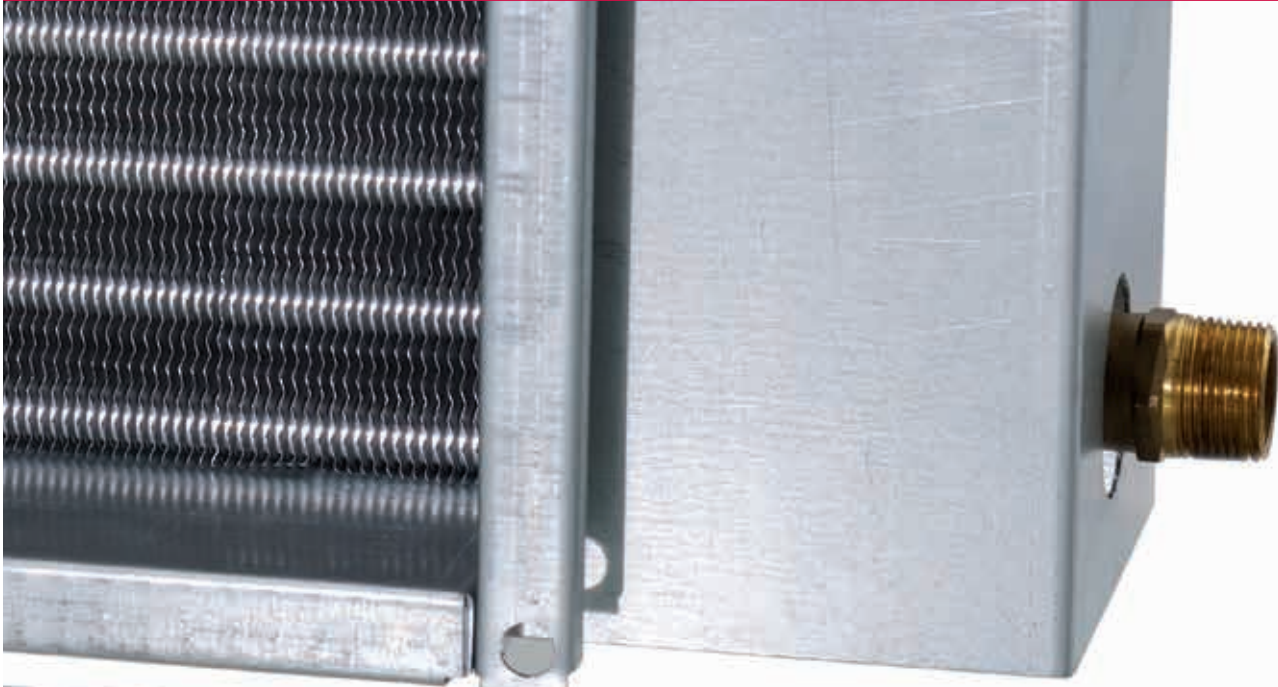


WHS, WCS, SHS, DXES, DXCS, CS
Customized duct heaters,
duct coolers and condensers



WHS/WCS/SHS/DXES/DXCS/CS

Customised rectangular duct heaters, duct coolers and condensers

VEAB customised range of duct heaters, duct coolers and condensers.

- 6 models for different applications
- WHS, heater for hot water
- WCS, cooler for cooled water
- SHS, heater for steam
- DXES, cooler for refrigerant
- DXCS, combined coil for DX cooling and heating
- CS, condenser for refrigerant

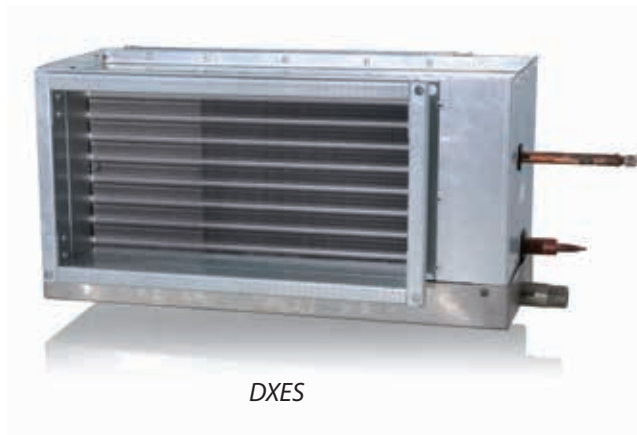
Design

See documentation for relevant model since the designs differ.

Control

See page 9 for more information about our regulators.

WHS / WCS / SHS /
DXES / DXCS / CS



WHS

Customised rectangular duct heaters for hot water

The WHS with rectangular duct connections is designed to use hot water as the heating medium and is used for heating the ventilation air in ventilation systems. The duct heaters are rated and manufactured to meet the customer's specification.

- Casing of hot-dip galvanized sheet steel
- Coil with copper tubes and aluminium fins
- The pipe connections of the coil have male threads
- Connections to the ducting by means of slip clamps or bolts
- Tappings for venting and drainage
- Tapping for fitting an insertion sensor for anti-freeze protection
- Recommended maximum air velocity 5 m/s

Design

The casing is made of hot-dip galvanized sheet steel. The coil has copper tubes and aluminium fins. The WHS is also equipped with tappings for drainage and venting, and a connection with a female thread for fitting an insertion sensor for anti-freeze protection.

A drawing and specification are submitted together with the quotation.



WHS / WCS / SHS /
DXES / DXCS / CS

Other material combinations

If required, a corrosion-resistant version of the WHS is also available, with stainless steel casing and with epoxy-coated aluminium fins or copper fins, for use in humid and corrosive environments.

Operating data

Max. operating temperature: + 150 °C
 Max. operating pressure: 1.0 MPa (10 bar)
 The coils are pressure tested and tested for leakage.

Installation

The WHS can be installed in a horizontal or vertical duct. Specify the direction of the air flow when ordering.

Control

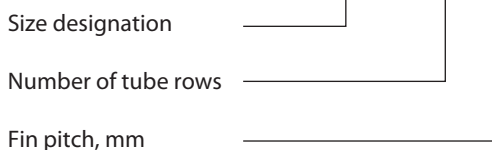
VEAB has a complete range of regulators, sensors, actuators and valves for controlling the room temperature and the supply air temperature. We also have regulators with built-in anti-freeze control, alarm and heating during stoppage.

Project design/ordering

Descriptive text - WHS

VEAB type WHS duct heater with casing of hot-dip galvanized sheet steel, and coil with copper tubes and aluminium fins. Equipped with tappings for drainage and venting, and a connection with female thread for anti-freeze protection (insertion sensor). Water connections with male threads.

Type designation WHS 400×200 - 3 - 2.5
 (example)



Specify the following for project ordering:

1. Duct size: - mm
2. Direction of air flow: - left/right
3. Air flow rate: - m³/h
4. Inlet air temp.: - °C
5. Outlet air temp. or required output: - °C or kW
6. Inlet water temp.: - °C
7. Outlet water temp. or water flow: - °C or l/s
8. Anti-freeze agent: - type / %

WCS

Customised rectangular duct coolers for cooled water

The WCS with rectangular duct connections is designed to use chilled water as the cooling medium and is used for cooling the ventilation air in ventilation systems. The duct coolers are rated and manufactured to meet the customer's specification.

- Casing of hot-dip galvanized sheet steel
- Coil with copper tubes and aluminium fins
- The pipe connections of the coil have male threads
- Connections to the ducting by means of slip clamps or bolts
- Stainless steel drip tray for the condensate
- Tappings for venting and drainage
- Recommended maximum air velocity 3 m/s

Design

The casing is made of hot-dip galvanized sheet steel. The coil has copper tubes and aluminium fins. The WCS is also equipped with tappings for drainage and venting. The connection with female thread for fitting an insertion sensor for anti-freeze protection must be specified, if required. A drawing and specification are submitted together with the quotation.

Other material combinations

If required, an anti-corrosion treated version of the WCS is available, with stainless steel casing and with epoxy-coated aluminium fins or copper fins, for use in humid and corrosive environments.

Operating Data

Max. operating pressure: 1.0 MPa (10 bar)
The coils are pressure tested and tested for leakage.



Installation

The WCS is designed for installation in a horizontal duct. Specify the direction of the air flow when ordering.

Droplet eliminator

If the air velocity is higher than 2.5 m/s, we recommend that a droplet eliminator should be fitted on the outlet side of the coil. This prevents water droplets from being entrained with the air flow out into the ducting. The droplet eliminator must be ordered separately.

Control

VEAB has a complete range of regulators, sensors, actuators and valves for controlling the room temperature and the supply air temperature.

Project design/ordering

Descriptive text - WCS

VEAB type WCS duct cooler with casing of hot-dip galvanized sheet steel and coil with copper tubes and aluminium fins. Equipped with tappings for drainage and venting. Water connections with male threads. Stainless steel drip tray equipped with condensate drain connection with male thread. If the air velocity is higher than 2.5m/s, the WCS should be ordered with droplet eliminator.

Type designation WCS 400×200 - 3 - 2.5
(example)

Size designation	_____
number of tube rows	_____
Fin pitch, mm	_____

Specify the following for project ordering:

- | | |
|---|---------------------|
| 1. Duct size: | - mm |
| 2. Direction of air flow: | - left/right |
| 3. Air flow rate: | - m ³ /h |
| 4. Inlet air temp.: | - °C |
| 5. Inlet air humidity: | - % RH |
| 6. Outlet air temp. or required output: | - °C or kW |
| 7. Inlet water temp.: | - °C |
| 8. Outlet water temp. or water flow: | - °C or l/s |
| 9. Anti-freeze agent: | - type / % |
| 10. Droplet eliminator, if required: | |

SHS

Customised rectangular duct heaters for steam

The SHS with rectangular duct connections is designed to use steam as the heating medium and is used for heating the ventilation air in ventilation systems. The duct heater is rated and manufactured to meet the customer's specification.

- Casing of hot-dip galvanized sheet steel
- Coil with copper tubes and aluminium fins
- The pipe connections of the coil have male threads
- Connections to the ducting by means of bolts
- Recommended maximum air velocity 5 m/s

Design

The casing is made of hot-dip galvanized sheet steel. The coil has copper tubes and aluminium fins. A drawing and specification are submitted together with the quotation.

Other material combinations

If required, an anti-corrosion treated version of the SHS is available, with stainless steel casing and epoxy-coated aluminium fins or with copper fins, for use in humid and corrosive environments.

Operating data

Max. operating temperature: + 164°C
 Max. operating pressure: 0.6 MPa (6 bar)
 The coils are pressure tested and tested for leakage.



Installation

The SHS is installed in a horizontal. Specify the direction of the air flow when ordering.

WHS / WCS / SHS /
DXES / DXCS / CS

Project design/ordering

Descriptive text - SHS

VEAB type SHS duct heater for steam, with casing of hot-dip galvanized sheet steel and coil with copper tubes and aluminium fins. Connecting pipes with male threads.

Specify the following for project ordering:

1. Duct size: - mm
2. Air flow rate: - m³/h
3. Inlet air temp.: - °C
4. Outlet air temp. or required output: - °C or kW
5. Inlet steam temp.: - °C
6. Outlet steam temp.: - °C
7. Operating pressure -bar

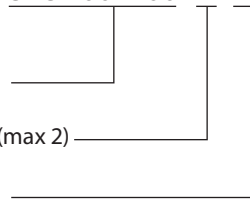
Type designation SHS 400x200 - 1 - 2.5

(example)

Size designation

Number of tube rows (max 2)

Fin pitch, mm



DXES

Customised rectangular duct coolers with DX coil

The DXES with rectangular duct connections is designed to use evaporative refrigerant as the cooling medium and is used for cooling the ventilation air in ventilation systems. The duct cooler is rated and manufactured to meet the customer's specification.

- Casing of hot-dip galvanized sheet steel
- Coil with copper tubes and aluminium fins
- The pipe connections of the coil are intended for brazing
- Connections to the ducting by means of slip clamps or bolts
- Stainless steel condensate drip tray
- Recommended maximum air velocity 3 m/s

Design

The casing is made of hot-dip galvanized sheet steel. The coil has copper tubes and aluminium fins. A drawing and specification are submitted together with the quotation.

Other material combinations

If required, an anti-corrosion treated version of the DXES is available, with stainless steel casing and epoxy-coated aluminium fins or with copper fins, for use in humid and corrosive environments.

Operating data

Max. operating pressure: 4.17 MPa (41.7 bar)
 Test pressure: 4.8 MPa (48 bar)
 The coils are pressure tested and tested for leakage.

Installation

The DXES is designed for installation in a horizontal duct. The direction of air flow must be specified in the order. On delivery, the coils are pressurized at 2 bar.



Droplet eliminator

If the air velocity is higher than 2.5 m/s, we recommend that a droplet eliminator should be fitted on the outlet side of the coil. This prevents water droplets from being entrained with the air flow out into the ducting. The droplet eliminator must be ordered separately.

Project design/ordering

Descriptive text - DXES

The VEAB type DXES duct cooler for direct expansion refrigerant, with casing of hot-dip galvanized sheet steel and coil with copper tubes and aluminium fins. Pipe connections intended for brazing. Stainless steel drip tray provided with a connection with male thread for condensate drainage. If the air velocity is higher than 2.5m/s, the DXES should be ordered with droplet eliminator.

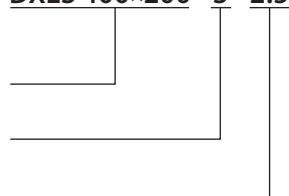
Type designation **DXES 400×200 - 3 - 2.5**

(example)

Size designation

Number of tube rows

Fin pitch, mm



Specify the following for project ordering:

1. Duct size: - mm
2. Direction of air flow: - left/right
3. Air flow rate: - m³/h
4. Inlet air temp.: - °C
5. Inlet air humidity: - % RH
6. Outlet air temp. or required output: - °C or kW
7. Refrigerant type: - °C
8. Evaporation temp.: - °C
9. Droplet eliminator, if required:

DXCS

Customised rectangular duct batteries for combined cooling and heating, for heat pump with dual pipe connections and controller

The DXCS with rectangular duct connections is designed to use refrigerant for cooling and heating the ventilation air in ventilation systems. The DXCS is rated and manufactured to meet the customer's specification.

- Casing of hot-dip galvanized sheet steel
- Coil with copper tubes and aluminium fins
- The pipe connections of the coil are intended for brazing
- Connections to the ducting by means of slip clamps or bolts
- Stainless steel condensate drip tray
- Recommended maximum air velocity 3 m/s

Design

The casing is made of hot-dip galvanized sheet steel. The coil has copper tubes and aluminium fins. A drawing and specification are submitted together with the quotation.

Other material combinations

If required, an anti-corrosion treated version of the DXCS is available, with stainless steel casing and epoxy-coated aluminium fins or with copper fins, for use in humid and corrosive environments.

Operating data

Max. operating pressure: 4.17 MPa (41.7 bar)
 Test pressure: 4.8 MPa (48 bar)
 The coils are pressure tested and tested for leakage.

Installation

The DXCS is designed for installation in a horizontal duct. The direction of air flow must be specified in the order. On delivery, the coils are pressurized at 2 bar.



WHS / WCS / SHS / DXES / DXCS / CS

Droplet eliminator

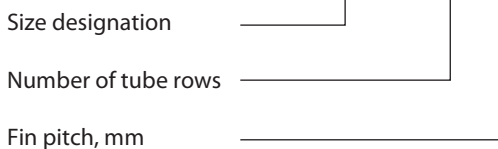
If the air velocity is higher than 2.5 m/s, we recommend that a droplet eliminator should be fitted on the outlet side of the coil. This prevents water droplets from being entrained with the air flow out into the ducting. The droplet eliminator must be ordered separately.

Project design/ordering

Descriptive text - DXCS

The VEAB type DXCS for direct expansion refrigerant, with casing of hot-dip galvanized sheet steel and coil with copper tubes and aluminium fins. Pipe connections intended for brazing. Stainless steel drip tray provided with a connection with male thread for condensate drainage. If the air velocity is higher than 2.5m/s, the DXCS should be ordered with droplet eliminator.

Type designation DXCS 400x200 - 3 - 2.5
 (example)



Specify the following for project ordering:

1. Duct size: - mm
2. Direction of air flow: - left/right
3. Air flow rate: - m³/h
4. Inlet air temp.: - °C
5. Inlet air humidity: - % RH
6. Outlet air temp. or required output: - °C or kW
7. Refrigerant type:
8. Evaporation temp.: - °C
9. Condensating temperature - °C
10. Droplet eliminator, if required:
11. Min and max internal volume of the coil
12. Cooling and heating output of the outdoor unit

CS

Customised rectangular condensers for in-duct mounting

The CS is a condenser designed for condensing refrigerants. The condensers are rated and manufactured to meet the customer's specification.

- Casing of hot-dip galvanized sheet steel
- Coil with copper tubes and aluminium fins
- The pipe connections of the coil are intended for brazing
- Connections to the ducting by means of slip clamps or bolts

Design

The casing is made of hot-dip galvanized sheet steel. The condenser has copper tubes and aluminium fins. A drawing and specification are submitted together with the quotation.

Other material combinations

If required, an anti-corrosion treated version of the CS is available, with stainless steel casing and epoxy-coated aluminium fins or with copper fins, for use in humid and corrosive environments.

Operating data

Max. operating pressure: 4.17 MPa (41.7 bar)
 Test pressure: 4.8 MPa (48 bar)
 The coils are pressure tested and tested for leakage.

Installation

The direction of air flow must be specified in the order. On delivery, the coils are pressurized at 2 bar. Check the pressure before the condenser is installed.



WHS / WCS / SHS / DXES / DXCS / CS

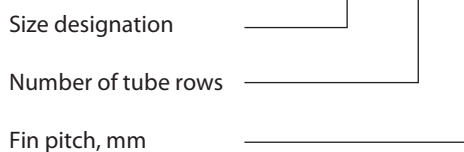
Project design/ordering

Descriptive text - CS

VEAB type CS condenser for in-duct mounting, with casing of hot-dip galvanized sheet steel and coil with copper tubes and aluminium fins. Pipe connections intended for brazing.

Type designation CS 400×200 - 3 - 2.5

(example)



Specify the following for project ordering:

1. Duct size: - mm
2. Direction of air flow: - left/right
3. Air flow rate: - m³/h
4. Inlet air temp.: - °C
5. Outlet air temp. or required output: - °C or kW
6. Refrigerant type: - °C
7. Condensing temperature: - °C
8. Nominal condenser capacity: - kW

Instead for item 8 above

- A. Compressor refrigeration rating: - kW
- B. Absorbed compressor capacity: - kW
- C. Evaporation temperature (+5 °C*): - °C

* unless otherwise specified

Regulators for water-based systems



AQUA24TF



RC



RC-DO



OPTIGO OP10

AQUA

Complete regulator with built-in room sensor. Floating control for controlling three-position actuators. Cascade connection with minimum limit for room temperature control. Can be equipped with external room and/or duct sensor and external setpoint adjustment. Temperature range 0 - 30°C, depending on the sensor employed.

AQUA24TF

24V supply. The regulator has a built-in controlling anti-freeze protection with two alarm relays and automatic control for heating during stoppage.

REGIO MINI

Complete regulator with built-in room sensor. Can be equipped with external room and/or duct sensors. Has two control outputs, e.g. for heating and cooling in sequence.

RC

24V supply. 0...10V output control signal. DIP switches are used for basic 20 - 26°C setpoint setting. The basic setting can be adjusted by ±3°C by means of the setpoint knob.

RC-DO

24V supply. 0...10V output control signal. The RC-DO has a back-lit display and a temperature range of 0 - 50°C.

OPTIGO

Regulator with display. One knob for all settings. For mounting on DIN rail. Operates with PT1000 sensor in the range of -20°C to + 40°C. Started/stopped with "run" signal from the fan.

OP5

24V supply. 0...10V control signal output. Operates with one sensor (room or duct sensor). Can be reset for heating or cooling control.

OP10

24V supply. Can be reset for 0...10V control signal output or 3-point control. Two control outputs, e.g. for heating and cooling in sequence. Input for two sensors and anti-freeze sensor. Supply air temperature control or room temperature control with cascade-controlled supply air. Anti-freeze control with heating during stoppage. Output, e.g. for starting/stopping of fans via 230V~, 5A relay. Programmable one-week timer for controlling of both fan and heating/cooling. Terminal for external timer that extends the operating time. Can be equipped with external setpoint adjuster.

OP10-230

Same functions as the OP10, but with 230V~ supply.

Sensor for AQUA

Temperature sensor with NTC element for use with AQUA type regulator:
TG-K330, TG-R430, TG-R530, TG-R630, TG-A130, TG-D130 and TG-D230.

Sensor for OPTIGO and REGIO MINI

Temperature sensor with PT-1000 element for use with OPTIGO type regulator:
TG-K3, TG-R4, TG-R5, TG-UH, TG-A1, TG-D1 and TG-D2.

WHS / WCS / SHS /
DXES / DXCS / CS



VEAB Heat Tech AB
Phone: +46(0)451-485 00 • Fax: +46(0)451-410 80
www.veab.com • veab@veab.com
Sweden