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, Cold Storage Control with Cyclic Defrost
- Output 0-10VDC
- Limit value alarm, Alarm relay
- Inputs for PTC/Pt1000 and 4...20 mA, Digital Input
- RS-485-Interface
- 4 different housings

Can be used for

- Cooling and HVAC Applications

ELREHA

ELEKTRONISCHE REGELUNGEN GMBH

Technical Manual 5311032-03/10E
Temperature, Humidity, Pressure Controller

Series: TAR x260

from Software Vers. **040603**




Contents

Type Overview

TAR	**1260**	Panel mounting, 12-24V AC/DC
TAR	**3260**	for 35mm DIN-rail, 230V~, 50-60 Hz
TAR	**5260**	Panel mounting, 230V~, 50-60 Hz
TAR	**19260**	19"-Module, 8TE, 230V~, 50-60 Hz
TAR	**23260**	for 35mm DIN-rail, 115V~, 60 Hz
TAR	**25260**	Panel mounting, 115V~, 60 Hz
TAR	**29260**	19"-Module, 8TE, 115V~, 60 Hz

Technische Daten

Operating Voltage		see type overview, approx. 3,5 VA
Output relays		3 x potential free, 8A cos phi=1, 3A ind. / 250V AC
Operating Temp.		-10...+55°C / 14...131°F
Storage Temp.		-30...+70°C / -22...158°F
Air humidity		max. 85% r.H., not condensing
Signal inputs		2x TF 201 or 2x TF 501, 1x 4...20 mA, 100 ohms shunt
Transmitter Supply	TAR 1260	12VDC, max. 35 mA
	TAR 3260, 5260	24V DC, unreg., max. 35 mA
	TAR 19260	18V DC, unreg., max. 40 mA
Display		LED, character height 13mm 19"-module : char. height 10mm
Resolution		0,1 / °C, 0,2 / °F
Control-/Display range		-100...+300 (°C, bar, °F up to +572)
Data storage parameters		typ. 10 years
Relay indicator		LED 2 mm, red
Digital Input (Optocpl.)		230V, 3mA (1260: external switch)
Analogue output		0-10 V DC, max. 3 mA
Resolution Analogue Outp.		8 bit within the set limit values
Data interface		RS-485 (*E-Link*)
Electrical connection		Screw terminals 2,5mm 19"-module : connector "F"
Housing, Protection		
	TAR 1260	77 x 35 mm, IP 54 from front
	TAR (2)3260	for 35mm DIN-rail, IP 30
	TAR (2)5260	96 x 48 mm, IP 54 from front
	TAR (2)19260	19"module, 8 TE

Further information you will find in the parameter listing

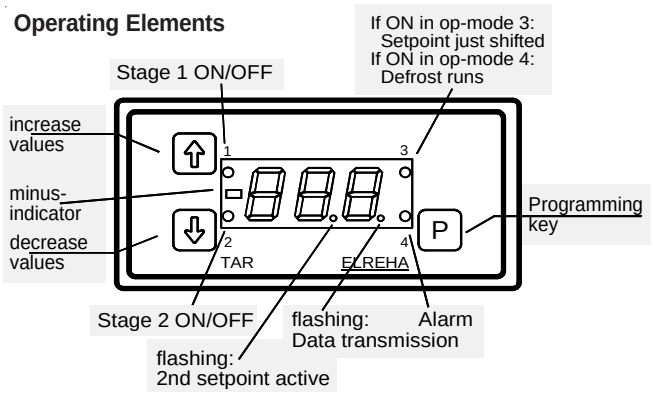
Accessories (please order separately)

- 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: Matching transformer, please contact us.
- For type TAR 19260: Subrack or Panel housing

- *Common risk note*
- *Risk of electrical shock*
- *Important Information*

Please note Safety Instructions on page 2 !

Operating



All TAR-versions are marked in the same way

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
Press "P" again ..... parameter value appears
Use keys '⇧/⇩' ..... adjust parameter value
Press 'P' again ..... value is stored, back to parameter no.

Unlock Keys
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 beforehand. This means that at parameter **P43** a certain value is to be set (see parameter listing) :

Press key "P" ..... parameter number appears
Use "⇧/⇩" ..... select code parameter (P43)
Press "P" again ..... parameter value appears
Use "⇧" ..... set code number (e.g. "88", see parameter listing)
Press "P" again ..... value is stored, back to parameter no.

If no key is hit for about 4 minutes, the access code is cancelled and the editing function is locked automatically.

Auto scrolling
Hold '⇧/⇩'-keys to scroll values automatically.

Wake-Up
If the controller was switched off via interface by a host (e.g a PC), the display shows "off". By holding the "⇩" key for > seconds the controller can be "waked-up" manually.

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 by holding the '⇧'-key for more than 2,5 seconds.
The defrost event can be terminated holding the '⇩'-key for more than 2,5 seconds.

Detecting controller type without a type label
1. Switch off supply voltage
2. Push and hold key 'P'
3. Switch on power again.

Now the display shows one after another :
"SOF" (Software), "260" (for x260), year, month and day of manufacturing.

Failure Display / Failure Behaviour

Sensor broken resp. short circuit
If one of the both inputs is broken or has short circuit or got a value outside its specified range, then the display flashes. The beeper and the alarm relay will be activated after 1 min. latest.

Display shows "oFF":
The controller unit is disabled via digital input OK1 or via network interface (DDC).

Display flashes, without minus sign:
Using temperature sensors=
One of the two sensors is broken or wrong type
Current input = > 25mA

Display flashes, <u>with</u> minus sign:
Using temperature sensors =
One of the two sensors has short-circuit or wrong type
Current input = < 2mA

CONNECTION INFORMATION & SAFETY INSTRUCTIONS

<u>Please read before Start-up</u>
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. Cleaning: The use of a dry, lint-free cloth is sufficient to clean the product. If you notice any damage, the product may <u>not</u> be connected to mains voltage! Danger of Life!
A riskless operation is impossible if
- The device has visible damages
- The device doesn't work
- After a long-time storage under unfavorable conditions
- After inadequate shipping conditions

- Limit of Application: This product is not designed nor manufactured for use 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 described applications.**
- **Electrical installation and putting into service must be done from authorized personnel.**
- Please note the local safety instructions !
- Before installation: Check the limits of the controller and your application. Before starting up we recommend you to read the manual for use, since only by doing so you can avoid damage or malfunction and you will benefit all the advantages offered by this product.
- **During installation and wiring never work when the electricity is not cut-off !**
- **Never operate unit without housing.**
- 'PE' terminal must be connected to ground because otherwise the operation of the internal noise filter will be disabled.
- Mounting the controller close to power relays is unfavourable in case of the electro-magnetic interference.
- Before applying voltage to the controller: Make sure that all wiring has been made in accordance with the wiring diagram in this manual.
- Respect the environmental limits for temperature and humidity. Outside these limits malfunctions may occur.
- Observe the max. admitted current rate for the relays.
- Use shielded cable for sensor elongation only. Don't install them in parallel with high-current cables to prevent inductive interference. A wire gauge of min. 0,5mm² is sufficient.
- Shielding must be connected to PE at the end near the controller
- TF-type sensors are not designed for being immersed in water for a long period of time (not pressure-proof). In such a case, always use dip-fittings.

Param.-No	P14=1	P14=2	P14=3	P14=4	P14=5	Code	Description	Default	Limits	Your value
P01	x	x	x	x		-	Actual value of sensor/transmitter 1	-	-	-
P02	x		x	x		-	Actual value of sensor 2	-	-	-
P03	x	x	x	x		-	Control setpoint 1 (*Absolute value*)	0	Within the limits P10/P11	
P04	x	x	x	x		-	Control setpoint 2 (*Absolute/Relative, dep. on P05. Relative value can be also set to negative*)	0	Within the limits set by P10/P11	
P05		x	x			88	Mode of setpoint 2	1	**1**= Absolute, **2**= Relative to P03	
P06	x	x	x	x		88	Setpoint-Offset (*Value the setpoints will be shifted after dig.input is activated)*	0	-100...+100°C	
P07	x	x	x	x		88	Switching mode of relay 1	1	**1** = Refr. (=dehumid.), **2** = DF, **3** = HT(moisten), **4** = cycling	
P08	x	x	x	x		88	Switching mode of relay 2	1	like P07, **2** = DF (not TAR 1x),	
P09	x	x	x	x		88	Switching mode alarm relay	1	**1** = de-activated, **2** = activated if P01is too high/low, sensor error **3** = de-activated, **4** = activated **if** P02 is too high/low, sensor error	
P10	x	x	x	x		88	Highest setpoint adjustable with P03 resp. P04	+50°C	-100...+300°C	
P11	x	x	x	x		88	Lowest setpoint adjustable with P03 resp. P04	-50°C	-100...P10°C	
P12	x	x	x	x		88	Hysteresis of Setpoint 1 (relay 1)	2	0,2...20	
P13	x	x	x	x		88	Hysteresis of Setpoint 2 (relay 2)	2	0,2...20	
P14	x	x	x	x		**70**	Operation Mode	2	**1** = 2x temperature sensor **2** = 1x temp.sensor or transm. **3** = 1x temp.sens. + 1x shift sens. **4** = like 1, with cyclic defrost **5** = 1x 4/20mA + 1x temp. sensor	
P15	x	x	x	x		88	Minimum idle time (relays 1 & 2)	0	0...59 min	
P16	x	x	x	x		88	Proportional range rel. 1 (*Heating resp. moisten*)	2.0	0...12	
P17	x	x	x	x		88	Proportional range rel. 2 (*refrig. resp. de-humid.*)	2.0	0...12	
P18			x			--	Sum of all current setpoint shifts *(Offset + setp.shift)*	-	Display only !	-
P19			x			88	Limit value of setpoint shift	0	-100...+300	
P20			x			88	Range of shift	0K	-100...+100K	
P21			x			88	Size of shift — If P14=3 only	0K	-100...+100K	
P20				x		88	Defrost cycle (h)	1	1...100 h	
P21				x		88	Defrost duration (min) — If P14=4 only	1	1...100 min	
P22	x	x	x	x		--	Remaining time alarm delay	-	Display only !	-
P23	x	x	x	x		--	Remaining idle time relay 1	-	Display only ! -	
P24	x	x	x	x		--	Remaining idle time relay 2	-	Display only !	
P25	x	x	x	x		--	Remaining time Digital Input delay (OK 1)	-	Display only !	
P26	x	x	x	x		**70**	Sensor type *(types 1-4 only for OP-modes 1,3,4, 5. with op-mode P14=2 all types usable, with op-mode P14=5 this selection affects to sensor input 2 only, sensor input 1 then is 4...20 mA)*	1	1 = TF 201 (°C), 2 = TF 201 (°F) 3 = Pt1000 (°C). 4 = Pt1000 (°F) 5 = 4...20 mA	
P27	x	x	x	x		88	Sensor / Transmitter 1 (P01) correction	0	-10,0...+10,0	
P28	x		x	x		88	Sensor 2 (P02) correction or cut-off	0	oFF, -10,0...+10,0	
P29		x				88	Displayed value at 20 mA input current	100	-100...+300	
P30		x				88	Displayed value at 4 mA input current	0	-100...+300	
P31	x	x	x	x		88	Alarm delay	5	1...99 min	
P32	x	x	x	x		88	Upper alarm limit *(Relative, related to the current setpoint selected by P03)*	-	0...300	
P33	x	x	x	x		88	Lower alarm limit *(Absolute value)*	-100	-100...+300	
P34	x	x	x	x		88	Digital Input 1 (OK 1)	0	0 = off, 1 = Night setpoint 2 = Ext. Alarm, 3 = Unit OFF	
P35	x	x	x	x		88	Delay time for Digital Input OK 1	2	0...99 min	
P36	x	x	x	x		88	Analog output: 10V DC at this value of P01	0	-100...+300	
P37	x	x	x	x		88	Analog output: 0V DC at this value of P01	0	-100...P36	
P38	x	x	x	x		88	Analog output: Slow-down time (I-part)	0	0 = disab., 1 = appr. 0,25 min 2 = appr. 0,5 min, 3 = appr. 1 min 4 = appr. 2 min, 5 = appr. 4 min	
P39	x	x	x	x		88	Analog output: Mode	0	0 = off, 1 = Proportional 2 = Antiproportional 3 = like 1 but relative to the active control setpoint 4 = like 2 but relative to the active control setpoint	
P40	x	x	x	x		88	Factor of period duration *(Period duration = 16 sec. * factor)*	1	1...10	
P41	x	x	x	x		88	Data transmission speed (Baudrate)	4	1 = 1200, 2 = 2400, 3 = 4800, 4 = 9600, 5 = 19200	
P42	x	x	x	x		88	Address of unit in a network	78	0...78 -	
P43	x	x	x	x		-	Access code	0	0...99	

x = Functions available in this mode.
Without "x" = parameter invisible.

Functional Description

Sensor connection

The controller operates either with temperature sensors of the types TF201 (PTCs) and TF 501 (PT1000) or with a 4...20 mA signal. The input can be selected by parameter **P26**. The selection of inputs and sensors depend on your requests:

Temperature Controller:
For temperatures < 80°C use sensors TF 201 or TF501.
For temperatures > 80 up to 300°C you must select an appropriate Pt1000 sensor.
Pressure control: 4...20mA (transmitter)
Humidity control: 4...20mA (transmitter)

Operation modes

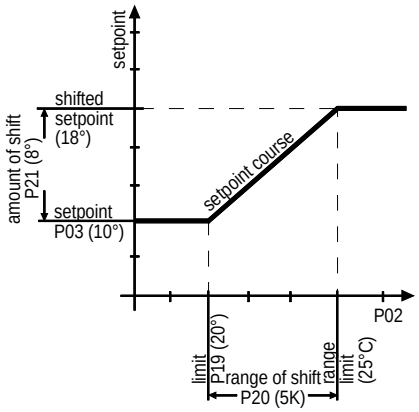
The controller can be configured for different operating modes (by parameter **P14)**:

P14 = 1: 2 control sensors
Sensor 1 effects to 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 transmitter (dual stage control)
Sensor Input 1 or the 4...20 mA signal input effects to both setpoints (**P03** / **P04**), Sensor Input 2 is de-activated. P03 is an absolute value, P04 can be also relative (adjustable 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 to 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, below that value there's no shift.
- 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 = 4: 2 control sensors, cyclic defrost function is active.
Sensor 1 effects to setpoint 1 (**P03**), sensor 2 effects to 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. the output effected by setpoint 1) is disabled in specific time intervals to enable air flow defrost. The 4...20 mA input is deactivated.

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. You also come back to this display at P01, if another parameter is selected and no key is pressed for about 4 minutes.
In operation modes 1, 3, 4 and 5 **P02** shows the actual temperature value of sensor 2.

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 standard current signal can be delivered by an 4...20 mA source or appropriate transmitter.

Adapting of transmitters, display correction

A transmitter delivers the measured value by a 4...20 mA signal. With parameter **P30/P29** the measuring scale will be preset.

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 and 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

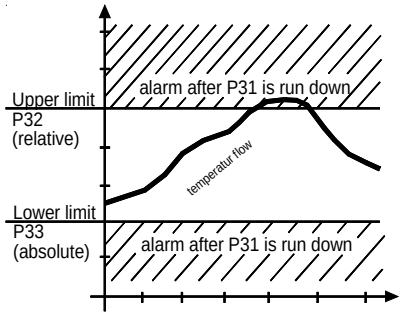
To prevent the setpoints being set to an invalid value (e.g. not below 0°C), the range of P03 / P04 can be restricted by parameters **P10** and **P11**.

Day / night shift resp. 2nd Setpoint

E. g. to save energy it is possible to work with 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 1 is activated.

Temperature- resp. Limit Value Alarm

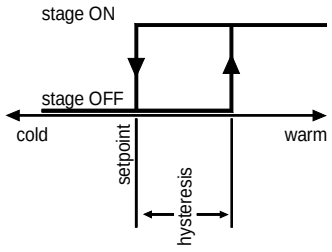
If the value measured with sensor 1 or the delivered 4...20 mA signal leaves the range preset by parameters **P32** and **P33**, then an alarm relay and a buzzer will be activated after a delay timer (**P31**) is run down. **P22** shows the remaining time of the alarm delay timer.
P33 (lower limit) is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



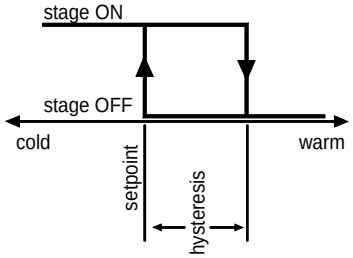
Relay switching characteristic

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

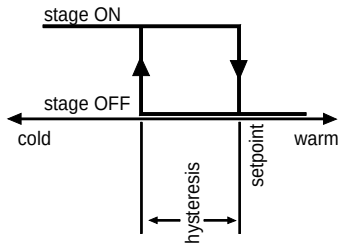
1= Refrigeration (Standard)
Used for standard applications (e.g. temperatures above 0°C).
The load would be switched by the N/O-contact.



2 = Freezing (DF)
Used for temperature applications below 0°C. 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.
Note: not usable for relay 2 at type 1260.



3 = HT (Heating)
Usable for heating applications. Load would be switched off in case of mains fail or controller defect.



4 = Cycling
Quasi-Proportional Control with cycling relay. Usable for heaters or certain valves. Here a range will be defined within the relay will cycle.

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 P49=2 the duration is 32 seconds, and so on.

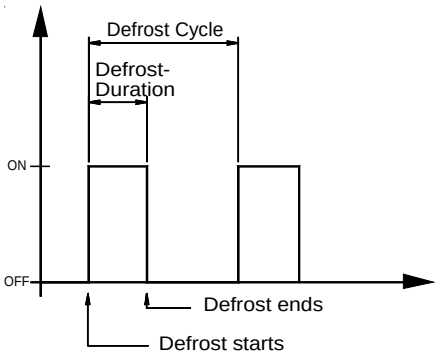
Cycling range of relay K1
Upper limit = *P03 (setp.1)*
Lower limit = *P03 (setp.1)* - ***P16***
Above this upper limit, relay 1 remains OFF permanently, below the lower limit relay 1 remains permanently ON (e.g. for heating, humidifying).

Cycling range of relay K2
P17 defines the Xp-range where relay 2 cycles within.
Lower limit = *P04 (setp.2)*
Upper limit = *P04 (setp.2)* + ***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. If the 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.

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 can be started and stopped manually while the actual value is being displayed, a running defrost event is indicated by an LED (see 'operating').



Digital Input

With the Digital (optocoupler) Input OK 1, normally connected to mains voltage, a function can be activated if mains is disconnected from this input. The function can be preset by **P34**.

The type **TAR 1260** has no optocoupler input, the function will be activated by opening an external, isolated contact connected to terminals 18/19.
Never connect mains voltage to this terminals !

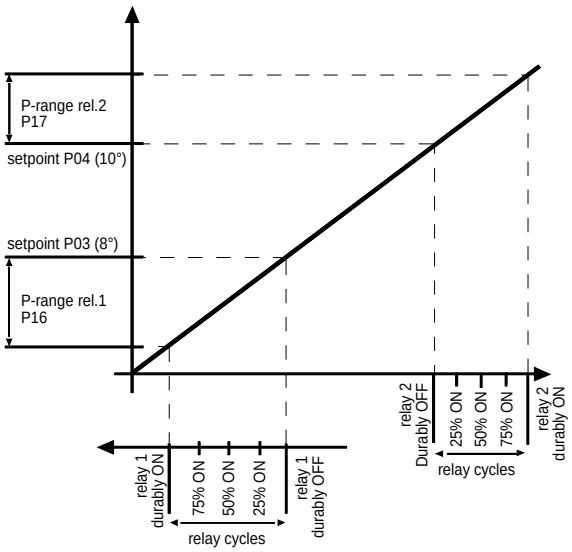
P34 = 0	Digital Input is **de-activated**
P34 = 1	No voltage (1260: ext. contact open) at Digital Input 1 switches to the **2nd/ night-setpoint**. Setpoints will be increased / decreased by the value of P06.
P34 = 2	No voltage (1260: contact open) at Digital Input 1 starts an **external alarm**. After P31 is run down, the internal buzzer and the alarm relay will be activated.
P34 = 3	If there is no voltage (1260: contact open) at Digital Input OK 1, all **control functions** will be disabled, the display shows 'oFF'. The unit can only be reactivated by connecting the input to mains again (1260: external contact closed). The analogue output delivers 0V. Relays configured for freezing (P07 or P08 = 2) will be activated.

An adjustable delay (**P35**) is effectual before one of the functions above will be started.

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



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)

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=0.. 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_{aus} rises farther, after P38 is run down, 7V will be reached.

TAR 1260 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 1260. Because of this:

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

Networking of TAR controllers

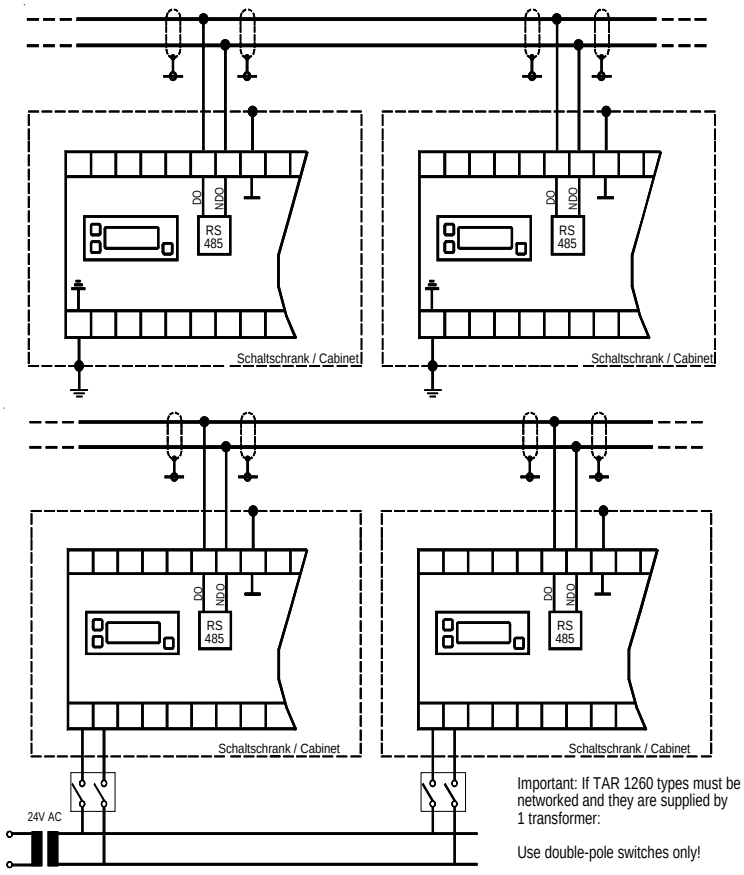
All controllers can be networked to a host via their built-in RS-485-interface. The host can be a PC with a qualified software or a Frontend System like a SMZ, which allows remote control of units and recording of all parameters.

- Because all units are connected parallel on the data cable, every unit has its own network address (**P42**) to ensure a specific communication.
- The communication speed is fixed by **P41**, the default value is 9600 Baud.
- Wiring can 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.

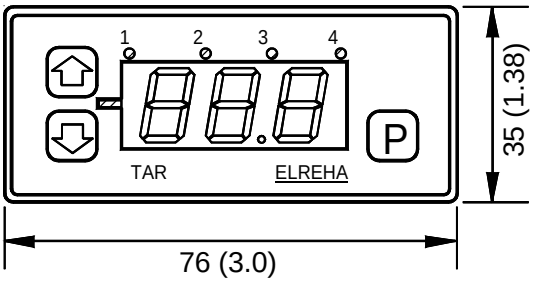
If networked controllers **(1260** types only) are supplied by one transformer only and the single positions must be switched off, use double-pole switches only.
If not, the unit will be supplied partially over the shielding of the data connection and continues operation, depending on the secondary voltage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

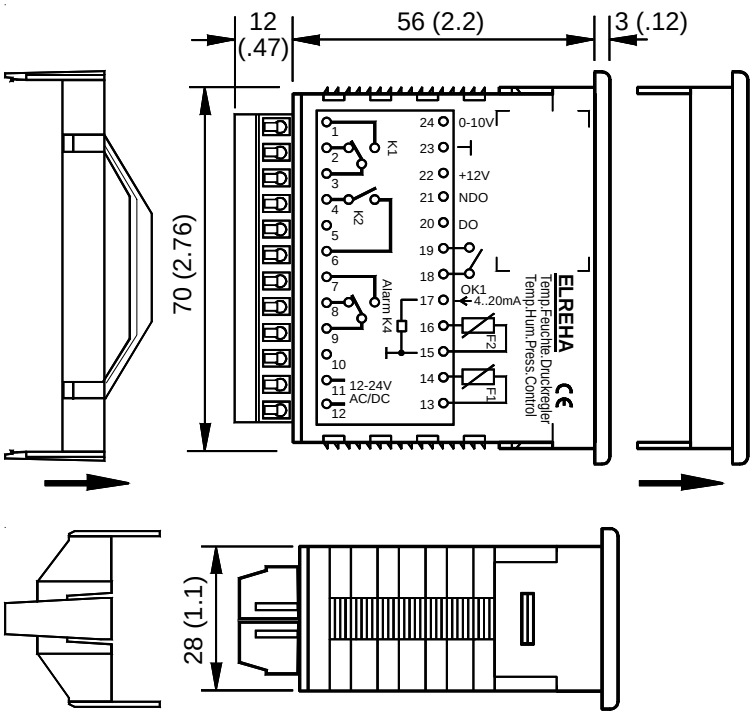
A better way is not to switch-off the supply voltage but to disable the unit by Digital Input.

Important: Never connect the secondary coil of the transformer to PE!

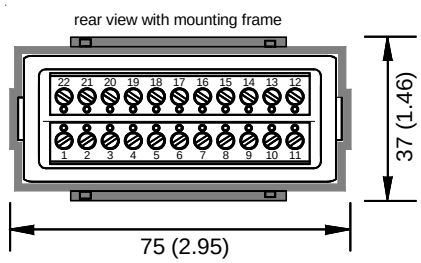


Dimensions TAR 1260

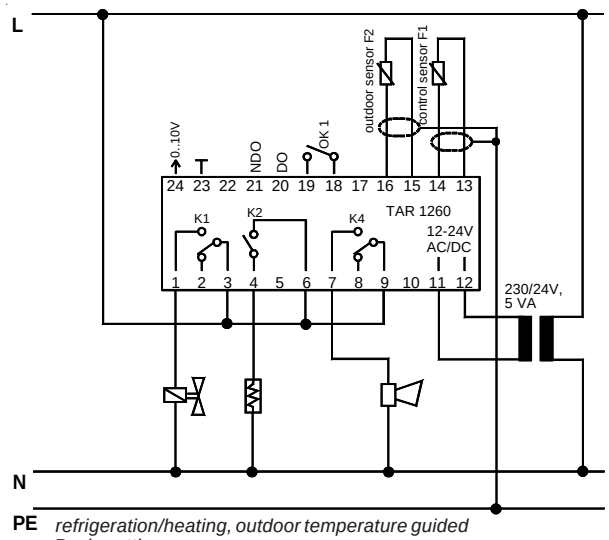




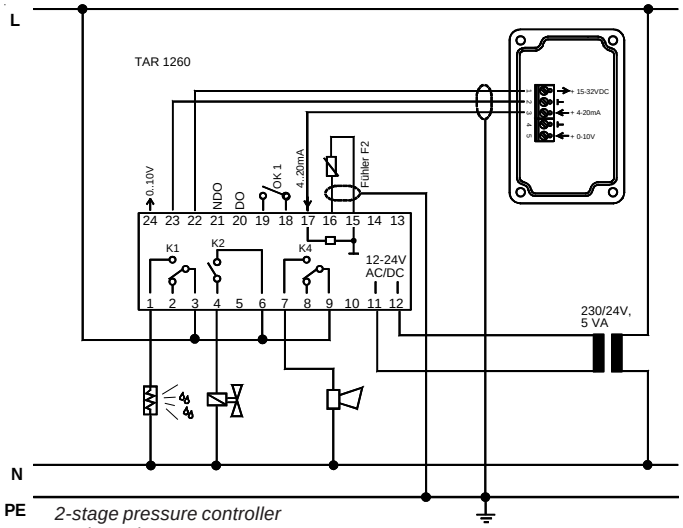
At controllers which are produced before 3/2002, terminal 22 delivers no voltage for transmitter supply !



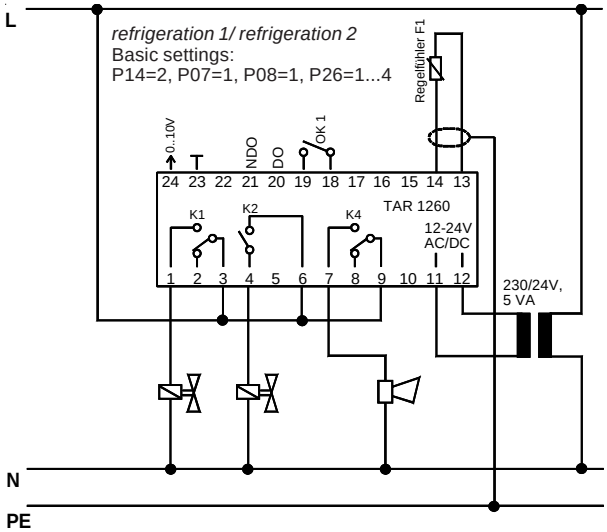
Connection Examples (simplified)



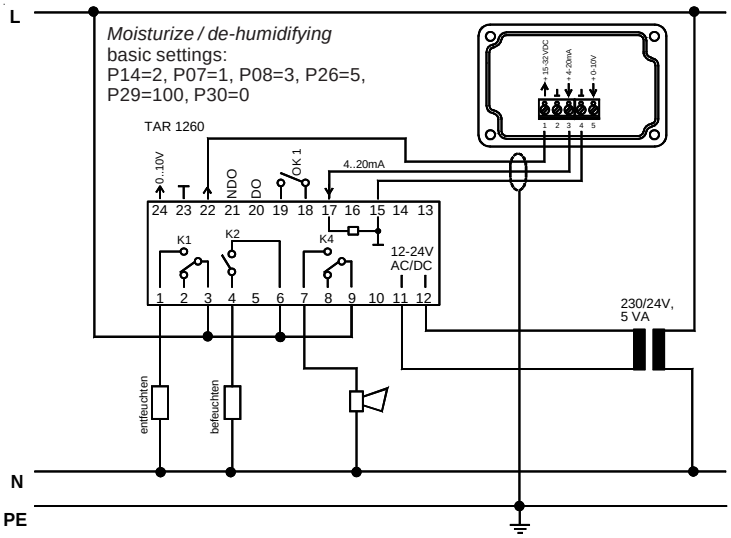
refrigeration/heating, outdoor temperature guided
Basic settings:
P14=3, P07=1, P08=3,
P26=1...4



2-stage pressure controller
Basic settings:
P14=2, P07=1, P08=1,
P26=5, P29/P30=depends on transmitter

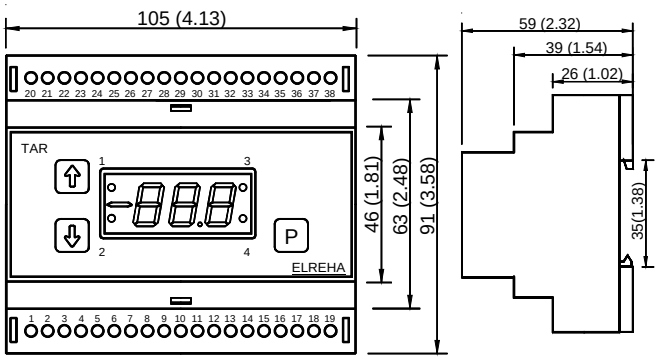


refrigeration 1/ refrigeration 2
Basic settings:
P14=2, P07=1, P08=1, P26=1...4

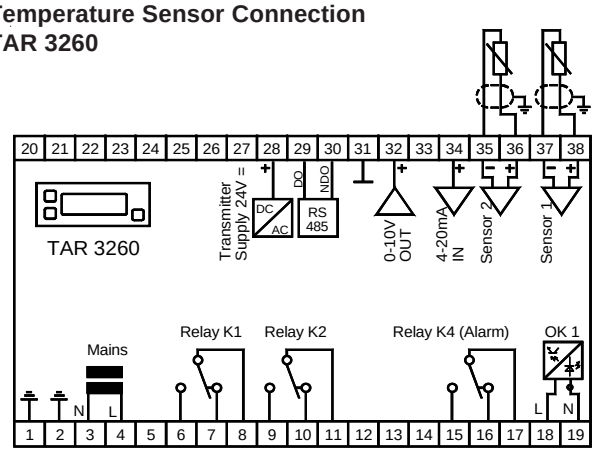


Moisturize / de-humidifying
basic settings:
P14=2, P07=1, P08=3, P26=5,
P29=100, P30=0

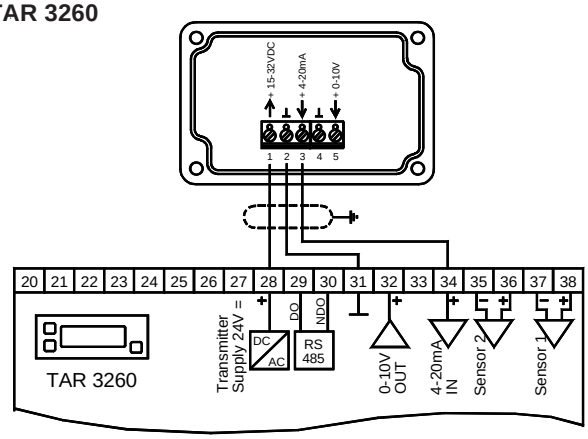
Dimensions TAR 3260



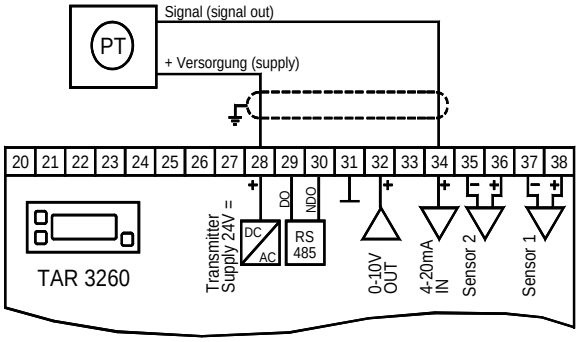
Temperature Sensor Connection TAR 3260



Humidity Transmitter Connection TAR 3260

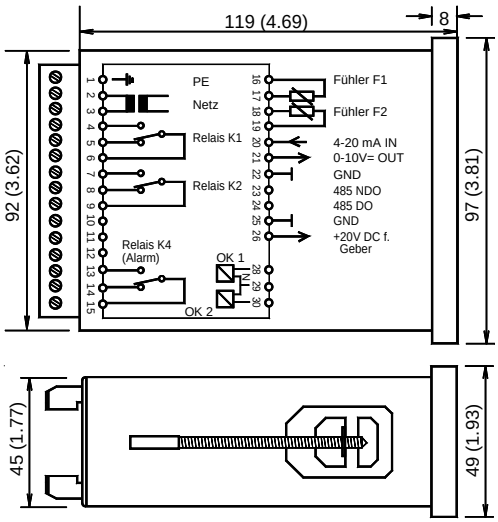


Pressure Transmitter Connection TAR 3260



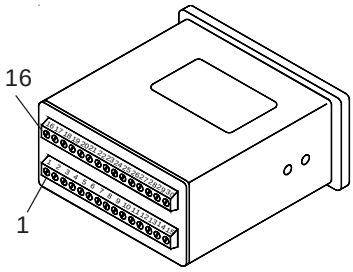
The controller is not suitable for 3-wire pressure transmitters.

Dimensions TAR 5260

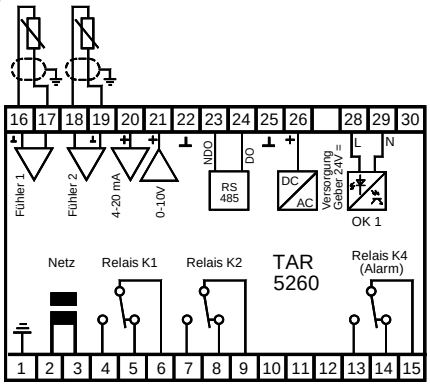


Panel housing acc. to DIN 43700 / IEC 61554

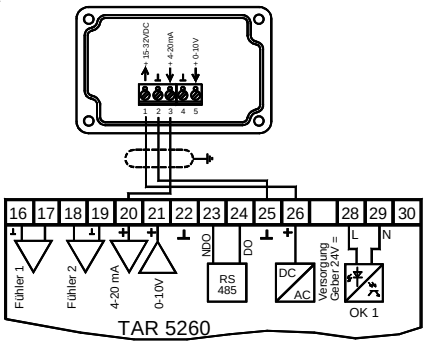
cut-out:
92 x 45 mm (w x h)
tolerances max:
+0,8 (w), +0,6 (h)



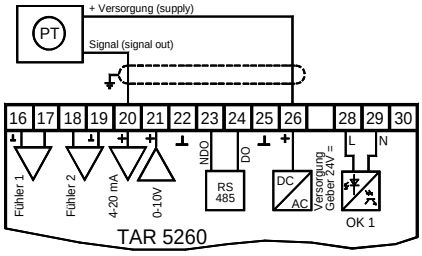
Temperature Sensor Connection TAR 5260



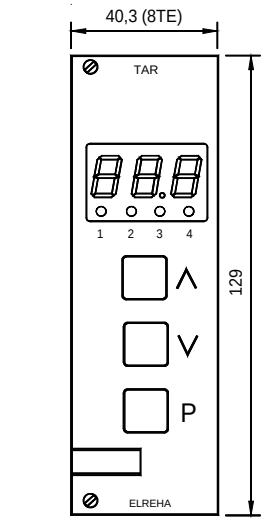
Humidity Transmitter Connection TAR 5260

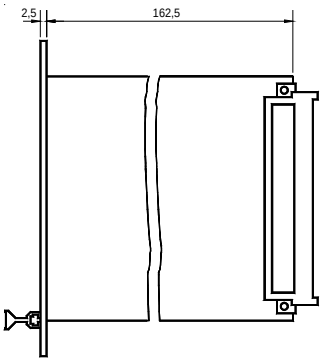


Pressure Transmitter Connection TAR 5260

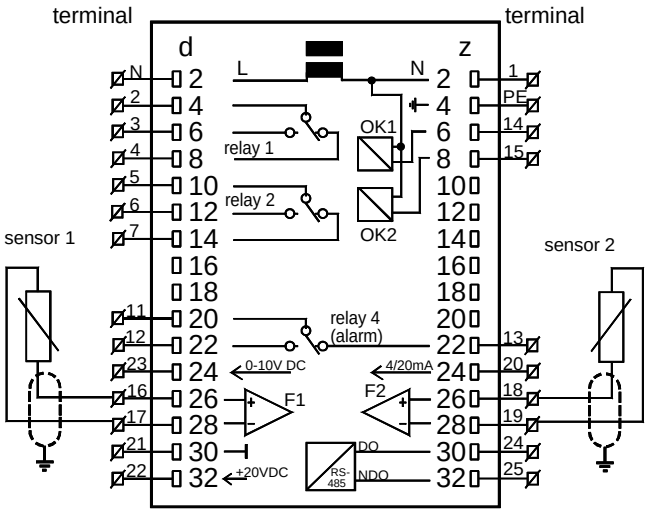


Dimensions TAR 19260



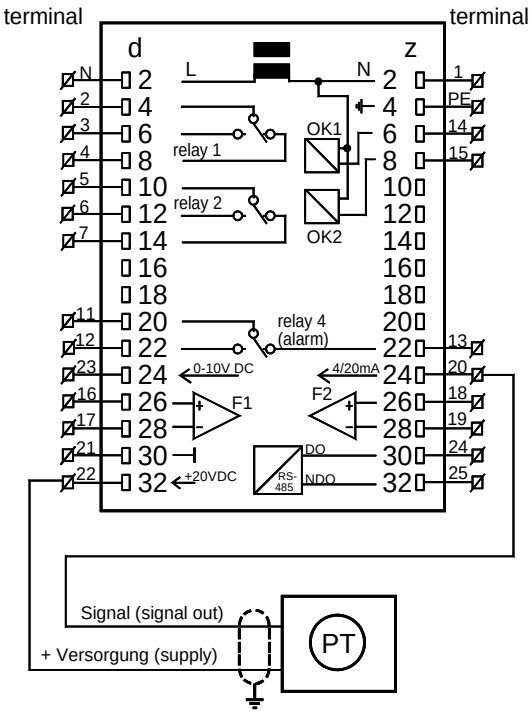


Temperature Sensor Connection TAR 19260

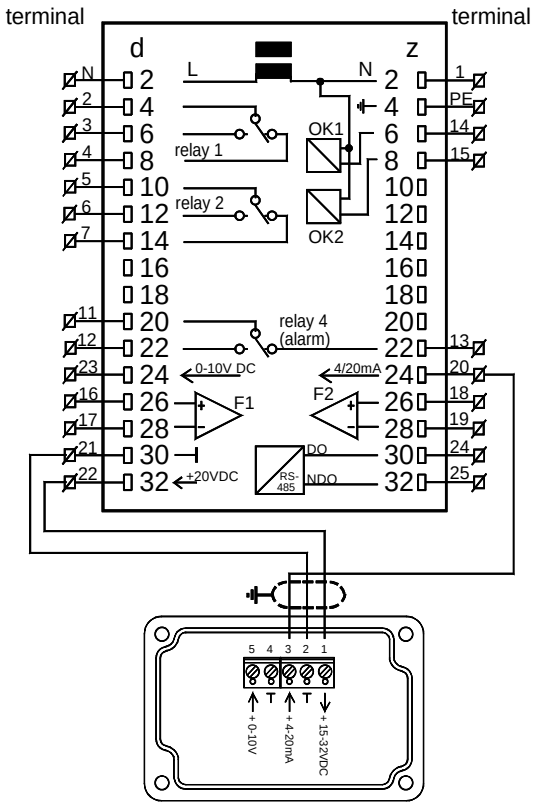


- The wiring diagrams show connectors equal to DIN 41612, type 'F', rear view.
- The 'terminal' numbers are used in ELREHA's prewired subracks.

Pressure Transmitter Connection TAR 19260



Humidity Transmitter Connection TAR 19260



Start-up example: 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 on page 2!**

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

Enter code number "**70**" at parameter **P43**

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

Enter code number "**88**" at parameter **P43**

- 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**.

Start-up example: 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 want to read the humidity value on a remote display with 0-10V-input.

- **Please always note safety instructions on page 2!**

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

Enter code number "**70**" at parameter **P43**

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

Enter code number "**88**" at parameter **P43**

- 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 (hysteresis 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**.

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.

EG-Conformity

CE

For all described products there is a declaration of conformity which describes that, when operated in accordance with the technical manual, the criteria have been met that are outlined in the guidelines of the council for alignment of statutory orders of the member states on EMC-Directive (2004/108/EC) and the Low Voltage Directive (LVD 2006/95/EC). This declarations are valid for those products covered by the technical manual which itself is part of the declaration. To meet the requirements, the currently valid versions of the relevant standards have been used.

This statement is made from the manufacturer / importer *by:*

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

Werner Roemer, *Technical Director*

Hockenheim.....**11.03.2008**.....
city *date* *sign*

This manual, which is part of the product, has been set up with care and our best knowledge, but mistakes are still possible.
Technical details can be changed without notice, especially the software. Please note that the described functions are only valid for units containing the software with the version-number shown on page 1of this manual. Units with an other software number can work a little bit different. You will find this number on the type label.

set up 11.9.08, tkd/jr	checked: 11.9.08, ek/al	approved: 11.9.08, mv/sha