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Единый адрес для всех регионов: tgf@nt-rt.ru || www.trafag.nt-rt.ru



Thermostats

Thermostats

For 70 years, Trafag thermostats have proven their robustness in the most adverse environmental conditions. Industry usage ranges from air conditioning applications to engine manufacturing and ship building and even to offshore oil and gas platform production. The appeal of Trafag thermostats lies in their high switching point precision even after decades of operation under harsh conditions without maintenance. Various sensor and casing designs cover a wide range of temperatures and possible applications.

Measurement principle

A capillary tube filled with liquid reacts to a temperature change as a result of the principle of thermal expansion. This expansion is detected using a precision structure which switches one or multiple microswitches.



Design variations

- With internal or external temperature set-point adjustment
- Internal or external measuring scale
- With or without a manual reset switch
- With or without switching differential adjustment
- Switch designs for inside or outside applications
- Optional capillary tube safeguard
- Single or double-step circuit
- CE, EX or ship certifications



Sensor systems and accessories







- Sensors that are fixed or can be mounted freely
- Copper (Cu), Cu nickel-plated or stainless steel sensor material
- Nickel-plated bronze or stainless steel protective sensor tube
- Additional capillary tube protection

Overview Thermostats

	A/AS/ASE 645/650	ADS 319	A2/A2S 198/199	IA/IAS 409/419	MSK 624/634	MP/MSP 663/664	
	page 110	page 111	page 112	page 113	page 114	page 115	
							
Designation of application	Room thermostat	Double room thermostat	Multistage room thermostat	Industrial room thermostat	Duct thermostat	Pipe mounting thermostat	
Measuring range	-45°C ... +15°C to 0°C ... +60°C	-30°C ... +30°C to 0°C ... +60°C	-45°C ... +15°C to 0°C ... +60°C	-30°C ... +30°C to 0°C ... +60°C	-30°C ... +40°C to +20°C ... +110°C	-10°C ... +35°C to +20°C ... +110°C	
Output signal	Floating change-over contact	Floating change-over contact	Floating change-over contact	Floating change-over contact	Floating change-over contact	Floating change-over contact	
Switching differential	Adjustable / not adjustable	Adjustable / not adjustable	Not adjustable	Adjustable / not adjustable	Adjustable / not adjustable	Adjustable / not adjustable	
Ambient temperature	-30°C ... +70°C	-30°C ... +70°C	-30°C ... +70°C	-30°C ... +70°C	-30°C ... +70°C	-30°C ... +70°C	
Protection	IP54	IP54	IP54	IP65	IP54	IP54	
Applications	HVAC Refrigeration	HVAC Refrigeration	HVAC Refrigeration	HVAC	HVAC	Process technology Water treatment	
Approval / conformity	EN60730-1/ EN60730-2-9: Typ 2.B.H	EN60730-1/ EN60730-2-9: Typ 2.B.H	EN60730-1/ EN60730-2-9: Typ 2.B.H	EN60730-1/ EN60730-2-9: Typ 2.B.H	EN60730-1/ EN60730-2-9: Typ 2.B.H	EN60730-1/ EN60730-2-9: Typ 2.B.H	
Type of protection							
Data sheet	H72170	H72146	H72137	H72116	H72177	H72175	
Instructions	H73624	H73170	H70311	H73111	H73624	H73663	

MST 624/634	M/MS 624/634	MS...R 630/632	F/F...R 990/991/992/993	GS 657/658	D...R 302	M2S 104/114
page 116	page 118	page 117	page 123	page 120	page 121	page 122
						
Direct mounting thermostat	Remote sensing thermostat	Remote sensing thermostat with limiter	Frost protection thermostat	Remote sensing thermostat	Double thermostat with remote sensor and limiter	Multistage thermostat with remote sensor
-30°C ... +40°C to +70°C ... +350°C	-30°C ... +40°C to +70°C ... +350°C	-30°C ... +40°C to +70°C ... +350°C	-5°C ... +15°C	+5°C ... +95°C and +20°C ... +150°C	-30°C ... +40°C to +70°C ... +350°C	-30°C ... +40°C to +70°C ... +350°C
Floating change-over contact	Floating change-over contact	Floating change-over contact	Floating change-over contact	Floating change-over contact	Floating change-over contact	Floating change-over contact
Adjustable / not adjustable	Adjustable / not adjustable	Not adjustable	Not adjustable	Not adjustable	Adjustable / not adjustable	Not adjustable
-30°C ... +70°C	-30°C ... +70°C	-30°C ... +70°C	Max. operating temperature: +70°C Min. operating temperature: switch point + 2°C	-30°C ... +70°C	-30°C ... +70°C	-30°C ... +70°C
IP54	IP54	IP54	IP 54	IP54	IP54	IP54
Machine tools HVAC Process technology Water treatment	Railways Machine tools HVAC Refrigeration Process technology	Railways Machine tools HVAC Refrigeration Process technology	HVAC Refrigeration	Process technology	HVAC Refrigeration	Machine tools HVAC Refrigeration Process technology
EN60730-1/ EN60730-2-9: Typ 2.B.H	EN60730-1/ EN60730-2-9: Typ 2.B.H	EN60730-1/ EN60730-2-9: Typ 2.B.H	EN60730-1/ EN60730-2-9: Typ 2.B.H	EN60730-1/ EN60730-2-9: Typ 2.B.H	EN60730-1/ EN60730-2-9: Typ 2.B.H	EN60730-1/ EN60730-2-9: Typ 2.B.H
H72174	H72172	H72173	H72123	H72179	H72142	H72139
H73624	H73624	H73624	H70821	H73624	H73170	H70311

Overview Thermostats

	L/LF 736/754	L...R 755	I/IS 404/414	IS...R 410/412	ISN/ISNT 471/472	ISP/ISPT 474	
	page 124	page 125	page 126	page 129	page 130	page 132	
							
Designation of application	Remote sensing thermostat, skeleton type	Remote sensing thermostat with limiter, skeleton type	Industrial thermostat with remote sensor	Industrial thermostat with remote sensor and limiter	Thermostat for shipbuilding	Compact thermostat for shipbuilding	
Measuring range	-30°C ... +40°C to +70°C ... +350°C	-30°C ... +40°C to +70°C ... +350°C	-30°C ... +40°C to +70°C ... +350°C	-30°C ... +40°C to +70°C ... +350°C	+20°C ... +110°C to +40°C ... +300°C	+5°C ... +95°C to +20°C ... +150°C	
Output signal	Floating change-over contact	Floating change-over contact	Floating change-over contact	Floating change-over contact	Floating change-over contact	Floating change-over contact	
Switching differential	Adjustable / not adjustable	Not adjustable	Adjustable / not adjustable	Not adjustable	Not adjustable	Not adjustable	
Ambient temperature	-30°C ... +70°C	-30°C ... +70°C	-30°C ... +70°C	-30°C ... +70°C	-30°C ... +70°C	-30°C ... +70°C	
Protection	IP00	IP00	IP65	IP65	IP65	IP65	
Applications	Machine tools	Machine tools	Railways Machine tools	Machine tools Process technology	Shipbuilding Engine manufacturing Railways	Shipbuilding Engine manufacturing Railways Hydraulics HVAC	
Approval / conformity	EN60730-1/ EN60730-2-9: Typ 2.B.H	EN60730-1/ EN60730-2-9: Typ 2.B.H	EN60730-1/ EN60730-2-9: Typ 2.B.H	EN60730-1/ EN60730-2-9: Typ 2.B.H	ABS, BV, CCS, DNV, GL, KRS, LRS, RINA, RMRS EN60730-1/ EN60730-2-9: Typ 2.B.H	ABS, BV, CCS, DNV, GL, KRS, LRS, NKK, RINA, RMRS EN60730-1/ EN60730-2-9: Typ 2.B.H	
Type of protection							
Data sheet	H72122	H72124	H72110	H72138	H72111	H72113	
Instructions	H70211	H70211	H73111	H73111	H73111	H73113	

EXS 404/414	EXAS 409/419	«Simple Apparatus» conformity to ATEX 414	«Simple Apparatus» conformity to ATEX 419
page 134	page 137	page 138	page 138
			
Ex Industrial thermostat with remote sensor	Ex Industrial room thermostat	Industrial room thermostat with remote sensor	Industrial room thermostat
-30°C ... +40°C to +70°C ... +350°C°C	-30°C ... +30°C to 0°C ... +60°C	-30°C ... +40°C to +70°C ... +350°C	-30°C ... +30°C to 0°C ... +60°C
Floating change-over contact	Floating change-over contact	Floating change-over contact	Floating change-over contact
Not adjustable	Not adjustable	Not adjustable	Not adjustable
-30°C ... +70°C	-30°C ... +60°C	-30°C ... +70°C	-30°C ... max. +65°C
IP65	IP65	IP65	IP65
⊕ II 2 G / D	⊕ II 2 G / D	Hazardous area	Hazardous area
SEV 15 ATEX 0156 X	SEV 15 ATEX 0156 X	EN60730-1/ EN60730-2-9: Typ 2.B.H EN60079-0, EN60079-11 Zone 1 and 2, 21 and 22	EN60730-1/ EN60730-2-9: Typ 2.B.H EN60079-0, EN60079-11 Zone 1 and 2, 21 and 22
Areas with gas explosion hazards: II 2 G Ex d e IICT6 Gb; Areas with dust explosion hazards: II 2 D Ex tb IIIC T80°C Db	Areas with gas explosion hazards: II 2 G Ex d e IICT6 Gb; Areas with dust explosion hazards: II 2 D Ex tb IIIC T80°C Db		
H72108	H72128	H72183	H72182
H73172	H73172	H73173	H73173

A/AS/ASE 645/650

Ambistat



Features

- Switching differential adjustable or fixed
- Short response time
- Protection IP54
- Electrical connection on terminal screw

Technical Data

Designation of application	Room thermostat	Switching differential	Adjustable / not adjustable
Measuring range	-45°C ... +15°C to 0°C ... +60°C	Repeatability	± 0.5 % FS typ.
Output signal	Floating change-over contact	Approval / conformity	EN60730-1/ EN60730-2-9: Typ 2.B.H

Data sheet
Instructions

H73624

H72170

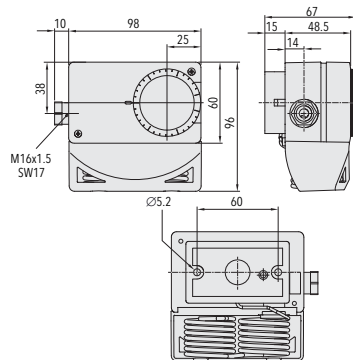
Standard products (extra short lead time)

Product No.	Type Code	Temperature range [°C]	Switching differential [°C]	Operating temperature [°C]
A30	645 2503 402 19	0 ... +30	0.7 ... 6 (adjustable)	-30 ... +50
A33	645 2502 402 19	-30 ... +30	0.7 ... 6 (adjustable)	-30 ... +40
A40	645 2504 402 19	+10 ... +40	0.7 ... 6 (adjustable)	-30 ... +70
A60	645 2512 402 19	0 ... +60	0.7 ... 6 (adjustable)	-30 ... +70
AS30	650 2503 402 19	0 ... +30	0.7 ... 6 (adjustable)	-30 ... +50
AS33	650 2502 402 19	-30 ... +30	0.7 ... 6 (adjustable)	-30 ... +40
AS40	650 2504 402 19	+10 ... +40	0.7 ... 6 (adjustable)	-30 ... +70
AS60	650 2512 402 19	0 ... +60	0.7 ... 6 (adjustable)	-30 ... +70
ASE40	650 2404 402 19 0000 0000 00 00 00 01	+10 ... +40	5 (fixed)	-30 ... +70

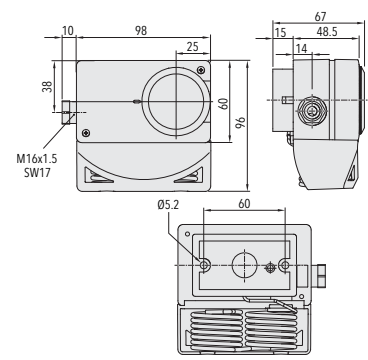
Sensor: Sensor coil

Sensor material: Copper

Electrical connection: Screw terminal

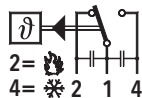


A ...
External switchpoint adjustment



AS ... / ASE ...
Internal switchpoint adjustment

AC 500 V, 10 (0.75) A
DC 30 V, 6 (1.5) A
DC 250 V, 0.25 (0.03) A



ADS 319

Ambi Duostat



Features

- Two individual measuring systems
- Protection IP54
- Electrical connection on terminal screw

Technical Data

Designation of application	Double room thermostat	Switching differential	Adjustable / not adjustable
Measuring range	-30°C ... +30°C to 0°C ... +60°C	Repeatability	± 0.5 % FS typ.
Output signal	Floating change-over contact	Approval / conformity	EN60730-1/ EN60730-2-9: Typ 2.B.H

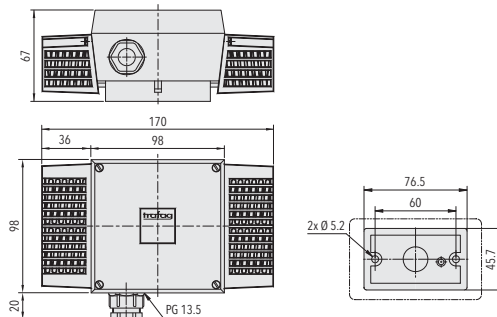
Data sheet	H72146
Instructions	H73170

Standard products (extra short lead time)

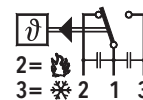
Product No.	Type Code	Temperature range [°C]	Set point adjustment	Operating temperature [°C]
ADS30	319 2503 402 19	0 ... +30	Internal switchpoint adjustment	-30 ... +50
ADS33	319 2502 402 19	-30 ... +30	Internal switchpoint adjustment	-30 ... +40
ADS60	319 2512 402 19	0 ... +60	Internal switchpoint adjustment	-30 ... +70

Sensor: Sensor coil
 Sensor material: Copper
 Electrical connection: Screw terminal

Switching differential [°C]: 0.7 ... 6 (adjustable)



AC 500 V, 10 (0.75) A
 DC 30 V, 6 (1.5) A
 DC 250 V, 0.25 (0.03) A



ADS ...
 Internal switchpoint adjustment

A2/A2S 198/199

Altero Ambistat



Features

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

Technical Data

Designation of application	Multistage room thermostat	Switching differential	Not adjustable
Measuring range	-45°C ... +15°C to 0°C ... +60°C	Repeatability	± 0.5 % FS typ.
Output signal	Floating change-over contact	Approval / conformity	EN60730-1/ EN60730-2-9: Typ 2.B.H

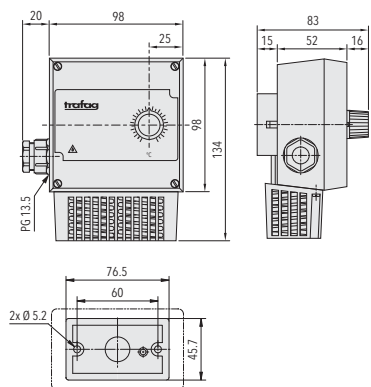
Data sheet H72137
Instructions H70311

Standard products (extra short lead time)

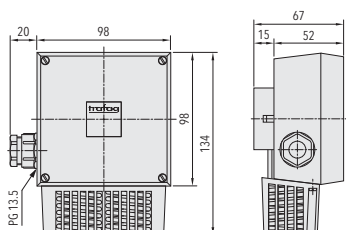
Product No.	Type Code	Temperature range [°C]	Set point adjustment	Operating temperature [°C]
A233	199 1102 402 19	-30 ... +30	External switchpoint adjustment	-30 ... +40
A230	199 1103 402 19	0 ... +30	External switchpoint adjustment	-30 ... +50
A260	199 1112 402 19	0 ... +60	External switchpoint adjustment	-30 ... +70
A2S33	198 1102 402 19	-30 ... +30	Internal switchpoint adjustment	-30 ... +40
A2S30	198 1103 402 19	0 ... +30	Internal switchpoint adjustment	-30 ... +50
A2S60	198 1112 402 19	0 ... +60	Internal switchpoint adjustment	-30 ... +70

Sensor: Sensor coil
Sensor material: Copper
Electrical connection: Screw terminal

Switching differential [°C]: 0.7 (fixed)
Smallest stage difference [°C]: -6
Largest stage difference [°C]: 15

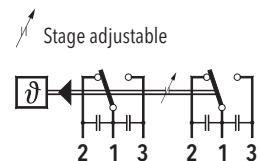


A2 ...
External switchpoint adjustment



A2S ...
Internal switchpoint adjustment

AC 500 V, 10 (0.75) A
DC 30 V, 6 (1.5) A
DC 250 V, 0.25 (0.03) A



Switch 1,
on scale

Switch 2,
+ or -
to switch 1

IA/IAS 409/419

Indu Ambistat



Features

- Compact design
- Rugged housing
- Protection IP65
- Any mounting position possible

Technical Data

Designation of application	Industrial room thermostat	Switching differential	Adjustable / not adjustable
Measuring range	-30°C ... +30°C to 0°C ... +60°C	Repeatability	± 0.5 % FS typ.
Output signal	Floating change-over contact	Approval / conformity	EN60730-1/ EN60730-2-9: Typ 2.B.H

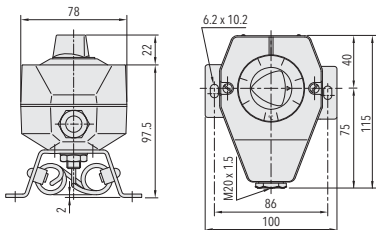
Data sheet	H72116
Instructions	H73111

Standard products (extra short lead time)

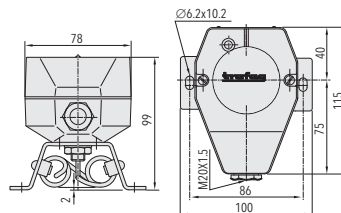
Product No.	Type Code	Temperature range [°C]	Set point adjustment	Operating temperature [°C]
IA33	409 2502 522 27	-30 ... +30	External switchpoint adjustment	-30 ... +40
IA35	409 2510 522 27	+5 ... +35	External switchpoint adjustment	-30 ... +50
IA60	409 2512 522 27	0 ... +60	External switchpoint adjustment	-30 ... +70
IAS33	419 2502 522 27	-30 ... +30	Internal switchpoint adjustment	-30 ... +40
IAS35	419 2510 522 27	+5 ... +35	Internal switchpoint adjustment	-30 ... +50
IAS60	419 2512 522 27	0 ... +60	Internal switchpoint adjustment	-30 ... +70

Sensor: Sensor coil
 Sensor material: Copper
 Electrical connection: Screw terminal

Switching differential [°C]: 0.7 ... 6 (adjustable)

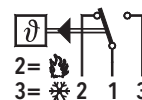


IA ...
External switchpoint adjustment



IAS ...
Internal switchpoint adjustment

AC 500 V, 10 (0.75) A
 DC 30 V, 6 (1.5) A
 DC 250 V, 0.25 (0.03) A



MSK 624/634

Duct Thermostat



Features

- Short response time
- Protection IP54
- Electrical connection on terminal screw

Technical Data

Designation of application	Duct thermostat	Switching differential	Adjustable / not adjustable
Measuring range	-30°C ... +40°C to +20°C ... +110°C	Repeatability	± 0.5 % FS typ.
Output signal	Floating change-over contact	Approval / conformity	EN60730-1/ EN60730-2-9: Typ 2.B.H

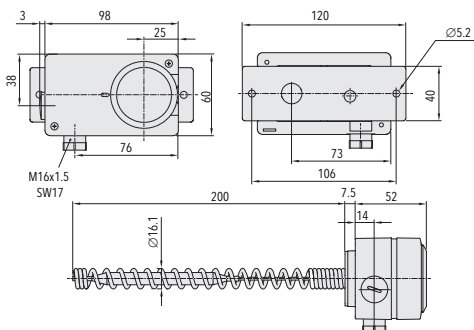
Data sheet	H72177
Instructions	H73624

Standard products (extra short lead time)

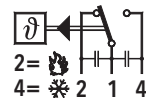
Product No.	Type Code	Temperature range [°C]	Set point adjustment	Sensor max. [°C]
MSK35	634 2509 432 30	0 ... +35	Internal switchpoint adjustment	50
MSK40	634 2501 432 30	-30 ... +40	Internal switchpoint adjustment	45
MSK80	634 2513 432 30	+10 ... +80	Internal switchpoint adjustment	100

Sensor: Capillary tube with direct mounted sensor
 Sensor material: Copper
 Electrical connection: Screw terminal

Switching differential [°C]: 0.7 ... 10 (adjustable)



AC 500 V, 10 (0.75) A
 DC 30 V, 6 (1.5) A
 DC 250 V, 0.25 (0.03) A



MSK ...
 Internal switchpoint adjustment
 Accessories: K200 / W200 See chapter "Accessories"

MP/MSP 663/664

Pipe Mounting Thermostat



Features

- For pipe or barrel mounting
- Short response time
- Protection IP54
- Electrical connection on terminal screw

Technical Data

Designation of application	Pipe mounting thermostat	Switching differential	Adjustable / not adjustable
Measuring range	-10°C ... +35°C to +20°C ... +110°C	Repeatability	± 0.5 % FS typ.
Output signal	Floating change-over contact	Approval / conformity	EN60730-1/ EN60730-2-9: Typ 2.B.H

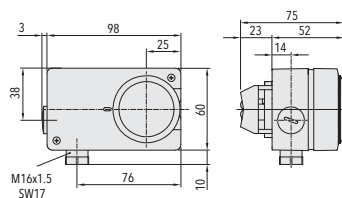
Data sheet	H72175
Instructions	H73663

Standard products (extra short lead time)

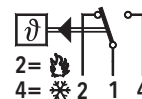
Product No.	Type Code	Temperature range [°C]	Set point adjustment	Sensor max. [°C]
MSP35	664 2594 502 00	-10 ... +35	Internal switchpoint adjustment	50
MSP80	664 2595 502 00	-10 ... +80	Internal switchpoint adjustment	85
MSP95	664 2520 502 00	+5 ... +95	Internal switchpoint adjustment	105
MSP110	664 2523 502 00	+20 ... +110	Internal switchpoint adjustment	115

Sensor: Capillary tube with direct mounted sensor
 Sensor material: Copper
 Electrical connection: Screw terminal

Switching differential [°C]: 3.7 ... 14 (adjustable)



AC 500 V, 10 (0.75) A
 DC 30 V, 6 (1.5) A
 DC 250 V, 0.25 (0.03) A



MSP ...
 Internal switchpoint adjustment

MST 624/634

Ministat



Features

- Short response time
- Protection IP54
- Electrical connection on terminal screw

Technical Data

Designation of application	Direct mounting thermostat	Switching differential	Adjustable / 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

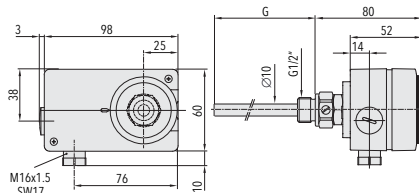
Data sheet H72174
 Instructions H73624

Standard products (extra short lead time)

Product No.	Type Code	Temperature range [°C]	Protection tube length [mm]	Switching differential [°C]	Sensor max. [°C]
MST8015	634 2595 322 12 1216 0150	-10 ... +80	150	2 ... 12 (adjustable)	105
MST8040	634 2595 322 12 1216 0400	-10 ... +80	400	2 ... 12 (adjustable)	85
MST9511	634 2520 332 12 1217 0110	+5 ... +95	110	2 ... 12 (adjustable)	85
MST9515	634 2520 322 12 1216 0150	+5 ... +95	150	2 ... 12 (adjustable)	105
MST9540	634 2520 322 12 1216 0400	+5 ... +95	400	2 ... 12 (adjustable)	105
MST15015	634 2531 322 12 1216 0150	+20 ... +150	150	2.5 ... 16 (adjustable)	165
MST15040	634 2531 322 12 1216 0400	+20 ... +150	400	2.5 ... 16 (adjustable)	165

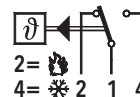
Sensor: Capillary tube with direct mounted sensor

Electrical connection: Screw terminal



MST ...
 Internal switchpoint adjustment

AC 500 V, 10 (0.75) A
 DC 30 V, 6 (1.5) A
 DC 250 V, 0.25 (0.03) A



MS...R 630/632

Mini Limistat



Features

- External or internal resetting
- Short response time
- Protection IP54
- Electrical connection on terminal screw

Technical Data

Designation of application	Remote sensing thermostat with limiter	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

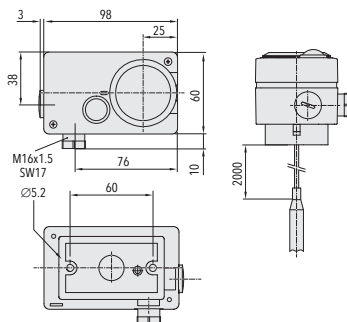
Data sheet	H72173
Instructions	H73624

Standard products (extra short lead time)

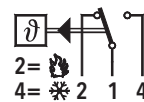
Product No.	Type Code	Sensor material	Temperature range [°C]	Sensor max. [°C]
MS95R	632 1220 322 19	Copper	+5 ... +95	105
MS150R	632 1231 322 19	Copper	+20 ... +150	165
MS230SR	632 1224 121 19	1.4435 (AISI316L)	+20 ... +230	250
MS350SR	632 1254 121 19	1.4435 (AISI316L)	+70 ... +350	380

Sensor: Capillary tube with remote sensor

Electrical connection: Screw terminal



AC 500 V, 10 (0.75) A
 DC 30 V, 15 (1.5) A
 DC 250 V, 0.3 (0.2) A



MS ... R
 Internal switchpoint adjustment, external reset
 Calibrated for increasing temperatures

M/MS 624/634

Ministat



Features

- Short response time
- Protection IP54
- Electrical connection on terminal screw

Technical Data

Designation of application	Remote sensing thermostat	Switching differential	Adjustable / 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

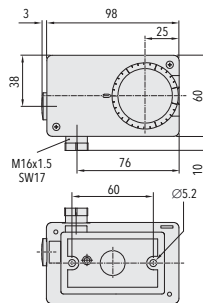
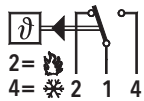
Standard products (extra short lead time)

Product No.	Type Code	Sensor material	Temperature range [°C]	Switching differential [°C]	Sensor max. [°C]
M35	624 2509 422 19	Copper	0 ... +35	0.7 ... 10 (adjustable)	70
M40	624 2501 422 19	Copper	-30 ... +40	0.7 ... 10 (adjustable)	45
M95	624 2520 322 19	Copper	+5 ... +95	2 ... 12 (adjustable)	105
M150	624 2531 322 19	Copper	+20 ... +150	2.5 ... 16 (adjustable)	165
M230S	624 2524 121 19	1.4435 (AISI316L)	+20 ... +230	3 ... 32 (adjustable)	250
M350S	624 2554 121 19	1.4435 (AISI316L)	+70 ... +350	4 ... 40 (adjustable)	380
MS35	634 2509 422 19	Copper	0 ... +35	0.7 ... 10 (adjustable)	70
MS40	634 2501 422 19	Copper	-30 ... +40	0.7 ... 10 (adjustable)	45
MS95	634 2520 322 19	Copper	+5 ... +95	2 ... 12 (adjustable)	105
MS150	634 2531 322 19	Copper	+20 ... +150	2.5 ... 16 (adjustable)	165
MS230S	634 2524 121 19	1.4435 (AISI316L)	+20 ... +230	3 ... 32 (adjustable)	250
MS350S	634 2554 121 19	1.4435 (AISI316L)	+70 ... +350	4 ... 40 (adjustable)	380

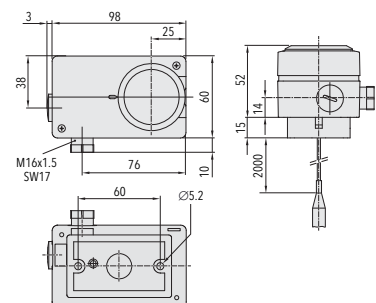
Sensor: Capillary tube with remote sensor

Electrical connection: Screw terminal

AC 500 V, 10 (0.75) A
 DC 30 V, 6 (1.5) A
 DC 250 V, 0.25 (0.03) A



M ...
External switchpoint adjustment



MS ...
Internal switchpoint adjustment

Data sheet
 Instructions

H72172
 H73624

Ordering information/type code

		XXX	XX	XX	XXX	XX	XXXXXXXXXX	XX	XX	
Custom build code	External adjustment	624								
	Internal adjustment	634								
Microswitch	Small switching differential, not adjustable	10	With gold plated contacts, switching differential not adjustable		21					
	Average switching differential, not adjustable	11	Adjustable large switching differential		24					
			Adjustable standard switching differential		25					
Range	Range [°C]	Sensor max. [°C]		Range [°C]	Sensor max. [°C]					
	-30 ... 40	45	01	-10 ... 80 ⁴⁾	85	95				
	-10 ... 25 ⁴⁾	60	07	5 ... 95	105	20				
	0 ... 35	70	09	20 ... 110 ⁴⁾	115	23				
	10 ... 45	85	11	20 ... 150	165	31				
	10 ... 80 ⁴⁾	100	13	20 ... 230	250	24				
	15 ... 30	60	17	40 ... 300 ⁴⁾	330	53				
	-10 ... 35	70	94	70 ... 350	380	54				
Sensor¹⁾	Range	Sensor diameter [mm]	Sensor material		Range	Sensor diameter [mm]	Sensor material			
	24, 53, 54	Ø4.7	Stainless steel	111	01, 07, 09, 11, 13, 17	Ø4.7	Copper	412		
	24, 53, 54	Ø7	Stainless steel	121	01, 07, 09, 11, 13, 17	Ø7	Copper	422		
	24, 53, 54	Ø9	Stainless steel	131	01, 07, 09, 11, 13, 17	Ø9	Copper	432		
	94, 95, 20, 23, 31	Ø4.7	Stainless steel	311	24, 53, 54	Ø4.7	Copper nickel plated	113		
	94, 95, 20, 23, 31	Ø7	Stainless steel	321	24, 53, 54	Ø7	Copper nickel plated	123		
	94, 95, 20, 23, 31	Ø9	Stainless steel	331	24, 53, 54	Ø9	Copper nickel plated	133		
	01, 07, 09, 11, 13, 17	Ø7	Stainless steel	421	94, 95, 20, 23, 31	Ø4.7	Copper nickel plated	313		
	24, 53, 54	Ø4.7	Copper	112	94, 95, 20, 23, 31	Ø7	Copper nickel plated	323		
	24, 53, 54	Ø7	Copper	122	94, 95, 20, 23, 31	Ø9	Copper nickel plated	333		
	24, 53, 54	Ø9	Copper	132	01, 07, 09, 11, 13, 17	Ø4.7	Copper nickel plated	413		
	94, 95, 20, 23, 31	Ø4.7	Copper	312	01, 07, 09, 11, 13, 17	Ø7	Copper nickel plated	423		
	94, 95, 20, 23, 31	Ø7	Copper	322	01, 07, 09, 11, 13, 17	Ø9	Copper nickel plated	433		
	94, 95, 20, 23, 31	Ø9	Copper	332						
	Fixing²⁾	Nut M10 (for remote sensing version)	10	Angle bracket (for remote sensing version)		17				
		Cap nut (for direct mounting version)	14	Grubscrew locked with spacer (cooling element) (for direct mounting version)		18				
		Grubscrew locked, lateral (direct mounting version)	12	Mounting bracket (for remote sensing version)		19				
	Protection tube	See data sheet H72114/H72163						XXXX.XXXX		
	Accessories	Switchpoint locking ⁴⁾	15	Condensators over Pin 1-2 / 1-3		23				
		Switchpoint fixed and sealed upon customer's request	88	Railway version (UIC 616)		28				
Switchpoint preset upon customer's request, no guarantee on switching accuracy		83	Outdoor application (vented)		44					
Switchpoint adjustment please indicate when ordering:			Cover with window		77					
- Switchpoint [bar]			Capillary tube protection: Flexible metal tube, brass nickel plated		90					
- Increasing or decreasing			Capillary tube protection: Flexible metal tube 1.4541/V2A		91					
Condensator over Pin 1-2		12	Capillary tube protection: PVC tube		92					
Condensator over Pin 1-3	13									
Capillary tube length	Capillary tube length up to 5000 mm (no specification required for direct mounting on protection tube) L=XXXX ³⁾									

¹⁾ See data sheet H72114/H72163

³⁾ Overlengths upon request

²⁾ See data sheet H72106

⁴⁾ Only with type 634 internal adjustment

GS 657/658

Galvanostat



Features

- Short response time
- Protection IP54
- Electrical connection on terminal screw
- Coated capillary tube 1500 mm

Technical Data

Designation of application	Remote sensing thermostat	Switching differential	Not adjustable
Measuring range	+5°C ... +95°C and +20°C ... +150°C	Repeatability	± 0.5 % FS typ.
Output signal	Floating change-over contact	Approval / conformity	EN60730-1/ EN60730-2-9: Typ 2.B.H

Data sheet	H72179
Instructions	H73624

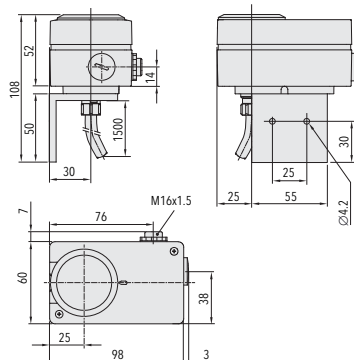
Standard products (extra short lead time)

Product No.	Type Code	Temperature range [°C]	Switching differential [°C]	Sensor max. [°C]
GS95	658 1120 326 26	+5 ... +95	2.5 (fixed)	105
GS150	658 1131 326 26	+20 ... +150	3.0 (fixed)	165

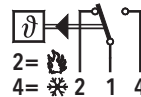
Sensor: Capillary tube with remote sensor

Sensor material: Copper with protection tube Teflon FEP

Electrical connection: Screw terminal



AC 500 V, 10 (0.75) A
 DC 30 V, 6 (1.5) A
 DC 250 V, 0.25 (0.03) A



GS ...
 Internal switchpoint adjustment

D...R 302

Duo Limistat



Features

- Two individual measuring systems
- Short response time
- Protection IP54
- Electrical connection on terminal screw

Technical Data

Designation of application	Double thermostat with remote sensor and limiter	Switching differential	Adjustable / 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

Data sheet	H72142
Instructions	H73170

Standard products (extra short lead time)

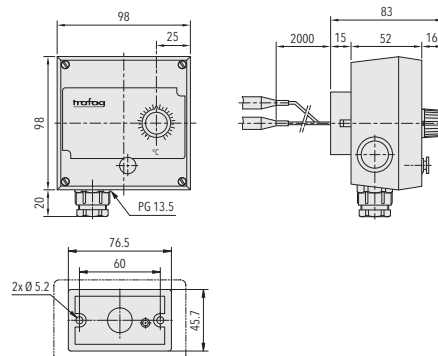
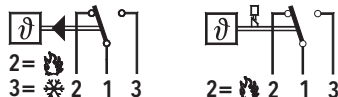
Product No.	Type Code	Temperature range [°C]	Switching differential [°C]	Measuring range limiter [°C]	Sensor max. [°C]
D95R	302 5836 362 19	+5 ... +95	2 ... 12 (adjustable)	+20 ... +110	105
D150R	302 5842 362 19	+20 ... +150	2.5 ... 16 (adjustable)	+35 ... +175	165
D300R	302 5839 162 19	+40 ... +300	4 ... 40 (adjustable)	+70 ... +350	380

Sensor: Capillary tube with remote sensor

Sensor material: Copper

Electrical connection: Screw terminal

AC 500 V, 10 (0.75) A
 DC 30 V, 6 (1.5) A
 DC 250 V, 0.25 (0.03) A



D ... R

External switchpoint adjustment

Calibrated for increasing temperatures

M2S 104/114

Alterostat



Features

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

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

Data sheet H72139
Instructions H70311

Standard products (extra short lead time)

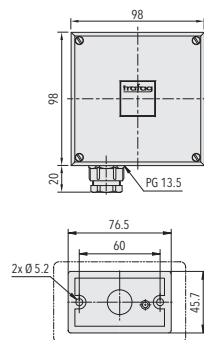
Product No.	Type Code	Temperature range [°C]	Switching differential [°C]	Smallest stage difference [°C]	Largest stage difference [°C]	Sensor max. [°C]
M2S40	114 1101 422 19	-30 ... +40	1.8 (fixed)	0.8	25	45
M2S35	114 1109 422 19	0 ... +35	1.8 (fixed)	0.8	15	50
M2S95	114 1120 322 19	+5 ... +95	2.5 (fixed)	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

M2S40 ... M2S150

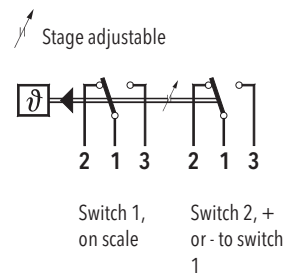
Sensor: Capillary tube with remote sensor
Sensor material: Copper
Electrical connection: Screw terminal

M2S230S ... M2S350S

Sensor: Capillary tube with remote sensor
Sensor material: 1.4435 (AISI316L)
Electrical connection: Screw terminal



M2S ...
Internal switchpoint adjustment



F/F...R 990/991/992/993

Froststat



Features

- Rugged aluminium housing
- Short response time
- Protection IP54
- Electrical connection on terminal screw

Technical Data

Designation of application	Frost protection thermostat	Switching differential	Not adjustable
Measuring range	-5°C ... +15°C	Repeatability	± 0.5 % FS typ.
Output signal	Floating change-over contact	Approval / conformity	EN60730-1/ EN60730-2-9: Typ 2.B.H

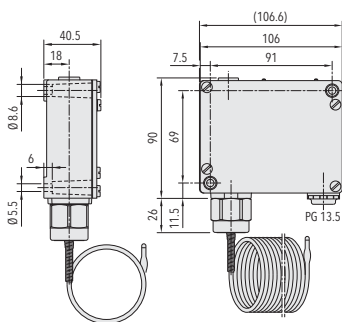
Data sheet	H72123
Instructions	H70821

Standard products (extra short lead time)

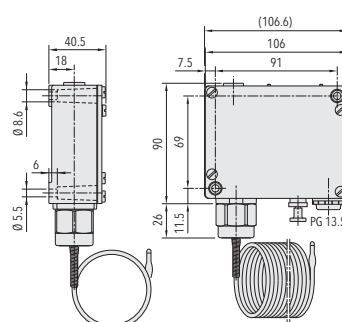
Product No.	Type Code	Sensor material	Set point adjustment
F15	991 1299 000	Copper capillary tube, L=6m	Internal switchpoint adjustment
F153	990 1299	Copper capillary tube, L=3m	Internal switchpoint adjustment
F15R	993 1299 000	Copper capillary tube, L=6m	Internal switchpoint adjustment and external reset knob
F153R	992 1299	Copper capillary tube, L=3m	Internal switchpoint adjustment and external reset knob

Sensor: Capillary tube with remote sensor

Electrical connection: Screw terminal

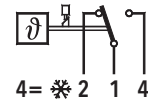


F ...
Internal switchpoint adjustment



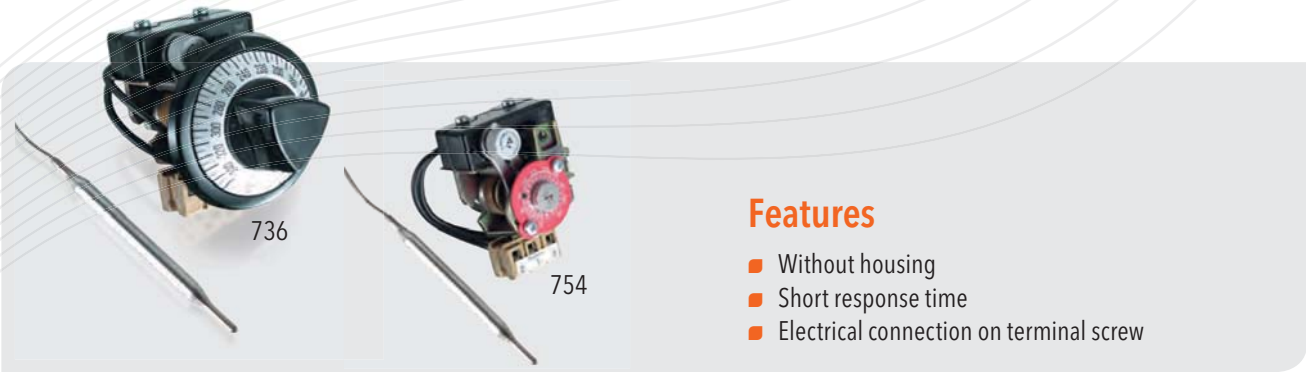
F ... R
Internal switchpoint adjustment, external reset
Calibrated for increasing temperatures

AC 500 V, 10 (0.75) A
DC 30 V, 15 (1.5) A
DC 250 V, 0.3 (0.2) A



L/LF 736/754

Laborstat



Features

- Without housing
- Short response time
- Electrical connection on terminal screw

Technical Data

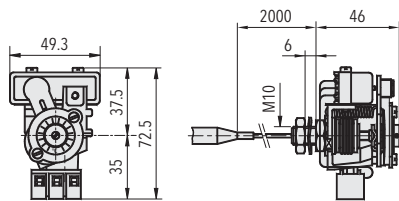
Designation of application	Remote sensing thermostat, skeleton type	Switching differential	Adjustable / not adjustable
Measuring range	-30°C ... +40°C to +70°C ... +350°C	Repeatability	± 0.5 % FS typ.
Output signal	Floating change-over contact	Approval / conformity	EN60730-1/ EN60730-2-9: Typ 2.B.H

- Data sheet H72122
- Instructions H70211

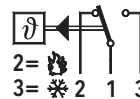
Standard products (extra short lead time)

Product No.	Type Code	Sensor material	Temperature range [°C]	Switching differential [°C]	Sensor max. [°C]
L35	754 2509 422 10	Copper	0 ... +35	0.7 ... 10 (adjustable)	60
L40	754 2501 422 10	Copper	-30 ... +40	0.7 ... 10 (adjustable)	45
L95	754 2520 322 10	Copper	+5 ... +95	2 ... 12 (adjustable)	105
L150	754 2531 322 10	Copper	+20 ... +150	2.5 ... 16 (adjustable)	165
L230S	754 2524 121 10	1.4435 (AISI316L)	+20 ... +230	3 ... 32 (adjustable)	250
L350S	754 2554 121 10	1.4435 (AISI316L)	+70 ... +350	4 ... 40 (adjustable)	380

Sensor: Capillary tube with remote sensor
 Electrical connection: Screw terminal



AC 500 V, 10 (0.75) A
 DC 30 V, 6 (1.5) A
 DC 250 V, 0.25 (0.03) A



L ...
 Internal switchpoint adjustment

L...R 755

Labor Limistat



Features

- Without housing
- Short response time
- Electrical connection on terminal screw

Technical Data

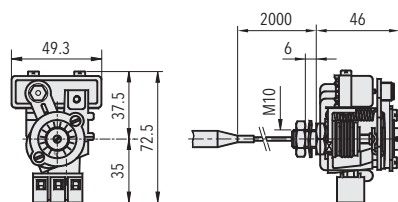
Designation of application	Remote sensing thermostat with limiter, skeleton type	Switching differential	Not adjustable
Measuring range	-30°C ... +40°C to +70°C ... +350°C	Repeatability	± 0.5 % FS typ.
Output signal	Floating change-over contact	Approval / conformity	EN60730-1/ EN60730-2-9: Typ 2.B.H

Data sheet	H72124
Instructions	H70211

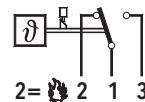
Standard products (extra short lead time)

Product No.	Type Code	Sensor material	Temperature range [°C]	Sensor max. [°C]
L95R	755 1220 322 10	Copper	+5 ... +95	105
L150R	755 1231 322 10	Copper	+20 ... +150	165
L230SR	755 1224 121 10	1.4435 (AISI316L)	+20 ... +230	250
L350SR	755 1254 121 10	1.4435 (AISI316L)	+70 ... +350	380

Sensor: Capillary tube with remote sensor
 Electrical connection: Screw terminal



AC 500 V, 10 (0.75) A
 DC 30 V, 6 (1.5) A
 DC 250 V, 0.25 (0.03) A



L ... R
 Internal switchpoint adjustment and reset
 Calibrated for increasing temperatures

I/IS 404/414

Industat



Features

- Compact design
- Rugged housing
- Protection IP65
- Any mounting position possible

Technical Data

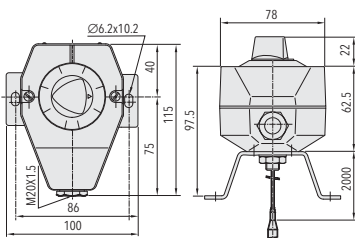
Designation of application	Industrial thermostat with remote sensor	Switching differential	Adjustable / not adjustable
Measuring range	-30°C ... +40°C to +70°C ... +350°C	Repeatability	± 0.5 % FS typ.
Output signal	Floating change-over contact	Approval / conformity	EN60730-1/ EN60730-2-9: Typ 2.B.H

Standard products (extra short lead time)

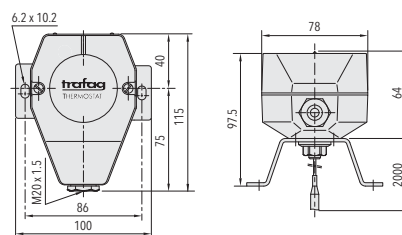
Product No.	Type Code	Sensor material	Temperature range [°C]	Switching differential [°C]	Sensor max. [°C]
I35	404 2509 422 27	Copper	0 ... +35	0.7 ... 10 (adjustable)	60
I40	404 2501 422 27	Copper	-30 ... +40	0.7 ... 10 (adjustable)	45
I95	404 2520 322 27	Copper	+5 ... +95	2 ... 12 (adjustable)	105
I150	404 2531 322 27	Copper	+20 ... +150	2.5 ... 16 (adjustable)	165
I230S	404 2524 121 27	1.4435 (AISI316L)	+20 ... +230	3 ... 32 (adjustable)	250
I350S	404 2554 121 27	1.4435 (AISI316L)	+70 ... +350	4 ... 40 (adjustable)	380
IS35	414 2509 422 27	Copper	0 ... +35	0.7 ... 10 (adjustable)	60
IS40	414 2501 422 27	Copper	-30 ... +40	0.7 ... 10 (adjustable)	45
IS95	414 2520 322 27	Copper	+5 ... +95	2 ... 12 (adjustable)	105
IS150	414 2531 322 27	Copper	+20 ... +150	2.5 ... 16 (adjustable)	165
IS230S	414 2524 121 27	1.4435 (AISI316L)	+20 ... +230	3 ... 32 (adjustable)	250
IS350S	414 2554 121 27	1.4435 (AISI316L)	+70 ... +350	4 ... 40 (adjustable)	380

Sensor: Capillary tube with remote sensor

Electrical connection: Screw terminal

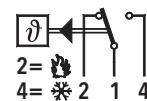


I ...
External switchpoint adjustment



IS ...
Internal switchpoint adjustment

AC 500 V, 10 (0.75) A
DC 30 V, 6 (1.5) A
DC 250 V, 0.25 (0.03) A



Data sheet
Instructions

H72110
H73111

Ordering information/type code

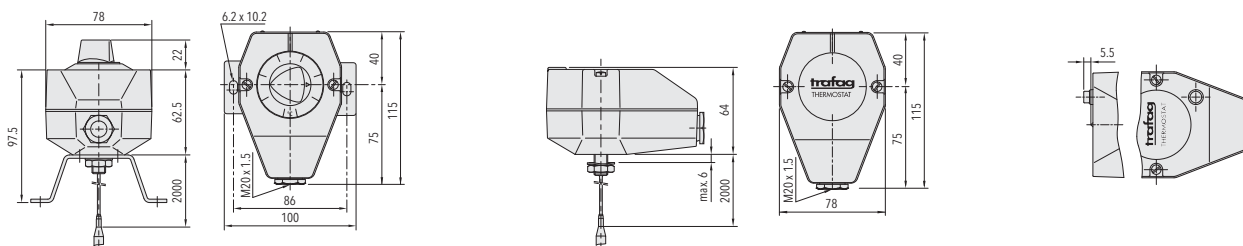
		XXX	XX	XX	XXX	XX	XXXXXXXXXX	XX	XX	
Custom build code	External adjustment	404								
	Internal adjustment	414								
Microswitch	Small switching differential, not adjustable		10							
	Average switching differential, not adjustable		11							
	With gold plated contacts, switching differential not adjustable		21							
	Adjustable large switching differential		24							
	Adjustable standard switching differential		25							
Range	Range [°C]	Sensor max. [°C]		Range [°C]	Sensor max. [°C]					
	-30 ... 40	50	01	-10 ... 80	85	95				
	-10 ... 25	60	07	5 ... 95	105	20				
	0 ... 35	70	09	20 ... 110	115	23				
	10 ... 45	85	11	20 ... 150	165	31				
	10 ... 80	100	13	20 ... 230	250	24				
	15 ... 30	60	17	40 ... 300	330	53				
	-10 ... 35	70	94	70 ... 350	380	54				
Sensor ¹⁾	Range	Sensor diame- ter [mm]	Sensor material	Range	Sensor diame- ter [mm]	Sensor material				
	01, 07, 09, 11, 13, 17	Ø7	Stainless steel	94, 95, 20, 23, 31	Ø9	Copper	421	332		
	01, 07, 09, 11, 13, 17	Ø4.7	Copper	94, 95, 20, 23, 31	Ø4.7	Copper nickel plated	412	313		
	01, 07, 09, 11, 13, 17	Ø7	Copper	94, 95, 20, 23, 31	Ø7	Copper nickel plated	422	323		
	01, 07, 09, 11, 13, 17	Ø9	Copper	94, 95, 20, 23, 31	Ø9	Copper nickel plated	432	333		
	01, 07, 09, 11, 13, 17	Ø4.7	Copper nickel plated	24, 53, 54	Ø4.7	Stainless steel	413	111		
	01, 07, 09, 11, 13, 17	Ø7	Copper nickel plated	24, 53, 54	Ø7	Stainless steel	423	121		
	01, 07, 09, 11, 13, 17	Ø9	Copper nickel plated	24, 53, 54	Ø9	Stainless steel	433	131		
	94, 95, 20, 23, 31	Ø4.7	Stainless steel	24, 53, 54	Ø4.7	Copper	311	112		
	94, 95, 20, 23, 31	Ø7	Stainless steel	24, 53, 54	Ø7	Copper	321	122		
	94, 95, 20, 23, 31	Ø9	Stainless steel	24, 53, 54	Ø9	Copper	331	132		
	94, 95, 20, 23, 31	Ø4.7	Copper	24, 53, 54	Ø4.7	Copper nickel plated	312	113		
	94, 95, 20, 23, 31	Ø7	Copper	24, 53, 54	Ø7	Copper nickel plated	322	123		
	94, 95, 20, 23, 31	Ø9	Copper	24, 53, 54	Ø9	Copper nickel plated	332	133		
	Fixing ²⁾	Nut M10 (for remote sensing version)							10	
		Flange connection (for remote sensing version)							16	
		Angle bracket (for remote sensing version)							17	
		Bracket (for remote sensing version)							27	
		Grubscrew locked, lateral (direct mounting version)							12	
		Cap nut (for direct mounting version)							13	
Cap nut (for direct mounting version)								14		
Grubscrew locked with spacer (cooling element) (for direct mounting version)								18		
Protection tube	See data sheet H72114/H72163							XXXX.XXXX		

Continuation on next page

Accessories	Signal lamp	14
	Switchpoint locking ⁴⁾	15
	Switchpoint fixed and sealed upon customer's request	88
	Switchpoint preset upon customer's request, no guarantee on switching accuracy	83
	Switchpoint adjustment please indicate when ordering:	
	- Switchpoint [bar]	
	- Increasing or decreasing	
	Condensator over Pin 1-2	12
	Condensator over Pin 1-4	13
	Condensators over Pin 1-2 / 1-4	23
	Railway version (UIC 616)	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

Capillary tube length	Capillary tube length up to 5000 mm (no specification required for direct mounting on protection tube) L=XXXX ³⁾
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¹⁾ See data sheet H72114/H72163
²⁾ See data sheet H72106
³⁾ Overlengths upon request
⁴⁾ Only with type 414, internal adjustment



IS...R 410/412

Indu Limistat



Features

- Compact design
- Rugged housing
- Protection IP65
- Any mounting position possible

Technical Data

Designation of application	Industrial thermostat with remote sensor and limiter	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

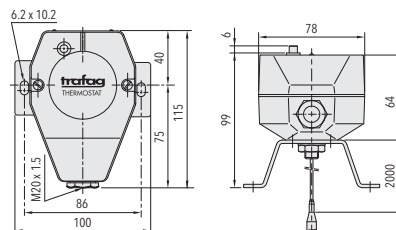
Data sheet	H72138
Instructions	H73111

Standard products (extra short lead time)

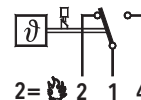
Product No.	Type Code	Sensor material	Temperature range [°C]	Sensor max. [°C]
IS95R	412 1220 322 27	Copper	+5 ... +95	105
IS150R	412 1231 322 27	Copper	+20 ... +150	165
IS230SR	412 1224 121 27	1.4435 (AISI316L)	+20 ... +230	250
IS350SR	412 1254 121 27	1.4435 (AISI316L)	+70 ... +350	380

Sensor: Capillary tube with remote sensor

Electrical connection: Screw terminal



AC 500 V, 10 (0.75) A
DC 30 V, 15 (1.5) A
DC 250 V, 0.3 (0.2) A



IS ... R

Internal switchpoint adjustment, external reset

Calibrated for increasing temperatures

ISN/ISNT 471/472

Navistat



Features

- Compact design
- Rugged housing
- High repeatability
- Protection IP65
- Any mounting position possible

Technical Data

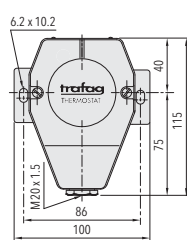
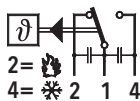
Designation of application	Thermostat for shipbuilding	Switching differential	Not adjustable
Measuring range	+20°C ... +110°C to +40°C ... +300°C	Repeatability	± 0.5 % FS typ.
Output signal	Floating change-over contact	Approval / conformity	ABS, BV, CCS, DNV, GL, KRS, LRS, RINA, RMRS EN60730-1/ EN60730-2-9: Typ 2.B.H

Standard products (extra short lead time)

Product No.	Type Code	Temperature range [°C]	Protection tube diameter [mm]	Protection tube length [mm]	Switching differential [°C]	Sensor max. [°C]
ISN11011	471 2323 332 27 8317 0110 90	+20 ... +110	12	110	4.5 (fixed)	115
ISN11015	471 2323 322 27 8316 0150 90	+20 ... +110	10	150	4.5 (fixed)	115
ISN11065	471 2323 342 27 8319 0065 90	+20 ... +110	15	65	4.5 (fixed)	115
ISN15011	471 2331 332 27 8317 0110 90	+20 ... +150	12	110	5 (fixed)	165
ISN15015	471 2331 322 27 8316 0150 90	+20 ... +150	10	150	5 (fixed)	165
ISN15065	471 2331 342 27 8319 0065 90	+20 ... +150	15	65	5 (fixed)	165
ISNT11011	471 2323 332 14 1417 0110	+20 ... +110	12	110	4.5 (fixed)	115
ISNT11015	471 2323 322 14 1416 0150	+20 ... +110	10	150	4.5 (fixed)	115
ISNT11065	471 2323 342 14 1419 0065	+20 ... +110	15	65	4.5 (fixed)	115
ISNT15011	471 2331 332 14 1417 0110	+20 ... +150	12	110	5 (fixed)	165
ISNT15015	471 2331 322 14 1416 0150	+20 ... +150	10	150	5 (fixed)	165
ISNT15065	471 2331 342 14 1419 0065	+20 ... +150	15	65	5 (fixed)	165

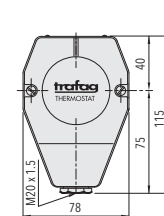
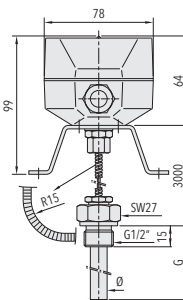
Sensor: Capillary tube with remote sensor
Electrical connection: Screw terminal

AC 500 V, 10 (0.75) A
DC 30 V, 15 (1.5) A
DC 250 V, 0.3 (0.2) A



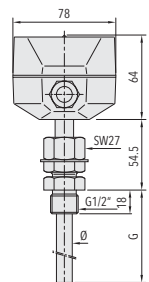
ISN ...

Internal switchpoint adjustment



ISNT ...

Internal switchpoint adjustment



Data sheet
Instructions

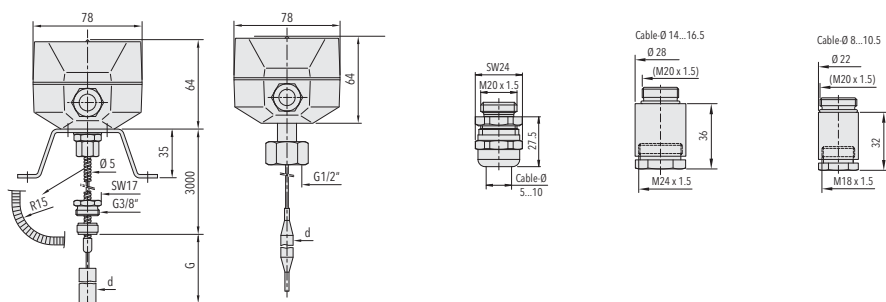
H72111
H73111

Ordering information/type code

		XXX . XX	XX	XXX	XX	XXXX	XXXX	XX	XX	
Custom build code	Controller, increased vibration resistance	471 . 23								
	Controller, high vibration resistance ¹⁾	471 . 26								
	Temperature switch with locking, high vibration resistance ²⁾	472 . 12								
Range	Range [°C]	Sensor max. [°C]								
	+20 ... 110	115						23		
	+20 ... 150	165						31		
	+40 ... 300	330						53		
Sensor	Range [°C]	Sensor diameter [mm]	Range [°C]	Sensor diameter [mm]						
	+20 ... 110	Ø7	+40 ... 300	Ø7				122		
	+20 ... 150	Ø9	+40 ... 300	Ø9				132		
	+20 ... 150	Ø12	+40 ... 300	Ø12				142		
Fixing	Version B (remote sensing version)								27	
	Version K (direct mounting version)								14	
Protection tube	Suitable for sensor	Protection tube diameter [mm]	Protection tube length [mm]	Electrical connection		Suitable for sensor	Protection tube diameter [mm]	Protection tube length [mm]	Electrical connection	
	322	10/8	min. 150	K, Stainless steel	1411	322	10/8	min. 150	B, Brass nickel plated	8316
	332	12/10	min. 110	K, Stainless steel	1412	332	12/10	min. 110	B, Brass nickel plated	8317
	342	15/13	min. 65	K, Stainless steel	1414	342	15/13	min. 65	B, Brass nickel plated	8319
	322	10/8	min. 150	K, Brass nickel plated	1416	322	10/8	min. 150	B, Stainless steel	8411
	332	12/10	min. 110	K, Brass nickel plated	1417	332	12/10	min. 110	B, Stainless steel	8412
	342	15/13	min. 65	K, Brass nickel plated	1419	342	15/13	min. 65	B, Stainless steel	8414
	142	15/13	min. 65	K, Brass nickel plated	1419	142	15/13	min. 65	B, Stainless steel	8414
Protection tube length	Length G, see data sheet H72114/H72163								XXXX	
Accessories	Switchpoint fixed and sealed upon customer's request									88
	Switchpoint preset upon customer's request, no guarantee on switching accuracy									83
	Switchpoint adjustment please indicate when ordering:									
	- Switchpoint [bar]									
	- Increasing or decreasing									
	Screwed cable gland M20x1.5 (EN 50262)									07
	Screwed cable gland M24x1.5 (DIN 89280)									27
	Screwed cable gland M18x1.5 (DIN 89280)									40
Capillary tube protection: Flexible metal tube, brass nickel plated									90	
Capillary tube length	Capillary tube length up to 5000 mm (no specification required for direct mounting on protection tube) L = XXXX Standard length: L = 3000 mm with flexible metal tube									

¹⁾ Without ship approval GL

²⁾ Without ship approval LRS



ISP/ISPT 474

Picotherm



Features

- Compact design
- Rugged housing
- High repeatability
- Protection IP65
- Any mounting position possible

Technical Data

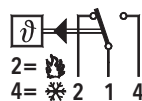
Designation of application	Compact thermostat for shipbuilding	Switching differential	Not adjustable
Measuring range	+5°C ... +95°C to +20°C ... +150°C	Repeatability	± 1 % FS typ.
Output signal	Floating change-over contact	Approval / conformity	ABS, BV, CCS, DNV, GL, KRS, LRS, NKK, RINA, RMRS EN60730-1/ EN60730-2-9: Typ 2.B.H

Standard products (extra short lead time)

Product No.	Type Code	Temperature range [°C]	Protection tube diameter [mm]	Protection tube length [mm]	Switching differential [°C]	Sensor max. [°C]
ISPT9515	474 0320 322 14 1416 0150 58 V3	+5 ... +95	10	150	4 (fixed)	100
ISPT9565	474 0320 342 14 1419 0065 58 V3	+5 ... +95	15	65	4 (fixed)	100
ISPT11015	474 0323 322 14 1416 0150 58 V3	+20 ... +110	10	150	4 (fixed)	115
ISPT11065	474 0323 342 14 1419 0065 58 V3	+20 ... +110	15	65	4 (fixed)	115
ISPT15015	474 0331 322 14 1416 0150 58 V3	+20 ... +150	10	150	5 (fixed)	165
ISPT15065	474 0331 342 14 1419 0065 58 V3	+20 ... +150	15	65	5 (fixed)	165
ISP9515	474 0320 322 00 8316 0150 58 90 V3	+5 ... +95	10	150	4 (fixed)	100
ISP9565	474 0320 342 00 8319 0065 58 90 V3	+5 ... +95	15	65	4 (fixed)	100
ISP11015	474 0323 322 00 8316 0150 58 90 V3	+20 ... +110	10	150	4 (fixed)	115
ISP11065	474 0323 342 00 8319 0065 58 90 V3	+20 ... +110	15	65	4 (fixed)	115
ISP15015	474 0331 322 00 8316 0150 58 90 V3	+20 ... +150	10	150	6 (fixed)	165
ISP15065	474 0331 342 00 8319 0065 58 90 V3	+20 ... +150	15	65	6 (fixed)	165

External switchpoint adjustment
Electrical connection: EN175301-803-A

AC 250 V, 3 (1) A
DC 24 V, 2 (4) A
DC 250 V, 0.1 (0.05) A



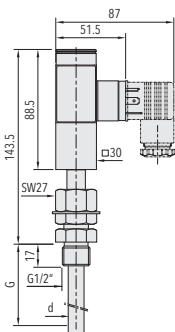
Data sheet
Instructions

H72113
H73113

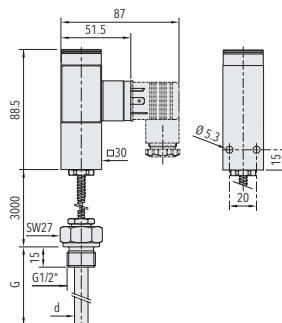
Ordering information/type code

		474 . XX	XX	XXX	XX	XXXX	XXXX	XX	XX
Microswitch	Standard, switching differential not adjustable	03							
Range	Range [°C]	Sensor max. [°C]							
	+5 ... +95	100	20						
	+20 ... +110	115	23						
	+20 ... +150	165	31						
Sensor	Sensor diameter [mm]								
	Ø7		322						
	Ø12		342						
Fixing ²⁾	Flange connection (for remote sensing version)					00			
	Cap nut (for direct mounting version)					14			
Protection tube	Mounting	Suitable for sensor	Protection tube diameter [mm]	Protection tube length [mm]					
	For direct mounting on protection tube	322	10	150	1416				
	For direct mounting on protection tube	342	15	65	1419				
	For remote sensing version	322	10	150	8316				
	For remote sensing version	342	15	65	8319				
Protection tube length	Protection tube length [mm]								
	65							0065	
	150							0150	
Accessories	Female electrical connector EN 175301-803-A (DIN43650-A)								58
	Capillary tube protection: Flexible metal tube, brass nickel plated								90
	Fixing set								V3
	Cover with window								77
Capillary tube length	Capillary tube length up to 5000 mm (no specification required for direct mounting on protection tube) L = XXXX								
	Standard length: L = 3000 mm with flexible metal tube								

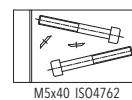
²⁾ See data sheet H72106



ISPT ...
Direct mounting version



ISP ...
For remote sensing version L = 3000 mm



EXS 404/414

EX Industat



Features

- Compact design
- Rugged housing
- Any mounting position possible
- Ex d e IIC T6 Gb
- Ex tb IIIC T80°C Db

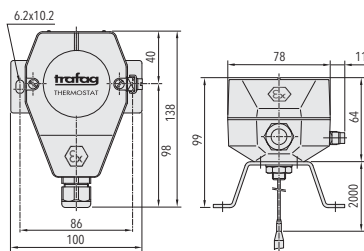
Technical Data

Designation of application	Ex Industrial 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	SEV 15 ATEX 0156 X

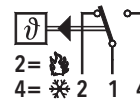
Standard products (extra short lead time)

Product No.	Type Code	Sensor material	Temperature range [°C]	Switching differential [°C]	Sensor max. [°C]
EXS35	414 9109 423 27 0000 0000 02	Copper nickel plated	0 ... +35	2.5 (fixed)	50
EXS40	414 9101 423 27 0000 0000 02	Copper nickel plated	-30 ... +40	2.5 (fixed)	45
EXS95	414 9120 323 27 0000 0000 02	Copper nickel plated	+5 ... +95	3.5 (fixed)	105
EXS150	414 9131 323 27 0000 0000 02	Copper nickel plated	+20 ... +150	5.5 (fixed)	165
EXS230S	414 9124 121 27 0000 0000 02	1.4435 (AISI316L)	+20 ... +230	8 (fixed)	250
EXS350S	414 9154 121 27 0000 0000 02	1.4435 (AISI316L)	+70 ... +350	10 (fixed)	380

Sensor: Capillary tube with remote sensor
Electrical connection: Screw terminal



AC 250 V, 5 (5) A
DC 30 V, 5 (3) A
DC 250 V, 0.25 (0.03) A



EXS ...
Internal switchpoint adjustment

Ordering information/type code

		XXX	XX	XX	XXX	XX	XXXXXXXXXX	XX	XX
Custom build code	External adjustment	404							
	Internal adjustment	414							
Microswitch	Standard, switching differential not adjustable		91						
Range	Range [°C]	Sensor max. [°C]		Range [°C]	Sensor max. [°C]				
	-30 ... +40	50	01	-10 ... +80	85	95			
	-10 ... +25	60	07	+5 ... +95	105	20			
	0 ... +35	70	09	+20 ... +110	115	23			
	+10 ... +45	85	11	+20 ... +150	165	31			
	+10 ... +80	100	13	+20 ... +230	250	24			
	+15 ... +30	60	17	+40 ... +300	330	53			
	-10 ... +35	70	94	+35 ... +175	200	56			
	+10 ... +70	85	59	+20 ... +270	330	55			
	+20 ... +85	100	58	+70 ... +350	380	54			
	+20 ... +115	130	57						
	Sensor ¹⁾	Range	Sensor diameter [mm]	Sensor material					
01, 07, 09, 11, 13, 17, 58, 59		Ø7	Stainless steel	421					
94, 95, 20, 23, 31, 56, 57		Ø4.7	Stainless steel	311					
94, 95, 20, 23, 31, 56, 57		Ø7	Stainless steel	321					
94, 95, 20, 23, 31, 56, 57		Ø9	Stainless steel	331					
24, 53, 54, 55		Ø4.7	Stainless steel	111					
24, 53, 54, 55		Ø7	Stainless steel	121					
24, 53, 54, 55		Ø9	Stainless steel	131					
01, 07, 09, 11, 13, 17, 58, 59		Ø4.7	Copper	412					
01, 07, 09, 11, 13, 17, 58, 59		Ø7	Copper	422					
01, 07, 09, 11, 13, 17, 58, 59		Ø9	Copper	432					
94, 95, 20, 23, 31, 56, 57		Ø4.7	Copper	312					
94, 95, 20, 23, 31, 56, 57		Ø7	Copper	322					
94, 95, 20, 23, 31, 56, 57		Ø9	Copper	332					
24, 53, 54, 55		Ø4.7	Copper	112					
24, 53, 54, 55		Ø7	Copper	122					
24, 53, 54, 55		Ø9	Copper	132					
01, 07, 09, 11, 13, 17, 58, 59		Ø4.7	Copper nickel plated	413					
01, 07, 09, 11, 13, 17, 58, 59		Ø7	Copper nickel plated	423					
01, 07, 09, 11, 13, 17, 58, 59		Ø9	Copper nickel plated	433					
94, 95, 20, 23, 31, 56, 57		Ø4.7	Copper nickel plated	313					
94, 95, 20, 23, 31, 56, 57		Ø7	Copper nickel plated	323					
94, 95, 20, 23, 31, 56, 57		Ø9	Copper nickel plated	333					
24, 53, 54, 55		Ø4.7	Copper nickel plated	113					
24, 53, 54, 55		Ø7	Copper nickel plated	123					
24, 53, 54, 55		Ø9	Copper nickel plated	133					
Fixing ²⁾	Nut M10 (for remote sensing version)			10					
	Bracket (for remote sensing version)			27					
	Grubscrew locked, lateral (direct mounting version)			12					
	Cap nut (for direct mounting version)			14					
	Grubscrew locked with spacer (cooling element) (for direct mounting version)			18					

Continuation on next page

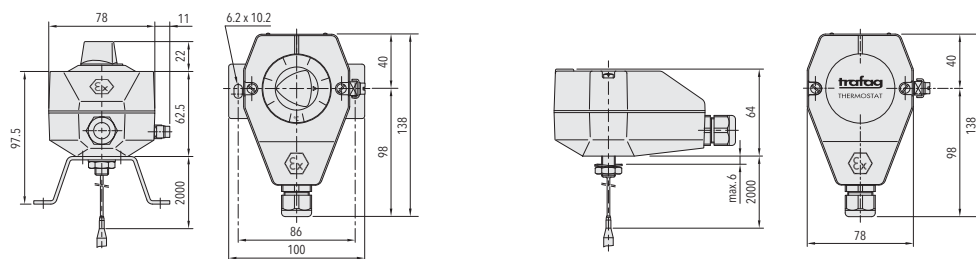
Protection tube	See data sheet H72114/H72163 XXXX.XXXX	
Accessories	Switchpoint locking ⁴⁾	15
	Switchpoint fixed and sealed upon customer's request	88
	Switchpoint preset upon customer's request, no guarantee on switching accuracy	83
	Switchpoint adjustment please indicate when ordering: - Switchpoint [bar] - Increasing or decreasing	
	Capillary tube protection: Flexible metal tube, brass nickel plated	90
	Capillary tube protection: Flexible metal tube 1.4541/V2A	91
Capillary tube length	Capillary tube length up to 5000 mm (no specification required for direct mounting on protection tube) L=XXXX ³⁾	

¹⁾ See data sheet H72114/H72163

²⁾ See data sheet H72106

³⁾ Overlengths upon request

⁴⁾ Only with type 414, internal adjustment



EXAS 409/419

Ex Indu Ambistat



Features

- Compact design
- Rugged housing
- Protection IP65
- Ex d e IIC T6 Gb
- Ex tb IIIC T80°C Db

Technical Data

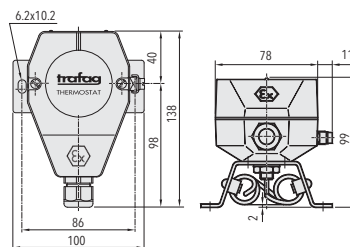
Designation of application	Ex Industrial room thermostat	Switching differential	Not adjustable
Measuring range	-30°C ... +30°C to 0°C ... +60°C	Repeatability	± 0.5 % FS typ.
Output signal	Floating change-over contact	Approval / conformity	SEV 15 ATEX 0156 X

Data sheet	H72128
Instructions	H73172

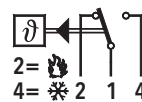
Standard products (extra short lead time)

Product No.	Type Code	Temperature range [°C]	Switching differential [°C]	Operating temperature [°C]
EXAS33	419 9102 523 27 0000 0000 02	-30 ... +30	2.5 (fixed)	-30 ... +40
EXAS35	419 9110 523 27 0000 0000 02	+5 ... +35	2.5 (fixed)	-30 ... +50
EXAS60	419 9112 523 27 0000 0000 02	0 ... +60	2.5 (fixed)	-30 ... +60

Sensor: Sensor coil
 Sensor material: Copper
 Electrical connection: Screw terminal



AC 250 V, 5 (5) A
 DC 30 V, 5 (3) A
 DC 250 V, 0.25 (0.03) A



EXAS ...
 Internal switchpoint adjustment

«Simple Apparatus» 414 conformity to ATEX

Industat



Features

- Compact design
- Rugged housing
- Protection IP65
- Any mounting position possible
- May be used as „simple apparatus“ in zones at risk of explosions

Technical Data

Designation of application	Industrial room thermostat with remote sensor
Measuring range	-30°C ... +40°C to +70°C ... +350°C
Output signal	Floating change-over contact
Switching differential	Not adjustable
Repeatability	± 0.5 % FS typ.
Approval / conformity	EN60730-1/ EN60730-2-9: Typ 2.B.H EN60079-0, EN60079-11 Zone 1 and 2, 21 and 22

Switch amplifier: See chapter "Accessories"
Further information for devices of the type "Simple Apparatus":
See chapter "Pressure Switches"

Data sheet H72183

«Simple Apparatus» 419 conformity to ATEX

Ambistat



Features

- Compact design
- Rugged housing
- Protection IP65
- Any mounting position possible
- May be used as „simple apparatus“ in zones at risk of explosions

Technical Data

Designation of application	Industrial room thermostat
Measuring range	-30°C ... +30°C to 0°C ... +60°C
Output signal	Floating change-over contact
Switching differential	Not adjustable
Repeatability	± 0.5 % FS typ.
Approval / conformity	EN60730-1/ EN60730-2-9: Typ 2.B.H EN60079-0, EN60079-11 Zone 1 and 2, 21 and 22

Switch amplifier: See chapter "Accessories"
Further information for devices of the type "Simple Apparatus":
See chapter "Pressure Switches"

Data sheet H72182

Safety temperature limiter KTSB

PTB 09
ATEX 1027



Features

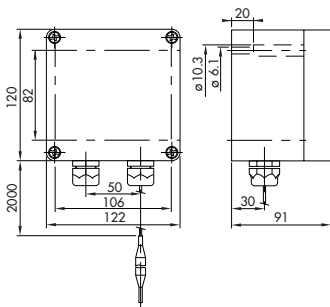
- High current ratings 16 A
- With mechanical reset
- Internal switchpoint adjustment

Technical Data

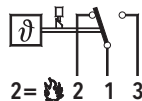
Sensor technology	Capillary tube with remote sensor
Sensor material	1.4435/316L
Output signal	Microswitch
Electrical connection	Screw terminal

Standard products (extra short lead time)

Product No.	Range T [°C]	Operating temperature [°C]	Media temperature [°C]	Capillary tube length [m]
KTSB150S	+20 ... +150	-50 ... +60	max. 165	2
KTSB230S	+20 ... +230	-50 ... +60	max. 250	2
KTSB350S	+70 ... +350	-50 ... +60	max. 380	2



AC 400 V, 16 A

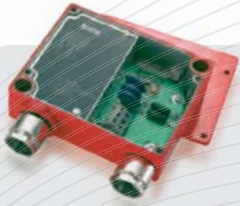


- Areas with gas explosion hazards EX II 2 G Ex d e IIC T6
- Areas with dust explosion hazards EX II 2 D Ex tD A21 IP 66 T80°C



Data sheet H72181

Marine transmitter for PT100 sensors T...



Features

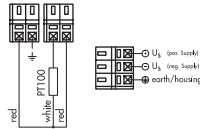
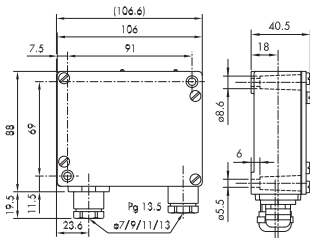
- For shipbuilding
- 4 ... 20 mA
- Protection IP65

Technical Data

Sensor type	PT100
Operating temperature	-40 ... +85 °C
Electrical connection	Screw terminal
Output signal	4 ... 20 mA

Standard products (extra short lead time)

Product No.	Type code	Range T [°C]	Supply [VDC]	Product No.	Type code	Range T [°C]	Supply [VDC]
T50	8100 01 0003 01	-50 ... +50	12 ... 30	T200	8100 05 0003 01	0 ... +200	12 ... 30
T100	8100 02 0003 01	0 ... +100	12 ... 30	T400	8100 06 0003 01	0 ... +400	12 ... 30



Data sheet
Instructions

H72102
H73102

Temperature sensor PT100



Features

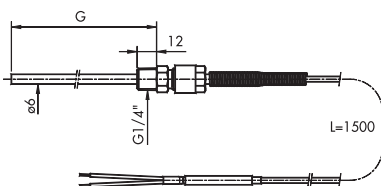
- 2-wire temperature sensor
- Incl. mounting stopper
- Protection IP65

Technical Data

Sensor type	PT100 (IEC751)
Protection tube material	1.4435/316L
Immersion	Adjustable
Electrical connection	2 wires

Standard products (extra short lead time)

Product No.	Range T [°C]	Protection tube length G [mm]	Class (IEC751)
PT100L15	-50 ... +250	150	B



Temperature sensor PT100/1000



Features

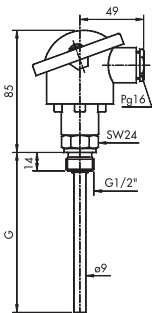
- 3-wire temperature sensor in DIN B head
- Protection IP65

Technical Data

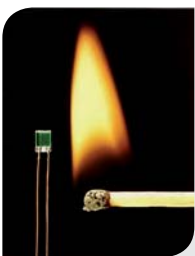
Sensor type	PT100 (IEC751) or 1000
Protection tube material	1.4435/316L
Immersion	Adjustable
Electrical connection	3 wires

Standard products (extra short lead time)

Product No.	Range T [°C]	Protection tube length G [mm]	Class (IEC751)	Product No.	Range T [°C]	Protection tube length G [mm]	Class (IEC751)
PT100L12	-50 ... +250	120	B	PT100L40	-50 ... +250	400	B
PT1000L12	-50 ... +250	120	B				



Temperature sensor



Features

- High Precision
- Compliant with DIN 43760
- Measuring current 5 mA

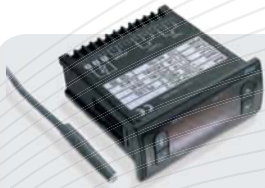
Technical Data

Sensor material	Nickel thin film on ceramic
Temperature range	-60°C ... +200°C
Response time water flow	0.3 s (@ 0.2m/s)
Response time airflow	27 s (@ 0.2m/s)

Description

Resistivity R ₀ @ 0°C [Ohm]	Electrical connection
100	lead frames
1000	lead frames

Electronic thermostat with display and relay LTR



Features

- 1 Panel mounting
- Single stage thermostat with display
- 1 Relay (SPDT)
- Protection IP54

Technical Data

Sensor type	PTC1000
Output signal	1 Relay
Electrical connection	Screw terminal
Operating temperature	-10°C... +50°C

Standard products (extra short lead time)

Product No.	Range T [°C]	Relay Output	U-Supply [VAC]	Dimensions [mm]	Cutout of panel
LTR5TSRE	-50 ... +150	240V/16 (4)A	240	76 x 35 x 77	71 x 29

Electronic controller with display ATR



Features

- Supply voltage: 24 ... 230 VAC/VDC
- 17 Sensor inputs to select
- 2 Relays and 1 SSR output, configurable

Technical Data

Inputs (to be selected)	Thermocouples: K,S,R,J Thermoresistors: PT100, PT500, PT1000, NI100, PTC, NTC, Potentiometers Linear signals: 0...10V, 0...20mA, 4...20mA, 0...40mV
Protection	IP65 front panel (with gasket) IP30 housing IP20 terminals
Operating temperature	0°C ... +45°C

Standard products (extra short lead time)

Product No.	Output signal	Supply voltage	Dimensions [mm]	Cutout of panel [mm]
ATR142	Relay 1: 8A - 250 VAC Resistive Load Relay 2: 5A - 250 VAC Resistive Load SSR 1: Configurable as command output and / or alarm output 12 VDC, 30 mA	24 ... 230 VAC/VDC ±15 %	77 x 35 x 60	28.5 x 70.5

Hygrostat HMH



Features

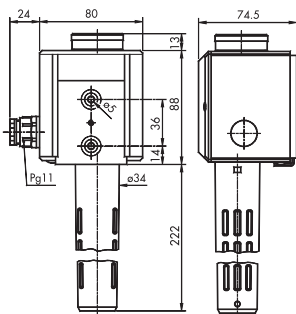
- With adjustable switch point
- rH 10 ... 100 %

Technical Data

Protection	IP54
Operating temperature	-20°C ... +60°C
Output signal	1 Microswitch 250 V / 10 A
Electrical connection	Screw terminal

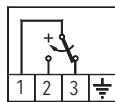
Standard products (extra short lead time)

Product No.	Humidity [%rH]	Hysteresis [d%rH]	Sensor T max. [°C]
HMH	10 ... 100	approx. 1.5	+70



AC 250 V, 10 A (25 °C)
8 A (60 °C)

2= dehumidifying
3= humidifying



 Data sheet

H72402

Technical Data Thermostats

	A/AS/ASE 645/650	ADS 319	A2/A2S 198/199	IA/IAS 409/419	MSK 624/634	MP/MSP 663/664	
Main characteristics							
Designation of application	Room thermostat	Double room thermostat	Multistage room thermostat	Industrial room thermostat	Duct thermostat	Pipe mounting thermostat	
Measuring range	-45°C ... +15°C to 0°C ... +60°C	-30°C ... +30°C to 0°C ... +60°C	-45°C ... +15°C to 0°C ... +60°C	-30°C ... +30°C to 0°C ... +60°C	-30°C ... +40°C to +20°C ... +110°C	-10°C ... +35°C to +20°C ... +110°C	
Output signal	Floating change-over contact	Floating change-over contact	Floating change-over contact	Floating change-over contact	Floating change-over contact	Floating change-over contact	
Switching differential	Adjustable / not adjustable	Adjustable / not adjustable	Not adjustable	Adjustable / not adjustable	Adjustable / not adjustable	Adjustable / not adjustable	
Accuracy							
Repeatability	± 0.5 % FS typ.	± 0.5 % FS typ.	± 0.5 % FS typ.	± 0.5 % FS typ.	± 0.5 % FS typ.	± 0.5 % FS typ.	
Scale accuracy typ.	± 2 % FS typ.	± 2 % FS typ.	± 2 % FS typ.	± 2 % FS typ.	± 2 % FS typ.	± 2 % FS typ.	
Switching point					Temperature compensated with bimetal switch lever	Temperature compensated with bimetal switch lever	
Electrical data							
Resistance of insulation	> 2 MΩ	> 2 MΩ	> 2 MΩ	> 2 MΩ	> 2 MΩ	> 2 MΩ	
Dielectric strength	U ≤ 250V: 1.45 kV U ≤ 500V: 2 kV terminal ground	U ≤ 250V: 1.45 kV U ≤ 500V: 2 kV terminal ground	U ≤ 250V: 1.45 kV U ≤ 500V: 2 kV terminal ground	U ≤ 250V: 1.45 kV / U ≤ 500V: 2 kV terminal ground	U ≤ 250V: 1.45 kV U ≤ 500V: 2 kV terminal ground	U ≤ 250V: 1.45 kV U ≤ 500V: 2 kV terminal ground	
Cable gland	M16x1.5 Cable-Ø 4...9 mm	PG13.5 Cable-Ø 5 ... 12.5 mm	PG13.5 Cable-Ø 5 ... 12.5 mm	M20x1.5 Cable-Ø 4...10 mm	M16x1.5 Cable-Ø 4...9 mm	M16x1.5 Cable-Ø 4...9 mm	
Terminal screw	3 x 1 ... 2.5 mm ²	3 x 1 ... 2.5 mm ²	6 x 1 ... 2.5 mm ²	3 x 1 ... 2.5 mm ²	3 x 1 ... 2.5 mm ²	3 x 1 ... 2.5 mm ²	
Environmental conditions							
Ambient temperature	-30°C ... +70°C	-30°C ... +70°C	-30°C ... +70°C	-30°C ... +70°C	-30°C ... +70°C	-30°C ... +70°C	
Protection	IP54	IP54	IP54	IP65	IP54	IP54	
Humidity	Max. 95 % relative	Max. 95 % relative	Max. 95 % relative	Max. 95 % relative	Max. 95 % relative	Max. 95 % relative	
Mechanical data							
Housing	PC/ABS-Blend V0	Noryl	Noryl	AlSi9Cu3, coated	PC/ABS-Blend V0	PC/ABS-Blend V0	
Weight	~ 300 g	~ 220 g	~ 480 g	~ 950 g	~ 220 g	~ 220 g	

	MST 624/634	M/MS 624/634	MS...R 630/632	F/F...R 990/991/992/993	GS 657/658	D...R 302	M2S 104/114
	Direct mounting thermostat	Remote sensing thermostat	Remote sensing thermostat with limiter	Frost protection thermostat	Remote sensing thermostat	Double thermostat with remote sensor and limiter	Multistage thermostat with remote sensor
	-30°C ... +40°C to +70°C ... +350°C	-30°C ... +40°C to +70°C ... +350°C	-30°C ... +40°C to +70°C ... +350°C	-5°C ... +15°C	+5°C ... +95°C and +20°C ... +150°C	-30°C ... +40°C to +70°C ... +350°C	-30°C ... +40°C to +70°C ... +350°C
	Floating change-over contact	Floating change-over contact	Floating change-over contact	Floating change-over contact	Floating change-over contact	Floating change-over contact	Floating change-over contact
	Adjustable / not adjustable	Adjustable / not adjustable	Not adjustable	Not adjustable	Not adjustable	Adjustable / not adjustable	Not adjustable
	± 0.5 % FS typ.	± 0.5 % FS typ.	± 0.5 % FS typ.	± 0.5 % FS typ.	± 0.5 % FS typ.	± 0.5 % FS typ.	± 0.5 % FS typ.
	± 2 % FS typ.	± 2 % FS typ.	± 2 % FS typ.	± 1.5 % FS typ.	± 3 % FS typ.	± 2 % FS typ.	± 2 % FS typ.
	Temperature compensated with bimetal switch lever	Temperature compensated with bimetal switch lever	Temperature compensated with bimetal switch lever		Temperature compensated with bimetal switch lever	Temperature compensated with bimetal switch lever	Temperature compensated with bimetal switch lever
	> 2 MΩ	> 2 MΩ	> 2 MΩ	> 2 MΩ	> 2 MΩ	> 2 MΩ	> 2 MΩ
	U ≤ 250V: 1.45 kV U ≤ 500V: 2 kV terminal ground	U ≤ 250V: 1.45 kV U ≤ 500V: 2 kV terminal ground	2 kV terminal ground	2 kV terminal ground	U ≤ 250V: 1.45 kV U ≤ 500V: 2 kV terminal ground	U ≤ 250V: 1.45 kV U ≤ 500V: 2 kV terminal ground	U ≤ 250V: 1.45 kV U ≤ 500V: 2 kV terminal ground
	M16x1.5 Cable-Ø 4...9 mm	M16x1.5 Cable-Ø 4...9 mm	M16x1.5 Cable-Ø 4...9 mm	M20x1.5 Cable-Ø 8...13 mm	M16x1.5 Cable-Ø 4...9 mm	PG13.5 Cable-Ø 5...12.5 mm	PG13.5 Cable-Ø 5 ... 12.5 mm
	3 x 1 ... 2.5 mm ²	3 x 1 ... 2.5 mm ²	3 x 1 ... 2.5 mm ²	3 x 1 ... 2.5 mm ²	3 x 1 ... 2.5 mm ²	6 x 1 ... 2.5 mm ²	6 x 1 ... 2.5 mm ²
	-30°C ... +70°C	-30°C ... +70°C	-30°C ... +70°C	Max. operating temperature: +70°C Min. operating temperature: switch point + 2°C	-30°C ... +70°C	-30°C ... +70°C	-30°C ... +70°C
	IP54	IP54	IP54	IP 54	IP54	IP54	IP54
	Max. 95 % relative	Max. 95 % relative	Max. 95 % relative	Max. 95 % relative	Max. 95 % relative	Max. 95 % relative	Max. 95 % relative
	PC/ABS-Blend V0	PC/ABS-Blend V0	PC/ABS-Blend V0	AlSi9Pb3	PC/ABS-Blend V0	Noryl	Noryl
	~ 430 g	~ 380 g	~ 250 g	~ 850 g	~ 380 g	~ 620 g	~ 480 g

Technical Data Thermostats

	L/LF 736/754	L...R 755	I/IS 404/414	IS...R 410/412	ISN/ISNT 471/472	ISP/ISPT 474	
Main characteristics							
Designation of application	Remote sensing thermostat, skeleton type	Remote sensing thermostat with limiter, skeleton type	Industrial thermostat with remote sensor	Industrial thermostat with remote sensor and limiter	Thermostat for shipbuilding	Compact thermostat for shipbuilding	
Measuring range	-30°C ... +40°C to +70°C ... +350°C	-30°C ... +40°C to +70°C ... +350°C	-30°C ... +40°C to +70°C ... +350°C	-30°C ... +40°C to +70°C ... +350°C	+20°C ... +110°C to +40°C ... +300°C	+5°C ... +95°C to +20°C ... +150°C	
Output signal	Floating change-over contact	Floating change-over contact	Floating change-over contact	Floating change-over contact	Floating change-over contact	Floating change-over contact	
Switching differential	Adjustable / not adjustable	Not adjustable	Adjustable / not adjustable	Not adjustable	Not adjustable	Not adjustable	
Accuracy							
Repeatability	± 0.5 % FS typ.	± 0.5 % FS typ.	± 0.5 % FS typ.	± 0.5 % FS typ.	± 0.5 % FS typ.	± 1 % FS typ.	
Stability typ.					± 1 % FS typ.	± 1 % FS typ.	
Scale accuracy typ.	± 2 % FS typ.	± 2 % FS typ.	± 2 % FS typ.	± 2 % FS typ.	± 2 % FS typ.	± 4 % FS typ.	
Switching point	Temperature compensated with bimetal switch lever	Temperature compensated with bimetal switch lever	Temperature compensated with bimetal switch lever	Temperature compensated with bimetal switch lever	Temperature compensated with bimetal switch lever	Temperature compensated with bimetal switch lever	
Electrical data							
Resistance of insulation	> 2 MΩ	> 2 MΩ	> 2 MΩ	> 2 MΩ	> 10 MΩ	> 10 MΩ	
Dielectric strength	U ≤ 250V: 1.45 kV U ≤ 500V: 2 kV terminal ground	2 kV terminal ground	U ≤ 250V: 1.45 kV / U ≤ 500V: 2 kV terminal ground	2 kV terminal ground	2 kV terminal ground	2 kV terminal ground	
Cable gland			M20x1.5 Cable-Ø 4...10 mm	M20x1.5 Cable-Ø 4...10 mm	M20x1.5 Cable-Ø 4...10 mm	Cable-Ø: 6...13 mm	
Terminal screw	3 x 1 ... 2.5 mm ²	3 x 1 ... 2.5 mm ²	3 x 1 ... 2.5 mm ²	3 x 1 ... 2.5 mm ²	3 x 1 ... 2.5 mm ²	4 x 0.5...1.5 mm ²	
Environmental conditions							
Ambient temperature	-30°C ... +70°C	-30°C ... +70°C	-30°C ... +70°C	-30°C ... +70°C	-30°C ... +70°C	-30°C ... +70°C	
Protection	IP00	IP00	IP65	IP65	IP65	IP65	
Humidity	Max. 95 % relative	Max. 95 % relative	Max. 95 % relative	Max. 95 % relative	Max. 95 % relative	Max. 95 % relative	
Mechanical data							
Housing		See ordering information	AlSi9Cu3, coated	AlSi9Cu3, coated	AlSi9Cu3, coated	AlMgSi1 anodized	
Weight	754: ~ 250 g 736: ~ 300 g	~ 250 g	~ 950 g	~ 950 g	~ 950 g	~ 260 g	

EXS 404/414	EXAS 409/419	«Simple Apparatus» conformity to ATEX 414	«Simple Apparatus» conformity to ATEX 419
Ex Industrial thermostat with remote sensor	Ex Industrial room thermostat	Industrial room thermostat with remote sensor	Industrial room thermostat
-30°C ... +40°C to +70°C ... +350°C	-30°C ... +30°C to 0°C ... +60°C	-30°C ... +40°C to +70°C ... +350°C	-30°C ... +30°C to 0°C ... +60°C
Floating change-over contact	Floating change-over contact	Floating change-over contact	Floating change-over contact
Not adjustable	Not adjustable	Not adjustable	Not adjustable
± 0.5 % FS typ.	± 0.5 % FS typ.	± 0.5 % FS typ.	± 0.5 % FS typ.
± 2 % FS typ.	± 2 % FS typ.	± 2 % FS typ.	± 2 % FS typ.
Temperature compensated with bimetal switch lever			
> 2 MΩ	> 2 MΩ	> 2 MΩ	> 2 MΩ
1.5 kV	1.5 kV	1.25 kV terminal ground	500 VAC terminal ground
M20x1.5/SW24 Cable-Ø 5.5...13 mm Approval: PTB 99 ATEX 3128 X	M20x1.5/SW24 Cable-Ø 5.5...13 mm Approval: PTB 99 ATEX 3128 X	M20x1.5 Cable-Ø 4...10 mm, max. cable length according to EN60079-11	M20x1.5 Cable-Ø 4...10 mm, max. cable length according to EN60079-11
3 x 1 ... 2.5 mm ²	3 x 1 ... 2.5 mm ²	3 x 1 ... 2.5 mm ²	3 x 1 ... 2.5 mm ²
-30°C ... +70°C	-30°C ... +60°C	-30°C ... +65°C	-30°C ... max. +65°C
IP65	IP65	IP65	IP65
Max. 95 % relative	Max. 95 % relative	Max. 95 % relative	Max. 95 % relative
AlSi9Cu3, coated	AlSi9Cu3, coated	AlSi9Cu3, coated	AlSi9Cu3, coated
~ 950 g	~ 950 g	~ 950 g	~ 950 g



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