

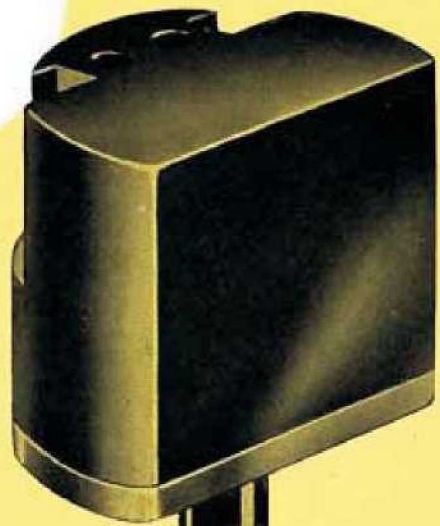
THE NEW

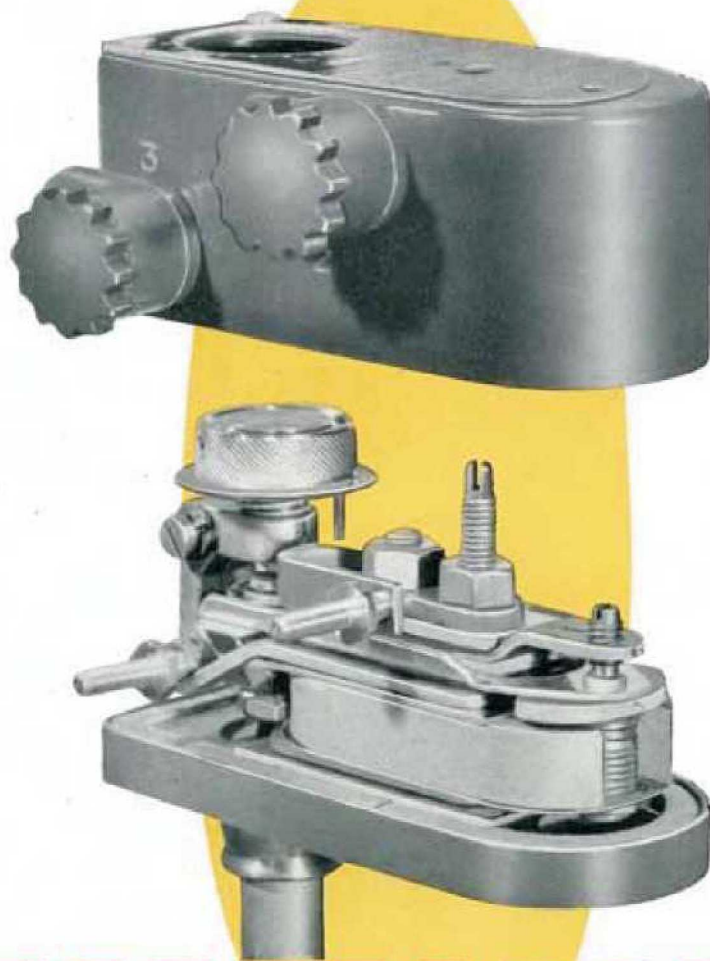
WGS **SATCHWELL**

Six Point

THERMOSTAT

*for Electric
Water Heating*





TYPE WR

Introduced 1928
weight 26½ oz.

DEVELOPMENT O



TYPE Z

Introduced 1934
weight 14½ oz.

HERE IS THE ANSWER to the demand for a cheaper immersion thermostat for domestic electric water heaters. The pictures above show how the value of successive types of Satchwell Thermostat have been improved during the last 27 years.

The latest instrument, the type VC Thermostat, being half the weight of the V Thermostat is appropriately priced and this is the result of clever re-design to eliminate all material and components unnecessary for reliability, and to reduce assembly time. This has been achieved without sacrificing any of these essential features of its predecessors:

1. The Satchwell magnetically controlled micro-gap switch. This comprises heavy precious alloy contacts and resilient switch member specially treated to withstand the stresses of normal operation.
2. A thermally sensitive member comprising a combination of brass and nickel iron alloy treated to provide stability over many years of operation.
3. Stable insulation coupled with protection against the ingress of dirt.
4. Easily accessible terminals of sound design.

Over four million Satchwell Water Heater Thermostats have set a Thermostat with the same switch movement, having a calibrated adjust

F A THERMOSTAT



TYPE V

Introduced 1950
weight 11½ oz.



TYPE VC

Introduced 1955
weight 5 oz.

Consequently, the high performance standards set by the V Thermostat, standards now proved to be higher than those set by earlier types, will be fully maintained by the VC instrument since the switch movements are identical in principle.

Although the VC Thermostat is adjustable, the means of adjustment has been simplified because of the growing realisation that the consumer himself does not want to adjust the temperature of his hot water supply. The new instrument has a setting

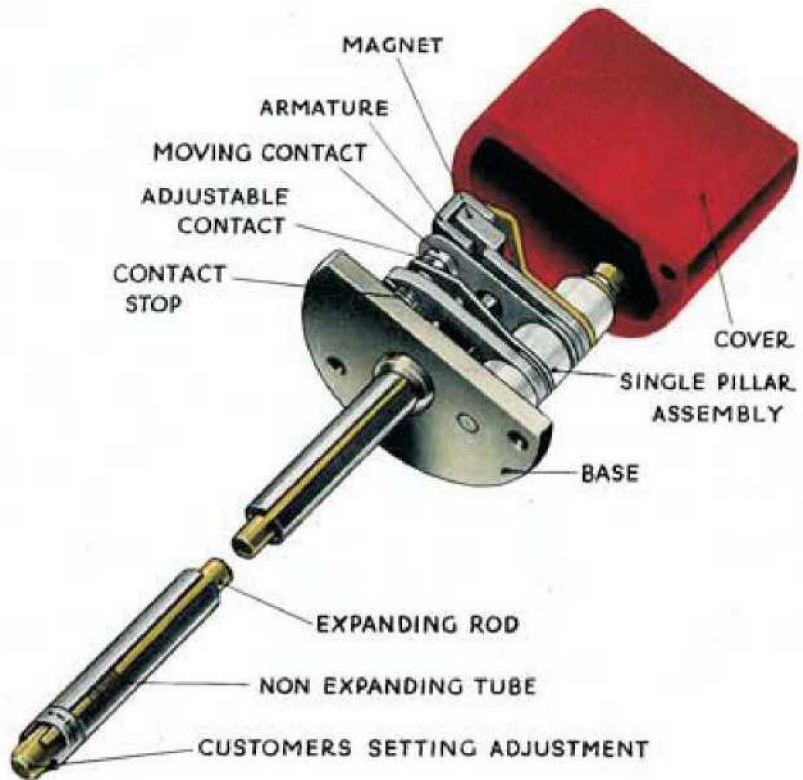
screw at the end of its stem which can be used with complete convenience by either water heater maker or installation electrician. This adjustment has fixed limits at its two extremes, and when set at one or the other, control at a specific temperature and within a proper tolerance will result. The adjusting screw can be set at any intermediate position.

The VC Thermostat is interchangeable with thermostats built to B.S. 1555-1949.

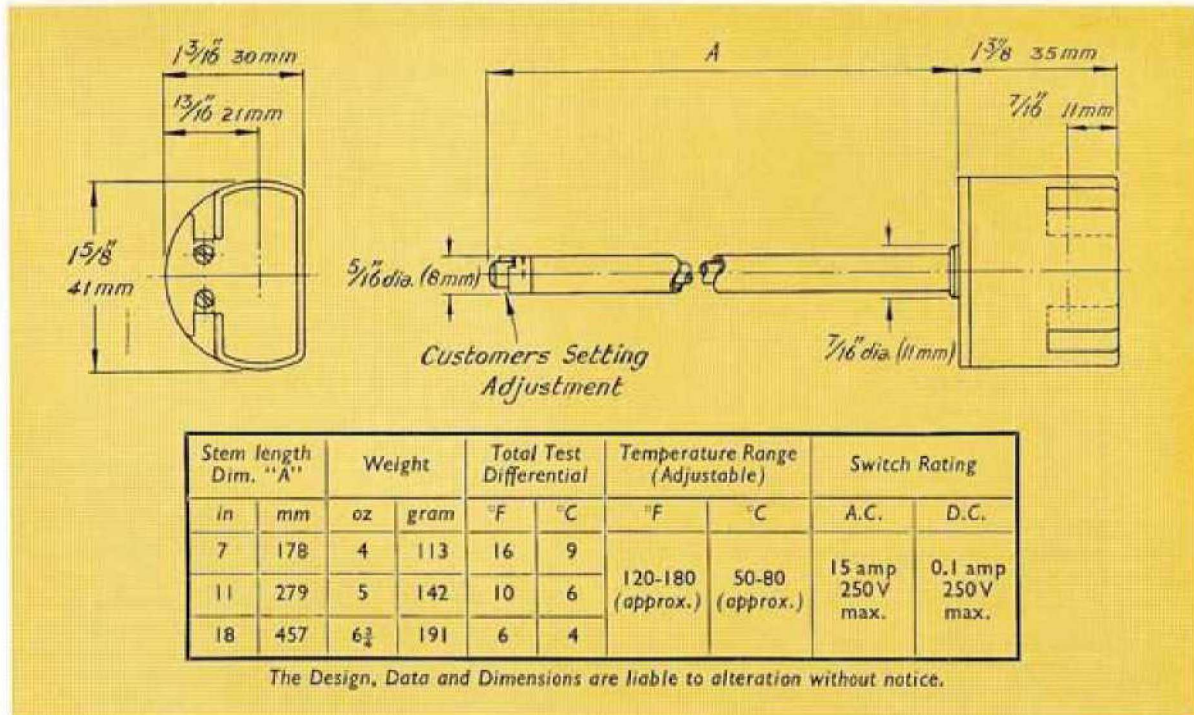
quality standard for water heater control that is unsurpassed. The VC
nent and being interchangeable, represents a revolutionary development.

The VC Six Point

- Satchwell magnetically controlled micro-gap switch
- Interchangeable with thermostats to BS 1555-1949
- Adjustable temperature setting
- Usual standard stem lengths
- Satchwell quality
- Unequaled value



DIMENSIONS



THE RHEOSTATIC CO. LTD.

SLOUGH · ENGLAND

TELEPHONE: SLOUGH 23311-6



Temperature Controls

**SATCHWELL
SUNVIC**

Room Thermostat TLX

Satchwell TLX Room Thermostats accurately control space temperature in conjunction with suitable mains or low voltage equipment. Models are available for the control of pumps, fans, relays, gas and oil burner controls, motorised valves, air conditioning equipment, and other devices requiring on/off or change over switching.

Physical Characteristics

The TLX range complies with test house requirements in most countries, including BS 3955. They have either a single pole single throw (on/off) or single pole double throw (change over) switch action. They have a robust magnetically controlled switch mechanism with contact rating either 2 amp (change over) or 6 amp (on/off). A unique fast break switch action gives long life and minimises radio and television interference.

TLX thermostats incorporate an accelerator heater which gives minimum space temperature variation even under the most difficult conditions. Fast response to change in temperature is assured by full width ventilation slots in top and bottom of the cover. Protection from accidental contact with electrical parts is provided by specially designed safety barriers.

Adjustable stops are incorporated in the control knob to enable the user to pre-set maximum and minimum temperatures – usually day/night settings. Alternatively, these stops may be used to lock the control knob on one setting, preventing accidental movement. Screw terminals are provided on the base moulding for easy wiring.

Types

The following additional feature versions are available:—

(a) On/off switches for heating, domestic hot water, and night set back (TLX 2910). (b) Three speed fan switches. (c) Temperature set back. (d) Thermometers. (e) Concealed setting. (f) Heating/cooling. (g) On/off switch. (h) Protective cover. (i) Weather resistant cover. (j) Numeric scale. (k) Dead zone. Full details of these features are given overleaf, and on Room Thermostat additional feature leaflet.

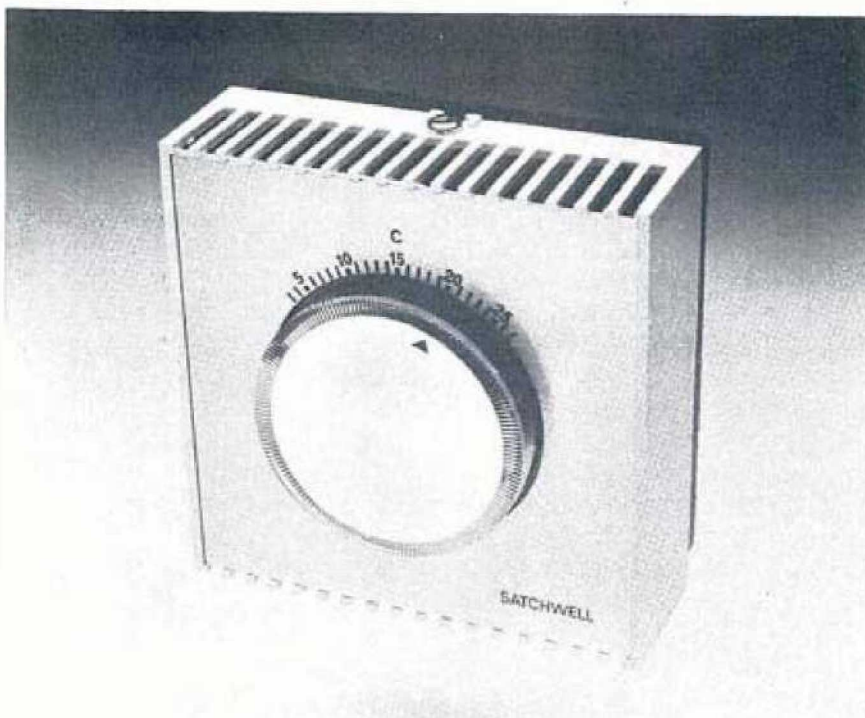
Installation

The TLX thermostat should be mounted in a position which is representative of the space to be controlled and where it will not be affected by draughts, heat radiation or the sun.

For accurate operation it is important that the accelerator heater is connected as shown on the appropriate connection diagram.

Backplates, to suit standard conduit fittings, are supplied with all thermostats.

To simplify installation, a wiring diagram is fixed to each thermostat. Detailed installation instructions are packed with each instrument.



Room Thermostats (Additional Feature Types)

Satchwell Room Thermostats accurately control space temperature in conjunction with suitable mains or low voltage equipment. Models are available for the control of pumps, fans, relays, gas and oil burner controls, motorised valves air conditioning equipment and other devices requiring on/off or change over switching.

Physical Characteristics

Both the TLX and TLM range comply with test house requirements in most countries, including BS3955. They have either a single pole single throw (On/Off) or single pole double throw (Change over) switch action. They have a robust magnetically controlled switch mechanism with contact rating either 2 amp (change over) or 6 amp (on/off) for TLX and 20 amp for TLM. A unique fast break switch action gives long life and minimises radio and television interference.

Both thermostats incorporate an accelerator heater which gives minimum space temperature variation even under the most difficult conditions. Fast response to change in temperature is assured by full width ventilation slots in top and bottom of the cover. Protection from accidental contact with electrical parts is provided by specially designed safety barriers.

Adjustable stops are incorporated in the control knob to enable the user to pre-set maximum and minimum temperatures – usually day/night settings. Alternatively, these stops may be used to lock the control knob on one setting, preventing accidental movement. Screw terminals are provided on the base moulding for easy wiring.

Types

This leaflet gives details on the additional feature range of TLX and TLM thermostats available. The basic instrument ranges are described on separate leaflets.

Installation

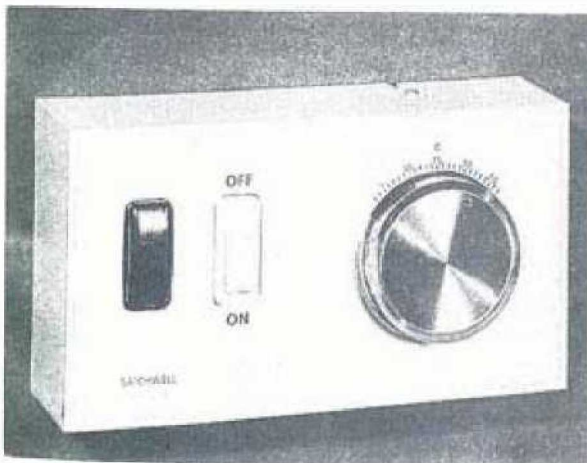
The thermostat should be mounted in a position which is representative of the space to be controlled and where it will not be affected by draughts, heat radiation or the sun.

For accurate operation it is important that the accelerator heater is connected as shown on the appropriate connection diagram.

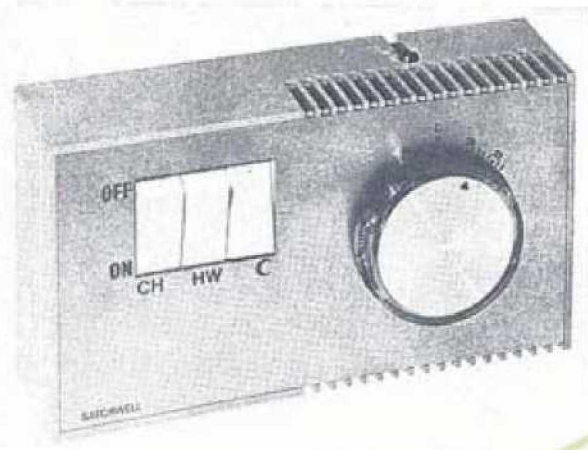
Backplates, to suit standard conduit fittings, are supplied with all thermostats.

To simplify installation a wiring diagram is fixed to each thermostat. Detailed installation instructions are packed with each instrument.

TLM 2677



TLX 2910



Room Thermostat TLM

Satchwell TLM Room Thermostats accurately control space temperature in conjunction with suitable mains voltage equipment up to a maximum rating of 20 amp.

Physical Characteristics

The TLM range complies with the test house requirements in most countries, including BS 3955. They have a single pole single throw on/off switch action and a robust magnetically controlled switch mechanism with contact rating 20 amps.

TLM thermostats incorporate an accelerator heater which gives minimum space temperature variation even under the most difficult conditions. Fast response to change in temperature is assured by full width ventilation slots in top and bottom of the cover. Protection from accidental contact with electrical parts is provided by specially designed safety barriers.

Adjustable stops are incorporated in the control knob to enable the user to pre-set maximum and minimum temperatures – usually day/night settings. Alternatively these stops may be used to lock the control knob on one setting, preventing accidental movement. Screw terminals are provided on the base moulding for easy wiring.

Types

The following addition feature versions are available.

a) On/off switch b) Temperature set back c) Concealed setting d) Non ventilated cover e) Change over contact 5 amp max f) Numeric scale g) 'Indicated', on and off position h) Low scale (frost protection) i) Protective cover j) Weather resistant cover.

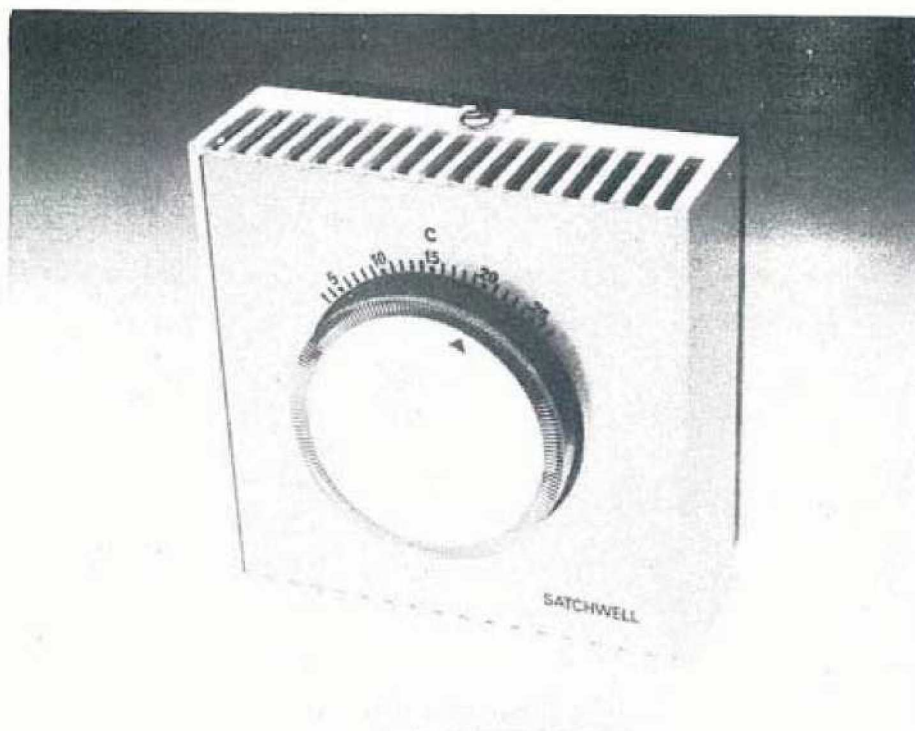
Installation

The TLM thermostat should be mounted in a position which is representative of the space to be controlled and where it will not be affected by draughts, heat radiation or the sun.

For accurate operation on loads up to 13 amps it is important that the accelerator heater is connected as shown on the appropriate connection diagram.

Backplates to suit standard conduit fittings, are supplied with all thermostats.

To simplify installation a wiring diagram is fixed to each thermostat. Detailed installation instructions are packed with each instrument.



Surface Mounting Thermostats SA and PA

The SA and PA are control or limit thermostats designed for surface mounting and are used to control the temperature of water or other fluids in domestic heating cylinders, pre-insulated domestic heating cylinders, industrial baths and pipes. These thermostats are suitable for switching heating loads up to 15A 250V ac or controlling the position of motorised valves.

SA thermostats are particularly suitable for use in conjunction with the Minival to control the temperature of hot water in the storage cylinders of domestic heating systems. The thermostat is strapped to the cylinder and a Minival installed in the primary return pipe. The control action of the SA maintains the water in the cylinder at a steady temperature which can be set lower than that of the boiler thus avoiding danger of scalding water and minimising fuel wastage.

PA thermostats are suitable for control and thermal limit switching applications where it is required to control the temperature of water or fluid flowing through pipes.

Physical Characteristics

The SA comprises a single pole double throw micro-gap switch which is actuated on change of temperature by a bimetal element incorporated in the base of the thermostat. The design of the switch ensures that full pressure is maintained between the contacts until the instant they are parted by a change in temperature. This results in reliable operation, consistent control and long life. Switch ratings are given overleaf.

The SA thermostat has a grey/green hammer finished sheet steel casing; a 21mm (¾in) hole for conduit entry is located at one end. A black adjusting knob with a calibrated temperature scale is provided so that any control point within the range of the instrument can be selected.

The PA is similar to the SA but has a modified base to facilitate clamping the thermostat to pipe-work.

There are no kits available for converting SA thermostats to PA thermostats.

Types

The SA thermostat is designed for fitting on a flat surface or on a curved surface of 305mm (12in) diameter or more. The PA thermostat is designed for mounting on ½in to 4in BS pipes.

Installation

The SA may be fitted to flat surface or to the curved surface of a cylinder of 305mm (12in) diameter or more. It is supplied with a screw, washer and a galvanised steel strip of sufficient length to enable the thermostat to be clamped to cylinders up to 610mm (24in) diameter maximum. Two additional slots are provided in the thermostat cover for use when the SA is fitted to pre-insulated cylinders. In all cases good thermal contact must be made between the SA and the heated surface.

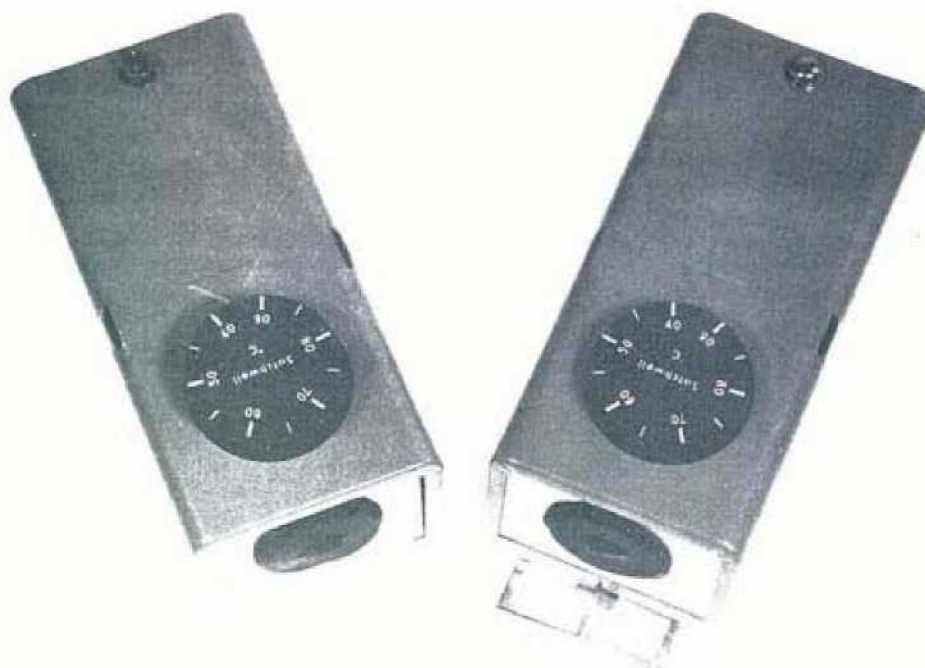
The PA may be clamped to the pipework by means of two clamping bolts and two galvanised steel straps provided with each thermostat. Good thermal contact between the pipe and the base of the thermostat is essential to ensure correct performance. This can be achieved easily by thoroughly cleaning the pipe before fixing and introducing a layer of metallic paste (provided with each thermostat) between the base and pipe.

The final connection to the thermostat should be made with heat resistant cable and flexible conduit should be used to avoid any strain on the thermostat since this may prevent proper thermal contact.

Detailed installation instructions are packed with each instrument.

SA

PA



Immersion Thermostats VK

The VK series of thermostats are stem type immersion instruments for controlling the temperature of domestic electric water heaters.

Physical Characteristics

Three stem lengths are provided (see overleaf) according to the scale range and degree of sensitivity required. In each case the temperature sensitive stem is made of brass and is used to operate a single-pole micro-gap switch.

Large switch contacts are fitted to provide a long trouble-free life and the complete switch mechanism is enclosed in a dust-excluding moulded plastic cover.

A temperature scale and adjusting knob are fitted in the head.

The VK is designed to conform with BS 3955.

Types

Units are available in three standard stem lengths 7", 11" or 18".

A waterproof case is available as an accessory. This is used with a special pocket to ensure a watertight enclosure which complies with BS 2817 and also CEE specifications No. 11 and 14.

Installation

The head of the thermostat is particularly small and compact and thus facilitates a neat installation. Electrical connections to the thermostats are easily made by two shrouded pinching-screw type terminals incorporated within the switch head moulding. Detachable clip fixing pockets of nickel-plated copper with a maximum working pressure of 4.8 bar (70 lbf/in²) can be supplied. Waterproof cases are provided with conduit entries screwed 3/4" BS or 13.5 Pg conduit, or with a gland for a flexible cable.

VK Thermostat, shown inserted into pocket



VK with waterproof case and pocket



Electronic Programmer DHP2201

for central heating and hot water control systems

The Satchwell Electronic Programmer is designed to give simplicity of operation with maximum facilities for economising the use of domestic heating appliances. The 24 hour day is divided into 12 time segments which will automatically control the on/off switching of domestic hot water and central heating to a chosen daily programme. In addition the whole programme, or parts of it, may be temporarily altered or suspended without disturbing the normal use programme condition.

The Programmer features an electronic clock display which can be used as a domestic clock and is suitable for any domestic heating system that incorporates a gas, oil or solid fuel automatic boiler and can be used with most types of secondary controls, both on/off and modulating.

Physical Characteristics

The Programmer is housed in an attractively styled white moulded case, with a brushed aluminium finish facia plate. A digital display 24 hour clock is a feature of the unit. Programme selection is by means of twelve slide switches operating over twelve time bands enabling the user to pre select on/off times for central heating and domestic hot water. Indicator lamps on the facia give a visual check that the selected programme is operating within the correct time band.

The Electronic Programmer includes two electrically separate single pole change over switches, one controlling the domestic hot water circuit, the other the heating circuit. The provision of these switches simplifies connection to boilers, circulating pumps, room or cylinder thermostats and motorised valves without the use of additional relays.

A programme override facility is incorporated to enable either circuit to be switched to the off, or continuous on position, regardless of the selected programme.

Operation

The setting of the programme for daily use is achieved by adjusting the slide switches up or down. Each switch may be moved to one of the three positions off (mid position) hot water only (up) hot water and central heating (down). Each of the twelve switches cover periods of the day based on a 24 hour clock. Any switch when moved from the off position to a selected programme function will automatically switch that function on for the timed period indicated. Where two or more switches are set adjacent to one another the switched period is the on time of the first switch to the off time of the last.

The control system may be programmed fully on or off.

Setting the Digital Clock

To set the clock a switch is supplied marked fast, slow, auto. On initial switch on, the clock display will flash intermittently indicating power on. By moving the switch to "fast" position the clock will cycle. When correct hours show switch to "slow" position to set minutes, when correct minutes show switch is set to "auto" and clock operates normally.

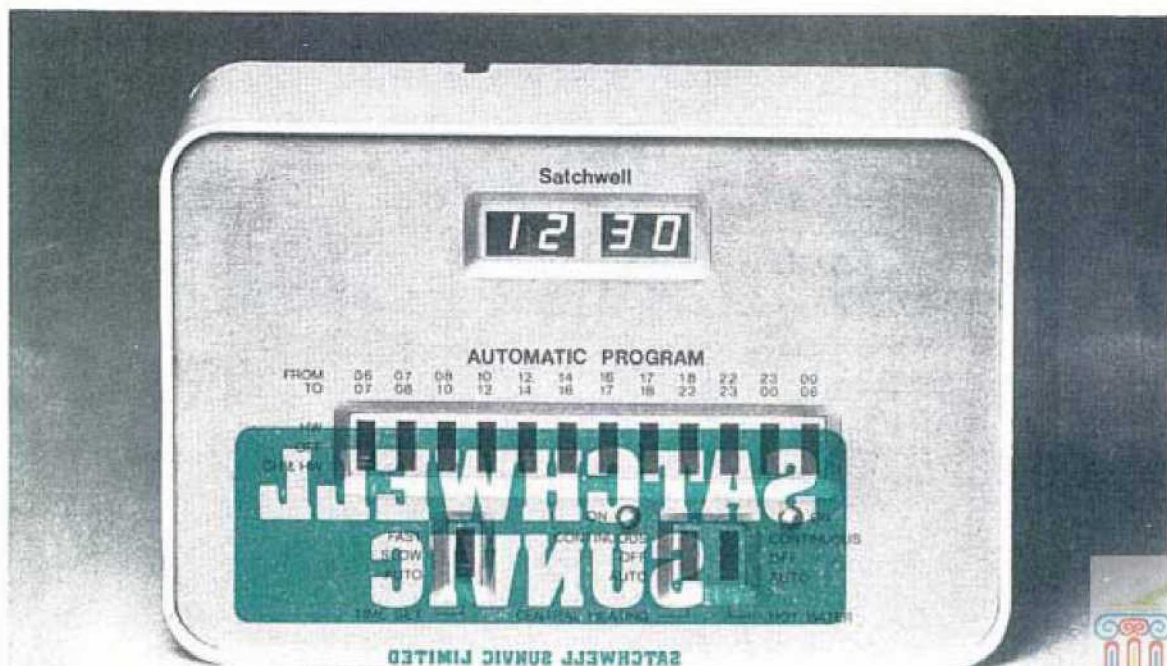
In the event of a power failure, when power is restored the unit will take up a heating "on" condition and the clock display will flash indicating that a power failure has occurred. The clock should be reset in the normal way.

Programme Override

This switch is a simple means of overriding the selected programme and gives provision to select an "off" or "continuous on" condition independent of the selected programme for either the hot water or heating circuit.

Installation

The Electronic Programmer is easy to install. The backplate complete with terminal block is fixed to the wall with two screws. It may be surface wired or mounted over a flush conduit box, connections being made to the terminal block. The programmer is then plugged on to the backplate and the three fixing screws tightened. Full Installation instructions are packed with each unit.



'Minival' Motorised Valve

The Minival is an on-off motorised twin-shoe valve for the flow control of low pressure hot and cold water. It is particularly suitable for central heating and can be used to regulate heating zones where on-off control by thermostats or other controllers is required. The valve can be controlled, for example, by a TLX room thermostat and a time switch or by any device having a single-pole change-over switch.

Physical Characteristics

The body is high quality brass and is made in compression fitting sizes 15 mm and 22 mm for use with copper pipe and also $\frac{1}{2}$ in, $\frac{3}{4}$ in and 1 in BSP parallel thread sizes.

The gland has been carefully designed, using the most up to date materials to give trouble free service and no adjustments or lubrication are required. The driving motor is contained in an attractively styled housing which is secured to the valve body by two nuts, and is supplied with cable. A window in the top of the housing indicates the valve position by showing silver when the valve is closed, changing to red when it is open.

Due to the design of the twin-shoe, very good shut-off is provided in the closed position.

Types

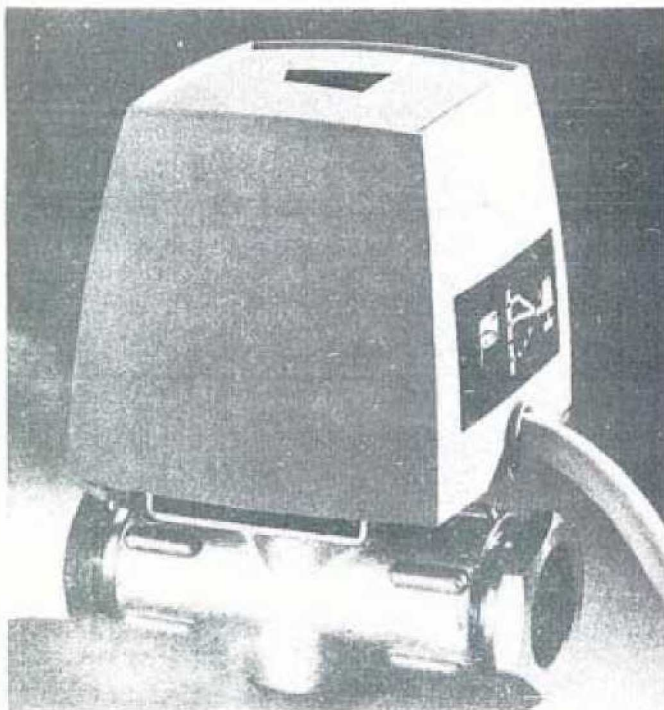
The Minival may be supplied with either an SM 3201 standard type motor or an SM 3203 motor with auxiliary switching facility. The latter type enables other functions, such as boiler firing or pump circulation, to be switched off when the valve starts to close.

Installation

The valve can be mounted in any attitude and due to its small size, unobtrusive positions can usually be found for it. Motor and valve are packed separately so that the valve can be installed in the pipe and the motor fixed in position at a later stage in the installation work.

It is advisable to flush out the whole system to remove any foreign matter that might cause damage to the valves. The motor is supplied complete with either four- or five-core cable according to type. Cable lengths and motor details are shown overleaf. If the orange lead of the SM 3203 is not being used, this should be insulated, as it will be live when the valve is open. The cable should be taken to a suitably located connexion box. Motors must not be connected in parallel.

Installation instructions are packed with each valve.



'Minival' is a registered trade mark.

Duoflow System

The Duoflow system is designed for installations employing a common pump to serve both the heating circuit and the domestic hot water requirements. The duovalve automatically switches hot water from the boiler to the central heating and hot water circuits or to either as required. When both heating and hot water services are at their pre-set temperatures, the boiler and circulating pump are switched off.

Physical Characteristics

The duoflow system uses a 3 port valve with separate 3 position actuator and an associated relay junction box. The 3 port valve has a single rotary shoe which closes off either port or takes up a midway position leaving both exit ports open. The DM drive unit is a 3 position unidirectional actuator. The duovalve is designed to conform with BS 3955, Part 3.

Temperatures are controlled by a TLX light duty room thermostat and SA cylinder thermostat. Temperature set back facility is available as an alternative with the TLX room thermostat.

A Junction Box incorporating a plug in relay is included as part of the system to allow for easy wiring of the overall installation and eliminate the need for internal wiring.

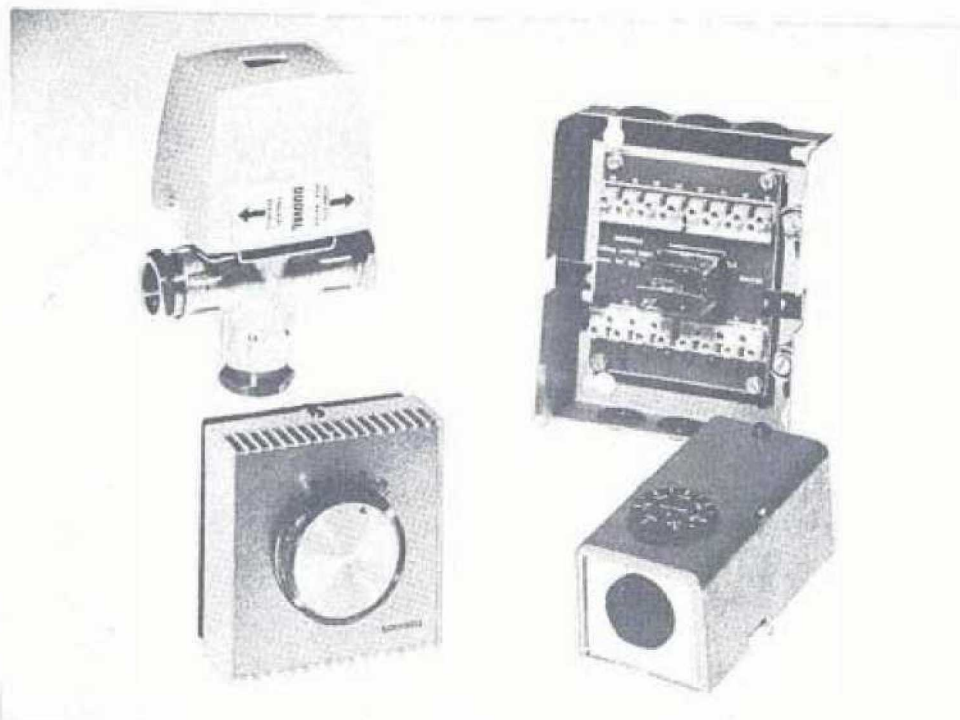
Types

The duovalve may be supplied with a 22mm compression fitting or 3/4" parallel thread.

Installation

The 3 port valve is symmetrical in design, allowing ease of installation. Either exit port may be connected to the cylinder circuit or to heating circuit.

Full installation instructions and wiring diagram are packed with each duovalve actuator.



Thermostatic Radiator Valve TRV

The TRV Thermostatic Radiator Valve individually controls the temperature in each radiator's effective heating area, having the extra advantage of adjustable stops for preselected day and night temperature and attractive styling that blends with any decor. It can be quickly and easily installed directly replacing the ordinary radiator hand valve.

Physical Characteristics

The TRV contains a well-proven temperature-sensitive element thermally insulated from the body which is nickel plated brass and has an O-ring type water-seal construction. At minimum setting it offers protection against frost by automatically allowing the hot water from the boiler to flow through the radiator should the ambient temperature drop below the safe level. In addition to its ability to control at any point over a wide range of temperature settings, it can be set to pre-chosen high or low limits to give quick, positive selection of day or night levels. The simple action of turning the knob to the top or bottom stops automatically selects the temperature levels required for the respective conditions. Alternatively the knob can be locked in one set position to overcome the possibility of undesirable interference. A further advantage of the valve is that the upper gland packing can be changed without draining the system. It can also be used on double or single pipe systems.

Installation

The valve body should be installed at the location for the normal manual valve. The body has a union connexion with a radiator tailpiece whilst the other connexion is a compression joint for a 15mm pipe.

The maximum permissible static-head is 80m (260 ft) water.

After the valve has been installed the thermostatic head is then fitted and locked to the body and the stops set as required.

Detailed installation instructions are given in Leaflet No. 717-0-001 a copy of which is packed with each instrument.

TRV 3451



TRV 3401



Boiler Thermostats TK, TKR and TKD

The TK, TKR and TKD are stem type thermostats for controlling the temperature of automatically fired boilers and similar plant. These thermostats are approved by the British Standards Institute and conform with the requirements of BS.3955, the British Gas Corporation and DOBETA.

Physical Characteristics

The temperature sensitive element of each switch is a liquid filled phial connected by a capillary tube to a capsule in the head of the instrument. Changes of temperature sensed by the phial are communicated hydraulically to the capsule which actuates a micro-gap switch. The action is specially designed to give long life and to be radio and television interference free.

The switches are enclosed in a die cast metal casing. The adjusting knob is located on the outside of the casing. The temperature scale is marked on this knob so that the setting is clearly visible whether the instrument is mounted horizontally or vertically. Details of scale ranges are given overleaf. The button for hand reset operation is located adjacent to the adjusting knob.

Types

There are three main types in this range.

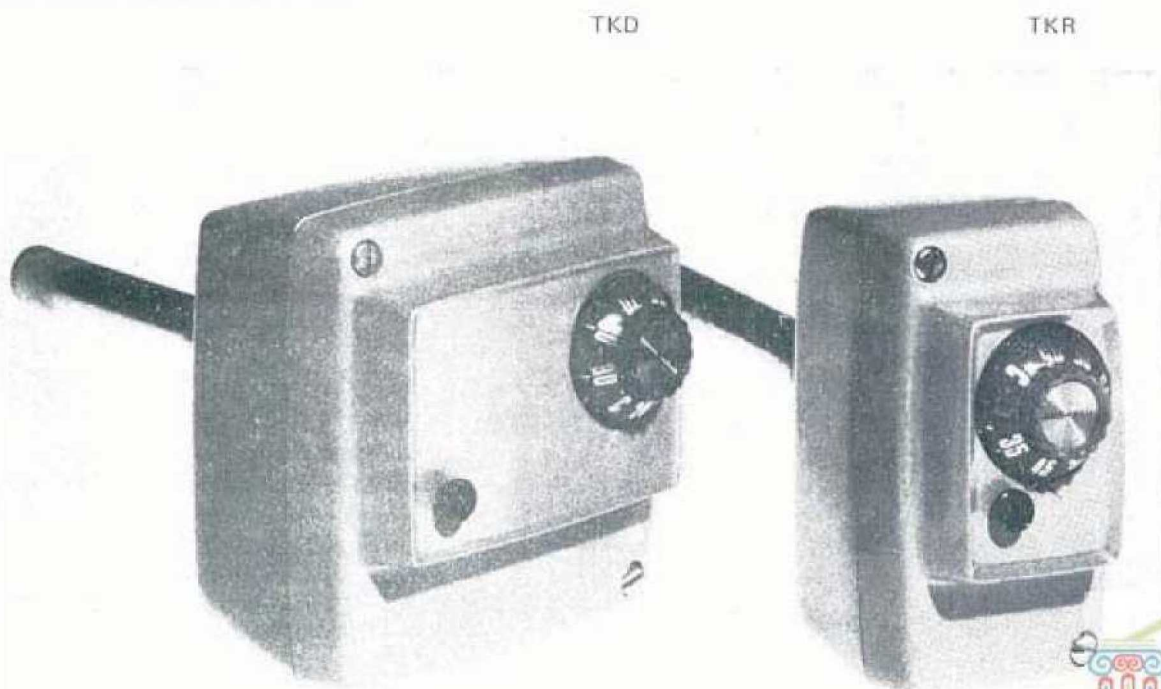
The TK is fitted with a thermally operated single pole changeover switch and has thermal reset action.

The TKR is fitted with a thermally operated single pole changeover switch. The contacts which open when the set temperature is reached can only be closed again by manual depression of the reset button.

The TKD is fitted with two thermally operated single pole changeover switches. One is arranged to operate as a control thermostat and has thermal reset; the other is arranged to be a limit thermostat and may have either thermal reset or hand reset.

Installation

All thermostats are supplied with separate corrosion resisting bronze pockets screwed $\frac{1}{2}$ in BSPT (taper thread) and rated at 17.5 kg/cm^2 (250 lbf/in^2) maximum working pressure. The thermostats may therefore, be removed if necessary without draining the system. Both phials of the TKD types fit into a single pocket. The TK and TKR both have one cable entry at the lower end of the casing; the TKD has two cable entries. It is recommended that a short length of flexible conduit is used for final connection to the thermostat to avoid imposing a strain on the head of the instrument.



Immersion Thermostats WR/WT/WPS/WTN

The thermostats in this series are stem type immersion thermostats designed to control the temperature of liquids in hot water heating installations, industrial processes, oil heaters and similar installations. They can be used for on-off control of electric heaters, solenoid valves, motorised valves or damper motors.

Physical Characteristics

The temperature sensitive stem is made from aluminium brass and nickel-iron and the resulting differential expansion is used to operate a micro-gap switch.

Different stem lengths are provided (see overleaf) according to the temperature range and sensitivity required. Large switch contacts are fitted to provide a long trouble-free life and the switch mechanism is enclosed in a dust-excluding moulded phenolic cover. Contacts 3 and 1 break circuit with rise of temperature, contacts 3 and 2 make circuit with rise of temperature.

Types

WR – the basic type with phenolic cover is for use where adequate mechanical protection can be provided.

WT – has a die-cast metal cover designed to protect the switch head and which can be sealed against unauthorised interference and enables the instrument to meet CEE 2-drop waterproof requirements.

WPS – also has a die-cast cover but is fitted with an exposed control knob and scale.

WTN – is fitted with a die-cast cover as the WT but has a covered hand resetting device which ensures that once the control circuit is broken by the thermostat (contacts 3 and 1) it cannot be remade until the thermostat is manually reset by means of a push-button adjacent to the control knob. This facility enables the thermostat to be used as a high limit control with complete safety. Contacts 3 and 2 can be used to operate an alarm warning device if required.

Installation

All thermostats in this series are normally supplied with a corrosion resisting bronze pocket which is screwed $\frac{1}{2}$ in BSP and which has a maximum working pressure of 250 lbf/in².

WT and WPS cases are tapped for 20 mm conduit and it is recommended that a short length of flexible conduit should be used to avoid imposing any mechanical strain on the thermostat head.

WPS Exposed Control Knob



WR Thermal Reset



WT Protected Control



Air Thermostats WTO/WPO/WTON

The thermostats in this series are stem type air thermostats and are designed to control the temperature in air ducts, industrial ovens and rooms or enclosures where the switch head and electrical connections must be outside the space being controlled because, for example, of high humidity. They can be used for on-off control of electrical heaters, solenoid valves, motorised valves or damper motors.

Physical Characteristics

Three stem lengths are provided (see overleaf) according to the scale range and sensitivity required. The high temperature versions have a 76 mm non-immersed section, for correct calibration. The stem is of brass alloy with a nickel-iron inner member which operates a changeover switch through expansion and contraction with changes in temperature. Large switch contacts are fitted to provide a long trouble-free life and the complete switch mechanism is enclosed in a dust-excluding moulded phenolic cover.

Types

WTO has a die-cast metal cover designed to protect the switch head and concealing the adjusting knob. It can be sealed against unauthorised interference which enables the instrument to meet CEE 2-drop waterproof requirements.

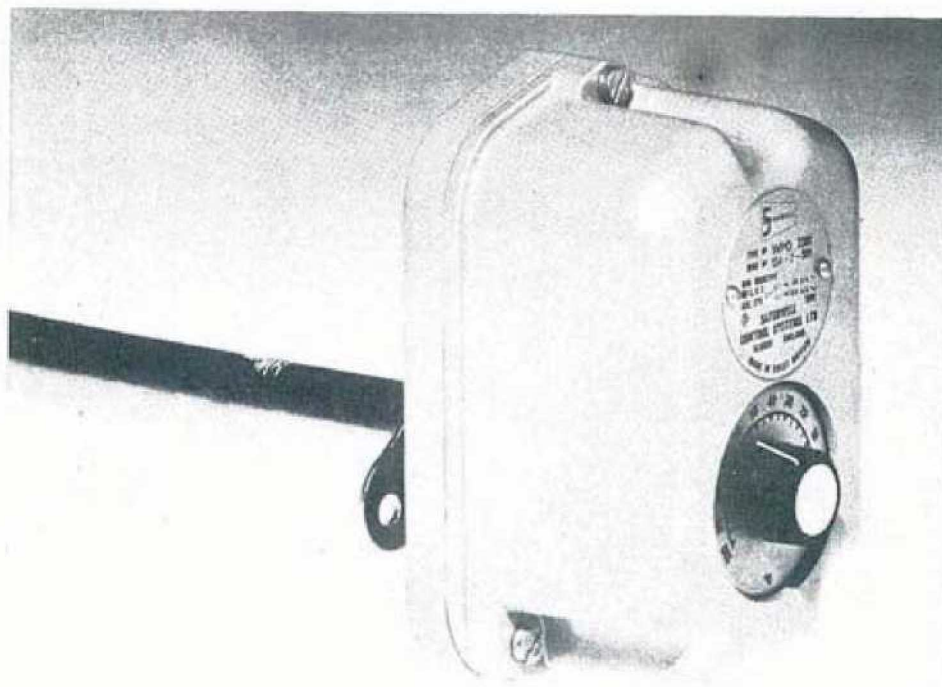
WPO also has a die-cast cover but with an external adjusting knob. The scale is calibrated in °C.

WTON thermostat is provided with a hand resetting device. This ensures that once the thermostat breaks the control circuit it will not be remade until the thermostat is manually reset by a pushbutton, located adjacent to the temperature adjusting knob. This facility enables the thermostat to be used as a high limit control with complete safety. An alarm circuit is closed when the main contacts open which can be used to operate a warning device.

Installation

Two screws secure the thermostat into a flange which can be separately mounted to a duct or other device. A 20 mm screwed conduit entry is provided and a continental cable gland can be supplied. Rigid conduit should not be taken direct to the case, but a short length of flexible conduit should be used to avoid imposing a strain on the thermostat head.

WPO



Thermometer LJ

The compact design and easily read scale of the LJ thermometer enables it to be installed in situations unsuitable for other types of thermometers. It has a particular application to heating and hot water systems and is easily fitted into a boiler, tank or piping.

Physical Characteristics

The sensitive stem of the thermometer contains a bimetal scroll, the free end of which is secured to an indicating disc so that a change of temperature produces positive movement of the disc without backlash. The whole of the stem containing the bimetal is immersible so that accurate and sensitive response to change of temperature is given.

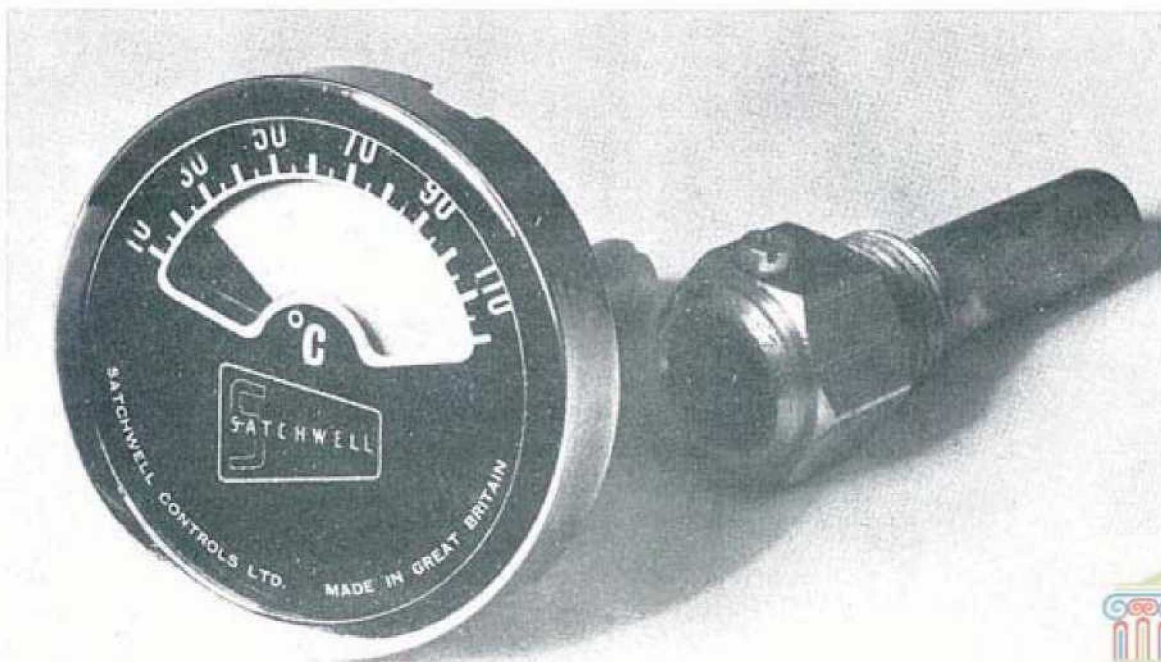
The dial of the thermometer contains a fixed scale plate with the graduations clearly marked. The indicating disc rotates against the scale and is coloured half red and half silver to facilitate reading at a distance.

Types

The instrument is available with either a 56 mm (2. 3/16 in.) or 150 mm (6 in.) stem. Thermometers with 56 mm stems are provided with a pocket, whilst thermometers with 150 mm stems can be supplied with a pocket, or with a flange for fixing on air duct. The 150 mm stems have an inactive portion for use with lagged vessels.

Installation

The thermometer is a dry mounting type and may be mounted in any attitude. The corrosion resisting bronze pocket is screwed 1/2 in. BSP and has a maximum working pressure of 17.6 bar (250 lbf/in²).



Thermal Relay TDW

The TDW is a compact, robustly constructed relay that is designed primarily for the control of domestic heating loads.

It is noiseless and simple in operation and can be used singly or in multiples for sequential switching for off-peak heating loads, under floor heating or warm air systems.

Being a thermal relay it has an inherent delay in operating of 10 to 60 seconds and so can be employed as a time delay switch. The main application for TDW is to enable large heating loads to be split into increments. This saves the whole load being switched on at one time and also makes it possible to control the load with a control of a lower switch rating.

The TDW relay may also be used for applications requiring one process to be initiated some time after another has started.

Physical Characteristics

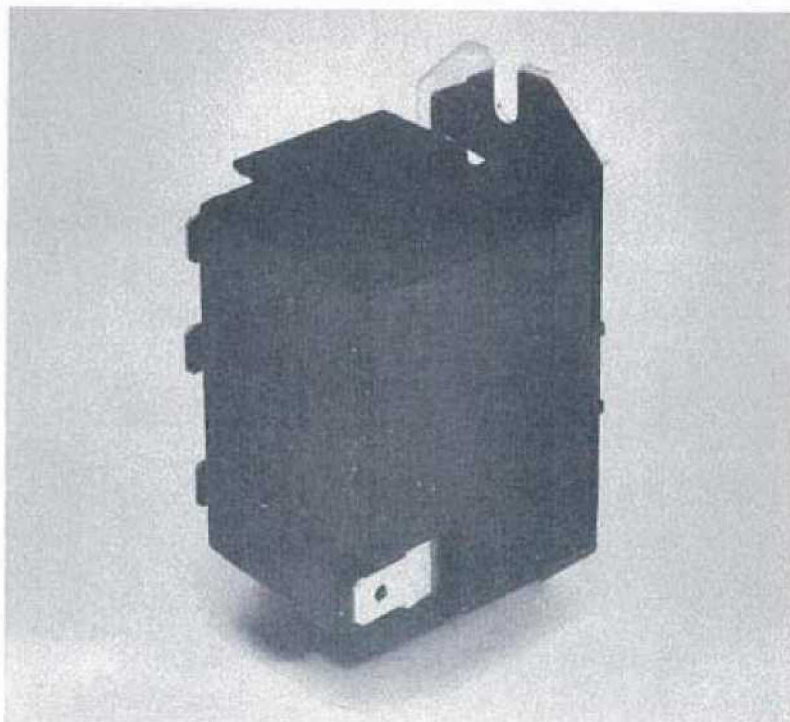
The TDW consists essentially of a 'U' shaped bi-metal pressing, one leg carrying the control winding, which when energised causes the bi-metal to deflect and operate a snap action switch. The other leg acts as a compensator for ambient temperature changes.

Types

The unit is available with either normally open or normally closed contacts.

Installation

Four terminals are provided on the relays the control winding being isolated from the load circuit. The TDW 1302 normally closed type has three terminals (see diagram) with the control windings in parallel with the load circuit.



Boiler Thermostats TK, TKR and TKD

The TK, TKR and TKD are stem type thermostats for controlling the temperature of automatically fired boilers and similar plant. These thermostats are approved by the British Standards Institute and conform with the requirements of BS.3955, the British Gas Corporation and DOBETA.

Physical Characteristics

The temperature sensitive element of each switch is a liquid filled phial connected by a capillary tube to a capsule in the head of the instrument. Changes of temperature sensed by the phial are communicated hydraulically to the capsule which actuates a micro-gap switch. The action is specially designed to give long life and to be radio and television interference free.

The switches are enclosed in a die cast metal casing. The adjusting knob is located on the outside of the casing. The temperature scale is marked on this knob so that the setting is clearly visible whether the instrument is mounted horizontally or vertically. Details of scale ranges are given overleaf. The button for hand reset operation is located adjacent to the adjusting knob.

Types

There are three main types in this range.

The TK is fitted with a thermally operated single pole changeover switch and has thermal reset action.

The TKR is fitted with a thermally operated single pole changeover switch. The contacts which open when the set temperature is reached can only be closed again by manual depression of the reset button.

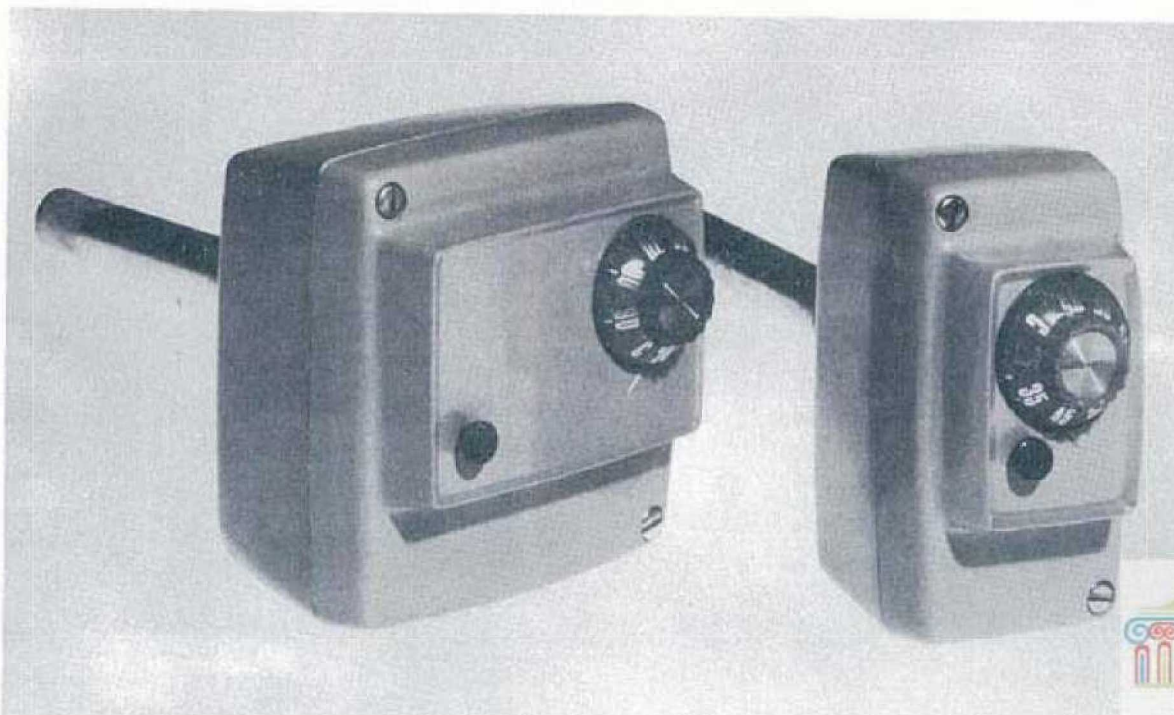
The TKD is fitted with two thermally operated single pole changeover switches. One is arranged to operate as a control thermostat and has thermal reset; the other is arranged to be a limit thermostat and may have either thermal reset or hand reset.

Installation

All thermostats are supplied with separate corrosion resisting bronze pockets screwed $\frac{1}{8}$ in BSPT (taper thread) and rated at 17.5 kg/cm^2 (250 lbf/in^2) maximum working pressure. The thermostats may therefore, be removed if necessary without draining the system. Both phials of the TKD types fit into a single pocket. The TK and TKR both have one cable entry at the lower end of the casing; the TKD has two cable entries. It is recommended that a short length of flexible conduit is used for final connection to the thermostat to avoid imposing a strain on the head of the instrument.

TKD

TKR



Clock Thermostat TLC

The TLC is a room thermostat with an attractive clock and built-in timeswitch which reduces the temperature at selected times.

Physical Characteristics

A 3-position switch provides the user with the choice of –

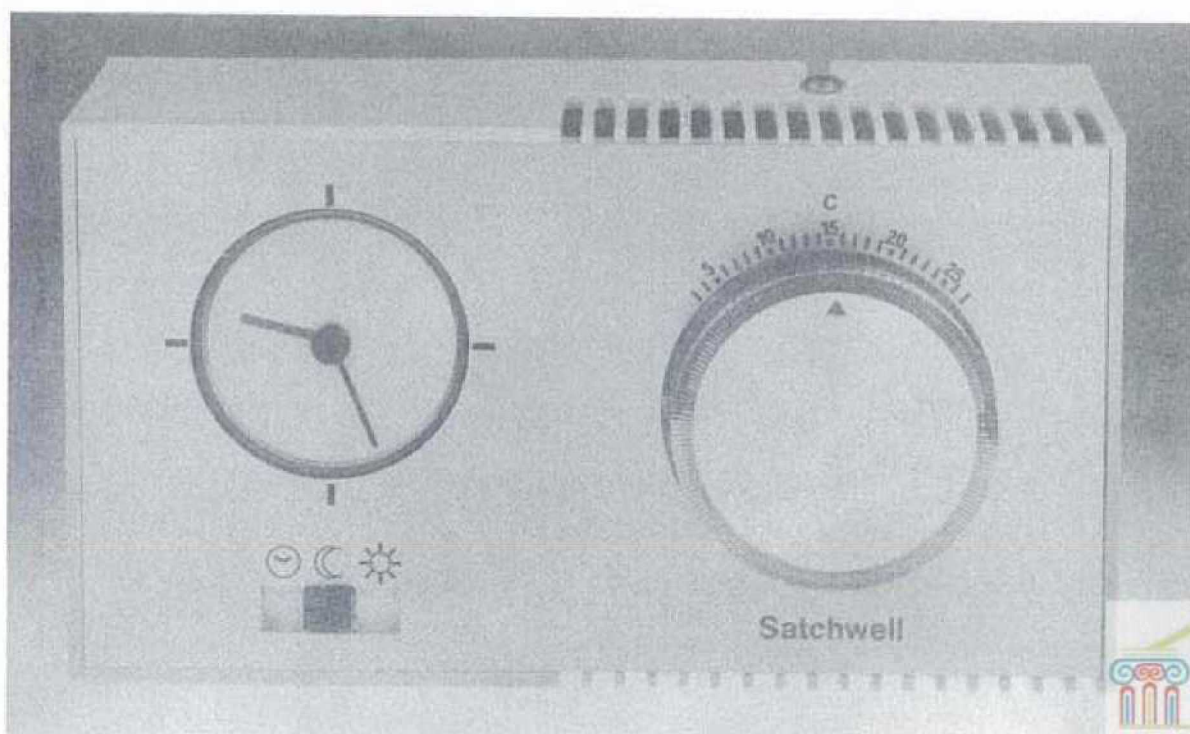
- 🕒 Automatic switching by timeswitch from set temperature to reduced temperature.
- 🌙 Override of timeswitch to give continuous temperature set-back.
- ☀️ Override of timeswitch to give continuous heat as set on thermostat.

The override switch can be adjusted at any time to suit the user's requirements for example, temperature reduction should the house be unoccupied, to save energy and avoid freezing. When set to automatic, a temperature set-back heater is energised once or twice in 24 hours. This is determined by the settings of the riders on the timeswitch.

For close control, an accelerator heater is incorporated, which reduces temperature differential to a minimum.

Installation

The instrument is mounted in a ventilated plastic cover. Provision has been made for surface wiring and a backplate is provided for wall or conduit box mounting. The thermostat should be mounted in a position which is typical of the space to be controlled and where it will not be affected by draughts, heat radiation or the sun. When used for on/off control such as switching the pump, it is important that the accelerator heater is connected as shown in diagram 1 overleaf.



'Simmerstat' Regulator

for electric cooker hotplates, boiling rings
and electric appliances

The Simmerstat provides infinitely variable control of the heat output of electric hotplates, boiling rings, grills, grill-boilers and warming cupboards. Its infinite control action allows any heat from zero to full to be selected at the turn of a knob. Appropriate positions are easily chosen by the user for simmering, quick boiling, jam-making or frying. In addition, the Simmerstat cuts down electricity consumption by up to 50 per cent.

It is also suitable for heat control of other appliances such as wash boilers and drying cabinets. No special allowances for fitting are necessary as it occupies the same space and utilises the same fixing holes as ordinary multi-heat switches and wiring is simplified.

Operation

Simmerstat regulators operate by opening and closing a snap-action switch in the load circuit at precise time intervals, the percentage of

time 'on' to time 'off' being varied by turning the knob. In this way, the average power input is regulated to any desired level. The time intervals are short, so that a smooth heat output from the appliance is assured.

Physical Characteristics

The control knob has a scale marking in five divisions from 'ON' to 'FULL'. The control can be rotated in either direction, and there are definite detents in the OFF and FULL position. The switching mechanism is mounted on phenolic with a phenolic cover designed to withstand the temperature conditions obtained in the switch compartment of a cooker when the oven is operating (up to 120°C).

Automatic compensation is provided for variations in ambient temperature of up to 85°C in the switch mechanism. Compensation for voltage fluctuations of up to ± 15 per cent is also automatic. Once a setting is chosen for a cooking operation, the rate of heat

output will not be affected by voltage fluctuations within these limits.

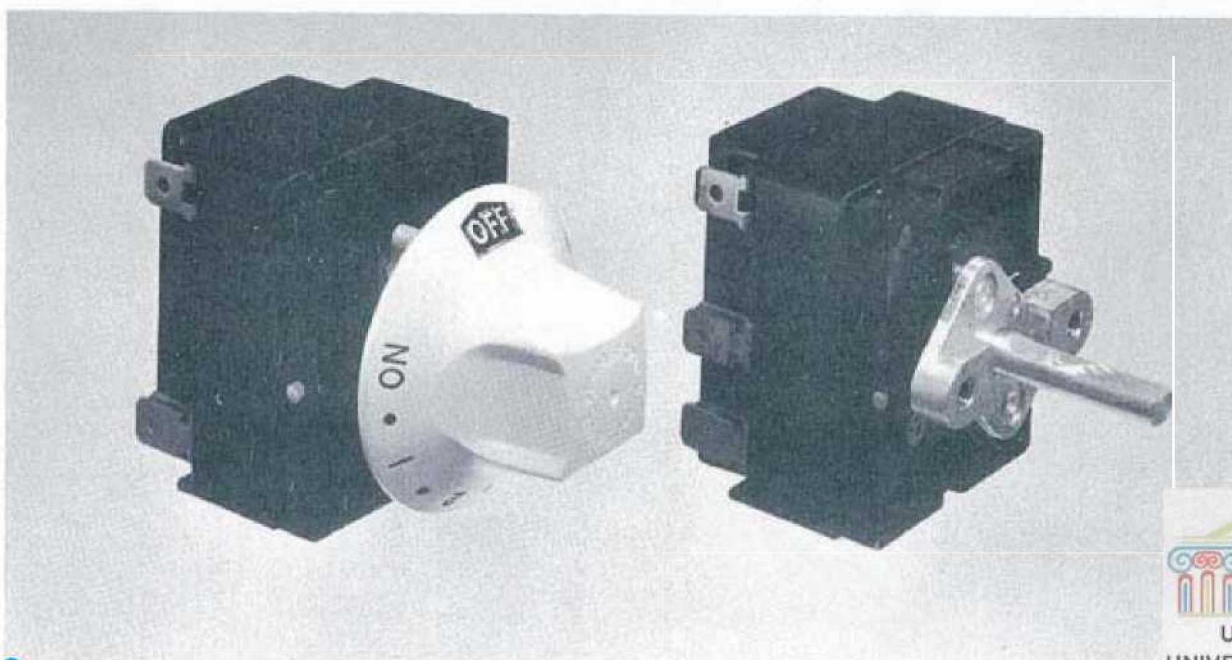
The standard control knob is a white plastic moulding with black scale markings. The Simmerstat can be supplied without a knob for those manufacturers who wish to use their own design.

Fixing

Single hole fixing is provided by a threaded bush with registering lugs for location on the switch panel. It is secured by a single centre fixing nut. Alternatively, 6mm spindle and two M4 tapped holes to DIN standard are available to order.

It may be fitted in any convenient position as there is no thermal contact with the hot plate.

Wiring connexions should be made in accordance with the diagrams overleaf; amp type terminals are provided on all units. Screw adaptors can be supplied.



Remote Phial Thermostats TO

The TO provides accurate temperature control for electric cooker ovens. It is equally suitable for gas ovens with electric control systems and also as a charge control on electric storage radiators.

Physical Characteristics

A thermally sensitive phial is connected via a 1000 mm (40 in) capillary tube to the switch unit. Temperature changes of the liquid in the phial are transmitted hydraulically through the capillary to a capsule which operates a 15A micro-gap switch.

The nominal control range is 100-290°C (200-550°F) – however, owing to the thermal effects of individual oven design, it is frequently necessary to apply a false setting. Therefore to facilitate oven design the TO has an adjusting screw, located on the front cover, which allows a false setting of $\pm 28^\circ\text{C}$ (50°F), making the instrument suitable for a wide variety of design situations. Double tab wiring terminals are provided for fast-on connectors.

Whilst most manufacturers employing the TO prefer to provide their own control knob and trim, a modern styled knob and bezel are available if required.

The instrument is approved to BS 3955.

Installation

The switch unit is provided with locating lugs and a screwed nosepiece for fixing to panels up to 6.5 mm ($\frac{1}{4}$ in) thickness. When the knob and bezel mentioned above are used, the maximum panel thickness is 3.2 mm ($\frac{1}{8}$ in). It may be fitted in any position within the limits of the capillary tube provided the temperature surrounding the unit does not exceed 107°C (225°F).

The phial may be installed in any attitude in the oven in a position which gives adequate reading over the complete control range. The capillary and phial must never be exposed to temperatures above 315°C (600°F).

In the case of storage radiators the phial should be installed so that it reads the core temperature by interference without exceeding the operating limits of the instrument.

