

Surface-mounting thermostats, type series AMTHF with 2, 3 or 4 1-pole snap switches

Special features

- Protection rating IP 54
- tested as per DIN EN 14597 (replacement for DIN 3440)

Brief description

Add-on thermostats are used to control and monitor thermal processes. The devices of type series AMTHF are available with 2, 3 or 4 switching stages as temperature controllers (TR) and temperature monitors (TW). The sequential gap in Kelvin for the individual circuit stages is factory-set fixed as per customer request. Add-on thermostats operate according to the fluid expansion principle, a microswitch is used as an electrical switching element.

Switching function

Temperature controller (TR) and temperature monitor (TW)

If the temperature exceeds the setpoint value set on the temperature probe, the microswitch will be tripped by the transmission mechanics and the current circuit opened or closed. The microswitch is reset to its original status once the setpoint value set is gone below (by the hysteresis).

Types

Types		Switching function	Circuit stages
with rigid shaft	with capillary		
AMTHFs-13	AMTHFf-13	TR	2
AMTHFs-133	AMTHFf-133	TR	3
AMTHFs-1333	AMTHFf-1333	TR	4
AMTHFs-23	AMTHFf-23	TW	2
AMTHFs-233	AMTHFf-233	TW	3
AMTHFs-2333	AMTHFf-2333	TW	4



Type AMTHFs-13



Type AMTHFf-13

Technical data

Control range and probe table — fluid-filled

Control / limit value ranges °C	Hysteresis %	max. probe temperature °C	max. switch head temperature °C	possible capillary lengths in m	max. sequential gap K	Probe length dimension "L" in mm, Probe Ø "d" in mm Ø "6" = Standard	
						Ø 6	Ø 8
-20 to + 40	1 2.5 5 7	+ 50 + 50 + 95 + 100	+ 50 + 50 + 50 (80) ¹ + 50 (80) ¹	5	5 8 25 50	245 245 138 103	145 145 91 73
0 to + 50	1 2.5 5 7	+ 60 + 60 + 105 + 110	+ 60 + 60 + 60 (80) ¹ + 60 (80) ¹	3 3 5 5	5 10 25 50	283 283 159 117	165 165 101 80
+20 to + 90	1 2.5 5 7	+ 115 + 115 + 140 + 175	+ 80 + 80 + 80 + 80	1 1 5 5	7 14 35 70	210 210 121 91	127 127 82 67
0 to +100	1 2.5 5 7	+ 125 + 125 + 165 + 200	+ 80 + 80 + 80 + 80	2 2 5 5	10 20 50 100	157 157 94 73	100 100 68 58
+30 to +110	1 2.5 5 7	+ 135 + 135 + 170 + 200	+ 80 + 80 + 80 + 80	2 2 5 5	8 16 40 80	188 188 110 84	116 116 76 63
0 to +150	1 2.5 5	+ 173 + 173 + 200	+ 80 + 80 + 80	1	15 30 75	113 113 72	78 78 57
0 to +200	1 2.5	+ 230	+ 80	1	20 40	113	78
+50 to +200	1 2.5	+ 230	+ 80	1	15 30	139	92
+50 to +250	1 2.5 5	+ 228 + 228 + 300	+ 80 + 80 + 80	1 1 5	20 40 100	105 105 64	70 70 49
+50 to +300	1 2.5	+ 345 + 345	+ 80 + 80	2	25 50	87	61

¹ Values in brackets only on request taking the operating statuses and the desired capillary length into consideration

Control range and probe table — gas-filled

Control / limit value ranges °C	Hysteresis %	max. probe temperature °C	max. switch head temperature °C	possible capillary lengths in m	max. sequential gap K	Probe length dimension "L" in mm, Probe Ø "d" in mm Ø "6" = Standard	
						Ø 6	Ø 8
+20 to +400	6 10	+ 460 + 500	+ 80 + 80	5	75 200	237 127	137 81
+20 to +500	3 / 5 6 10	+ 530 + 575 + 575	+ 80 + 80 + 80	1 5 5	48 95 250	278 176 95	158 106 65

Capillary and temperature probe

Type	Scale limit value	Capillary	Temperature probe	Remarks
AMTHF	up to 200 °C	Copper (Cu), Ø 1.5 mm Material No. Cu-DHP	Copper (Cu), Material No. Cu-DHP hard soldered	—
	up to 350 °C	Copper (Cu), Ø 1.5 mm Material No. Cu-DHP	Stainless steel (CrNi), Material No. 1.4571 hard soldered	—
	up to 500 °C	Stainless steel (CrNi), Ø 1.5 mm	Stainless steel (CrNi), Material No. 1.4571 welded	—
	up to 350 °C	Stainless steel (CrNi), Ø 1.5 mm	Stainless steel (CrNi), Material No. 1.4571 welded	against surcharge
Capillary length	1000 mm, max. 5000 mm as standard			
min. bending radius of the capillary	5 mm			

Note: If the max. admissible temperature is not reached on the probe, capillary and switching head, it is possible to increase the capillary length, where it is limited to 1, 2 or 3 m as per the control range and probe table, on request. Please specify the temperature values occurring on the thermostats.

Electrical data

Switching element	2, 3 or 4 1-pole snap switch Microswitch with change-over contact		
max. contact rating	Hysteresis switching function	N/C contact, terminal 2	N/O contact, terminal 4
	TR, TW 2.5%, 5%, 6%, 7%, 10%	AC 230 V +10%, 16 (3) A, cos φ = 1(0.6) DC 230 V +10%, 0.25A	AC 230 V +10%, 8 (1.5) A, cos φ = 1(0.6) DC 230 V +10%, 0.25A
	TR, TW 1 %, 3 %	AC 230 V +10%, 6 (2) A, cos φ = 1(0.6) DC 230 V +10%, 0.25A	
Contact reliability	To ensure high switching reliability, we recommend a minimum load of: AC / DC = 24 V, 20 mA		
Rating surge voltage	1500 V (via the switching contacts 400 V)		
Overvoltage category	II		
Required fuse rating	see max. contact rating		
Electrical connection	Screw connection up to 2.5 mm ² cable cross section		

Operating data

Hysteresis in % of the control / limit value range	Switching function	with fluid-filled measuring system						
		Rated value		Possible process value				
	TR, TW	2.5		2.5 max. 3.5	serial			
		5		5 max. 6	on request			
		7		7 max. 8	on request			
		1		1 max. 2	Surcharge			
		with gas-filled measuring system						
		5		5 max.11	serial			
		6		6 max. 14	on request			
		10		10 max. 16	on request			
3		2.5 max. 4	Surcharge					
Sequential gap for multi-pin version	with hysteresis	Sequential gap from the scale range minimum		maximum	Switching point accuracy of the sequential gaps from the scale range			
	1% 2.5% 3%, 5% 6%, 7%, 10%	1% 1% 2% 3%	as per control range table		≤ 1% ≤ 1% < 2% < 3%			
	The sequential gap is specified in K in relation to the set point value of contact deck I.							
	Prefix - = switching prior to reaching the set point value, Prefix + = switching after reaching the set point value. Enter "0" for the sequential gap for a simultaneously switching version.							
Switching point accuracy in % of the control/limit value range	Switching function	Hysteresis			in the upper third of the scale or limit value			
		fluid-filled	gas-filled					
	TR	1%, 2.5% 5% 7%	- - 3%, 5%, 6%, 10%					
	TW	1%, 2.5% 5% 7%	- - 3%, 5%, 6%, 10%					
medium ambient temperature influence	When the ambient temperature on the switch head and/or the capillary deviates from the calibration temperature +22 °C, a switch point offset occurs. Higher ambient temperatures = lower switching point Lower ambient temperature = higher switching point							
	For temperatures with scale limit value / limit value							
	< 200 °C		÷ 200 °C ≤ +350 °C			÷ 400 °C ≤ +500 °C		
	TR, TW		TR, TW			TR, TW		
	Hysteresis in %							
	1 / 2.5	5	7	1 / 2.5	5	3 / 5	6	10
	Ambient temperature influence on the switch head in %/K							
	0.15	0.26	0.34	0.12	0.21	0.12	0.17	0.24
	Ambient temperature influence on the capillary in %/m							
	0.05 · K · m		0.09 · K · m		0.04 · K · m		0.05 · K · m	
	If the operating temperature on the switch head deviates essentially from the ambient calibration temperature +22 °C, this can be taken into account on request during adjustment against surcharge.							

Operating data

Permissible storage temperature	-50 to 50 °C
admissible ambient temperature during use	max. 80 °C
Rated position	as per DIN 16257, NL 0 to NL 90 (different rated positions on request)

Case

serial	Case lid: Polycarbonate, shock resistant Case bottom section: Die-cast aluminum, lacquered	Color: pebble gray RAL 7032 Color: anthracite gray RAL 7015
Set point adjustment	AMTHF.-1... Switching point adjustable from the outside using the rotary knob	AMTHF.-2... The switching point can be adjusted by means of a screwdriver once the case lid has been removed
Protection class	EN 60 529-IP 54	
Cable inlet	serial: self-sealing grommet M 20 × 1.5, sealing range 8-10 mm	
Weight	approx. 0.8 kg	
Switch head fastening, type series AMTHFf with capillary	serial	Screw-connection by means of counter nut M 18 × 1 on the case stud, capillary outlet on the case stud
	Extra code	
	711	with 2 screws through the case bottom section, lateral capillary outlet on the case, lid and bottom part made of plastic
	764	Fastening flange made of steel sheet, capillary outlet on the case stud
	248	Wall bracket

Process connection*

Type series AMTHFs with rigid shaft	Scale limit value <u>up to</u> 150 °C Sheath "20"	Scale limit value <u>exceeding</u> 150 °C Sheath "30"
	Screw-in sleeve with screw-in spigot G 1/2 form A as per DIN 3852/	Screw-in sleeve with screw-in journal G 1/2 form A as per DIN 3852/2 and intermediate piece, to ensure that the max. admissible ambient temperature of +80 °C is not exceeded on the case
Type series AMTHFf with capillary	plain cylindrical probe "10" (standard)	
	Screw-in sheath "20" (on request)	
	Screw-in sleeve with screw-in spigot G 1/2 form A as per DIN 3852/2 and clamping piece with locking screw to lock the probe	
Material	Sheath "20"	Sheath "30"
	up to +150 °C CuZn as a standard over +150 °C CrNi	over +150 °C CrNi
Fitting length S	Standard lengths: 100, 120, 150, 200 or 300; different lengths on request	
Immersion tube Ø	D = 8 mm, D = 10 mm	

Note:

Physical and toxic features of the expansion means, which could occur in the event of a measuring system break.

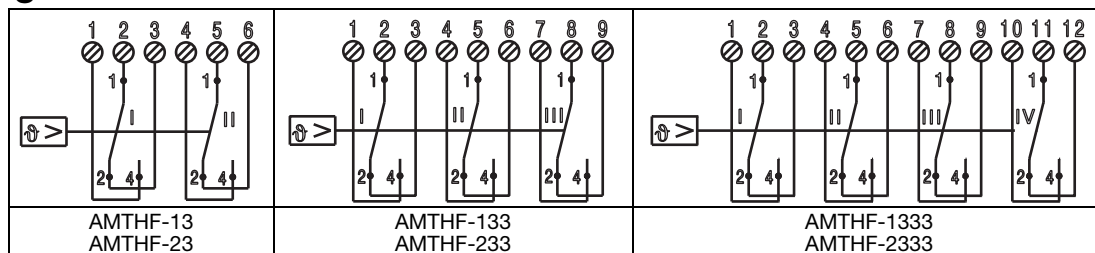
Control range with scale limit value	Hazardous reactions	Fire and explosion hazard		hazardous to waters	Information about toxicology		
		Ignition temperature	Explosion limit		irritant	dangerous to health	toxic
< +200 °C	no	+ 355 °C	0.6 - 8 V%	Yes	Yes	1	no
≥ 200 °C ≤ +300 °C	no	+ 490 °C	- -	Yes	Yes	1	no
> 350 °C ≤ +500 °C	no	no	no	no	no	no	no

¹ There is currently no statement by the health authority concerning hazards to health in the event of short-term exposure and low concentration, e.g. measuring system break.

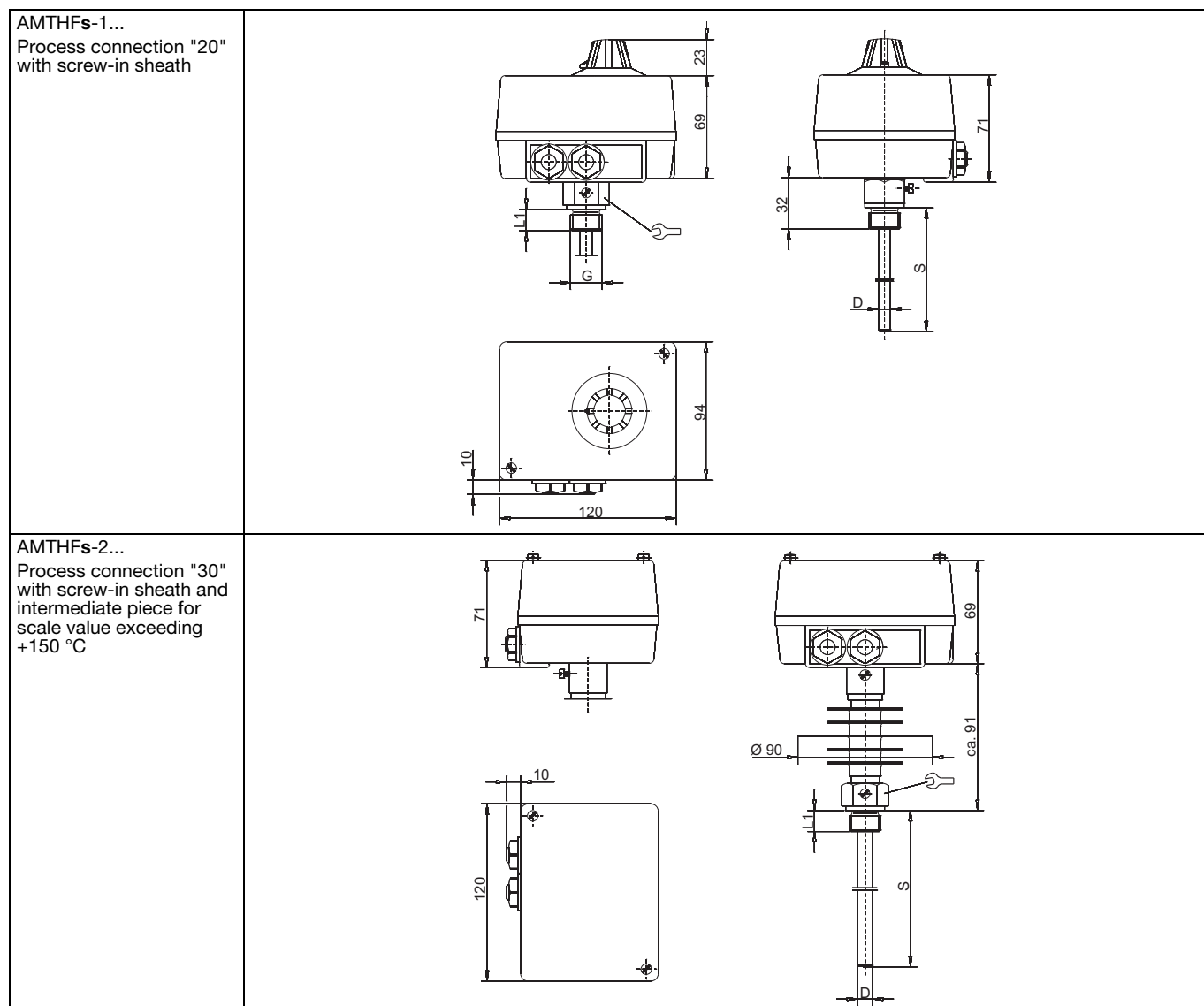
Approvals/approval marks

Approval marks	Inspection authority	Certificates/ inspection number	Inspection basis	Valid for
EAC	Gost Norm AG	on demand	Technical rules of the customs union Russia/Belarus/Kazakhstan	AMTHF

Connection diagrams



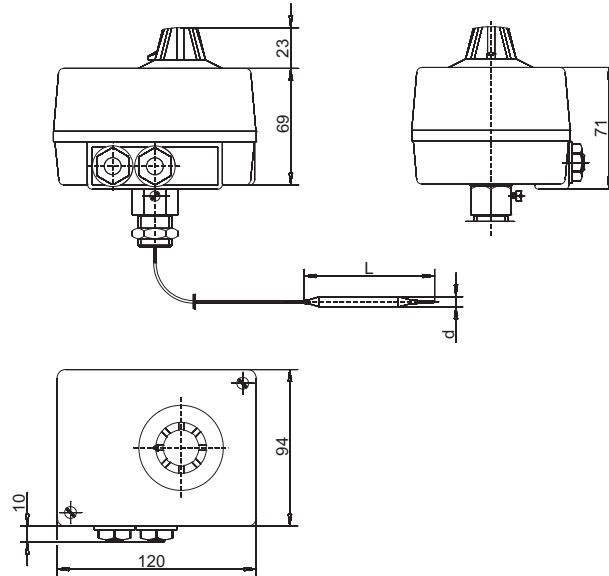
Dimensions



Dimensions

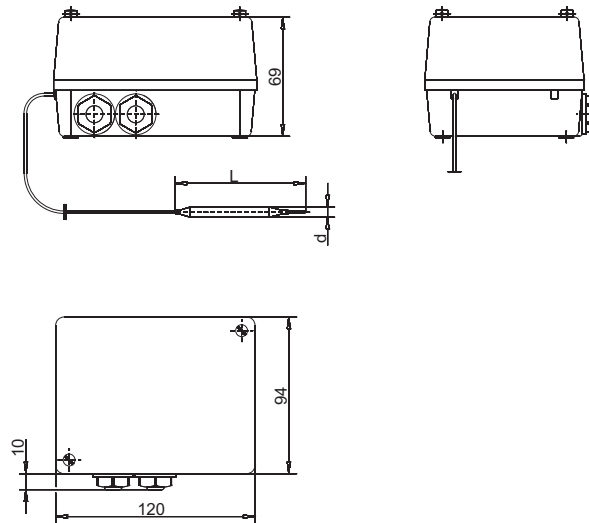
AMTHFf-1...

Process connection "10"
plain cylindrical probe



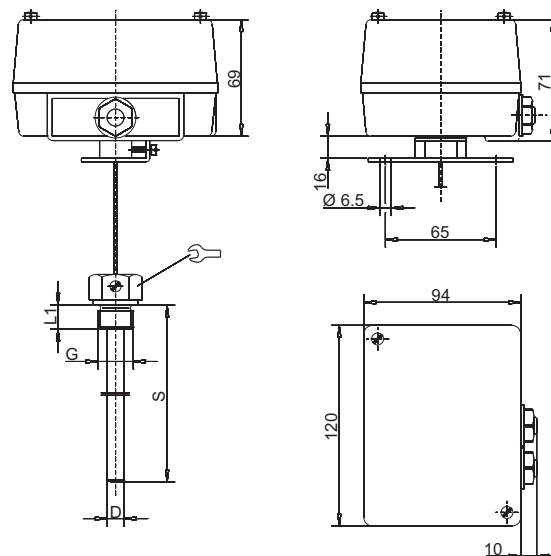
AMTHFf-2.../711

Capillary outlet
lateral on the case,
with plain cylindrical
probe, process connec-
tion "10"



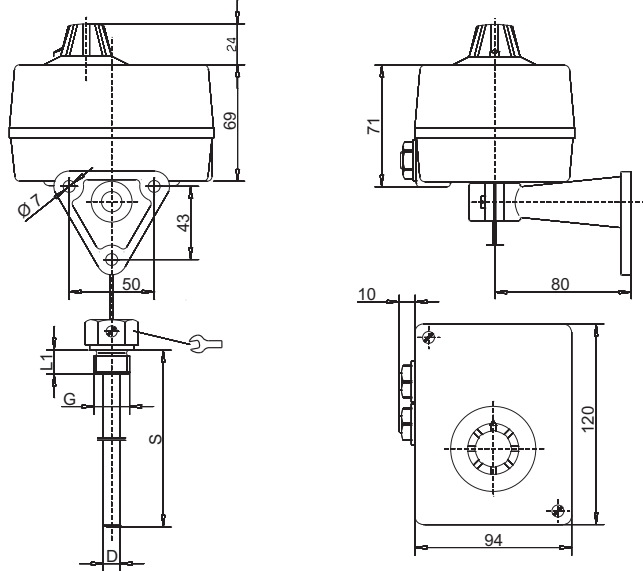
AMTHFf-2.../764

with "72" sheet steel
flange with screw-in
sheath "20"



Dimensions

AMTHFf-1.../248
with "73" wall support
with screw-in sheath "20"



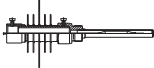
Order details

Surface-mounting thermostats, type series AMTHF

Order code	(1) Basic type		
603051	Surface-mounting thermostat, type series AMTHF with 2, 3 or 4 1-pole snap switches		
(2) Basic type extension (function)			
0013	AMTHF.-13	Temperature controller	2-pin
0023	AMTHF.-23	Temperature monitor	2-pin
0133	AMTHF.-133	Temperature controller	3-pin
0233	AMTHF.-233	Temperature monitor	3-pin
1333	AMTHF.-1333	Temperature controller	4-pin
2333	AMTHF.-2333	Temperature monitor	4-pin
(3) Design			
1	AMTHF s	with rigid shaft	
2	AMTHF f	with capillary	
(4) Control / limit value ranges			
013	-20 to + 40 °C		
021	0 to + 50 °C		
041	+20 to + 90 °C		
025	0 to +100 °C		
052	+30 to +110 °C		
027	0 to +150 °C		
028	0 to +200 °C		
062	+50 to +200 °C		
063	+50 to +250 °C		
064	+50 to +300 °C		
045	+20 to +400 °C		
046	+20 to +500 °C		
(5) Hysteresis			
10	1 %	of the scale range with fluid-filled measuring systems	
25	2.5 %		
50	5 %		
70	7 %		
30	3 %	of the scale range with gas-filled measuring systems	
50	5 %		
60	6 %		
01	10 %		
(6) Capillary length (specifications in mm)			
0	AMTHFs without capillary		
1000	1000 mm		
2000	2000 mm		
3000	3000 mm		
4000	4000 mm		
5000	5000 mm		
. . . .	(Special length, specifications in plain text)		
(7) Capillary material			
00	AMTHFs without capillary		
40	Cu (Copper)		
20	CrNi (stainless steel)		

Order details

Surface-mounting thermostats, type series AMTHF

Order code	(8) Process connection*
10	plain cylindrical probe (only for AM.f) 
20	Screw-in sheath 
30	Screw-in sheath with intermediate piece 
	(9) Thread of process connection*
00	without thread (process connection "10")
13	External thread G 1/2
	(10) Material of process connection
00	only with process connection "10"
46	CuZn (Brass)
20	CrNi (Stainless steel 1.4571)
	(11) Fitting length "S" (immersion tube length)
000	AMTHF without sheath
100	100 mm
120	120 mm
150	150 mm
200	200 mm
300	300 mm
400	400 mm
...	(Special length, specifications in plain text)
	(12) Diameter "D" (immersion tube diameter)
00	AMTHF without sheath
8	8 mm
10	10 mm
	(13) Diameter "d" (probe diameter)
6	6 mm
8	8 mm
	(14) Extra codes
000	no extra code
711	Switch head fastening with 2 screws through the case bottom section, lateral capillary outlet on the case, lid and bottom part made of plastic
764	Fastening flange made of steel sheet, capillary outlet on the case stud
248	Wall bracket

* For different connection types and sheaths, please refer to data sheet 606710.

Sequential gap for 2-, 3- and 4-pin devices: Please specify in plain text (e.g. +2K, +5K, +8K)

Order code:

(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12) (13) (14)
603051 / - . - ... - .. - - .. - .. - .. - .. - ... - .. - .. / ... ,

Order example:

603051 / 0133 - 2 - 025 - 25 - 2000 - 40 - 10 - 00 - 00 - 000 - 00 - 6 / 248

Sequential gap: _____