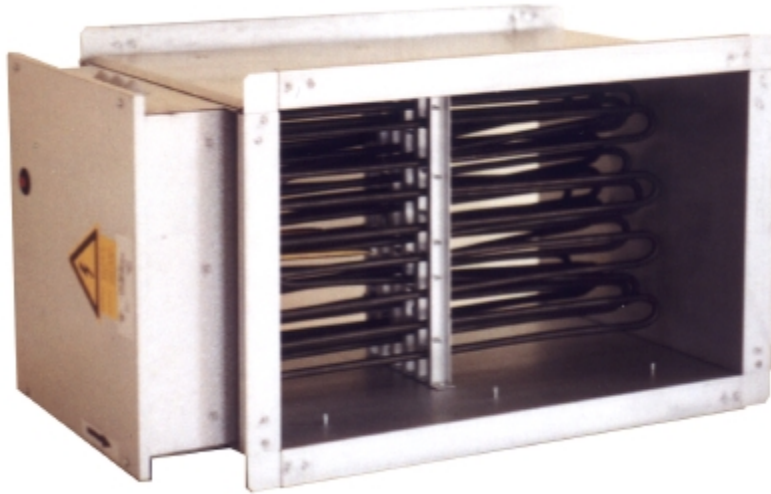


ELECTRICAL RECTANGULAR DUCT HEATERS RVA



TECHNICAL SPECIFICATIONS

DESCRIPTION

Casing of rectangular duct heater is manufactured of galvanised steel sheet and the heater element – of stainless steel. The heaters can be installed in any position. The direction of the airflow is indicated by the arrow on the heater casing. In horizontal ducting heaters must be installed with the electrical connection box facing sideways to the left or to the right, but not upwards or downwards. Duct heaters must be installed so, that the airflow would be even across whole cross-sectional area.

Because the airflow is influenced by bends, fans, valves, filters etc., the heater should be located so, that the minimum distance from them must be not less than the diagonal dimension of the heater, i.e. from corner to corner across the heater casing in the ducting.

For heaters rated at 30kW or less, the heater can be cut at the same time as the fan/ airflow is stopped. For heaters in excess of 30kW, it is recommended that the fan/airflow continues to run from 2 to 3 minutes after the heater is turned off. Standart duct heaters are designed for a minimum air velocity of 1,5 m/s and a maximum output air temperature of 50° C.

POWER STEPS AND REGULATION

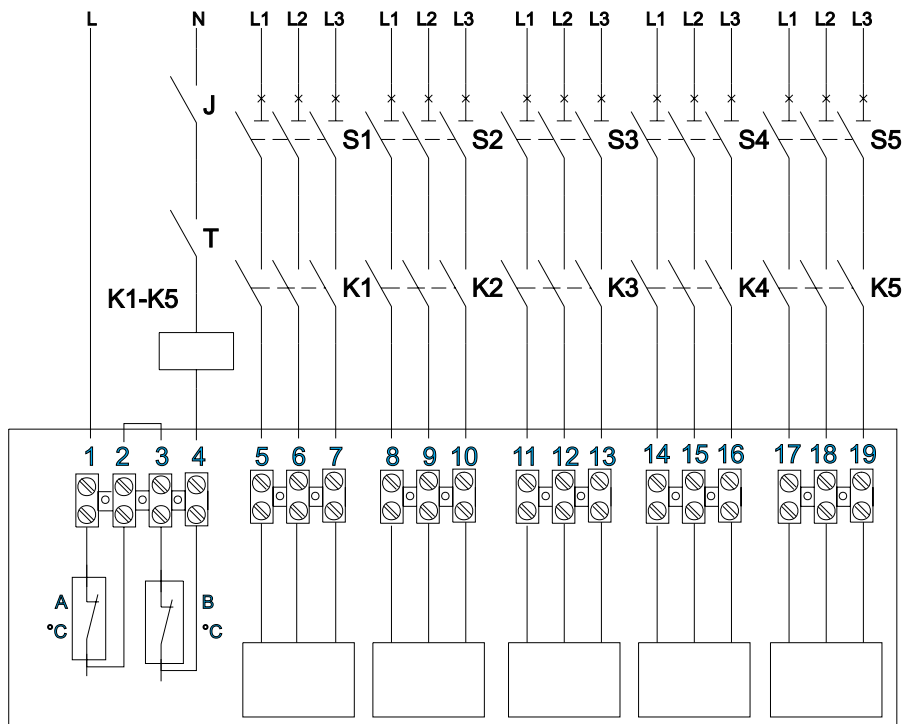
Recommended heater`s power steps and regulation is given in the table below.

Total rated power [kW]	Power steps	Controller
6 - 15	One step	TTC 25
15 - 27	One step	TTC 40F
27 - 57	Three steps (15 + 12 + 30) kW	TTC 40F + TT-S4/D

WIRING DIAGRAM

- A** - Overheat protection with manual reset
- B** - Overheat protection with automatical reset
- J** - Interlock

- T** - Thermostat
- K1-K5** - Contactors
- S1-S5** - All-phase breakers



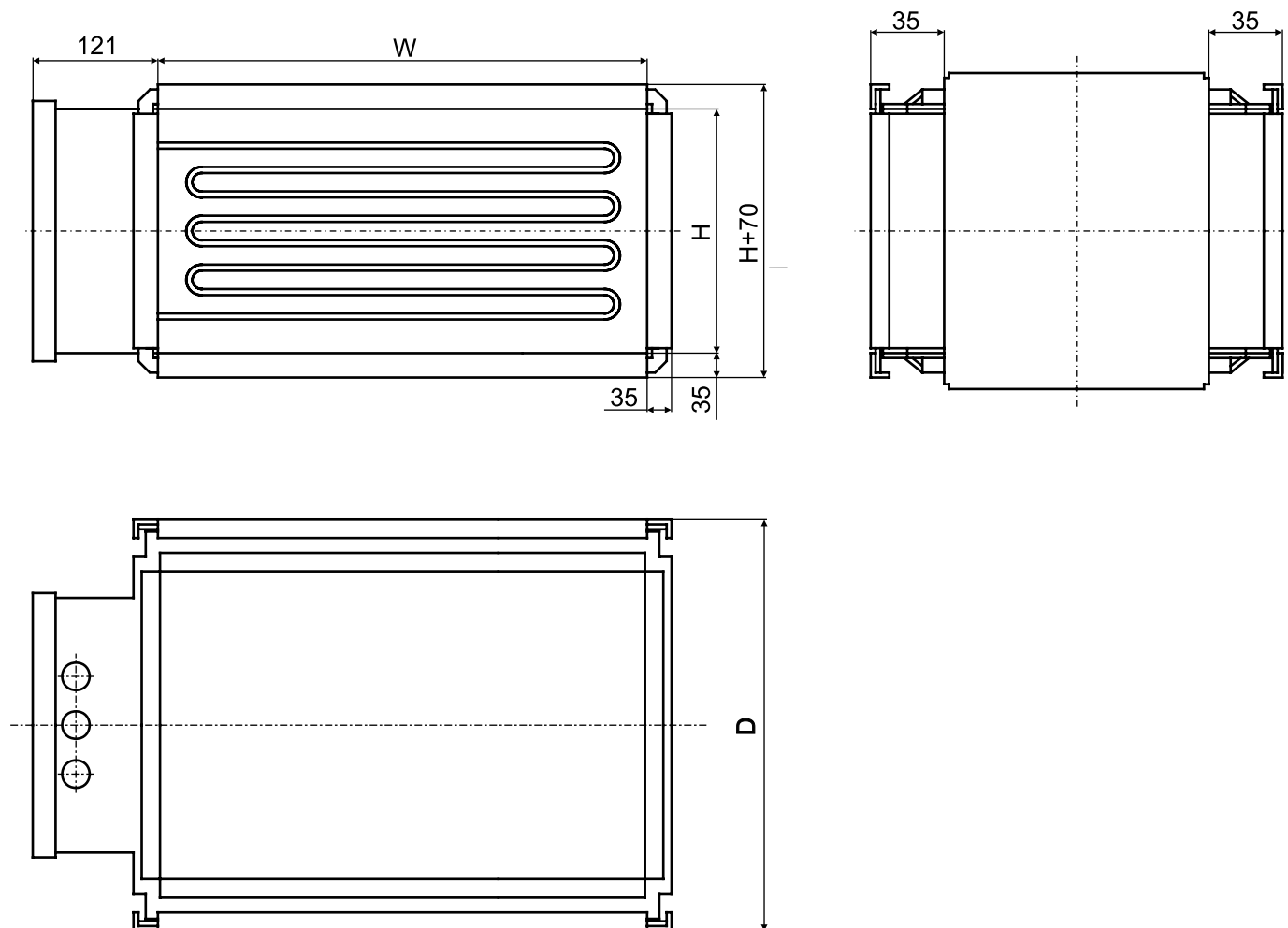
OVERHEAT PROTECTION

All RVA duct heaters has two overheat thermostats: the first one cuts out when the temperature reaches 50°C (resets automatically), the second one cuts out when the temperature reaches 100°C (is reset manually with pushbutton on the casing).

RVA has no internal temperature controller. External heating controllers TTC are used in this case.

DIMENSIONS

Dimensions W and H are selected depending on the dimensions of ducting in which the heater can be installed. Minimum air velocity of 1,5 m/s also must be taken into consideration.



POWER REQUIREMENTS

Heating power range of manufactured RVA heaters varies from 0,3 kW to 300 kW.

Calculation of required heater power: $P = Q * 0,36 * (t_2 - t_1)$

I.e.: **P** - heating power [W],

Q - airflow [m³/h],

t₁ - temperature of incoming air [°C],

t₂ - required air temperature [°C].

Example. Airflow – 2500 m³/h. The requirement is to increase air temperature from +10°C to +20°C:

$P = 2500 * 0,36 * (20 - 10) = 9000$ W; Suitable heating power is approx. 9,0 kW.

PRESSURE DROP

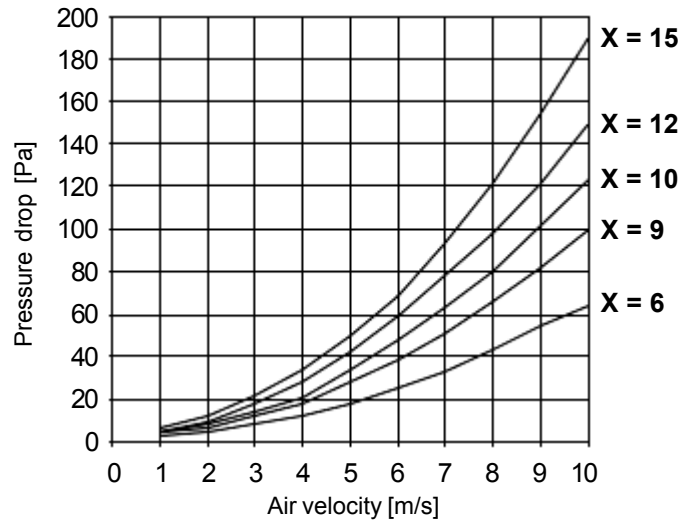
Pressure drop across a duct heater depends on air velocity and the number of rows of heating elements (with reference to diagram).

Calculation of heating element rows number: $X = P / (A * 15)$

I.e.: **X** - approx. number of heating element rows

P - total rated power [kW],

A - cross sectional area [m²].



SURFACE TEMPERATURE OF HEATING ELEMENTS

Surface temperature of the heater elements depends on air velocity and surface heating power rating of the element (approx. 3 W/cm²). The diagram illustrates the surface temperature of the element as a function of air velocity at an air output temperature of approx. 20°C from the heater.

