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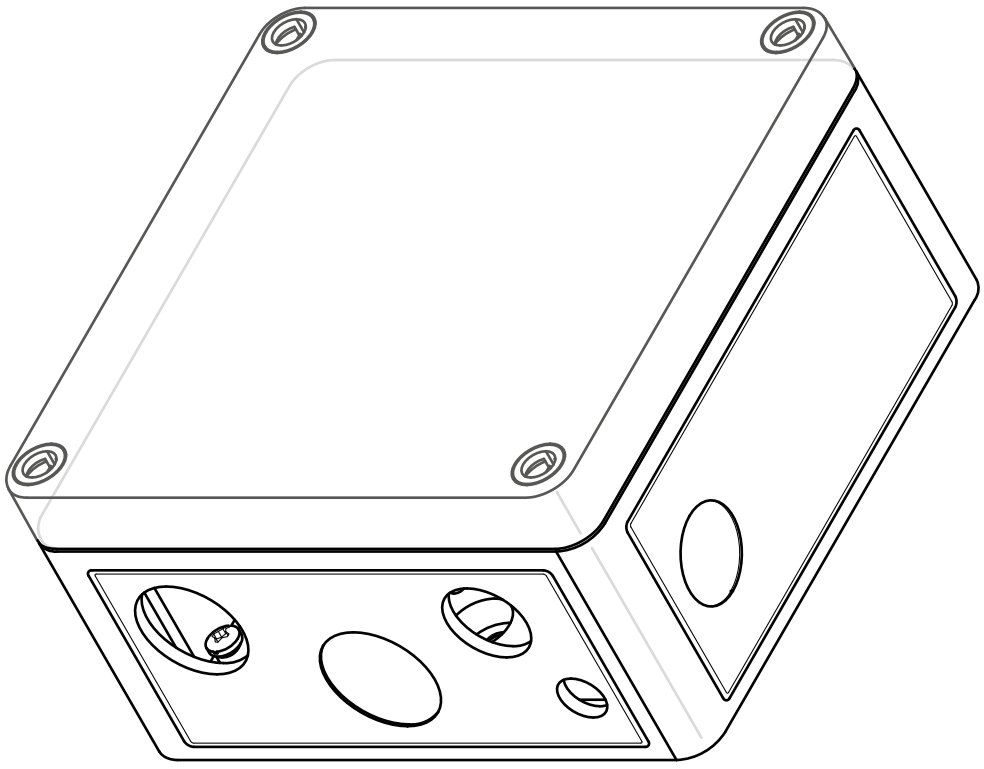
OPERATION-MANUAL



ELTC-15

Temperature controller up to 999°C
with ramp mode and
connection possibility for 2 trace heaters

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BU-101
Revision 5

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For proper and safe use of the ELTC-15 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-15 temperature controller up to 999°C with ramp mode and connection possibility for 2 trace heaters

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Revision: **5**	Julian Engel	Date:	03.07.2023

INTRODUCTION

The electronic temperature controller of the ELTC type series is a controller with digital display for wall mounting. The temperature measured with a Pt100 temperature sensor or a thermocouple type K is processed and displayed by a microcontroller.

After an actual value/setpoint comparison, the output relays are then switched according to the configuration. Cable glands and terminals are built in for electrical connection. The device is supplied in a splash-proof plastic housing with a transparent housing cover including accessories. 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.

SCOPE OF DELIVERY

The scope of delivery of the article includes:

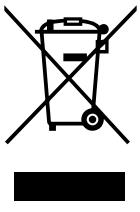
Qty.	Item
1 Pcs.	Temperature controller
1 Pcs.	Operation manual DE & EN
2 Pcs.	M25x1,5 cable gland
2 Pcs.	M25 O-ring
2 Pcs.	M25 2x6mm Multi-seal insert
1 Pcs.	M25 locknut
2 Pcs.	M20x1,5 cable gland
2 Pcs.	M20 O-ring
1 Pcs.	M20 locknut
1 Pcs.	M12x1,5 cable gland
1 Pcs.	M12 O-ring
1 Pcs.	Terminal cover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

STORAGE

NOTE

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

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.

FUNCTIONAL DESCRIPTION & TECHNICAL DATA

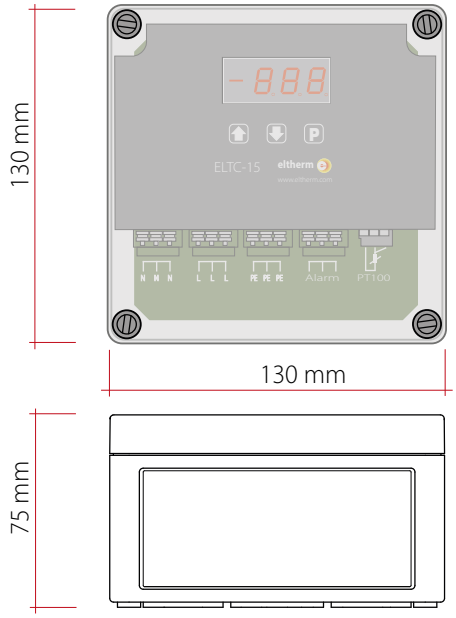
FUNCTIONAL DESCRIPTION

If the actual value (P01) falls below the setpoint (P10 minus hysteresis P11), relay K1 switches the heating on. The integrated alarm relay enables error messages via a changeover contact in case of over / under temperature, sensor interruption or sensor short circuit. In the event of sensor errors, relay K1 switches the heating line off or on, depending on the configuration of the controller.

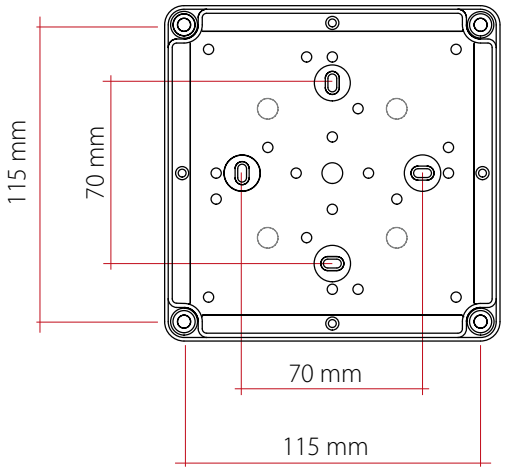
TECHNICAL DATA

Nominal voltage	90…260 VAC, 50/60 Hz
Power consumption	max. 5 W
Relays K1	20A res./ max 250 VAC (closing contact)
Relay K2 (alarm)	8A res. / max. 250 VAC (changeover contact)
Operating temperature	-25 to +55°C
Storage temperature	-30 to +60°C
Setting range	-50 to +410°C with Pt100 / -50 to +999°C with thermocouple type K
Display range	-50 to +999°C
Accuracy	±1K, ±2 Digits with Pt100 / +/- 0.5% F.S. (with thermocouple type K)
Display	LED, red, 11mm
Sensor connection	Pt100 2-wire, Pt100 3-wire & thermocouple type K
Connection terminals	Sensor: 0.2...1.5mm² copper wire, stripping length 9...10mm Others: 0.1...2.5mm² copper solid, stripping length 5...6mm
Measuring current / cable length	max. 1 mA / 140m with 0,5mm² or 280m with 1mm² (10 Ohm)
Housing material	Polycarbonate, gray, clear lid
Housing dimension	130 x 130 x75 mm (WxHxD)
Protection class	IP 65
Type of mounting	Wall mounting
Weight	approx. 0,6 kg

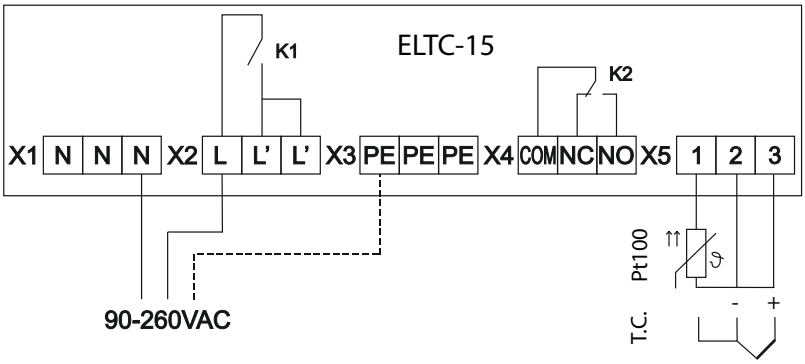
Dimensions



Drilling pattern



CONNECTION PLAN



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) / jumper thermocouple
X5.2	Connection Pt100 (red) / - compensation line thermocouple (white)
X5.3	Connection Pt100 3-wire compensation (not necessary with 2-wire) / compensation line thermocouple (green)

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.

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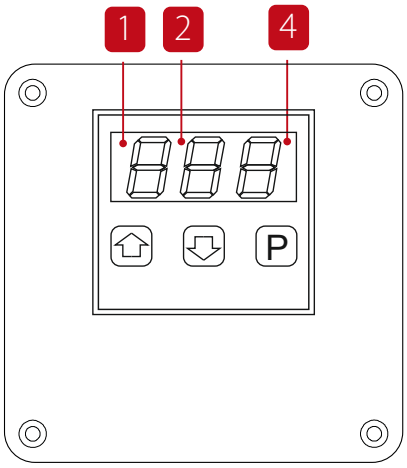
OPERATION

OPERATING PANEL



After switching on, the type number ("C15") and software version of the device appear and after approx. three seconds the measured actual value. 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

Autoscrolling

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

LEDs in Display

"**1**" = Control relay ON
"**2**" = Ramp ON
"**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.

Error messages

In the event of an error, the display shows an error code. Sensor errors are displayed with a delay of approx. 10 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
- E04 = thermocouple fault
- E07 = Error relay K1 open
- E08 = Error relay K1 short circuit
- E09 = Internal error

- C00 = Protected parameters, code entry required

With errors E07 to E09, further operation of the device is prevented.

Ramp status codes

- rF0 = Ramp completed correctly
- rF1 = Ramp cancelled & cooled down in controlled manner
- rF2 = Bandgap alarm occured at least one time
- rF3 = Ramp cancelled

The ramp status „**rF**" is displayed alternating to the parameter „P01" (3 s „P01", 1 s Rampenstatus). The ramp state information can be cleared by pressing key „**P**".

PARAMETERS AND THEIR MEANING

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

Parameter	Meaning and range
P01 Actual value	display only
P10 Control setpoint	range P13...P14, [5°C]
P11 Switching hysteresis	range 2...P41-1K, [2K]
P12 Minimum standstill time (relay K1)	0..30.0 min., [0.0 min], resolution 0,1 min.
P13 Maximum adjustable setpoint	range P14...+950°C, [+950°C]
P14 Smallest adjustable setpoint	range -50°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) 4 = Thermocouple K, °C (resolution 1K) 5 = Thermocouple K, °F (resolution 2°F)
P21 Sensor correction	-30...+10K, [0]
P30 Overtemperature alarm	P31...999°C, [999°C]
P31 Undertemperature alarm	-60...P30, [-60°C]
P32 Alarm delay in operation	0...99 min., [0.0 min.] resolution 0,1 min.
P33 Alarm delay after switch-on	0...500 min., [0 Min.]
P34 Alarm relay mode (Relay K1 and K2)	0 = relay K2 (active) energizes on sensor error Load relay K1 drops in case of sensor error [1] = relay K2 (passive) drops in case of sensor error Load relay K1 drops in case of sensor error 2 = K2 works as enable relay Load relay K1 drops in case of sensor error 3 = Relay K2 (active) energizes in case of sensor error Load relay K1 energizes in case of sensor error 4 = Relay K2 (passive) drops in case of sensor error Load relay K1 energizes in case of sensor error 5 = K2 works as enable relay Load relay K1 energizes in case of sensor error

Parameter	Meaning and range
P40 Ramp function	0 = Ramp inactive [1] = Ramp active
P41 Band alarm-hysteresis	range P11+1...11K, [5K]
P50 (Start value) Ramp setpoint 1	Nop, 0...950°C [100°C], Nop=inactive
P51 Time for rampe 1	1..999 Min., [30 Min],
P52 Ramp setpoint 2	Nop, 0...950°C [100°C]
P53 Time for rampe 2	1..999 Min., [30 Min],
P54 Ramp setpoint 3	Nop, 0...950°C [100°C]
P55 Time for rampe 3	1..999 Min., [30 Min],
P56 Ramp setpoint 4	Nop, 0...950°C [100°C]
P57 Time for rampe 4	1..999 Min., [30 Min],
P58 Ramp setpoint 5	Nop, 0...950°C [100°C]
P59 Time for rampe 5	1..999 Min., [30 Min],
P60 Ramp setpoint 6	Nop, 0...950°C [100°C]
P61 Time for rampe 6	1..999 Min., [30 Min],
P62 Ramp setpoint 7	Nop, 0...950°C [100°C]
P63 Time for rampe 7	1..999 Min., [30 Min],
P64 Ramp setpoint 8	Nop, 0...950°C [100°C]
P65 Time for rampe 8	1..999 Min., [30 Min],
P66 Ramp setpoint 9	Nop, 0...950°C [100°C]
P67 Time for rampe 9	1..999 Min., [30 Min],
P68 (End value) Ramp setpoint 10	Nop, 0...950°C [100°C]
P70 Display of the current Ramp setpoint	-60…999°C
P71 Display of the current Ramp phase	0 = Ramp off 1 = reaching set point 1 2 = reaching set point 2 10 = reaching set point 10

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ATTENTION

P34=3, P34=4 and P34=5 is only permissible for frost protection applications and use of self-regulating trace heaters.

Mode Enable relay

In this operating mode (P34=2), relay K2 switches independently of P32 and P33 as soon as the actual value is within P30 and P31.

Mode Alarm relay

(P34 = 0 or 1) : If the actual temperature is below P31 when the device is started, P33 is used once as the alarm delay to give more time to the system. In normal operation, P32 is used as alarm delay.

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.

RAMP MODES

Ramp start

Press the „↑" key for >5 seconds, LED „**2**" lights up continuously.If the current temperature is below the value stored for P50, it is first heated up to this value. Then the stored ramp function (P50...P68) starts. If the current temperature is above the value stored for P50, the ramp function starts with the current temperature. After reaching the last stored ramp value, LED „**2**" goes out, then the set temperature setpoint (P10) is approached and permanently maintained.

Pause

Press „↓" key for >5 seconds, LED „**2**" flashes in a regular cycle. Current temperature is held permanently. Pressing the „↓" key again for >5 seconds continues the ramp.

Controlled cancellation of ramp

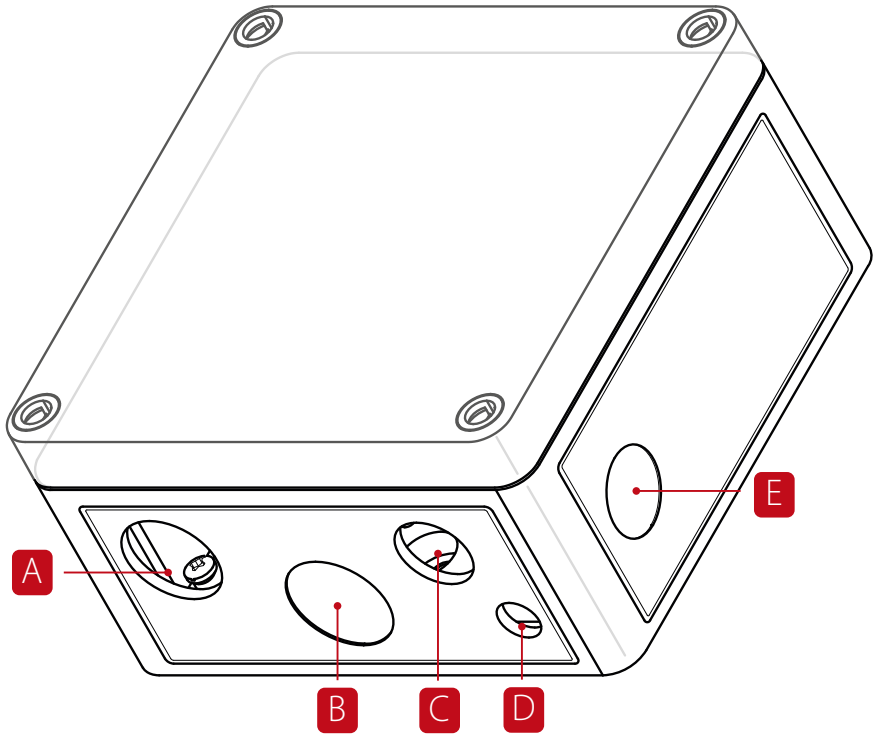
Press „↑" and „↓" keys simultaneously for >5 seconds, LED „**2**" flashes alternately long / short. Starting from the current temperature, the ramp is now run down with the last deposited falling branch. After reaching the last ramp value, LED „**2**", goes out, then the set temperature setpoint (P10) is approached and permanently maintained.

Immediate cancellation of amp

Press „↑" and „↓" keys simultaneously for >5 seconds, LED „**2**" flashes alternately long / short. Press the „↑ and „↓" keys again simultaneously for >5 seconds, LED „**2**" goes out. The ramp function is now inactive, the set temperature setpoint (P10) is approached and permanently maintained.

HOUSING CONSTRUCTION

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		P50	
P11		P51	
P12		P52	
P13		P53	
P14		P54	
P20		P55	
P21		P56	
P30		P57	
P31		P58	
P32		P59	
P33		P60	
P34		P61	
P40		P62	
P41		P63	
		P64	
		P65	
		P66	
		P67	
		P68	

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