

# ALTEROSTAT

Swiss based Trafag is a leading international supplier of high quality sensors and monitoring instruments for the measurement of pressure and temperature.



## Applications

- Machine tools
- HVAC
- Refrigeration
- Process technology

## Features

- With 1 adjustable step between 2 stages
- Short response time
- Protection IP54
- Electrical connection on terminal screw

03/2018

Data sheet H721390

## Technical Data

Designation of application	Multistage thermostat with remote sensor	Switching differential	Not adjustable
Measuring range	-30°C ... +40°C to +70°C ... +350°C	Repeatability	± 0.5 % FS typ.
Output signal	Floating change-over contact	Approval / conformity	EN60730-1/ EN60730-2-9: Typ 2.B.H

Subject to change

## Ordering information/type code

		XXX	XX	XX	XXX	XX	XXXXXXXXXX	XX	XX
<b>Custom build code</b>	External adjustment	<b>104</b>							
	Internal adjustment	<b>114</b>							
<b>Microswitch</b>	Small switching differential, not adjustable		<b>10</b>						
	Average switching differential, not adjustable		<b>11</b>						
	With gold plated contacts, switching differential not adjustable		<b>21</b>						
<b>Range</b>	<b>Range [°C]</b>	<b>Sensor max. [°C]</b>		<b>Range [°C]</b>	<b>Sensor max. [°C]</b>				
	-30 ... +40	45	<b>01</b>	-10 ... +80	85	<b>95</b>			
	-10 ... +25	60	<b>07</b>	+5 ... +95	105	<b>20</b>			
	0 ... +35	70	<b>09</b>	+20 ... +110	115	<b>23</b>			
	+10 ... +45	85	<b>11</b>	+20 ... +150	165	<b>31</b>			
	+10 ... +80	100	<b>13</b>	+20 ... +230	250	<b>24</b>			
	+15 ... +30	60	<b>17</b>	+40 ... +300	330	<b>53</b>			
	-10 ... +35	70	<b>94</b>	+70 ... +350	380	<b>54</b>			
<b>Sensor <sup>1)</sup></b>	<b>Range</b>	<b>Sensor diameter [mm]</b>	<b>Sensor material</b>	<b>Range</b>	<b>Sensor diameter [mm]</b>	<b>Sensor material</b>			
	01, 07, 09, 11, 13, 17	Ø7	Stainless steel	24, 53, 54	Ø4.7	Copper	<b>112</b>		
	94, 95, 20, 23, 31	Ø4.7	Stainless steel	24, 53, 54	Ø7	Copper	<b>122</b>		
	94, 95, 20, 23, 31	Ø7	Stainless steel	24, 53, 54	Ø9	Copper	<b>132</b>		
	94, 95, 20, 23, 31	Ø9	Stainless steel	01, 07, 09, 11, 13, 17	Ø4.7	Copper nickel plated	<b>413</b>		
	94, 95, 20, 23, 31	Ø9	Stainless steel	01, 07, 09, 11, 13, 17	Ø7	Copper nickel plated	<b>423</b>		
	24, 53, 54	Ø4.7	Stainless steel	01, 07, 09, 11, 13, 17	Ø9	Copper nickel plated	<b>433</b>		
	24, 53, 54	Ø7	Stainless steel	94, 95, 20, 23, 31	Ø4.7	Copper nickel plated	<b>313</b>		
	24, 53, 54	Ø9	Stainless steel	94, 95, 20, 23, 31	Ø7	Copper nickel plated	<b>323</b>		
	01, 07, 09, 11, 13, 17	Ø4.7	Copper	94, 95, 20, 23, 31	Ø9	Copper nickel plated	<b>333</b>		
	01, 07, 09, 11, 13, 17	Ø7	Copper	24, 53, 54	Ø4.7	Copper nickel plated	<b>113</b>		
	01, 07, 09, 11, 13, 17	Ø9	Copper	24, 53, 54	Ø7	Copper nickel plated	<b>123</b>		
	94, 95, 20, 23, 31	Ø4.7	Copper	24, 53, 54	Ø9	Copper nickel plated	<b>133</b>		
	94, 95, 20, 23, 31	Ø7	Copper						
	94, 95, 20, 23, 31	Ø9	Copper						
	<b>Fixing <sup>2)</sup></b>	Nut M10 (for remote sensing version)						<b>10</b>	
Angle bracket (for remote sensing version)							<b>17</b>		
Mounting bracket (for remote sensing version)							<b>19</b>		
Grubscrew locked, lateral (direct mounting version) <sup>5)</sup>							<b>12</b>		
Cap nut (for direct mounting version) <sup>5)</sup>							<b>14</b>		
Grubscrew locked with spacer (cooling element) (for direct mounting version)							<b>18</b>		
<b>Protection tube</b>	See data sheet H72114/H72163						XXXX.XXXX		

XXX XX XX XXX XX XXXXXXXXXX XX XX

<b>Accessories</b>	Signal lamp	14
	Switchpoint locking <sup>4)</sup>	15
	Switchpoint fixed and sealed upon customer's request <sup>4)</sup>	88
	Switchpoint preset upon customer's request, no guarantee on switching accuracy <sup>4)</sup>	83
	Switchpoint adjustment please indicate when ordering: - Switchpoint [°C] - Increasing or decreasing	
	Condensator over Pin 1-2	12
	Condensator over Pin 1-3	13
	Condensators over Pin 1-2 / 1-3	23
	Railway version IEC 61373, category 2	28
	Outdoor application (vented)	44
	Capillary tube protection: Flexible metal tube, brass nickel plated	90
	Capillary tube protection: Flexible metal tube 1.4541/V2A	91
	Capillary tube protection: PVC tube	92
	<b>Capillary tube length</b>	Capillary tube length up to 5000 mm (no specification required for direct mounting on protection tube) L=XXXX <sup>3)</sup>
<b>Steps between stages</b>	Desired stage difference to be indicated when ordering (without indication = switches synchronous) Switch 1 on scale, difference switch 2 to scale -6°C ... +15°C Minimum distance between switches: Switch 10: ±1°C Switch 11/21: ±2°C	

<sup>1)</sup> See data sheet H72114/H72163

<sup>2)</sup> See data sheet H72106

<sup>3)</sup> Overlengths upon request

<sup>4)</sup> Only with type 114, internal adjustment

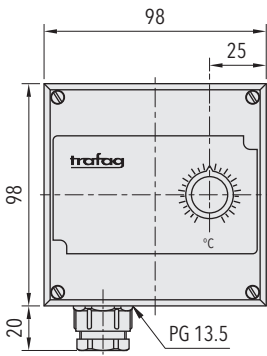
<sup>5)</sup> Media max. 150°C in continuous operation

Standard products (extra short lead time)						
Product No.	Type Code	Temperature range [°C]	Switching differential [°C]	Smallest stage difference [°C]	Largest stage difference [°C]	Sensor max. [°C]
M2S40	114 1101 422 19	-30 ... +40	1.8 (fixed)	0.8	25	45
M2S35	114 1109 422 19	0 ... +35	1.8 (fixed)	0.8	15	50
M2S95	114 1120 322 19	+5 ... +95	2.5 (fixed)	1.2	35	105
M2S150	114 1131 322 19	+20 ... +150	3 (fixed)	1.5	40	165
M2S230S	114 1124 121 19	+20 ... +230	4.5 (fixed)	2	70	250
M2S350S	114 1154 121 19	+70 ... +350	5 (fixed)	2.5	80	380

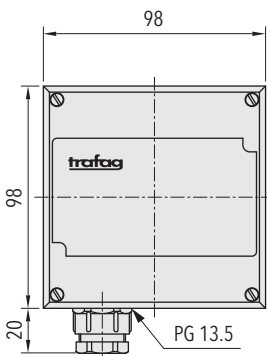
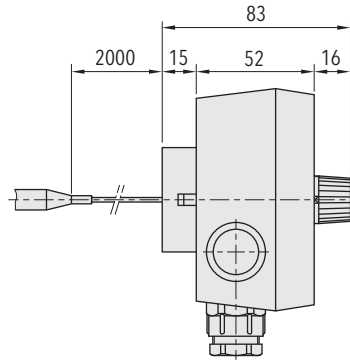
Specifications		
<b>Accuracy</b>	Repeatability	± 0.5 % FS typ.
	Scale accuracy typ.	± 2 % FS typ.
	Switching differential	See table
	Switching point	Temperature compensated with bimetal switch lever
<b>Environmental conditions</b>	Ambient temperature	Range ≤ +45°C: -30°C ... +50°C Range +45°C ... +250°C: -30°C ... +70°C Range > + 250°C: -10°C ... +70°C (Important: Temperature at sensor may not exceed maximum sensortemperature)
	Storage temperature	Range ≤ +45°C: -30°C ... +50°C Range > +45°C: -30°C ... +85°C
	Protection	IP54
	Humidity	Max. 95 % relative
<b>Mechanical Data</b>	Sensor housing	See ordering information
	Filling	Liquid
	Housing	Noryl
	Screwed cable gland	Polyamide (PA)
	Installation	any position
	Weight	~ 480 g
<b>Microswitch</b>	Rating	See table
	Resistance of insulation	> 2 MΩ
	Dielectric strength	U ≤ 250V: 1.45 kV U ≤ 500V: 2 kV terminal ground
	Life time (mechanical)	Microswitch 10/11: 20 Mio. cycles Microswitch 21: 0.5 Mio. cycles
<b>Electrical connection</b>	Cable gland	PG13.5 Cable-Ø 5...12.5 mm
	Terminal screw	6 x 1...2.5 mm <sup>2</sup>

Additional information		
<b>Documents</b>	Data sheet	<a href="http://www.trafag.com/H72139">www.trafag.com/H72139</a>
	Instructions	<a href="http://www.trafag.com/H70311">www.trafag.com/H70311</a>
	Flyer	<a href="http://www.trafag.com/H70965">www.trafag.com/H70965</a>

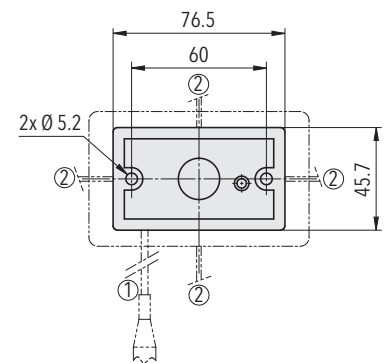
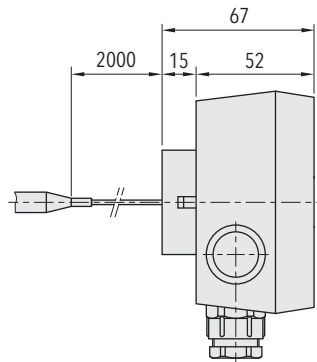
## Dimensions



104.XXXX.XXX.XX...

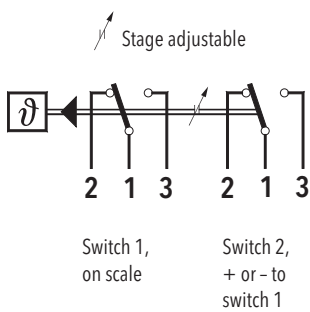


114.XXXX.XXX.XX...



Fixation 19

## Electrical connection



Switching differential typ.					
<b>Measuring range</b>	[°C]	-30 ... +40 +10 ... +80	-10 ... +25 0 ... +35 +10 ... +45	+15 ... +30	-10 ... +35
<b>Microswitch 10</b> Switching differential (fixed value, not adjustable)	[°C]	0.7	0.7	0.7	1.5
<b>Microswitch 11</b> Switching differential (fixed value, not adjustable)	[°C]	1.8	1.8	1.8	2.5
<b>Microswitch 21</b> Switching differential (fixed value, not adjustable)	[°C]	1.8	1.8	1.8	2.5
Steps between stages from switch S2 to switch S1 (S1 on scale): <b>S1 &lt; S2</b>	[°C]	0.8 ... 25	0.8 ... 15	0.8 ... 10	1.2 ... 25
Steps between stages from switch S2 to switch S1 (S1 on scale): <b>S1 &gt; S2</b>	[°C]	0.8 ... 12	0.8 ... 6	0.8 ... 4	1.2 ... 8
<b>Measuring range</b>	[°C]	-10 ... +80 +5 ... +95 +20 ... +110	+20 ... +150	+20 ... +230	+40 ... +300 +70 ... +350
<b>Microswitch 10</b> Switching differential (fixed value, not adjustable)	[°C]	1.5	1.8	2	2.5
<b>Microswitch 11</b> Switching differential (fixed value, not adjustable)	[°C]	2.5	3	4.5	5
<b>Microswitch 21</b> Switching differential (fixed value, not adjustable)	[°C]	2.5	3	4.5	5
Steps between stages from switch S2 to switch S1 (S1 on scale): <b>S1 &lt; S2</b>	[°C]	1.2 ... 35	1.5 ... 40	2 ... 70	2.5 ... 80
Steps between stages from switch S2 to switch S1 (S1 on scale): <b>S1 &gt; S2</b>	[°C]	1.2 ... 15	1.5 ... 20	2 ... 30	2.5 ... 40

Electrical data switch		Rating	
		Resistive Load (Inductive Load)	
Type	Features	AC	DC
<b>10</b>	Small switching differential, not adjustable	125 V, 10 (1.5) A 250 V, 10 (1.25) A	250 V, 0.2 (0.02) A 125 V, 0.4 (0.03) A 30 V, 2 (1) A 14 V, 15 (2.5) A
<b>11</b>	Average switching differential, not adjustable	125 V, 15 (1.5) A 250 V, 15 (1.25) A 500 V, 10 (0.75) A	250 V, 0.25 (0.03) A 125 V, 0.5 (0.05) A 30 V, 6 (1.5) A 14 V, 15 (1.5) A
<b>21</b>	Gold plated contacts, not adjustable	24 V, 0.1 (0.1) A 12 V, 1 (1) A 5 V, 2 (2) A	24 V, 0.1 (0.1) A 12 V, 1 (1) A 5 V, 2 (2) A