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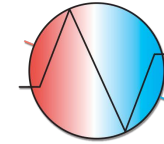
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Soluciones desde 1991

# **RECUPERADORES GAS-GAS A PLACAS**



# Customer Segments



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Plate exchanger for comfort ventilation



Products for industrial or corrosive applications



# Industrial and corrosive applications

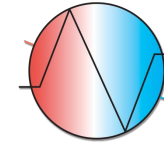
As a rule, significantly higher savings potential due to:






- Reduction of fresh energy consumption
- Conversion of process waste heat
- Reduction of CO2 emissions



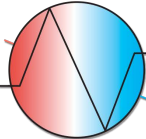
# Product types overview



sealed		welded
slide-in	frame-type	case-type
		
aluminum or stainless-steel		stainless-steel
up to 150/600 °C		up to 800 °C



# sealed plate exchangers

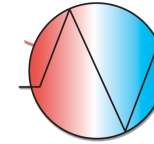


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optional: hole pattern, rivet-nuts



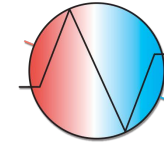
# sealed plate exchangers



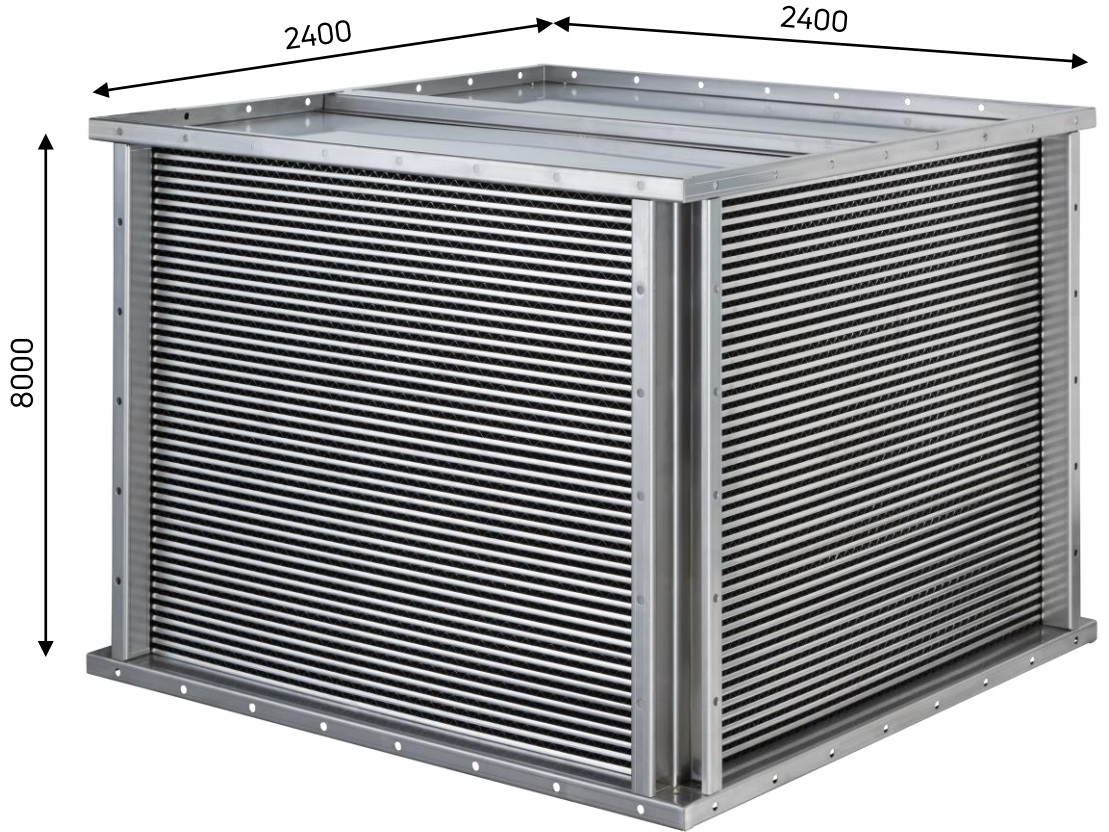
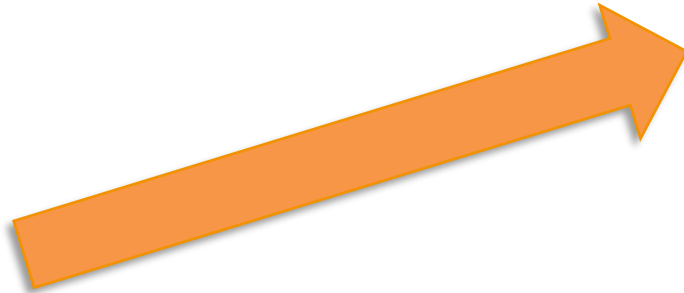
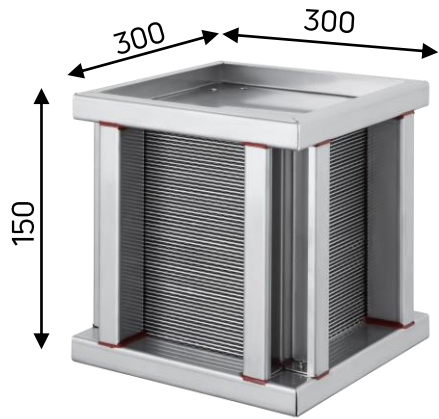
aluminum	stainless-steel
up to 150 °C	up to 600 °C
slide-in or frame-type	
PU, silicone or solvent-based sealing	PU, silicone, solvent-based or ceramic sealing
optional extra sealing up to 0.5% leakage	
individual corrugated and separator layer	
max. differential pressure 10'000 PA	
individual fin spacing for supply- and exhaust-air	
scalable from 200x200 up to 2800x2800 mm, selectable width 150-5500 mm	
100-250'000 kg/h massflow	
up to 88% dry efficiency	



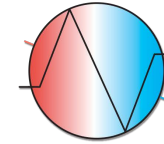
scalable



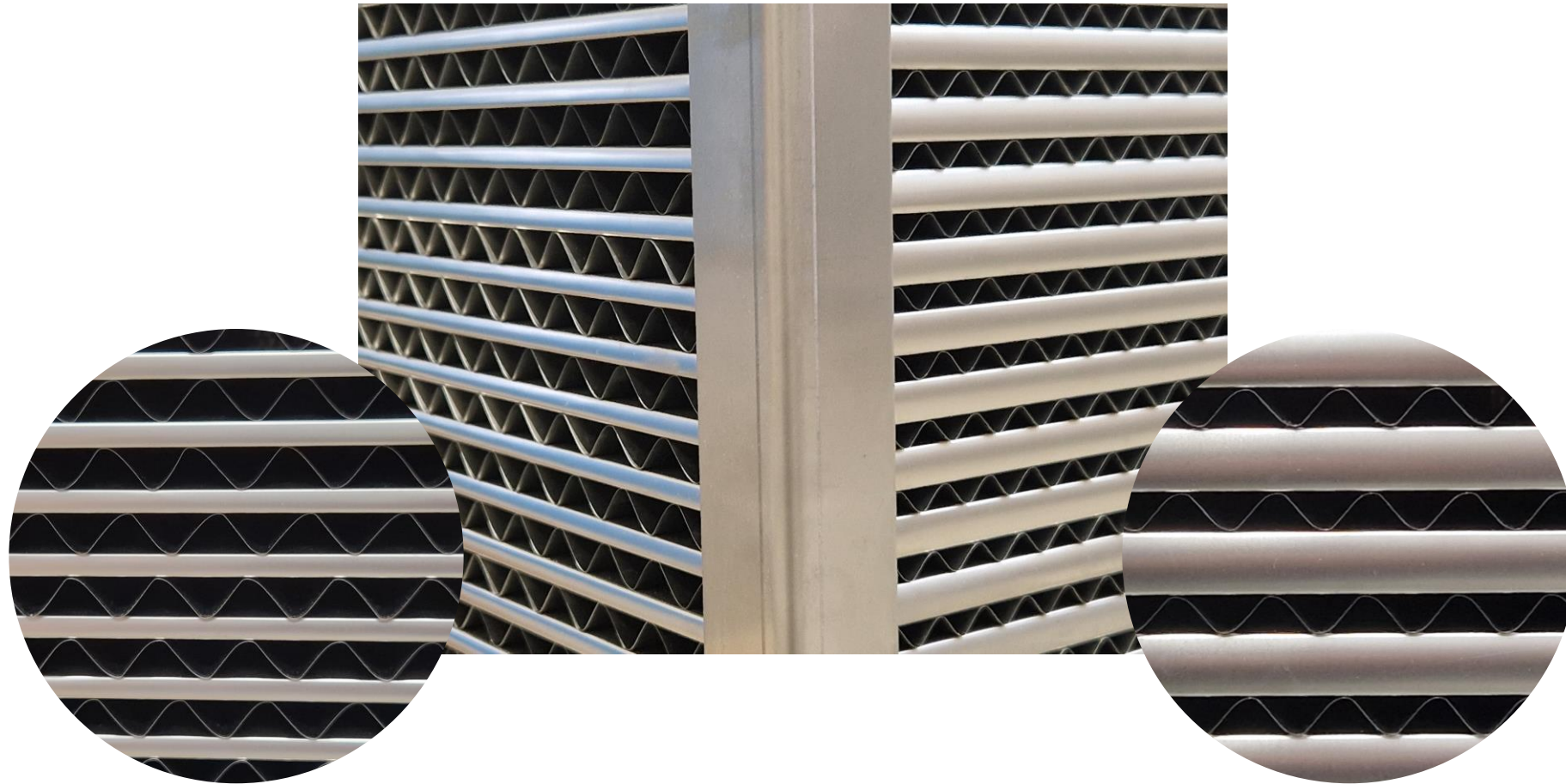
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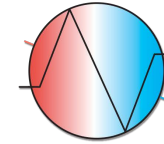
# individual fin spacing



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# welded plate exchanger



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stainless-steel

fully welded casing

sealant-free

separator sheet 0.5 mm

corrugated sheet 0.1 mm spot welded

casing sheets 1.0 mm

max. differential pressure 50'000 PA

individual fin spacing for supply- and exhaust-air

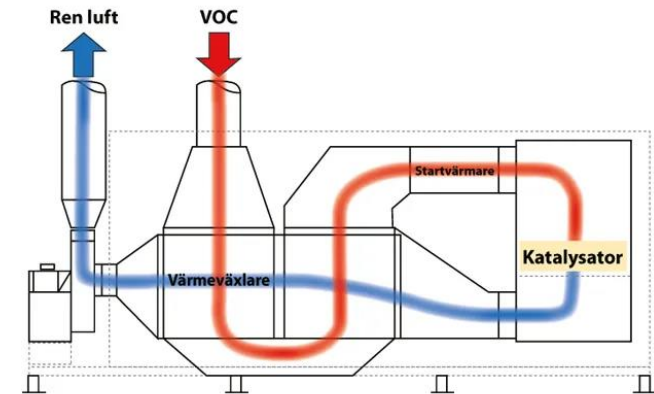
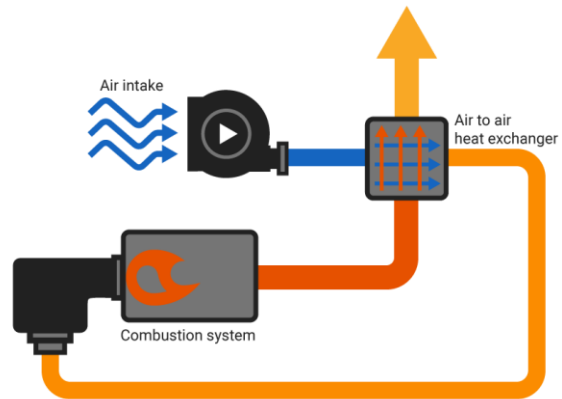
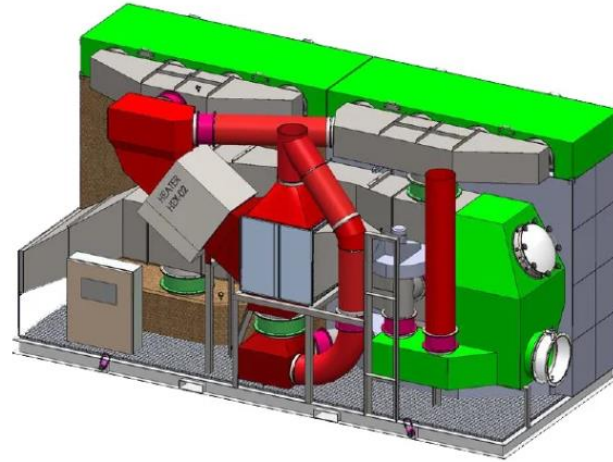
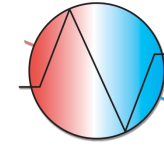
240x240 up to 1200x1200 mm plate square

150-1500 mm usable width

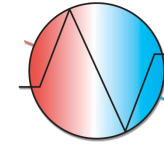
100-35'000 kg/h

up to 81% dry effectiveness

# Use cases



# Enablers/disablers



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## **disablers:**

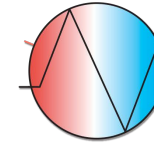
1. liquid medias
2. pressure over ambient
3. transport of heat energy

## **enablers:**

1. exhaust temperatures  $>180\text{ }^{\circ}\text{C}$
2. Volume flows of 200-50'000 m<sup>3</sup>/h
3. Individual dimensions
4. direct mount flange
5. gastight or sealant-free
6. numerable energy costs/savings



# Dimensioning software Winpoly



Winpoly.Net V9.3.2.0 - Cross-flow heat exchanger

SI IP Customer: <Select customer> Device calculation: English

In	Case 1		Case 2	
	Supply	Exhaust	Supply	Exhaust
Nominal volume [m³/h]	4250	4250	4250	4250
Temperature [°C]	-12.0	20.0	32.0	20.0
Relative humidity [%]	90.0	40.0	40.0	40.0
Absolute humidity [g/kg]	1.20	5.79	11.89	5.79
Enthalpy [kJ/kg]	-9.1	34.8	62.6	34.8

Out	Case 1		Case 2	
	Supply	Exhaust	Supply	Exhaust
Eff. volume [m³/h]	4071	3997	4336	4356
Mass flow [kg/h]	5100	5100	5100	5100
Density [kg/m³]	1.25	1.28	1.18	1.17
Temperature [°C]	8.3	2.7	24.8	27.2
Relative humidity [%]	17.8	100.0	60.6	25.9
Absolute humidity [g/kg]	1.20	4.58	11.89	5.79
Enthalpy [kJ/kg]	11.4	14.3	55.2	42.1

Result	
1253/2014: <b>60.1%</b>	EN13053: <b>58.0% H5</b>
Sens. effectiveness dry [%]	59.9 / 60.3
Sens. effectiveness wet [%]	63.6 / 60.3
Temp. efficiency dry [%]	<b>59.9</b> / <b>60.3</b>
Temp. efficiency wet [%]	<b>63.6</b> / <b>60.3</b>
Recuperation power [kW]	29.0 / -10.3
EATR [%] / OACF	0.0 / 1.00 / 0.0 / 1.00
Pressure drop increase [%]	0.0 (0 Pa) / 0.0 (0 Pa)
Std. pressure drop [Pa]	<b>154</b> / <b>154</b> / <b>154</b> / <b>154</b>
Face velocity [m/s]	1.86 / 2.09 / 2.19 / 2.09
Condensate [l/h]	0.0 / 6.2 / 0.0 / 0.0

Notes: Condensation! Start of freezing at -7.1°C

**Project**  
 Customer: Project: Description: Details...

**Product**  
 Cross-flow heat exchanger

**Environment**  
 Level [m]: 0 Pressure diff.  $\Delta p_{2-1}$  [Pa]: 0  
 Pressure [hPa]: 1013.25

**Construction**  
 Bloc material: Stainless Steel 316Ti Case type: Flange type Bypass: Bypass.. Layout: Plates vertically  
 Sealing max. 90°C: Casing material: Stainless steel 304 Hole pattern: without  
 Extra sealant  In series  Width divided

**Type**  
 Plate length: 06 Width [mm]: 1000 Fin spacing (exh. air): 15 - 3.0mm Series: AN CA  
 Fin spacing (sup. air): 15 - 3.0mm

**N1515.060940-E2**  
 Length (A1): 700 mm Weight: 233 kg Price: ---  
 Height (A2): 700 mm F: 73 mm  
 Width (B): 1000 mm M: 30 mm  
 Fin spacing ETA: 3.0 mm N: 43 mm  
 Fin spacing SUP: 3.0 mm  
 Flange width (E): 30 mm  
 Active width: 940 mm



# Specific project enquiries

In order to make an estimate or even an interpretation, we need certain information:

Exhaust air: volume flow (Nm<sup>3</sup>/h or kg/h), temperature, possibly humidity if < 100 °C

Supply air: volume flow (Nm<sup>3</sup>/h or kg/h), temperature, possibly humidity if exhaust air <100 °C

Target efficiency OR target temperature of supply air

if possible, estimation of the possible dimensions

if possible, max. acceptable pressure drop

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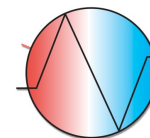
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