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JUMO Instrument Co. Ltd.
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JUMO Process Control, Inc.
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JUMO heatTHERM-AT

Type 603070

- Surface-mounting / Room thermostat
- **PUSH IN** connection system
- IP54 protection max.

Brief description

Thermostats control and monitor thermal processes. The JUMO heatTHERM-AT is available as a single or twin thermostat, as a surface-mounting or room thermostat, according to choice.

The mounting options provided for the surface-mounting model are, in general: protection tube, wall or pipe surface.

The instruments can be supplied as temperature controllers TR, temperature monitors TW, safety temperature monitors STW or safety temperature limiters STB.

The JUMO heatTHERM-AT operates on the principle of liquid expansion. The electrical switching device is a snap-action switch.

Switching action

Temperature controller TR and temperature monitor TW

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

Safety temperature monitor STW

If the temperature at the probe exceeds the selected limit, the snap-action switch is operated and the circuit is opened or closed. If the temperature drops below the selected setpoint (by the amount of the switching differential), the snap-action switch returns to its initial position.

Failure of the measuring system, i.e. a leakage of the expansion liquid, will cause the pressure under the diaphragm to drop, thus permanently opening the circuit.

If the probe cools down to below -20°C (approx.), the same circuit will open, but will close automatically when the temperature rises.

Safety temperature limiter STB

If the temperature at the probe exceeds the set limit, the snap-action switch is operated, the circuit is opened or closed and the snap-action switch is locked out mechanically.

After the temperature has fallen below the limit temperature by about 8 °C, the snap-action switch can be reset manually.

Failure of the measuring system, i.e. a leakage of the expansion liquid, will cause the pressure under the diaphragm to drop, thus permanently opening the circuit. The thermostat can no longer be reset.

If the probe cools down to below -20°C (approx.), the same circuit will open, but will close automatically when the temperature rises.

Temperature compensation

If the ambient temperature deviates from the +22°C calibration ambient temperature, this will result in a shift of the switching point. Thanks to the temperature compensation (standard on the STW and STB, optional on the TR and TW), the switching point shift is reduced to a minimum.



Type 603070/0170



Type 603070/0001
Process connection H



Type 603070/0020



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Types and approvals

Type	Switching action	DIN Reg. No. ¹	Approvals
603070 / 0001	TR	TR	 PED ^{1,2} 97 / 23 / EC  You will find the Declarations of Conformity at: www.jumo.net or ask for them to be sent.
603070 / 0002	TW	TW	
603070 / 0020	STW	STW (STB)	
603070 / 0070	STB	STB	
603070 / 0101	TR / TR	TR TR	
603070 / 0102	TR / TW	TR TW	
603070 / 0120	TR / STW	TR STW (STB)	
603070 / 0170	TR / STB	TR STB	
603070 / 0202	TW / TW	TW TW	
603070 / 0220	TW / STW	TW STW (STB)	
603070 / 0270	TW / STB	TW STB	
603070 / 2020	STW / STW	STW (STB) STW (STB)	
603070 / 2070	STW / STB	STW (STB) STB	
603070 / 7070	STB / STB	STB STB	

¹ applied for

² STW and STB only

Technical data

Control range and probe table for TR, TW

Control range °C	Switching differential %	Max. probe temperature °C	Probe length L, probe dia. d = 6 mm mm
-10 to +40	2.5	50	175
	7	50	99
0 to +50	2.5	60	175
	7	60	99
0 to +100	2.5	125	100
	7	125	62
+20 to +120	2.5	145	100
	7	145	62
0 to +200	2.5	230	74
	7	230	--

Control range and probe table for STW, STB

Settable value / range °C	Scale span ° Δ	Max. probe temperature °C	Probe length L, probe dia. d = 6 mm mm
+95	fixed	145	72
+100	fixed		
+110	fixed		
+120	fixed		
+95 to +120	78		
+70 to +130	142	155	60

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Technical data

Housing	housing base: PA (reinforced) color: silver gray RAL 7001 housing cover: ABS, with viewing window (PMMA) color: cobalt blue RAL 5013
Setpoint adjustment TR TW, STW, STB	switching point adjustable from the outside, using the rotary knob switching point adjustable with screwdriver, after removing housing cover; check of the switching point that was set by means of the viewing window
Enclosure protection	IP40 as per EN 60529 (IP54 with extra code 402)
Cable entry	M20 x 1.5 cable gland, for 6 – 12 mm cable dia.
Housing mounting	• pipe mounting, with tightening strap • protection tube mounting • wall mounting
Weight	approx. 0.2 kg

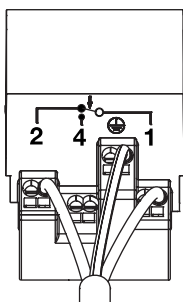
Electrical data

Contact type	snap-action switch with single-pole changeover (SPDT) contact	
Contact rating	TR, TW, STW	STB
	break (SPST-NC) contact (contacts 1-2): 16 (2.5) A, 230 V AC +10%, p.f. = 1(0.6) 0.25 A, 230 V DC +10% make (SPST-NO) contact (contacts 1-4): 6.3 (2.5) A, 230 V AC +10%, p.f. = 1(0.6) 0.25 A, 230 V DC +10%	break (SPST-NC) contact (contacts 1-2): 16 (2.5) A, 230 V AC +10%, p.f. = 1(0.6) 0.25 A, 230 V DC +10% signal contact (contacts 1-4): 2 (0.4) A, 230 V AC +10%, p.f. = 1(0.6) 0.25 A, 230 V DC +10%
Connection	PUSH IN [®] contact (push-in terminal)	
Conductor cross-section	0.75 – 4 mm ² solid wire 0.75 – 2.5 mm ² stranded wire 0.75 – 2.5 mm ² stranded wire with core-end ferrule	
Switching reliability	To ensure maximum switching reliability, we recommend a minimum loading of: AC / DC = 24 V, 20 mA, for silver contacts	

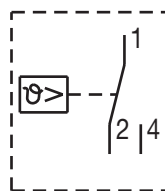
Operating data

Switching point accuracy	TR, TW		STW, STB
	switching differential 2.5%	switching differential 7%	+0 / -6%
	in upper third of scale ± 1.5%, at start of scale ± 6%	in upper third of scale ± 4%, at start of scale ± 6%	
Ambient temperature error	without ambient temperature compensation (optional with extra code 707)		with ambient temperature compensation
	A deviation from the ambient temperature at the switch head and capillary from the +22°C calibration ambient temperature will result in a switching point shift of about -0.1°C/°C ¹ (measured at +120°C limit, permanently set, and with a 2000 mm capillary length)		
Limit temperatures	for transport and storage: -50 to +50°C in operation: +80°C max. for pipe mounting: +120°C max. pipe temperature		
Nominal position (NL)	to DIN 16257, NL 0 – NL 90 (other NL on request)		

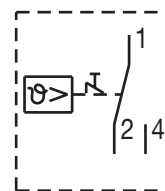
Connection diagram



TR, TW, STW:



STB:



¹ Change in switching point referred to change in ambient temperature

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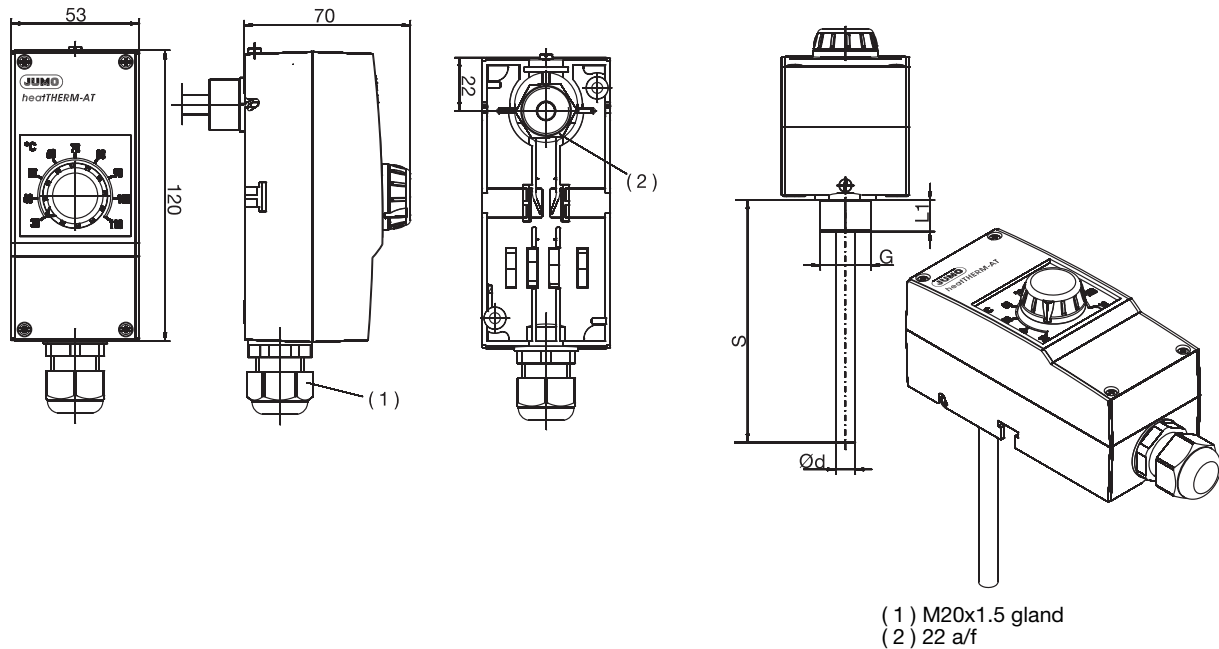
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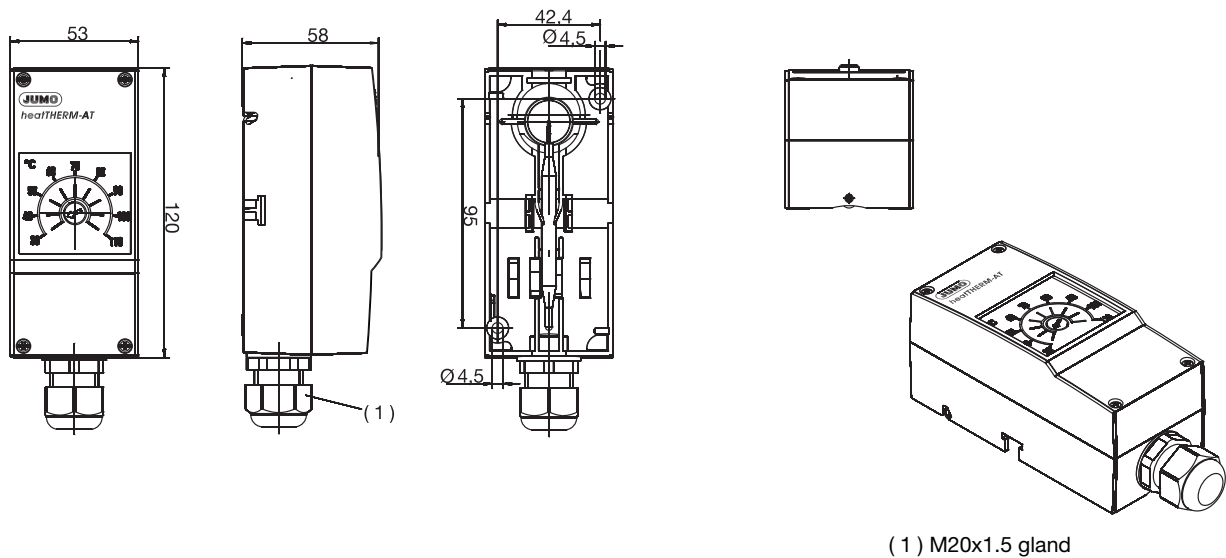


Dimensions

Type 603070 / 0001



Type 603070 / 0002



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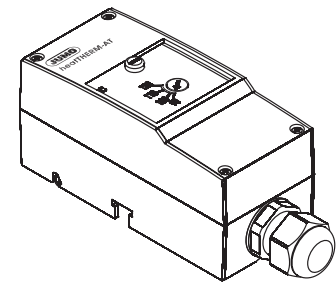
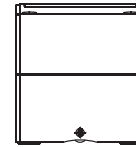
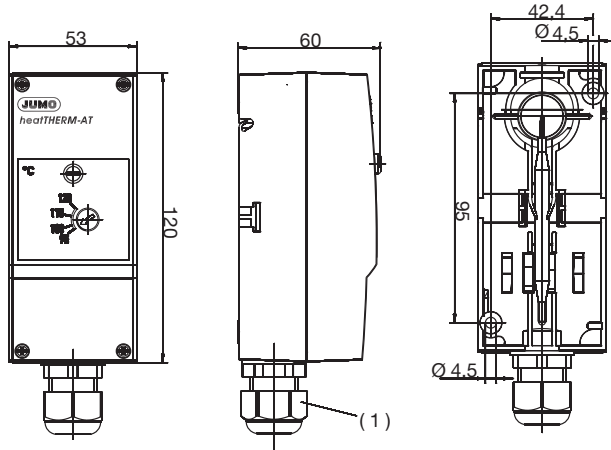
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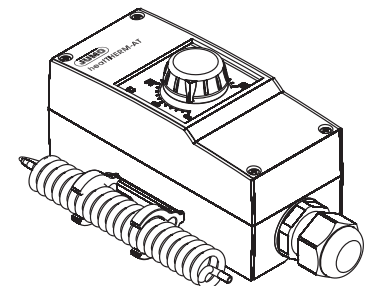
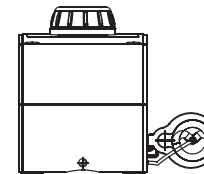
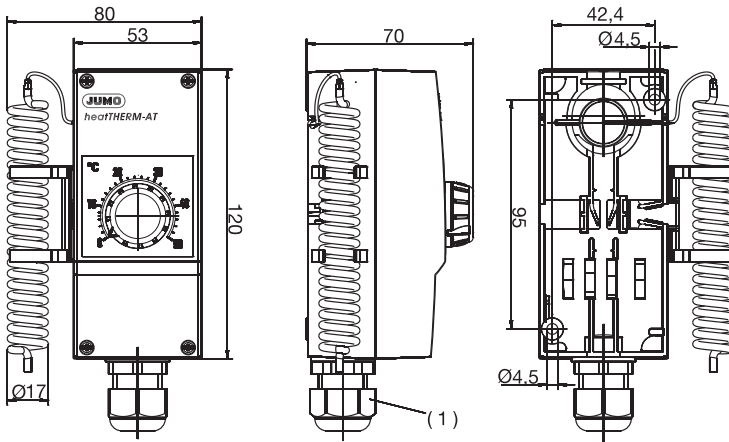
Dimensions

Type 603070 / 0070



(1) M20x1.5 gland

Type 603070 / 0001
 Process connection H



(1) M20x1.5 gland

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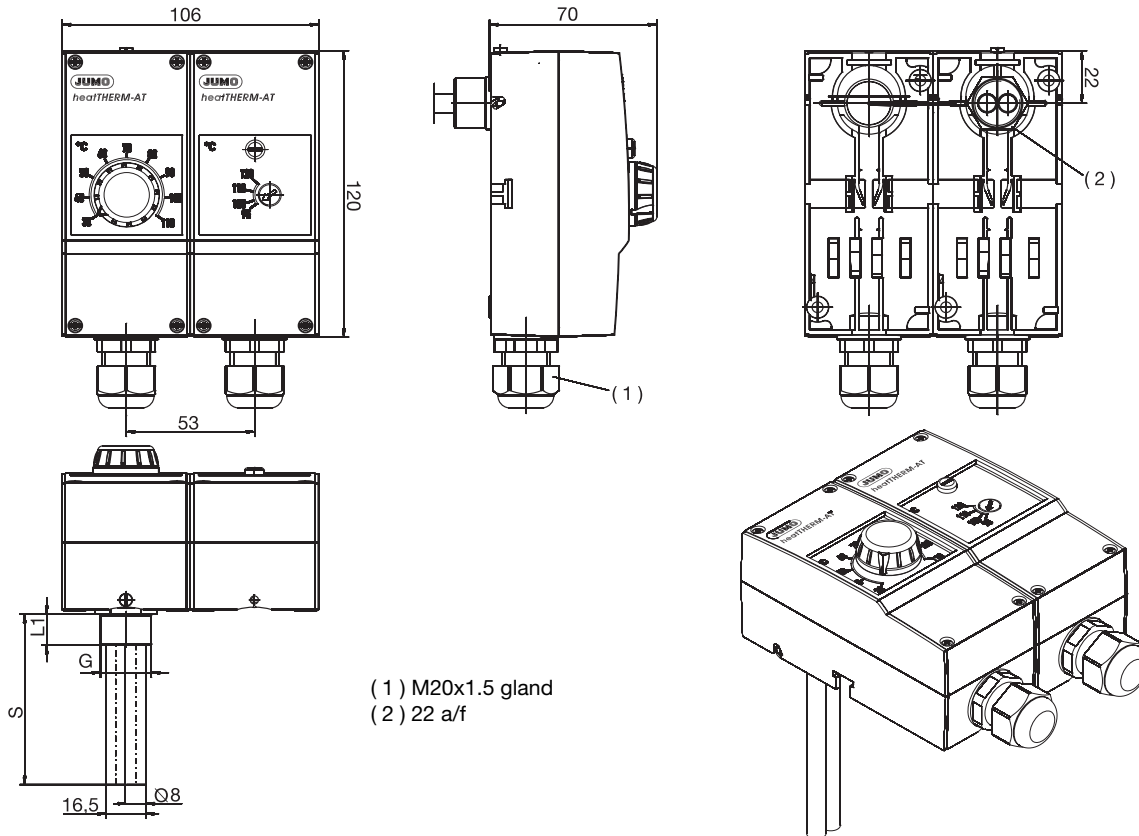
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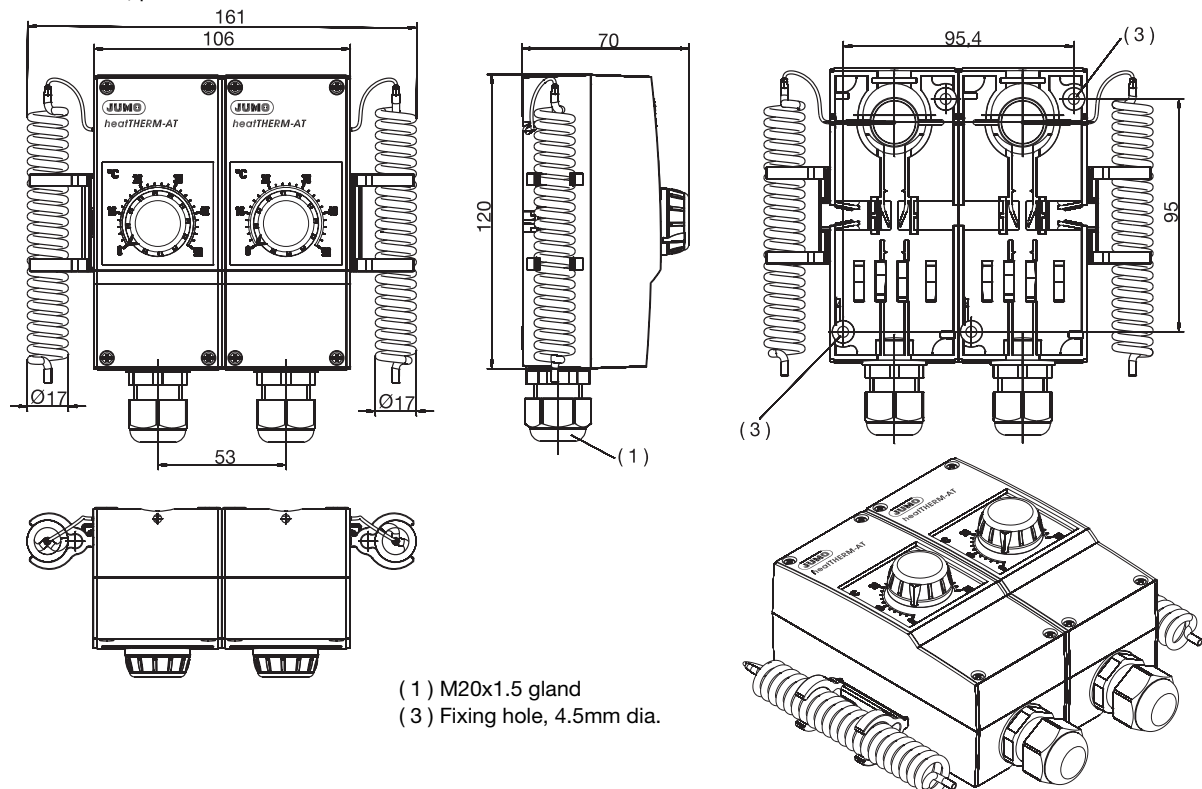


Dimensions

Type 603070 / 0170



Type 603070 / 0101, process connection H



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Order details

Surface-mounting thermostat, type 603070

Order code	(1) Basic type
603070	heatTHERM-AT, with single-pole snap-action switches
(2) Basic type extensions	
0001	 Temperature controller (TR)
0002	 Temperature monitor (TW)
0020	 Safety temperature monitor (STW)
0070	 Safety temperature limiter (STB)
0101	 Temperature controller / Temperature controller (TR / TR)
0102	 Temperature controller / Temperature monitor (TR / TW)
0120	 Temperature controller / Safety temperature monitor (TR / STW)
0170	 Temperature controller / Safety temperature limiter (TR / STB)
0202	 Temperature monitor / Temperature monitor (TW / TW)
0220	 Temperature monitor / Safety temperature monitor (TW / STW)
0270	 Temperature monitor / Safety temperature limiter (TW / STB)
2020	 Safety temperature monitor / Safety temperature monitor (STW / STW)
2070	 Safety temperature monitor / Safety temperature limiter (STW / STB)
7070	 Safety temperature limiter / Safety temperature limiter (STB / STB)
(3) Style	
5	Surface-mounting thermostat, with protection tube, capillary, or as a surface probe (single thermostat)
6	Room thermostat with coiled probe or plain cylindrical probe

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Order details

Surface-mounting thermostat, type 603070

Order code	(4) Control/ limit range 1
016	-10 to + 40°C (TR, TW)
021	0 to + 50°C (TR, TW)
025	0 to +100°C (TR, TW)
042	+20 to +120°C (TR, TW)
028	0 to +200°C (TR, TW)
095	+95°C (STW, STB)
100	+100°C (STW, STB)
110	+110°C (STW, STB)
120	+120°C (STW, STB)
666	+95 to +120°C adjustable (STW, STB)
671	+70 to +130°C adjustable (STW, STB)
	additional control/limit ranges on request
	(5) Control/ limit range 2
000	none (for single thermostat)
016	-10 to + 40°C (TR, TW)
021	0 to + 50°C (TR, TW)
025	0 to +100°C (TR, TW)
042	+20 to +120°C (TR, TW)
028	0 to +200°C (TR, TW)
095	+95°C (STW, STB)
100	+100°C (STW, STB)
110	+110°C (STW, STB)
120	+120°C (STW, STB)
666	+95 to +120°C adjustable (STW, STB)
671	+70 to +130°C adjustable (STW, STB)
	additional control/limit ranges on request
	(6) Switching differential
00	no differential
028	approx. 2.5%
095	approx. 7%
	(7) Capillary length
0	0 mm (room thermostat only)
2000	2000 mm
...	special length (specify in plain text, in 500 mm steps)
	(8) Material of capillary
40	copper (Cu)
26	stainless steel (CrNi, 1.4571)

