

■ Warm water heater battery for rectangular duct connection.

Casing made of galvanised steel with flanges on both sides to fit the HELIOS rectangular fan range. Heating elements made of copper with aluminium fins. Max. operating temp.: t_{max} 120 °C. Max. operating pressure: 8 bar. Water pipes with male thread. Equipped with water and air outlets.

■ Installation

The heater must be installed downstream of the fan. If installing it before the fan, make sure that the air flow temperature at the fan does not exceed the fan's max. temperature.

To protect the heater from dirt and to prevent it from being clogged (reducing air flow and heat output) we recommend the use of the air filter KLF.

A rectangular duct with a length of at least 1 metre must be installed between fan and heater in order to ensure a balanced air flow. An air bleed valve and a water drain valve must be provided for releasing air and water from the unit.

Note: In order to avoid water freezing in the pipes, frost protection shall be provided onsite.

■ Selection

The actual temperature increase depends on the air flow volume, heater output and inlet water temperature.

Follow steps a – c to determine the required heater.

When selecting a fan (air flow volume decision) the resistance of the heater (pressure drop) must be (chart d) considered.

a) Temperature increase

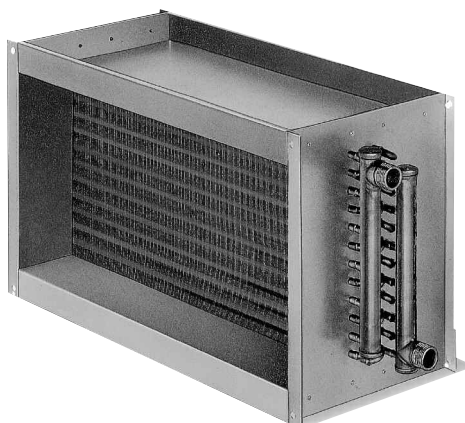
Definition: $\Delta T = \theta_i - \theta_a$ [K]

ΔT : Temperature difference of air [K]

θ_i : Air temp., off air heater [°C]

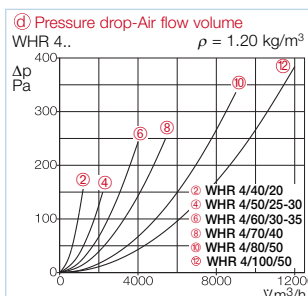
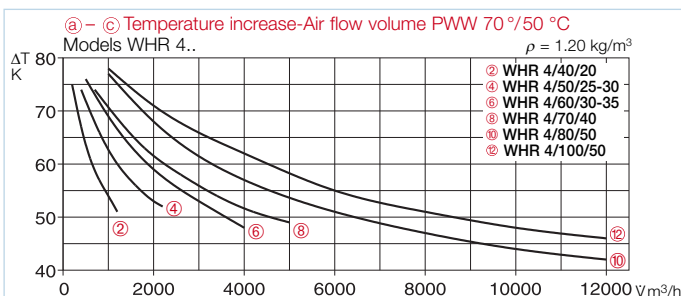
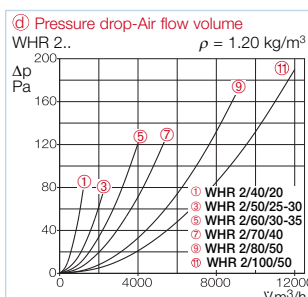
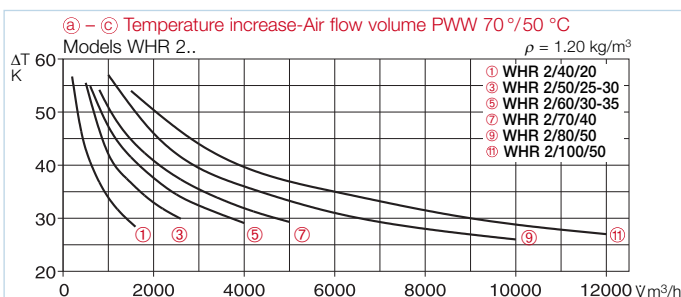
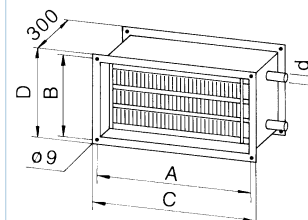
θ_a : Air temp., on air heater [°C]

WHR Duct



Accessories	Page
Temperature controller WHS	316

Dimensions in mm see chart



b) Air flow volume

Shown on the performance curve whereby the total resistance of the system and heater (see chart d) (pressure drop) must be taken into account.

c) Determination of required air

$$Q_H = \frac{V \cdot \Delta T \cdot c_{PL} \cdot \rho_L}{3600} \text{ [kW]}$$

V: Air flow volume [m³/h]

ΔT : Temperature difference of air [K]

c_{PL} : Specific heat capacity of air

(1,0) [kJ/kg K]

ρ_L : Air density (1.2) [kg/m³]

d) Determination of pressure drop

The pressure drop of the heaters at air flow volumes is illustrated in the above charts.

Type	Ref. No.	Fits fan nominal size	Air Data					Water data ¹⁾		Dimensions				Connection d* ³⁾	Nominal weight	Suitable temperature controller	
			heat output		Δ T air		at V	pressure drop	at water flow rate	A	B	C	D			Type	Ref. No.
		NG cm	kW ¹⁾	kW ²⁾	K ¹⁾	K ²⁾	m³/h	Δp _w kPa	l/h	mm	mm	mm	mm	ø"	kg		
WHR 2/40/20	8782	40/20	14	7.7	32	18	1200	10	610	420	220	450	250	3/4	7.0	WHS 1100	8815
WHR 4/40/20	8783	40/20	22	12.6	51	29	1200	7	980	420	220	450	250	3/4	7.3	WHS 1100	8815
WHR 2/50/25-30	8784	50/25-30	24	14	33	18	2200	7	1050	520	270/320	550	350	3/4	9.3	WHS 1100	8815
WHR 4/50/25-30	8785	50/25-30	38	21	52	28	2200	5	1680	520	270/320	550	350	1	11.1	WHS 2200	8816
WHR 2/60/30-35	8786	60/30-35	32	18	34	19	2600	8	1420	620	320/370	650	400	3/4	11.2	WHS 2200	8816
WHR 4/60/30-35	8787	60/30-35	51	30	55	32	2600	7	2270	620	320/370	650	400	1	14.0	WHS 2200 ⁴⁾	8816
WHR 2/70/40	8788	70/40	50	28	30	17	4500	6	2200	720	420	750	450	1	17.0	WHS 2200	8816
WHR 4/70/40	8789	70/40	81	44	50	27	4500	4	3570	720	420	750	450	1	17.0	—	—
WHR 2/80/50	8795	80/50	82	46	28	16	8000	11	3630	820	520	850	550	1	15.0	—	—
WHR 4/80/50	8796	80/50	138	80	48	28	8000	15	6110	820	520	850	550	1	20.0	—	—
WHR 2/100/50	8797	100/50	104	59	29	18	10000	19	4630	1020	520	1050	550	1	18.0	—	—
WHR 4/100/50	8798	100/50	172	99	48	28	10000	14	7640	1020	520	1050	550	1	24.0	—	—

The values apply for an intake air temp. of 0 °C and flow/return water temp: ¹⁾ 90/70 °C, ²⁾ 60/40 °C

³⁾ 3/4" = 19.05 mm, 1" = 25.4 mm, male thread

⁴⁾ under reduced heat output at ca. 2200 l/h