



Duct water heaters

WKH

for round ducts

Use

- For warming up of supply air in ventilation systems installed in various premises.
- Suitable for installation in supply or air handling units to warm up the supply air flow.
- For indoor use only if water serves as a heat carrier.
- For outdoor application use antifreezing mixture (ethylene glycol solution).
- Compatible with Ø 100 to 315 mm round air ducts.

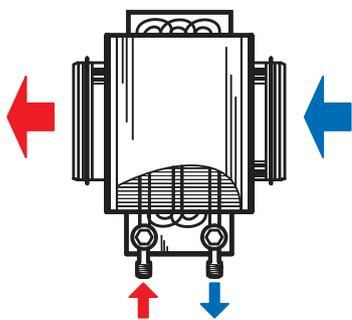
Design

- Galvanized steel case.
- Copper pipe manifold.
- Heat exchange surface made of aluminium plates.
- Airtight connection with air ducts due to rubber seals.
- Equipped with a nipple for the system deaeration.
- Outlet header is equipped with a spigot for installation of an immersion temperature sensor or freezing protection mechanism.
- Available in two- or four-row tube modifications.
- Suitable for operation at maximum operating pressure 1.6 MPa (16 bar) and maximum operating temperature +100 °C.

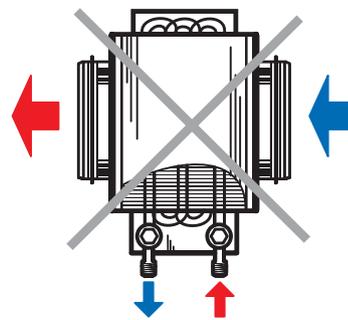
Mounting

- Fixing to round ducts with clamps.
- Any mounting position that ensures the heater deaeration.
- Install a filter upstream to the heater to protect heating elements against dirt ingress.

- Install the heater in front or behind the fan. In case of mounting behind the fan ensure a distance of not less than two connecting diameters for air flow stabilization and keep the maximum permissible air temperature inside the fan.
- Connect the heater on counter-flow basis, otherwise its capacity drops by 5-15 %. All the nomographic charts are rated for counter-flow connection.
- For correct and safe heater operation an automatic control and protection system is recommended, including the following functions:
 - regulation of the heating capacity and temperature of the air heated up;
 - filter clogging control by a differential air pressure sensor;
 - ventilation system start-up with pre-heated heater;
 - use of air dampers fitted with a spring return actuator;
 - fan turns off in case of freezing danger for the heater.



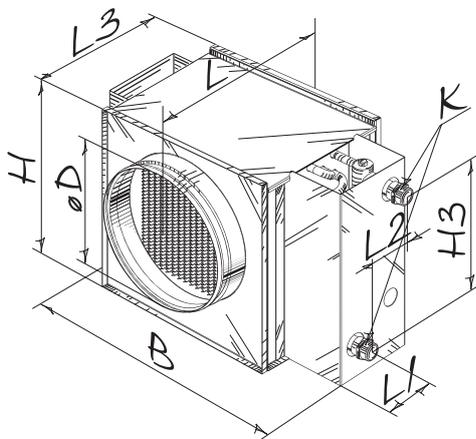
Connection against air flow



Connection along air flow

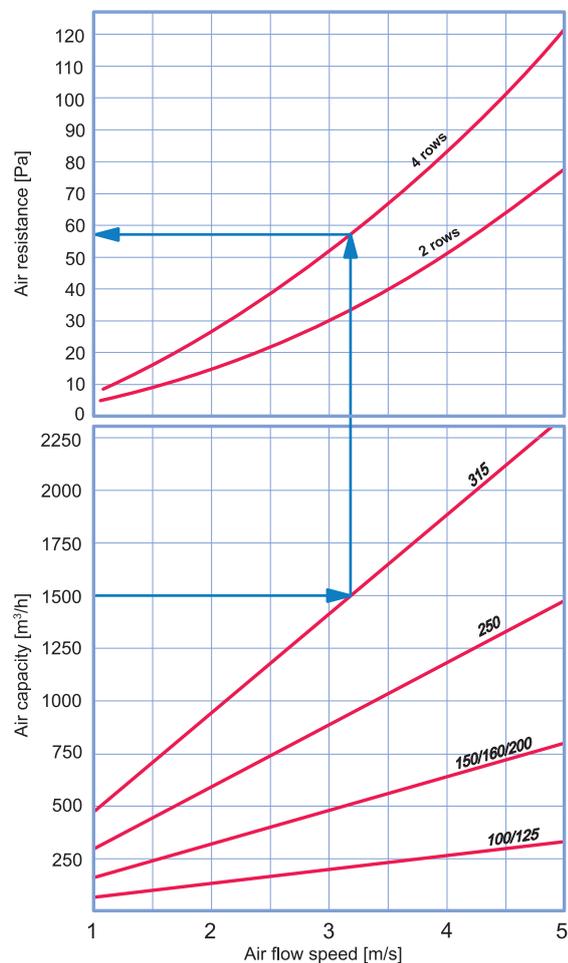
■ Overall dimensions

Type	Dimensions [mm]									Number of water coil rows	Weight [kg]
	∅D	B	H	H3	L	L1	L2	L3	K		
WKH 100-2	99	350	230	150	300	32	43	220	G 3/4"	2	3.9
WKH 100-4	99	350	230	150	300	28	65	220	G 3/4"	4	5.2
WKH 125-2	124	350	230	150	300	32	43	220	G 3/4"	2	4.0
WKH 125-4	124	350	230	150	300	28	65	220	G 3/4"	4	5.3
WKH 150-2	149	400	280	200	300	32	43	220	G 3/4"	2	7.5
WKH 150-4	149	400	280	200	300	28	65	220	G 3/4"	4	8.2
WKH 160-2	159	400	280	200	300	32	43	220	G 3/4"	2	7.5
WKH 160-4	159	400	280	200	300	28	65	220	G 3/4"	4	8.2
WKH 200-2	198	400	280	200	300	32	43	220	G 3/4"	2	7.5
WKH 200-4	198	400	280	200	300	28	65	220	G 3/4"	4	8.2
WKH 250-2	248	470	350	270	350	32	43	270	G 1"	2	10.3
WKH 250-4	248	470	350	270	350	28	65	270	G 1"	4	10.8
WKH 315-2	313	550	430	350	450	57	43	370	G 1"	2	12.6
WKH 315-4	313	550	430	350	450	53	65	370	G 1"	4	13.4

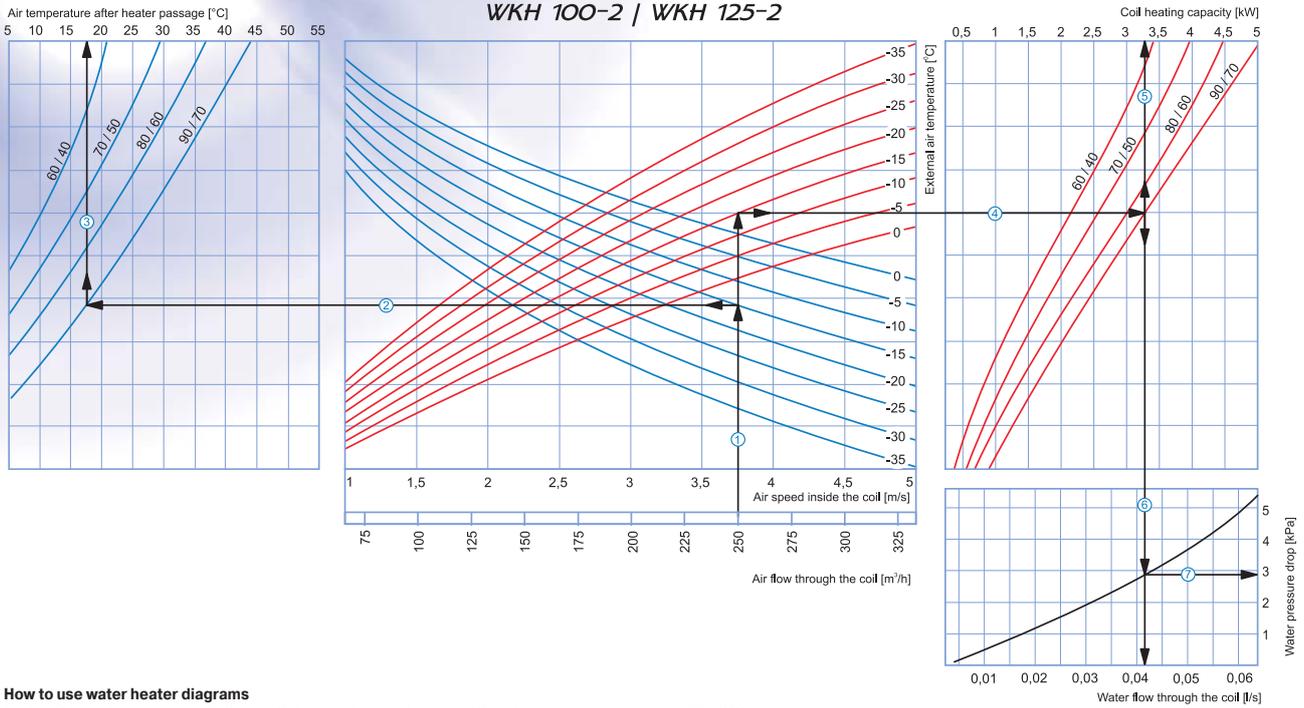


Air pressure loss for water heaters WKH

WKH round heaters



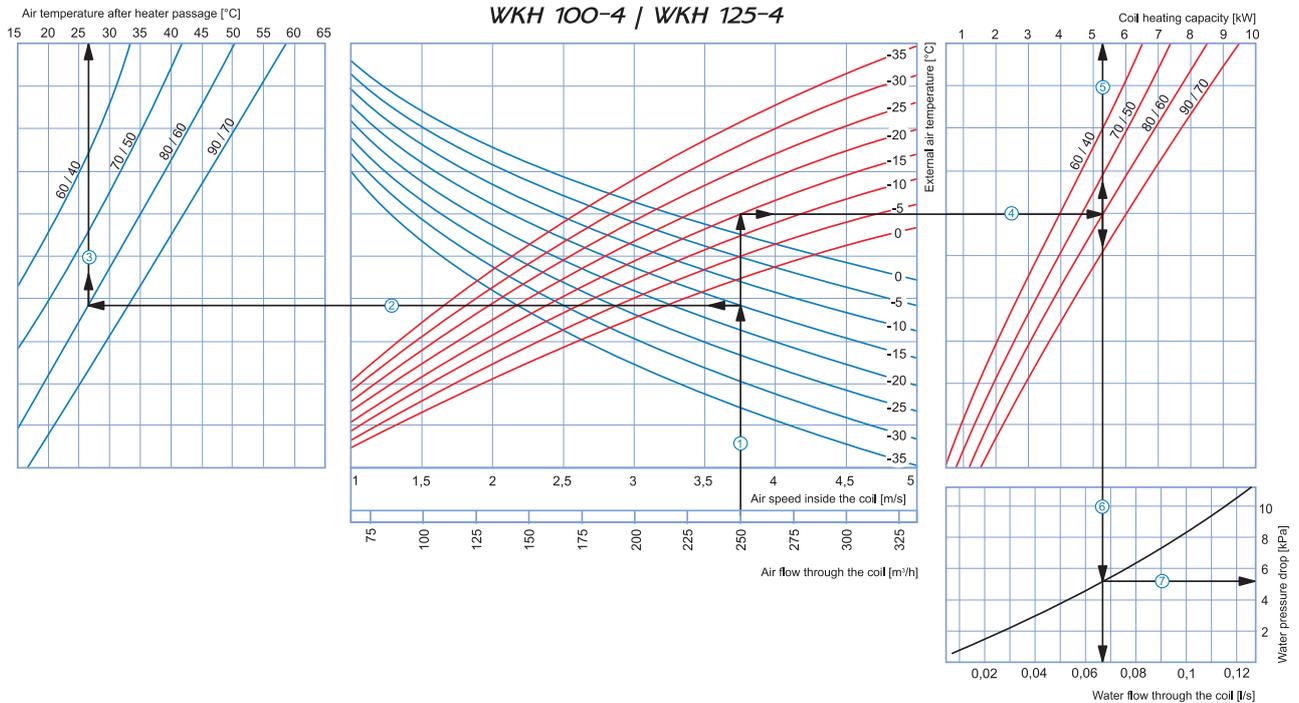
Water heaters calculation diagram



How to use water heater diagrams

System Parameters: Air flow = 250 m³/h. Outside air temperature = -15 °C. Water temperature (in/out) = 90/70 °C.

- **Air Speed inside coil:** Starting from 250 m³/h on the air flow scale draw a vertical line ①. This line crosses the air speed axis and shows a value of about 3.75 m/s.
- **Supply air temperature:** Prolong the line ① up to the point where it crosses the outside air temperature (blue curve, e.g. -15 °C); then draw a horizontal line ② from this point to the left until it crosses the water in/out temperature curve (e.g. 90/70 °C). From this point draw a vertical line ③ to the supply air temperature axis on top of the graphic (+17,5 °C).
- **Heating coil capacity:** Prolong the line ① up to the point where it crosses the outside air temperature (e.g. -15 °C, red curve) and draw a horizontal line ④ from this point to the right until it crosses the water in/out temperature curve (e.g., 90/70 °C). From here draw a vertical line ⑤ up to the scale representing the heating coil capacity (3.25 kW).
- **Water flow:** Prolong the line ⑤ down to the water flow axis ⑥ at the bottom of the graphic (0.042 l/s).
- **Water pressure drop:** Draw the line ⑦ from the point where the line ⑥ crosses the black curve to the pressure drop axis (2.9 kPa).

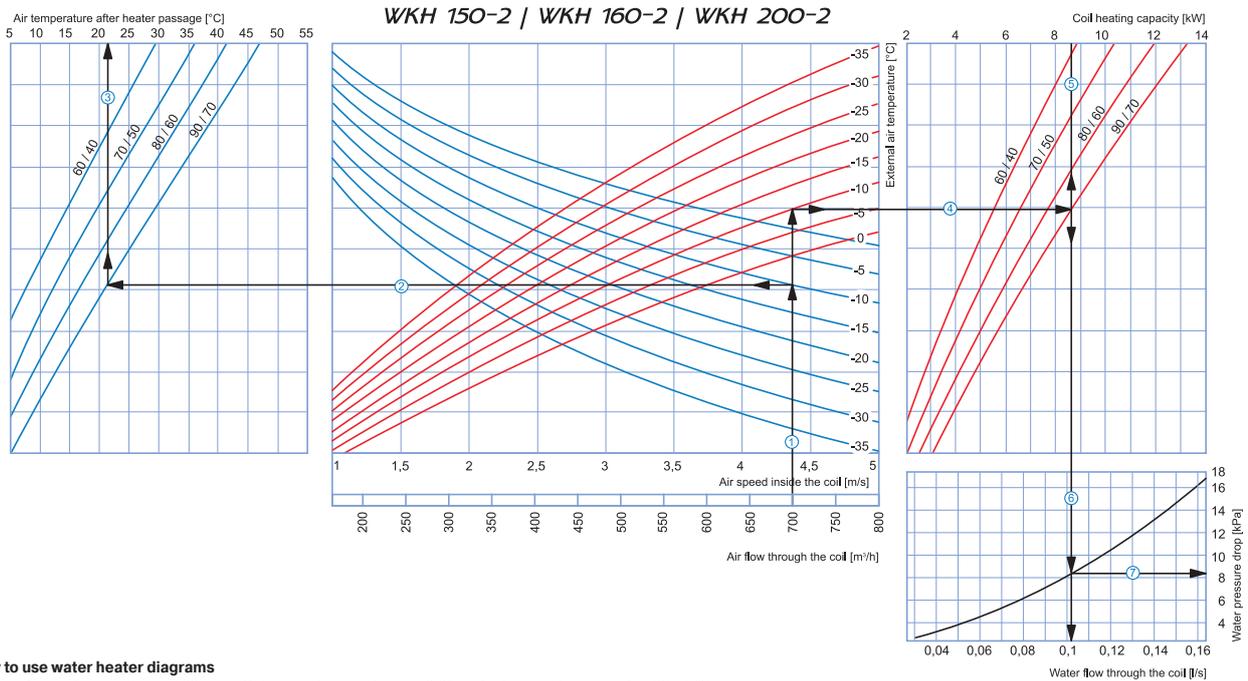


How to use water heater diagrams

System Parameters: Air flow = 250 m³/h. Outside air temperature = -15 °C. Water temperature (in/out) = 80/60 °C.

- **Air Speed inside coil:** Starting from 250 m³/h on the air flow scale draw a vertical line ①. This line crosses the air speed axis and shows a value of about 3.75 m/s.
- **Supply air temperature:** Prolong the line ① up to the point where it crosses the outside air temperature (blue curve, e.g. -15 °C); then draw a horizontal line ② from this point to the left until it crosses the water in/out temperature curve (e.g. 80/60 °C). From this point draw a vertical line ③ to the supply air temperature axis on top of the graphic (+27 °C).
- **Heating coil capacity:** Prolong the line ① up to the point where it crosses the outside air temperature (e.g. -15 °C, red curve) and draw a horizontal line ④ from this point to the right until it crosses the water in/out temperature curve (e.g., 80/60 °C). From here draw a vertical line ⑤ up to the scale representing the heating coil capacity (5.2 kW).
- **Water flow:** Prolong the line ⑤ down to the water flow axis ⑥ at the bottom of the graphic (0.067 l/s).
- **Water pressure drop:** Draw the line ⑦ from the point where the line ⑥ crosses the black curve to the pressure drop axis (5.2 kPa).

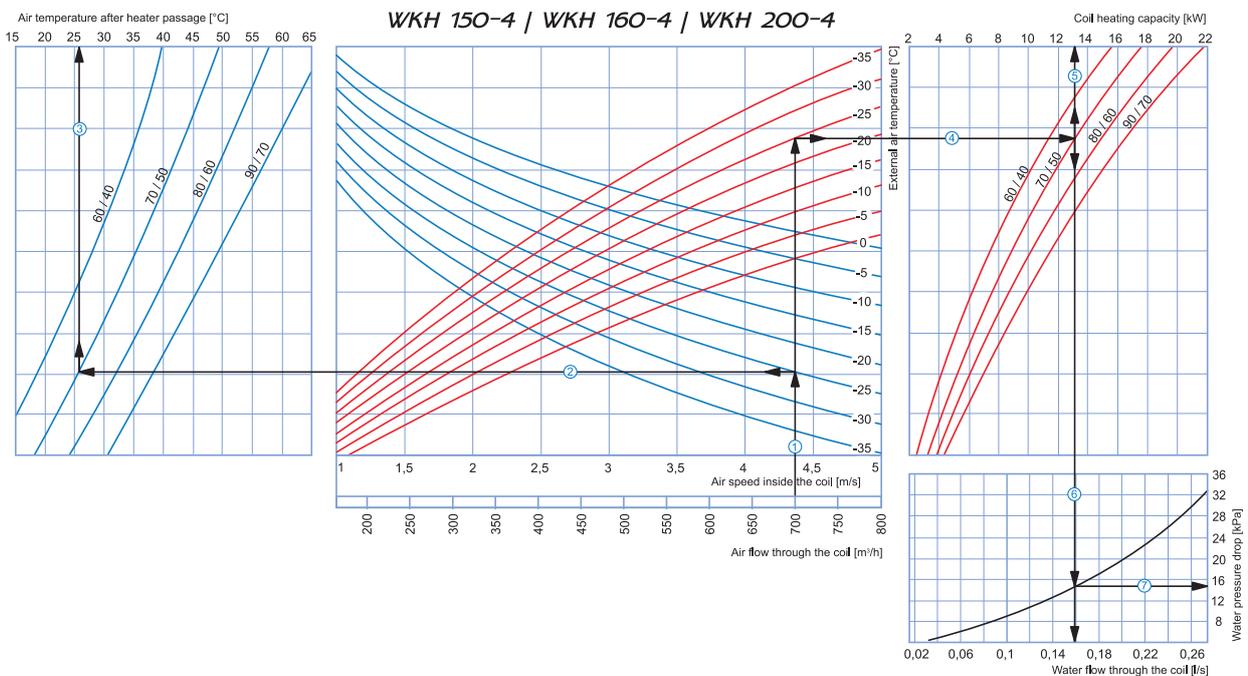
Water heaters calculation diagram



How to use water heater diagrams

System Parameters: Air flow = 700 m³/h. Outside air temperature = -10 °C. Water temperature (in/out) = 90/70 °C.

- **Air Speed inside coil:** Starting from 700 m³/h on the air flow scale draw a vertical line ①. This line crosses the air speed axis and shows a value of about 4.4 m/s.
- **Supply air temperature:** Prolong the line ① up to the point where it crosses the outside air temperature (blue curve, e.g. -10 °C); then draw a horizontal line ② from this point to the left until it crosses the water in/out temperature curve (e.g. 90/70 °C). From this point draw a vertical line ③ to the supply air temperature axis on top of the graphic (+21 °C).
- **Heating coil capacity:** Prolong the line ① up to the point where it crosses the outside air temperature (e.g. -10 °C, red curve) and draw a horizontal line ④ from this point to the right until it crosses the water in/out temperature curve (e.g., 90/70 °C). From here draw a vertical line ⑤ up to the scale representing the heating coil capacity (8.6 kW).
- **Water flow:** Prolong the line ⑤ down to the water flow axis ⑥ at the bottom of the graphic (0.11 l/s).
- **Water pressure drop:** Draw the line ⑦ from the point where the line ⑥ crosses the black curve to the pressure drop axis (8.2 kPa).

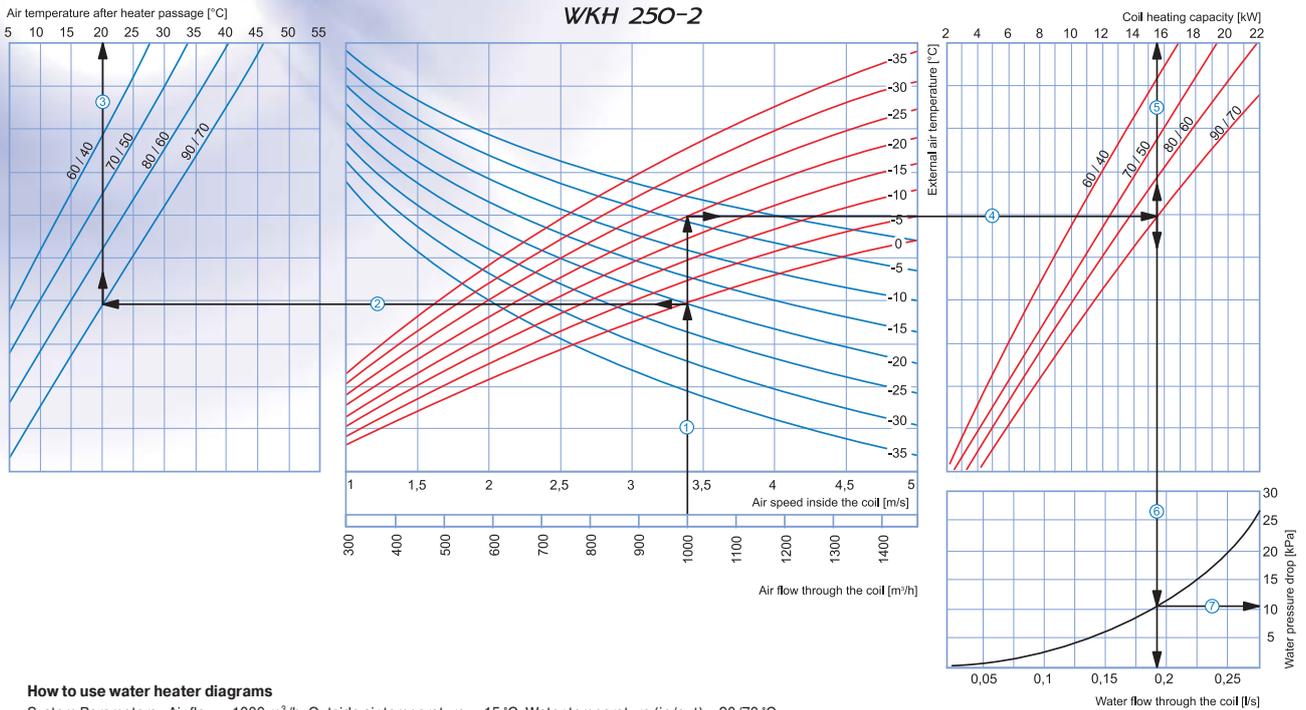


How to use water heater diagrams

System Parameters: Air flow = 700 m³/h. Outside air temperature = -25 °C. Water temperature (in/out) = 70/50 °C.

- **Air Speed inside coil:** Starting from 700 m³/h on the air flow scale draw a vertical line ①. This line crosses the air speed axis and shows a value of about 4.4 m/s.
- **Supply air temperature:** Prolong the line ① up to the point where it crosses the outside air temperature (blue curve, e.g. -25 °C); then draw a horizontal line ② from this point to the left until it crosses the water in/out temperature curve (e.g. 70/50 °C). From this point draw a vertical line ③ to the supply air temperature axis on top of the graphic (+26 °C).
- **Heating coil capacity:** Prolong the line ① up to the point where it crosses the outside air temperature (e.g. -25 °C, red curve) and draw a horizontal line ④ from this point to the right until it crosses the water in/out temperature curve (e.g., 70/50 °C). From here draw a vertical line ⑤ up to the scale representing the heating coil capacity (13.0 kW).
- **Water flow:** Prolong the line ⑤ down to the water flow axis ⑥ at the bottom of the graphic (0.16 l/s).
- **Water pressure drop:** Draw the line ⑦ from the point where the line ⑥ crosses the black curve to the pressure drop axis (15 kPa).

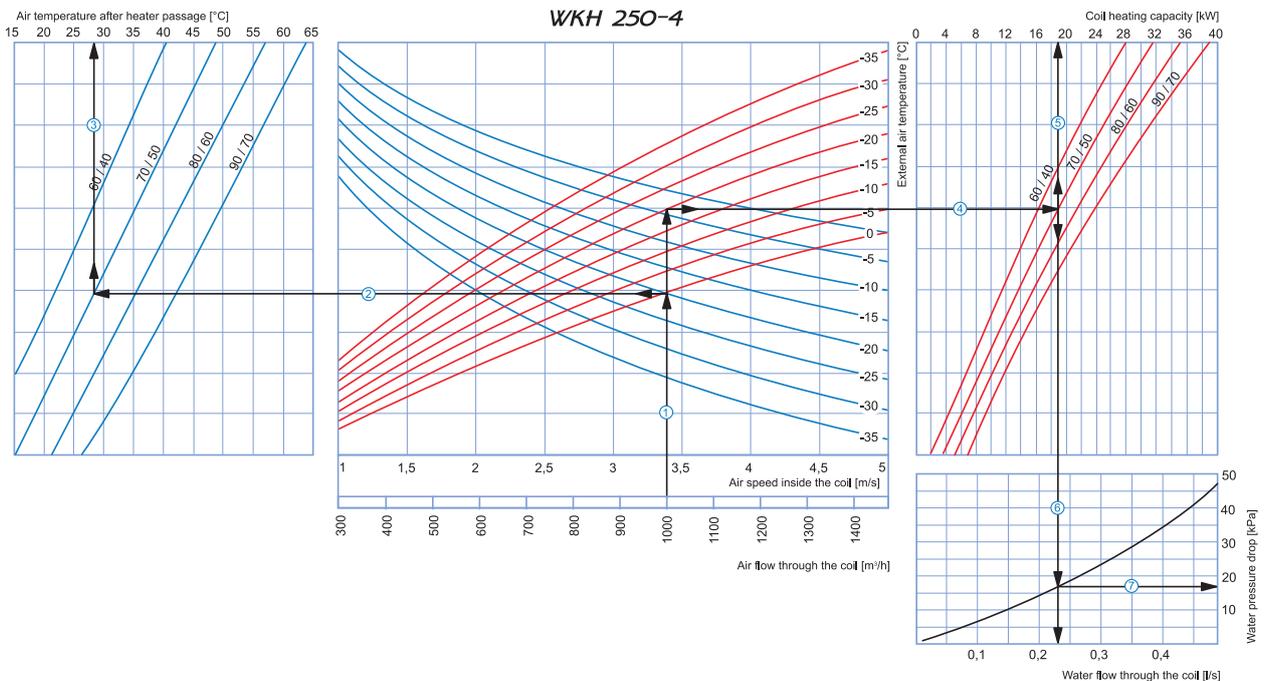
Water heaters calculation diagram



How to use water heater diagrams

System Parameters: Air flow = 1000 m³/h. Outside air temperature = -15 °C. Water temperature (in/out) = 90/70 °C.

- **Air Speed inside coil:** Starting from 1000 m³/h on the air flow scale draw a vertical line ①. This line crosses the air speed axis and shows a value of about 3.4 m/s.
- **Supply air temperature:** Prolong the line ① up to the point where it crosses the outside air temperature (blue curve, e.g. -20 °C); then draw a horizontal line ② from this point to the left until it crosses the water in/out temperature curve (e.g. 90/70 °C). From this point draw a vertical line ③ to the supply air temperature axis on top of the graphic (+20 °C).
- **Heating coil capacity:** Prolong the line ① up to the point where it crosses the outside air temperature (e.g. -20 °C, red curve) and draw a horizontal line ④ from this point to the right until it crosses the water in/out temperature curve (e.g., 90/70 °C). From here draw a vertical line ⑤ up to the scale representing the heating coil capacity (15.5 kW).
- **Water flow:** Prolong the line ⑤ down to the water flow axis ⑥ at the bottom of the graphic (0.019 l/s).
- **Water pressure drop:** Draw the line ⑦ from the point where the line ⑥ crosses the black curve to the pressure drop axis (11 kPa).

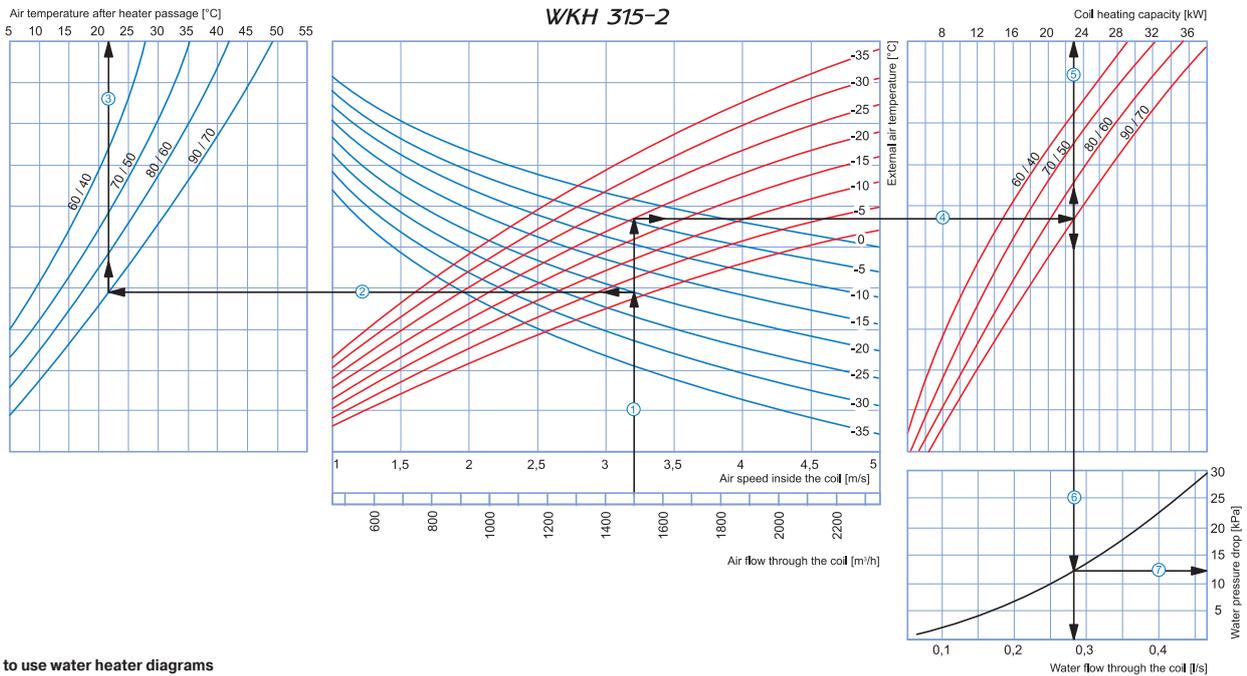


How to use water heater diagrams

System Parameters: Air flow = 1000 m³/h. Outside air temperature = -20 °C. Water temperature (in/out) = 70/50 °C.

- **Air Speed inside coil:** Starting from 1000 m³/h on the air flow scale draw a vertical line ①. This line crosses the air speed axis and shows a value of about 3.4 m/s.
- **Supply air temperature:** Prolong the line ① up to the point where it crosses the outside air temperature (blue curve, e.g. -20 °C); then draw a horizontal line ② from this point to the left until it crosses the water in/out temperature curve (e.g. 70/50 °C). From this point draw a vertical line ③ to the supply air temperature axis on top of the graphic (+27 °C).
- **Heating coil capacity:** Prolong the line ① up to the point where it crosses the outside air temperature (e.g. -20 °C, red curve) and draw a horizontal line ④ from this point to the right until it crosses the water in/out temperature curve (e.g., 70/50 °C). From here draw a vertical line ⑤ up to the scale representing the heating coil capacity (19 kW).
- **Water flow:** Prolong the line ⑤ down to the water flow axis ⑥ at the bottom of the graphic (0.023 l/s).
- **Water pressure drop:** Draw the line ⑦ from the point where the line ⑥ crosses the black curve to the pressure drop axis (17 kPa).

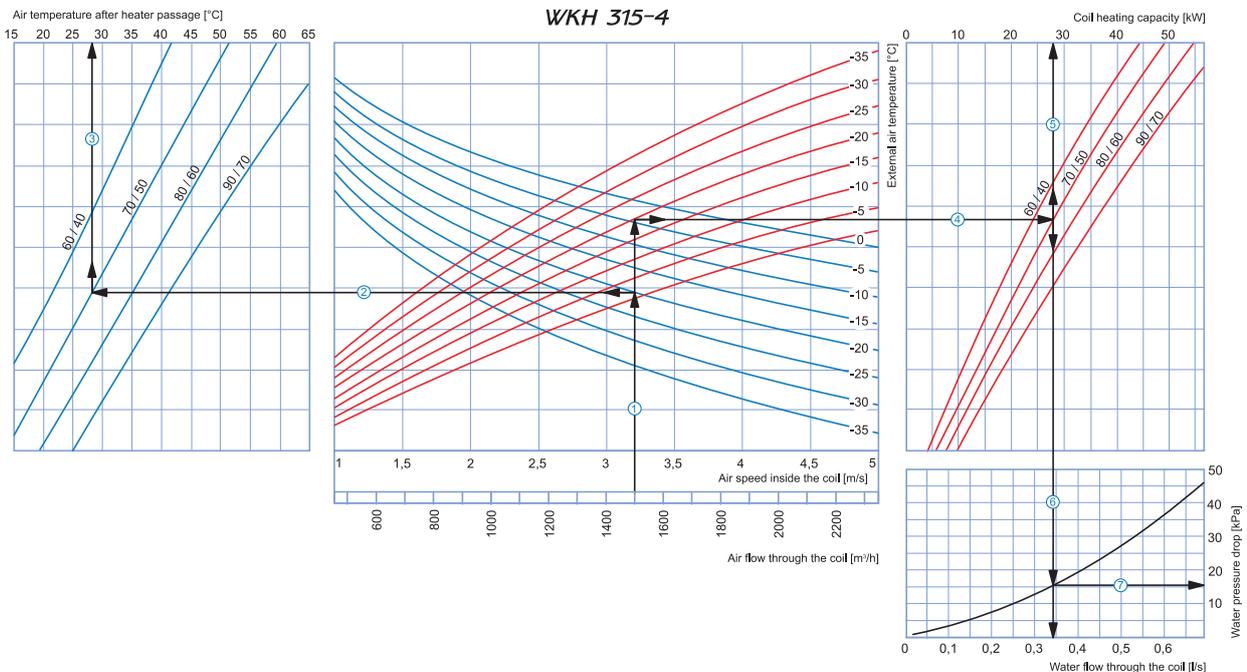
Water heaters calculation diagram



How to use water heater diagrams

System Parameters: Air flow = 1500 m³/h. Outside air temperature = -20 °C. Water temperature (in/out) = 90/70 °C.

- **Air Speed inside coil:** Starting from 1500 m³/h on the air flow scale draw a vertical line ①. This line crosses the air speed axis and shows a value of about 3.2 m/s.
- **Supply air temperature:** Prolong the line ① up to the point where it crosses the outside air temperature (blue curve, e.g. -20 °C); then draw a horizontal line ② from this point to the left until it crosses the water in/out temperature curve (e.g. 90/70 °C). From this point draw a vertical line ③ to the supply air temperature axis on top of the graphic (+21 °C).
- **Heating coil capacity:** Prolong the line ① up to the point where it crosses the outside air temperature (e.g. -20 °C, red curve) and draw a horizontal line ④ from this point to the right until it crosses the water in/out temperature curve (e.g., 90/70 °C). From here draw a vertical line ⑤ up to the scale representing the heating coil capacity (23 kW).
- **Water flow:** Prolong the line ⑤ down to the water flow axis ⑥ at the bottom of the graphic (0.28 l/s).
- **Water pressure drop:** Draw the line ⑦ from the point where the line ⑥ crosses the black curve to the pressure drop axis (12.5 kPa).



How to use water heater diagrams

System Parameters: Air flow = 1500 m³/h. Outside air temperature = -20 °C. Water temperature (in/out) = 70/50 °C.

- **Air Speed inside coil:** Starting from 1500 m³/h on the air flow scale draw a vertical line ①. This line crosses the air speed axis and shows a value of about 3.2 m/s.
- **Supply air temperature:** Prolong the line ① up to the point where it crosses the outside air temperature (blue curve, e.g. -20 °C); then draw a horizontal line ② from this point to the left until it crosses the water in/out temperature curve (e.g. 70/50 °C). From this point draw a vertical line ③ to the supply air temperature axis on top of the graphic (+28 °C).
- **Heating coil capacity:** Prolong the line ① up to the point where it crosses the outside air temperature (e.g. -20 °C, red curve) and draw a horizontal line ④ from this point to the right until it crosses the water in/out temperature curve (e.g., 70/50 °C). From here draw a vertical line ⑤ up to the scale representing the heating coil capacity (28.0 kW).
- **Water flow:** Prolong the line ⑤ down to the water flow axis ⑥ at the bottom of the graphic (0.34 l/s).
- **Water pressure drop:** Draw the line ⑦ from the point where the line ⑥ crosses the black curve to the pressure drop axis (16 kPa).