

COMFORT

HYDRONIC TERMINALS

HRD2

**HIGH EFFICIENCY HEAT RECOVERY
UNITS FROM 430 TO 3700 m³/h**

EFFICIENCY
UP TO
+86%



AIR QUALITY IS THE QUALITY OF LIFE

CLEANER AND FRESHER AIR



Nowadays we spend most of our time indoors, often at home or at work. All of us are exposed to biological pollutants such as harmful bacteria, viruses, moulds and chemicals.

HRD2 presents an ideal solution to ensure a constant flow of fresh air, to maintain the correct level of oxygen and to remove pollutants. The outside air is filtered and treated by the recovery unit, which integrates with the existing air conditioning or heating system perfectly.

TOTAL CONTROL OF ALL FUNCTIONS

Equipped with an electrical panel pre-installed on the machine and the remote control display provided as standard, the heat recovery does not require any other additional component.

All you need for the heat recovery and air renewal is given within one ready-to-use solution.



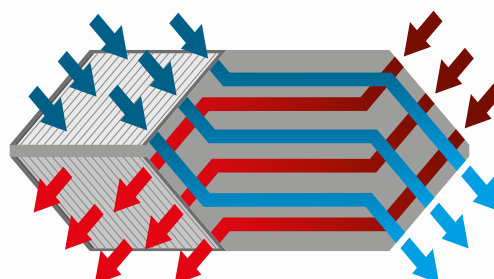
The exhaust air is a precious source of energy available for free. The HRD2 heat recovery unit uses this energy and turns it into an interesting energy saving opportunity.

HIGH EFFICIENCY, GIVEN FOR FREE

Exhaust air is a valuable source of energy, available at no cost. Not using it means wasting important opportunities for energy savings.

Thanks to an innovative heat recovery system, HRD2 allows you to extract the energy contained in the exhaust air and re-use it to condition or heat the renewal air.

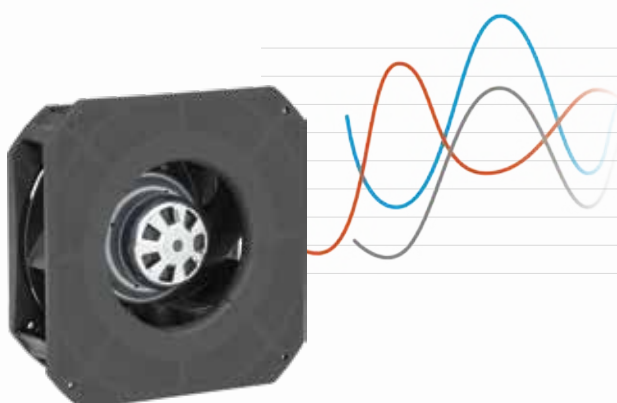
The new heat recovery unit is in line with the requirements of the Eco-design legislation no. 1253/2014, and it features efficiency levels that are always higher than those set by the laws.



CONTINUOUS AND PRECISE REGULATION

Advanced control logic and technical components with high adjustment capabilities allow HRD2 to precisely match the thermal demands of the air renewal.

Thanks to the continuous and precise modulation of the fan speed, maximum environmental comfort and minimized energy consumption are always guaranteed.



TECHNOLOGICAL CHOICES

Cutting-edge technical features focused on maximum efficiency and top quality design of every single detail.

EC MOTOR - PLUG FANS

The air movement is carried out by centrifugal EC plug fans with free impeller and backward blades. The impeller is made of plastic, reinforced with fiberglass for sizes 050 and 090, and aluminum material for larger sizes. These materials ensure high solidity and resistance that make the impeller ideal for heavy workloads. HRD2 features two brushless type fans, one for the supply air and the other for the exhaust air.



CONSTANT AIR FLOW MONITORING

Electronic control of the fan speed guarantees perfect adjustment of the air flow, keeping it constant during the operation and thus maintaining the performance required by the distribution system.

Alternatively, the air flow can be dynamically modulated thanks to the CO2 probe: according to the environmental requirements, HRD2 adjusts the fan speed in order to handle the exact required flow, with great advantages in terms of energy consumption reduction.



CONSTRUCTION DETAILS

The self-supporting HRD2 structure is characterized by top quality features and details that ensure durability and easy maintenance:

- Self-supporting steel structure with 25mm double panels made of galvanized sheet metal internally and painted sheet externally;
- Thermal and acoustic insulation made of non-flammable mineral wool and additional insulation for the parts close to the heat exchanger in order to avoid condensation even with extreme outdoor temperature conditions;
- Removable inspection openings and panels for easy access to internal components;
- Supporting feet for vertical versions;
- Longitudinal mounting brackets for horizontal versions;
- Compact air filters made of synthetic material (outer layer), fiberglass (inner layer) and a galvanized steel frame. The filters are type F7 with a very low pressure drop on the external air intake, and type M5 on the ambient air intake. Access to filters is facilitated by removable panels.



BY-PASS SYSTEM WITH MOTORIZED DAMPER

The by-pass system with motorized damper enables the use of the heating or cooling capacity (free cooling or free-heating) contained in the outside air to ensure a further reduction of energy consumption. All of this for free, just by taking advantage of the favorable conditions of the outside temperature.



FREE COOLING

The by-pass damper is open when outdoor temperature is lower than indoor temperature minus the free cooling differential (with hysteresis), and the operating mode is in cooling.



FREE HEATING

The by-pass damper is open when the outdoor temperature is higher than the indoor temperature plus the free heating differential (with hysteresis), and the operating mode is in heating.



High efficiency air-to-air heat recovery unit

The heart of HRD2 is the high efficiency air-to-air heat recovery, which can transfer much of the energy contained in the exhaust air to the fresh air. Characterized by a counterflow system made of sealed aluminium heat exchanger plates, the HRD2 recuperator ensures a perfect air flow separation.

ENERGY ANALYSIS

For the purposes of the energy analysis, the thermal profile of a typical installation of the tertiary sector located in Verona has been considered. Here the heat recovery unit works from 8am to 8pm, with a primary air flow entering at 22°C.

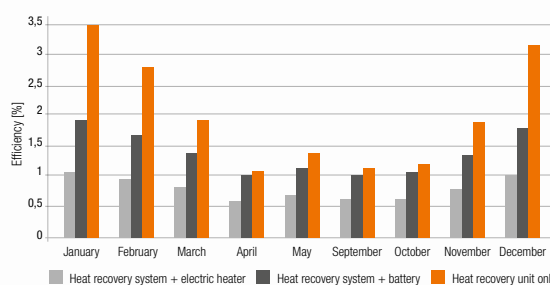
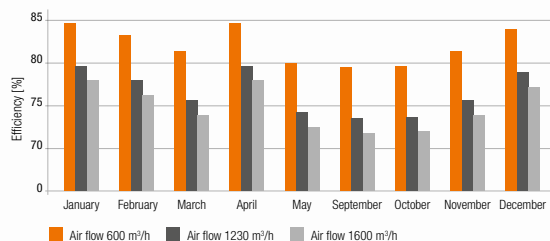
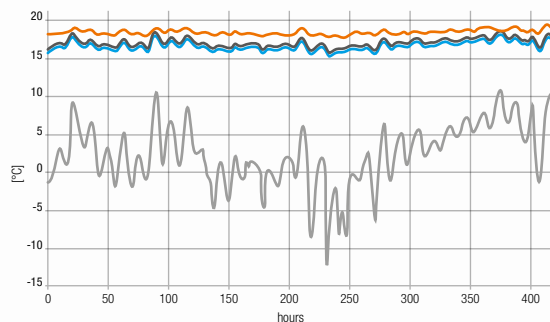
- Minimum air flow: 600 m³/h
- Nominal capacity: 1230 m³/h
- Maximum air flow: 1600 m³/h

RESULTS

The air-to-air heat recovery system of HRD2 shows an increase in the efficiency levels of 84% (in wet conditions). The greater the difference between indoor and outdoor temperatures, the greater the efficiency of the unit. In winter conditions, for example, the HRD2 unit can alone achieve an air temperature of 18°C (air flow 600 m³/h).

When compared to the solutions recovery+electrical heater and recovery+battery, the HRD2 recovery system is always more efficient when the fan is operating at maximum air flow. This is particularly clear in the winter period when the **efficiency of the solution with only recovery reaches a value equal to 3.4***, three times higher than the efficiency of a heat recovery system+electrical heater.

*Efficiency calculated according to the primary energy



HRD2

**HEAT RECOVERY UNIT
FROM 430 TO 3700 m³/h**



EC FAN



CONTROL



PLATE



PLUG FAN



VERSIONS

OR Horizontal installation, right air supply
OL Horizontal installation, left air supply

VR Vertical installation, right air supply
VL Vertical installation, left air supply



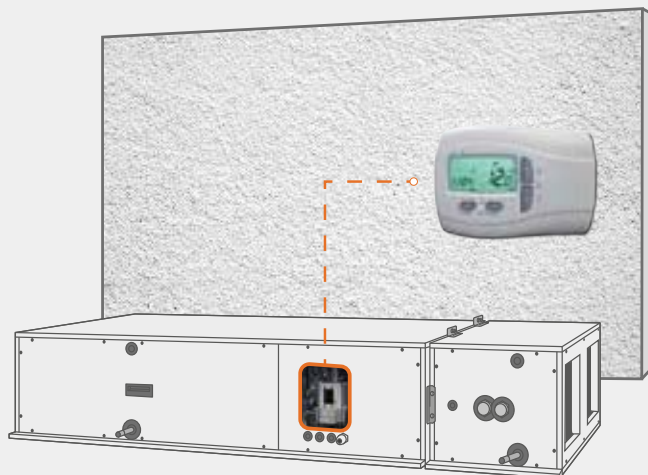
CONFIGURATIONS

- With pre-heating function
- With post-heating function
- With filter pressure switch
- With differential pressure sensor

CONTROL

The control system consists of an electrical panel mounted on-board and a remote control with display for the management of all functional parameters. Thanks to four probes installed on the four sides of the unit, the ventilation is easily regulated according to the desired requirements.

- ✓ Manual or automatic ventilation control
- ✓ Ventilation control with CO₂ sensor
- ✓ Ventilation control through air pressure sensor
- ✓ Modulating control of the water valve
- ✓ Summer/ winter mode
- ✓ Pre/post heating management
- ✓ Filter pressure switch management
- ✓ Defrost and antifreeze management
- ✓ Free cooling/free heating management
- ✓ Post ventilation
- ✓ Weekly programming
- ✓ Alarm management
- ✓ Fire alarm management
- ✓ Connection with the BMS Protocol Modbus RS485



HRD2			050	090	140	210	300	410
ELECTRICAL DATA								
Power supply		V/ph/Hz	230/1/50	230/1/50	230/1/50	230/1/50	400/3+N/50	400/3+N/50
Fan Power Input		W	327	339	904	930	1841	1910
Max absorbed power		W	340	340	920	930	2000	2000
Overall current input Nominal		A						
Absorbed current		A	2,80	2,90	6,00	6,00	3,40	3,5
Fan speed control		V						
PERFORMANCE								
Air flow rate		m³/h	426	776	1230	1843	2720	3685
Air flow rate		m³/s						
ESP External Static Pressure	(1)	Pa	218	153	265	172	194	200
Sound Pressure on inlet side Lp (IR)	(2)	dB(A)	53	52	53	60	62	60
Sound Pressure on outlet side Lp (OD)	(2)	dB(A)	61	60	61	68	70	68
Efficiency of Heat recovery	(3)	%	86,2	86,9	83,7	85,3	84,8	85,0
Total capacity (heating mode)	(3)	kW	3,68	6,77	10,3	15,8	23,2	31,4
Heat recovery outlet temperature	(3)	°C	16,3	16,5	15,6	16,0	15,9	16,0
COMPLIANCE WITH (UE 1253/2014)								
Efficiency of Heat recovery	(4)	%	81,4	80,1	77,9	77,4	76,8	76,8
Efficiency bonus		W/m3/s	252	213	147	132	114	114
Filter correction factor								
SFP internal limit		W/m3/s	1337	1283	1201	1162	1113	1078
Total internal air pressure drop	(4)	Pa	601	679	570	583	633	636
Overall fan static efficiency	(5)	%	45,0	53,1	47,5	50,7	59,0	59,2
SFP internal		W/m3/s	1336	1279	1200	1150	1073	1074
SIZE AND WEIGHT								
A	(6)	mm	1350	1470	1850	1850	2150	2150
B	(6)	mm	680	820	1030	1460	1460	1840
H	(6)	mm	330	370	455	455	590	590
Operating weight	(6)	Kg	85	105	175	235	290	360

ACCESSORIES



Air filter pressure switch

Device for the filter check.



Motorized dampers

Motorized dampers for air flow management.



External section with changeover water coil

Module for energy integration when the desired temperature is achieved.



3-way valves

3-way valves for water flow management inside the coil module.



CO₂ sensor

Sensor for modulating the air flow according to the air quality.

- Round connections
- Anti-vibration joints
- Roof cover for vertical and horizontal units



Notes:

- 1 Fresh air/supply air circuit.
- 2 Sound pressure level in free field on a reflective surface, 1 m from fan front and 1 m from the ground. Non-binding value obtained from sound power level.
- 3 Size valued in the following hypothesis at wet conditions: outside air temp. -7°C 80% RH; room air temperature 20°C; 55% RH
- 4 Size valued in the following hypothesis at dry conditions: outside air temperature 5°C; room air temperature 25°C
- 5 Including motor&speed controller efficiency
- 6 Unit in standard configuration/execution, without optional accessories.



for a greener tomorrow

Eco Changes is the Mitsubishi Electric Group's environmental statement, and expresses the Group's stance on environmental management. Through a wide range of businesses, we are helping contribute to the realization of a sustainable society.



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