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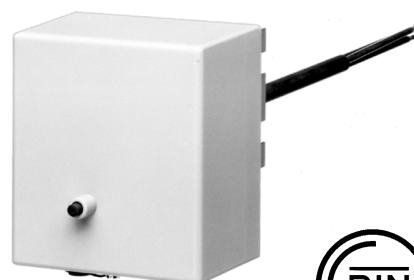
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# Warm-air Thermostats WTHc Series tested to DIN 3440

for stock items  
 see page 4



WTHc-2280



WTHc-2280-SW

## Brief description

Thermostats control and monitor thermal processes. Thermostats in the WTHc series are suitable for application in warm-air heating installations to DIN 4794. They consist of 3 separate sensing and switching systems that can function as temperature controller TR, temperature monitor TW and safety temperature limiter STB.

In fault condition, the STB sets the system being monitored to a safe operational state. Warm-air thermostats operate on the principle of liquid expansion. Microswitches serve as the electrical switching devices.

## Switching action

### Temperature controller TR and temperature monitor TW

When the temperature at the probe exceeds the selected setpoint, the microswitch is operated via the transmission mechanism and the circuit is opened or closed. When the temperature drops below the selected setpoint (by the amount of the switching differential), the microswitch returns to its initial position.

### Lock-out facility on the safety temperature limiter STB

If the temperature at the probe exceeds the set limit, the circuit is opened and the microswitch is locked out mechanically. After the temperature has fallen below the critical temperature by about 10 °C, the microswitch can be reset manually.

### Self-monitoring facility on the safety temperature limiter STB

In the event of a measuring system failure, i.e. if the expansion liquid has leaked, then the pressure on the diaphragm of the STB drops and the electrical circuit is permanently open. It is no longer possible to reset the system. When the temperature at the probe falls below -20°C, the circuit is also opened, but will close again automatically when the temperature rises.

## Types and approvals

Types	Switching action	DIN Reg. No.	Test
WTHc-2280 WTHc-2240	TR/TW/STB	TR/TW/STB 106405	 DIN 3440

Extra codes	
<b>U</b> STB with break (n.c.) contact, lock-out and additional signal contact (Type WTHc-2240 only)	<b>SW</b> housing with IP54 rating, protected against dust and splashing water

## Technical data

### Control ranges and limit

Control range / limit	Fan controller	Burner monitor	Protection temperature limiter
	TR – System 2 +20 to +80°C	TW – System 2 +70 to +90°C	STB – System 80 or 40 limit 100°C

### Capillary and temperature probe

Capillary	material: copper (Cu), Mat. Ref. 2.0090
	diameter: Ø 1.5 mm
	capillary length including probe: 350 mm with support tube 1250 mm without support tube <sup>1</sup>
	minimum bending radius: 5 mm
Temperature probe	material: copper (Cu), Mat. Ref. 2.0090, brazed
	diameter: 3 probes Ø 4 mm

<sup>1</sup> probe coding on version with capillary: fan controller TR: red, burner monitor TW: blue

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**Electrical data**

Switching device	Fan controller Burner monitor	Safety temperature limiter STB System 80	Safety temperature limiter STB System 40/U
	microswitch with changeover contact	microswitch with break (n.c.) contact and lock-out	microswitch with break (n.c.) contact, lock-out and additional signal contact
Max. contact rating	10 (2) A, 230 V AC +10%, p.f. = 1 (0.6) 0.25A, 230 V DC +10%		
Electrical connection	via terminal strip, after removing housing cover; temperature controller and terminal strip are mounted on a printed circuit board (epoxy-resin glass fiber)		

**Operating data**

Switching differential	Switching action:	fan controller TR burner monitor TW	14 ± 2°C 6 ± 1°C
Switching point accuracy	Switching action:	in upper third of scale or at limit setting	at start of scale
	fan controller TR	± 4°C	± 6°C
	burner monitor TW	± 4°C	± 4°C
	safety temperature limiter STB	+0 -5°C	- - -
Ambient temperature effect	on switch head: 0.35 °C per °C on capillary: per meter: 0.07 °C per °C		
Operating medium	air		
Time constant	in air: ≤ 120 sec		
Safe overtemperature	at the temperature probe: +200°C		
Permissible storage temperature	-50 to +50°		
Permissible ambient temperature in use	80°C max.		
Nominal position (NL)	to DIN 16 257, NL 0 — NL 90 (other NL on request)		

**Housing**

standard	housing cover: polycarbonate base: sheet steel, zinc-plated	color: pebble gray RAL 7032
Extra code SW	housing cover: polycarbonate, impact-resistant base: die-cast aluminium, painted	color: pebble gray RAL 7032 color: anthracite gray RAL 7015
Setpoint adjustment	safety temperature limiter STB: fixed factory setting	fan controller TR and burner monitor TW: switching point adjustable with screwdriver, after removing housing cover
	<b>standard</b>	<b>with extra code /SW</b>
Enclosure protection	EN 60 529 - IP40	EN 60 529 - IP54
Cable entry	2 push sockets	clamping nipple M 20 x 1.5, for 8 — 10 mm cable dia.
Switch head fixing	by 2 screws through housing base	by 2 screws at the flange of the support tube, then by one screw at the hexagon of the support tube
Weight	approx. 0.7 kg	

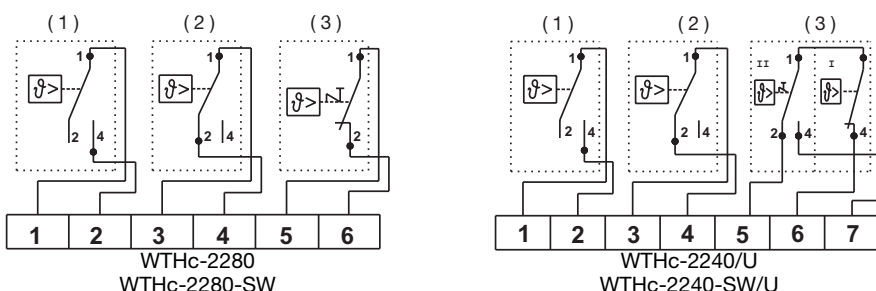
**Note:**

Physical and toxicological properties of the expansion fluid that may escape in the event of a system fracture.

Control range with end of scale	Dangerous reactions	Fire and explosion hazard		Water contamination	irritant	Toxicological data	
		Ignition temperature	Explosion limit			danger to health	toxic
≤ +200°C	no	+ 355°C	0.6 — 8 % v/v	yes	yes	1	no

At present, there is no restrictive statement from the health authorities concerning any danger to health over short periods and at low concentrations, e.g. after a fracture of the measuring system.

**Connection diagrams**



- (1) TR (fan)
- (2) TW (burner)
- (3) STB (burner)

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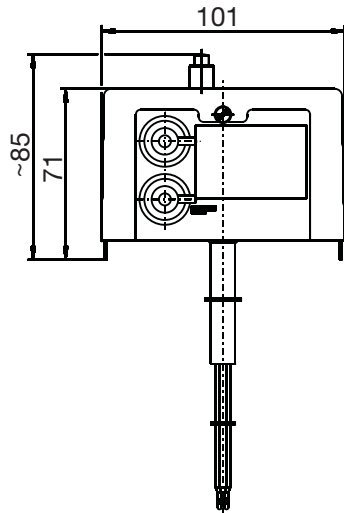
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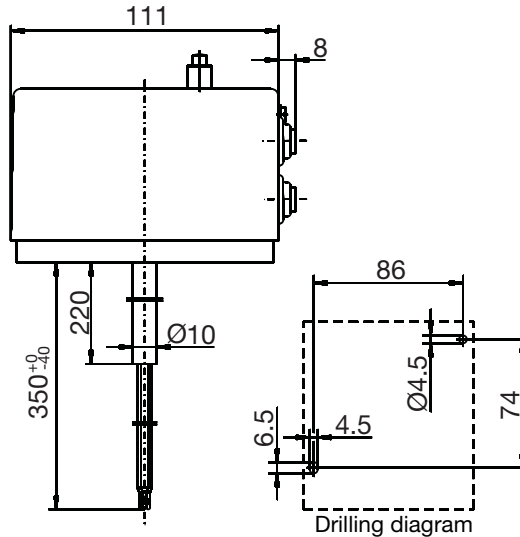


## Dimensions

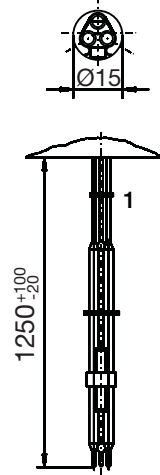
WTHc-2280  
 WTHc-2240/U  
 IP40 protection



Style 1  
**with** support tube,  
 switch head mounted by 2 screws  
 through housing base,  
 extra code **r**

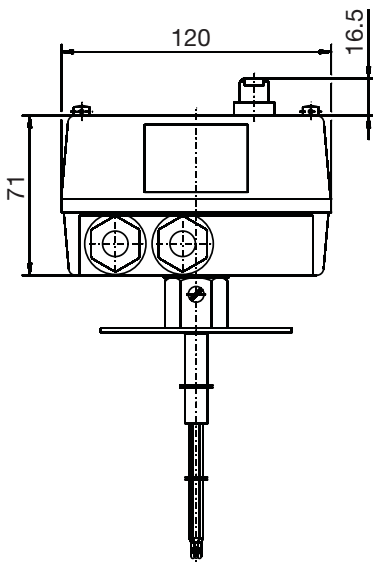


View A

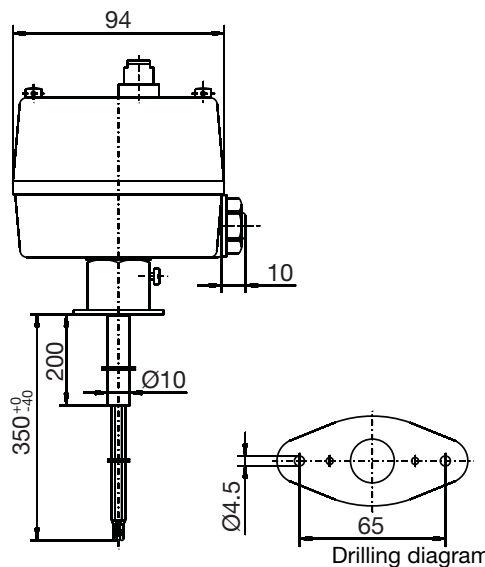


Style 2  
**no** support tube, switch head  
 mounted by 2 screws through  
 housing base,  
 extra code **r** with capillary,  
 process connection **A**

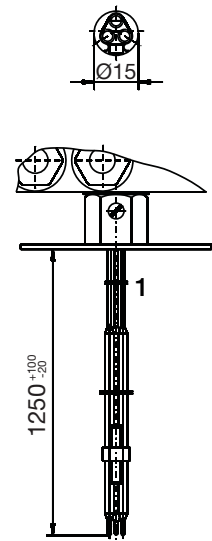
WTHc-2280-SW  
 WTHc-2240/U/SW  
 IP54 protection



Style 1  
**with** support tube,  
 process connection **UOF**,  
 mounting flange with support tube



View A



Style 2  
**no** support tube, switch head  
 fixing by mounting flange in CuZn  
 (brass), extra code **b** with  
 capillary, process connection **A**

<sup>1</sup>probe coding: fan controller TR: **RED**; burner monitor TW: **BLUE**

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## Stock items

(delivery: 3 working days after receipt of order)

Sales No.	Type	Control range °C	Capillary incl. probe mm	Fitting length mm
60/60002161	WTHc-2280	TR = + 20 to +80 TW = + 70 to +90 STB = +100 fixed	--	350
60/60002162	WTHc-2280		1250	--
60/60002658	WTHc-2280-SW		--	320

## Order details

### Warm-air thermostats, WTHc series

<b>Order code</b> 604514	<b>(1) Basic type</b> Warm-air thermostat, WTHc series
	<b>(2) Basic type extensions</b>
2280	WTHc-2280 temperature controller TR and temperature monitor TW with changeover contact, safety temperature limiter STB with break (SPST-NC) contact and lock-out
2240	WTHc-2240 temperature controller TR and temperature monitor TW with changeover (SPDT) contact, safety temperature limiter STB with break (SPST-NC) contact, lock-out and additional signal contact (with extra code U only)
	<b>(3) Style</b>
1	with support tube
2	without support tube, with capillary
	<b>(4) Control / limit range for temperature controller<sup>1</sup></b>
040	+20 to +80°C
	<b>(5) Control / limit range for temperature monitor<sup>1</sup></b>
070	+70 to +90°C
	<b>(6) Limit for safety temperature limiter<sup>1</sup></b>
100	+100°C
	<b>(7) Capillary length</b>
0	style 01, without capillary
1250	1250 mm
...	(special length, details in mm, max. 5000 mm)
	<b>(8) Process connection (PA)</b>
00	switch head mounting r, Style 01
10	A = plain cylindrical probe (on Style 02 only)
26	UOF = mounting flange with support tube
	<b>(9) Fitting length S (immersion tube length)</b>
000	Style 02, with capillary
350	350 mm
...	(special length, details in mm)
	<b>(10) Probe diameter</b>
4	4 mm
	<b>(11) Extra codes<sup>2</sup></b>
000	no extra code
574	<b>U</b> STB with break (n.c.) contact, lock-out and additional signal contact (on type WTHc-2240 only)
718	<b>SW</b> housing with IP54 rating, protected against dust and splashing water
711	<b>r</b> switch head mounting by 2 screws through housing base
764	<b>b</b> mounting flange in CuZn (brass)

<b>Order code</b>	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>	<b>(4)</b>	<b>(5)</b>	<b>(6)</b>	<b>(7)</b>	<b>(8)</b>	<b>(9)</b>	<b>(10)</b>	<b>(11)<sup>2</sup></b>										
604514	/	....	-	.	-	...	-	...	-	..	-	...	-	.	/	...					
<b>Order example</b>	604514	/	2240	-	1	-	040	-	070	-	100	-	0	-	26	-	350	-	4	/	574

<sup>1</sup> other control/limit ranges on request

<sup>2</sup> List extra codes in sequence, separated by commas.