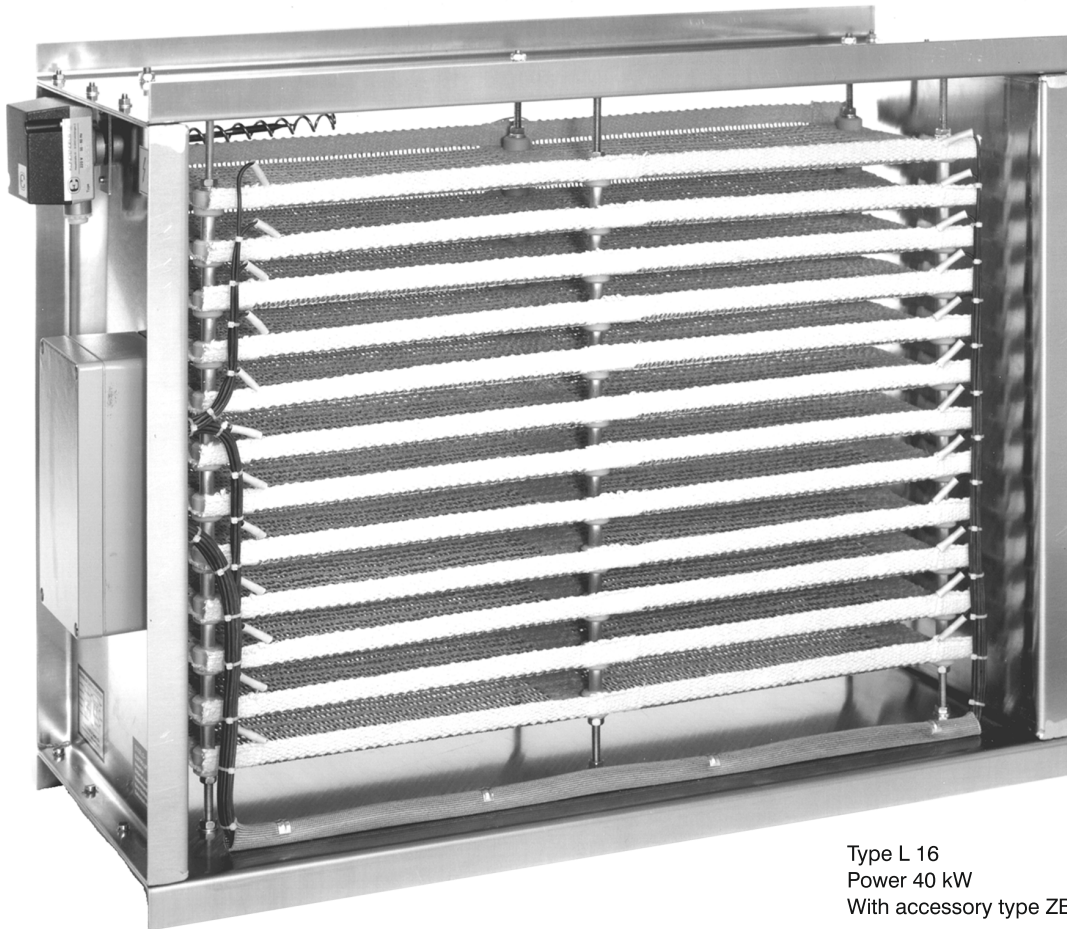


ENGELS - ELEKTRIC-AIR HEATER Information

ELECTRIC HEAT FOR HEATING, AIR-CONDITIONING AND VENTILATION SYSTEMS



Type L 16
Power 40 kW
With accessory type ZB 121

Tested safety according to the regulations
Low Voltage Directive 2006/95/EU
Certified under no. 954228



über *100 Jahre*
ENGELS

ELECTRIC AIR HEATER in low temperature design

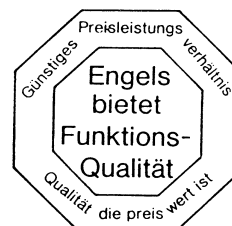
Designed to meet the requirements of the market

For heating flowing, dust-free air and non-flammable, non-aggressive and non-explosive gases up to 373 K (+ 100° C) (standard version) or up to 473 K (+ 200° C) (special version on request).

For all areas as preheaters, reheaters, zone reheaters, duct heaters and device installation registers in standard and special designs.

We offer you the advantageous and user-friendly 'stock programme', as well as customised solutions.

Modern and advanced
Specially developed for
air conditioning technology



- reliable
- electronically controllable
- practical
- economical

Technical description

Design – Material

Engels electric air heaters are heat exchangers for electrical energy that have been specially developed for use in heating, air conditioning and ventilation technology. Due to the many special design and functional features, these devices offer optimum solutions for heating flowing air. The bolted duct is made of aluminium ALMG 3, DIN material no. 3.3535, with a circumferential, undrilled flange of 25 - 35 mm (standard units) as standard or according to specification for special units. The material thickness is between 1.5 - 3 mm, depending on the size. The device series Engelcanal® type ELP 1-36 and Engelvari-o® type ELR 025 - 12 have channels made of galvanised sheet metal. We only use original Engels heating grilles® as heating elements. These special heating elements have proven themselves millions of times over in a wide variety of electric heating appliances for heating air. Engels-Heizgitter® are woven in a meandering pattern on special high-performance weaving machines developed in-house. Thanks to this special manufacturing process, the non-glowing heating conductor made of the corrosion-resistant special alloy CuNi 44 (details on page 76) lies freely in the air flow. This unique advantage ensures inertia-free control, a low surface temperature and the absence of dangerous post-heating. We use glass filament yarn as the carrier material for the electrical and thermal insulation of the heating conductor, as well as for the tried and tested self-supporting design of the heating grids. The E-glass fibre used is incombustible and is impregnated with an incombustible, solvent-free high-temperature insulating compound to achieve the required stability. Further information on page 74.

Engels-Heizgitter® are flat, vibration and impact resistant, have a large surface area and operate silently. The large heat-generating surface ensures good heat dissipation to the air flowing past. They are installed in a layered construction with ceramic insulating bricks and aluminium tubes (AL 99.5) as spacers, on galvanised threaded rods. For the internal wiring, silicone copper wire (continuous temperature resistance 453 K (+ 180° C)) is normally used, whereby all connections are routed to terminals and the individual heating grids are connected as staggered as possible according to the respective switching levels for the purpose of even heat distribution. The external aluminium terminal box (not for type E-HR 6) complies with the VDE 0110/part 2 regulation with regard to the permissible clearances and creepage distances and enables a quick and safe electrical connection to the internal terminal strip.

All parts used are corrosion-protected.

Installation and assembly

Please observe the relevant regulations and our detailed installation instructions on page 21 - catalogue EL 2021.

Experience has shown that there are no problems when used at normal humidity levels.

The correct setting of the temperature limiter and air flow monitor should be checked before commissioning.

Control

We offer you the complete solution:

Engeltherm® - Electronic temperature control units

Engelthrottemp temperature control and control cabinets.

ENGELS - ELEKTRO-AIR HEATER

Electrical connection regulation

The electrical connection may only be carried out by a qualified electrician. Particular attention must be paid to VDE 0100/DIN 57100. The safety measures mentioned in our Information No. S 20 must be integrated into the control system, which must always be installed by the customer. Furthermore, the important instructions for the electrical connection on pages 21 + 22 must be observed. The VDE-compliant terminal strips make simple, quick and safe. The switching stages/groups can be selected from the list or according to specifications. The smallest possible step power is always the power of the heating grid specified in the list. Larger stage subdivisions can always be a multiple of this output. If the specified number of switching groups is changed, it must be checked whether the switching can take place in Ph-N or only in Δ/Y . The maximum number of switching stages is the number of installed heating grids, with Ph-N switching, whereby the total power can also be evenly distributed over three phases. In principle, the control of electric heat exchangers should not be based on the electrical output, but solely on the level of the temperature increase to be achieved ($\Delta-9$) and the desired control accuracy. Temperature fluctuations above $\Delta 9 = 4$ K should be avoided for reasons of comfort. Control can be achieved by means of linear step switches and at least standard solutions by means of electronic controller design. With our ENGELTHERM® ETDL control system, we offer you decentralised networking of the control unit and air heater for on-site control via a 0-10 V control signal. This stepless, continuous pulse-pause control for power setting enables economical and extremely precise temperature control in the power range of 0.5 - 25 kW. With Engelthrottemp, we offer you complete temperature control and control cabinets for electric air heaters for outputs of 3 - 60 kW, also with infinitely variable thyristor control. Due to the specified switching capacity of the safety elements of max. 10 A, direct activation is only possible up to a maximum output of 2 kW. For all higher outputs, control must be provided by the customer via power contactors.

Note

It is possible to increase the power by combining several devices.

Other voltages (up to max. 690 volts) can be supplied on request. Other dimensions, outputs, designs etc. according to special programme. Most devices are also available in silicone-free versions on request.

Engels electric air heaters are tested in accordance with Low Voltage Directives 2006/95/EU, EN 60335-1, EN 60335-2-30 and EN 62233 and certified under No. 954228.

Technical data - standard appliances

Operating voltage:	230 volts(alternating current) 230 volts or 400 volts (three-phase current)
Heat output:	listed appliances up to 100 kW correspond to 360000 kJ (86000kcal)
Air outlet temperature:	max. 333-373 K (+60° to +100°C), higher temperatures on request
Air velocities:	approx. 1.5 -10 m/s (n.m. min. 2 - 3 m/s)
Dimensions:	according to list