



CV  
Circular electric duct heaters

# CV

## Circular Electric Duct Heaters

VEAB's circular electric duct heaters are used to heat the ventilation air for various rooms and areas with individually controlled temperatures. When the system is appropriately sized, they can even heat up the entire building.

Circular electric duct heaters are also used for pre-heating or post-heating in air handling units. The duct heaters are available with an integrated electronic regulator or for external feedback control. An electronic flow switch can also be integrated.

- 7 sizes Ø 100 - 400 mm
- Output range 200 W – 15,000 W
- Air tightness class C as per EN 15727
- Integrated electronic flow switch is included in several models
- Integrated regulator or external feedback control
- Two integrated overheating protection devices
- Enclosed stainless tubular heating elements



### Standard Design

Casing made of steel plate with a coating of Magnelis ZM310, which means the plate fulfils corrosion class C5. Heating element in stainless steel, EN 1.4301.

The junction box contains all the terminals required for electrical connection.

The duct connection is suitable for push-in assembly in round ducts. CV is manufactured with IP44 rating, but also available with IP55.

### Overheating Protection

All CV models have dual overheating protection: one with automatic reset and one with manual reset. These are connected in series with the heating elements upon delivery and therefore do not need to be connected to any external relay (except model -E, see p. 11). This provides increased security and lower installation costs. All duct heaters feature a reset button for the overheating protection on the heater cover.

### Air velocity

Duct heaters with built-in flow sensors are made for a minimum air flow of 0.7 m/s. Heaters marked P are made for a minimum air flow of 0.5 m/s. Other duct heaters are made for a minimum air flow of 1.5 m/s.

### Air Tightness Class C

CV duct heaters meet air tightness class C, which ensures that the heated air reaches its destination and does not leak out of the ventilation system—that saves both energy and money.

### Electronic Flow Switch - Q

All models with an integrated control unit and for air velocities down to 0.7 m/s, there also is an option for adding an integrated electronic flow switch.

The flow switch continuously monitors the airflow and switches off the heater if the air velocity drops below 0.7 m/s and thus prevents overheating. When the air velocity rises above 0.7 m/s again, the heater is automatically switched back on. This implies that CV duct heaters with an integrated flow switch meet the requirement for interlocking with the fan/air flow and can be installed without any external interlock. This results in a very simple installation.

### Alarm Relay, Addition -L

All models can be equipped with an integrated relay with potential-free alarm contact, which indicates loss of voltage or whether the manually resettable overheating protection device has tripped.

### Reinforced Electrical Insulation

To avoid leakage currents to earth, the heating elements are mounted in electrically insulating material. Suitable for marine use, for example.

### Approvals

Our duct heaters are tested and approved by Intertek Semko AB in accordance with the following directives:

LVD directive: EN 60355-1 and EN 60335-2-30

EMC directives: EN 61000-6-3 and EN 61000-6-1

EMF directive: EN 62233



## Control Unit

### Integrated Regulator

The integrated regulator provides for a simple installation, among others, because it requires less cabling, which reduces both the installation cost and the risk of misconnections.

The regulator is electronic and regulates the output using a triac with so-called time-proportional control (pulse/pause technology). This results in very accurate temperature control. Since feedback control is performed electronically, its operation is completely noiseless and involves minimal wear.

The following models are available with an integrated regulator:

#### ViCi-QAL and ViCi-AL

Duct heaters with control systems via analogue 4-20mA or 2-10VDC/0-10VDC. For PWM, please contact VEAB before ordering.

#### ViCi-QO and ViCi-O

Duct heaters with control systems via one or two PT100, PT1000 or NTC sensors. NTC includes the option of external setpoint adjustment, while PT100 and PT 1000 only permit internal setpoint adjustment. The min./max. inlet air temperature is adjusted internally in all instances.

### External Regulator

There also are duct heaters without integrated regulator that can instead be complemented with an external one.

The following models are available for an external regulator:

### P

Air Velocity Down to 0.5 m/s.

Only in combination with ViCi-A or ViCi-O, and with no integrated regulator.

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#### Air Velocity Down to 0.5 m/s -P- ViCi-O(L), -P- ViCi-A(L)

See pages 12-13.

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#### -M(L) and -E(L)

The duct heater is complemented with an external temperature regulator and sensor. See pages 12 and 13.

## Additional Options

There are several options beyond the standard design that can be adapted to your application.

### Other Types of Materials

The casing can be made of stainless steel, EN 1.4301, or of acid-resistant stainless steel, EN 1.4404.

### Anti-condensation Insulation (except CV Ø100, Ø250, Ø315 and Ø400)

To reduce the risk of condensation in the junction box when the duct heater is installed in a warm and humid area, at the same time as the air in the duct is cold, a 4 mm thick insulation is added to the inside of the junction box.

### IP55 Degree of Protection

Our duct heaters can be manufactured with an IP55 degree of protection instead of the standard IP44.

### Modbus

Duct heaters fitted with ViCi adjustment have Modbus communication as standard.  
Contact VEAB for further information.

### Duct Heaters with Outlet Temperatures Higher Than 50 °C

Only available in a rectangular design with circular connections. See "Rectangular Electric Duct Heaters".

### Dimensions over Ø400 mm

Only available in a rectangular design with circular connections. See "Rectangular Electric Duct Heaters".

### Output Above 15 kW

Only available in a rectangular design with circular connections. See "Rectangular Electric Duct Heaters".

### Reinforced Electrical Insulation

To avoid leakage currents to earth, the heating elements are mounted in electrically insulating material.  
Suitable for marine use, for example.

# Product Range Overview

Size designation		CV 10	CV 12	CV 16	CV 20	CV 25	CV 31	CV 40
Diameter ( Ø mm)		100	125	160*	200	250	315	400 **
Minimum air volume m <sup>3</sup> /h		43	70	110	170	270	415	690
Output	Voltage							
300 W	230 VAC 1-ph.		X <sup>3</sup>	X <sup>2</sup>				
400 W	230 VAC 1-ph.	X <sup>3</sup>						
600 W	230 VAC 1-ph.	X <sup>3</sup>	X <sup>5</sup>	X <sup>3</sup>	X <sup>2</sup>	X <sup>1</sup>		
900 W	230 VAC 1-ph.		X <sup>7</sup>	X <sup>4</sup>	X <sup>2</sup>	X <sup>2</sup>	X <sup>1</sup>	
1200 W	230 VAC 1-ph.		X <sup>8</sup>	X <sup>5</sup>	X <sup>3</sup>	X <sup>2</sup>	X <sup>1</sup>	
1500 W	230 VAC 1-ph.		X <sup>9</sup>	X <sup>6</sup>	X <sup>3</sup>	X <sup>3</sup>	X <sup>2</sup>	
1800 W	230 VAC 1-ph.		X <sup>10</sup>	X <sup>6</sup>	X <sup>4</sup>	X <sup>3</sup>	X <sup>2</sup>	
2100 W	230 VAC 1-ph.			X <sup>7</sup>	X <sup>4</sup>	X <sup>3</sup>	X <sup>2</sup>	
2700 W	230 VAC 1-ph.			X <sup>8</sup>				
3000 W	230 VAC 1-ph.				X <sup>6</sup>	X <sup>4</sup>	X <sup>3</sup>	X <sup>2</sup>
3000 W	400 VAC 2-ph.				X <sup>6</sup>	X <sup>4</sup>	X <sup>3</sup>	X <sup>2</sup>
3300 W	400 VAC 2-ph.			X <sup>9</sup>				
5000 W	400 VAC 2-ph.			X <sup>12</sup>	X <sup>8</sup>	X <sup>6</sup>	X <sup>4</sup>	X <sup>3</sup>
6000 W	400 VAC 2-ph.				X <sup>9</sup>	X <sup>7</sup>	X <sup>4</sup>	X <sup>3</sup>
5000 W	400 VAC 3-ph.			X <sup>12</sup>				
6000 W	400 VAC 3-ph.				X <sup>9</sup>	X <sup>7</sup>	X <sup>4</sup>	X <sup>3</sup>
9000 W	400 VAC 3-ph.					X <sup>9</sup>	X <sup>6</sup>	X <sup>4</sup>
12000 W	400 VAC 3-ph.					X <sup>10</sup>	X <sup>7</sup>	X <sup>5</sup>
15000 W	400 VAC 3-ph.							X <sup>5</sup>

\*= Also available with a 150 mm diameter.

\*\*= Also available with a 355 mm diameter.

<sup>1</sup>= See pressure drop curve 1

<sup>2</sup>= See pressure drop curve 2

<sup>3</sup>= See pressure drop curve 3

<sup>4</sup>= See pressure drop curve 4

<sup>5</sup>= See pressure drop curve 5

<sup>6</sup>= See pressure drop curve 6

<sup>7</sup>= See pressure drop curve 7

<sup>8</sup>= See pressure drop curve 8

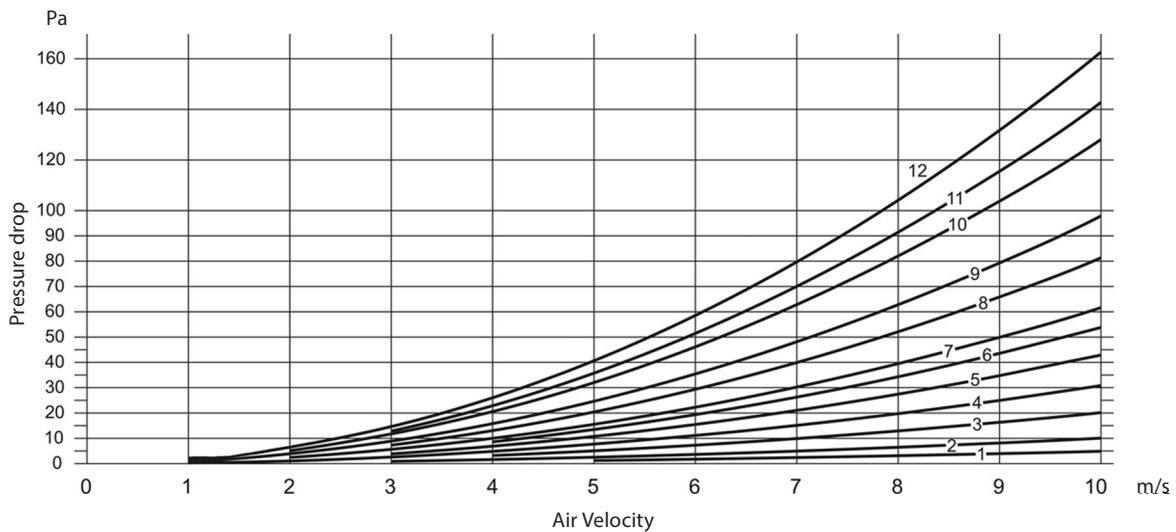
<sup>9</sup>= See pressure drop curve 9

<sup>10</sup>= See pressure drop curve 10

<sup>11</sup>= See pressure drop curve 11

<sup>12</sup>= See pressure drop curve 12

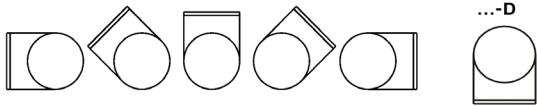
## Pressure Drop Chart



### Installation

These duct heaters can be mounted in horizontal or vertical ducts. The air flow through the duct heater must follow the air direction arrow on the duct heater. In horizontal ducts, the junction box must be installed pointing up or rotated to the sides by up to 90°.

Installation with the junction box pointing down is not allowed. The distance to or from a duct bend, fan, damper, etc. must be at least equal to twice the connection diameter.



### Interlocking with Fan/Air Flow

Electric duct heaters must always be installed in such a way that they are interlocked with the fan that blows air into the duct or with the air flow streaming through the heater.

The power fed to the duct heater must be cut off, should the fan be shut off or if the air flow ceases.

The - ViCi-QAL and - ViCi-QO models with integrated electronic flow switch fulfil the requirement for interlock with fan/air flow and can be installed without external interlock.

For all other models, this function must be connected to the input voltage fed to the duct heater or directly connected to the integrated regulator, if any.

### Minimum Air Velocity and Output Temperature

Duct heaters with integrated flow sensors - ViCi-QAL and - ViCi-QO are dimensioned for a minimum air flow of 0.7 m/s. Heaters with P in their product code are dimensioned for a minimum air flow of 0.5 m/s. Other heaters must have a minimum air flow of 1.5 m/s. Maximum temperature of outgoing air for all the above is 50 °C (for higher temperatures see “Electrical Rectangular Heaters”).

Ambient temperature during operation:

Without integrated control device = 40 °C max.

With integrated control device = 30 °C max.

The air velocity can be calculated using the following formula:

$$V = \frac{Q}{3600 \times A}$$

V = air velocity, m/s

Q = air flow, m<sup>3</sup>/h

A = sectional area of duct heater, m<sup>2</sup>

$$A = \frac{\pi \times D^2}{4}$$

D = duct heater diameter, Ø m

### Power Requirements

The volume of air that goes through the duct heater is heated according to the following formula:

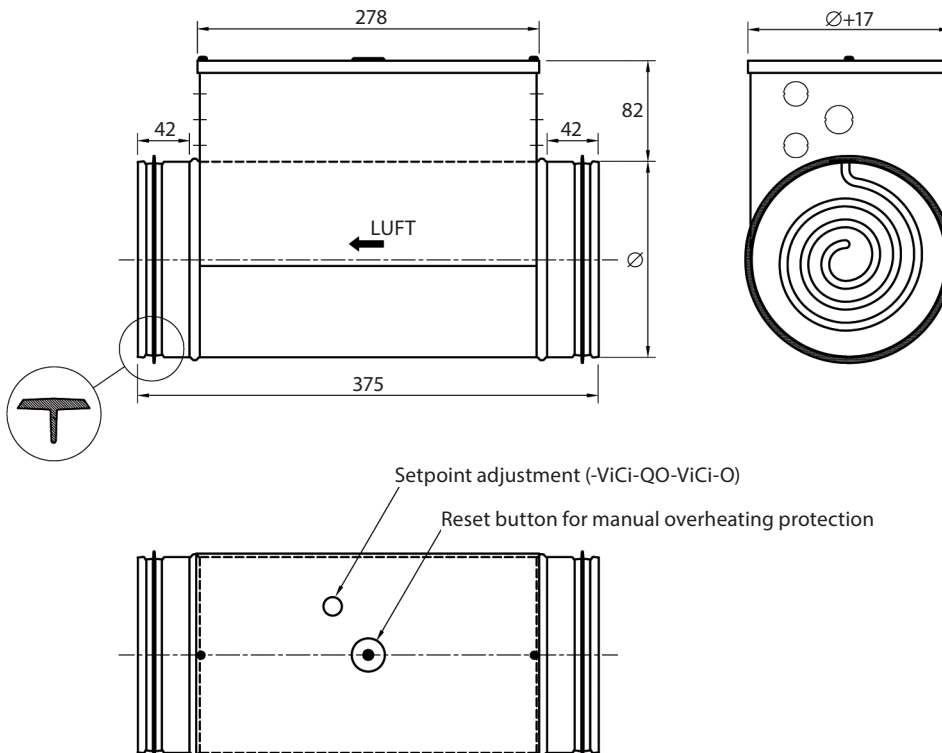
$$P = Q \times 0.36 \times \Delta$$

P = output in W

Q = air flow in m<sup>3</sup>/h

Δ = temperature increase in °C

### Dimensional Drawing



# CV

## Circular Electric Duct Heaters with Integrated Control Device for Room or Duct Sensors

The integrated controller provides for a simple installation among others due to less cabling. This in turn reduces both the installation cost and the risk of misconnections.

The duct heater operates with an external room or duct sensor. The temperature is adjusted on the heater cover or on an external setpoint adjuster.

### - ViCi-QO

Duct heater with integrated control device for room or duct sensors. The heater can be set up for external setpoint adjustment or for setpoint adjustment on the heater cover.

A second sensor can be connected in the inlet duct. Min./Max. temperatures can then be set on the duct heater control board. The model also has an integrated electronic flow switch that further simplifies installation as it can be installed as a “standalone” unit.

Sensors and a possible external setpoint adjuster are available as separate accessories.



### - ViCi-O

Same model as above, but without integrated electronic flow switch.

### - ViCi-QOL and - ViCi-OL

Same models as above, but with an additional integrated relay with potential-free alarm contact, which indicates loss of voltage or whether the manually resettable overheating protection device has tripped.

## Project Design/Orders

### Descriptive text - ViCi-QO

Duct heater, VEAB type - ViCi-QO, with casing made of steel plate with a coating of Magnelis ZM310, which means the plate fulfils corrosion class C5. Heating element in stainless steel, EN 1.4301. The duct heater meets air tightness class C as per EN 15727. Integrated electronic flow switch. Feedback control is achieved by means of the integrated temperature regulator for room or duct sensors. Setpoint adjustment is performed externally or on the heater cover. Sensors and a possible setpoint adjuster must be ordered separately.

### Descriptive text - ViCi-O

Duct heater, VEAB type - ViCi-O, with casing made of steel plate with a coating of Magnelis ZM310, which means the plate fulfils corrosion class C5. Heating element in stainless steel, EN 1.4301. The duct heater meets air tightness class C as per EN 15727. Feedback control is achieved by means of the integrated temperature regulator for room or duct sensors. Setpoint adjustment is performed externally or on the heater cover. Sensors and a possible setpoint adjuster must be ordered separately.

### Type designation (example)

Size designation, see page 4

Output in hundreds of watts

Voltage 1=230V~ 2=400V2~ 3=400V3~

Type of regulation - ViCi-QO/ViCi-O, see above)

Addition L= Alarm relay

CV 16 - 50 - 2 -ViCi-QO L

## Accessories

There are several sensor/setpoint combinations for CV -ViCi-QQ(L). Five typical cases are presented here. Data for sensors, see page. 15. For a complete connection diagram, refer to the installation instructions on our website [www.veab.com](http://www.veab.com) (select Products/Duct Heaters – Electric).

### For setpoint adjustment:

#### Duct Sensors

Option 1: Duct sensor with setpoint adjustment on heater cover.



TG-K330 as sensor.



The setpoint is adjusted manually on the duct heater cover.

Option 2: Duct sensor with separate setpoint adjustment.



TG-K330 as sensor.



TG-R430 as setpoint adjuster.

#### Room Sensors

Option 3: Room sensor with setpoint adjustment.



TG-R430 as setpoint adjuster and room sensor.

Option 4: Room sensor with separate setpoint adjustment.



TG-R530 (IP30) or TG-R630 (IP54) as room sensor.



TG-R430 as setpoint adjuster.

Option 5: Room sensor with setpoint adjustment on heater cover.



TG-R530 (IP30) or TG-R630 (IP54) as room sensor.



The setpoint is adjusted manually on the duct heater cover.

### For Min./Max. limitation:

#### Duct Sensors



TG-K360 as min./max. inlet air sensor.

TG-K360 as min./max. inlet air sensor.

# CV

## Circular Electric Duct Heaters with Integrated Control Device for External Control Signal 0...10 V

The integrated controller provides for a simple installation among others due to less cabling. This in turn reduces both the installation cost and the risk of misconnections.

### - ViCi-QAL

Duct heaters with integrated control equipment for 4-20mA, 2-10VDC, 0-10VDC (and 0/10V PWM on request)

The model also has an integrated electronic flow switch that further simplifies installation as it can be installed as a "standalone" unit.

Potential-free alarm contact, which indicates loss of voltage or whether the manually resettable overheating protection device has tripped.

### - ViCi-AL

Same model as above, but without integrated electronic flow switch.

### - ViCi-QAL and ViCi-AL

Same models as above, but with an additional integrated relay. The potential-free alarm contact included indicates loss of voltage or whether the manually resettable overheating protection device has tripped.



## Project Design/Orders

### Descriptive text - ViCi-QAL

Duct heater, VEAB type CV - ViCi-QAL, with casing made of steel plate with a coating of Magnelis ZM310, which means the plate fulfils corrosion class C5. Heating element in stainless steel, EN 1.4301. The duct heater meets air tightness class C as per EN 15727. Integrated electronic flow switch with potential-free alarm contact, which indicates loss of voltage or whether the manually resettable overheating protection device has tripped. Feedback control is achieved by means of an integrated regulator for external 0...10 V control signal.

### Type designation

(example)

Size designation, see page 4 \_\_\_\_\_

Output in hundreds of watts \_\_\_\_\_

Voltage 1=230V~ 2=400V2~ 3=400V3~ \_\_\_\_\_

Type of regulation ViCi-QA/ViCi- A \_\_\_\_\_  
Addition L=Alarm relay

### Descriptive text - ViCi-AL

Duct heater, VEAB type CV - ViCi-AL, with casing made of steel plate with a coating of Magnelis ZM310, which means the plate fulfils corrosion class C5. Heating element in stainless steel, EN 1.4301. The duct heater meets air tightness class C as per EN 15727. Integrated relay with potential-free alarm contact, which indicates loss of voltage or whether the manually resettable overheating protection device has tripped. Feedback control is achieved by means of an integrated regulator for external 0...10 V control signal.

### CV 16 - 50 - 2 - ViCi-QA L



## Feedback Control with Accessories

There are several ways to regulate a CV - ViCi-QAL - ViCi-AL. Three examples are presented here. For a complete connection diagram, refer to the installation instructions on our website [www.veab.com](http://www.veab.com) (select Products/Duct Heaters – Electric).

### Higher Level Systems



2-10V/0-10 V/4-20mA



### Air Handling Unit Having an Integrated Control Unit with Output for post-heating battery



2-10V/0-10 V/4-20mA



### Regulator control



2-10V/0-10 V/4-20mA



# CV

## Circular Electric Duct Heaters for External Control Device

VEAB electric duct heaters for external control are complemented with an external temperature regulator. They can be installed on walls or in control cabinets. Regulators and sensors must be ordered separately, see p. 14 and 15.

### - M

A PULSER or TTC regulator is most suitable for its feedback control.

The overheating protection is reset manually on the duct heater cover. Output up to 9000 W.

### - ML

Same model as above, but with an additional integrated relay with potential-free alarm contact, which indicates loss of voltage or whether the manually resettable overheating protection device has tripped.



### Project Design/Orders

#### Description – M

Duct heater, VEAB type CV -M, with casing made of steel plate with a coating of Magnelis ZM310, which means the plate fulfils corrosion class C5. Heating element in stainless steel, EN 1.4301. The duct heater meets air tightness class C as per EN 15727. Feedback control is achieved by means of an external regulator to be ordered separately.

#### Description – ML

Duct heater, VEAB type CV -ML, with casing made of steel plate with a coating of Magnelis ZM310, which means the plate fulfils corrosion class C5. Heating element in stainless steel, EN 1.4301. The duct heater meets air tightness class C as per EN 15727. Integrated relay with potential-free alarm contact, which indicates loss of voltage or whether the manually resettable overheating protection device has tripped. Feedback control is achieved by means of an external regulator to be ordered separately.

#### Type designation

(example)

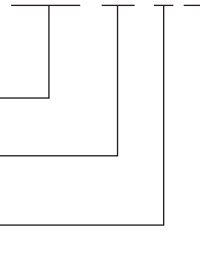
Size designation, see page 4

Output in hundreds of watts

Voltage 1=230V~ 2=400V2~ 3=400V3~

Type of feedback control (-M/-ML, see above)

**CV 16 - 50 - 2 ML**



# CV

## Circular Electric Duct Heaters for External Control Device

VEAB electric duct heaters for external control are complemented with an external temperature regulator. They can be installed on walls or in control cabinets. Regulators and sensors must be ordered separately, see p. 14 and 15.

### - E

A PULSER or TTC regulator is most suitable for its feedback control.

The integrated manual overheating protection device is reset on the duct heater cover. The overheating protection devices are single pole and must be connected to the external control circuit.

Power up to 15000 W.



### - E - D

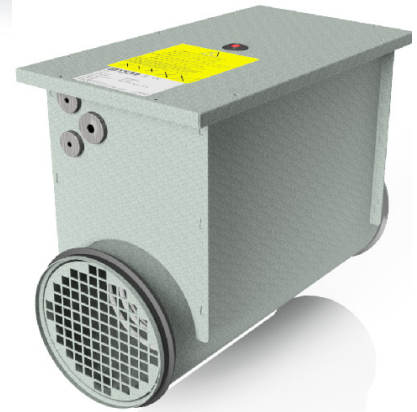
Same model as above, but can be fitted with junction box at the bottom.

Overheating protection with capillary tube.

### - E - DRI

Same model as above, but can be fitted with junction box at the bottom.

Overheating protection with capillary tube and improved electrical insulation.



## Project Design/Orders

### Descriptive text -E

Duct heater, VEAB type CV -E, with casing made of steel plate with a coating of Magnelis ZM310, which means the plate fulfils corrosion class C5.

Heating element in stainless steel, EN 1.4301. The duct heater meets air tightness class C as per EN 15727. Feedback control is achieved by means of an external regulator to be ordered separately.

### Type designation

(example)

CV 16 - 50 - 2 E D

Size designation, see page 4

Output in hundreds of watts

Voltage 1=230V~ 2=400V2~ 3=400V3~

Type of regulation

Option D- DRI

# CV

## Circular Electric Duct Heaters for Air Velocities Down to 0.5 m/s

### Models

#### - P- ViCi-O

Duct heater with integrated control device for room or duct sensors. The heater can be set up for external setpoint adjustment or for setpoint adjustment on the heater cover.

For suggestions on combinations of sensors and possible external setpoint adjusters, see page 7.

Sensors and setpoint adjusters are available as separate accessories, see page 15.

#### - P- ViCi-AL

Duct heaters with integrated control equipment for external 0...10 V control signal.

The heater comes with an integrated relay with potential-free alarm contact, which indicates loss of voltage or whether the manually resettable overheating protection device has tripped.

#### - P

The duct heater is complemented with an external temperature regulator and sensor. PULSER regulators are most suitable for its feedback control for an output greater than 230 W.

Below 230 W, we recommend a model with integrated control unit. The overheating protection is reset manually on the duct heater cover.

Regulators, sensors and setpoint adjusters are available as separate accessories, see page 14-15.

#### - P- ViCi-OL, -PL

Same models as -P- ViCi-O/-P but with an additional integrated relay with potential-free alarm contact, which indicates loss of voltage or whether the manually resettable overheating protection device has tripped.

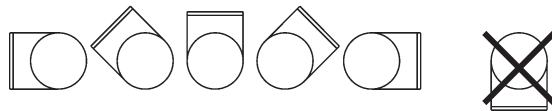


### Installation

These duct heaters can be mounted in horizontal or vertical ducts. The air flow through the duct heater must follow the air direction arrow on the duct heater.

In horizontal ducts, the junction box must be installed pointing up or rotated to the sides by up to 90°.

Installation with the junction box pointing down is not allowed. The distance to or from a duct bend, fan, damper, etc. must be at least equal to twice the connection diameter.



### Interlocking with Fan/Air Flow

Electric duct heaters must always be installed in such a way that they are interlocked with the fan that blows air into the duct or with the air flow streaming through the heater.

The power fed to the duct heater must be cut off, should the fan be shut off or if the air flow ceases.

## Dimensional Drawing

See page 5.

## Degree of protection

CV-P is manufactured with IP44 rating, but also available with IP55.

## Minimum Air Velocity and Output Temperature

The duct heaters are dimensioned for an air velocity down to 0.5 m/s and an operating outlet air temperature of 50 °C max. For a formula to calculate the air velocity, see page 5.

## Power Requirements

For a formula to calculate the air velocity, see page 5.

## Product Range Overview

Size designation		CV 08	CV 10	CV 12	CV 16
Diameter (∅ mm)		80	100	125	160*
Minimum air volume m <sup>3</sup> /h		9	15	24	37
Output	Voltage				
200 W	230 VAC 1-ph.	X <sup>5</sup>	X <sup>3</sup>	X <sup>3</sup>	
400 W	230 VAC 1-ph.		X <sup>3</sup>	X <sup>5</sup>	
600 W	230 VAC 1-ph.			X <sup>7</sup>	X <sup>4</sup>
800 W	230 VAC 1-ph.			X <sup>8</sup>	
1000 W	230 VAC 1-ph.			X <sup>9</sup>	
1200 W	230 VAC 1-ph.			X <sup>10</sup>	X <sup>6</sup>
1800 W	230 VAC 1-ph.				X <sup>8</sup>

\*= Also available with a 150 mm diameter.

3= See pressure drop curve 3, on page 4

4= See pressure drop curve 4, on page 4

5= See pressure drop curve 5, on page 4

6= See pressure drop curve 6, on page 4

7= See pressure drop curve 7, on page 4

8= See pressure drop curve 8, on page 4

9= See pressure drop curve 9, on page 4

10= See pressure drop curve 10, on page 4

## Project Design/Orders

### Descriptive text - P- ViCi-O

Duct heater, VEAB type CCV -P-ViCi-O with a coating of Magnelis ZM310, which means the plate fulfils corrosion class C5. Heating element in stainless steel, EN 1.4301. The duct heater meets air tightness class C as per EN 15727 and made for a minimum air flow of 0.5 m/s. Setpoint adjustment is performed externally or on the heater cover.

A Min./Max. limit sensor can also be used in the inlet air.

### Descriptive text - P- ViCi-AL

Duct heater, VEAB type CV -P- ViCi-AL with a coating of Magnelis ZM310, which means the plate fulfils corrosion class C5. Heating element in stainless steel, EN 1.4301. The duct heater meets air tightness class C as per EN 15727 and is manufactured for air velocities down to 0.5 m/s. Integrated relay with potential-free alarm contact, which indicates loss of voltage or whether the manually resettable overheating protection device has tripped. Feedback control is achieved by means of an integrated regulator for external 0...10 V control signal.

### Description – P

Duct heater, VEAB type CCV -P with a coating of Magnelis ZM310, which means the plate fulfils corrosion class C5. Heating element in stainless steel, EN 1.4301.

The duct heater meets air tightness class C as per EN 15727 and is manufactured for air velocities down to 0.5 m/s. Feedback control is achieved by means of an external regulator to be ordered separately.

## Regulators



PULSER



PULSER D



TTC 2000



TTC 40F

### PULSER Series

A range of electric heating regulators that regulate the output using a so-called time-proportional control (pulse/pause technology). This results in very accurate temperature control.

IP30 degree of protection (PULSER D IP20).

Max. load 230V~ 3200 W and 400V2~ 6400 W

### PULSER M

Includes an integrated room sensor and a setpoint adjuster.

Can be configured to operate with an external main sensor, e.g. duct sensor TG-K330.

Comes with an outlet for a minimum or maximum limiting sensor, used when the inlet air needs to be limited to a minimum or maximum value in connection with room feedback control.

Automatic switch-over between 230V- and 400V2-.

### PULSER D

Operates with an external sensor.

Includes an integrated setpoint potentiometer, can also be connected to an external setpoint adjuster.

For DIN rail mounting

Automatic switch-over between 230V- and 400V2-.

### PULSER 230 X010 and PULSER 400 X010

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

Voltage 230V~ or 400V2~.

### TTC Series

A range of electric heating regulators that regulate the output using a so-called time-proportional control (pulse/pause technology). This results in very accurate temperature control. The setpoint is adjusted on the regulator or externally.

The TTC series includes outputs for external main sensors and min./max. sensors.

Use TG-K360 as min./max. sensor.

As an alternative, the TTC series can be controlled by an external 0...10 V control signal.

### TTC 2000

For wall mounting.

Maximum installed output: 17 kW, 400 VAC 3-ph.

Automatic switch-over: 210...415 VAC 3-ph.

Degree of protection: IP30

### TTC 25 and TTC 40F

For mounting on DIN rail in a control cabinet.

Automatic switch-over: 210...415 VAC 3-ph.

Degree of protection: IP20

Maximum power outputs:

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	IP20
	Duct sensor TG-K360 Min./max.sensor for TTC Series	0-60 °C	IP20
	Room sensor TG-R430 With setpoint adjustment	0-30 °C	IP30
	Room sensor TG-R530	0-30 °C	IP30
	Room sensor TG-R630	0-30 °C	IP54
	Pressure switch DTV300 incl. connection set	20 - 300 Pa Max. 1A 230V~	IP54
	Pressure switch AFS-222	10 - 3000 Pa Max. 15A 230V~	IP20
	Connection set ANS	For AFS-222	

### PULSER M

With extra input for min. or max. limiting sensors in the inlet air duct\*. PULSER M will regulate the room temperature and at the same time keep a minimum inlet air temperature. Automatic switch-over between 230V~ and 400V2~.

\*Use duct sensor/minimum sensor TG-K330.



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