Brief Description

- Usable as: Temperature-, Humidity-, Pressure- or Cold Storage Controller
- Operation Modes:
  - Double Single Setpoint,
  - Dual Setpoint,
  - Proportional-/ PI-Controller,
  - Step Controller,
  - Setpoint shift by 2nd sensor or 4..20mA-input,
  - Cold Storage Control with Cyclic Defrost
- Output 0-10VDC
- Limit value alarm, Alarm relay
- Inputs for PTC/Pt1000 and 4...20 mA, Digital Input
- Networkable via RS-485-Interface

Can be used for

- Cooling, Heating and HVAC Applications

ELREHA

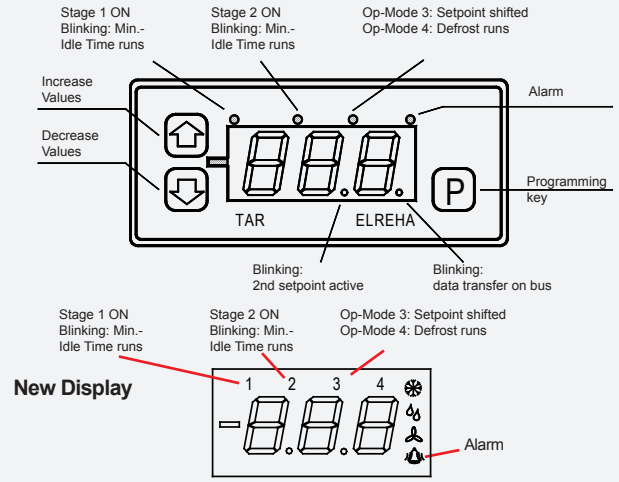
ELEKTRONISCHE REGELUNGEN GMBH

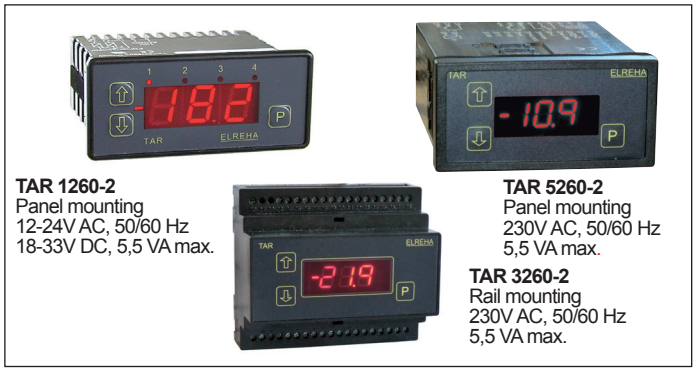
Technical manual **5311032-53/20E**

Temperature, Humidity, Pressure Controller

TAR 1260-2 from SoftwVers. 1.0.5
TAR 3260-2 from SoftwVers. 2.0.0
TAR 5260-2 from SoftwVers. 2.0.1

Operating Elements





Parameters (setpoints, times, etc.)
All selectable parameters hold a parameter number (e.g. P03), you will find a listing on the next page.

Calling up and editing
Press key 'P' ..... parameter number appears
Use '⇧/⇩' ..... select desired parameter (hold key for autoscroll)
Press "P" again ..... parameter value appears
Use keys '⇧/⇩' ..... adjust parameter value (hold key for autoscroll)
Press 'P' again..... value is stored, back to parameter no.

Unlock Keys / Access code
To prevent un-authorized persons from editing parameter values, there is a locking function which allows only the most important parameters to be changed at any time. All other parameters must be unlocked as follows:
- enter access code before programming at parameter **P46** *or*
- directly at the parameter to be changed. If a code no. is necessary the display shows "C00". Set the matching code no. by the "⇧/⇩"-keys (70 or 80, see parameter listing) and confirm by "P".

If no key is hit for about four minutes, the access code is cancelled and the editing function is locked automatically.

Start-up behavior
Directly after start-up the display shows "260" (controller type), after that a display test passes.

How to find out the controller type
- Press key "P" for > 2 sec. = Display shows controller type (**260**)
- Key "⇩" additionally = Software version is displayed

Manual controller "wake-up"
If the controller is switched off via interface (e.g. from a PC), the display shows "**oFF**". By holding key "⇩" for > 3 sec. the controller unit engage.

Manual Defrost
In cold storage controller mode (P14=4) and while the actual value of sensor 1 is displayed, a defrost event can be initiated:
- Press key "⇧" for more than 2 seconds = Defrost ON
- Press key "⇩" for more than 2 seconds = Defrost OFF.

Reset parameters to factory settings
Switch OFF supply voltage, press and hold "P"-key, switch voltage ON again. Code request "C" appears. Enter "88", confirm by "P". One by one software version, date and "def" appear. With this, all values are reset to the factory settings.

CAUTION

Please note Safety Instructions !
When replacing older types please note changed functions and connectors !
If your controller has a different software version, some functions could not be present !

Technical Data (see parameter listing for more information)

Supply Voltage	see above
Output Relays	3x potential free
Contact Rating	8A resistive, 3A cos phi 0,4, 250V AC
TAR 1260-2 (UL)	resistive: 120/240V AC, 8A, 30 k cycles motor: 125/250V AC, ¼ HP, 30 k cycles
Ambient Temperature TAR 1260-2 (UL)	-10..+65°C (14..149°F)
Ambient Temperature TAR 3260-2/5260-2	-10..+55°C (14..131°F)
Storage Temperature	-30..+70°C (-22..158°F)
Relative Humidity	max. 85% r.H., not condensing
Signal Inputs	2x TF 201 (PTC) or TF 501 (Pt1000) 1x 4...20mA, 100 ohms shunt
Transducer Supply	DC unregulated, depending on transformer, max. 35 mA
Display	
(1260-2)	LED, 7-segment, red, character height 13mm (.51 inch)
(3260-2, 5260-2)	LED, 7-segment, red, character height 11mm (.43 inch)
Resolution / Accuracy	0,1°C / 0,2°F / typ. ±1K
Control-/Display Range max.	-100...+300 (°C, °F, bar, % r.F.)
Control-/Display Range (with TF 201)	-40...+80°C / -40...176°F
Data storage parameters	≥20 years
Relay indicators	3 mm, red
Digital input (OK/DI)	depends on type (see below)
Analog Output	0-10V DC, max. 3 mA
Analog Output Resolution	8 bit within the set benchmarks
Interface	*E-Link* (RS-485)
Electrical connection	screw terminals 2,5mm² (.1 inch)
Housing / Protection / Digital Input	
TAR 1260-2	77 x 35 mm front frame, IP 54 from front Digital input for external, potential free contact
TAR 3260-2	for rail mounting, IP 30 Digital input for mains voltage, 50-60Hz, max. 3mA
TAR 5260-2	96 x 48 mm front frame, IP 54 from front Digital input for mains voltage, 50-60Hz, max. 3mA

Further data you will find in the parameter listing.

Accessories (please order separately)
- Temperature sensor TF 201 (up to 80°C max.) *or*
- Temperature sensor TF 501 (PT1000, up to 300°C, dep. on type) *or*
- 2-wire pressure transmitter, type DG.. or similar with 4-20 mA output
- Humidity transmitter FF 2520 with 4...20mA output
- For type TAR 1260-2: Transformer 107-1300-0052 (230V / 12V / 5VA). Attention! These transformers are not suitable to supply a transducer at the same time.

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Parameter listing	P14=1	P14=2	P14=3	P14=4	P14=5	Code	Description	Range	Factory Settings
P01	x	x	x	x	x	-..	Actual value of sensor/transmitter 1	display only !	
P02	x	.	x	x	x	-..	Actual value of sensor 2	display only !	
P03	x	x	x	x	x	-..	Control setpoint 1 (*Absolute value*)	within P10 and P11	0
P04	x	x	x	x	x	88.	Control setpoint 2 (*Absolute/Relative, depends on P05* *Relative value may also be negative.* *Range with P14 = 1,4 or 5 : within P11..P10* *Range with P14 = 2 or 3, complete control range)*	within P10 and P11	0
P05	.	x	x	.	.	88.	Mode of setpoint 2	**1**= Absolute, **2**= Relative to P03	1
P06	x	x	x	x	x	88.	Setpoint-Offset *(Value the setpoints will be shifted while digital input OK1 is activated for 2nd setp. shift)*	-100...+100°C	0
P07	x	x	x	x	x	88.	Switching mode of relay 1	**1** = Refrigeration. (=dehumid), **2** = Freezing, **3** = Heating (= moisten), **4** = Cycling	**1**
P08	x	x	x	x	x	88.	Switching mode of relay 2	like P07	1
P09	x	x	x	x	x	88.	Switching mode of alarm relay	**1** = de-activated **2** = activated if P01 is too high/low **3** = de-activated, **4** = activated if P02 is too high/low	1
P10	x	x	x	x	x	88.	Highest setpoint adjustable with P03 resp. P04	P11...+300°C	+50
P11	x	x	x	x	x	88.	Lowest setpoint adjustable with P03 resp. P04	-100°C...P10	-50
P12	x	x	x	x	x	88.	Hysteresis of control setpoint 1 (relay 1)	0,2...20	2,0
P13	x	x	x	x	x	88.	Hysteresis of control setpoint 2 (relay 2)	0,2...20	2,0
P14	x	x	x	x	x	**70**	Operation Mode	**1** = 2x temperature sensor **2** = 1x temperature sensor or. transmitter **3** = 1x temperature sensor + 1x shift sens. **4** = like 1, add. cyclic defrost **5** = sensor 1: 4-20mA; sensor 2: Temp. **6** = sensor 1: 4-20mA; + 1 shift sensor	2
P15	x	x	x	x	x	88.	Minimum Idle Time (relays 1 & 2)	0...59 min	0
P16	x	x	x	x	x	88.	Proportional range rel.1 (*Heating resp. moisten*)	0...12	2.0
P17	x	x	x	x	x	88.	Proportional range rel.2 (*Heating resp. moisten*)	0...12	2.0
P18			x			--	Sum of all current setpoint shifts (*offset + setpoint shift*)	display only !	
P19			x			88.	Limit value of setpoint shift	-100...+300	0
P20			x			88.	Range of shift — Only if P14=3	-100...+100K	0
P21			x			88.	Size of shift — Only if P14=3	-100...+100K	0
P20				x		88.	Defrost cycle (h) — Only if P14=4	1...100 h	4
P21				x		88.	Defrost duration (min) — Only if P14=4	1...100 min	45
P22	x	x	x	x	x	--	Remaining time alarm relay	display only !	
P23	x	x	x	x	x	--	Remaining idle time relay 1	display only !	
P24	x	x	x	x	x	--	Remaining idle time relay 2	display only !	
P25	x	x	x	x	x	--	Remaining time digital input delay (OK)	display only !	
P26	x	x	x	x	x	**70**	Sensor type . *With operation mode P14=1 or 4 only 1-4 is possible.* *With operation mode P14=2 or 3 all types are possible.* *With op.-mode P14=5 or 6 only the settings 5 and 6 are reasonable.*	1 = TF 201 (°C), 2 = TF 201 (°F) 3 = TF 501 (°C). 4 = TF 501 (°F) 5 = 4...20 mA / TF 201, °C 6 = 4...20 mA / TF 501, °C	1
P27	x	x	x	x	x	88.	Sensor / Transmitter 1 correction	-10,0...+10,0	0
P28	x	.	x	x	x	88.	Sensor 2 correction	oFF, -10,0...+10,0	0
P29		x			x	88.	Displayed value at 20 mA signal current	-100...+300	100
P30		x			x	88.	Displayed value at 4 mA signal current	-100...+300	0,0
P31	x	x	x	x	x	88.	Alarm delay	1...99 Min	5
P32	x	x	x	x	x	88.	Upper Alarm Limit *(Relative, related to the current setpoint P03 + the P06 offset)*	0...300	100
P33	x	x	x	x	x	88.	Lower Alarm Limit *(Absolute value)*	-100...+300	-100
P34	x	x	x	x	x	88.	Digital input OK/DI 1	oFF, 1 = night setpoint (2nd setp.) 2 = ext. alarm, 3 = controller OFF	oFF
P35	x	x	x	x	x	88.	Delay time for digital input OK/DI1	0...99 min	2
P36	x	x	x	x	x	88.	Analog output: 10V DC if actual value P01 =	P37...+300 * see text	50,0
P37	x	x	x	x	x	88.	Analog output: 0V if actual value P01 =	-100...P36 * see text	-50,0
P38	x	x	x	x	x	88.	Analog output: slow-down time (I-part)	oFF, 1 = ~0,25 min, 2 = ~0,5 min 3 = ~1 min, 4 = ~2 min, 5 = ~4 min	oFF
P39	x	x	x	x	x	88.	Analog output: mode	oFF, 1 = proportional 2 = antiproportional 3 = proportional, relative to current setpoint 4 = antiproport., relative to current setpoint	oFF
P40	x	x	x	x	x	88.	Factor of period duration *(Period duration = 16 sec. * factor)*	1...10	1
P41	x	x	x	x	x	88.	Data transmission speed (baudrate)	1=1200, 2=2400, 3=4800, 4=9600, 5=19200, 6=28800, 7=57600	4
P42	x	x	x	x	x	88.	Address of the controller in a network	1...78	78
P43	x	x	x	x	x	88.	"Display Hold" (DH) while defrost	0 = off, 1 = on	0
P44	x	x	x	x	x	88.	ON-time of the relay K1 while a sensor failure (emergency mode), depends on a 30 min. interval	0...100%	50
P45	x	x	x	x	x	-..	Current error + error listing	multiple errors present: scroll by '⇧/⇩' keys	
P46	x	x	x	x	x	-..	Access code	0...99	0

ℹ x = Functions available in this mode, without "x" = parameters invisible

Failure Display / Failure handling

Sensor short circuit or broken
If one of the sensors is broken, disconnected or hot-wired, or the value is located outside of the specified range, the display shows "- - -" at first. After 1 minute the display flashes and shows an error code. The alarm relay will be activated at the same time.

Error Codes

E00 .....ok
E01 .....sensor F1 broken
E02 ..... sensor F1 short circuit
E03 .....sensor F1 overtemperature
E04 ..... sensor F1 low temperature
E05 .....sensor F2 broken
E06 ..... sensor F2 short circuit
E07 .....sensor F2 overtemperature
E08..... sensor F2 low temperature
E09.....failure at the digital input
E11 ..... 4/20mA input < 3mA
E12..... 4/20mA input >21mA

Failure of Sensor 1 (control sensor) / Emergency Mode
If this sensor fails, the controller starts an emergency mode. Relay K1 then is clocking with a %-part (**P44**) of a 30 minutes interval. With P44 = 0 or 100 you can select if the relay is continuously on or off during this mode.

Display shows "oFF" if:
1. ...controller unit is switched OFF via digital input OK/DI1 or via network.
2. ...you select P02 or P28 and the evaporator sensor is switched off.

Functional Description

Sensor connection
The controller operates either with temperature sensors of the types TF201 and TF 501 (PT1000) or with a 4...20 mA signal. The input can be selected by parameter **P26**.

Ranges:
P26 = 1 (TF 201).....-50...+100°C
P26 = 3 (TF 501/Pt1000).....-100...+300°C
With the settings P26 = 5 or 6 the 4...20mA input will be activated and a probe type will be assigned to the active probe input.

Please note the specific temperature restrictions of the different sensor types (e.g. -40...+80°C with standard-TF-types) and ask for matching products if necessary.

Humidity-/Pressure Control:
Range dep. on transmitter, max. -100...+300

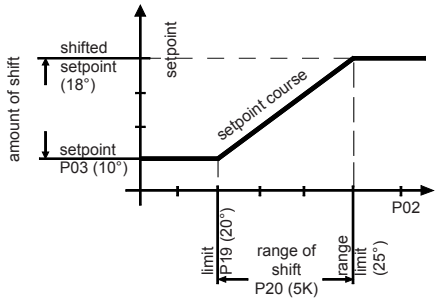
Operation modes
The controller can be configured for different operating modes (by parameter **P14)**:

P14 = 1: 2 control sensors
Sensor 1 effects on setpoint 1 (**P03**), sensor 2 effects to setpoint 2 (**P04**). Both setpoints are absolute values. So you realize **2 independent single stage temperature controllers** in one unit. In this mode the 4...20mA input is de-activated.

P14 = 2: 1 control sensor or 1 transmitter 4-20mA, for **dual stage control**.
Sensor input 1 or the 4...20 mA signal input effects on both setpoints (**P03** / **P04**), sensor input 2 is de-activated. P03 is an absolute value, P04 can be also relative (adj. by **P05**).

P05 = 1: Setpoint 2 (P04) is an absolute value (used for dual stage control with individual setpoints)
P05 = 2: Setpoint 2 (P04) is a relative value (used for dual stage control with neutral zone, that means that P04 will be shifted the same amount if P03 is shifted)

P14=3: 1 control sensor
+ 1 sensor for setpoint shift
Sensor 1 effects on setpoint 1 (P03), sensor 2 may shift setpoint 1. The 4...20 mA input is de-activated. With this, you realize e.g. an outdoor temperature guided control.
P19 is the limit from which a rise or lowering (shift) becomes possible, **P20** is the range of the shift, **P21** the amount of the shift.



Example:

- Control Setpoint 1 *P03 = 10°C*
- Limit value *P19 = 20°C*,
  that means increasing starts with 20° at sensor input 2, no shift below that value.
- range of shift *P20 = 5K*,
  that means shift range is 25K in total, above 25°C at sensor 2 maximum setpoint shift.
- Size of shift *P21 = 8K*,
  from 25°C the control setpoint is P03 + 8K, in this example = 18°C.

P18 shows the current shift amount. This value is a sum of the day/night shift and the setpoint shift.

P14 = 3: 1 control sensor
+ 4...20mA-input for setpoint shift
The 4...20mA input can also be used for setpoint shifting. For that, you have to select "5" or "6" (depending on probe type) at **P26**.
P29 and **P30** defines the temperature range which is represented by the 4...20mA signal. With this settings, the signal replaces a temperature probe and will be displayed at **P02**.

P14 = 4: control sensors + cyclic defrost
Sensor 1 effects on setpoint 1 (**P03**), sensor 2 effects on setpoint 2 (**P04**). With this configuration you realize two independent single stage controllers in one unit like above, but parameters 20/21 get a different function. Cooling via setpoint 1 (i.e. output effected by setpoint 1) is disabled in specific time intervals to enable **air flow defrost**.

P14 = 5: 2 different control sensors
The 4-20mA input effects on setpoint 1 (**P03**), temp. sensor input F2 on setpoint 2.
With this mode you can realize e.g. **humidity control and temperature control at the same time**.
The 4-20mA input acts on the analog output..

P14 = 6: **4...20mA-input**
+ 1 sensor for setpoint shift
Like P14=3, but with this setting the 4...20mA input can be used for control and the temperature sensor for setpoint shifting.

Actual Value Display / Status Display
With temperature sensors:
Temperatures can be displayed in °C or °F selected by parameter P26 (= sensor type switch). The resolution is 0.1°C (or 0,2°F).
While operating with temperature sensors, **P01** shows the actual value of sensor 1.
If another parameter is selected and no key is pressed for about 4 minutes, you come back to this parameter automatically.
In op-modes P14=2, the **P02** display is disabled.

With 4...20 mA transmitters:
In op-modes (P14) 2 and 5 the "4...20 mA"-input is activated and can be read at P01.
The current signal can be delivered by any 4...20 mA sources or appropriate transmitter.

Adapting of transmitters, display correction
A transmitter delivers the measured value by a 4...20 mA signal. Parameter **P30/P29** presets the measuring scale.

Example 1: Humidity transmitter,
Range 0...100% r.H., P29 = 100, P30 =0
Example 2: Pressure transmitter,
Range –0,5 ... +9.0 bar, P29 = 9.0, P30 = -0.5

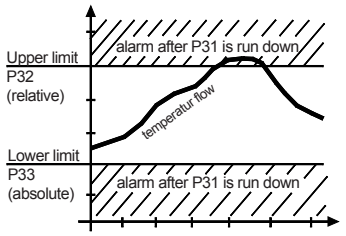
With **P27** the display of actual value **P01** can be corrected, with **P28** a correction of the value displayed by **P02** is possible.

Switching hysteresis
For the setpoints P03 / P04 you can fix a switching hysteresis with parameters **P12** and **P13**. The position of the hysteresis (above/below the setpoint) depends on the selected relay switching mode (**P07** resp. **P08**).

Setpoint limits
To prevent the setpoints being set to an invalid value (e.g. not below 0°C), the range of P03 / P04 can be restricted by parameters **P10** and **P11**.

Day / night shift resp. **2nd Setpoint**
E. g. to save energy it is possible to switch to other setpoints at any time. By parameter **P06** an offset value can be set on which all setpoints will be shifted if digital input OK/DI 1 is activated.

Temperature- resp. Limit Value Alarm
If the value measured with sensor 1 or the delivered 4...20 mA signal leaves the range preset by parameters **P32** and **P33**, the alarm relay will be activated after a delay timer (**P31**) is run down. **P22** shows the remaining time of the alarm delay timer. P33 (lower limit) is an absolute value and P32 is always a relative value coupled to the current setpoint (P03 + eventually shift).



Relay switching characteristic
The switching characteristic of relays K1 and K2 are defined by parameters **P07** and **P08**.
The following options can be selected:

1= Refrigeration (Standard)
Used for standard applications (e.g. temperatures above 0°C). The load would be switched by the N/O-contact.
Actual value = setpoint + hysteresis: Relay on
2 = Freezing (DF)
The load would be switched by the N/C-contact, this enables that the load will be switched on permanently in case of mains loss or controller defect.
Actual value = setpoint + hysteresis: Relay off

Note: not usable for relay 2 at 1260-2.

3 = Heating (HT)
Usable for heating applications. Load would be switched off in case of mains fail or controller defect.
Actual value = setpoint **-** hysteresis: Relay on
4 = Cycling
Quasi-Proportional Control with cycling relay for heaters or certain valves. Here a range will be defined the relay will cycle within. The relay's ON/OFF ratio (cycle ratio) depends on control deviation. The period duration will be set by **P40**. With P40=1 the period duration is 16 seconds, with P40=2 the duration is 32 seconds, and so on.

Cycling range of relay K1
Upper limit = *P03 (setp.1)*
Lower limit = *P03 (setp.1)* - ***P16***
Above this upper limit, relay 1 remains OFF permanently, below the lower limit relay 1 remains permanently ON (e.g. for heating, humidifying).

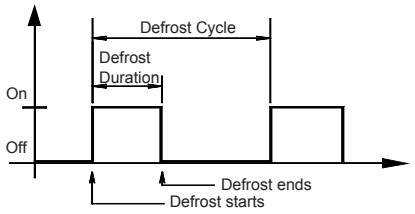
Cycling range of relay K2
P05=1:
Lower limit = *P04 (setp.2)*
Upper limit = *P04 (setp.2)* + ***P17***
P05=2:
Lower limit = *P03* + *P04*
Upper limit = *P03* + *P04* + ***P17***
Above this upper limit, relay 2 remains permanently ON (e.g. for refrigeration, de-humidifying), below the lower limit relay 2 remains OFF.

Alarm relay characteristic
Parameter **P09** defines if the alarm relay K4 is affected from the actual value **P01** or **P02** and whether the alarm relay is activated (active ON) or de-activated if an alarm occurs.

Minimium idle time
If a relay has been switched OFF, it can be activated first after timer **P15** is run down. This is valid for both control relays. If the relay switching characteristic is set to 'cycling' this function is de-activated.
Parameters **P23** and **P24** show the remaining time until the relays will switch ON again. The minimum idle time affects immediately after power-up of the controller.

Defrost Function

In **operation mode** (**P14=4**) a simple defrost function can be used. This function suppresses (in adjustable intervals) the switch-on of relay 1 to enable an air circulation defrost.
The parameters **P20** and **P21** have another significance in this mode. P20 defines the defrost cycle, P21 the defrost duration.
After power-on of the unit the defrost cycle time (P20) runs down first, before a defrost can start.



To prevent a temperature alarm while a defrost event, P31 must be lengthened eventually.
A defrost event can be started and stopped manually while the actual value is being displayed, while running it is indicated by a LED.

(DH) Display Hold Function
This function allows to hold the last measured actual temperature value on the display during a defrost cycle. After the defrost cycle has been terminated, the display shows the current measured value again. The DH-function can be initiated by **P43**.

Digital Input

Digital input OK/DI1 is normally connected to mains voltage (not 1260-2). If this voltage is interrupted, the function set with **P34** is initiated after a time delay (**P35**), which is adjustable within 0...99 min, at '0' the minimum delay is appr. 4 seconds. **P25** shows the remaining delay time of the OK/DI.

CAUTION Using the **TAR 1260-2** this function must be started by opening an external, potential free contact connected to terminals 11/12. **Never connect mains voltage to these terminals, danger of destruction!** This contact must be suitable for 5VDC/1mA.

P34 = oFF Digital Input is **de-activated**
P34 = 1 The unit switches to the **2nd/night-setpoint**. Setpoints will be increased / decreased by the value of P06.
P34 = 2 An **external alarm** will be detected after the time set by **P35**. After P31 is run down, LED 4 and the alarm relay will be activated.
P34 = 3 All **control functions** are disabled, P01 shows 'oFF'. The unit can only be reactivated by closing the external contact. Relays, configured for freezing (**P07** or **P08** = 2) will engage.

Analogue output behaviour:
- Delivers 0V with op-mode proportional (P39=1 or 3).
- Delivers 10V with op-mode anti-proportional (P39 = 2 or 4)

Voltage Output / Analogue Output

The analog output comes with a 0-10 V DC-signal usable both for delivering an actual value 1 (**P01**) image or as a P/PI-control output.

P39 fixes the operation mode of the output.

P39=oFF..Output is de-activated.
P39=1..Output effects proportional, i.e. increasing actual value -> increasing output voltage. **P36/P37** are the absolute actual values the output delivers 10V / 0V.
P39=2.. Output effects anti-proportional, i.e. increasing actual value -> decreasing output voltage. **P36/P37** are the absolute values the output delivers 0V / 10V.
P39=3 Output effects proportional (increasing actual value -> increasing output voltage), relative to the active setpoint (P03 + shift). **P36/P37** define a proportional band around the active setpoint. Output voltage is 10V at **P03 + P36** and 0V at **P03-P37**.

Example: P36 = 10°C, P37 = -10°C
P39 = 3, P03 = 15°C,
Output voltages 10V at P03 + P36 = 25°C
0V at P03 + P37 = 5°C

P39=4.. Output effects anti-proportional (increas. actual value -> decreasing outp. voltage), relative to the active setpoint. **P36/P37** define a proportional band around the active setpoint. Output voltage is 0V at **P03 + P36** and 10V at **P03-P37**.

Example: P36 = 10°C, P37 = -10°C
P39 = 3, P03 = 15°C,
Output-: voltages 0V at P03 + P36 = 25°C
10V at P03 - P37 = 5°C

Example Act. Val. Image (e.g. Remote Display):
The output must deliver 0V with -50°C and 10V at +50°C: -> P37 = "-50", P36 = "+50", P39 = "1"

Example anti-proportional Controller:
Any device with 0-10V-input must be controlled depending on pressure, half open at 5.0 bar. With descending pressure the device should go more open, fully open from 4 bar. With increasing pressure the device must close, fully closed from 6 bar.

P37 ="4.0", P36 ="6.0", P39 ="2"

Slow-down time / I-part
P38 (slow-down time) fixes the effect of the I-part to the control process in 5 steps. The I-part amount of the controlling variable is identical with the P-part and will be added. The full size of the I-part will effect after P38 is run down.

Effects of the Slow-down time
When P39 = 1
Act.Val. = Setpoint: Output 5V ± I-Part
Act.Val. > Setpoint: Output shifts with I-part to 10V
Act.Val. < Setpoint: Output shifts with I-part to 0V
When P39=2
Act.Val. = Setpoint: Output 5V ± I-Part
Act.Val. > Setpoint: Output shifts with I-part to 0V
Act.Val. < Setpoint: Output shifts with I-part to 10V
When P39 = 3
P36/P37 define a proportional band around the active setpoint. The output voltage is 10V at **P03 + P36** and 0V at **P03 + P37**.

Act.Val. = Setpoint: Output 5V ± I-Part
Act.Val. > Setpoint: Output shifts with I-Part to 10V
Act.Val. < Setpoint: Output shifts with I-Part to 0V
When P39 = 4
P36/P37 define a proportional band around the active setpoint. The output voltage is 0V at **P03 + P36** and 10V at **P03 + P37**.
Act.Val. = Setpoint: Output 5V ± I-Part
Act.Val. > Setpoint: Output shifts with I-Part to 0V
Act.Val. < Setpoint: Output shifts with I-Part to 10V

After an excursive change of the actual value the P-part is calculated from the max. output voltage and the proportional band:
Ux = (10V / (|P36 - P37| [K])) * delta Theta [K]

Example:
- 10V U_{out} at +10°C, 0V U_{out} at -10°C
- aimed setpoint 0°C = 5V U_{out}
- current actual value 0°C

Actual value increases by 2K ->

- U_{out} rises to 6V immediately
- U_{out} continues rising, after P38 is run down, 7V will be reached.

CAUTION **TAR 1260-2 and Servo Drives / Actuators**

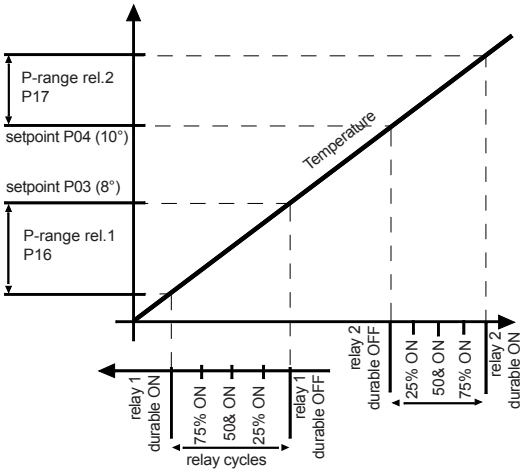
Actuators work with 24V AC mostly and so you get the thought to supply actuator and controller from the same source. Unfortunately, supply voltage and control input are not isolated in actuators, this may destroy the TAR. Because of this:

If a TAR 1260-2 must control a servo drive, the TAR must be supplied by a separate transformer !

Example for a cycling heater:

Switching char. ..... P07 = 4
Setpoint 1 ..... P03 = 8°C
P-range relay 1 ..... P16 = 4K

8°C = relay OFF permanently
7°C = relay cycles, 25% ON, 75% OFF
6°C = relay cycles, 50% ON, 50% OFF
5°C = relay cycles, 75% ON, 25% OFF
4°C = relay ON permanently



CAUTION **Important !! -->**

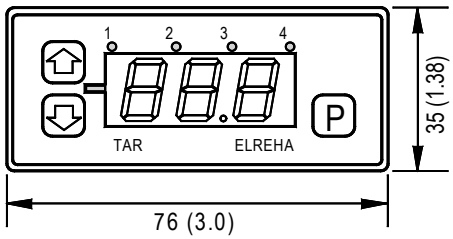
Please note the decreased lifetime of the relay contacts in cycling operation. Please care for a suitable relief.

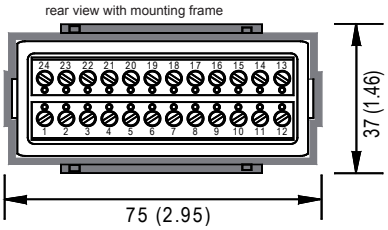
Cycle 16 sec.:
load current 0,8A res. --> 2 years
load current 1,2A res. --> 1 year
load current 1,9A res. --> 0,5 years

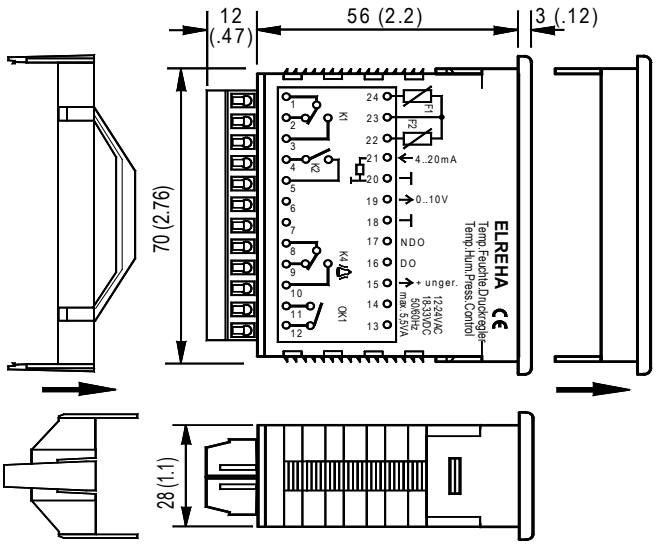
(Theoretical values according to the relays data sheet)

TAR 1260-2 - Dimensions

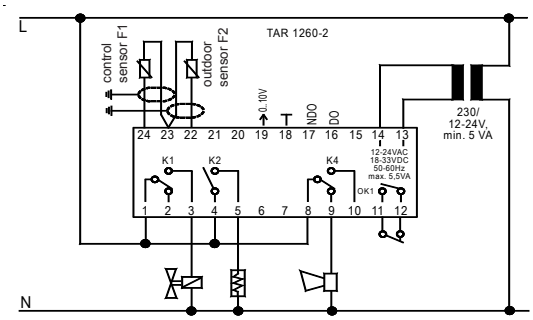
dimensions in: mm (inches)



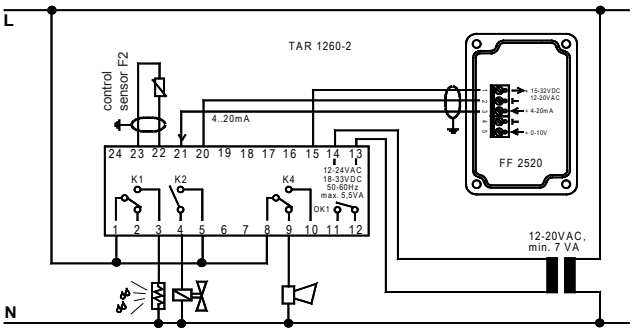




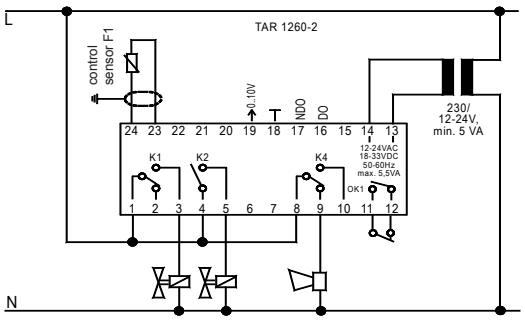
Connection & Application Examples (simplified)



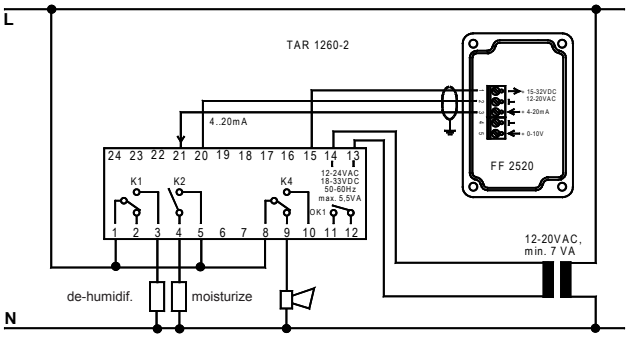
refrigeration/heating, outdoor temperature guided
Basic settings: P14=3, P07=1, P08=3, P26=1...4



Humidity- / Temperature control simultaneously
Basic settings: P14=5, P07=1, P08=1, P26=depending on sensor, P29=100, P30=0



refrigeration 1/ refrigeration 2
Basic settings: P14=2, P07=1, P08=1, P26=1...4



Moisturize / de-humidifying
Basic settings: P14=2, P07=1, P08=3, P26=5, P29=100, P30=0

Networking of TAR controllers

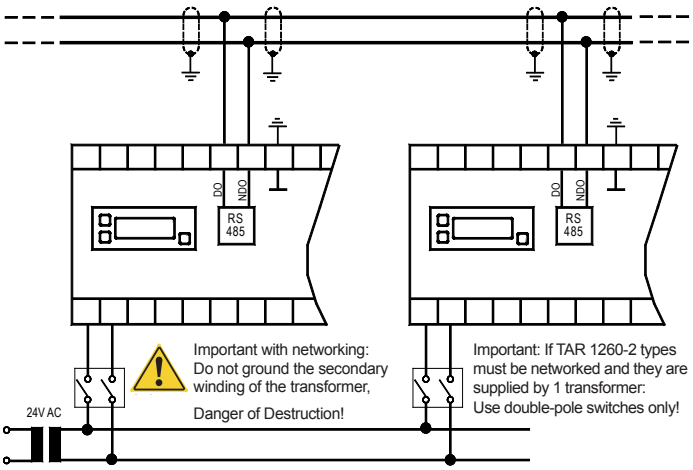
All controllers can be networked to a host (PC or SMZ) via their built-in RS-485-interface, which allows remote control of units and recording of all parameters.

- Because all units are connected parallel on the data cable, every unit has its own network address (**P42**) to ensure a specific communication. **!! NOTE: Never use address 64 !!**
- The data transmission speed is fixed by **P41**, the default value is 9600 Baud.
- Wiring must be made by standard data cable.
- Shieldings must be connected to the nearest grounding terminal.
- The unshielded part of the data cable must be as short as possible.

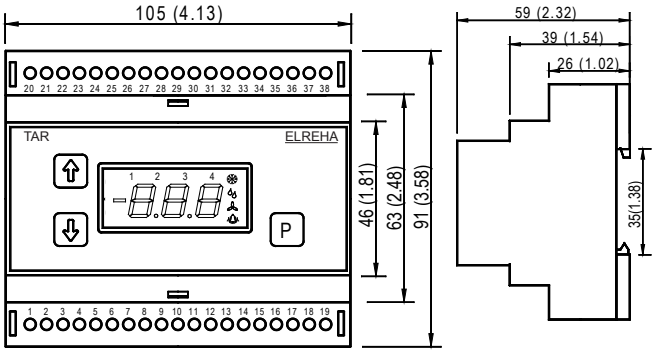
If networked controllers **(1260-2** types only) are supplied by one transformer only and the single positions must be switched off, use double-pole switches only. If not, the unit will be supplied partially over the shielding of the data connection and continues operation, depending on the secondary voltage of the transformer. Please note: If a unit is not supplied, the PC-software notifies a unit breakdown !
A better way is not to switch-off the supply voltage but to disable the unit by Digital Input.

CAUTION

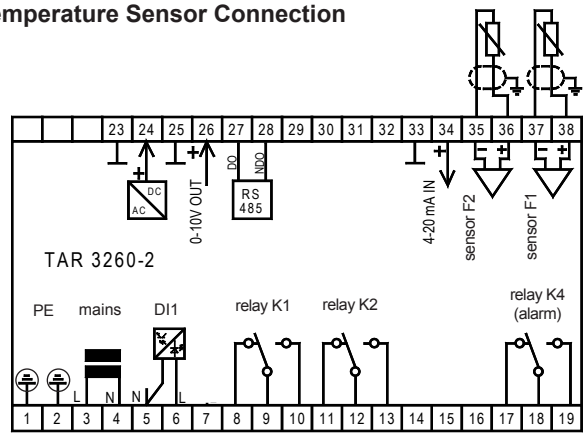
Important: Never connect the secondary coil of the transformer to PE!
Danger of destruction with networking!



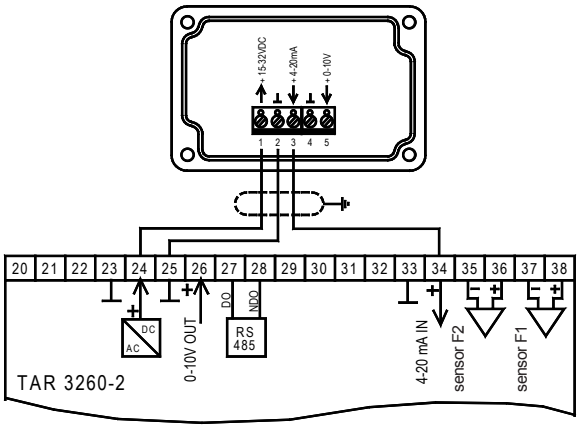
Dimensions / Wiring TAR 3260-2



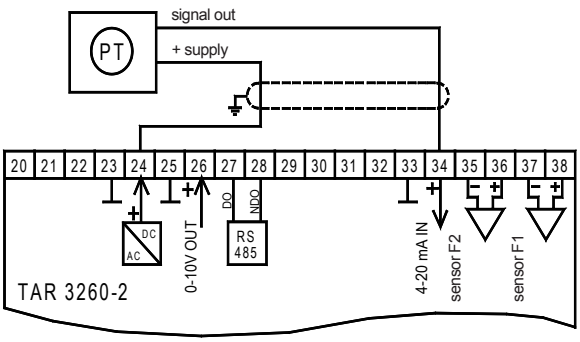
Temperature Sensor Connection



Humidity Sensor Connection



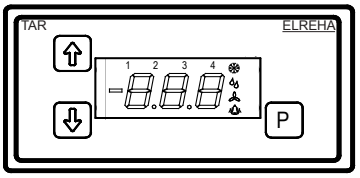
Pressure Transducer Connection

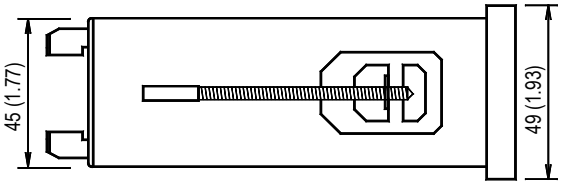


CAUTION

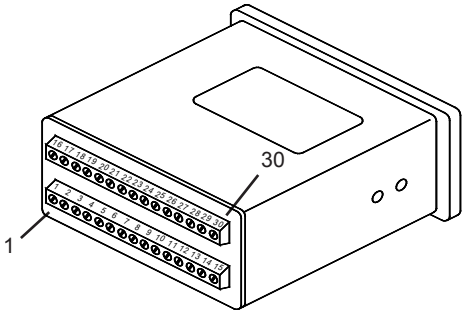
The controller is not suitable for connecting 3-wire pressure transducers.

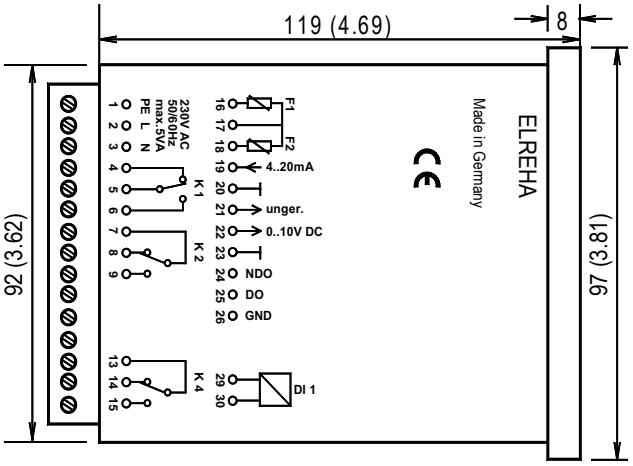
Dimensions / Wiring TAR 5260-2





Panel housing acc. to DIN 43700 / IEC 61554
cut-out: 92 x 45 mm (w x h)
tolerances max: +0,8 (w), +0,6 (h)





Note

Protective Earth

Earth

Dimensions in mm,
(in brackets = inches)

Start-up Examples

Dual Channel Temperature Controller

Requirements:

Cooling ON at +10°C/ OFF at +9°C, Heating ON at +1°C/OFF at +2°C, the offset Heating/Cooling remains always equal, Overtemperture Alarm at +15°C, Undertemperature Alarm at 0°C, both after 30 minutes.
The alarm relay works active-low. At a certain time the setpoint must be increased by 2K (night operation). The controller works with the temperature sensor TF 201. The customer must be prevented from adjusting the setpoint lower than 0°C.

- **Please always note safety instructions!**

If the TAR is switched ON, the display shows the value of sensor input 1.

Notice Enter code number "**70**" at parameter **P46**

- P26= 1, Sensor Type TF 201 and display in °C
- P14= 2, Operating mode with 1 control sensor (F1) only

Notice Enter code number "**88**" at parameter **P46**

- P03= 9.0 (cooling setpoint, relay K1)
- P04= -7.0 (heating setpoint 7 K below P03, relay K2)
- P05= 2 (heating setpoint is relative value, coupled to the cooling setpoint)
- P06= 2.0 (cooling setpoint will be increased by 2K while night operation)
- P07= 1 (relay K1 will be activated with rising temperature)
- P08= 3 (relay K2 will be activated with falling temperature = Heating)
- P09= 1 (alarm relay K4 will be de-activated with an alarm)
- P10= 15 (the setpoint cannot adjusted higher than +15°)
- P11= 0 (the setpoint cannot adjusted lower than 0°)
- P12= 1 (hysteresis of cooling relay, 1K)
- P13= 1 (hysteresis of heating relay, 1K)
- P31= 30 (alarm delay 30 minutes)
- P32= 5 (overtemperature alarm 5 K higher than cooling setpoint)
- P33= 0 (underemperature alarm at 0°)
- P34= 1 (digital input open = night shift)
- P35= 0 (night shift works immediately)

Display Correction
The Actual Value Display **P01** can be adjusted by **P27,** the Actual Value Display **P02** can be adjusted by **P28**.

TAR as Humidity Controller

Requirements:

De-humidifying ON at 80% r.H., moisten ON at 60% r.H., hysteresis 2%, both setpoints are absolute values, no alarm, no night shift.
The controller must work with the humidity transmitter FF 2520.
No setpoint limitation for the customer.
The customer wants to read the humidity value on a remote display with 0-10V-input.

- **Please always note safety instructions!**

If the TAR is switched ON, the display shows the value of sensor input 1.

Notice Enter code number "**70**" at parameter **P46**

- P26=5, Transmitters with 4-20 mA signal
- P14=2, Operating mode with 1 control sensor only

Notice Enter code number "**88**" at parameter **P46**

- P03=78.0 (de-humidify setpoint, relay K1)
- P04=62.0 (moisten setpoint, relay K2)
- P05=1 (setpoints are absolute values)
- P06=0 (no setpoint shift)
- P07= 1 (relay K1 will be activated by rising humidity = de-hum.)
- P08= 3 (relay K2 will be activated by falling humidity = hum.)
- P10= 100
- P11= 0
- P12= 2 (hyst. for de-humidifying relay, 2%)
- P13= 2 (hysteresis for moistening relay, 2%)
- P29= 100 (display value with 20 mA current input)
- P30= 0 (display value with 4 mA current input)
- P34= 0 (Digital input disabled)
- P36= 100 (Analog output delivers 10V DC at 100% r.H.)
- P37= 0 (Analog output delivers 0V at 0% r.H.)
- P39= 1 (operating mode of analogue output)

Display Correction
The actual value display **P01** can be adjusted by **P27**.

Notice **Installation hint:**
If the measured values 'jump' check the following: Is the shielding of the sensor wire connected to PE near the controller unit? Is the PE terminal of the controller unit connected to PE? If the sensor wire is shielded correctly but the value on the display continues 'jumping', please try to solve the problem by removing the shield from PE and connecting it to a ground terminal of the TAR.

CONNECTION INFORMATION & SAFETY INSTRUCTIONS

Notice

The guarantee will lapse in case of damage caused by failure to comply with these operating instructions! We shall not be liable for any consequent loss! We do not accept liability for personal injury or damage to property caused by inadequate handling or non-observance of the safety instructions! The guarantee will lapse in such cases.

This manual contains additional safety instructions in the functional description. Please note them!

DANGER

If you notice any damage, the product may not be connected to mains voltage! Danger of Life!
A riskless operation is impossible if:

- The device has visible damages or doesn't work
- After a long-time storage under unfavourable conditions
- The device is strongly draggled or wet
- After inadequate shipping conditions

- Never use this product in equipment or systems that are intended to be used under such circumstances that may affect human life. For applications requiring extremely high reliability, please contact the manufacturer first.
- **The product may only be used for the applications described on page 1.**
- **Electrical installation and putting into service must be done from qualified personnel.**
- **During installation and wiring never work when the electricity is not cut-off ! Danger of electric shock!**
- **Never operate unit without housing. Danger of electric shock!**
- **All 'PE' terminals must be connected to ground. Danger of electric shock!** Additionally, the internal noise filter will not work, faulty indicated values may occur.
- Please note the safety instructions and standards of your place of installation!

CAUTION

- Before installation: Check the limits of the controller and the application (see tech. data). Check amongst others:
  - Make sure that all wiring has been made in accordance with the wiring diagram in this manual.
  - Supply voltage (is printed on the type label).
  - Environmental limits for temperature/humidity.
  - Maximum admitted current rate for the relays. Compare it with the peak start-up currents of the controlled loads (motors, heaters,etc.).
    Outside these limits malfunction or damages may occur.

- Sensor/probe cables must be shielded. Don't install them in parallel to high-current cables. Shielding must be connected to PE at the end close to the controller.
  If not, inductive interferences may occur.
- Please note for elongation: The wire gauge is not critical, but should have 0,5mm² as a minimum.
- Mounting the controller close to power relays is unfavourable. Strong electro-magnetic interference, malfunction may occur!
- Take care that the wiring of interface lines meets the necessary requirements.
- All used temperature sensors must be identical. Never use different types at the same time. This will not work.
- TF-type sensors are not designed for being immersed in fluids permanently. In such a case, always use dip-fittings. With extreme temperature variations, the sensor may be damaged.

Notice

Cleaning
The use of a dry, lint-free cloth and household agents is sufficient to clean the product.
Never use acids or acidic fluids! Risk of damage!

UL file #.....E155131

Notice

Modifications of the -2 series
- Modified terminals and electrical connections
- Error messages now available as codes + error listing
- Access codes can be entered at any parameter now.
- 3 new parameters added, code parameter is now P46

EC Declaration of Conformity

CE

*For the devices **TAR 1260-2, TAR 3260-2 and TAR 5260-2** we state the following:*
*When operated in accordance with the technical manual, the criteria have been met that are outlined in the EMC Directive **2014/30/EC** and the Low Voltage Directive **2014/35/EC**. This declaration is valid for those products covered by the technical manual which itself is part of the declaration.*

Following standards were consulted for the conformity testing to meet the requirements of EMC and Low Voltage Guidelines:

EN 55011:2016, EN 61010-1:2010, EN 61326-1:2013 **CE marking of year: 2017**

This statement is made for the manufacturer / importer

ELREHA Elektronische Regelungen GmbH
D-68766 Hockenheim
www.elreha.de
(*Name / Address*)

by:

Werner Roemer, *Technical Director*

Hockenheim .....**12.6.2017**.....
City *Date* *Signature*

set up: 12.6.17, tkd/jr	checked: 14.6.17, ek/ha	approved: 14.6.17, mv/sha	transl.(E):	transl.(F):	corr: