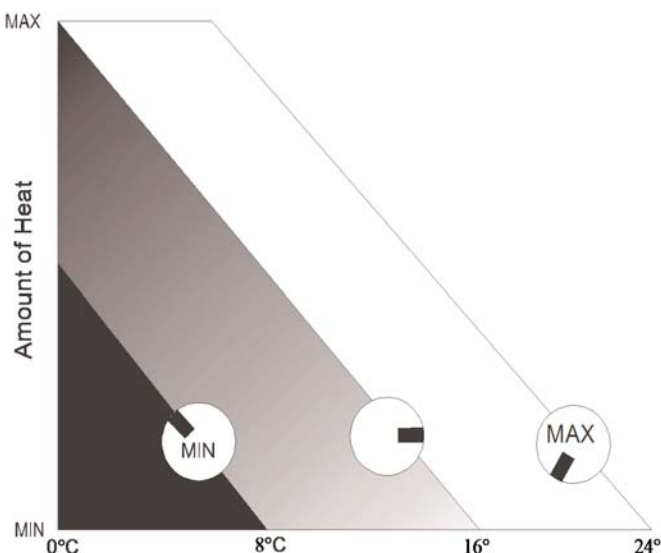
There are two alternative methods of operation, selected by internal switches. Programme 1 is standard Economy 7 white-meter and off-peak tariffs of up to 8 hours which do not provide a mid-day boost. The controller operates in this case by delaying the switch-on time for the heating according to the amount heat required. Once the heating is switched on, it will normally remain on until the end of the off-peak period.

Programme 2 is designed for off-peak tariffs exceeding 8 hours and for those which include a day-time boost. In this programme the heating is switched on for part of every hour throughout the off-peak period. The percentage of the hour for which the heating is on depends upon the amount of heat required.

There is also a built-in test programme which is operational when neither of the main programmes is selected. In this case, the heating is switched on every 28 seconds; the percentage of each 28 second interval for which the heating is on is the same percentage as would be given in each of the operational programmes.

For installations where there are regular times during which the building is unoccupied (e.g. schools, offices, etc.) the amount of heat stored can be automatically reduced by the addition of a time switch or manual switch.

Fig 1



The control is assembled on a printed circuit panel which slots into the attractive moulded housing and is retained by a snap-on cover plate on which the connection details are printed. The edge of the p.c. panel locates in the socket- base to connect with the wiring terminals. The electronic circuits are protected by a fuse and surge-arrestor.

The outdoor sensor is enclosed in a small moulded housing.

The construction of both sensor and controller is double insulated, Class II and the outdoor housing is weather-proof if a suitable cable gland is fitted.

### Installation

A contactor must be chosen which is capable of switching the heating load. The contactor coil is connected to the controller and must be rated for 240V AC operation with a maximum steady current of 0.25A. A subsidiary relay must be used for coils of higher consumption.

The controller requires a single-phase restricted-hour supply, preferably fused at 5A. If a separate supply is not available, a heater circuit may be used provided that the fuse rating does not exceed 15A and the cable is correctly sized.

The controller and contactor are most easily fitted adjacent to the consumer fuses for the heating circuits. There are no restrictions on mounting provided that the ambient temperature limits are strictly observed. Consumer access to the controller will normally be required.

Once the location has been decided upon, the controller should be separated from the base by fully loosening the two plastic-headed-screws and carefully pulling the controller and base apart.

There are two 16 mm knockouts in the rear of the base and five removable grommets for surface wiring. The positions of the two fixing holes and the cable entries can be marked off the template provided.

When the base is mounted, the card can be trapped behind it so that the user instructions remain permanently displayed.

The outdoor sensor should be sited where it will be influenced by the outside temperature. Apart from outside walls, suitable positions could also include garage or outbuilding, under eaves, or below suspended floors.

If the position is exposed, the 16mm cable entry should be underneath and a weatherproof cable-gland fitted.

If the recommended supply fused at 5A is provided, all connections between the sensor, controller, contactor-coil and supply-fuse should be made using 1 sq mm insulated and sheathed cable.

For fuse ratings above 5A, the supply connections must be made in the correct conductor size up to a maximum of 2.5 sq mm.

No earth is needed for the controller or sensor. The connections must conform exactly to the wiring diagram shown on page 3 and the correct supply polarity must be observed. The resistor mounted in the base between terminals 1 and 2 (outside sensor terminals) should be left in place and the sensor not connected until after commissioning. (the resistor must be removed when the sensor is connected)

## Commissioning

N.B. Before carrying out any installation check, the controller must first be removed or isolated. Always check that the supply is isolated before removing the controller from its base.

The controller will be supplied with both programme switches in the "Off" position (slider toward the edge of connector) and will function in the test mode. Check that the resistor is connected between terminals 1, 2 and that if the set-back facility is used the switch is open.

With the controller plugged in and the restricted-hour supply connected, the controller should be energised continuously with the heat-level control set at maximum (fully clockwise). With the control set at Normal (8 hours), the contactor should be energised for approximately 14 seconds in every 28 seconds.

If the above test is satisfactory, isolate the supply, remove the controller and connect the outdoor sensor leads in place of the resistor between terminals 1,2. The sensor polarity is not important. Replace the control and repeat the test described above.

By estimating the outside temperature and comparing it with the temperature and control settings shown in Fig 1, it should be possible to judge the percentage of the 28 second interval for which the contactor will be energised. If the contactor is energised continuously with the control at minimum, the sensor connections are probably open-circuit and should be rechecked.

If the contactor fails to energise at all with the control at maximum, the sensor connections may be short-circuit, or the supply or internal fuse blown. Moisture inside the sensor housing may cause the controller to give reduced or no heat.

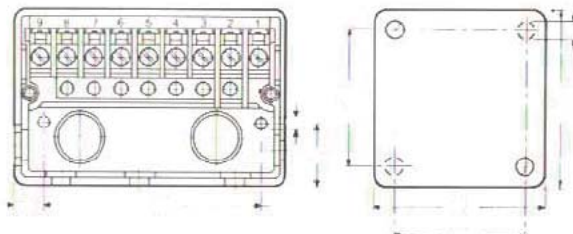
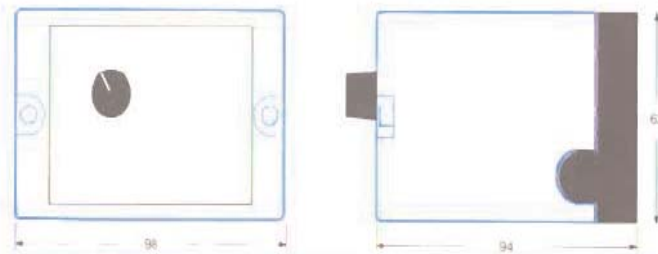
If operation in the test mode is satisfactory, the controller should again be isolated and the printed circuit panel removed by carefully springing the ends of the housing apart and removing the cover plate. The programme switches should be identified (see fig.2) and the correct programme selected by sliding the appropriate switch towards the number (away from the edge connector). Reassemble the printed-circuit panel into the housing, taking care to insert it in the slots provided, and snap-in the cover plate. The controller can then be refitted and the off-peak supply connected.

## Operation

For best results, the following procedure should be followed:

1. Set any appliance heat input controls to maximum.
2. Set the heat levels on the "Weather Watcher" to "Normal" for the tariff in use.
3. After a few days, the control can be readjusted to provide more heat (clockwise) or less heat (anti-clockwise) if the level in the main livingrooms is too low or too high. Do not adjust the level by more than 1 point at a time, and wait for a day or so before making any further adjustment.
- 4). Once the level of heat in the living-rooms is satisfactory, the heat level in other rooms, a bedroom for example can be reduced if required by turning down the charge setting on the heater concerned.
- 5) In late spring and early autumn it may be possible to reduce the heat level setting by about 1 point compared to the winter setting. N.B. For maximum economy, set the control as low as possible for reasonable comfort.

There should be no need to adjust it frequently



## Technical Data

<b>Electrical Supply</b>	
<b>Voltage</b>	240±10%
<b>Frequency</b>	50Hz AC only
<b>Consumption</b>	approx 4 VA
<b>Internal Fuse</b>	2A
<b>Supply Fuse</b>	5A
<b>Loading Switching</b>	by external contactor
<b>Coil Voltage</b>	240V AC
<b>Maximum coil current</b>	0.25A
<b>Ambient</b>	
<b>Temperature</b>	0...35°C
<b>Maximum humidity</b>	95% RH
<b>Construction</b>	BS 3955 Class 2
<b>Weight</b>	
<b>Controller</b>	245 gm
<b>Sensor</b>	48 gm
<b>Cable size</b>	
<b>Conductor</b>	1 sq mm
<b>(Maximum)</b>	2.5 sq mm
<b>Insulation</b>	250V AC
<b>Product Number</b>	403901
<b>Contents</b>	

Controller  
sensor  
data/installation notes  
user card/template

## Additional Material (Not supplied)

contactor for suitable  
heating load

## mounting screws:

controller 2 off M4 or No 6 wood  
sensor 2 off M4 or No 6 wood  
cable gland (for exposed sensor) 16mm cable.

