

ENGELTHERM® - Regulation System ETDL



EQUIPMENT

Type ETDL 3/230

Control transformer 08-230/24 V AC,
Control-contactor fuse protection 1 A
Driver power controller TRL-DC
(Vibration package control through pulse-width modulation)
Pulse output 24 V DC, input 0-10 V
Semi-conductor relay Type RGC 1A60D15KE 600V - 20A
Rated load voltage 230 V AC
Control voltage 4 - 32 V DC, LED display
Semiconductor protection fuse 16 A / 25 A
Load contactor HS 20 - 20/24 V
Phoenix connecting terminals Type MBK 5/4 mm, with grounding terminal.

Type ETDL 9/400

As before, transformer 30 W.
Two semi-conductor relays Type RGC 1A60D15KE 600V - 20A.
Three semiconductor protection fuses 16 A or 25 A, according to air heater power. Load contactor HS 20 - 40/24 V

Type ETDL 16/400

As before, transformer 30 W.
Two semi-conductor relays Type RGC 1A 60D25 KKE 600V-30A.
Three semiconductor protection fuses 16 A or 25 A, according to air heater power. Phoenix connecting terminals Type UK 5N/UK 6 N = 4/6 mm.
Load contactor DIL M17-10/24 V.

Type ETDL 25/400

As before, transformer 30 W.
Two semi-conductor relays Type RGC 1A 60D 40KGE 600V-40A.
Three semiconductor protection fuses 50 A Phoenix connecting terminals Type UK 5N/UK 16 N = 4/16 mm. Load contactor DIL M32-10/24 V.
The control units type ETDL are always fixed on the air heater with approx. 10 mm separation distance.

By order:

Engelcontrol® Safety Temperature Limiter Type ZB 121/123,
or STBW 225 always installed in the air heater.
Engelair® Air-Flow Controller Type ELW 180 always provided loose,
for on-site duct fitting. 1/3 spare fuses are enclosed.

Accessories

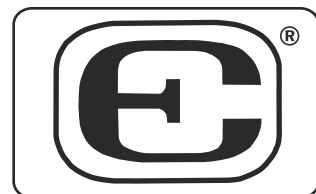
Continuous control device as a room thermostat
Type STR - Peta 75,800 (KTRVB-048.100)
Setpoint value scale 5....30°C. (Range of adjustment)
Material Plastic ABS
Color Pure White sim. RAL 9010
Operating voltage 24 V AC
Analog output 0...10 V / 5 mA
Protection Type IP 30, Protection Class III
Electrical connection screwed terminals
Fixing - Wall installation on UP receptacle

Continuous control device for supply-air temperature control Type STK-Peta 75.833 (KTRVB-042,207) (with conduit sensor Type K-LF 22) Relative setpoint value scale (0 - setpoint value + 21°C.)
Threshold arrows "+" and "-" for warmer and colder, ± 3 K / + internal ± 5 K
Operating voltage 24 V AC
Otherwise as before.

Conduit sensor Type K-LF 22
NTC sensor, cable approx. 1.5 m, with protection spiral 200 mm
Parallel routing of the sensor line with power cables is to be avoided.
Please use screened lines.
Connect screen to terminal 6 (in case of STK-Peta 75.833).

Documentation

Product brochure, parts list
structure-plan control part
circuit diagram, plant schematic
datasheet component parts



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Vertriebs-
GmbH

GG 2.016 / 500

ENGELTHERM® - the better solution

All specifications implemented according to best knowledge, without guarantee - reprinting prohibited.

ENGELTHERM®

Connection of control unit and air heater for air-conditioning and ventilation systems with electrical air heaters



The perfect complete control solution with thyristor
Electronic, continuous power control / temperature control by means of control activation through 0-10 V signal, e.g. with DDC or continuous control devices with room or conduit sensors

NEW - now up to 25 kW

Optimum and economical system solution - All from a single source



ELECTRICAL air heater
for heating, air-conditioning
and ventilation systems



ENGELTHERM® - Control unit directly on the air heater

Economical and convenient

Temperature regulation and control

ENGELTHERM® Regulation System ETDL

General

Increasing demands for convenience, as well as economical and technical necessities, ever more frequently today require a reheating of air streams with electrical air heaters. Optimum temperature control systems with functionally-coordinated system components are necessary here. With **ENGELTHERM® Regulation System ETDL** we offer you a decentralized networking of control unit and air heater for on-site control activation through 0 - 10 V actuating signal, e.g. with DDC or continuous control devices with room or conduit sensor. The new scale for optimum, intelligent regulation, with integrated security measures.

Application

As constant supply-air temperature control for individual rooms in air-conditioning and ventilating systems with electrical air heaters, in connection with DDC regulation or continuous-control devices. As a result of installation of an ENGELCONTROL® Safety Temperature Limiter (e.g. Type ZB 121) and the ENGELAIR® Air-Flow Controller Type ELW 180, the required security measures, e.g. VDE Specification 0100/DIN 57100 - Part 420, are fulfilled. The electrical connection may be implemented only by an authorized electrician, in accordance with VDE 0100/DIN 57100. The prescribed on-site protection by means of circuit breaker and a possibly necessary repair/main switch must be considered.

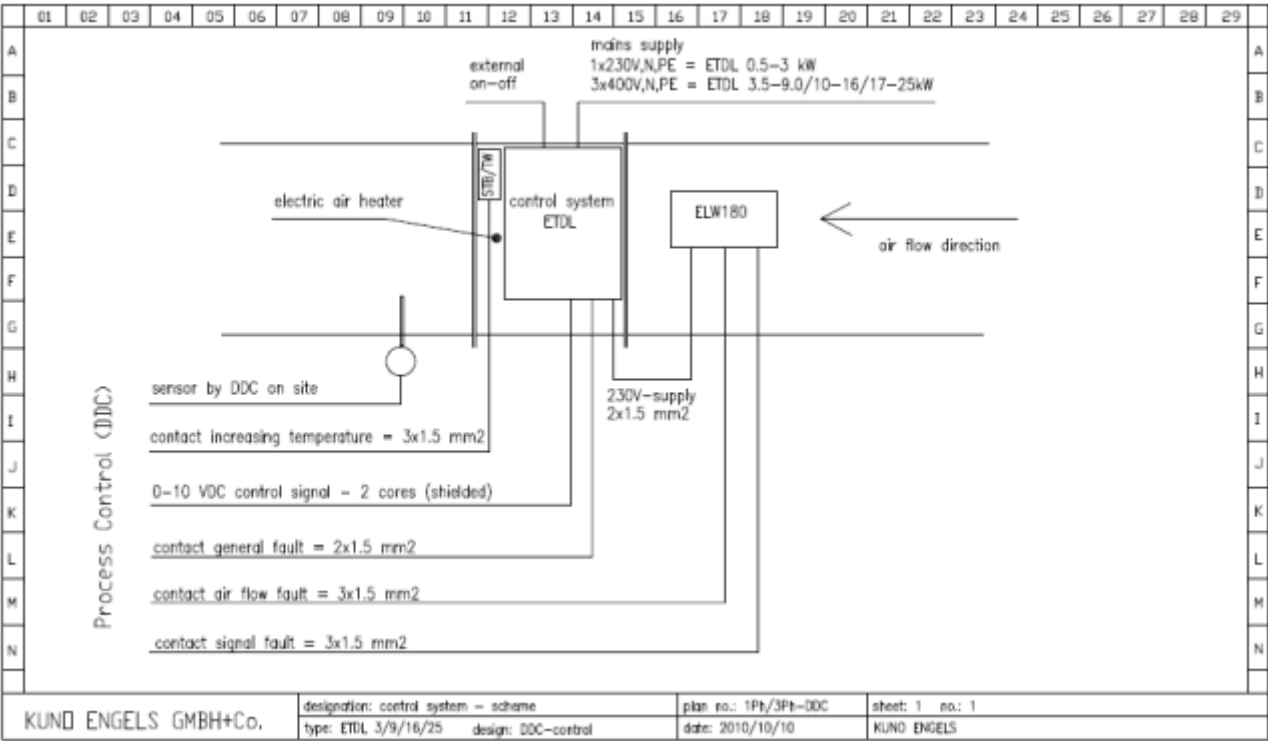
- Interpulse period control
- Professional series-production solution
- Future-oriented technology
- Continuous, 100% control
- Optimal price / performance ratio
- Energy-saving

Function

All **ENGELTHERM® Control Units Type ETDL** are attached ex-works directly to the required electrical air heater and are equipped completely for on-site connection. The continuous, constant impulse control for the power setting is implemented by means of an analog actuating signal from the operations control center (DDC) or through continuous control devices with room or conduit sensor, constant 0 - 10 V DC, for the control activation of the existing thyristor (in case of Type ETDL 9/400, ETDL 16/400 and ETDL 25/400 two items in power-save mode). The thyristor switch units employed (semi-conductor relay) switch in the crossover point of the voltage and thus not according to the phase-crossover principle, i.e. no disturbing mains-system reactions occur, in accordance with the EMC Directive.

The Type ETDL 3/230 is planned for connection to 230 V alternating current, while the Types ETDL 9/400, ETDL 16/400 and ETDL 25/400 require a 400 V three-phase AC current connection. On-site a conduit sensor is to be inserted for the actual-value recording (in case of DDC Regulation) or a continuous control device (0-10 V) provided and the ENGELAIR® air-flow controller Type ELW 180 fixed before the air heater in the conduit. For the voltage supply, the air flow controller is connected to the control unit (terminals U2 + N). The ENGELCONTROL® Safety Temperature Limiter Type ZB 121 (on request Type ZB 123) is provided with a potential-free changeover contact which, exactly as in the case of the potential-free change-over contacts (relay 1 + 2) of the air flow controller Type ELW 180, is to be connected with the operations control center (DDC) on-site for the signal and failure indication. In case of utilization of a continuous control device, the safety temperature limiter, as well as the potential-free, change-over relays of the air flow controller, can be connected directly into the control unit on site. A potential-free make contact (signal 9+10) for a centralized fault indication is always existing. The electrical air heater is always connected directly with the control unit. A temperature precision of $\pm 0.2^{\circ}\text{C}$ can be achieved by optimal adjustment of the constant actuating signal on the control section and the pulse train of the semi-conductor control activation.

System functional schematic for DDC regulation



Economical and convenient

Temperature regulation and control

ENGELTHERM® Regulation System ETDL



Technical data

Dimensions	Acc. to list
Operating voltage	ETDL 3/230 230 V AC Type ETDL 9/400 - ETDL 25/400 400 V three-phase AC current 50 Hz. 230/24 V
Control voltage	Rose switch box
Housing	Color Gravel Grey RAL 7032/7035 in accordance with DIN 40050 - IP 50
Protection type	298 K
Ambient temperature	75%
Relative humidity	max. 1000 m above MSL
Setting elevation	in accordance with DIN/VDE 0106 and VBG4 (Class 1)
Contact protection	VDE 0100/DIN 57100
Produced to directives	Type ETDL 3/230 5x M 16 x 1.5 mm, 2x M 20 x 1.5 mm
Cable inlet	Type ETDL 9/400 - ETDL 16/400 5x M 16 x 1.5 mm, 2x M 25 x 1.5 mm
(Bores)	Type ETDL 25/400 5x M 16 x 1.5 mm 2x M 32 x 1.5 mm

ENGELTHERM®

Regulation System ETDL

For constant supply-air temperature control

or room temperature control of individual rooms

in air-conditioning and ventilation systems with electrical air heaters.

Type designation	Operating voltage	Air heater power max.	Rated current max.	Dimensions external approx. mm	Weight approx. kg
ETDL 3/230	230VAC	3 kW	14A	200x200x120	3,5
ETDL 9/400	400 V 3Ph	9 kW	14A	300x200x120	5,0
ETDL 16/400	400 V 3Ph	16 kW	24A	300x300x120	6,5
ETDL 25/400	400 V 3Ph	25 kW	37A	380x300x210	11,5

Installation

Utilization with the following electrical air heaters

Control unit	ENGELNORM®	ENGELCANAL®	ENGELVARI-O®
ETDL 3/230 0,5-3 kW	E 05/E 1/E 2/L 1/L 2 L 3/L 4/L 5	ELP 1/ELP 1,5/ELP 3	ELR 0,5/ELR1 /ELR 1,5 ELR 2/ELR 3
ETDL 9/400 2-9 kW	L 4/L 5/L 6/L 7/L 8/L 9 EL 6/ E 7,5	ELP 3/ELP 6/ELP 8 ELP 3-6/ELP 9	ELR 2/ELR 3/ELR 4 ELR 5/ELR 7/ELR 9
ETDL 16/400 10-16 kW	L 10/L11/E12/E16 EL 12 / EL 16	ELP 12/ELP10/ELP15 ELP12-2 / ELP15-2	ELR 12 E-HR 5 / E-HR 7
ETDL 25/400 17-25 kW	L12 / L13 / L14 / E20	ELP 20 / ELP 25	Special devices

Also on air heaters in special design (according to your specifications), the corresponding control units in the designated range of performance can almost always be attached.

Note:

Please always consider our information S 20 and A-1999.

Before the connection, it is to be tested whether the operating voltage indicated on the rating plate agrees with the actual mains voltage.

The connection is to be carried out according to the enclosed terminal diagram.

With the dimensioning of the conductor cross-section, pure ohmic loading can be assumed.

Type ETDL 25/400 may be employed horizontally only. With installed regulation systems, protrusions can result with some air heaters due to the dimensions.