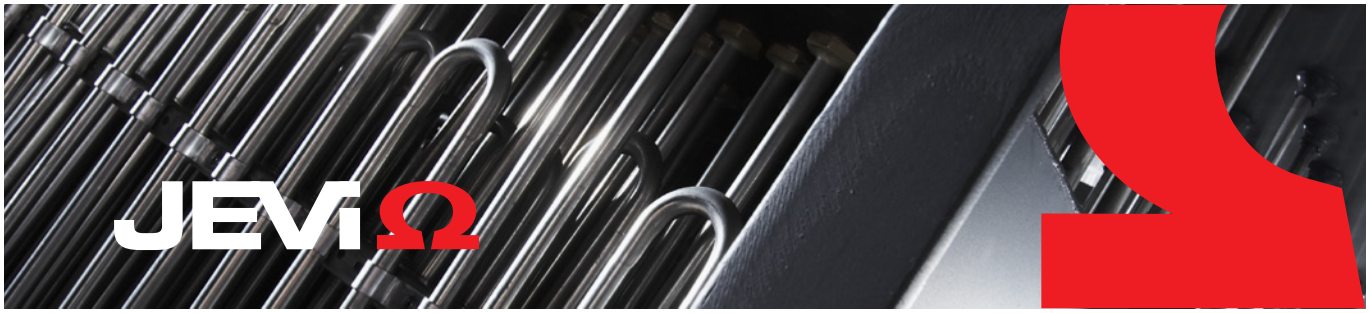

DUCT HEATERS

DUCT HEATERS TYPE EFR & EFRS

Duct heaters for ventilation systems, such as additional heat in the case of heat recovery systems in homes or otherwise in connection with air duct systems. Duct heaters type EFR are supplied for 230 V as standard, but can be supplied for 400 V. Duct heaters type EFRS are supplied for 3x400 V as standard.

DESCRIPTION

Duct section:

Hot galvanised spiral tube with rubber sealing rings at either end. Type EFRS can on requset be supplied with flange connection and in stainless steel.

Junction box:

Electrogalvanised sheet iron box supplied with 2 x M20 cable glands. Electrical connection via the mounted terminal block (an installation guide will be supplied on delivery).

Degree of protection EFR IP44 / EFRS from IP22 to IP66

Heating elements:

Heating elements made of AISI 304 (stainless steel) with a surface load of 2.5 W/cm² for air speeds in excess of 2 m/sec.

Overtemperature protection:

A 1-pole thermal limiter (30-87°C) and a thermal cutout with manual reset (125°C) are built into the junction box.

TEMPERATURE CONTROL

It is recommended to regulate the air temperature with a room thermostat, such as Triac Pulser® 920 on 1-phase and TTC2000 on 3-phase models.

Type EFR

Type EFRS

STANDARD PROGRAMME EFR

Item no.	Voltage	Power	Size (D x L)
21800016	230 V	335 W	Ø125x400
21800024	230 V	670 W	Ø125x400
21800032	230 V	1000 W	Ø125x400
21800040	230 V	2000 W	Ø125x400
21800057	230 V	335 W	Ø160x400
21800081	230 V	670 W	Ø160x400
21800115	230 V	1000 W	Ø160x400
21800149	230 V	2000 W	Ø160x400
21800164	230 V	335 W	Ø200x400
21800180	230 V	670 W	Ø200x400
21800206	230 V	1000 W	Ø200x400
21800222	230 V	2000 W	Ø200x400
21800248	230 V	335 W	Ø250x400
21800263	230 V	670 W	Ø250x400
21800289	230 V	1000 W	Ø250x400
21800305	230 V	2000 W	Ø250x400

STANDARD PROGRAMME EFRS

Item no.	Voltage	Power	Size (D x L)
21800306	3x400 V	3300 W	Ø200x400
21800307	3x400 V	4800 W	Ø200x400
21800308	3x400 V	6000 W	Ø250x400
21800309	3x400 V	7500 W	Ø250x400
21800310	3x400 V	9600 W	Ø250x400
21800311	3x400 V	6300 W	Ø315x400
21800312	3x400 V	9600 W	Ø315x400

On request we can supply with other voltage, power, materials and diameter.

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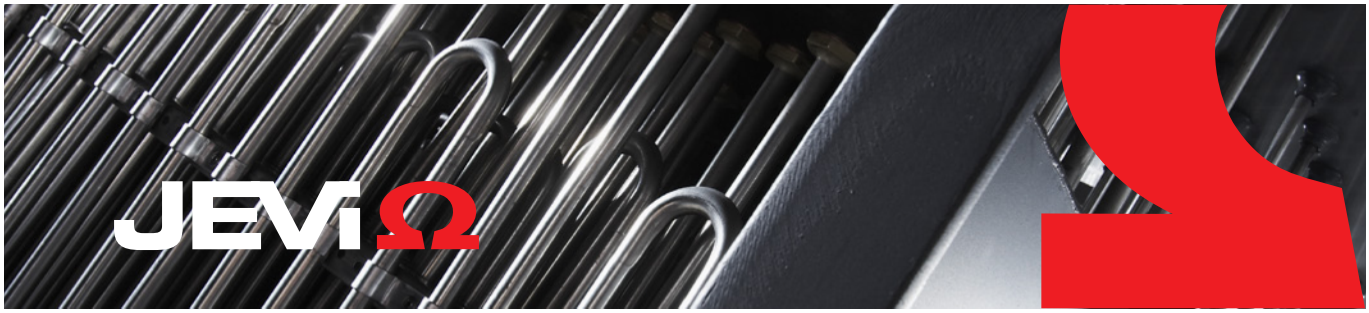

DUCT HEATERS - EFFK

Duct heaters designed for flange mounting in connection with air conditioning/heat recovery and ventilation systems. Special versions for e.g. grain drying plants, process plants, ships and high temperature heaters can be produced to order. Supplied in 3 x 400 V -Y~ as standard. Can be connected to 3 x 230 V-D~ on request.

MATERIAL SELECTION

These duct heaters are made from hot-dip galvanised steel plate as standard, but other materials are also available depending on the application.

DESCRIPTION

Duct section:
Hot-dip galvanised steel plate which is spot welded together and has a flange edge for attachment to the ventilation duct.

Junction box:
This is integrated in the duct section and provided with cable glands. Electrical connection must take place via the terminals fitted (an installation guide will be supplied on delivery). Degree of protection IP22, but other degrees of protection can be supplied on request.

Heating elements:
Heating elements made of AISI 304 (stainless steel) with a surface load of 2.5 W/cm² for air speeds in excess of 2 m/sec. A lower surface load is used for air speeds of less than 2 m/sec. AISI 309/Inconell (stainless steel) is used as the tubing material for high temperature heaters (tube cap temperature max. 800°C). The heating elements are fitted with M14 nipples.

Over temperature protection:
A thermal limiter with automatic reset and a thermal limiter with manuel reconnection are built into the junction box. These are connected to the temperature regulator.

TEMPERATURE CONTROL

See heater control on page 6.

OTHER OPTIONS

Besides the duct heaters described, JEVI has a complete range of explosion proof heaters.
Contact the JEVI sales department for more information.

See the standard programme on the next page.

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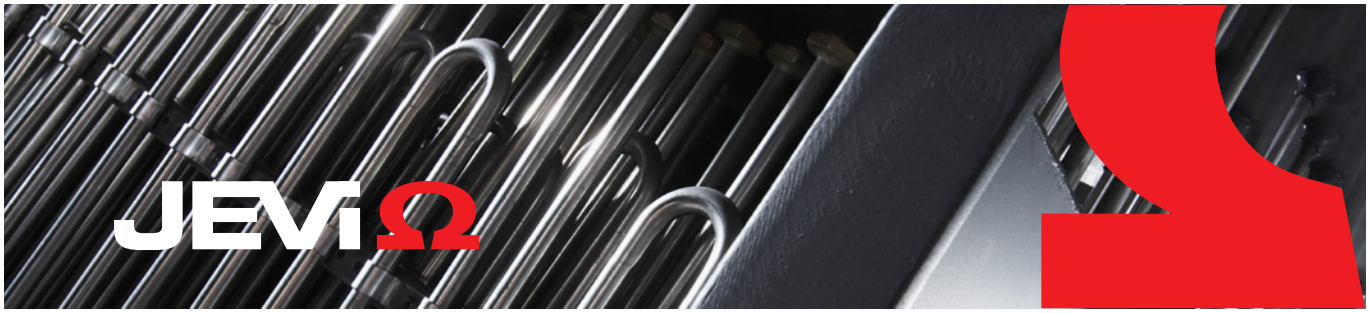

RANGE

Item no.	Voltage	Power	Size	No. of grps.	No. of element rows	Grp. 1	Grp. 2	Grp. 3	Grp. 4
21803051	3 x 400 V	5.25 kW	300 x 300 x 300	3	5	0,75	1,5	3,0	-
21803101	3 x 400 V	9.60 kW	300 x 300 x 300	3	10	1,5	2,7	5,4	-
21803150	3 x 400 V	18.90 kW	300 x 300 x 300	3	11	2,7	5,4	10,8	-
21804109	3 x 400 V	10.80 kW	400 x 400 x 400	3	6	1,5	3,3	6,2	-
21804190	3 x 400 V	18.90 kW	400 x 400 x 400	3	7	2,7	5,4	10,8	-
21804281	3 x 400 V	29.40 kW	400 x 400 x 400	4	12	2,1	3,9	7,8	15,6
21804406	3 x 400 V	38.10 kW	400 x 400 x 400	4	15	2,7	5,4	9,6	20,4
21805239	3 x 400 V	24.60 kW	500 x 500 x 500	4	5	1,5	3,3	6,6	13,2
21805502	3 x 400 V	48.60 kW	500 x 500 x 500	4	11	3,3	6,6	13,2	25,5
21805775	3 x 400 V	76.60 kW	500 x 500 x 500	4	15	5,1	10,2	20,4	40,8
21806328	3 x 400 V	31.50 kW	600 x 600 x 600	4	4	2,1	4,2	8,4	16,8
21806591	3 x 400 V	58.50 kW	600 x 600 x 600	4	9	3,9	7,8	15,6	31,2
21806955	3 x 400 V	94.50 kW	600 x 600 x 600	4	14	6,3	12,6	25,2	50,4
21806112	3 x 400 V	112.50 kW	600 x 600 x 600	4	8	7,5	15,0	30,0	60,0

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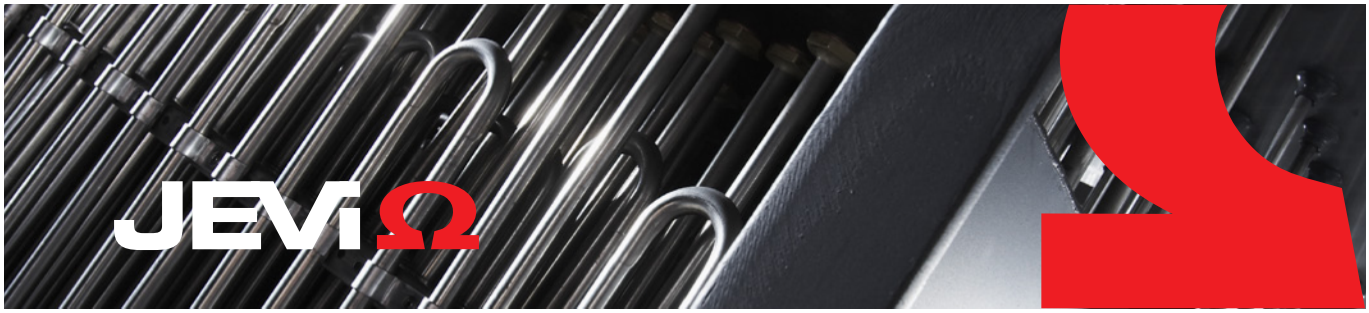


PLUG-IN HEATER - EFI

Electrical heater designed for fitting in connection with air conditioning/heat recovery and ventilation systems. Special versions for e.g. grain drying plants, process plants, ships and high temperature heaters can be produced by order.

DESCRIPTION

Junction box:

This is fitted with a mounting plate and cable glands. Electrical connection via the terminals fitted. An installation guide will be supplied on delivery. Degree of protection IP44, but other degrees of protection can be supplied on request.

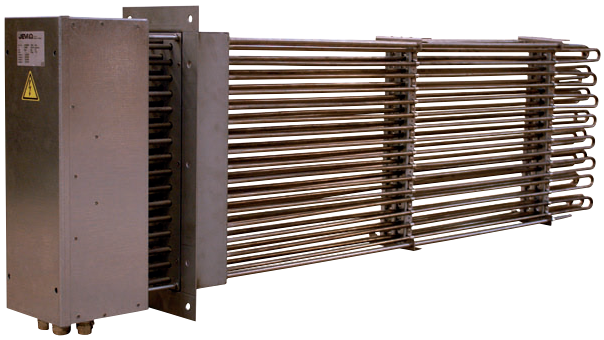
Heating elements:

Heating elements made from AISI 304 (stainless steel) with a surface load of 2.5 W/cm² for air speeds in excess of 2 m/sec. A lower surface load is used for air speeds of less than 2 m/sec.

A thermal limiter with automatic reset and a fire thermostat with manual reconnection are built into the junction box. These are connected to the temperature regulator.

TEMPERATURE REGULATION

Use of multi-step regulation is recommended, such as JEVI's 4-step regulator, or thyristor control.



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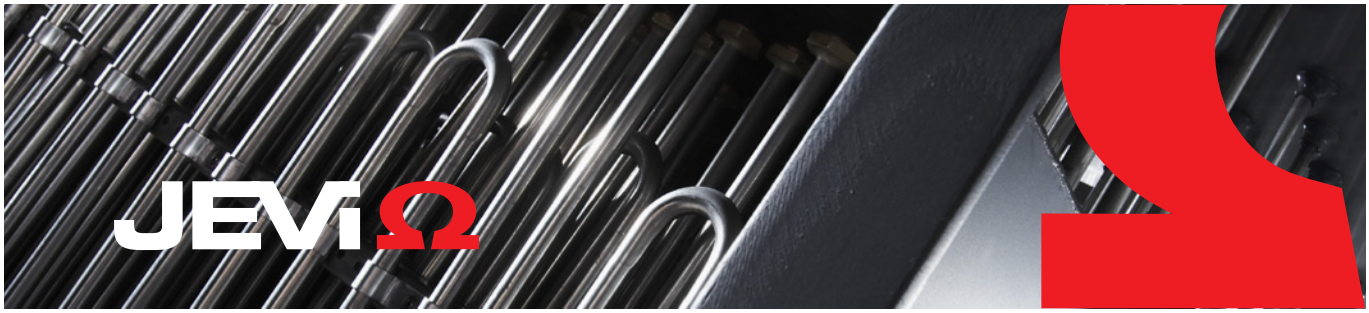


DIMENSIONING

You can use the formula below to work out the necessary power of a heater.

$$P = \frac{M \times 36 \times \Delta t}{100}$$

P = Power
M = Air volume, m³/h
Δt = Temperature increase, °C

The number 36 indicates the power required to increase the temperature from 0 to 100°C per 1 m³ of air per hour.
This formula is a guideline for up to about 80°C and must in any case only be regarded as a recommendation.

Example:
In a ventilation system, you want to increase the temperature from 20°C to 30°C. The air volume is 5000 m³/h.

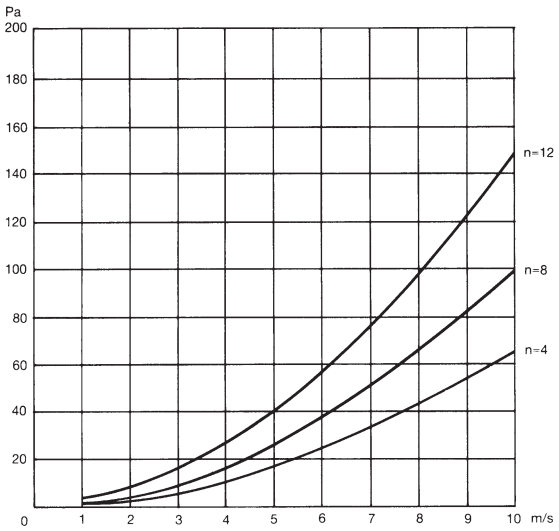
That is: M = 5000 and ΔT = 10

$$P = \frac{5000 \times 36 \times 10}{100} = 18000\ W = 18{,}0\ kW$$

In the standard programme for the EFFK types, you can then find the following type: Type 21804190 with 18.9kW

PRESSURE DROP OVER HEATERS

Guideline table
n = no. of element rows (1 Pa = 1 kp/m²)



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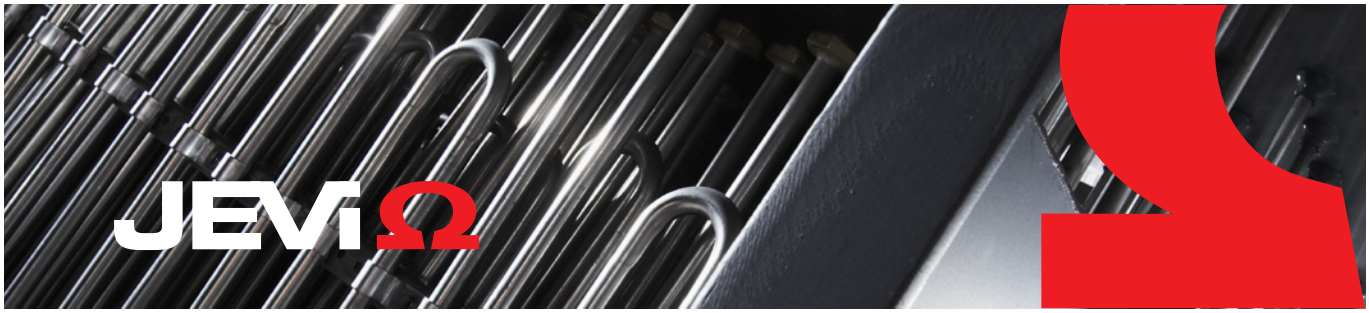

CONTROLS AND CONTROL SYSTEMS

Most heating units are supplied by JEVI together with a control system. To ensure full compatibility and optimum design, production of both the heating unit and the control system together is preferable. The efficiency of any heating system is defined by the ability to control it with precision. This is why we have developed vast expertise when it comes to offering the best solutions for controlling heating systems. A wide range of control systems are available for normal areas. For hazardous areas we offer ATEX-certified systems with the types of protection Ex d, Ex de and Ex p.

ON-OFF CONTROL

On-off control is ideal for application in which precise temperature control is not necessary. On-off control switches the entire heating unit either on or off. Control systems may include thermostats or, for improved accuracy, electronic regulators with a PT100 sensor or a thermoelement as a sensor.

STEP CONTROL

Step control is advisable for precise regulation of heating systems under heavy load. The power is divided into a number of steps, each of which is enabled by means of a special contactor, depending on the temperature difference between the setpoint and the process temperature. The step controller selects the number of steps to be connected.

THYRISTOR CONTROL

Thyristor control is preferable when extreme temperature accuracy, minimal maintenance, a low noise level (no noise from on-off contactors) and minimisation of power consumption are required. Thyristor control also increases the service life of the heating unit, lower heating element temperatures and prevents high peak temperatures.

COMBINATION OF THYRISTOR & STEP CONTROL

The heating unit is divided into a series of smaller units for very heavy loads, or when the heating system constitutes a significant proportion of the electrical capacity installed. By way of example, 50% of the power can be controlled by a contactor (on/off) and 50% can be fine-tuned by means of a thyristor.

Please contact our technical sales team for further information. phone: +45 75 83 02 11 or e-mail: jevi@jevi.dk

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