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Thermostats for panel mounting Series ETH

Version approved to DIN 3440 and Pressure Equipment Directive 97/23/EC

ETHf-20

ETHf-70

Brief description

ETH panel-mounting thermostats monitor thermal processes. The thermostats are available as safety temperature monitors STW (STB) and safety temperature limiters STB. In the event of a fault, the STB sets the system being monitored to a safe operational state. Panel-mounting thermostats operate on the principle of fluid expansion, with a microswitch serving as the electrical switching element.

Switching action

Safety temperature monitor STW
If the temperature at the probe exceeds the set limit, the circuit is opened by a snap-action switch. If the temperature falls below the set limit (by the switching differential), the switch 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 by about 10 % of span below the safe temperature limit (approx. 15% for limit setting > +350°C), the microswitch can be reset manually.

Use of the safety temperature monitor STW as a safety temperature limiter STB
In this case, the circuit connected to the thermostat must comply with DIN 3440 and with Section 8.7 of DIN/VDE 0116.

Self-monitoring on safety temperature limiter STB and safety temperature monitor STW (STB)
Failure of the measuring system, i.e. a leakage of the expansion fluid, will cause the pressure under the diaphragm to drop, thus permanently opening the circuit. Resetting is no longer possible.
If the temperature at the probe cools down to below -20°C approx., the circuit will also be opened. As the temperature rises to above -20°C approx., the STB has to be reset manually. On the STW (STB), the reset is performed automatically.

Types and approvals

Type	Switching action	DIN Reg. No.		Important note
ETHf-20 ETHf-70	STW (STB) STB	STB 79998 S STB 780098	DIN Geprüft	The DIN Registration No. becomes invalid if pockets are used that are not listed in our Data Sheet 60.6710.

Technical data

Control ranges and temperature probes

liquid-filled					
Type	**Control/ limit setting ranges in °C**	**Max. permissible probe temperature in °C**	**Maximum capillary length in mm**	**Probe length "L" in mm** Probe dia. "d" in mm, dia. "6" = standard	
				6	**8**
ETHf-20	+30 to +110	135		108	75
ETHf-70	+60 to +130	150		116	79
	+20 to +150	175	5000	77	60
	+50 to +250	290		64	49
	+50 to +300	345		55	- - -
gas-filled					
ETHf-20	+20 to +400	460	1000	176	106
ETHf-70	+20 to +500	550	2000	127	81
	+20 to +500	550	4000	202	119

Capillary and temperature probe

Type	**End of scale**	**Capillary**	**Temperature probe**	**Note**
ETHf- . .	up to 200°C	copper (Cu) 1.5mm dia. Mat. Ref. 2.0090	copper (Cu) Mat. Ref. 2.0090 brazed	–
	up to 350°C	copper (Cu) 1.5mm dia. Mat. Ref. 2.0090	stainless steel (CrNi) Mat. Ref. 1.4571 brazed	–
	up to 500°C	stainless steel (CrNi) 1.5mm dia. Mat. Ref. 1.4571	stainless steel (CrNi) Mat. Ref. 1.4571 welded	–
	up to 350°C	stainless steel (CrNi) 1.5mm dia. Mat. Ref. 1.4571	stainless steel (CrNi) Mat. Ref. 1.4571 welded	at extra cost
Capillary length	standard 1000 mm, max. 5000 mm			
Min. bending radius of capillary	5 mm			

Electrical data

Switching element	ETHf-20	ETHf-70	ETHf-70/U
	microswitch with changeover contact	microswitch with break contact and lock-out	microswitch with break contact, lock-out and additional signal contact
Max. current rating	10 (2) A, 230 V AC +10%, p.f. = 1 (0.6) 0.25A, 230 V DC +10%		
	with differential 2% 6 (1.2) A, 230 V AC +10%, p.f. = 1 (0.6)	–	–
	gold-plated microswitch, code /au 0.1 A, 24 V AC / DC contact resistance 2.5 — 10 mΩ		–

Operating data

Switching differential in % of control / limit setting range	Switching action	with liquid-filled measuring system		
		Nominal value	Possible actual value	
	STW (STB)	5	4 max. 6	standard
		9	8 max. 11	on request
		2	1 max. 3	at extra cost
		with gas-filled measuring system		
		7	5 max. 12	standard
		9	8 max. 16	on request
		2	1.5 max. 3	at extra cost
Switching point accuracy in % of limit setting range	in upper third of scale +0/-5 %, at start of scale +0/-10 %			
Ambient temperature error referred to control / limit setting range	A deviation of the ambient temperature at the thermostat head from the 22 °C calibration ambient temperature produces a shift of the switching point: higher ambient temperature = lower switching point lower ambient temperature = higher switching point			
	Panel-mounting thermostats with end of scale			
	< 200 °C	≥ 200 °C ≤ 350 °C	> 350 °C ≤ 500 °C	
	due to thermostat head, % per °C			
	0.17	0.13	0.12	
	due to capillary, % per °C per m length			
	0.054	0.11	0.03	
Permissible storage temperature	-50 to +50 °C			
Permissible ambient temp. in operation	+80 °C max.			
Nom. position (NL)	unrestricted			

Thermostat head

Chassis material	zinc-plated steel
Fixing	2 screws M 3, 22 mm spacing
Scale span	250° ∢
Electr. connection	screw terminals up to 2.5 mm^2 conductor cross-section
Limit setting	The limit can be adjusted at the setpoint spindle prior to mounting, by using a screwdriver.
Protection	EN 60 529-IP00
Weight	approx. 0.2 kg

Process connection

Series ETH**f**- with capillary	plain cylindrical probe A
	Please refer to Data Sheet 60.6710 for other process connections and pockets.

Note

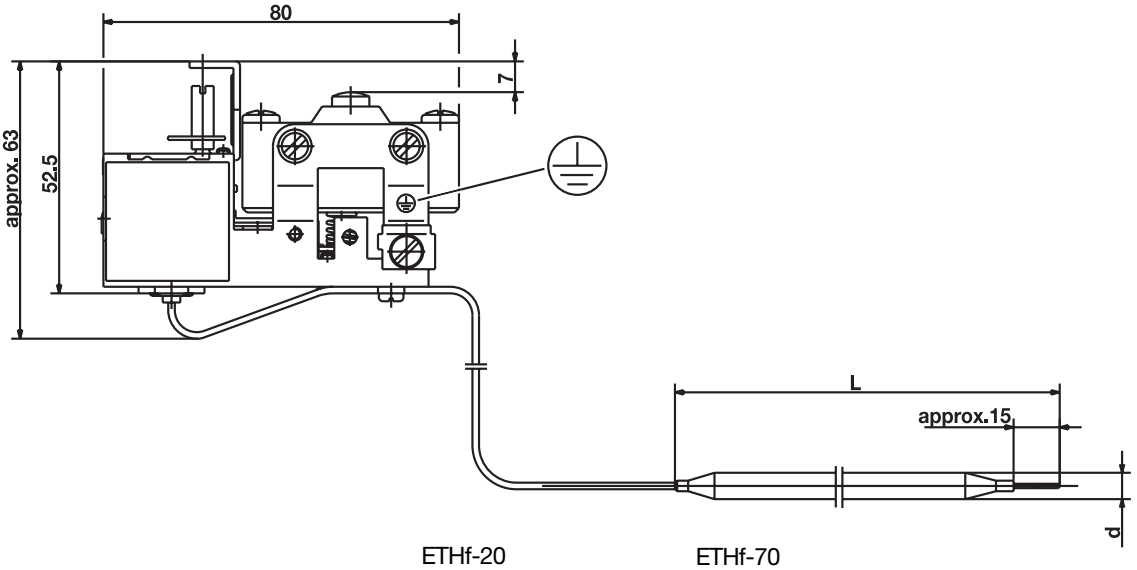
Physical and toxicological properties of the expansion fluid which may escape in the event of a system fracture.

Control range with end of scale °C	Dangerous reactions	Fire and explosion hazard		Water contamination	Toxicological data		
		Ignition temp. °C	Explosion limit % v/v		irritant	danger to health	toxic
< +200	no	+ 280	1.2 — 7.5	yes	yes	[1]	no
≥ 200 °C ≤ +350	no	+ 490	1 — 3.5	yes	yes	[1]	no
> 350 °C ≤ +500	no	no	no	no	no	no	no

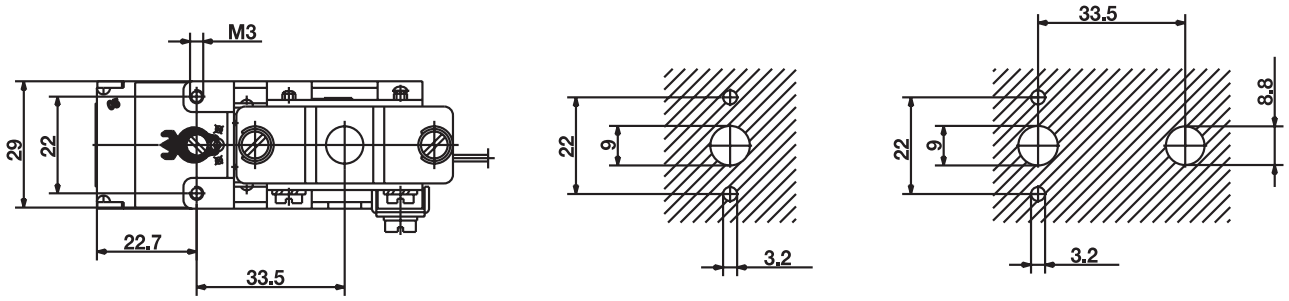
[1] At present there is no restrictive statement from the health authorities concerning any danger to health over short periods and at low concentrations, e.g. after a fracture of the measuring system.

Dimensions

ETHf-70, with plain cylindrical probe A, no pocket

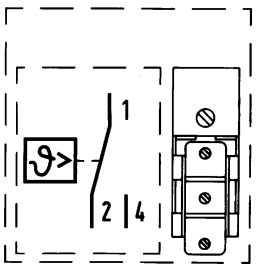


ETHf-20 ETHf-70

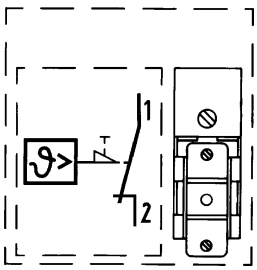


Connection diagrams

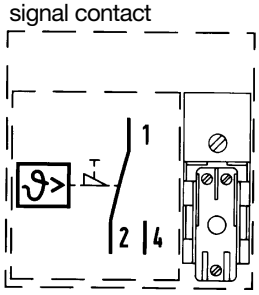
ETHf-20
with changeover contact



ETHf-70
with break contact
and lock-out



ETHf-70
with break contact,
lock-out and additional
signal contact



Order details
ETH series

Order code			
602010	(1)	**Basic type**	
		Panel-mounting thermostat, ETH series	
	(2)	**Basic type extension**	
20		ETHf-20 Safety temperature monitor	with capillary
70		ETHf-70 Safety temperature limiter	with capillary
	(3)	**Control / limit setting ranges**	
052		+30 to +110	
066		+60 to +130	
043		+20 to +150	
063		+50 to +250	
064		+50 to +300	
045		+20 to +400	
046		+20 to +500	
	(4)	**Switching differential**	
00		no differential (ETHf-70 STB)	
20		2 % of scale span	
50		5 % of scale span	
70		7 % of scale span	
90		9 % of scale span	
	(5)	**Capillary length** (in mm)	
1000		1000 mm	
2000		2000 mm	
3000		3000 mm	
4000		4000 mm	
5000		5000 mm	
. . . .		(special length, details in plain text)	
	(6)	**Material of capillary**	
40		Cu (copper)	
20		CrNi (stainless steel 1.4571))	
	(7)	**Process connection***	
10		A = plain cylindrical probe	
		* see Data Sheet 60.6710 for other process connections and pockets	
	(8)	**Diameter d (probe diameter)**	
6		6 mm	
8		8 mm	
	(9)	**Extra codes**	
000		no extra code	
574		**U** STB with break contact, lock-out and additional signal contact (basic type -70 STB only)	
702		**au** snap-action switch contacts gold-plated	

Order code

(1)		(2)		(3)		4)		(5)		(6)		(7)		(8)		(9)
602010	/	. .	-	. . .	-	. .	-	. . . .	-	. .	-	. .	-	.	/	. . .

Order example

602010	/	70	-	043	-	00	-	1000	-	40	-	10	-	6	/	574