Halton RH-E, electrical duct heater - Technical description

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1 Product name - Introduction

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1.2 About this document

This technical description is intended for anyone needing detailed technical information about the product. It also provides general design-related information, such as design examples. More detailed designs can be carried out using the Halton eHIT selection tool, available at ***www.ehit.halton.com***.

1.3 Summary of changes

Release	Date	Description
1.4	19-Dec-2025	2.2 Dimensions: Added "L" dimension.
1.3	07-Apr-2025	Updated images in dimensions and installation sections
1.2	30-Oct-2024	Updated images based on quality
1.1	14-May-2024	Minor visual updates
1.0	28-Feb-2024	First release

1.4 Warnings

Make sure you read this document and understand its content before using the heater.

The model and serial number of the heater are located on the label of the product.

Warning! Safety requirements

Improper use of this heater can result in serious bodily injury due to hazards of fire and explosion, burn and electrical shock.

Use only with electrical voltage and frequency specified on model label. Do not perform any service with the

heater plugged in. Serious injury or death may occur if personnel come in contact with high voltage lead.

Parts of the heater become very hot when operating and immediately after operating. Severe burns may occur if the heater is not allowed to cool down properly before servicing.

Transporting and storing

All products are packed by the producer for normal transporting conditions. For unloading and storing, use proper lifter to prevent product damage and employee injuries. Do not lift the product by the power supply cable or control box. Avoid impacts and impact loads.

Until the final installation, store products in a dry place with humidity not more than 70% (20°C), the average ambient temperature must be 5-40°C. The storing place must be covered from water and dirt. Avoid long term storing. It is not recommeneded to store products for more than 1 (one) year.

Receiving and handling

Inspect the heater for any possible shipping damage. Inspect the heater element wire for any deformation that could cause a short circuit or ground. Make sure the casing of the heater is not damaged.

Service

No special service is required for electric heaters. Check the electrical connection at least once a year.

Quality

100% of the heaters are tested before shipment.

Disposal

Important environmental information about this product.

	This symbol on the device or the package indicates that disposal of the device after its lifecycle could harm the environment. Do not dispose of the unit as unsorted municipal waste; it should be taken to a specialized company for recycling. Respect the local environmental rules. If in doubt, contact your local waste disposal authorities.

2 Product description

2.1 Overview

Electrical duct heaters, circular and rectangular, are designed to heat fresh air in a ventilation system. The Aluzinc-coated steel makes the casing high-temperature proof. AISI 304 stainless steel is used to make the heating element's tube. There are two protection thermostats and screw terminals installed in the heaters for easy connection.

The heaters are either installed horizontally, with an electrical connection box facing upwards or sideways, or vertically (only if the airflow direction is upwards). The heaters must not be installed in explosive and aggressive substance environments. The heaters can be used only for heating or preheating clean air. The heaters are intended only for inside installation. A protective grill supports accidental contact of the installed heater with the heating element. The minimum air velocity in the duct of the heater must be 1,5 m/s, and the maximum temperature of the output is 50°C.

Main features:

Model RW=H	▪ Circular and regtangular models ▪ Aluzinc-coated sheet steel, AZ 150 casing
Model RW=C	▪ Circular and regtangular models ▪ Coil has copper tubes and tube connections, and hydrophilic aluminium fins ▪ Stainless steel drip tray for collecting the condensate

Control types:

Types	Features
RE=1	Room panel + flow watch
RE=2	On/Off
RE=3	External 0...10V control
RE=4	External PWM control

2.2 Dimensions

Circular

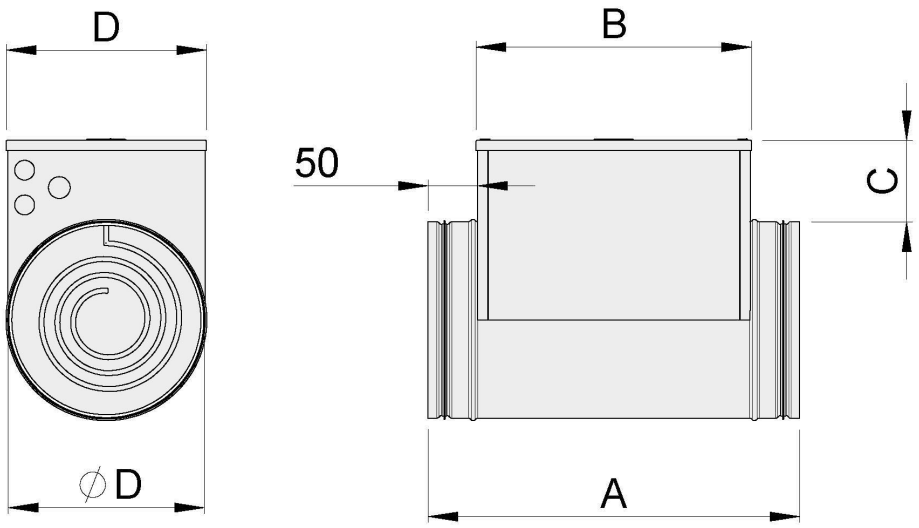

Fig. 1. Dimensions of circular electrical duct heater

	A [mm]	B [mm]	C [mm]	D [mm]
NS-100	370	276	71	100
NS-125	370	276	71	125
NS-160	370	276	71	160
NS-200	370	276	71	200
NS-250	370	276	71	250
NS-315	373	276	71	315
NS-400	373	276	81	400
NS-500	630	532	81	500

Rectangular

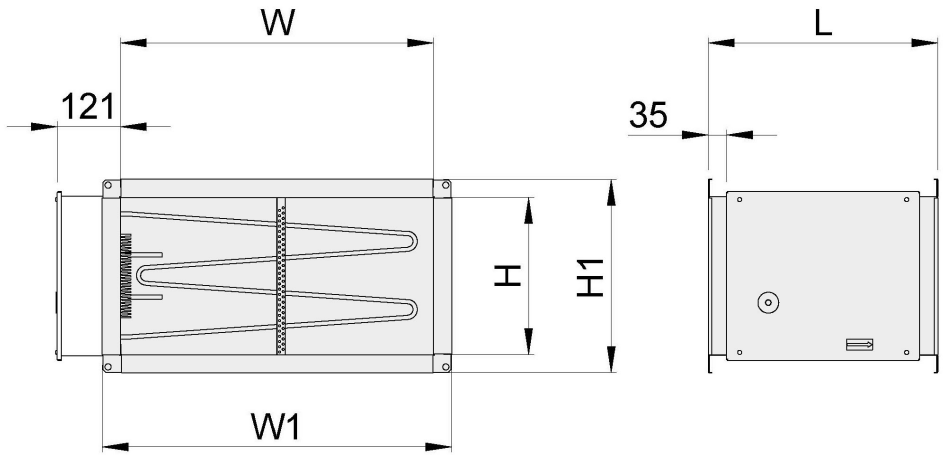

Fig. 2. Dimensions of rectangular electrical duct heater

H1=H+70, W1=W+70, L=370

2.3 Specification

Electrical duct heaters are circular and rectangular designed to heat or cool fresh air in a ventilation system. They are compact and either installed horizontally or vertically.

Halton RH-E, electrical duct heater

Function

- Control type RE=1 - Room panel + flow watch
- Control type RE=2 - On/Off
- Control type RE=3 - External 0...10V control
- Control type RE=4 - External PWM control

Material

- Casing of Aluzinc-coated sheet steel, AZ 150
- The coil has copper tubes and tube connections, and aluminium fins.
- Heating element stainless steel, AISI 304

Standards

- Air tightness
  - Circular models class D to EN 15727
  - Rectangular models class C to EN 15727

2.4 Order code

RH-S-D-W-H; RT-RE-RW-ZT

Main options	
S = Type of duct connection	
R	Rectangular
C	Circular
D = Size of duct connection [mm]	0, 100, 125, 160, 200, 250, 315, 400, 500
W = Width of duct connection [mm]	0, 200, 250, 300, 400, 500, 600, 800
H = Height of duct connection [mm]	0, 150, 200, 250, 300, 400

Other options	
RT = Coil type	
E	Electrical
W	Water
RE = Control type (electrical)	
NA	Not assigned

Other options	
1	Room panel + flow watch
2	On/off
3	External 0-10V control
4	Enternal PWM control
RW = Control type (water)	
NA	Not assigned
H	Heating
C	Cooling / Heating
ZT = Tailored product	
N	No
Y	Yes (ETO)

Order code example

RH-C-160-0-0; RT=E, RE=2, RW=NA, ZT=N

3 Design information

3.1 Installation

The heaters are either installed horizontally, with an electrical connection box facing upwards or sideways, or vertically (only if the airflow direction is upwards).

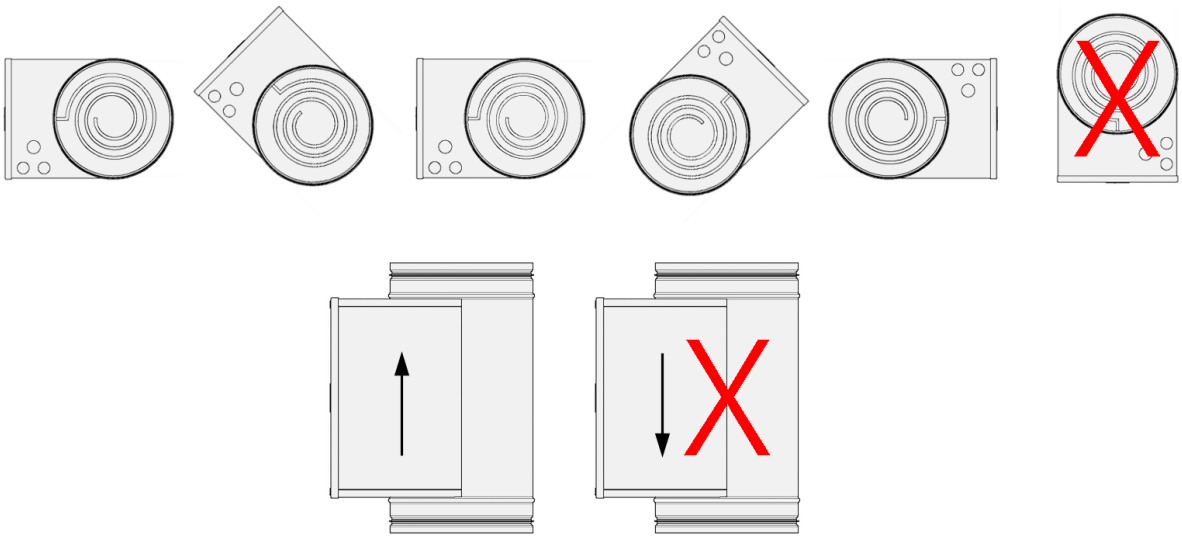

Fig. 3. Circular installation position

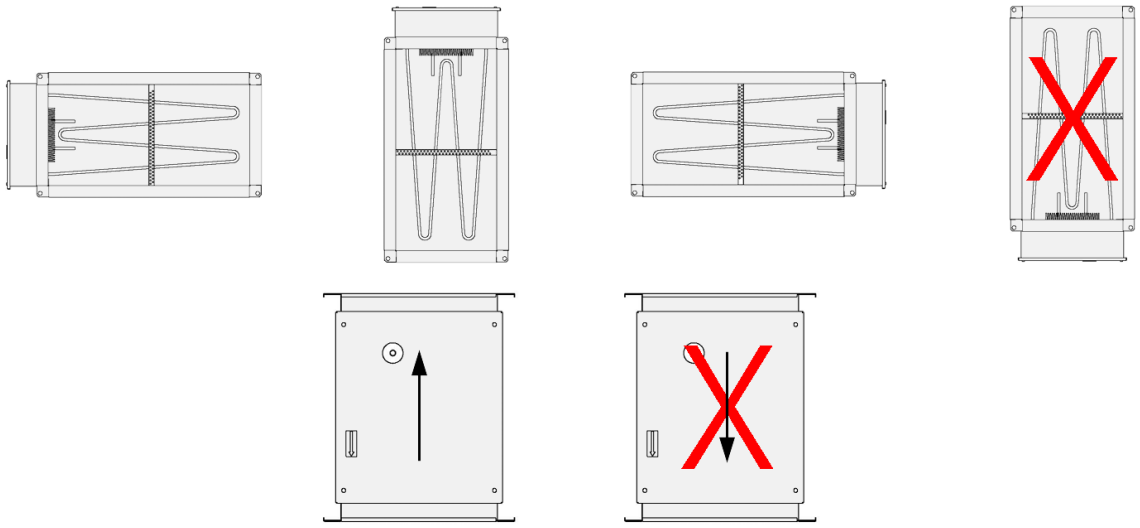

Fig. 4. Rectangular installation position

Avoid installing heaters in explosive and aggressive substance environments. They can be used only for heating or preheating clean air and are intended only for inside installation. A protective grill supports accidental contact of the installed heater with the heating element. The minimum air velocity in the heater's duct must be 1,5 m/s.

Important

Only a competent electrician must wire the main power supply for installation. Choose a suitable power supply cable for the heater. When installing these heaters, strictly follow the country's standards and regulations.

During the installation an electrical isolation automatic circuit breaker (not included) is needed to enable the installer to cut all power supply lines. The automatic circuit breaker must be selected based on the heater's power and nominal current (see the electrical rating plate on the heater's cover) and should have characteristic B. Connect the heater to the mains power supply, check that the voltage, frequency, power and current are the same as those indicated on the electrical rating plate. The heater must be earthed.

We recommend installing a supply air temperature sensor at a distance multiplied by the heater's diameter (3xD). For example, if the heater's diameter is 200 mm, the sensor's installation distance is 3x200 = 600 mm.

3.2 Maintenance

No special service is required for electrical heaters, only to check electrical connect refer to the building maintenance program for the maintenance cycle.

3.3 Service

Electrical heaters do not require service. Only the electrical connection must be checked at least once per year.

4 Technical reference data

4.1 Control type

4.1.1 Room panel + flow watch (RE=1)

With control type room panel+flow watch, the electrical duct heater is operated by two temperature sensors. One supplies the air duct and the other one the room. The setpoint temperature is 0...30°C. A different air temperature setpoint can be set using the wired remote control panel. This control type is designed with integrated temperature control and one temperature sensor.

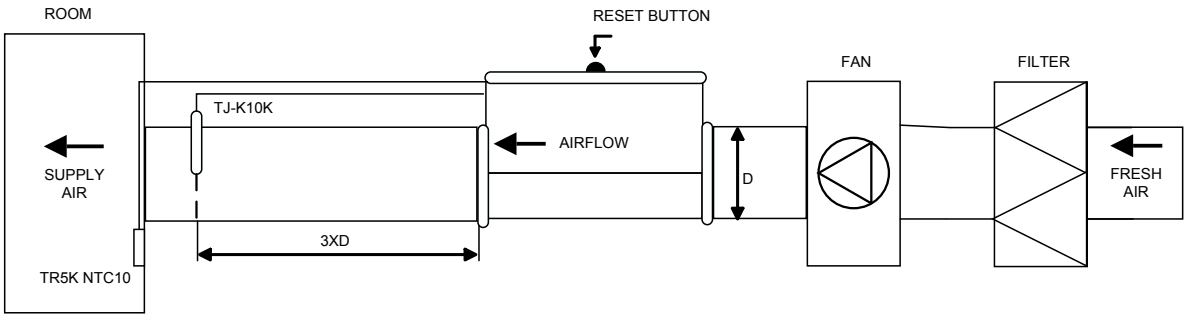

Fig. 5. Control scheme with room panel+flow watch (RE=1)

4.1.2 On/Off (RE=2)

With control type On/Off, the electrical duct heater is operated by an external controller.

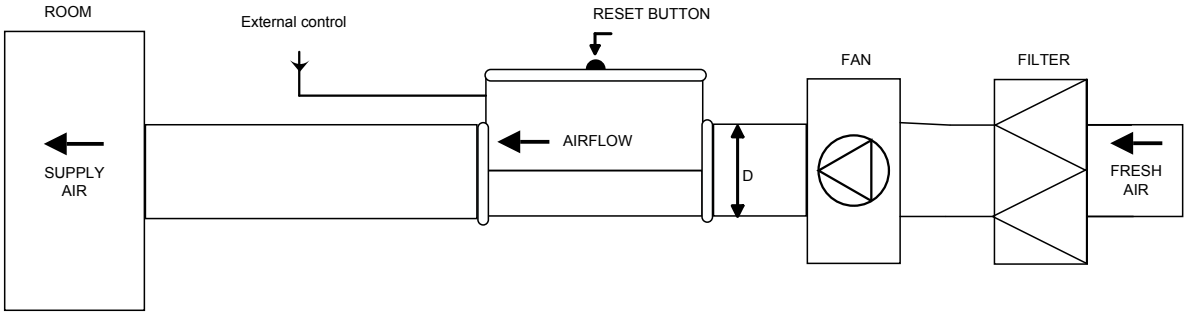

Fig. 6. Control scheme with On/Off (RE=2)

4.1.3 0...10V (RE=3)

With control type 0...10V, the electrical duct heater is operated by an external 0...10VDC signal. The external signal controls the heating elements directly to 0-100% heating power. In this type of solution, for example the BMS system controls the reheater.

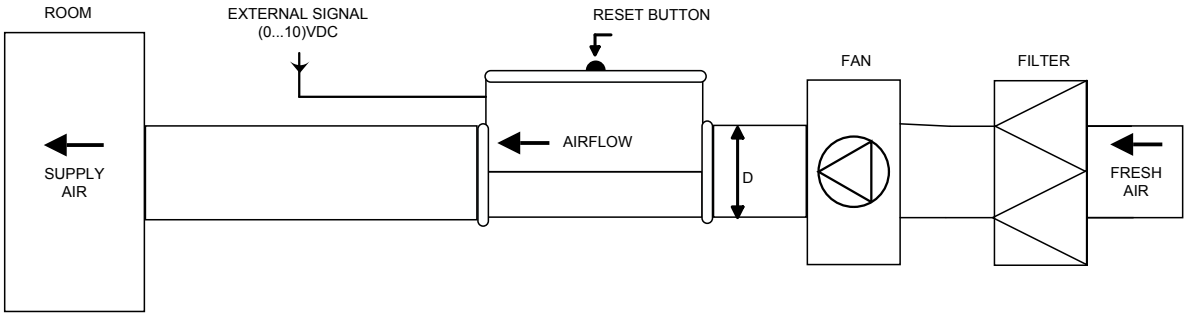

Fig. 7. Control scheme with 0...10V (RE=3)

4.1.4 PWM (RE=4)

With control type PWM, the electrical duct heater is operated by an external PWM signal. The external signal controls the heating elements directly to 0-100% heating power. In this type of solution, for example the BMS system controls the reheater.

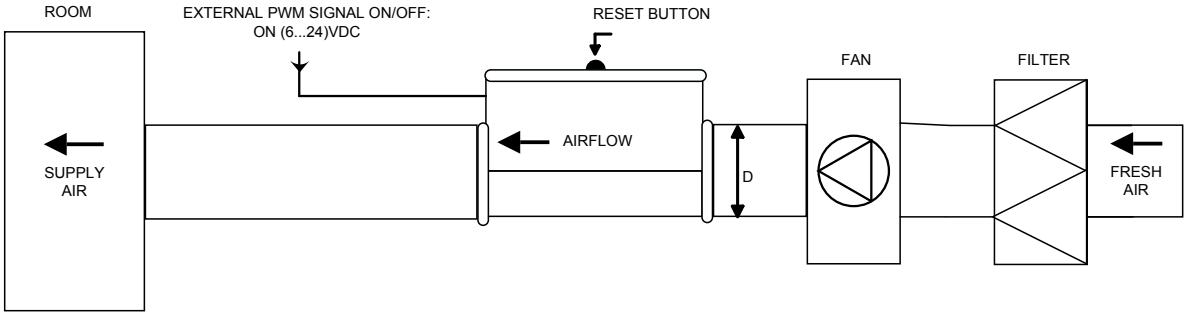

Fig. 8. Control scheme with PWM (RE=4)

4.2 Power information

Electrical power information

Below, you will find the power information of the standard products. More power options are available in all models. Please contact sales.

	Size [mm]	Power [kW]	Voltage [V]
Circular	100	0,6	1x230
	125	0,9	1x230
	160	1,8	1x230
	200	2	1x230
	250	3	3x400
	315	6	3x400
	400	9	3x400
	500	15	3x400

	Size [mm]	Power [kW]	Voltage [V]
Rectangular	200x150	2	1x230
	200x200	3	3x400
	250x150	3	3x400
	250x200	4,5	3x400
	250x250	6	3x400
	300x150	3	3x400
	300x200	6	3x400
	300x250	6	3x400
	300x300	6	3x400
	400x150	6	3x400
	400x200	6	3x400
	400x250	6	3x400
	400x300	9	3x400
	400x400	12	3x400
	500x150	6	3x400
	500x200	9	3x400
	500x250	9	3x400
	500x300	9	3x400
	500x400	15	3x400
	600x150	7,5	3x400
	600x200	9	3x400
	600x250	12	3x400
	600x300	15	3x400
	600x400	18	3x400
	800x200	12	3x400
	800x250	15	3x400
	800x300	18	3x400
	800x400	21	3x400

4.3 Overheating protector

Two overheat protection thermostats are installed in the electrical circulation heater. The first one with an automatic reset, turns off the heating when the temperature reaches 50°C, and turns on when the temperature drops below 50°C. The second one with a manual reset, turns off the heating when the temperature reaches

100°C. In this case, it needs to be figured out why the heater overheated. Eliminate the cause of the overheating and press the reset button on the cover of the heater.

4.4 Troubleshooting

No heating from heater	1. If the manual protection is activated, check for a fault before pressing the reset button. If the fault is identified after it has been rectified, press the reset button using a screwdriver or a similar object. 2. No power supply to heater - check all external electrical components (relays, switches). 3. Temperature sensor fault. Check the sensor resistance, it must be 10kΩ at 25°C. 4. Pressure switch fault. Check if the pressure in the system is set correctly (check the pressure when the air flow is not less than 1.5m/s). 5. If LED 1 lights continuously, it means that there is a failure of PTC (air velocity) sensor, supply (TJ-K10K), or room (NTC10) air temperature sensor, potentiometer on the top of the heater casing, or wired remote control panel TR5K. 6. When the heater power supply is switched on after a power supply interruption or after any failure, the controller is in preparing mode for 30 seconds. 7. PCB fault.
Heater gives full output, not by set point	1. Temperature sensor fault. Check the sensor resistance, it must be 10kΩ at 25°C. 2. Airflow sensor fault. Check the sensor resistance, it must be 22Ω between X15...X16 and 10Ω between X15...X18. The sensor must be clear. 3. When the heater power supply is switched on after a power supply interruption or after any failure, the controller is in preparing mode for 30 seconds. 4. Triacs fault. 5. PCB fault.

Automatic circuit breaker switches off	1. Check the circuit breaker's data, it must correspond to the heater's electrical data. 2. Check the isolation of the connection cables or wires, check if the heater is grounded. 3. Check the power supply source data, it must correspond to the heater's electrical data.
Protection thermostat cut off	1. Low airflow speed through the heater. Check the filters, fans, and ducts of the system.