

VTM300 MASTER 3-PHASE REGULATOR

1. SAFETY INSTRUCTIONS

1.1. Important

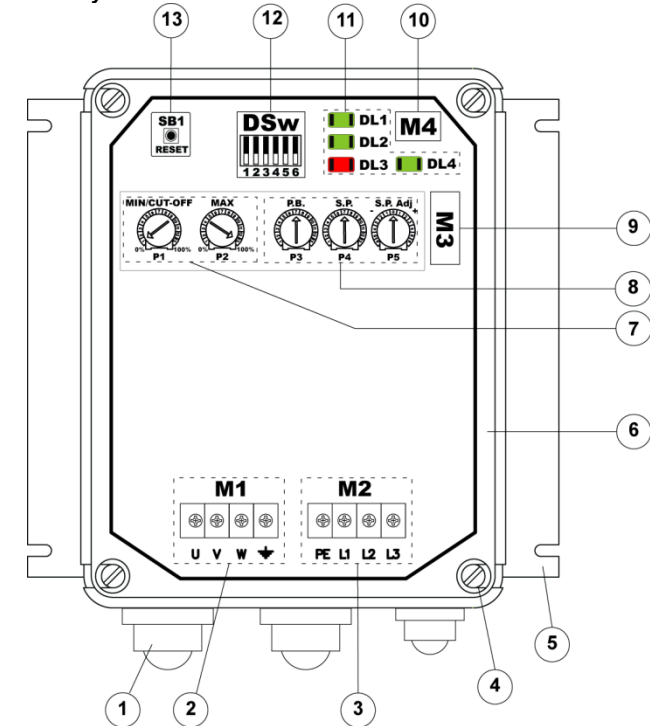
- Read these instructions carefully before installation.
- Before use, follow all the installation and electrical connection instructions.
- Keep these instructions with the regulator for future use.
- Observe current technical and safety regulations.
- The device must be professionally installed and commissioned by a qualified technician. INCORRECT installation may cause damages.
- Before turning on device power, always check that it is correctly grounded.
- DO NOT tamper with or REMOVE internal regulator components; this NULL AND voids THE WARRANTY and can cause damages.
- The user must be protected against electrical shock and the motor must be equipped with overload protection, as per current pertinent regulations.
- According to safety regulations, protection against any contact with live parts must be ensured by correct device installation; all parts that ensure protection must be secured so as irremovable without the help of a tool.
- DO NOT turn on the regulator without the protection lid.
- NEVER touch electrical circuit parts when the power is on.
- Install the regulator away from direct sunlight so as not to overheat the case.
- Make sure working conditions (working temperature, humidity, etc.) are within the indicated limits (see point 7).
- Do not install the device near heat sources (resistances, hot air ducts, etc.) where room temperature can exceed 50 °C, devices that generate strong magnetic fields, sites subject to rain, humidity, dust, excessive mechanical vibrations or shocks.

2. VTM300 REGULATOR UNIT DESCRIPTION

2.1. Overview

The VTM series three-phase regulators are built on a Vetronite support in an IP55 grade GW PLAST box. The control zone is at the top of the board while the power zone is at the bottom. In addition to the M3 and M4 terminal boards, regulation, connection and signal devices are found in the control zone. Fan speed control varies to maintain the value measured by the transducer or probe within the PB proportional band. Output increases as input increases. The S.P. set point is at the center of the proportional band.

2.2. Key

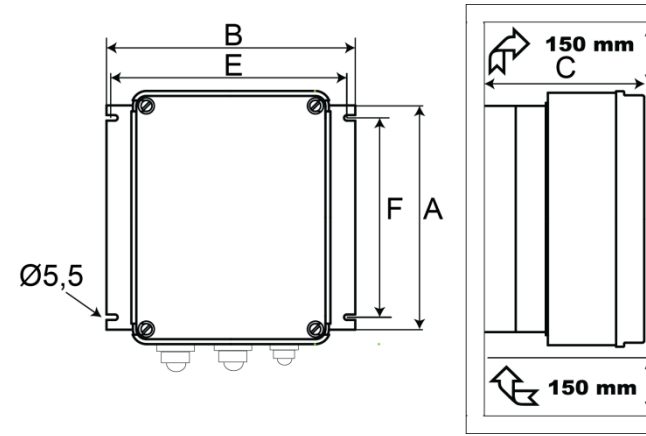


VTM300 Key		
1	-	Wire clamps - connection wires
2	M1	Three-phase output terminal board (U-V-W) + load GND
3	M2	Three-phase power supply terminal board (L1-L2-L3) + PE
4	-	TPN lock screws with max 2.5 N m torque
5	-	Wall mount perforated fin
6	-	GW PLAST case
7	P1	Minimum voltage settings (MIN / CUT-OFF)
	P2	Maximum voltage settings (MAX)
8	P3	Proportional band settings (P.B.)
	P4	Set point settings (S.P.)
	P5	Set point fine tuning (S.P. Adj.)
9	M3	Command input terminal board
10	M4	Alarm relay terminal board
11	DL..	Signal led
12	DSw	Programming dip switch
13	SB1	Reset button

2.3. Mechanical dimensions

Model	Plate data			Mechanical dimensions					Weight(*)
	A	kV A	IP	A	B	C	E	F	
VTM308	8	5.5	55	254	235	114	213	200	2.3
VTM312	12	8	55	254	230	128	213	200	2.5
VTM320	20	14	55	254	230	158	213	200	3.8

* Packaging included



3. INSTALLATION

3.1. INSTALLATION

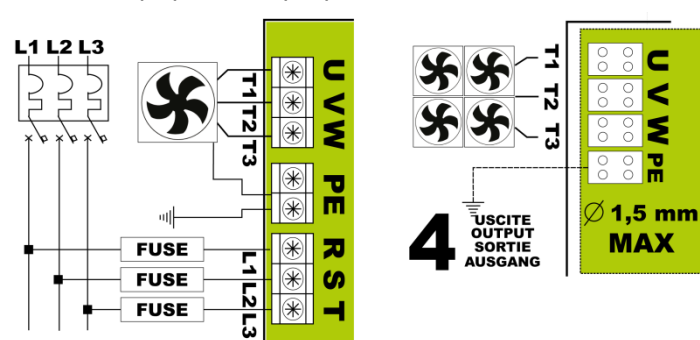
Vertically install the device with the wire inlet facing down. To permit correct heat dissipation, guarantee ≥ 150 mm clearance over and under the regulator. Reassemble and make sure the external protection lid is fully closed.

3.2. Electrical connections

Flexible wire section.
 Signal: rated section 1.5 mm² (15 AWG)
 Power: VTM 308 ≥ 1.5 mm² (15 AWG)
 VTM 312 ≥ 2.5 mm² (13 AWG)
 VTM 320 ≥ 4.0 mm² (11 AWG)

N.B. Protection devices: see point 8.

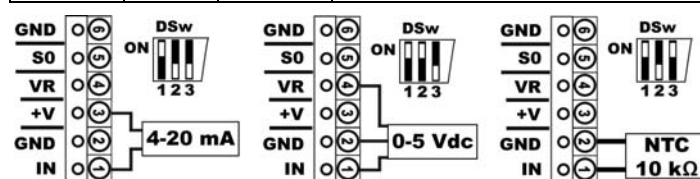
3.2.1. Power (M1) and load (M2*) connection:



(*)The regulator can be set to directly connect no. 4 fans (Three-phase + Ground) upon request

3.2.2. Command signal connections (M3)

M3	Terminal	Label	Description
	6	GND	Reference grounding
	5	S0	ON-OFF input (see point 3.3.3)
	4	VR	Reference voltage output +5.0 Vdc ($\pm 1.0\%$)
	3	V+	Power supply voltage output +20 Vdc ($\pm 20\%$)
	2	GND	Reference grounding
	1	IN	Transducer signal input



3.2.3. Alarm relay connection (M4)

M4	Terminal	Label	Description
	3	NO	Normally open contact
	2	NC	Normally closed contact
	1	COM	Shared terminal

3.3. Dip-Switch function settings (DSw1 – DSw6)

DSw	Description
1,2,3	Command signal selection (see point 3.3.2)
4	OFF = P1 (MIN) minimum voltage settings ON = P1 cut-off voltage settings
5,6	ON-OFF input function (see point 3.3.3)

3.3.1. DSw default settings



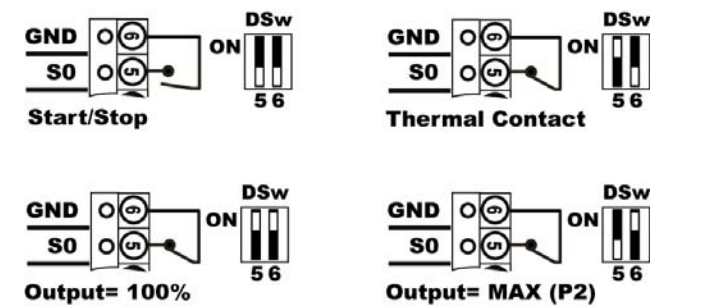
3.3.2. Command input function programming

WARNING Press button SB1 after changing DSw settings to apply changes.

DSw1	DSw2	DSw3	Description
ON	OFF	OFF	Transducer 4-20 mA
ON	ON	OFF	Transducer 0-5 V
ON	OFF	ON	Sensor NTC 10 kΩ 25 °C
ON	ON	ON	Cos Phi calibration (reserved)

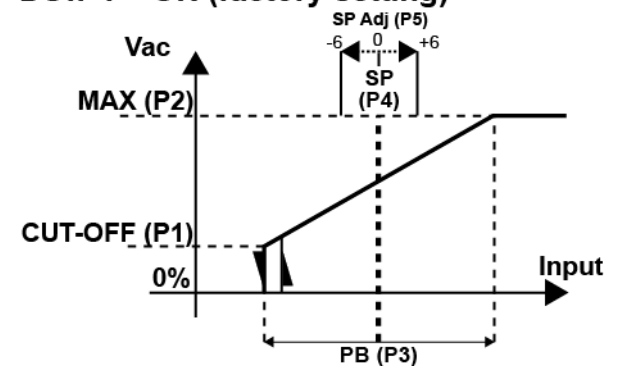
3.3.3. Functional programming for the ON-OFF input (S0)

DSw5	DSw6	Description
OFF	OFF	Start/Stop function (open = start)
ON	OFF	Thermal contact function (closed = start)
ON	ON	Output function at 100% (closed = 100%)
OFF	ON	Output function at MAX (closed = MAX (P2))

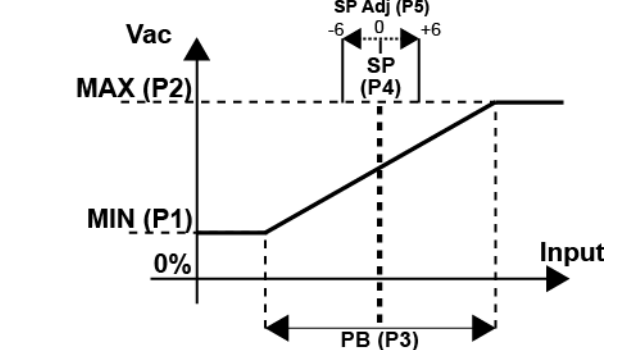


4. FUNCTIONAL CHARACTERISTIC

DSw 4 = ON (factory setting)

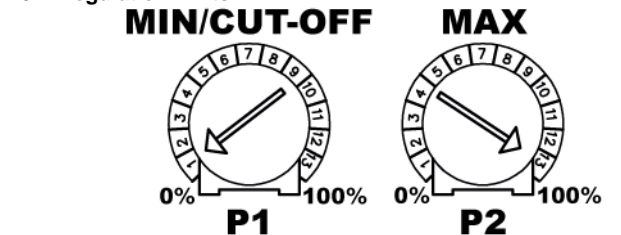


DSw 4 = OFF



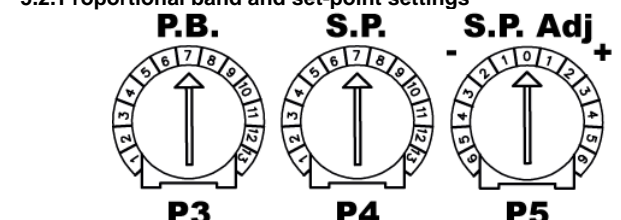
5. TRIMMER SETTINGS

5.1. Regulation limits



Trimmer	Label	Description
P1	MIN/CUT-OFF	Use as minimum voltage (MIN) DSw4 = OFF (range from 0-100%). Turn P1 clockwise to the required minimum voltage.
		Use as CUT-OFF (shutdown point) DSw4 = ON (range from 0-100%). Once the minimum voltage is set, turn DSw4 ON and press SB1 (reset). Cut-Off will be set to minimum voltage.
P2	MAX	Maximum speed limit settings (range 0-100%).

5.2. Proportional band and set-point settings

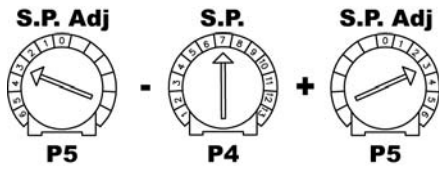


Trimmer	Description
P.B.	Proportional band settings (see point 5.5)
S.P.	Set-point settings (see point 5.3)
S.P. Adj.	Set-point fine tuning (see point 5.3)

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5.3. P4 (S.P.) set-point and P5 (S.P.Adj) fine tuning

The set-point value is given by adding or subtracting S.P. Adj. to/from S.P. The set-point is at the center of the proportional band.



5.4. S.P. and S.P. Adj. range

5.4.1. Scale 4-20 mA

- S.P. Adj.		S.P.		+ S.P. Adj.		mA		+ S.P. Adj.					
-6	-5	-4	3	2	1	SP	+1	+2	+3	+4	+5	+6	
5.4	5.5	5.6	5.7	5.8	5.9	1	6	6.1	6.2	6.3	6.4	6.5	6.6
6.4	6.5	6.6	6.7	6.8	6.9	2	7	7.1	7.2	7.3	7.4	7.5	7.6
7.4	7.5	7.6	7.7	7.8	7.9	3	8	8.1	8.2	8.3	8.4	8.5	8.6
8.4	8.5	8.6	8.7	8.8	8.9	4	9	9.1	9.2	9.3	9.4	9.5	9.6
9.4	9.5	9.6	9.7	9.8	9.9	5	10	10.1	10.2	10.3	10.4	10.5	10.6
10.4	10.5	10.6	10.7	10.8	10.9	6	11	11.1	11.2	11.3	11.4	11.5	11.6
11.4	11.5	11.6	11.7	11.8	11.9	7	12	12.1	12.2	12.3	12.4	12.5	12.6
12.4	12.5	12.6	12.7	12.8	12.9	8	13	13.1	13.2	13.3	13.4	13.5	13.6
13.4	13.5	13.6	13.7	13.8	13.9	9	14	14.1	14.2	14.3	14.4	14.5	14.6
14.4	14.5	14.6	14.7	14.8	14.9	10	15	15.1	15.2	15.3	15.4	15.5	15.6
15.4	15.5	15.6	15.7	15.8	15.9	11	16	16.1	16.2	16.3	16.4	16.5	16.6
16.4	16.5	16.6	16.7	16.8	16.9	12	17	17.1	17.2	17.3	17.4	17.5	17.6
17.4	17.5	17.6	17.7	17.8	17.9	13	18	18.1	18.2	18.3	18.4	18.5	18.6

5.4.2. Scale 0-15 bar

- S.P. Adj.		S.P.		+ S.P. Adj.		bar		+ S.P. Adj.					
-6	-5	-4	3	2	1	SP	+1	+2	+3	+4	+5	+6	
1.31	1.41	1.50	1.59	1.69	1.78	1	1.88	1.97	2.06	2.16	2.25	2.34	2.44
2.25	2.34	2.44	2.53	2.63	2.72	2	2.81	2.91	3.00	3.09	3.19	3.28	3.38
3.19	3.28	3.38	3.47	3.56	3.66	3	3.75	3.84	3.94	4.03	4.13	4.22	4.31
4.13	4.22	4.31	4.41	4.50	4.59	4	4.69	4.78	4.88	4.97	5.06	5.16	5.25
5.06	5.16	5.25	5.34	5.44	5.53	5	5.63	5.72	5.81	5.91	6.00	6.09	6.19
6.00	6.09	6.19	6.28	6.38	6.47	6	6.56	6.66	6.75	6.84	6.94	7.03	7.13
6.94	7.03	7.13	7.22	7.31	7.41	7	7.50	7.59	7.69	7.78	7.88	7.97	8.06
7.88	7.97	8.06	8.16	8.25	8.34	8	8.44	8.53	8.63	8.72	8.81	8.91	9.00
8.81	8.91	9.00	9.09	9.19	9.28	9	9.38	9.47	9.56	9.66	9.75	9.84	9.94
9.75	9.84	9.94	10.03	10.13	10.22	10	10.31	10.41	10.50	10.59	10.69	10.78	10.88
10.69	10.78	10.88	10.97	11.06	11.16	11	11.25	11.34	11.44	11.53	11.63	11.72	11.81
11.63	11.72	11.81	11.91	12.00	12.09	12	12.19	12.28	12.38	12.47	12.56	12.66	12.75
12.56	12.66	12.75	12.84	12.94	13.03	13	13.13	13.22	13.31	13.41	13.50	13.59	13.69

5.4.3. Scale 0-25 bar

- S.P. Adj.		S.P.		+ S.P. Adj.		bar		+ S.P. Adj.					
-6	-5	-4	3	2	1	SP	+1	+2	+3	+4	+5	+6	
2.19	2.34	2.50	2.66	2.81	2.97	1	3.13	3.28	3.44	3.59	3.75	3.91	4.06
3.75	3.91	4.06	4.22	4.38	4.53	2	4.69	4.84	5.00	5.16	5.31	5.47	5.63
5.31	5.47	5.63	5.78	5.94	6.09	3	6.25	6.41	6.56	6.72	6.88	7.03	7.19
6.88	7.03	7.19	7.34	7.50	7.66	4	7.81	7.97	8.13	8.28	8.44	8.59	8.75
8.44	8.59	8.75	8.91	9.06	9.22	5	9.38	9.53	9.69	9.84	10.00	10.16	10.31
10.00	10.16	10.31	10.47	10.63	10.78	6	10.94	11.09	11.25	11.41	11.56	11.72	11.88
11.56	11.72	11.88	12.03	12.19	12.34	7	12.50	12.66	12.81	12.97	13.13	13.28	13.44
13.13	13.28	13.44	13.59	13.75	13.91	8	14.06	14.22	14.38	14.53	14.69	14.84	15.00
14.69	14.84	15.00	15.16	15.31	15.47	9	15.63	15.78	15.94	16.09	16.25	16.41	16.56
16.25	16.41	16.56	16.72	16.88	17.03	10	17.19	17.34	17.50	17.66	17.81	17.97	18.13
17.81	17.97	18.13	18.28	18.44	18.59	11	18.75	18.91	19.06	19.22	19.38	19.53	19.69
19.38	19.53	19.69	19.84	20.00	20.16	12	20.31	20.47	20.63	20.78	20.94	21.09	21.25
20.94	21.09	21.25	21.41	21.56	21.72	13	21.88	22.03	22.19	22.34	22.50	22.66	22.81

5.4.4. Scale 0-30 bar

- S.P. Adj.		S.P.		+ S.P. Adj.		bar		+ S.P. Adj.					
-6	-5	-4	3	2	1	SP	+1	+2	+3	+4	+5	+6	
2.63	2.81	3.00	3.19	3.38	3.56	1	3.75	3.94	4.13	4.31	4.50	4.69	4.88
4.50	4.69	4.88	5.06	5.25	5.44	2	5.63	5.81	6.00	6.19	6.38	6.56	6.75
6.38	6.56	6.75	6.94	7.13	7.31	3	7.50	7.69	7.88	8.06	8.25	8.44	8.63
8.25	8.44	8.63	8.81	9.00	9.19	4	9.38	9.56	9.75	9.94	10.13	10.31	10.50
10.13	10.31	10.50	10.69	10.88	11.06	5	11.25	11.44	11.63	11.81	12.00	12.19	12.38
12.00	12.19	12.38	12.56	12.75	12.94	6	13.13	13.31	13.50	13.69	13.88	14.06	14.25
13.88	14.06	14.25	14.44	14.63	14.81	7	15.00	15.19	15.38	15.56	15.75	15.94	16.13
15.75	15.94	16.13	16.31	16.50	16.69	8	16.88	17.06	17.25	17.44	17.63	17.81	18.00
17.63	17.81	18.00	18.19	18.38	18.56	9	18.75	18.94	19.13	19.31	19.50	19.69	19.88
19.50	19.69	19.88	20.06	20.25	20.44	10	20.63	20.81	21.00	21.19	21.38	21.56	21.75
21.38	21.56	21.75	21.94	22.13	22.31	11	22.50	22.69	22.88	23.06	23.25	23.44	23.63
23.25	23.44	23.63	23.81	24.00	24.19	12	24.38	24.56	24.75	24.94	25.13	25.31	25.50
25.13	25.31	25.50	25.69	25.88	26.06	13	26.25	26.44	26.63	26.81	27.00	27.19	27.38

5.4.5. Scale 0-45 bar

- S.P. Adj.		S.P.		+ S.P. Adj.		bar		+ S.P. Adj.					
-6	-5	-4	3	2	1	SP	+1	+2	+3	+4	+5	+6	
3.94	4.22	4.50	4.78	5.06	5.34	1	5.63	5.91	6.19	6.47	6.75	7.03	7.31
6.75	7.03	7.31	7.59	7.88	8.16	2	8.44	8.72	9.00	9.28	9.56	9.84	10.13
9.56	9.84	10.13	10.41	10.69	10.97	3	11.25	11.53	11.81	12.09	12.38	12.66	12.94
12.38	12.66	12.94	13.22	13.50	13.78	4	14.06	14.34	14.63	14.91	15.19	15.47	15.75
15.19	15.47	15.75	16.03	16.31	16.59	5	16.88	17.16	17.44	17.72	18.00	18.28	18.56
18.00	18.28	18.56	18.84	19.13	19.41	6	19.69	19.97	20.25	20.53	20.81	21.09	21.38
20.81	21.09	21.38	21.66	21.94	22.22	7	22.50	22.78	23.06	23.34	23.63	23.91	24.19
23.63	23.91	24.19	24.47	24.75	25.03	8	25.31	25.59	25.88	26.16	26.44	26.72	27.00
26.44	26.72	27.00	27.28	27.56	27.84	9	28.13	28.41	28.69	28.97	29.25	29.53	29.81
29.25	29.53	29.81	30.09	30.38	30.66	10	30.94	31.22	31.50	31.78	32.06	32.34	32.63
32.06	32.34	32.63	32.91	33.19	33.47	11	33.75	34.03	34.31	34.59	34.88	35.16	35.44
34.88	35.16	35.44	35.72	36.00	36.28	12	36.56	36.84	37.13	37.41	37.69	37.97	38.25
37.69	37.97	38.25	38.53	38.81	39.09	13	39.38	39.66	39.94	40.22	40.50	40.78	41.06

5.4.6. Scale 0-5 Vdc

- S.P. Adj.		S.P.		+ S.P. Adj.		Vdc		+ S.P. Adj.					
-6	-5	-4	3	2	1	SP	+1	+2	+3	+4	+5	+6	
0.32	0.35	0.38	0.41	0.44	0.47	1	0.50	0.53	0.56	0.59	0.62	0.65	0.68
0.65	0.68	0.71	0.74	0.77	0.80	2	0.83	0.86	0.89	0.92	0.95	0.98	1.01
0.99	1.02	1.05	1.08	1.11	1.14	3	1.17	1.20	1.23	1.26	1.29	1.32	1.35
1.32	1.35	1.38	1.41	1.44	1.47	4	1.50	1.53	1.56	1.59	1.62	1.65	1.68
1.65	1.68	1.71	1.74	1.77	1.80	5	1.83	1.86	1.89	1.92	1.95	1.98	2.01
1.99	2.02	2.05	2.08	2.11	2.14	6	2.17	2.20	2.23	2.26	2.29	2.32	2.35
2.32	2.35	2.38	2.41	2.44	2.47	7	2.50	2.53	2.56	2.59	2.62	2.65	2.68
2.65	2.68	2.71	2.74	2.77	2.80	8	2.83	2.86	2.89	2.92	2.95	2.98	3.01
2.99	3.02	3.05	3.08	3.11	3.14	9	3.17	3.20	3.23	3.26	3.29	3.32	3.35
3.32	3.35	3.38	3.41	3.44	3.47	10	3.50	3.53	3.56	3.59	3.62	3.65	3.68
3.65	3.68	3.71	3.74	3.77	3.80	11	3.83	3.86	3.89	3.92	3.95	3.98	4.01
3.99	4.02	4.05	4.08	4.11	4.14	12	4.17	4.20	4.23	4.26	4.29	4.32	4.35
4.32	4.35	4.38	4.41	4.44	4.47	13	4.50	4.53	4.56	4.59	4.62	4.65	4.68

5.4.7. Scale NTC 10-60 °C