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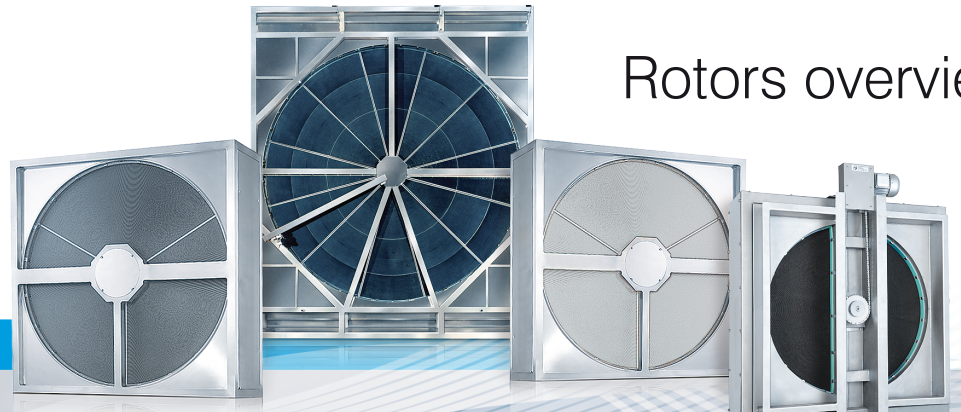
Rotors overview



Quick guide 2024

EUROVENT CERTIFIED PERFORMANCE AARE www.eurovent-certification.com

AHRI CERTIFIED www.ahridirectory.org Air-to-Air ERV AHRI Standard 1060

ASHRAE

GOST

VDI 6022

Rotors overview

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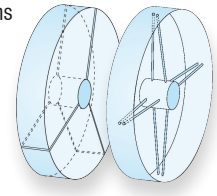
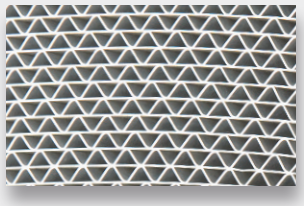
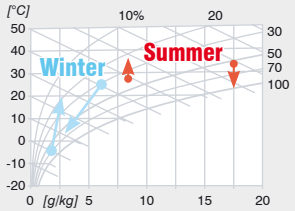
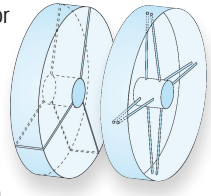
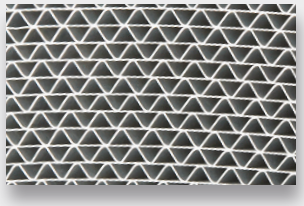
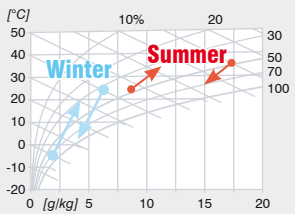
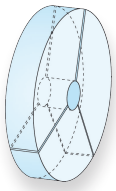
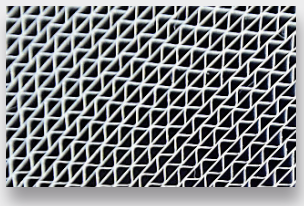
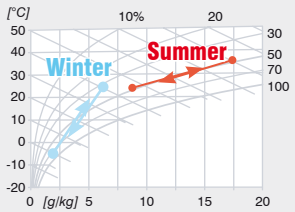
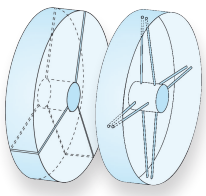
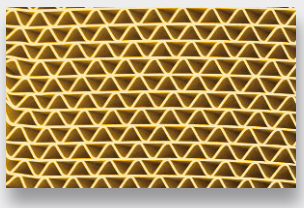
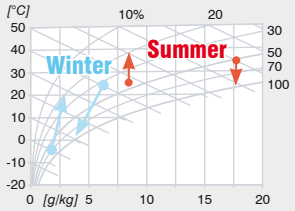
Rotor type		Heat recovery		Preferred application	Wave heigh	Thickness of material
Condensations Rotor P Speed 10 rpm				only sensible, latent only at Condensation	Systems with no humidification and no cooling	1,4 mm 1,6 mm 1,8 mm 2,0 mm 2,2 mm 2,4 mm	0,06 E 0,1 B
Enthalpie Rotor E Speed 10 rpm				sensible, limited latent	Systems with humidification and without cooling	1,4 mm 1,6 mm 1,8 mm 2,0 mm 2,2 mm 2,4 mm	0,06 E 0,1 B
Sorptions Rotor HUgo N Speed 20 rpm				sensibe and latent, (within the whole seasonal cycle)	Systems with humidification and cooling, reduction of cooling capacity by drying and cooling the external air	1,4 mm 1,6 mm 1,8 mm 2,0 mm 2,2 mm 2,4 mm	0,06 E
Epoxy-Coated Rotor K Speed 10 rpm				only sensible, latent only at Condensation	Systems with high exhaust air requirements such as: - swimming pools - industrial exhaust systems - Adiabatic humidification of exhaust air - Paint booths Adiabatic cooling	1,4 mm 1,6 mm 1,8 mm 2,0 mm 2,2 mm 2,4 mm	0,06 E 0,1 B

Rotor range overview

Housing versions

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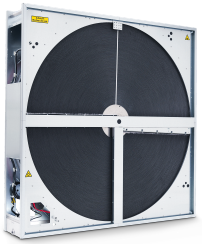
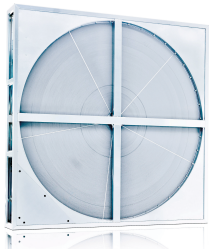
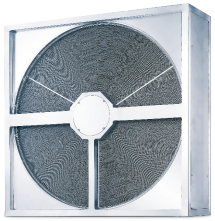
	RRU ECO	RRS	RRT	RRV
All housing versions are available with the storage masses P-condensation, E-enthalpy (hybrid), N-sorption and K-epoxy coated available				
Housing material	Galvanized steel	Galvanized steel	Aluminum	Stainless steel V2A or V4A
Execution	screwed	welded	welded	welded
Max. housing size (HS)	2550 x 2550 mm	4250 x 4250 mm	8000 x 8000 mm	3000 x 3000 mm
Cladding sheets	galvanized	galvanized	Aluminum	V2A (1.4301) or V4A (1.4571)
Undivided housing version up to	2550 mm (Ø 2500) mm	up to 3000 mm	up to 3000 mm	up to 3000 mm
Divided housing version up to	not possible	from Ø 2381mm (Smaller sizes available on request)		
Standard depths	290	400 mm to 2000 mm housing size 440 mm to 3000 mm housing size 550 mm to 4250 mm housing size	400 mm to 2000 mm housing size 440 mm to 2999 mm housing size 510 mm to 3999 mm housing size 550 mm to 5000 mm housing size 650 mm to 6600 mm housing size	400 mm to 2000 mm housing size 440 mm to 3000 mm housing size
Use as	Slide-in Rotor	Slide-in Rotor or build-in Rotor		
Installation position	vertical	horizontal / vertical		
Inspection of drive on narrow side	yes	yes	yes	yes
Inspection through triangular doors on the inflow and outflow sides	optional from size 1251 mm	optional from size 1500 mm	optional from size 1500 mm	optional from size 1500 mm
Sealing system	Brush seal	Brush seal, Felt, Murtfeldt from Ø 1650 mm		
Drive system MicroMax / **Drive system DRHX**	up to HS 2550 / up to HS 1950 (N) up to HS 2550 (P/E/K)	up to HS 4250 / up to HS 2060* (N) up to HS 2660* (P/E/K)	up to HS 5000 (N) up to HS 6400 (P/E/K) / up to HS 2000 (N) up to HS 2550 (P/E/K)	up to HS 3000 / up to HS 2060 (N) up to HS 2660 (P/E/K)
Conroller out of / in housing	Standard built-in and pre-wired; optional: Supplied loose	Standard built-in and pre-wired; optional: Supplied loose	Standard built-in and pre-wired; optional: Supplied loose	Standard built-in and pre-wired; optional: Supplied loose

All P-condensation, E-enthalpy (hybrid), N-sorption and K-epoxy-coated storage masses are available with the following film thicknesses and wave heights
P/E/N film thicknesses = E-0.06mm, B-0.1mm wave heights 1.4 / 1.6 / 1.8 / 2.0 / 2.2 / 2.4mm (Eurovent);
K film thicknesses = E-0.06mm wave heights 1.4 / 1.6 / 1.8 / 2.0 / 2.2 / 2.4 mm (Eurovent);film thicknesses = A-0.12mm wave heights 1.8 / 2.0 / 2.2 / 2.4mm

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Cleaning

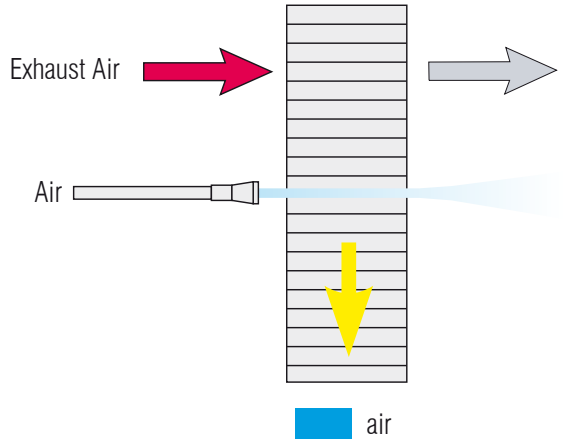
Sensible for ventilation and air conditioning systems with high exhaust air loads.

Cleaning of the storage medium surface with compressed air and/or high-pressure water. Note media provision (compressors and HP modules) and the necessary piping!

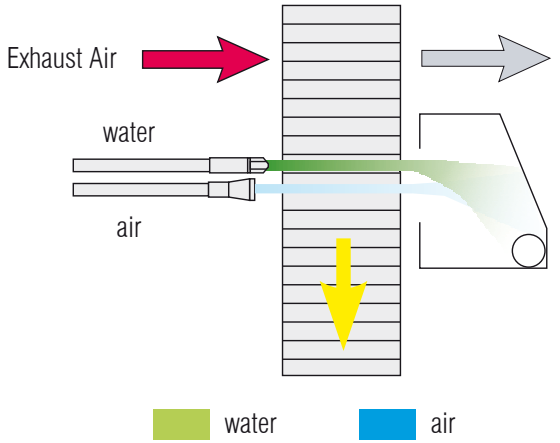
The cleaning equipment also has to be cleaned (particularly for wet cleaning)

Reinforced media of at least 0.1mm foil thickness recommended for high-pressure cleaning.

Compressed air cleaning



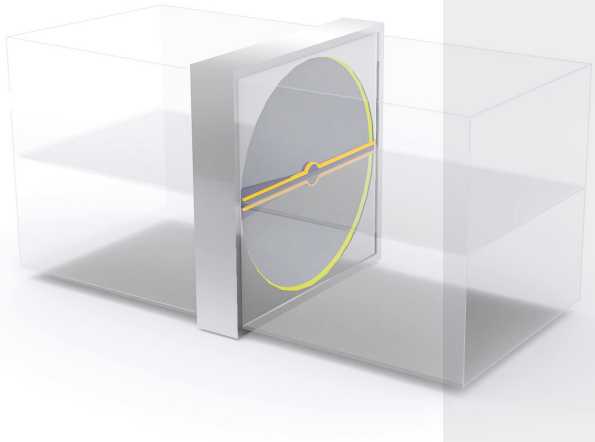
Compressed Air and pressure water cleaning



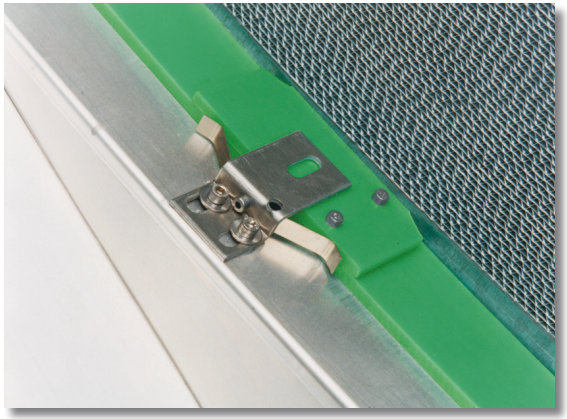
Glossary

Sealing Systems

Reduction of leakage at rotor circumference and water line separation.



There are two types of seals:
airflow separation (■)
Rotor circumference (■) .



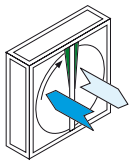
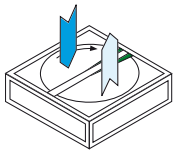
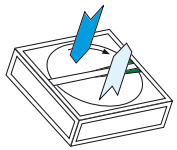
Special plastic seal (spring-loaded) for paint booths and systems with very high sealing requirements (■■)

Brush seal for airflow separation (■)
standard ventilation and air-conditioning

Pressure-stable felt seal for standard ventilation and air-conditioning (■■)

Rotor circumference brush seal (■)
standard ventilation and air-conditioning

Glossary

Installation position		- vertical with horizontal or vertical air flow separation	**As a general rule, no transfer of external power in the rotor frame** - No additional construction required
		- horizontal installation	- Framed support of rotor and bearing area required
		- horizontal inclined installation	- Base frame construction and brake motor and/or control system with holding torque and guide plates recommended
Odour transfer		Depending on the direction of leakage (fan arrangements) and water solubility of the odours, odour transfer takes place with condensation.	Kitchen smells; water-soluble, bathroom smells ;non-water-soluble, use of sorption rotors not recommended.
Rotor operation control		Gives error messages for unintentional rotor stoppage (e.g. V- belt blockage, break) designed as proximity switch (magnetic) in the rotor housing.	

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Rotor controller

Drive variant with stepper motors

Drive variant with geared motors

Control of the speed of the rotor and thus the recovery performance.

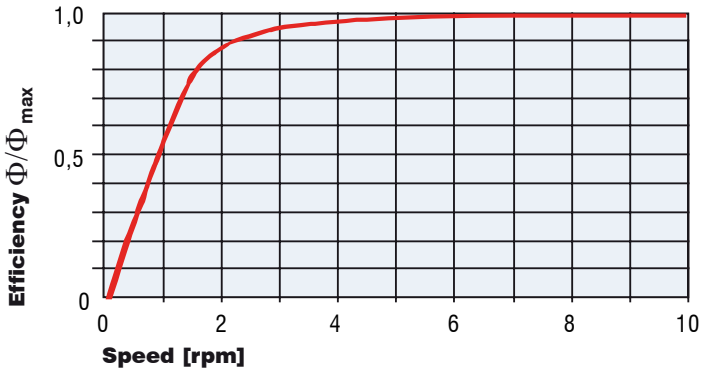
Controller can be specified in the LV MSR, retrofitting possible.

Controller operation with on-site control signal or as individual control with sensors.

Drive variant with stepper motors
Stepper motor with control unit for variable or constant speed

Drive variant with geared motors
Three-phase 50 Hz motors are optionally available for constant drive or for operation with a frequency converter, designed with worm gears

Various sizes are available for both systems



The diagram shows the dependence of the efficiency on the rotor speed

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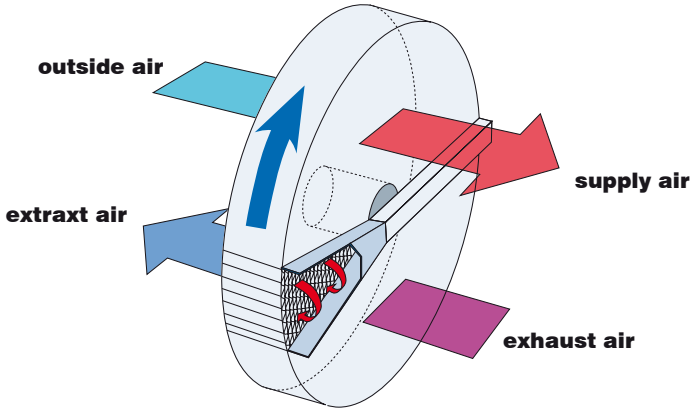
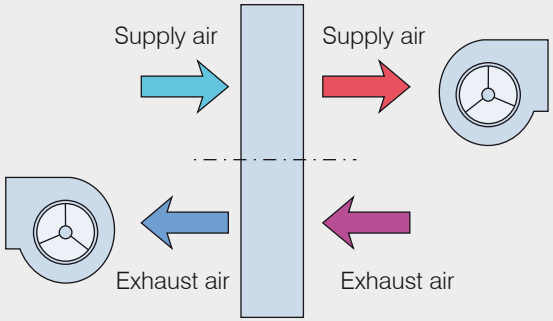
Self-Cleaning	Counter-current air flow cleans dry contamination from storage masses. Requirement: rotating rotor and/or activated intermittent operation.	
Software terminology clarification	Standard volume	Air volume relative to 20°C / 50% relative humidity / 1013 mbar
	Operating volume	Air volume for given temperatures and relative humidities
	Flow rate	Air speed in relation rotor to effective surface, not cross section of duct
	Pressure loss standard density	relates to standard volume
Purge sector	Avoidance of cross contamination between return and supply air due to rotation. Respect purge sector air-volume in fan layout. Rotational direction: from return air across purge sector to supply air. Purge sector always on warm side of wheel.	



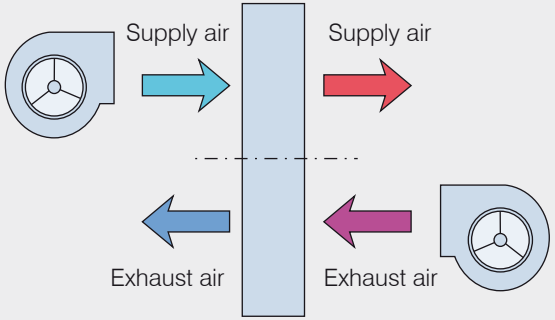
Glossary

Purge sector dimensions depend on the pressure difference between the through flows



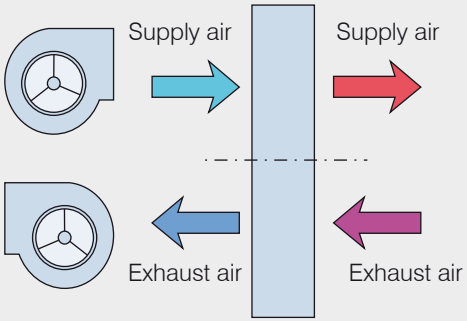
Purge sector: yes

Leakage: ≈ 3-5%



Purge sector: yes

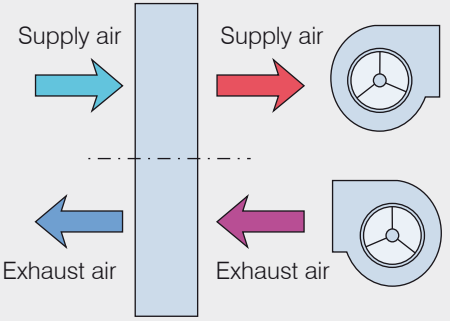
Leakage: ≈ 3-5%



Purge sector : yes / may be reduced in size

Leakage: Leakage higher than 10% in direction of supply air

Sealing: Double center line sealing.



Purge sector: no

Leakage: Leakage higher than 10% in direction of exhaust air

Sealing: then double seals on middle horizontal frame.

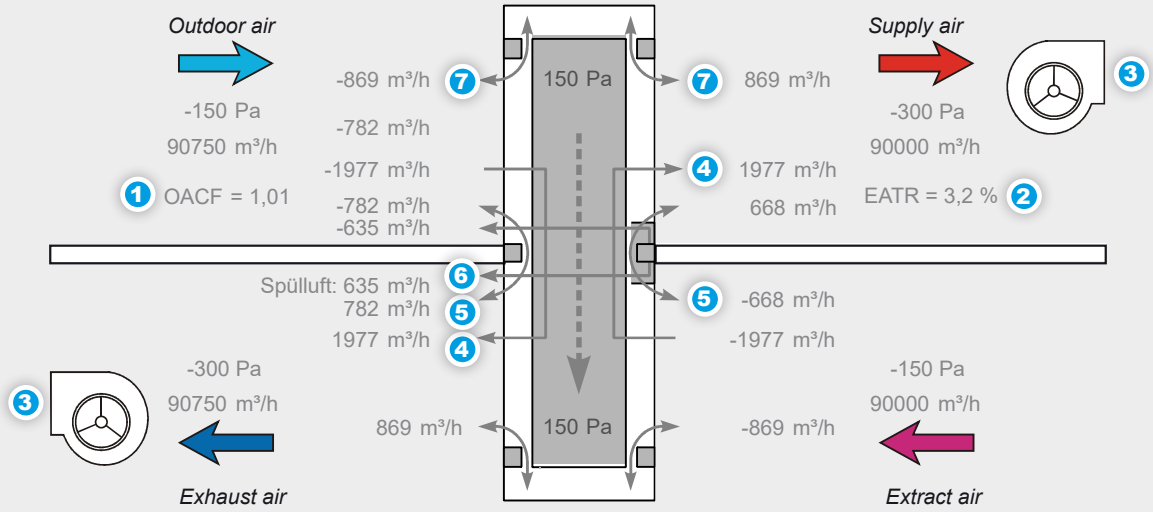
Water-tight collection chamber with condensate drain

Inclined aluminium tray in rotor housing with drainage at the lowest position for efficient draining of condensate and cleaning fluid.

Required for rotors with cleaning units and/or high levels of condensate.

Glossary

Leakage and Purge Sector Calculation



1 **OACF: (Outdoor Air Correction Factor)**
Outdoor Air Volume/Supply Air Volume (possibly < 1)
Classification number for increased power of ODA/SUP-fan.
Consists of leakage caused by sealing gaps and purge air, if applicable.

2 **EATR: (Exhaust Air Transfer Ratio)**
Extract Air Volume in Supply Air/Supply Air Volume (>0)
Classification number for the amount of extract air transferred into the supply air.
Under ideal circumstances (use of an effective purge sector) this value can be reduced to nearly 0%. Consists of air transferred due to rotation 4 and leakage caused by sealing gaps 5 and 7.

3 **Fan Arrangement:**
Influences the pressure situation over the rotor and therefore direction and amount of leakage, as well as a possible purge sector application. Ideal: draw through arrangement on both sides of the rotor.

4 **Rotation induced transfer:**
Air volume inside the rotor matrix that is cross-transferred to supply and exhaust air by rotation.

5 **Cross-Sealing:**
Leakage in the area of the crossbeam separating supply and extract air.

6 **Purge Air::**
Leakage effective supply air volume that rejects rotation induced transfers from the rotor matrix. Depends on the pressure grade between outdoor and extract air (min. 200 Pa).
To be effective: Purge Air > Rotation induced transfer
Possible purge sector sizes: 2x 2,5° or 2x 5°, depending on the purge pressure

7 **Circumference Sealing:**
Leakage depends on the type of sealing used.
For example: Felt with defined sealing gap or sliding seal with reduced gap

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Product Desciption

Example:
RRU (ECO)P-E18-1500/1500-1375

RRU ECO	P	E	16	–	xxxx	/	xxxx	–	xxxx

Housing	Type of rotor	Thickness of material	Height of matrix	Housing height [mm]	Housing width [mm]	Wheel diameter [mm]
RRS RRT RRV RRU ECO	**P:** Condensations rotor **E:** Enthalpy rotor **N:** Sorption rotor HUgo **K:** Epoxy coated rotor	E - 0.06 B - 0.10	14 16 18 20 22 24			

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Notice

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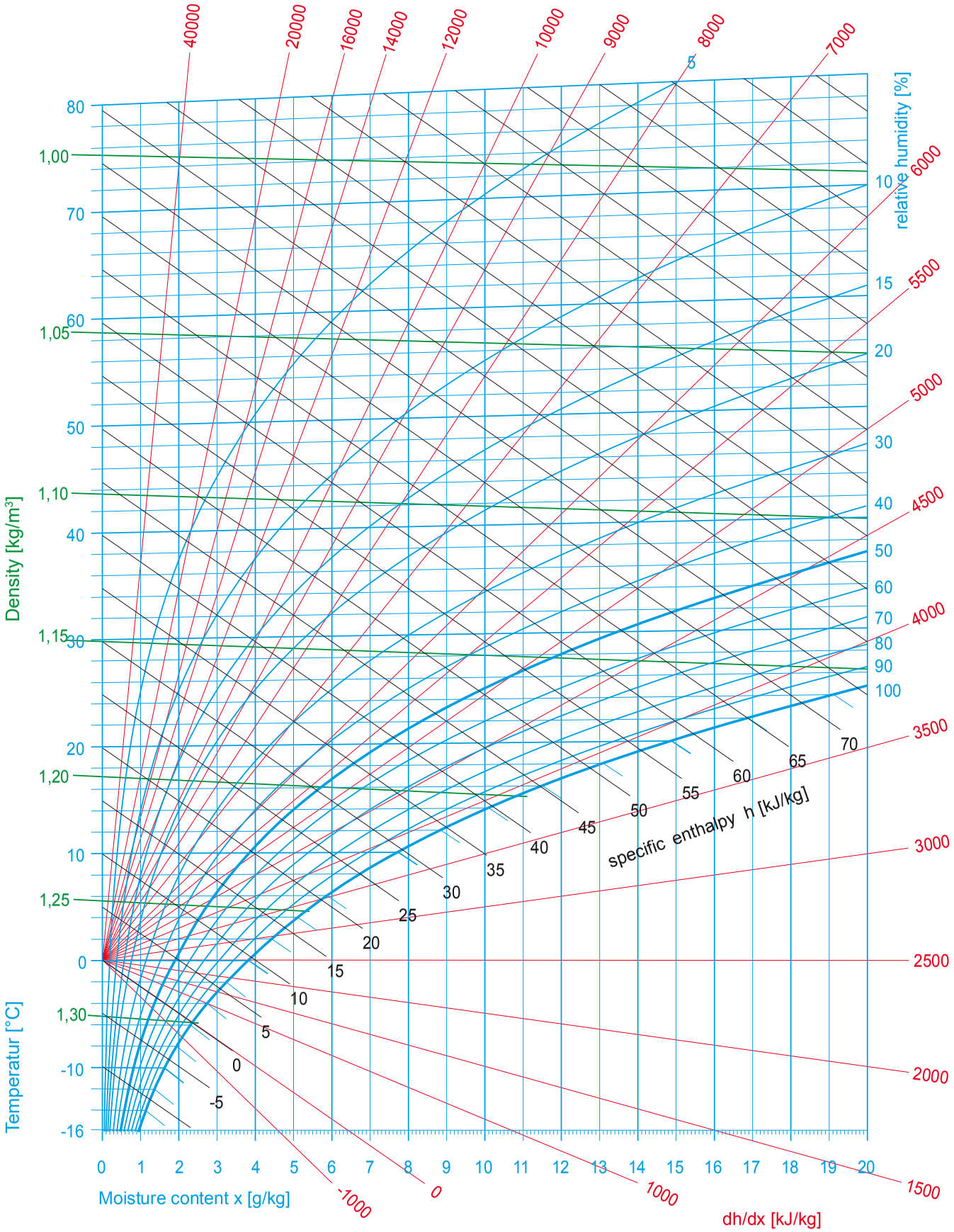
Mollier-diagram for p=1013 mbar



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