

The type 40TH Thermostat is designed for use in domestic cooking, heating and catering appliances and varied industrial applications.

It follows the successful Type 90TH, but is smaller in all dimensions – height, width and depth. Its compactness better serves the appliance designer for whom control compartment space is at a premium.

Having a snap-action switch movement, the 40TH satisfies EEC directive 76/889 for radio interference, which in effect outlawed slow-make-and-break switching as traditionally used in Diamond H thermostats for cooking applications up to that time. It naturally also meets market requirements in which snap-action is a technical necessity, e.g. where the thermostat operates a solenoid valve, contactor or relay.

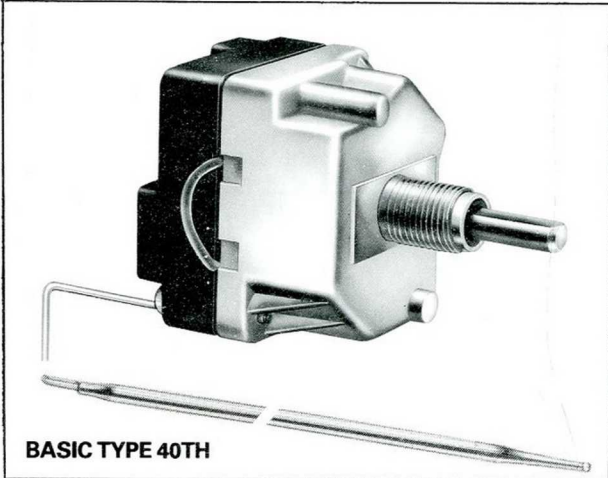
The 40TH Series is available either for single-hole bush fixing, with two locating spurts, to UK standard (40TH, 41TH and 42TH) or for Continental fixing with two screws on 28 mm centres (44TH). The Series is fitted throughout with 6.3 mm (0.250") tab terminals for push-on connectors.

The 41TH and 42TH versions incorporate an auxiliary switch to provide additional circuit control as required in more complex applications such as electric cookers with grill/oven combinations – or fan ovens.

Diamond



Thermostats Series 40TH Snap-action



BASIC TYPE 40TH

Basic Types

40TH – Basic Thermostat – single pole, single circuit.

41TH – Basic Thermostat – with single pole front auxiliary switch.

42TH – Basic Thermostat – with double pole front auxiliary switch.

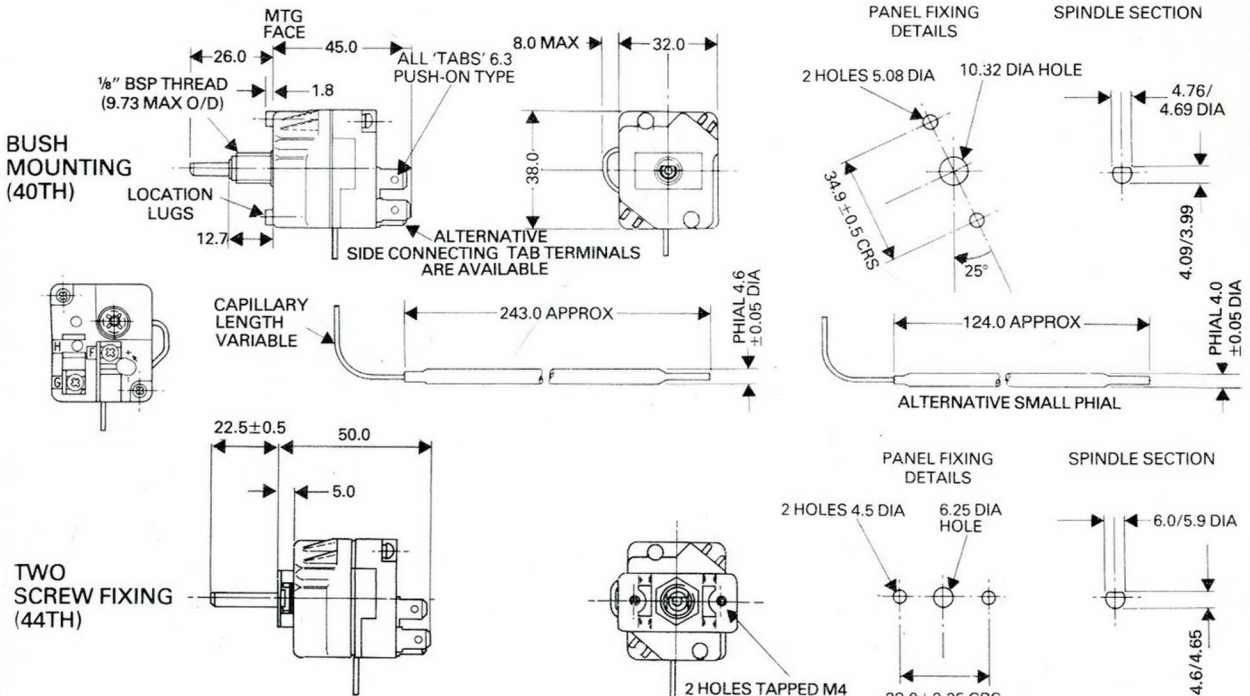
Above are for bush mounting ($\frac{3}{16}$ " dia. spindle).

44TH – As 40TH but for 2-screw fixing (6 mm spindle).

Max. capacity of front auxiliary switch is 2-circuit changeover (6 terminals).

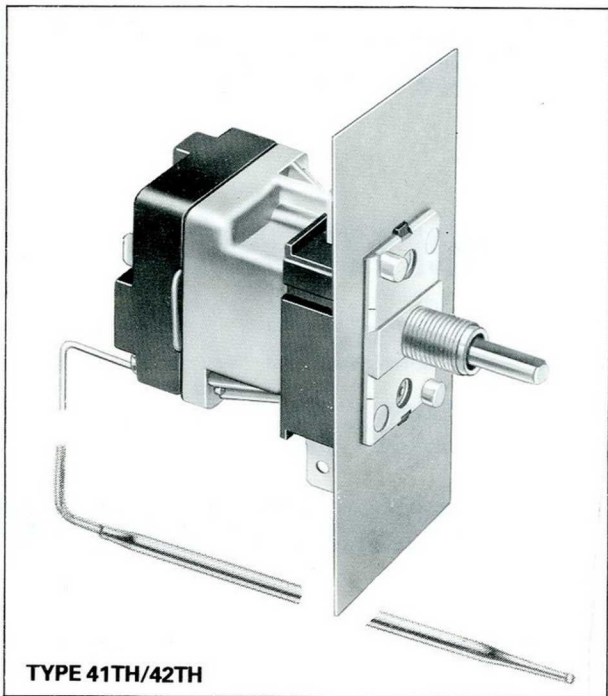
(See overleaf for dimensions, etc. of 41TH/42TH.)

Dimensions – 40TH/44TH

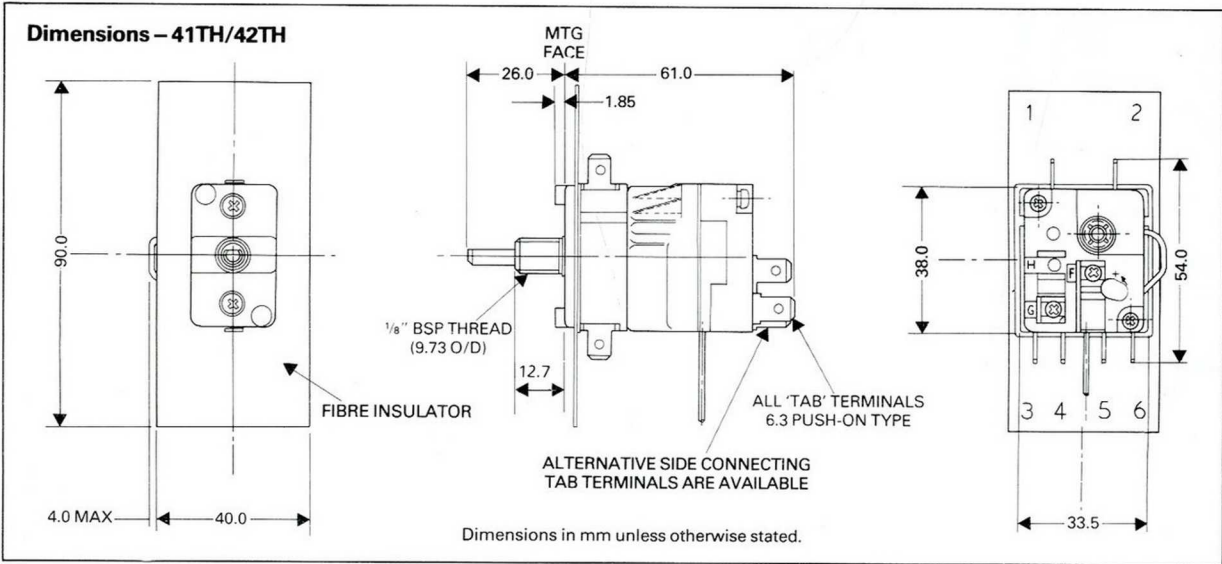


Dimensions in mm unless otherwise stated.

Type 41TH/42TH is a 40TH with a front auxiliary switch fitted to provide additional circuit control as required in more complex applications such as an electric cooker with two ovens or a fan-assisted oven.



TYPE 41TH/42TH



Specification for 40TH Series	
Rating	Temperature Ranges
Thermal Switch – 250V AC 15A	60–290°C standard over 286 degrees angular (standard)
Auxiliary Switch – 250V AC 15A	Other ranges to customer specification
Control	(Minimum level 50°C. Maximum level 300°C)
Thermal Switch – Single pole, single circuit, snap-action	Capillary Length
Auxiliary Switch – Maximum 2-circuit changeover slow-break	460 mm Minimum (other lengths available on application)
Terminations	Insulated sleeving can be fitted if required.
6.3 mm (0.250”) push-on type	Phial size
Screw and clamp adaptors available if required	243 mm × 4.6 mm O/D approx. (standard)
Ambient Temperature	140 mm × 4.0 mm O/D approx. (alt.)
Head temperature – maximum 110°C	BEAB certified to BS3955 Pt.3 1972 Type 1 control

Dimensions and specifications subject to change without notice.

Diamond H Controls Limited.

A subsidiary of OAK Industries Inc., Vulcan Road North, Norwich NR6 6AH, England. Tel: Norwich (0603) 45291/9. Telex: 975163.

6K (1.85) Printed in England.

These well-proven controls, formerly manufactured by Harper-Wyman Ltd., provide a range of capillary thermostats and flame supervision devices for gas cooking and heating appliances.

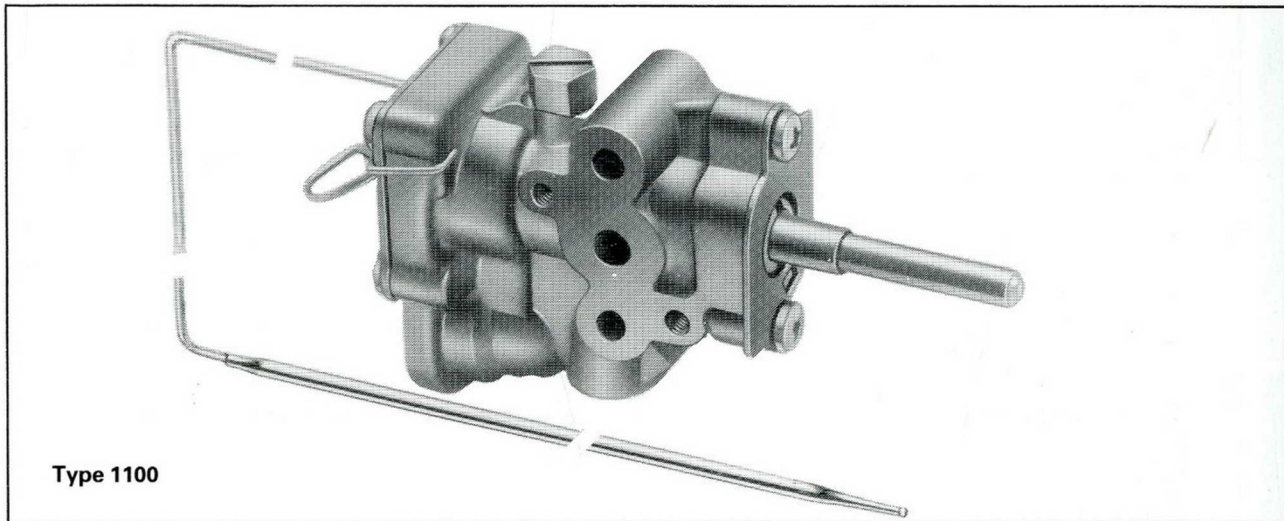
Diamond



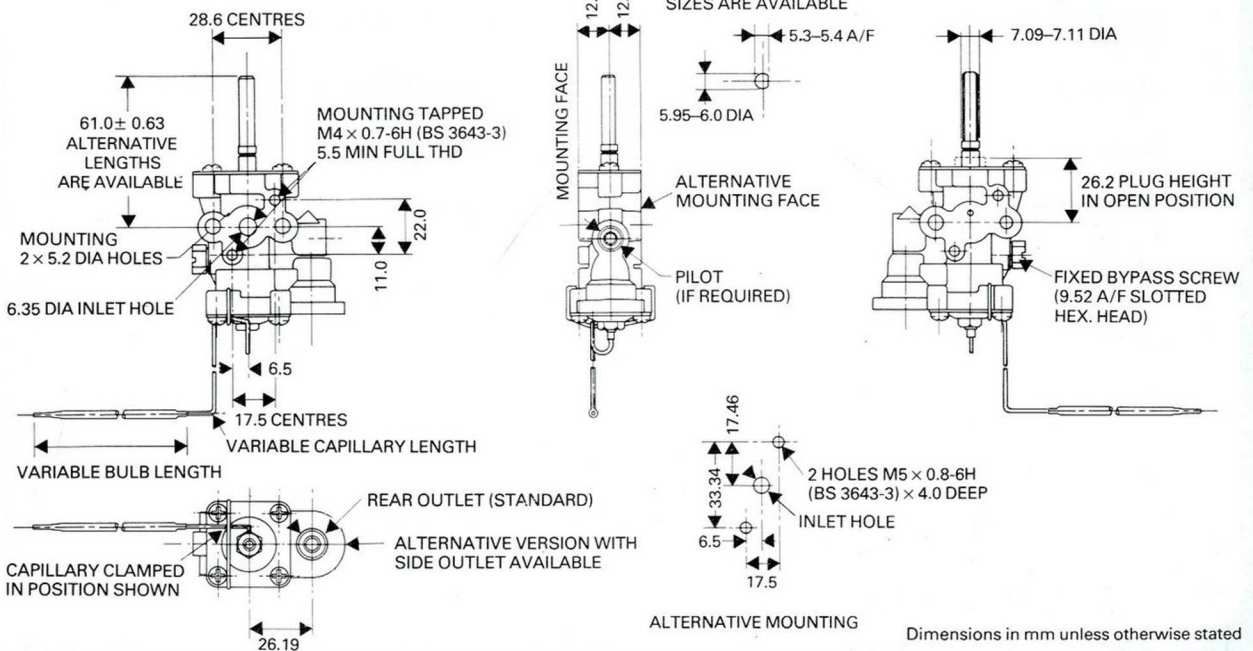
Gas Thermostat

This thermostat has a simplified construction using a parallel plug, and a direct acting sensing element. The exterior of the device has been arranged to provide a variety of fixing and gas connection positions. Sizes of gas outlet are available to 10 mm. Standard features include a fixed bypass and pilot outlet position. All variants are suitable for use on all gas types.

Gas Controls



Dimensions – Series 1100 Gas Thermostat



Flame Supervision Devices

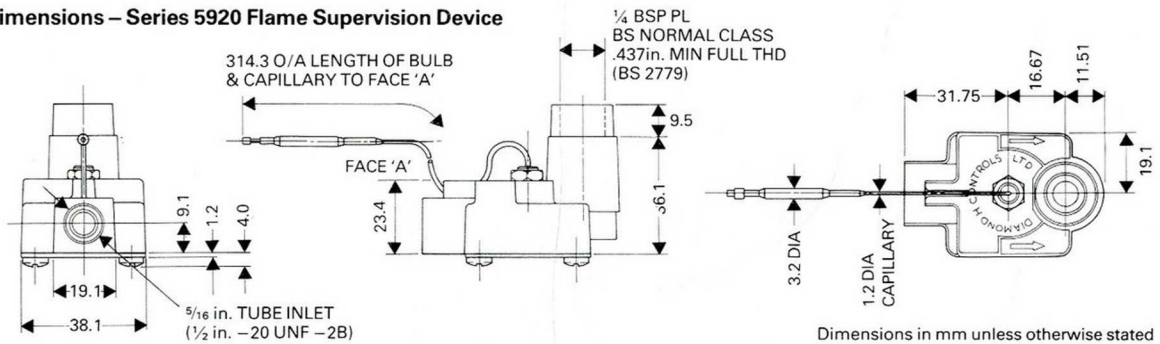
Flame supervision devices perform an important function in ensuring the safety of gas appliances. The main requirements of such a device are quick response and safe operation. These requirements are readily met by the 5920 Series mercury vapour actuated flame supervision device.

Many features can be added to standard designs, such as fixed bypass, pilot outlet or pressure test points. Gas inlet pipe sizes can be accommodated up to 8 mm, with outlet thread sizes to G 1/4 .



Type 5920

Dimensions – Series 5920 Flame Supervision Device



Specification for 1100 Gas Thermostat

Gas

1st, 2nd and 3rd family.

Full Flow Capacity (2nd family)

0.58 m³/hr at 0.75 mbar pressure drop.

Temperature Range

80°C to 280°C.

Ambient Temperature

Body – Maximum 120°C.
Sensor – Maximum 315°C.

Mounting

3 standard configurations (see dimensioned drawing).

Outlet

Maximum 10 mm tube fitting.

Capillary Length

To suit customer specification.

Sensor

Diameter – 3.2 mm or 4.6 mm standard.
Length – to suit customer temperature range.

Spindle

To suit customer specification.

Rotation (Anti-clockwise from Off)

55° low reference position.
55° – 295° active dial.

Ignition Switch

Facility for mounting a front rotary switch is available.

Included in British Gas List of Controls. Conforms to BS.4201.

Specification for 5920 Flame Supervision Device

Gas

1st, 2nd and 3rd family.

Full Flow Capacity

708 dm³/h air at 1 mbar pressure drop.

Ambient Temperature Range

0°–110°C.

Flame Sensor Temperature

830°C maximum.

Opening and Closing Times

Opening – 60 seconds max./ Closing – 60 seconds max.

Mounting Attitude

Universal.

Inlet/Outlet

Inlet – 8 mm tube (female) max./ Outlet G 1/4 (female) max.

Capillary

Standard length 315 mm (including bulb)

Included in British Gas list of controls Conforms to BS 6047.

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5K (1.85) Printed in England.

The Diamond H range of water heater thermostats has been designed to meet a variety of requirements in domestic and commercial water heating systems.

The Types RS and 2RS are suitable for both top- and side-entry applications, and the WS, a short-length unit (106mm entry length) for side-entry applications. The Types RS and 2RS are both available in three alternative stem lengths: 178mm (7"), 279mm (11") and 457mm (18").

The extremely small head size of the RS makes it specially suitable for the control of white meter, dual-element heaters in which two thermostats are required to fit into a standard immersion heater head.

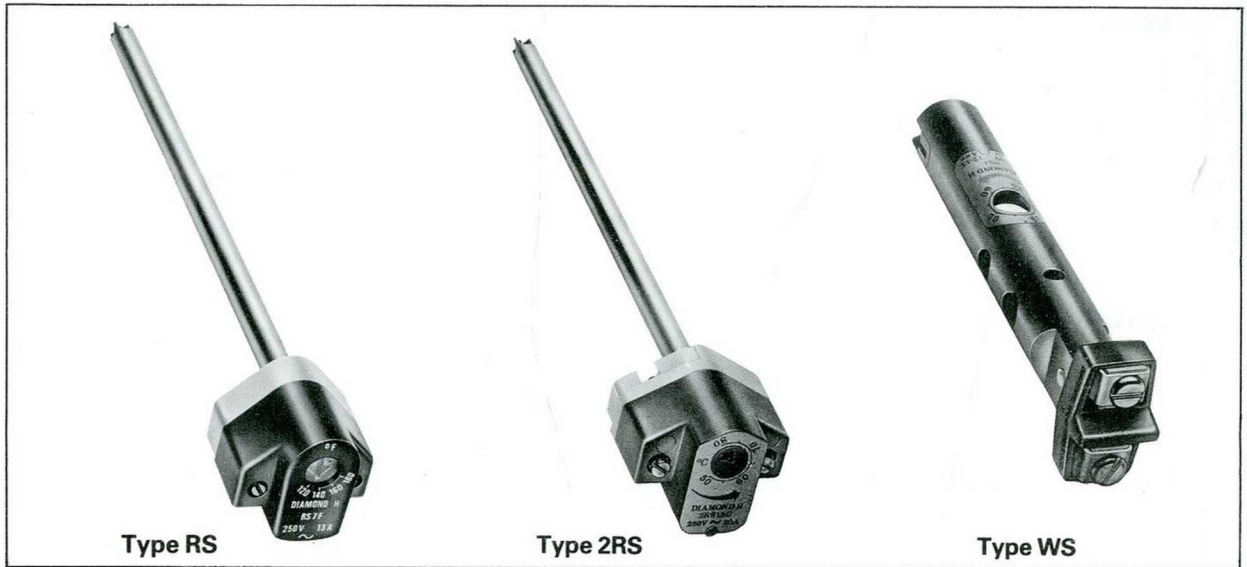
Rated at 20A 250V AC the Type 2RS is intended for applications requiring a heavier current rating than the Type RS which is rated at 13A 250V AC.

The WS lends itself to ease and speed of installation with its accessible terminals incorporating a saddle clamp.

These thermostats are not suitable for control of unvented or pressurised water heating systems unless an additional over-pressure and/or over-temperature control is fitted.

Diamond

Thermostats for Electric Immersion Heaters



Principles of Operation

TYPES RS AND 2RS

Operation is based upon differential expansion between a brass tube and an inner nickel/iron rod, the resulting movement being used to actuate a specially-developed snap-action micro-gap switch.

TYPE WS

A snap-action switch is actuated by deflection of a bi-metal member as a result of temperature change.

Construction

TYPE RS

The switch assembly is mounted on a porcelain base, with brass pillar terminals, accessible through a black phenolic cover which provides for entry of the mains wiring.

TYPE 2RS

The 2RS is probably the most electrically and thermally robust thermostat of its type on the market.

Heavy brass terminals with large brass screws support thick copper conductors to the switch which is of the contactor type having a double micro-gap air break.

The switch assembly is mounted on a stable ceramic base with a green cover of electrically superior material, namely a polyester thermosetting moulding.

The terminal screws protrude just proud of the cover to assist location of the screw-driver slot in difficult wiring situations.

TYPE WS

The bi-metal and snap-action switch members are incorporated in a black phenolic tube with a setting screw accessible through a hole in the side of the tube.

Standard Types

Type	Stem Length ('L')		Approx. Range	Typical Differential
	mm	in		
RS7C	178	7	48–83°C	5–10°C
RS7F	178	7	119–182°F	9–18°F
RS11C	279	11	48–83°C	4.5–8.5°C
RS11F	279	11	119–182°F	8–15°F
RS18C	457	18	48–83°C	3–7°C
RS18F	457	18	119–182°F	5–12°F
2RS7C	178	7	48–83°C (119–182°F)	6–11°C (12–20°F)
2RS11C	279	11	48–83°C (119–182°F)	4.5–8.5°C (8–15°F)
2RS18C	457	18	48–83°C (119–182°F)	3–7°C (5–12°F)
2RSW11C *	279	11	30–86°C (86–187°F)	4.5–8.5°C (8–15°F)
WS1	106	4.18	48–83°C (119–182°F)	2–8°C (4.5–14°F)

*See overleaf.

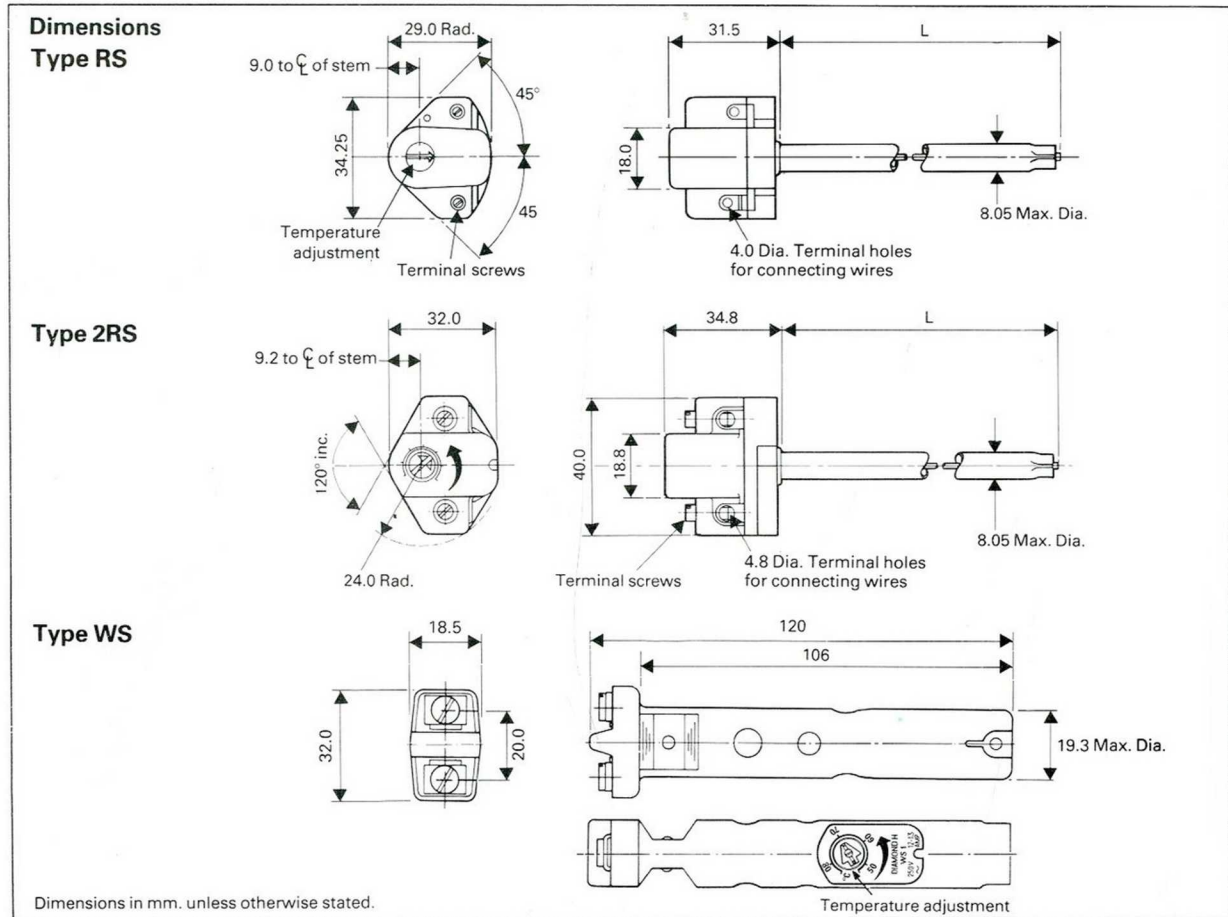
Other temperature ranges are available.

Special Versions
TYPE 2RSW11C*

This thermostat has an extended temperature range making it particularly suitable for providing warm water for use in schools and nurseries, etc., generally complying in this respect with G.L.C. and other requirements. It is also popular with housing associations and is suitable for export to Middle East countries requiring that 32°C and 85°C markings be shown on the scale.

TYPE WS3

A special unit suitable for 'sink/bath' applications where one thermostat is required to control two elements via a remote switching system. This thermostat can also be used with a single element to provide depression of about 10°C from operation of a remote switch.



Specification

	Type RS	Type 2RS	Type WS
Contact Rating	250V AC 13A	250V AC 20A	250V AC 13A (for use with 3kW heaters only) For applications with loads less than 3kW consult manufacturer.
Maximum Head Ambient Operating Situations as defined by BS3955	100°C Dirt free	100°C Normal	100°C Dirt free

All types comply with BS3955 Part 3: 1979 "Electrical Controls for Household and Similar Purposes".

The Types RS and 2RS are 'Type 2' controls; viz: fully approved as meeting declared performance and safety criteria.

NOTE:
 The user must ensure that the cable used for wiring is rated to withstand the temperature rise of terminals, which will be additional to the surrounding head ambient,

e.g. In the case of immersion heaters the head ambient within the immersion heater head can be approaching 70°C and current carrying terminal temperature in excess of 85°C.

Heat resisting 85°C cable to BS6141 Table 8 (E.P.R. insulated/CSP HOFR sheathed) will be necessary. 2.5mm² is considered suitable for 13A and 4.0mm² for 20A.

P.V.C. is regarded as unsuitable for immersion heater wiring.

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Diamond H Controls Limited.

Diamond

1TS Thermal Switch

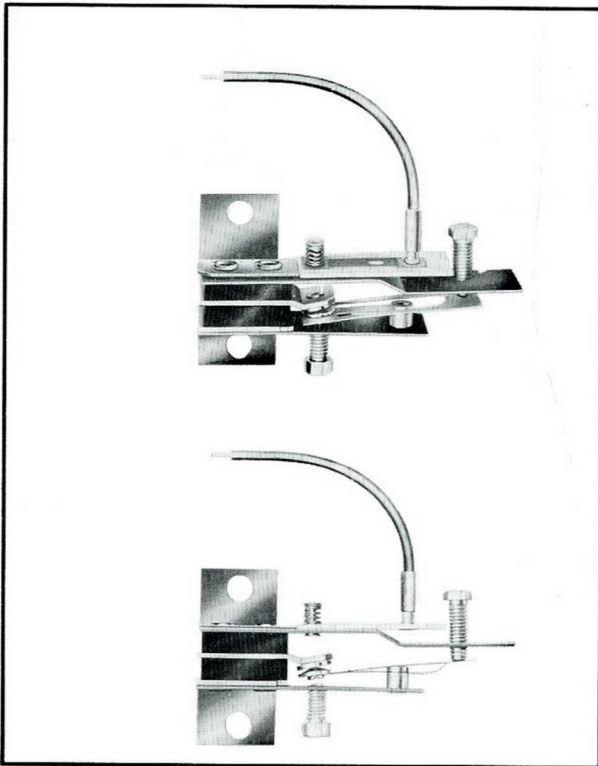
The 1TS Thermal Switch is a low-cost single-pole relay using as its motive power a low-power heater applied to a bimetal.

The snap-action microswitch, actuated by the bimetal member, has over many years proved its ability to handle arduous inductive loads, notably in the field of street lighting.

The 1TS will operate equally satisfactorily either by step or by gradual power changes to the heater.

A 'shear-break' lever is available as a special feature. This lever operates only to break sticking contacts tending to have become welded together under overload conditions.

The 3-watt heater has a high reliability factor, comprising an alumina substrate on which is deposited a screen-printed resistor material.

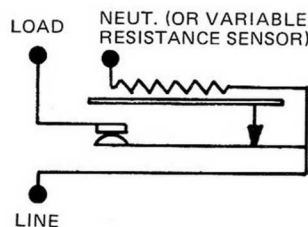


Types

1TS-A1 has Normally-Closed contacts

1TS-B1 has Normally-Open contacts

SCHEMATIC WIRING DIAGRAM



Typical Applications

Street lighting

Used in series with a photocell, the 1TS is widely employed for direct switching of the lamp load in street lighting according to the light level; lighting columns can thereby be economically fitted for independent operation, either singly or in pairs.

Security Lighting

The 1TS is used in series with a photocell, as in street lighting, to switch the security lighting on at dusk and off at dawn.

Sequence Switching

Two methods are available by using multiple units:—

- i) In series: A energises B, B energises C, etc (Fail-safe)
- ii) In parallel: A operates, then B, then C, etc (Shorter time functions)

Inhibitor Switching

Circuit B cannot be operated unless Circuit A is complete

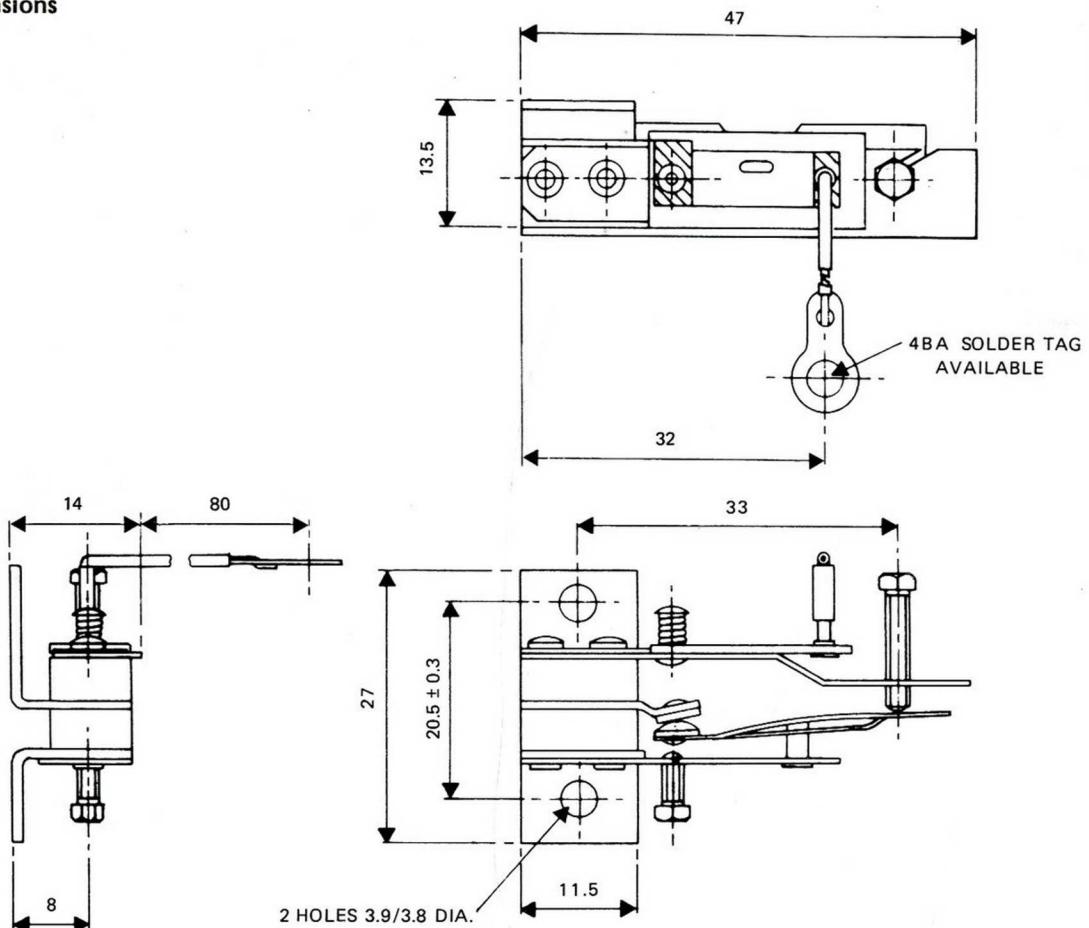
Time Delay

Units can be calibrated to operate after a specified time — 15 secs. minimum and 40 secs. maximum.

Standby Switching

A useful feature of the 1TS in this application, as compared with other devices, is its inherent time delay before switching the auxiliary power supply (preventing the nuisance of operation caused by short-term mains interruption).

Dimensions



Dimensions in mm. unless otherwise stated

Specification

Rating

Complies with the requirements of BS5972.

Voltage Range

60-200V AC adjustment capability

Contact Gap

Recommended 0.2 mm. Minimum

Switch Differential

Adjustable

N.B. The 'shear-break' lever described in the introduction to this leaflet is fitted on some models as an optional extra. This feature, which is available for applications where inrush currents of an inductive nature can cause contact stick, is not shown in the foregoing drawings and illustrations but full details can be provided on request.

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DIAMOND H CONTROLS LTD

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TECHNICAL SALES BULLETIN

WATER HEATER THERMOSTAT



TYPE WS

The type WS Thermostat has been designed for use with the standard range of BS 3456 Side Entry Immersion Heaters.

The control meets the demand for a low cost, efficient thermostat of small dimensions.

Principle of Operation

The design of the thermostat embodies a simple bi-metal operated, snap-action switch, which operates when subjected to a temperature change.

Temperature setting may be altered by adjusting the small white indicating disc which is marked in 10°C intervals.

Special Wiring Feature

An improved terminal design incorporates the clamping saddle on the TOP side of the terminal, for speedier installation.

a subsidiary of OAK Industries Inc.

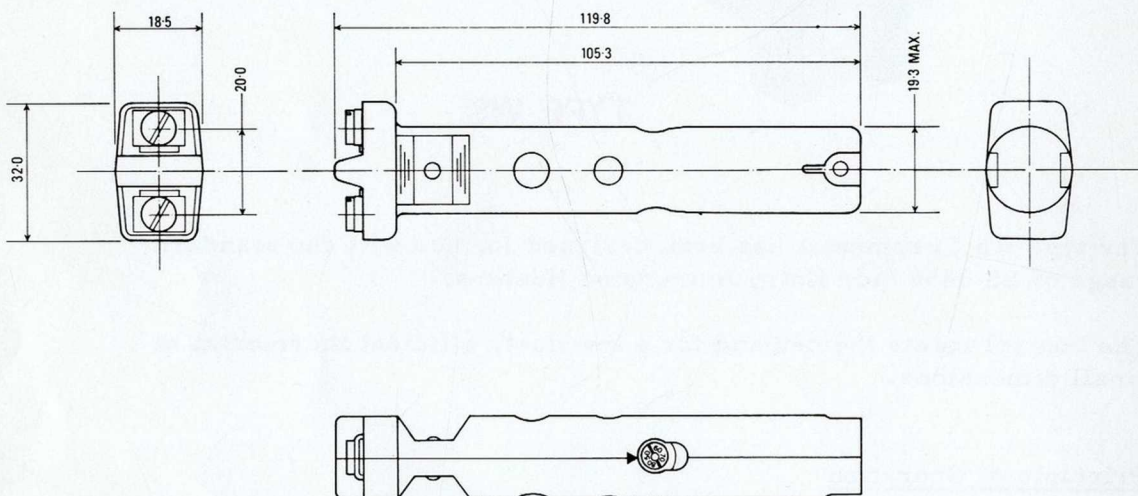
Specification

The WS Thermostat has been designed to conform to BS 3955, Part 3, 1972 Type I control.

Rating 13 amps, 250V A.C. For use with 3 kW Immersion Heaters only.

Temperature Range 49°C - 85°C (120°F - 185°F) adjustable in 10°C intervals.

Differential 2 - 8°C depending on Immersion Heater design.



SPECIFICATION AND DIMENSIONS SUBJECT TO ALTERATION
WITHOUT NOTICE.