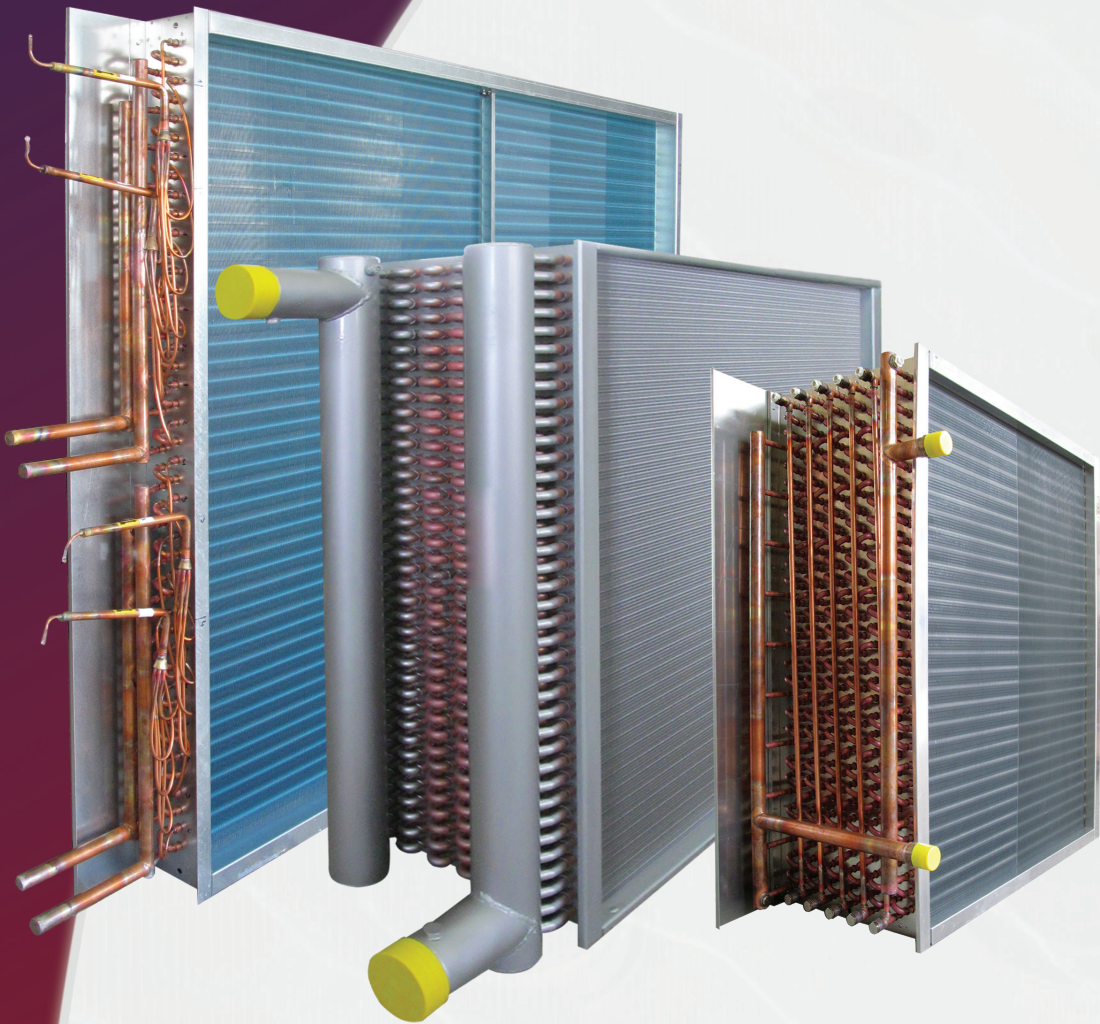


quality · expertise · experience



Heat exchangers

Finned heat exchangers

Fins

- The types of fins:
 - Al 0,12; 0,15; 0,20; 0,25 mm
 - AEpoxy 0,12; 0,15; 0,20 mm
 - AHydro 0,15 mm
 - Copper (Cu) 0,12; 0,18 mm
- Fin form:
 - smooth
 - corrugated

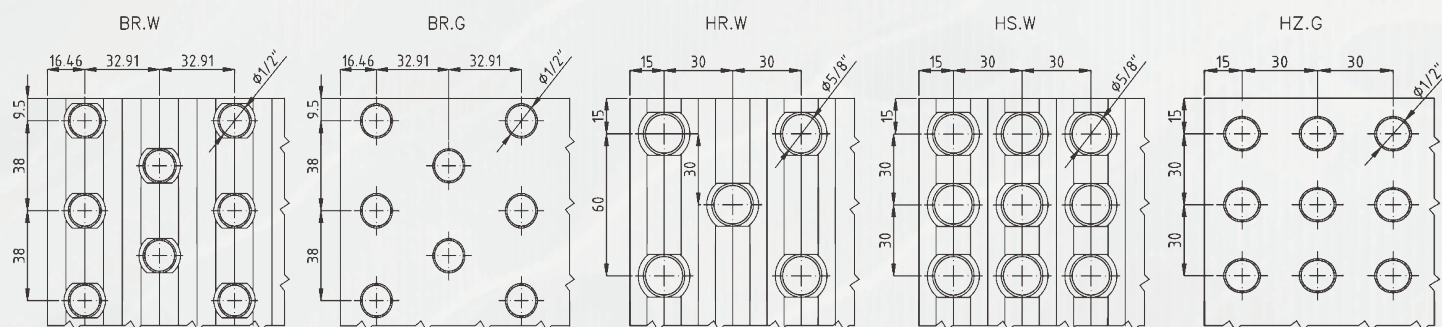
Tubes

- Smooth (material):**
 - Cu 1/2" (12,7 mm); 1/2" x 0,35; 0,7 mm
 - Cu 5/8" (15,875 mm); 5/8" x 0,4; 0,8 mm
- Internally grooved (material):**
 - Cu 1/2" x 0,36 mm
 - Cu 5/8" x 0,4 mm
- Connected with fins by mechanical expansion

Headers (inlet/outlet)

- Stainless steel and copper tubes are processed
- Header connections are terminated by thread (Ms, Fe), flange or ready for soldering
- Venturi distributors with capillary tubes Ø 4,5,6,8 a 10 mm are used for evaporators

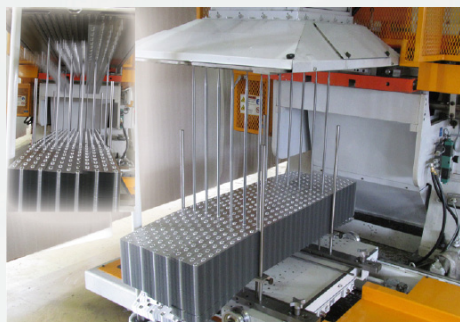
Geometries



Fins systems

Type	Cu tubes		Geometry		Fin spacing /mm/	Fin form	No. of tubes		No. of rows		Finned length /mm/	
	/ Zoll /	/ mm /	height	depth			min.	max.	min.	max.	min.	max.
BR.W	1/2"	12,70	38	32,91	1,6 - 6,5	corrugated	2	70	1	24	300	3800
BR.G	1/2"	12,70	38	32,91	1,6 - 6,5	smooth	2	70	1	24	300	3800
HR.W	5/8"	15,875	60	30	1,6 - 6,5	corrugated	2	44	1	24	300	3800
HS.W	5/8"	15,875	30	30	1,6 - 5,0	corrugated	2	88	1	24	300	3800
HZ.G	1/2"	12,70	30	30	1,6 - 4,0	smooth	2	88	1	24	300	3800

Note: Other materials are available on request.



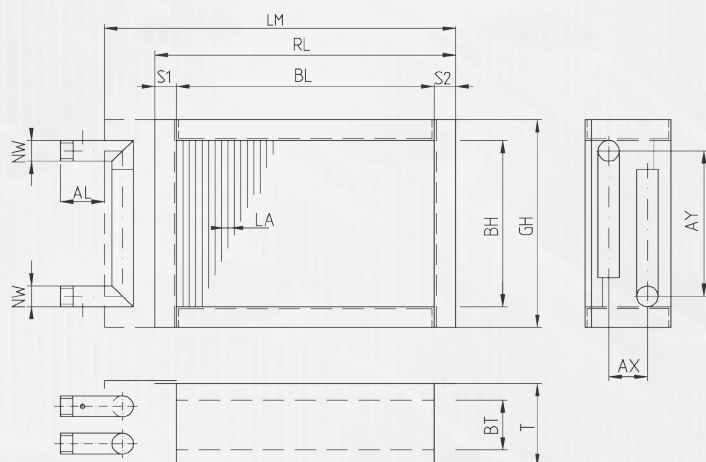
Frames

	Codes	1	2	3	4	/mm/
1	Aluminium	-	1,6	2	3	
2	Galvanised	1	1,5	2	3	
3	Stainless	1	1,5	2	3	
4	Copper	-	1,5	2	-	
5	Brass	-	-	2	-	

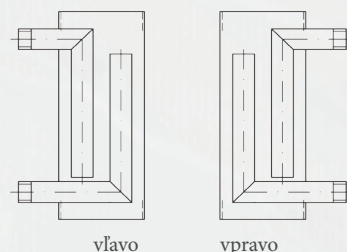
Final inspection

As well as the normal dimensional and visual inspection, all heat exchangers are tested for leaks in water (20°C) using dry air with a pressure up to 25 bar (water exchangers) or nitrogen up to 31 bar (freon exchangers). Other inspection activities, ranging from incoming material inspection and inspection at each processing stage up to final output inspection are carried out according to STN EN ISO 9001:2009/EN ISO 9001:2008.

Standard design



Side collectors



LM	- frame + header
BL	- finned length
BH	- finned height
BT	- finned depth
RL	- frame length
GH	- frame height
T	- frame depth
NW	- header diameter
AL	- terminal length
LA	- fin spacing
AX	- header pitch horizontal
AY	- header pitch vertical

Working position

			1	2
Vertical airflow	HW CW SW	V		
	CD	V		
	DX	V		
	ST	V		
Horizontal airflow	HW CW SW	H		
	CD	H		
	DX	H		
	ST	H		

Additional possibilities include:

- heat exchangers with PVC and Al eliminators
- tanks with outlet (galvanised, Al, stainless) and others.

Dimensions of headers

Code	Steel		Code	Copper	
	/inch/			/inch/	/mm/
1	DN15	1/2"	10	1/2"	15 x 1
2	DN20	3/4"	11	3/4"	22 x 1
3	DN25	1"	12	1"	28 x 1,5
4	DN32	5/4"	13	5/4"	35 x 1,5
5	DN40	6/4"	14	6/4"	42 x 1,5
6	DN50	2"	15	2"	54 x 2
7	DN65	2 1/2"	16	2 1/2"	76,1 x 2
8	DN80	3"	17	3"	88,9 x 2
9	DN100	4"	18	4"	108 x 2,5

Operating values

Type of heat exchanger	Max. pressure /bar/	Temperature /°C/
HW	16	100
SW	16	150
ST	4	150
CW	16	acc. medium **
CD	25	acc. coolant*
DX	acc. coolant *	acc. coolant*

* The most used coolants: R507A , R410A ,R407C, R134A, R22

** Anti-freeze mixtures allowing temperature of -50°C (Et. glycol, Pr. Glycol, Pekasol, Temper,...)

Surface finish:

Nitro-aluminium color is spray-coated only on steel headers, flanges and weld points. Other types of finish, e.g. by epoxy colors and varnishes, powder colors, etc. upon special request.

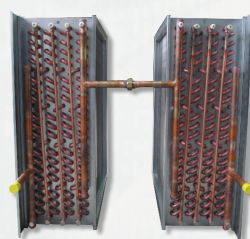
Highly efficient heat recovery systems (HKVS)

Traditional circuit heat recovery systems achieve a lower rate of efficiency (45 - 60%). Our engineers are able to design systems with heat recovery efficiency of 70 - 75% thanks to the use of top-class software and special circulation designs.

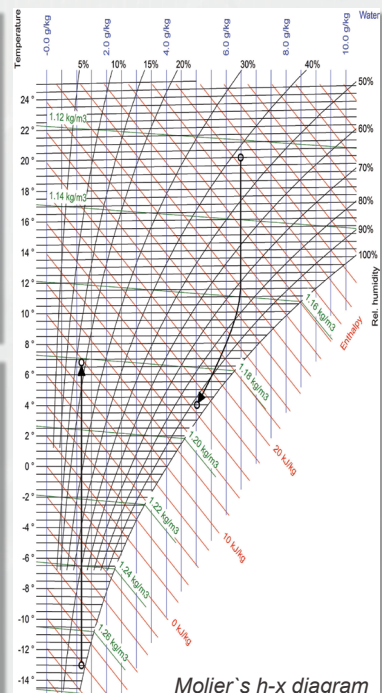
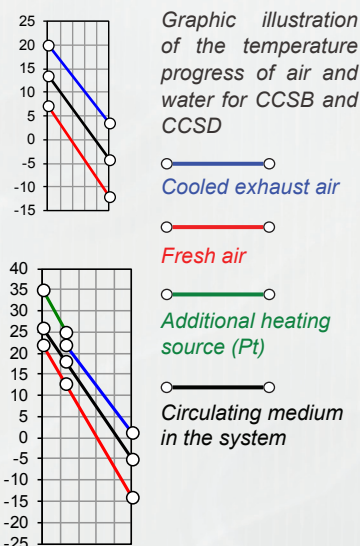
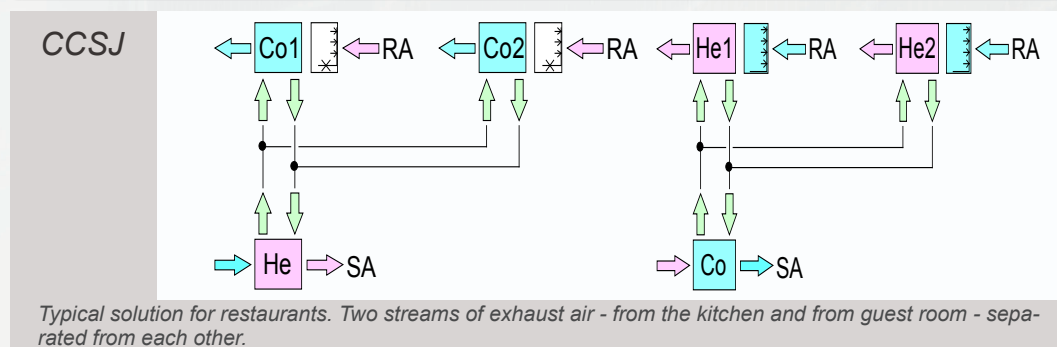
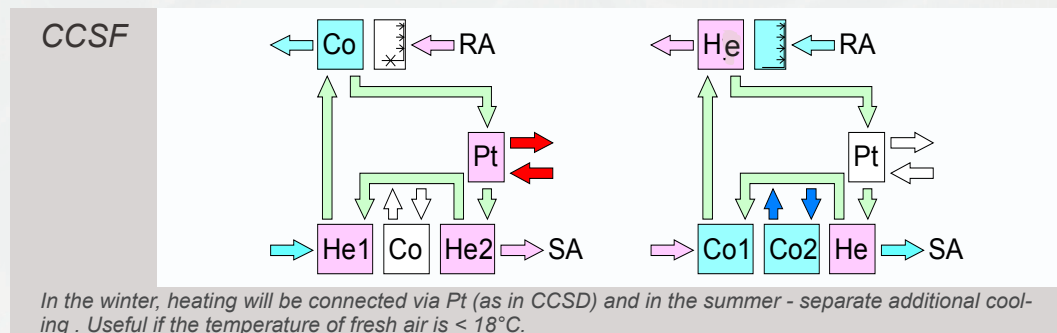
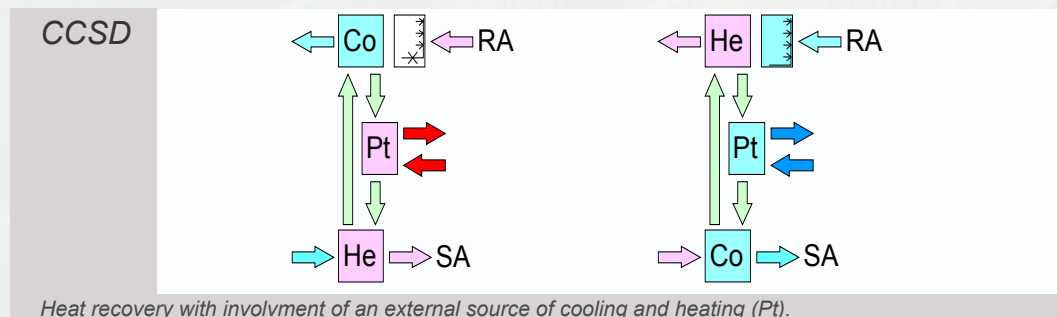
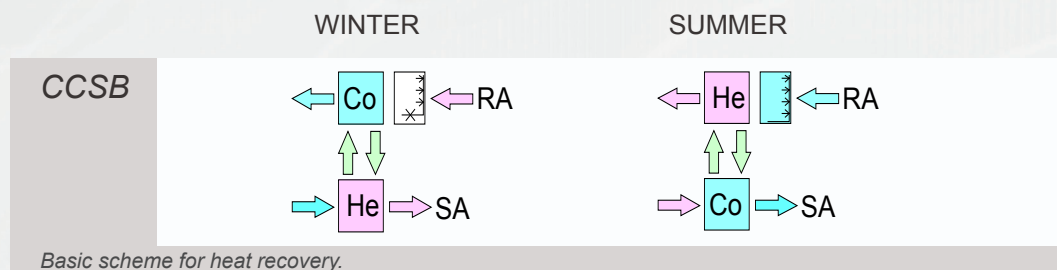
The main advantage of HKVS is that exhaust and supply air can be spatially separated, so there is no mixing of those two air streams.

Other advantages:

- high efficiency (70 - 75 %)
- advantageous for the use of alternative energy sources and low- potential waste heat (e.g. solar collectors, heat pumps, waste water from other technological equipment and other resources).
- usable for various forms of polluted air, e.g. from the kitchen, hospitals, laboratories, etc.

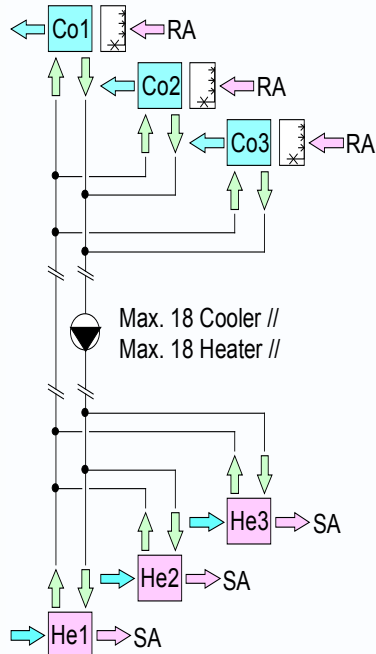


Schemes for heat recovery systems applications

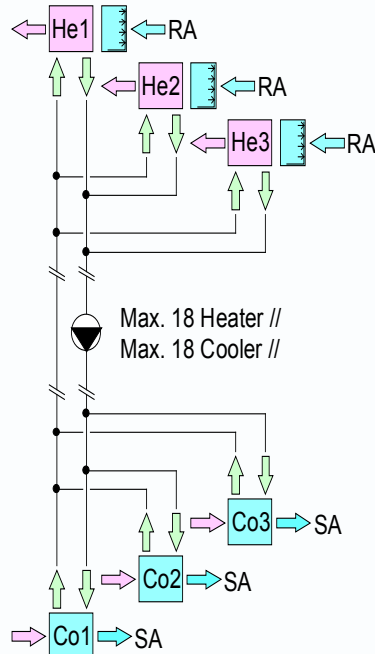


CCSK

WINTER

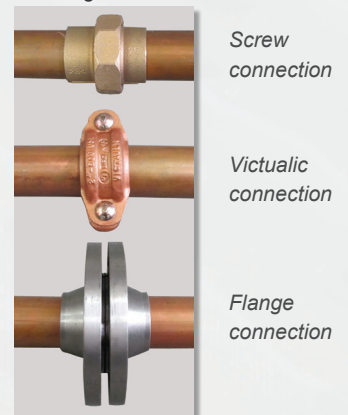


SUMMER



Connecting multiple heat exchangers (max. 18) into the same system (e.g. at the airport terminal).
Different combinations of numbers and dimensions (the amount of air) of Co and He, e.g. 3 x various Co

Possibilities for connecting heat exchangers:



RA - return air

Co - heat exchanger - cooler

Pt - plate heat exchanger /fluid/

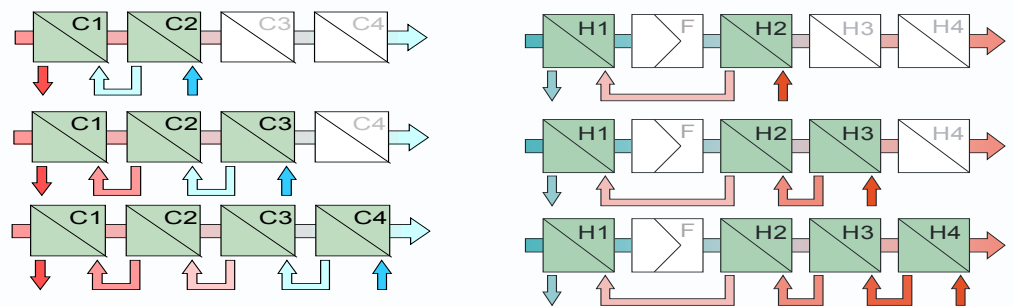
SA - supply air

He - heat exchanger - heater

- adiabatic humidification passive

- adiabatic humidification active

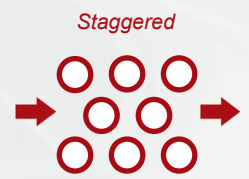
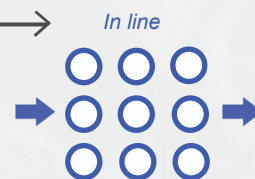
HKVS multistaged - divided



The reason of division: HKVS with high efficiency (large number of rows, e.g. 24 rows) are divided in order to maintain ease of cleanability and handling.

For the above described applications, we can offer highly efficient heat exchangers. Our design takes into consideration:

- total energy efficiency
- importance of low air pressure loss
- high efficiency of heat exchange surface area (usually heat exchangers with 12 - 24 rows)
- aligned or alternated geometries
 - fins Al, AEpoxy, Cu; thickness: 0,15; 0,2 a 0,25 mm
 - fin form: smooth corrugated
 - special interconnection of water circuits
 - elimination of co-current connection



As an important part of HKVS, we recommend to apply a compact hydraulic system with frequency convertor.

For the technical design of heat exchangers a reputable computer program ZCS -software (www.zcs.ch) is used.



Heat exchangers codes:

HW - BR.G - 2,1 - 1000 - 988 - 12R - 13 - Cu 0,35 - Al 0,15 - V2A - 1 - Cu 2" - E2 - VL

HW - Type of heat exch.

HW	- water heater
SW	- hot water heater
CW	- water cooler
ST	- steam heater
CD	- condenser
DX	- evaporator

BR - Geometry

BR	- 38 x 33
HZ	- 30 x 30
HS	- 30 x 30
HR	- 60 x 30

G - Fin form

W	- corrugated
G	- smooth

2,1 - Fin spacing

1000 - Finned length

988 - Finned height

12R - No. of rows

13 - No. of circuits

Cu 0,35 - Al 0,15

Finned thickness - 0,12; 0,15; 0,20; 0,25 mm

Al	- Standard Al foil
AE	- Al-Epoxid lacquered foil
AH	- Hydrophilic foil
Cu	- Copper fin

Tube thickness - 0,35; 0,7; 0,4; 0,8 mm

Cu	- smooth tube
Cx	- internally grooved

V2A - Frame

FeZn
Alu
V2A
V4A
Cu

1 - No. of external circuits

Cu 2" - Header

Header connections:

Brass nipple (MPT)
Brass socket (FPT)
Threaded flange (Fe)
Welding flange (Fe)
Victaulic

E2 - The way of bleeding

E0 - any E+E
E1 - standard E+E
E2 - internal E+E (HKVS)

VL - Position of headers

V - Vertical H - Horizontal
L, R - direction of airflow:
L - left, R - right

Note: Besides direct connection (see pic.), there is an alternative connection in direction, respectively against airflow direction.

