



CV
Circular electric duct heaters

CV

Circular electric duct heaters

VEAB circular electric duct heaters are used for heating the ventilation air supplied to individual rooms and zones with individually controlled temperatures. In correctly designed systems, they can also heat the entire building. Circular electric duct heaters are also used for reheating the supply air in ventilation units with heat recovery. The duct heaters are available with built-in electronic regulator or for external control.

- Seven sizes from 100 to 400 mm dia.
- Power ratings from 300 W to 12 000 W
- Degree of protection IP 43 as standard. IP 55 to special order.
- With built-in regulator or for external control
- Can be installed both horizontally and vertically.
- Built-in overheating protections, one with automatic reset and the other with manual reset.
- Tightness class C to EN 1751.



Built-in control

The CV with built-in control offers simple installation for lower installation cost. The installation requires a minimum of cable runs, and the risk of incorrect wiring is reduced.



Regulator unit for external control

VEAB offers a wide range of regulator units for external control. These can be mounted on a wall, a ceiling or a DIN rail in an electrical cubicle, but easily accessible for inspection and service.

Design

The casing is made of Aluzinc-coated sheet steel, and the heater elements are made of stainless steel EN 1.4541.

The junction box includes the necessary terminal blocks for electrical connections. The duct connection is suitable for insertion mounting in circular ducts.

The CV is made to degree of protection IP 43. Degree of protection IP 55 is available to special order (not the MTU version).

Conforms to tightness class C to EN 1751.

Approvals

The duct heaters have been tested and approved by SEMKO in accordance with:

LVD Directive: EN 60355-1, EN 60335-2-30, SEMKO 111-1967 and SEMKO 111 FA11982.

EMC Directive: EN 50081-1, 50082-1, EN 61000-3-2 and EN 61000-3-3



Overview of range

Diameter (mm)	100	125	160 ²⁾	200	250	315	400 ³⁾
Minimum air flow, m ³ /h ¹⁾	43	70	110	170	270	415	690
Type:	CV 10	CV 12	CV 16	CV 20	CV 25	CV 31	CV 40
Rating/voltage							
300 W / 230 V AC		•	•				
400 W / 230 V AC	•						
600 W / 230 V AC	•	•	•	•	•		
900 W / 230 V AC		•	•	•	•	•	
1200 W / 230 V AC		•	•	•	•	•	
1500 W / 230 V AC		•	•	•	•	•	
1800 W / 230 V AC		•	•	•	•	•	
2100 W / 230 V AC			•	•	•	•	
2700 W / 230 V AC			•				
3000 W / 230 V AC				•	•	•	•
3000 W / 400 V 2-phase				•	•	•	•
3300 W / 400 V 2~			•				
5000 W / 400 V 2~			•	•	•	•	•
6000 W / 400 V 2~				•	•	•	•
5000 W / 400 V 3~			•				
6000 W / 400 V 3~				•	•	•	•
9000 W / 400 V 3~					•	•	•
12000 W / 400 V 3~					•	•	•

1) Max. outlet temperature 40°C. For higher temperatures, consult VEAB.

2) Also available with 150 mm dia. Delivered without rubber seals.

3) Also available with 350 mm dia. Delivered without rubber seals.

Type MTU, MTEM and MTXL duct heaters with built-in control equipment

Types MTU, MTEM and MTXL of the CV series of duct heaters have built-in electronic temperature regulators that control the output across a triac by time proportional control (intermittent ON/OFF control). This provides very accurate temperature control. Since control takes place by means of the built-in triac, the system is totally silent and sustains a minimum of wear.

Type M, ML, E and R duct heaters for external control equipment

The CV duct heater is also available without built-in regulator and is then supplemented with an external temperature regulator or thermostat. The duct heaters are available in four types: M, ML, E and R.

Overheating protection

All CV heaters have two overheating protections, one of which is with automatic reset and the other with manual reset. On delivery, these are connected in series with the heater elements and therefore need not be connected to an external relay. This improves reliability and lowers the installation costs.

Exception: for the 12 000 W type E heater, the built-in overheating protections must be connected to an external control circuit.

Resetting the overheating protection

The overheating protection reset buttons of all duct heaters with the exception of type R are located on the heater cover. Resetting of type R duct heater for 230V AC is carried out electrically by means of type RSI/RSU reset button arranged in any suitable location, or via the PULSER 220 R electric heater regulator.

Installation and sizing

The duct heaters can be installed in horizontal or vertical ducts. The air flow through the duct heater must be in the direction of the arrow on the heater. In a horizontal duct, the junction box should be at the top, within an angle of 90° to the sides. The heater must not be mounted with the junction box at the bottom. The distance to or from a duct bend, fan, damper or the like must be at least twice the connection diameter.

Interlock with fan/air flow rate

Electric duct heaters must always be installed so that they are interlocked either with the fan that delivers air into the duct or with the air flow rate through the heater. The power supply to the duct heater must be interrupted if the fan is tripped or the air flow is interrupted. This function can be connected to the incoming power supply to the duct heater, or directly to the heater regulator for duct heaters with built-in control.

Minimum air velocity

The duct heaters are designed for a minimum air velocity of 1.5 m/s and a maximum operating outlet air temperature of 40°C. We also manufacture duct heaters for higher outlet air temperatures. Get in touch with VEAB during your project design work.

Ambient temperatures for duct heaters:
 Without built-in control equipment = 40°C max.
 With built-in control equipment = 30°C max.

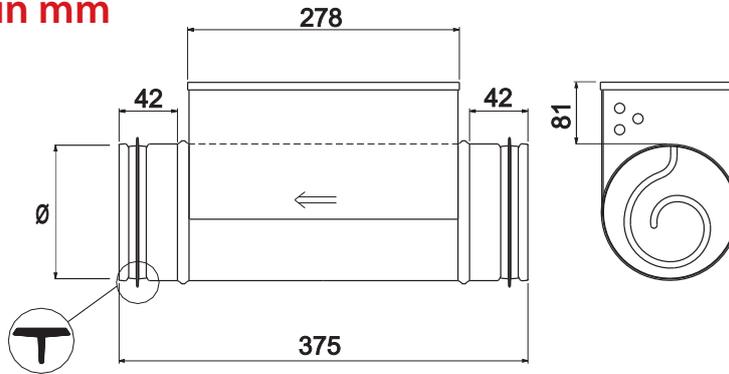
Power demand

The air flowing through the duct heater is heated in accordance with the following formula:

$$P = Q \times 0.36 \times \Delta t$$

P = Power, W
 Q = Air flow rate, m³/h
 Δt = Temperature rise, °C

Dimensions in mm

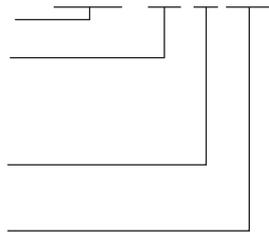


Project design/ordering

Type designation

- Duct size, cm
- Power, x100 W
- Power supply:
 - 1 = 230V AC
 - 2 = 400V 2-phase
 - 3 = 400V 3-phase
- Control equipment type

CV 16 - 50 - 2 MTU



Specify the following when placing your order

1. Type:
2. Voltage
3. Output
4. Min. air flow: - m³/h
5. Duct size: - mm
6. Control equipment and type of sensor

CV

Circular electric duct heaters with built-in control equipment

The CV heater with built-in control equipment offers simple installation and reduces the installation cost. The installation requires a minimum of cable runs, and reduces the risk of incorrect wiring.

Type MTU

Duct heater with built-in temperature regulator for room or duct sensors. The heater can be adjusted for external setpoint adjustment or for setpoint adjustment on the heater cover.

Sensors and any external setpoint adjusters are available as separate accessories.

Type MTXL

Duct heater with built-in regulator for external 0...10V control signal.

The heater has a built-in relay with potential-free alarm contacts that indicate loss of power supply or tripping of the overheating protection for manual reset.

Type MTEM

Duct heater with built-in temperature regulator for room sensor with type TG-R430 setpoint selector and TG-K360 supply air sensor. The required room temperature can be set on the TG-R430. The minimum and maximum supply air temperatures can be set on the duct heater circuit board.

The sensors and setpoint selectors are available as separate accessories.

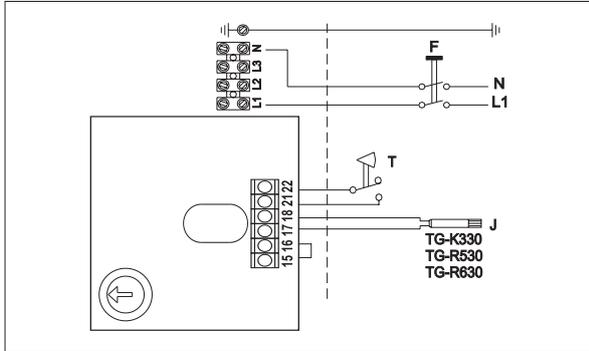


Accessories

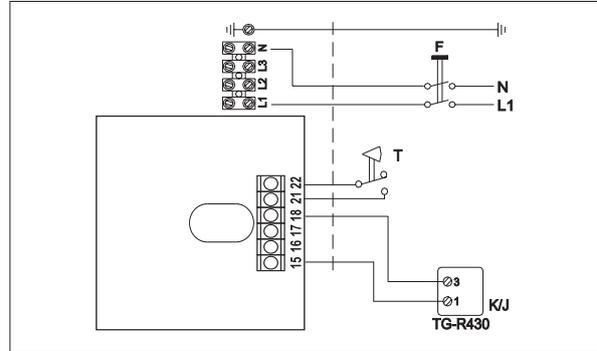
	Product	Range	Degree of protection
	Duct sensor TG-K330	0 - 30°C	IP 20
	Duct sensor TG-K360 Min./max. sensor for MTEM	0 - 60°C	IP 20
	Room sensor TG-R430 with setpoint adjustment	0 - 30°C	IP 30
	Room sensor TG-R530	0-30°C	IP 30
	Room sensor TG-R630	0-30°C	IP 65
	Pressure switch DTV200, incl. connection kit	20 - 300 Pa Max. 5A, 230V AC	IP 54
	Pressure switch AFS-222	10 - 3000 Pa Max. 15A, 230V AC	IP 20
	Connection kit	For AFS-222	

Circuit diagrams for duct heaters with built-in control equipment

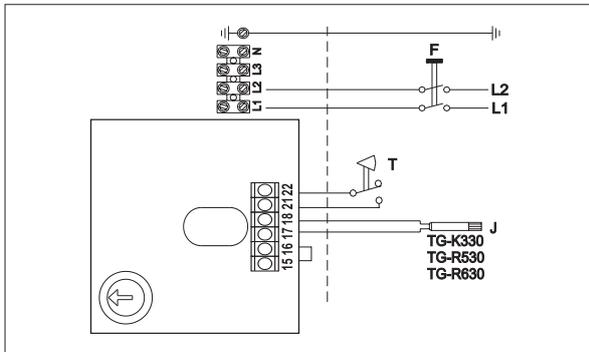
CV...-1 MTU For internal setpoint



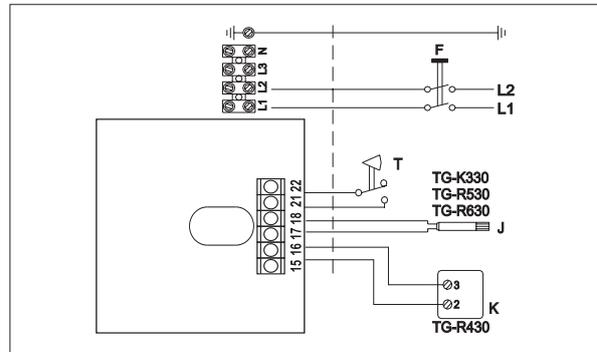
CV...-1 MTU For external setpoint



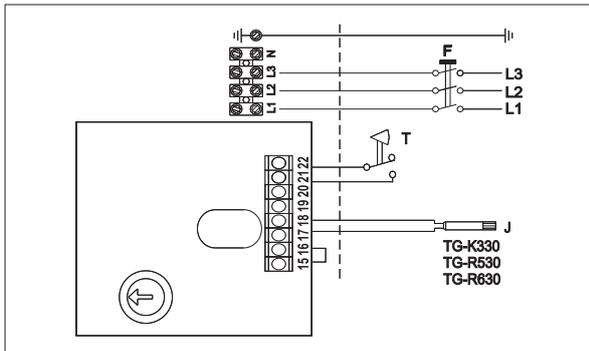
CV...-2 MTU For internal setpoint



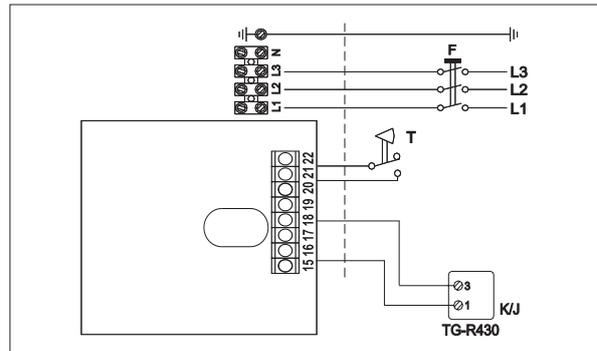
CV...-2 MTU For external setpoint



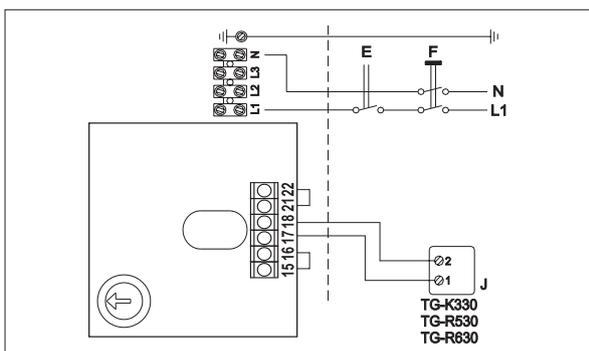
CV...-3 MTU For internal setpoint



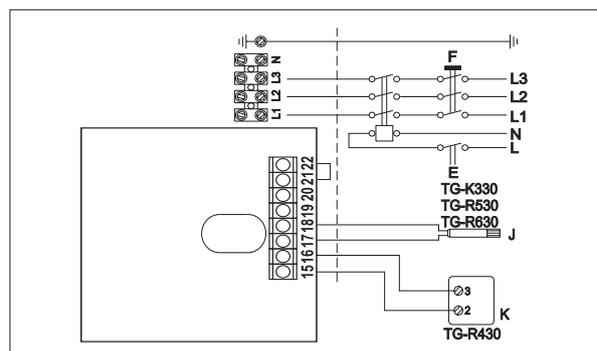
CV...-3 MTU For external setpoint



CV...-1 MTU Interlocked with fan

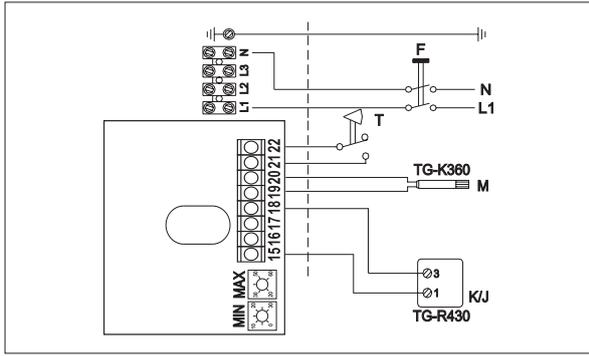


CV...-3 MTU Interlocked with fan

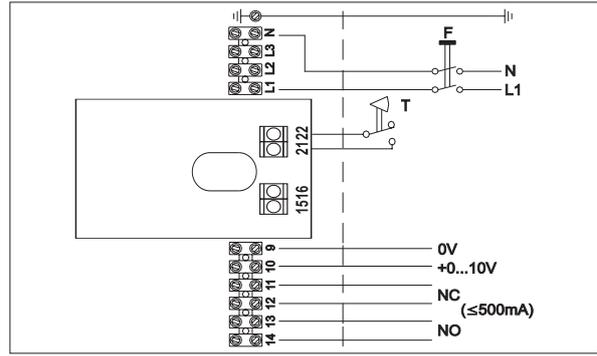


CIRCULAR ELECTRIC DUCT HEATERS
WITH BUILT-IN CONTROL EQUIPMENT

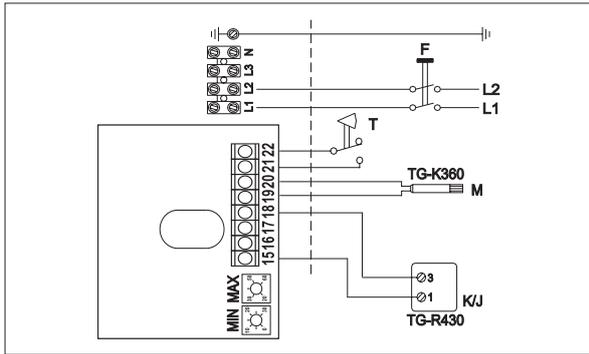
CV...-1 MTEM



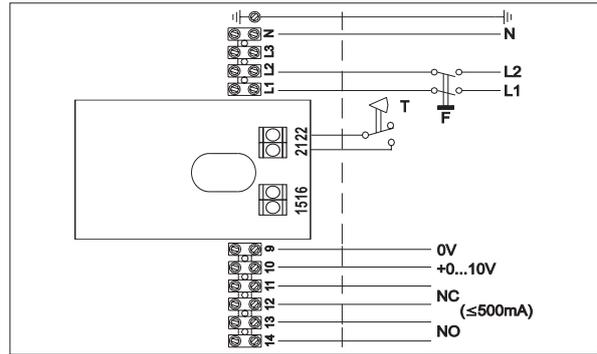
CV...-1 MTXL



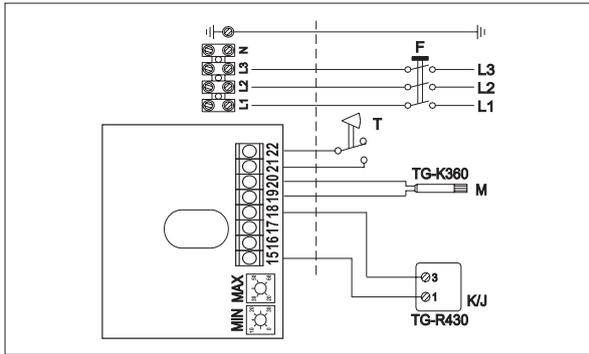
CV...-2 MTEM



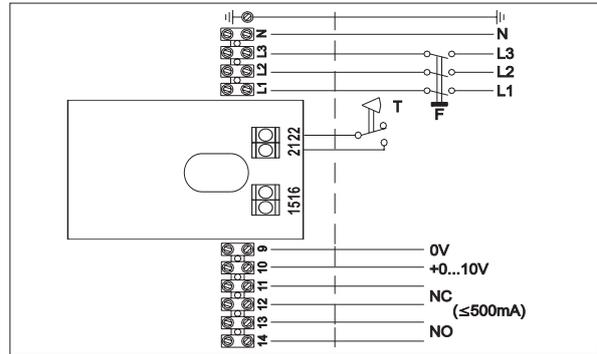
CV...-2MTXL



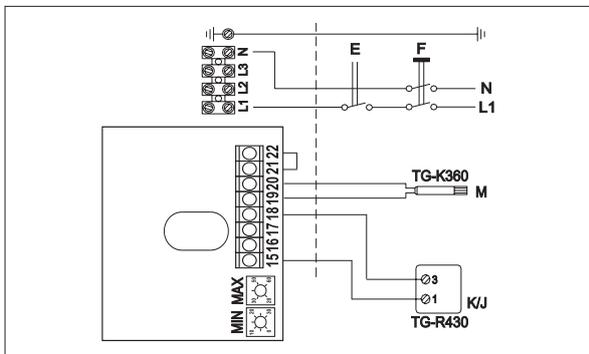
CV...-3 MTEM



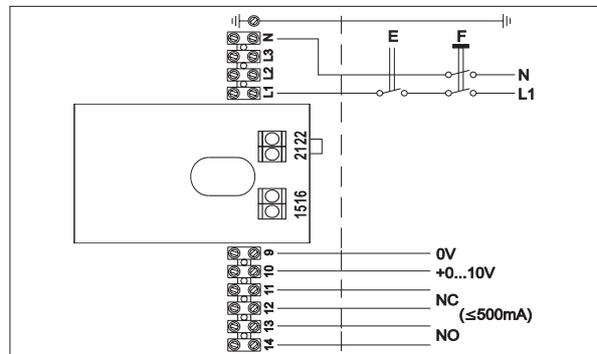
CV...-3MTXL



CV...-1 MTEM Interlocked with fan



CV...-1 MTXL Interlocked with fan



E = Interlock
F = All-pole switch
J = Sensor
K = Temperature adjuster
M = Limiting sensor
T = Interlock with flow switch

NC = Potential-free alarm contacts. Close on tripping of overheating protection with manual reset and on loss of power supply.
NO = Potential-free alarm contacts. Open on tripping of overheating protection with manual reset and on loss of power supply.

CV

Circular electric duct heaters for external control equipment

VEAB electric duct heaters for external control can be supplemented with an external temperature regulator or thermostat. These can be mounted on a wall, a ceiling or a DIN rail in an electrical cubicle.

Type M

Can be controlled by a PULSER or TTC type regulator. The overheating protection can be reset manually on the duct heater cover. Rating: up to 9000 W.

Type ML

Can be controlled by a PULSER or TTC type regulator. Alarm relay with potential-free alarm contacts for indicating that the overheating protection has tripped. The overheating protection can be reset manually on the duct heater cover. Ratings up to 9000 W.

Type E

Can be controlled by a type TTC regulator. The built-in overheating protection can be reset manually on the duct heater cover. The overheating protections are single-pole and must be connected to an external control circuit. Rating: 12 000 W

Type R

The built-in overheating protection can be reset manually by electrical remote control via an external type RSI/RSU reset button with indicating lamp. The lamp lights up when the overheating protection has tripped. For 230 V, a PULSER 220 R can be used, which has a built-in reset button and indicating lamp, in addition to the usual control function. For 400 V, a PULSER or TTC is used and an external RSI/RSU reset button.



Electric heater regulators



PULSER



PULSER D



TTC 2000



TTC 40F

PULSER series

PULSER is a series of electric heater regulators that regulate the output by means of time proportional control (intermittent ON/OFF control). This provides very accurate temperature control.

Degree of protection: IP 30 (PULSER D IP20)
Max. load: 230V AC, 3200 W
400V, 2-phase, 6400 W

PULSER

The PULSER operates with one sensor, i.e. the built-in room sensor or an external sensor, e.g. a duct sensor. Automatic switching between 230V AC and 400V, 2-phase.

PULSER D

Same characteristics as the PULSER, but for DIN rail mounting.

PULSER M

M stands for min. sensor or max. sensor, which means that in addition to, for example, a main sensor (room sensor), a minimum sensor can be connected in the supply air duct*. PULSER M then controls the room temperature, at the same time maintaining a minimum supply air temperature.

Automatic switching between 230V AC and 400V, 2-phase.

*Use duct sensor/min. sensor TG-K330.

PULSER ADD

The PULSER ADD does not have its own sensor, but is under slave control of another PULSER and operates in parallel with it. This means that twice the power can be controlled from one sensor.

Automatic switching between 230V AC and 400V, 2-phase.

PULSER 220 R

This is specially adapted for operating together with the CV type R duct heater for 230V AC. The PULSER-R is provided with a reset button and a lamp that lights up when the overheating protection has tripped.

PULSER 200 X010 and PULSER 380 X010

These regulators are controlled by an external 0...10V control signal.

TTC Series

Electric heater regulators that control the output by time proportional control (intermittent ON/OFF control), which provides very accurate temperature control. The setpoint is preset either on the regulator or externally.

The TTC series has terminals for external main sensor and min./max. sensor. Use the TG-K360 as min./max. sensor. Alternatively, the TTC series can be controlled by an external 0...10V signal.

TTC 2000

For wall mounting

Maximum installed power: 17 kW, 400V, 3-phase
Automatic switching: 210V AC - 415V 3-phase
Degree of protection: IP 30
Terminals: For 0...10V external control signal

TTC 25 and TTC 40F

Operate like the TTC but are intended for mounting on a DIN rail in an electrical cubicle.

Automatic switching: 210V AC - 415V 3-phase
Degree of protection: IP 20
Terminals: For 0...10V external control signal

Maximum power at the terminals:

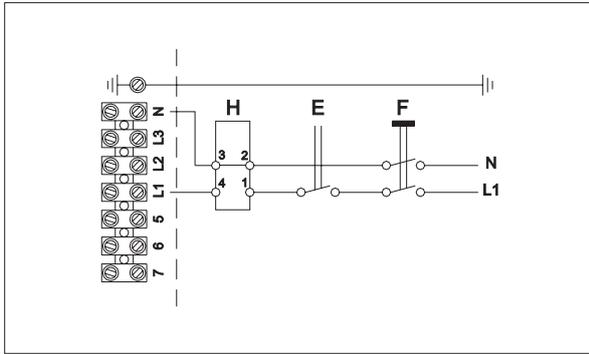
TTC 25: 25 A, 400 V, 17 kW
TTC 40F: 40 A, 400 V, 27 kW

Accessories

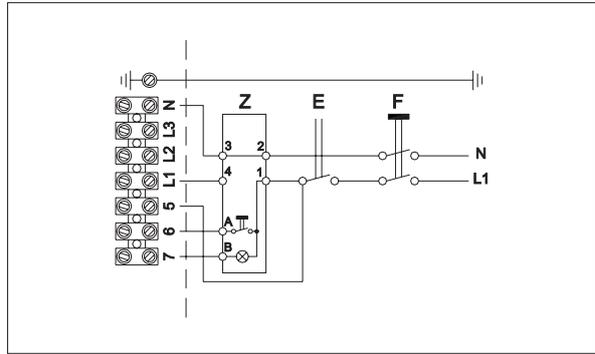
	Product	Range	Degree of protection
	Duct sensor TG-K330	0-30°C	IP 20
	Duct sensor TG-K360 Min./max. sensor for TTC series	0-60°C	IP 20
	Room sensor TG-R430 with setpoint adjustment	0-30°C	IP 30
	Room sensor TG-R530	0-30°C	IP 30
	Room sensor TG-R630	0-30°C	IP 65
	Pressure switch DTV200, incl. connection kit	20 - 300 Pa Max. 5A, 230V AC	IP 54
	Pressure switch AFS-222	10 - 3000 Pa Max. 15A, 230V AC	IP 20
	Connection kit ANS	For AFS-222	
	Reset button RSI/RSU for remote resetting of overheating protection in CV type R		

Circuit diagrams

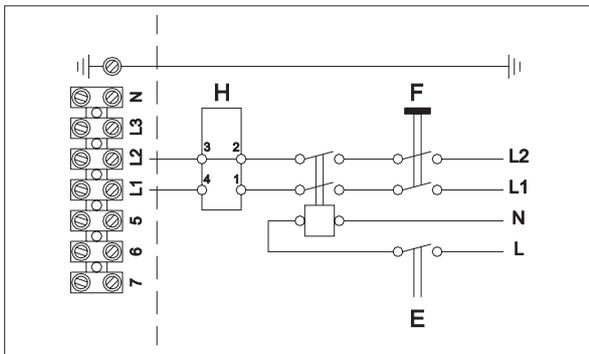
CV...-1 M and PULSER



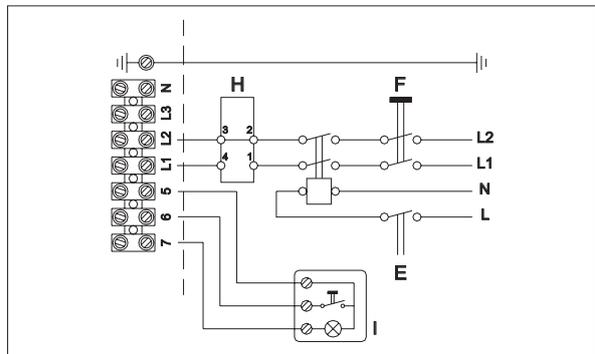
CV...-1 R and PULSER 220R



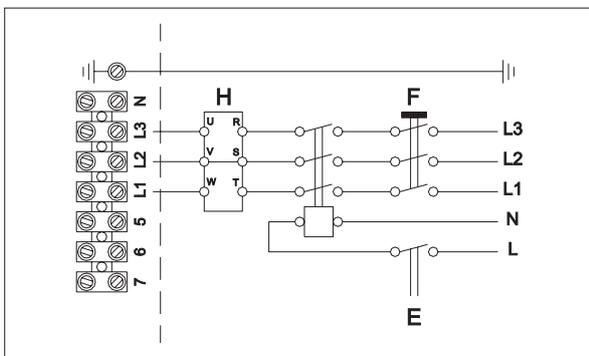
CV...-2 M and PULSER



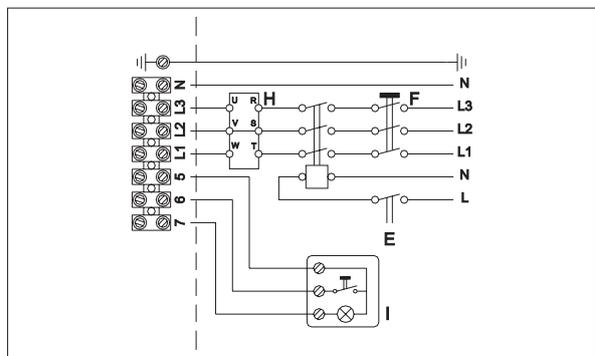
CV...-2 R with PULSER and RSI/RSU



CV...-3 M and TTC



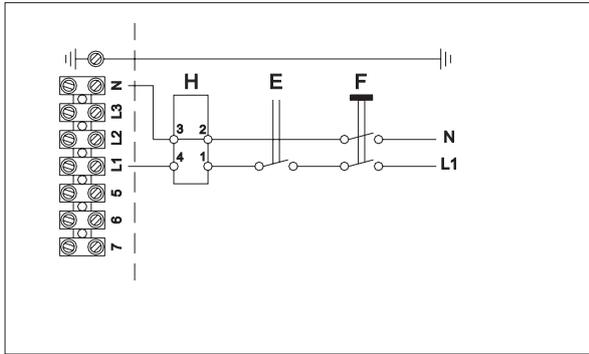
CV...-3 R with TTC and RSI/RSU



E = Interlock
F = All-pole switch
H = Pulser alt. TTC

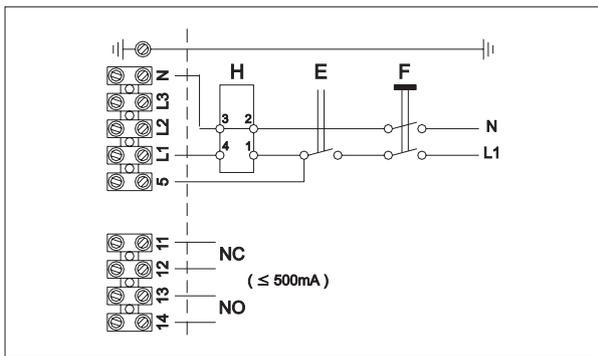
I = Reset button RSI/RSU
Z = PULSER 220R

CV...-3 E with rating of 12 000 W

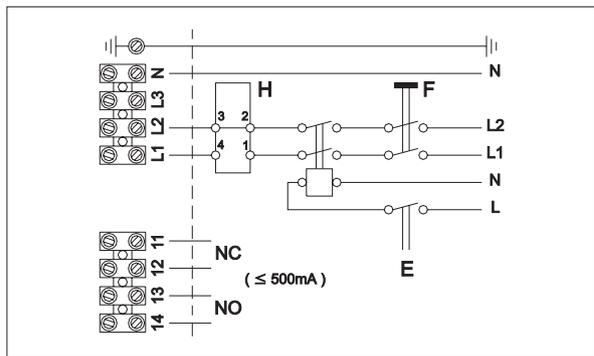


CV with external temperature regulator and auxiliary relay for alarm signal (potential-free)

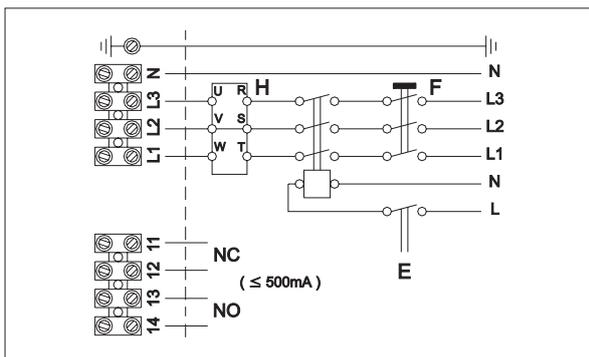
CV...-1 ML and PULSER



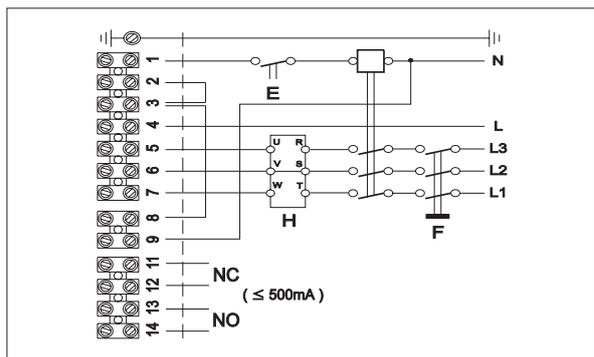
CV...-2 ML and PULSER



CV...-3 ML and TTC



CV...-3EL



NC = Potential-free alarm contacts. Close on tripping of overheating protection with manual reset and on loss of power supply.
NO = Potential-free alarm contacts. Open on tripping of overheating protection with manual reset and on loss of power supply.



VEAB Heat Tech AB • Phone: + 46 451 485 00 • Fax: + 46 451 410 80
www.veab.com • veab@veab.com