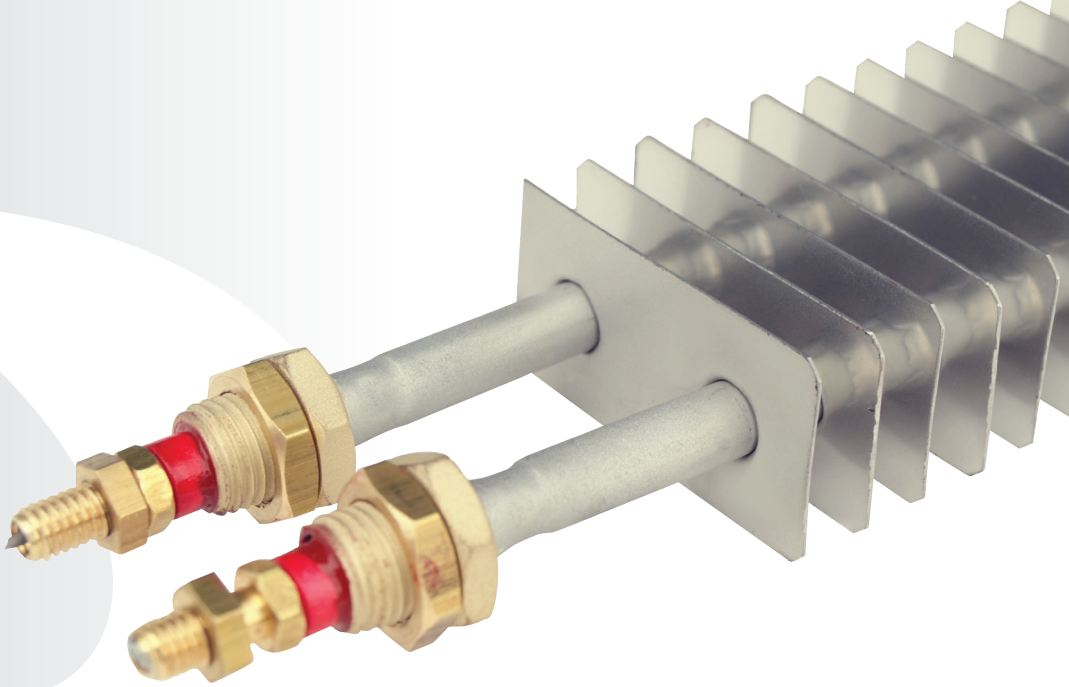

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INDUSTRIAL HEATING EQUIPMENT

About Us

Resterm Industrial Heating Equipment started operating with its knowledge and experience in the field of industrial heating element production in 2013 in Istanbul.

Resterm Industrial Heating Equipment, making production and sales of duct type electric heaters for manufacturer and end user in the HVAC (Heating, Ventilation and Air Conditioning) market, produces solutions for its customers by reinforcing technical analyses upon necessity with cost efficient quality products and service manner as an engineering company.

Product portfolio of Resterm consists of from rectangular and circular duct type heaters, tubular and finned heating element types, electric floor convectors, heater control panels, safety and automation equipments.

By making no concession on quality, Resterm Industrial Heating Equipment aims to help its customers make profits with accurate technical solutions without any cost pressure and value added products. It will gain value together with its customers by being one of the leader companies of the sector and providing solutions beyond expectations without making any concessions on its foundation aims.

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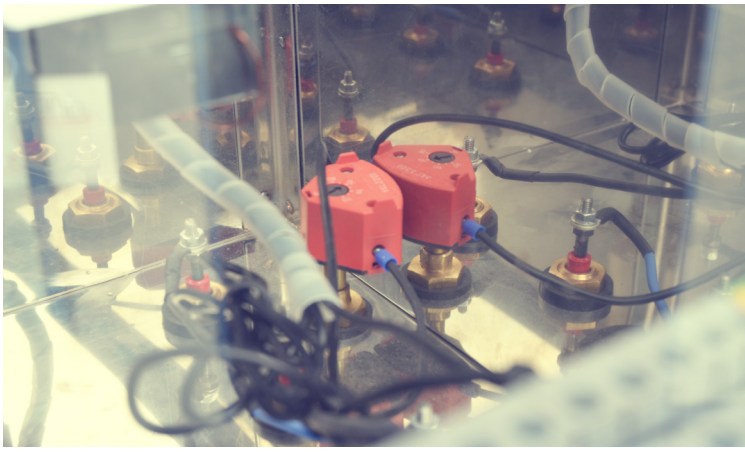
Duct Type Heaters

Duct type heaters are produced in special sizes as circular and rectangular sections. Heating element parts of the heaters produced as galvanized sheet or stainless steel sheet are 304 stainless steel. They are produced as tubular or finned due to the fact that finned ones provide more efficient heating since heating surface is enhanced.
General usage areas of them are ventilation systems. These devices, specially designed for different duct types and sizes, are used as preheater to heat outdoor air, and as main and after heater to heat the area and the blast. They are quite useful devices with easy mounting to the duct especially in cases watery system heaters cannot be used. Products can be produced including power and control equipment optionally.

Air Handling Unit Type Heater



These are the devices specially designed for air handling unit manufacturer companies. Products produced suitable for the sizes of air handling unit cells are detailed in 2 different designs.
They are used as preheater, main heater and/or end heater in all air handling units, especially hygienic air handling units.

There are standard safety thermostat as 70°C and 110°C (with manual reset option) in all the heaters.

* Upon special request, Zone 2 and Exproof equipment can be produced.

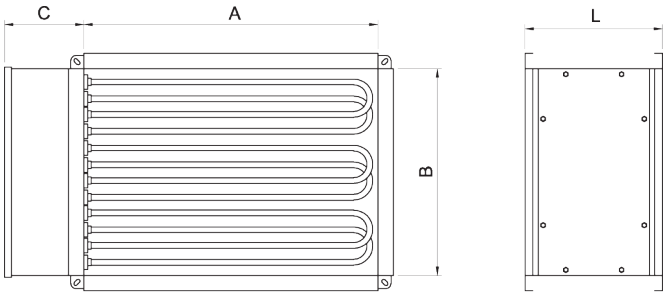
Rectangular Duct Type Electrical Heater

Rectangular Duct Type Electrical Heater Power Range

Min. 0,5 kW – Max. 2.000 kW

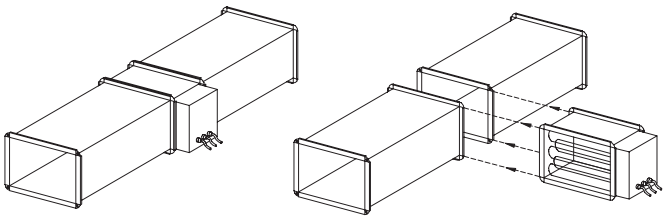
Rectangular Duct Type Electrical Heater Sizes

A :	Min. 200 mm / Max. 3000 mm
B :	Min. 200 mm / Max. 3000 mm
L :	Min. 150 mm / Max. 1000 mm
C :	Standard 120 mm / with control equipment 220 mm



RRH - 350x400 - 6 - 380 - 3 - 0/1/2/3 - 0/T

- Control equipment
  0: None, T: Present
- Panel type
  0: None, 1: Suitable for step control
  2: Suitable for 3 steps control via 0-10V
  3: Suitable for proportional control via 0-10V
- Step
- Power Supply
- Capacity (kW)
- Circular Duct Size (mmxmm)
- Circular Type Duct Heather



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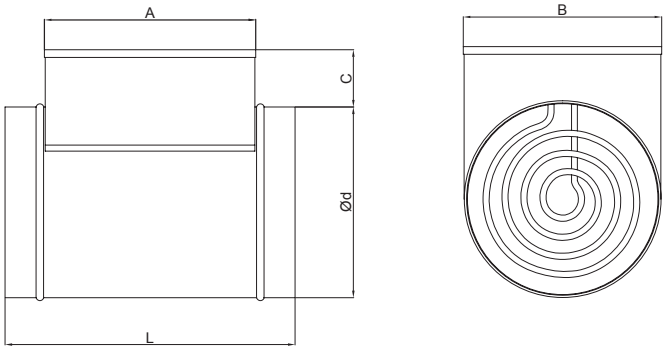
Circular Duct Type Electrical Heater

Circular Duct Type Electrical Heater Power Range

Min. 0,3 kW – Max. 18 kW

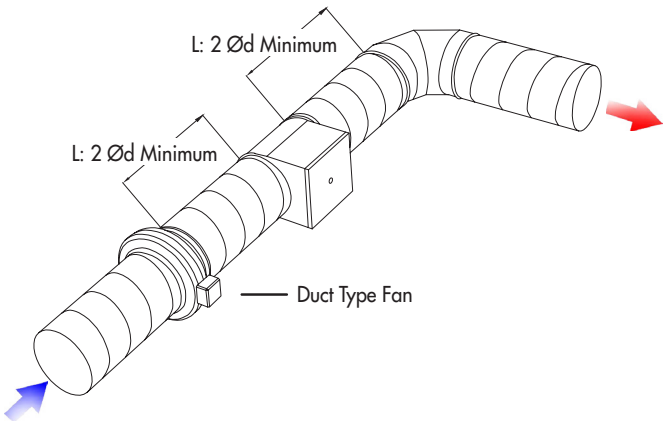
Circular Duct Type Electrical Heater Sizes

D :	Min. 125 mm / Max. 450 mm
L :	Min. 380 mm / Max. 490 mm
A :	Min. 260 mm / Max. 370 mm
B :	Min. 125 mm / Max. 450 mm
C :	Min. 80 mm / Max. 250 mm



RCH - Ø315 - 6 - 380 - 3 - 0/1/2/3 - 0/T

- Control equipment 0:None, T:Present
- Panel type 0: None, 1: Suitable for step control 2: Suitable for 3 steps control via 0-10V 3: Suitable for proportional control via 0-10V
- Kademe Bilgisi
- Besleme Bilgisi
- Kapasite (kW)
- Yuvarlak Kanal Ölçüsü (mmxmm)
- Yuvarlak Tip Kanal Isıtıcı



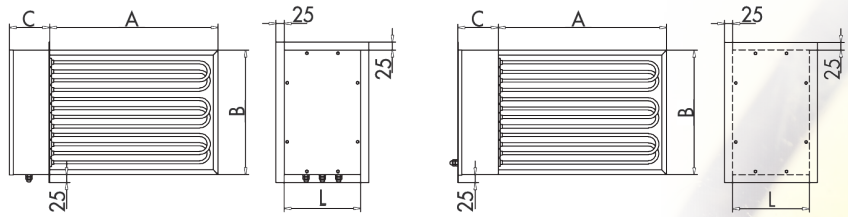
Flanged Air Handling Unit Type Electrical Heater

Flanged Air Handling Unit Type Electrical Heater Power Range

Min. 0,5 kw – Max. 2.000 kw

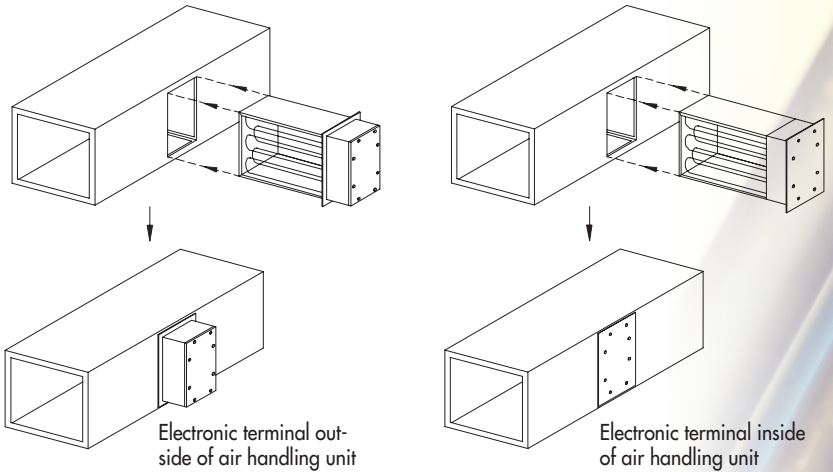
Flanged Handling Unit Type Electrical Heater Sizes

A :	Min. 200 mm / Max. 3000 mm
B :	Min. 200 mm / Max. 3000 mm
L :	Min. 150 mm / Max. 1000 mm
C :	Standard 120 mm / with control equipment 220 mm



RSH - 350x400 - 6 - 380 - 3 - 0/1/2/3

- Panel Type
  0: None, 1: Suitable for step control
  2: Suitable for 3 steps control via 0-10V
  3: Suitable for proportional control via 0-10V
- Step
- Power Supply
- Capacity (kW)
- Air Handling Unit Size (mmxmm)
- Air Handling Unit Type Heater



Electronic terminal outside of air handling unit

Electronic terminal inside of air handling unit

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INDUSTRIAL HEATING EQUIPMENT

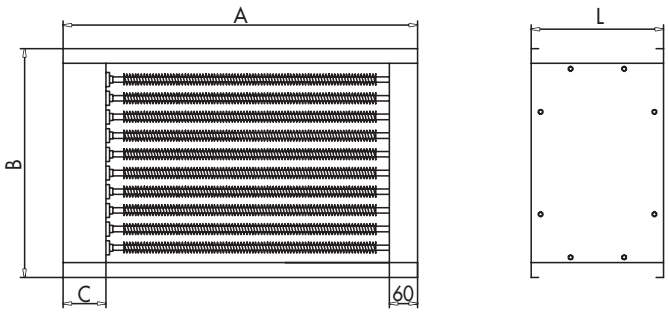
Sliding Air Handling Unit Type Electrical Heater

Sliding Air Handling Unit Electrical

Min. 0,5 kW – Max. 2000 kW

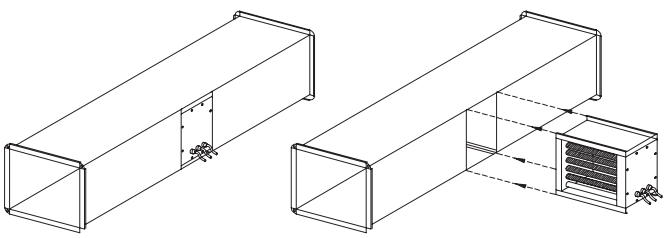
Sliding Air Handling Unit Electrical Heater Sizes

A :	Min. 500 mm / Max. 6000 mm
B :	Min. 200 mm / Max. 3000 mm
L :	Min. 150 mm / Max. 1000 mm
C :	Standard 80 mm / with control equipment 220 mm



RSH - 350x400 - 6 - 380 - 3 - 0/1/2/3

- Panel type
  0: None, 1: Suitable for step control
  2: Suitable for 3 steps control via 0-10V
  3: Suitable for proportional control via 0-10V
- Step
- Power Supply
- Capacity (kW)
- Air Handling Unit Size (mmxmm)
- Air Handling Unit Type Heater



Calculations

Capacity Calculation

- Exit temperature of electric heaters should be designed as 50°C maximum.
- Air speed within the electric heater must be 1.5 m/sec.

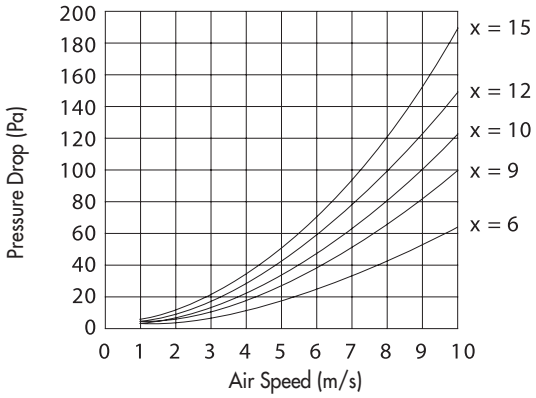
$P = 0{,}36 \times Q \times \Delta T$

P = Total Power (W)
Q = Air Volume (m^3/h)
ΔT = Temperature Difference (°C)

Pressure Drop :

$$X = \frac{P}{S \times 15}$$

X = Heater Resistance Ordinal number
P = Total Power (kW)
S = Cross Section (m^2) (S = A x B)



Pressure loss in the duct depends on design speed and heating element ordinal number. Heating element ordinal number is calculated through the formula located on the next side and ordinal number and pressure loss corresponding available air speed on the graphic above are found.

Points To Be Taken Into Account During Mounting

- The electrical connection box should not be located on below level so that the condensation in the duct does not damage the heater.
- Mounting of the equipment such as fan, bend and damper should be within a specific distance to provide proper air-flow on duct type heater. This distance is twofold of diagonal length of rectangular type heater and twofold of diameter of the duct type heater for circular type.

Quality Control Tests

Heating elements/Duct type heaters whose production is completed, are subject to functionality and electrical safety tests stated below:

- High voltage test
- Leakage current test
- Hot Insulation test
- Cold Insulation test
- Operational scenario test (optional)

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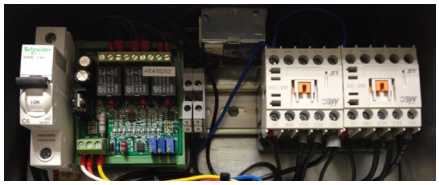
Control Equipments

Safety Thermostat

There are two safety thermostats which activates at 70°C and 110°C on the device. When the temperature inside the device reaches over 70°C, immersion type 70°C thermostat desactivates and closes heater contactor. In case there is a breakdown in 70°C thermostat, when the temperature reached up to 110°C thermostat, 110°C thermostat with manual reset desactivates contactor. Reset button must be pushed so that the device could reactivate. Generally, the devices should not be started up to prevent this problem which is frequently encountered when the device is started up without air-flow.

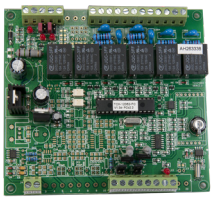
Control Panel

Upon the request of the customer, internal and external type panel application can be made on the device. Panels, on which equipment suitable for the requested control scenario is used, are custom manufacturing and submitted to the customer in working condition by completing scenario tests.



On/Off Mode Control Panel

It consists of two-piece structure as Control card + Digital control panel. It has On/off control opportunity with its 3 stages. User temperature setting, temperature display, manual/automatic temperature control can be done through the digital control panel. Mode can be used together with the contactor circuit in the panel.

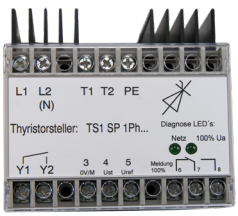


Proportional Stage Control Card

It provides On/Off control up to 3 stages with 0-10V control signal to be sent from an external controller and/or an automation system. It is used together with mode contactor circuit in the panel.

Power Thyristör

It provides proportional control with 0-10V control signal to be sent from an external controller and/or an automation system. Required power is established via the product with the same power amount of the electrical heater manufactured as single-stage.



Air Flow Switch

It is a safety equipment which blocks working of the electrical heater in case there is no air flow. It is attached to contactor circuit serially.

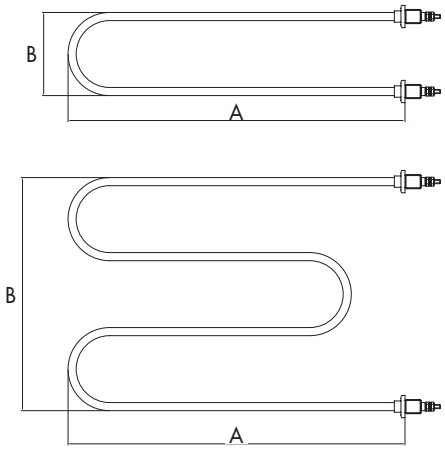
Temperature Sensors

They are used for measuring temperature in the ducts to which the heaters are attached. Controlling or limiting the heater exit temperature is conducted through control panels to which they are attached.

Heating Elements

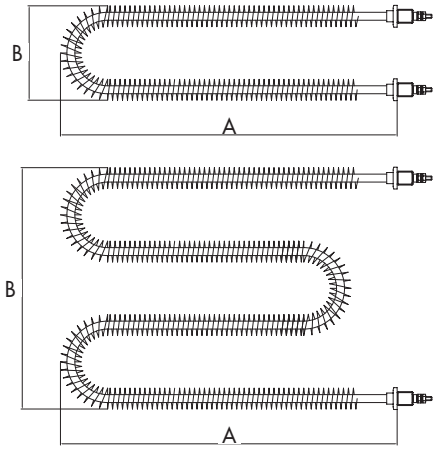
Heating elements used as main equipment in duct type heaters are produced as 2 types: tubular and finned ones. Heating element tube is made of stainless material with AISI 304 quality. Heating element is produced by centering Ni/Cr-80/20 wire in the middle of stainless tube, filling with MgO powder under vibration and compressing with MgO powder. Heating elements whose filling is completed are annealed in special forges so that they could be bended easily and tempered. M14 brass union used at the edges of the heating elements provides easy mountage of them to the case.
Heating elements can be produced in Ø 6.5 mm, Ø 8.5 mm and Ø 11 mm diameters, according to their technical adequacy such as duct sizes or usage areas.
Finned heating elements are obtained by covering tubular heating element with serpentine produced with AISI 304 stainless material in special winding machines.

Heating Element Power Range
Min. 0,4 kW – Max. 9,0 kW



Tubular Heating Element U Type
A : Min. 200 mm – Max. 3.000 mm
B : Min. 40 mm

Tubular heating element M Type
A : Min. 200 mm – Max. 2.000 mm
B : Min. 120 mm



Element U Type
A : Min. 200 mm – Max. 3.000 mm
B : Min. 70 mm

Element U Type
A : Min. 200 mm – Max. 2.000 mm
B : Min. 210 mm

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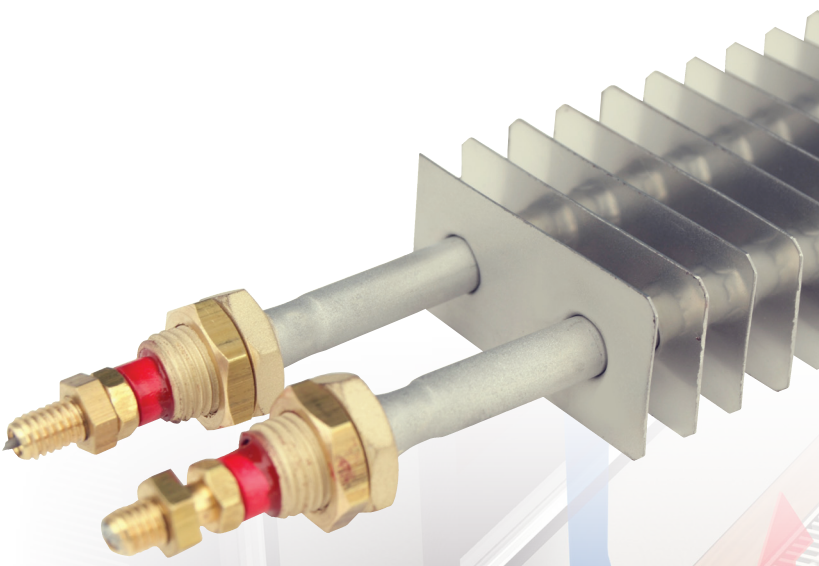
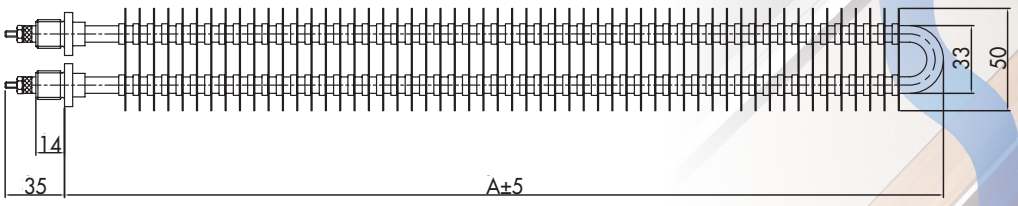
Floor Convector Heaters

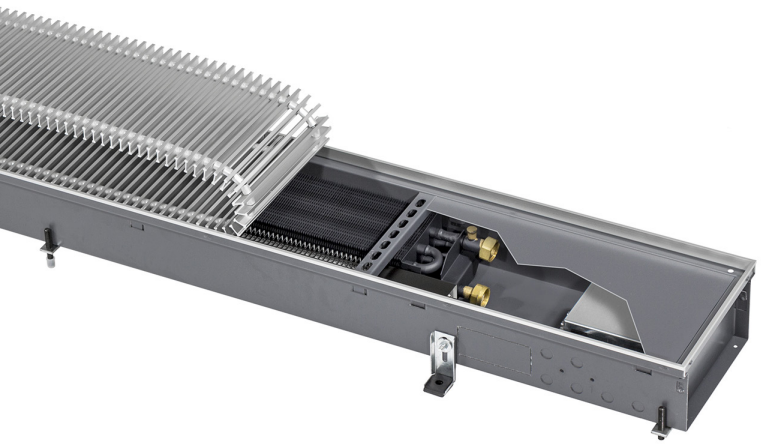
They are specially-designed heating elements for floor convectors, whose usage has become widespread with the increase of structures having glass-made facades (offices, business centers, villas etc.). High efficiency of heating is provided by increasing air contact surface due to stainless steel wings mounted to U Type heating elements in special form. They ensure the floor convectors which are mainly produced to have watery battery to have electrical battery without any change of design. These products are designed for floor convector manufacturers and they are made of 304 stainless steel material with different length and capacity options proper for convector size.

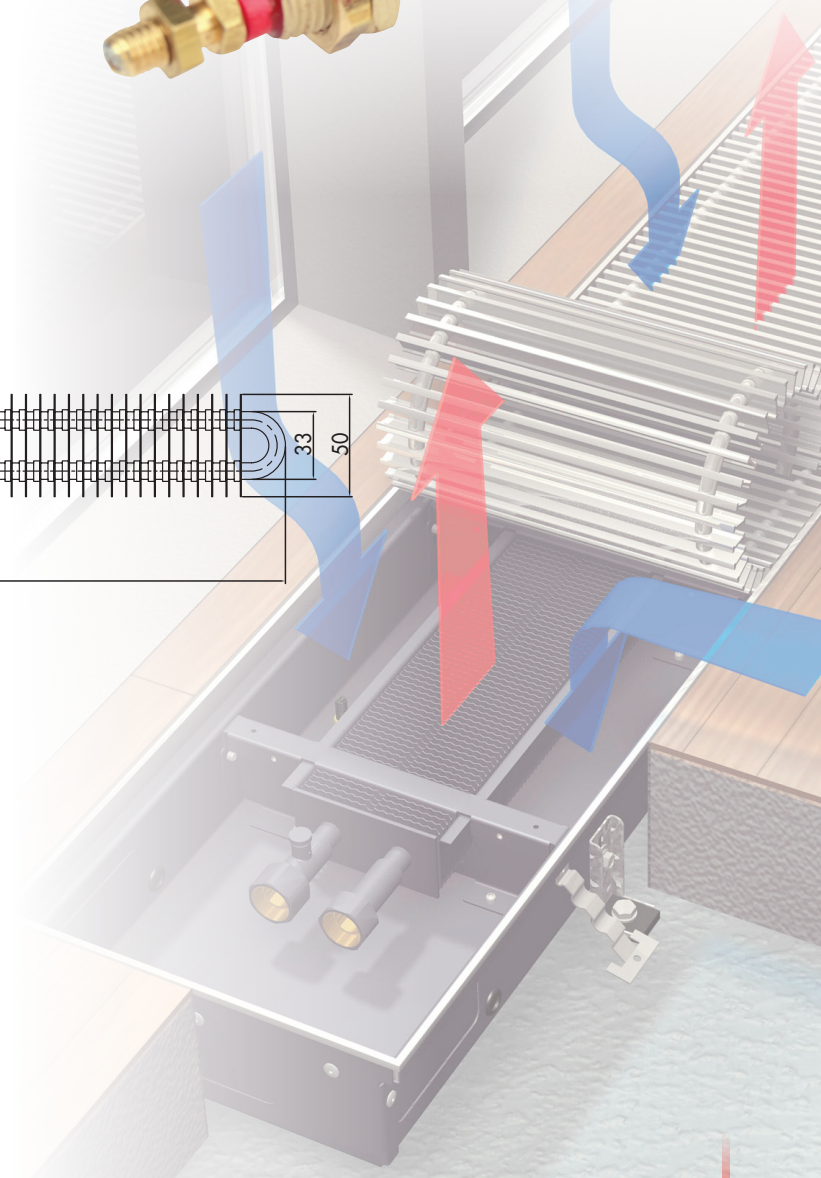
Floor Convector Heater Power Range
Min. 0,4 kW – Max. 9,0 kW

Floor Convector Heater Sizes
A : Min. 200 mm / Max. 3000 mm









CERTIFICATE

of product conformity

Certificate NO: 2023-PTC-4240

PTC Technical Inspection and Certification

ATTESTATION OF COMPLIANCE

(UYGUNLUK ONAYI)

By examining the technical files and test reports, it has been determined that the specified product complies with the 2014/35/EU LVD Directive Regulation published by the European Union Technical Commission.

Teknik dosya ve test raporları incelenerek belirtilen ürünün Avrupa Birligi Teknik Komisyonu tarafından yayımlanan 2014/35/AB LVD Direktifi Yönetmeliğine uygunluğu saptanmıştır.

Manufacturer(Üretici) : RESTERM ENDÜSTRİYEL ISITMA EKİPMANLARI SAN. VE TİC. A.Ş.
Girne Mah. Irmaklar Sok. Küçük Yalı İş Merkezi A Blok No: 72/28A Maltepe / İSTANBUL

Applicant(Başvuru Sahibi) : RESTERM ENDÜSTRİYEL ISITMA EKİPMANLARI SAN. VE TİC. A.Ş.
Girne Mah. Irmaklar Sok. Küçük Yalı İş Merkezi A Blok No: 72/28A Maltepe / İSTANBUL

Pruduct(Ürün) : KANAL TİPİ ELEKTRİKLİ ISITICI / DUCT TYPE ELECTRICAL HEATER

Type / Model(Tip Model) : RRH , RRH Dikdörtgen Kanal Tipi Elektrikli Isıtıcı / RRH Rectangular Type Electrical Heater , RCH Yuvarlak Kanal Tipi Elektrikli Isıtıcı / RCH Circular Type Electrical Heater , RSH Santral Tipi Elektrikli Isıtıcı / RSH Air Handling Unit Type Electrical Heater, RHU Elektrikli Hava Apareyi / RHU Unit Heater

Trademark(Marka) : RESTERM END. ISITMA EKİPMANLARI

Test Report No(Test Rapor No) : 2021-PTC-0901-1

Base Of Attestation(Onay Dayanağı) : TS EN 60335-1 ; TS EN 60335-2-30

CERTIFIED

www.ptc.com.tr

ID NO : 26I2019

The certificate is issued after testing of the named product(s) and/or audit of the technical documentation and confirms that the tested product complies with the essential protection requirements of the mentioned directives on a voluntary basis.

Sertifika, belirtilen ürünün/ürünlerin test edilmesinden ve/veya teknik dokümantasyonun denetlenmesinden sonra verilir ve test edilen ürünün, belirtilen direktiflerin zorunlu koruma şartlarına gönüllü olarak uygun olduğunu onaylar.

The referred technical file(s) shows that the product complies with standard(s) recognized as giving presumption of compliance with the essential requirements listed EU Directive(s) above,other relevant Directives and standarts have to be observed. This attestation does not abrogate the compulsory obligation of the manufacturer to issue the declaration of conformity.

Diğer ilgili standartlara ve direktiflere uyulmalıdır. Bu onay üreticinin uygunluk beyanı düzenleme zorunluluğunu ortadan kaldırmaz. Referans teknik dosya ile ürünün yukarıda belirtilen AT Direktiflerinin temel gereklerine uygunluğu kabul edilir.

Date /Tarih : 15/09/2023

Issue Date / Basım Tarihi : 15/09/2023

Expiry to /-e Kadar Geçerli : 15/09/2024

PTC Ürün Test ve Belgelendirme San.Tic.Ltd.Şti

Signature (İmza)

PTC
Ürün Test ve Belgelendirme San.Tic.Ltd.Şti

Örnek Mah. Udi Hasanbey Sok. No: 31
Reis Plaza Ataşehir / İSTANBUL
Tel: +0(216) 393 32 32
info@ptctesting.com – www.ptctesting.com

inspect

Certificate
Sertifika

Client Name and address
Müşteri ismi ve adresi

RESTERM ENDÜSTRİYEL ISITMA EKİPMANLARI SANAYİ VE TİCARET A.Ş

GİRNE MAH. IRMAKLAR SK. KÜÇÜKYALI İŞ MRK. A BLOK NO:72/ 28A
MALTEPE / İSTANBUL / TÜRKİYE

Standard
Standard

ISO 9001:2015 Quality Management System

INSPECT assessed and approved that related firm meets the requirements of the designated standard at related scope
INSPECT ilgili kuruluşun yukarıda belirtilen standardın gereklerine uygunluğunu ilgili kapsamda tetkik etmiş olup onaylamaktadır.

Scope
Kapsam

DESIGNING, MANUFACTURING AND SELLING OF DUCT TYPE ELECTRICAL AND WATER COIL HEATERS, AIR HANDLING UNIT TYPE ELECTRICAL HEATERS, ELECTRICAL UNIT HEATER

KANAL TİPİ ELEKTRİKLİ VE SULU ISITICILAR, KLİMA SANTRALİ TİPİ ELEKTRİKLİ ISITICILAR, ELEKTRİKLİ HAVA APAREYLERİ TASARIMI, ÜRETİMİ VE SATIŞI

IAF/Category Code: 18
Initial issue date: 01.Nov.2019
Issue date of this certificate: 14.Nov.2023
Validity of this certificate: 30.Oct.2024
Recertification date: 30.Oct.2025
Certificate No: 22.09.326-QM

General Manager

To verify the validity of this certificate please visit: www.inspect.com.tr
Bu sertifikanın geçerliliğini kontrol etmek için lütfen www.inspect.com.tr'yi ziyaret ediniz

The validity of this certificate is depend on the success of surveillance assessments
Bu belgenin geçerliliği ara denetimlerin başarılı olmasına bağlıdır.

IAS ACCREDITED
Management System Certification Body
MSCB-148

INSPECT Uluslararası Belgelendirme ve Gözetim Hiz. Tic. Ltd. Şti. / TURKEY
www.inspect.com.tr - Belge periyodu 3 yıldır. / Certificate period is 3 years.

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ENDÜSTRİYEL ISITMA EKİPMANLARI

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Küçükyalı İş Merkezi
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