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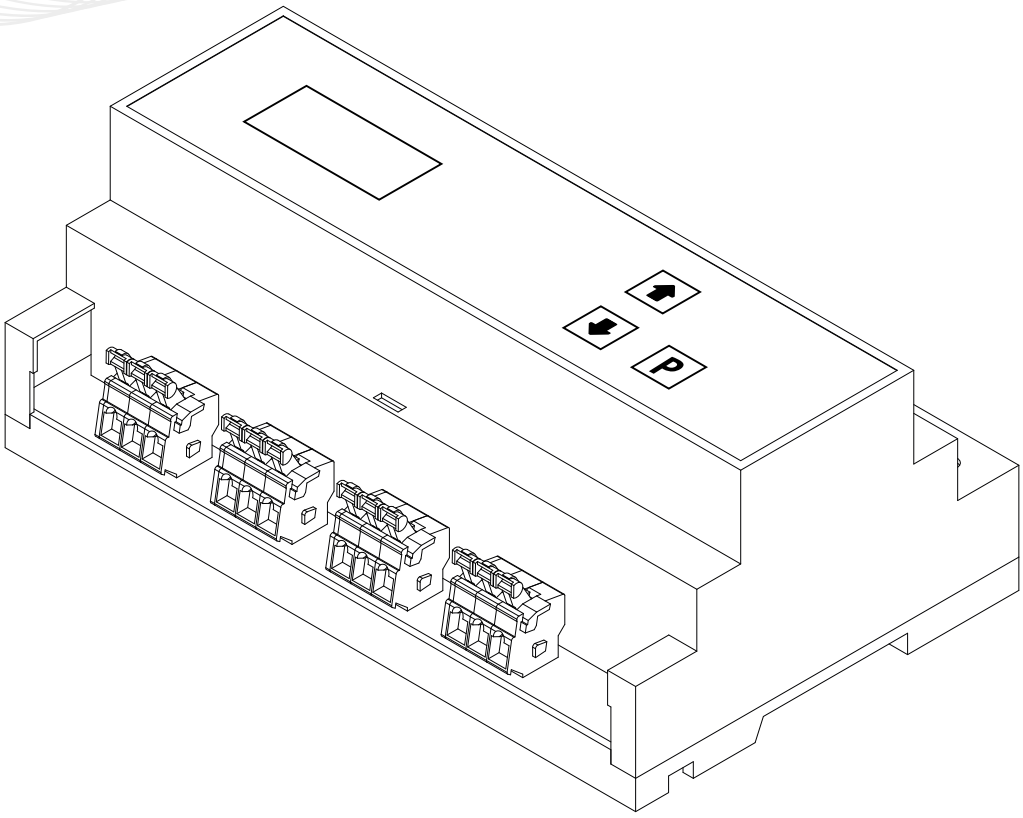
OPERATION-MANUAL



ELTC-14P & ELTC-24P

Ambient temperature controller up to 99°C
for wall- or DIN rail mounting

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BU-112
Revision 3

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CONTENT

For proper and safe use of the ELTC-14P and ELTC-24P temperature controller, please follow these instructions.
Please keep these instructions for future reference (e.g. in the system documentation).

RESERVATION

Subject to technical changes. Changes, errors and misprints do not constitute grounds for claims for damages.
For safety components and systems, the assembly instructions as well as the relevant and currently valid standards and regulations must be observed.

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Operation manual
ELTC-14P & ELTC-24P
ambient temperature controller
up to 99°C for wall- or DIN rail mounting

Author:	Peter Schmidt	Date:	29.01.2019
Revision: **3**	Julian Engel	Date:	23.10.2023

INTRODUCTION

The electronic temperature controller of the ELTC series is a controller with digital display for wall mounting (ELTC-14P) or DIN rail mounting (ELTC-24P). The wall-mounted ELTC-14P is equipped with cable glands and terminals for electrical connection.
The device is supplied in a splash-proof plastic housing with a transparent housing cover including accessories.
The temperature measured with a Pt100 temperature sensor is processed and displayed by a microcontroller.
After an actual value/setpoint comparison, the output relays are then switched according to the configuration.
The temperature controller is also suitable for connection of temperature sensors type ELTF-PTEx in hazardous areas.

Display conventions

Particularly important points in these instructions are indicated by the following symbols:

DANGER

indicates an extremely dangerous situation.
If it is not avoided, there is a danger to life or at least a high risk of serious injury.

ATTENTION

indicates a potentially dangerous situation.
If not avoided, there is a risk of damage or malfunction.

WARNING

indicates a potentially dangerous situation.
If it is not avoided, there is a risk of injury or at least a high risk of damage.

NOTE

important information and instructions for safe, effective and environmentally sound use.

RECEIPT OF GOODS

Upon receipt of the goods, check the controllers and accessories and compare the information on the type plate with the information on the delivery bill to ensure that the correct material has been delivered.

STORAGE

NOTE

Storage should be in a dry place at an ambient temperature of -30 °C to 60 °C.

SCOPE OF DELIVERY

The scope of delivery of the article includes:

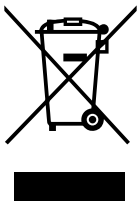
ELTC-14P

Qty.	Item
1 Pcs.	Temperature controller ELTC-14P
1 Pcs.	Operation manual DE & EN
2 Pcs.	M25x1,5 cable gland
2 Pcs.	M25 O-ring
2 Pcs.	M25 2x6mm Multi-seal insert
1 Pcs.	M25 locknut
2 Pcs.	M20x1,5 cable gland
2 Pcs.	M20 O-ring
1 Pcs.	M20 locknut
1 Pcs.	M12x1,5 cable gland
1 Pcs.	M12 O-ring
1 Pcs.	Terminal cover
2 Pcs.	Redetachable rivets

ELTC-24P

Qty.	Item
1 Pcs.	Temperature controller ELTC-24P
1 Pcs.	Operation manual DE & EN

DISPOSAL



NOTE

The WEEE logo (shown above) indicates that this product should not be disposed of with other waste.
For more information on disposal and
and recovery of waste electrical and electronic equipment
For more information on the disposal and recovery of waste electrical and electronic equipment (WEEE) and collection points, please contact your local waste management company or the manufacturer from whom you purchased the product.

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FUNCTIONAL DESCRIPTION & TECHNICAL DATA

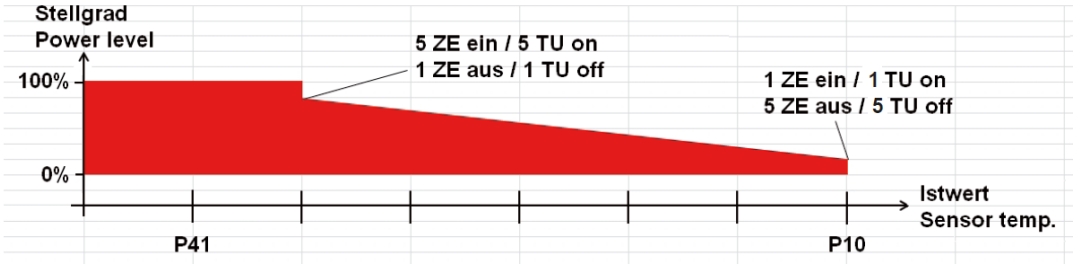
FUNCTIONAL DESCRIPTION

Mode 2-Point control (Parameter P40=2)

If the actual temperature (P01) falls below the control setpoint (P10 minus hysteresis P11), relay K1 will switch heating circuit ON. The integrated alarm relay provides error messaging (via changeover contact) to indicate over-/ under temperature, sensor-interrupt or short circuit. During sensor malfunctions, the relay K1 switches continuously on or off, depending on configuration.

Mode Proportional regulation (Parameter P40=3)

The load contact is open at ambient temperatures above the set set point (P10). At ambient temperatures below the entered minimum ambient temperature (P41) + 1/6 the difference between set point and minimum ambient temperature, the load contact is permanently switched on. At ambient temperatures between, the controller runs in clock mode. As basic display the power level P05 will be used. The time unit is defined via P42, with this also the parameters P50..P56 will be included in the calculation in the refined operating mode. In operation the TU is continuously calculated and adapted to the current ambient conditions.

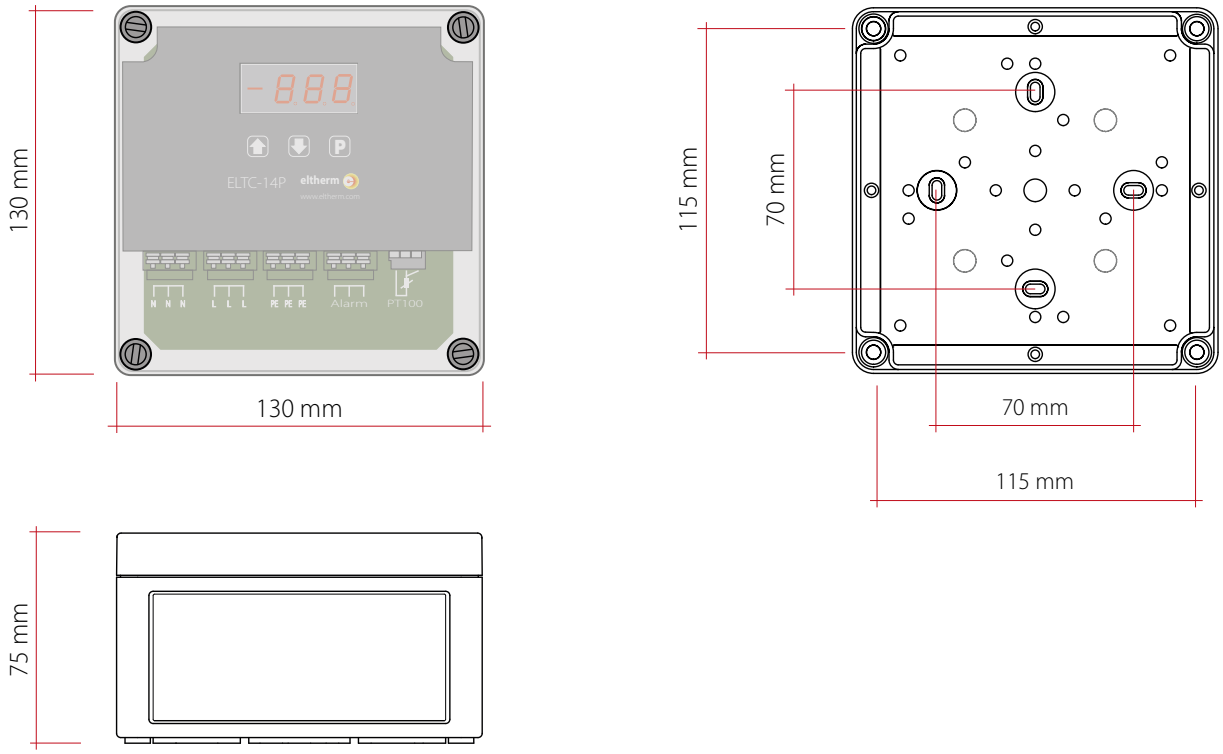


TECHNICAL DATA

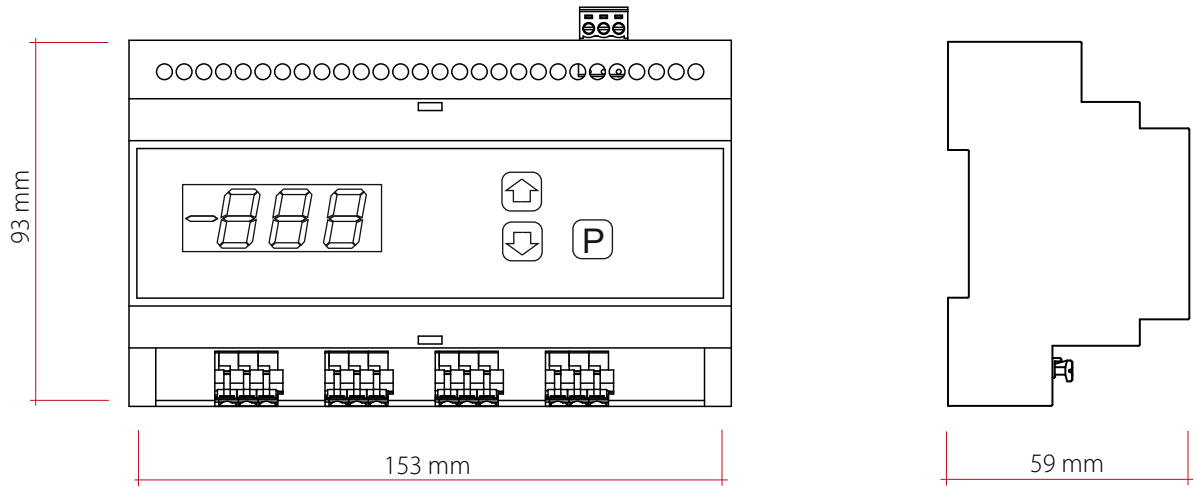
Controller type	ELTC-14P (Art. 0620010)	ELTC-24P (Art. 0620011)
Nominal voltage	90 to 260 VAC, 50/60 Hz	90 to 260 VAC, 50/60 Hz
Power consumption	max. 5 W	max. 5 W
Relay K1	20 A res., max. 250 VAC	20 A res., max. 250 VAC
Relay K2 (alarm)	8 A res. / max. 250 VAC (changeover contact)	8 A res. / max. 250 VAC (changeover contact)
Operating temperature	-25 to +55 °C	-25 to +55 °C
Storage temperature	-30 to +60 °C	-30 to +60 °C
Setting range	-60 to +99 °C, configurable	-60 to +99 °C, configurable
Display range	-80 to +410 °C	-80 to +410 °C
Accuracy	± 1K, ± 2 Digits (-50 to 400 °C)	± 1K, ± 2 Digits (-50 to 400 °C)
Display	LED, red, 11 mm	LED, red, 11 mm
Sensor connection	Pt100 2-wire & Pt100 3-wire	Pt100 2-wire & Pt100 3-wire
Connection terminals	Sensor: 0.5...1.5mm² copper wire, stripping length 9…10mm Others: 0.1...2.5mm² copper solid, stripping length 5...6mm	Sensor: 0.2...1.5mm² copper wire, stripping length 9…10mm Others: 0.1...2.5mm² copper solid, stripping length 5...6mm
Housing material	Polycarbonate, grey; clear lid	ABS, black
Housing dimension	130 x 130 x 75 mm (WxHxD)	153 x 93 x 59 mm (WxHxD)
Protection class	IP 65	IP 20
Type of mounting	Wall mounting	DIN rail TS
Weight	approx. 0.3 kg	approx. 0.5 kg

Dimensions

ELTC-14P

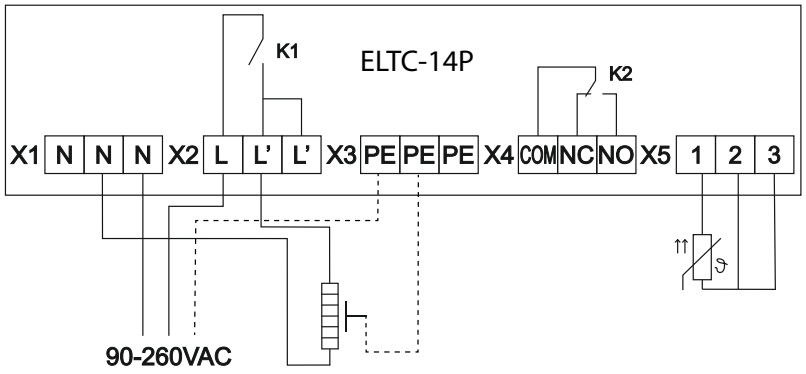


ELTC-24P



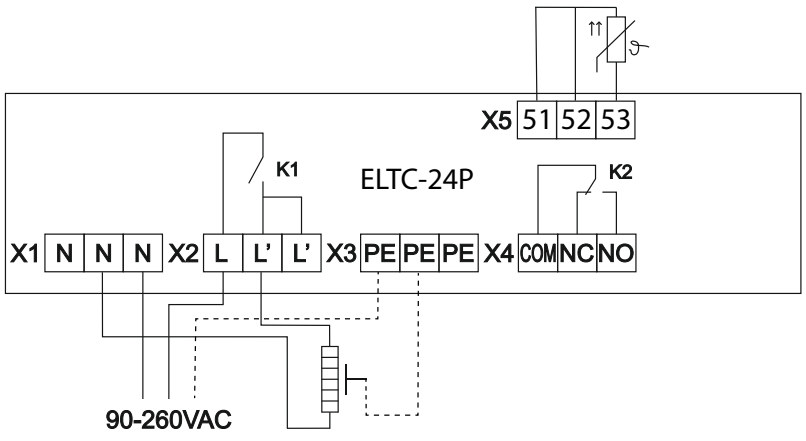
CONNECTION PLAN

ELTC-14P



Terminal	Connection
X1.1	Common connection neutral (N)
X1.2	
X1.3	
X2.1	Mains supply input (L)
X2.2	Heater connection A
X2.3	Heater connection B
X3.1	Common connection protective earth (PE)
X3.2	
X3.3	
X4.1	Alarm relay COM
X4.2	Alarm relay NC
X4.3	Alarm relay NO
X5.1	Connection Pt100 (white)
X5.2	Connection Pt100 (red)
X5.3	Connection Pt100 3-wire compensation (not necessary with 2-wire)

ELTC-24P



Terminal	Connection
X1.1	Common connection neutral (N)
X1.2	
X1.3	
X2.1	Mains supply input (L)
X2.2	Heater connection A
X2.3	Heater connection B
X3.1	Common connection protective earth (PE)
X3.2	
X3.3	
X4.1	Alarm relay COM
X4.2	Alarm relay NC
X4.3	Alarm relay NO
X5.53	Connection Pt100 (white)
X5.52	Connection Pt100 (red)
X5.51	Connection Pt100 3-wire compensation (not necessary with 2-wire)

SPECIAL NOTES

Installation and safety information

ATTENTION

- Electrical connection / commissioning must be carried out by a qualified electrician.
- The relevant local safety regulations must be observed. Observe the connection values according to the type plate and these instructions.
- When selecting the installation site, observe the IP protection class and permissible operating temperature. Locations protected from direct precipitation and sunlight are advantageous.
- Operation only with closed cover, tightened screw connections / blind plugs and installed seals. Avoid damage, tensile stress, kinking and torsion of the connected lines.
- The sensor lines must be shielded when extended, the shielding must be grounded on one side near the controller. The cable must not be laid parallel to lines carrying mains voltage. The total line resistance must not exceed 10 ohms.
- Make sure that the connection terminals have the correct size and dimensioning to accommodate the conductors.

ATTENTION

- Persons involved in installations and testing of electrical trace heating systems should be appropriately qualified to perform the required actions
- Electrical heat-tracing systems should be installed under the direction of a qualified electrician who has completed supplemental training on electrical heat-tracing systems
- Critical work, such as making connections or terminations, should be performed only by qualified personnel

DANGER

A residual current circuit breaker is required for each circuit.

DANGER

Before starting work on heating or connection lines or terminals, make sure that the corresponding circuit is switched off and secured against unintentional reconnection

NOTE

After switching on the controller, the display shows the current actual value.

Notes on commissioning

ATTENTION

The settings of the controller must be checked during commissioning.

NOTE

The temperature control device and the temperature sensor(s) should be calibrated against the factory setting during commissioning if necessary.

Declaration of Conformity

CE

We declare that the described product fully complies with Directives 2014/35/EU, 2014/30/EU and 2011/65/EU. If you need a detailed declaration of conformity, please contact us.

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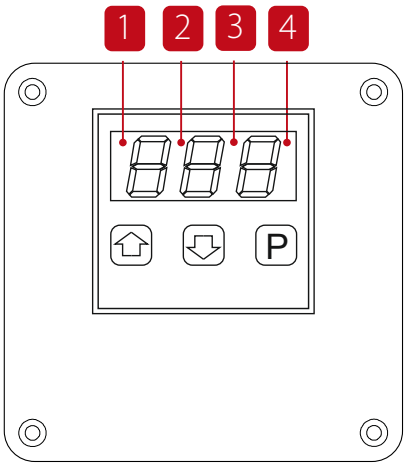
OPERATION

OPERATING PANEL



After switching on, the type number ("14P" resp. "24P") and software version of the device appear and after approx. three seconds the power level. If the "**P**" key is pressed briefly, the "Set" display appears and then the setpoint value is displayed with an automatic return after 5 seconds. If the "**P**" key is pressed for approx. 3 seconds, the parameter list "P10" is displayed. If the "**P**" key is held down for a further 3 seconds, " dC" for degrees Celsius or " dF" for degrees Fahrenheit is displayed.

Selecting and changing parameters

To reach the parameter list, "**P**" must be pressed for approx. 3 seconds until "P10" appears in the display.

Press „P" for 3 seconds
Parameter no. appears

Press „⬆/⬇"
Select parameters

Press „P"
Parameter value appears

Press „⬆/⬇"
Change parameters

Press „P"
New value saved, back to parameter no.

Press „⬆/⬇" till „P01" or T > 1 minute
Exit input mode

LEDs in Display

"**1**" = Control relay ON
"**2**" = 2-Point control
"**3**" = Proportional control
"**4**" = Alarm relay activated (=switched OFF)

A flashing of the LEDs indicates a function delay.

Keys

"⬆" = Increase values
"⬇" = Decrease values
"**P**" = Programming key

Protection against unauthorized operation

The control setpoints can basically be set without restriction, provided they are not limited by "P13/P14". All other parameters are protected by a code.
If a code is required, the display shows "C00". Use the arrow keys "⬆/⬇ " to set the required code number "C42" and confirm with "**P**".
After approx. 1 minute without pressing any key, the code is requested again.

Autoscrolling

If you hold down the arrow keys "⬆/⬇", the values continue to scroll automatically.

Error messages

In the event of an error, the display shows an error code. Sensor errors are displayed with a delay of approx. 20 seconds.

Error codes

- E01 = Sensor short circuit or temperature < -60°C
- E02 = Sensor interruption or temperature > 410°C
- E03 = 3rd wire is missing or R ≥ 10Ω
- E07 = Error relay K1 open
- E08 = Error relay K1 short circuit
- E09 = Internal error

- C00 = Protected parameters, code entry required

In case of errors E07...E09 further operation of the device is prevented.

Special displays

- ON = Continuous operation ON
- OFF = Continuous operation OFF
- 2P = 2-point operation

PARAMETERS AND THEIR MEANING

In [...] the factory settings are indicated.

Parameter	Meaning and range
P01 Actual value	display only
P05 Power level	range 0,17... 83,100; display only
P06 Time unit regulation	display only
P10 Control setpoint	range P13...P14, [5°C]
P11 Switching hysteresis	range 2...10K, [2K]
P12 Minimum standstill time (relay K1)	0..30 min., [0.0 min], resolution 0.1 min.
P13 Maximum adjustable setpoint	range P14...+99°C, [+30°C]
P14 Smallest adjustable setpoint	range -60°C...P13, [0°C]
P20 Sensor type	0 = Pt100, 3-wire, °C (resolution 1K) [1] = Pt100, 2-wire, °C (resolution 1K) 2 = Pt100, 3-wire, °F (resolution 2°F) 3 = Pt100, 2-wire, °F (resolution 2°F)
P21 Sensor correction	-30...+10K, [0]
P34 Alarm relay mode (Relay K2)	0 = Alarm active 1 = Alarm passive 2 = Alarm active, Heater **ON** in case of error [3] = Alarm passive, Heater **ON** in case of error
P40 Operating mode	0 = permanent OFF 1 = permanent ON 2 = 2-Point control (with **P11**) [3] = proportional regulation
P41 Minimum ambient temperature	range -70 °C to (P10 - 6 K), max. P10 - 6 K; [-30 °C]
P42 Cooling times	[0] = refined parameters P50 to P56 1= TU 30 s 2 = TU 60 s 3 = TU 120 s
P43 Power correction	65 to 130 %, 5 %-Steps; [100 %]

Parameter	Meaning and range
P50 Material selection	[1] = Metal 2 = Plastic
P51 Insulation material	1 to 15, [6] (see table below)
P52 Insulation thickness	1 to 59, [6] (see table page 10)
P53 Medium selection	1 to 5, [2] (see table page 10)
P54 Geometry	[0] = Pipe 1 = Vessel
P55 Nominal pipe diameter metal	1 to 32, [11] (see table page 10)
P56 Nominal pipe diameter plastic	1 to 17, [3] (see table page 10)

PARAMETER CONTENTS

In [...] the factory settings are indicated.

P51: Insulation material @20 °C

No.	Insulation material	Heat transfer resistance in W/(m²xK)
1	Calcium silicate, low density	0,08
2	Calcium silicate structural	0,21
3	Elastomer foam	0,033
4	Elastomer foam high temp	0,038
5	Foam glass	0,038
[6]	Foamglass ASTM C552-88	0,052
7	Mineral fiber 035	0,035
8	Mineral fiber 040	0,040
9	Mineral fiber ASTM C547-77	0,035
10	Mineral fiber ASTM C553-70	0,040
11	Mineral fiber BS3958	0,036
12	Perlite expanded ASTM C610-85	0,067
13	Perlite expanded	0,067
14	Polyisocyanurate	0,027
15	Polyurethane foam rigid	0,023

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P52: Insulation thickness

No.	Material thickness
1	4,76 mm / 3/16"
2	5 mm / 1/5“
3	6,25 mm / 1/4“
4	7 mm
5	8 mm / 5/16“
[6]	9 mm / 5/16“
7	9,5 mm / 3/8“
8	10 mm / 2/5“
9	11 mm / 7/16“
10	12 mm
11	12,7 mm / 1/2“
12	13 mm
13	14 mm
14	14,3 mm / 9/16“
15	15 mm / 3/5“

No.	Material thickness
16	16 mm / 5/8“
17	17 mm
18	17,5 mm / 11/16“
19	18 mm
20	19 mm / 3/4“
21	20 mm
22	20,32 mm / 4/5“
23	22 mm / 7/8“
24	24 mm / 15/16“
25	25 mm / 1“
26	30 mm
27	32 mm / 1 ¼“
28	35 mm
29	38 mm / 1 ½“
30	40 mm

No.	Material thickness
31	45 mm / 1 ¾“
32	50 mm
33	51 mm / 2“
34	57 mm / 2 ¼”
35	60 mm
36	64 mm / 2 ½”
37	70 mm / 2 ¾”
38	76 mm / 3”
39	83 mm / 3 ¼”
40	80 mm
41	89 mm / 3 ½“
42	90 mm
43	95 mm / 3 ¾“
44	100 mm / 4“
45	110 mm

No.	Material thickness
46	114 mm / 4 ½“
47	120 mm
48	127 mm / 5“
49	130 mm
50	140 mm / 5 ½“
51	150 mm
52	153 mm / 6“
53	160 mm
54	165 mm / 6 ½“
55	170 mm
56	178 mm / 7”
57	180 mm
58	190 mm / 7 ½“
59	200 mm / 8”

P53: Medium selection

No.	Medium
1	water, brine, caustic soda
[2]	water based liquids, acids, bases
3	liquid hydrocarbon, vegetable oils
4	gases
5	others

P55: Nominal pipe diameter, metal

No.	Nominal diameter
1	3 mm / 1/8“
2	6 mm / 1/4“
3	10 mm / 3/8“
4	15 mm / ½“
5	20 mm / ¾“
6	25mm / 1“
7	32 mm / 1 ¼“
8	40 mm / 1 ½“
9	50 mm / 2“
10	65 mm / 2 ½“
[11]	80 mm / 3“
12	90 mm / 3 ½“
13	100 mm / 4“
14	125 mm / 5“
15	150 mm / 6“
16	175 mm / 7“

No.	Nominal diameter
17	200 mm / 8“
18	225 mm / 9“
19	250 mm / 10“
20	300 mm / 12“
21	350 mm / 14“
22	400 mm / 16“
23	450 mm / 18“
24	500 mm / 20“
25	550 mm / 22“
26	600 mm / 24“
27	650 mm / 26“
28	700 mm / 28“
29	750 mm / 30“
30	800 mm / 32“
31	850 mm / 34“
32	900mm / 36“

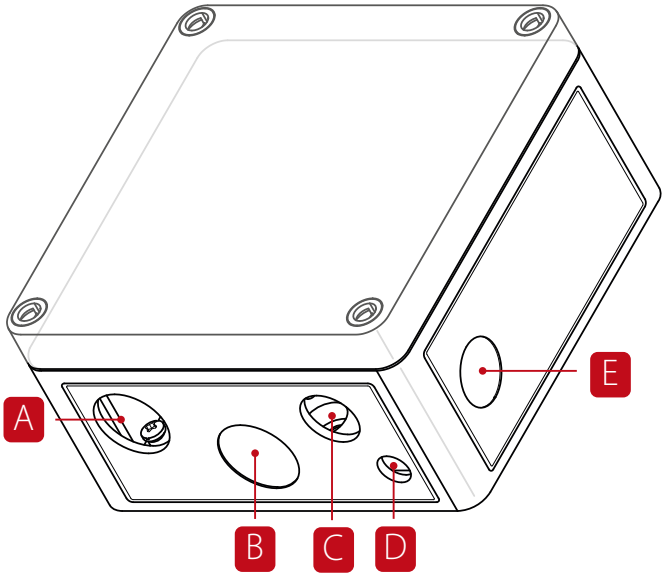
P56: Nominal pipe diameter, plastic

No.	Nominal diameter
1	10 mm / 3/8“
2	12 mm / 3/8+“
[3]	15 mm / ½“
4	20 mm / ¾“
5	25mm / 1“
6	32 mm / 1 ¼“
7	40 mm / 1 ½“
8	50 mm / 2“
9	65 mm / 2 ½“

No.	Nominal diameter
10	75 mm / 2 7/8“
11	100 mm / 4“
12	125 mm / 5“
13	150 mm / 6“
14	200 mm / 8“
15	250 mm / 10“
16	300 mm / 12“
17	400 mm / 16“

HOUSING CONSTRUCTION ELTC-14P

Holes / Stamping



Pos.	Size
A	M25
B	M25 (pre-stamped, e.g. connection two ELSR)
C	M20
D	M12
E	M20 (pre-stamped, e.g. connection cable to the alarm contact)

Cable gland compatibilities

Pos.	with cable gland / with separate connection set	Clamping range	suitable for e.g.
A	M20 and O-ring	6 - 12 mm	Supply line
B	M25, O-ring and locknut	6 - 13 mm	Connection cable for second heating circuit: ELW-x one-sided connection, EL-CLIC P, terminal box
B	M25, O-ring and locknut	2 x 6 mm	Connection cable for second heating circuit: ELK-x connection on both sides
B	M25, from connection set ELVB-SR	*	ELSR-x
B	M25, from connection set ELVB-ELP	*	ELP-x
C	M20 and O-ring	6 - 13 mm	ELW-x one-sided connection, EL-CLIC P, terminal box
C	M20, from connection set ELVB-SR	*	ELSR-x
C	M20, from connection set ELVB-ELP	*	ELP-x
D	M12 and O-ring	3-6,5mm	Temperature sensor
E	M20, O-ring and locknut	6 - 12 mm	Connection cable alarm contact

*dependent on the respective separate connection set

DOWNLOADS

You can find helpful downloads for this or other products under the following link:

https://eltherm.com/downloads

NOTES

Parameter	Own settings	Parameter	Own settings
P10		P42	
P11		P43	
P12		P50	
P13		P51	
P14		P52	
P20		P53	
P21		P54	
P34		P55	
P40		P56	
P41			

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