PRODUCTS INFORMATION

English

EMD

REFRIGERANT DRYERS

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REFRIGERANT DRYERS
EMD

About us

Ing. **Enea Mattei SpA** is an Italian company that has been producing air compressors since 1919. Over the years, the company has continually evolved and is today one of the world's foremost companies in the compressed air sector and the leader in the production of rotary vane compressors.

Behind the success of Mattei are the choice the company has made in terms of design, production and marketing, driven by the results of its continual and in-depth research and development programmes.

During these years of continual change, Mattei has been able to adapt to the requirements of the market and through the results of its research has created products that are always innovative and technologically advanced.

Certified quality

Quality as an integral part of all company functions and constant improvement of all production processes so as to always guarantee the maximum level of reliability and satisfaction. This, in brief, is the value and the meaning of **Mattei's** operational philosophy. A way of approaching the market and customers that makes **Mattei** an absolute point of reference in the compressed air sector.
Since 1994, **Mattei** has been operating with a Quality System certified by the DNV Institute under UNI EN ISO 9001 regulations.

Compressed air: a great resource to know

Compressed air is a point of strength for modern industry, due to its easy and flexible use. However, when the air is compressed, moisture and other contaminants increase.
If not removed from the air system, this corrosive mixture damages the pneumatic tools, resulting in expensive down times, product deterioration, and reduced life of the equipments.

The water vapour contained in the intake air is condensed inside the after coolers, due to temperature lowering, and then it enters the air distribution system, causing damages to the machine using compressed air and to pneumatic systems. The installation of a Mattei dryer is essential to eliminate condensate polluting the production process.

Mattei extends its product offering for the compressed air treatment, introducing the new EMD thermal mass dryers.

The Impulse Technology regulation system guarantees high energy savings and an excellent dew point stability, thanks to the EMD dryers that are able to adapt itself to the work load.

The regulation system of the dryer controls the compressed air system operation and guarantees the most energetically effective method for compressed air drying.

- NEW HIGH EFFICIENCY HEAT EXCHANGER
- HIGHEST ENERGY SAVINGS
- MINIMUM PRESSURE DROPS
- LOWEST ENVIRONMENTAL IMPACT
- REDUCED CARBON FOOTPRINT
- EASY INSTALLATION
- EASY SERVICEABILITY
- MAXIMUM RELIABILITY

REFRIGERANT DRYERS
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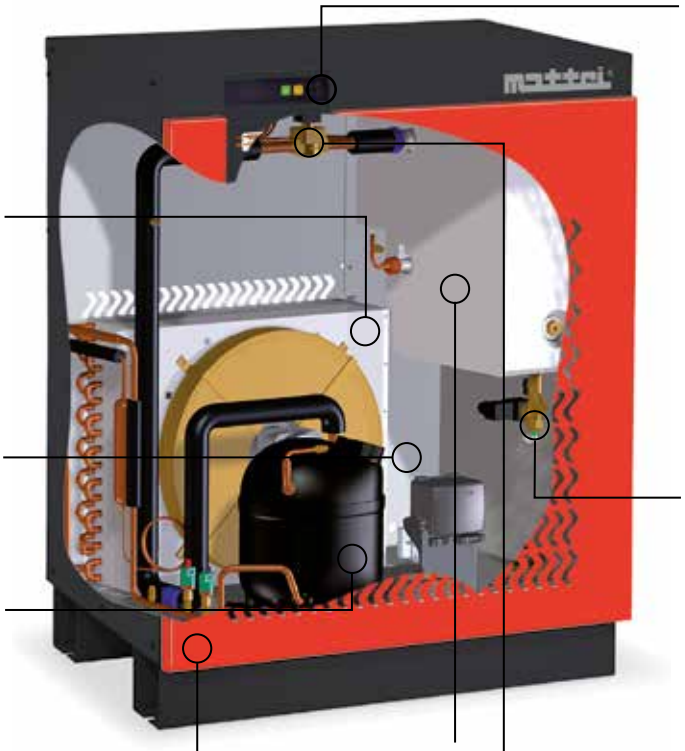
HIGH-PERFORMANCES CONDENSER
The air-cooled condenser is designed to ensure operation up to 50°C external temperature and to achieve very high energy efficiency values. EMD 051 – 321 are supplied with tubeless condenser with steel fins protected by a double layer dipping painting. EMD 401 – 1651 are equipped with a condenser coil with copper tubes and aluminium fins. Thanks to the ducted condenser coil, the maintenance activities are possible also with dryer ON. Condenser filters standard on EMD 1001 – 1651.

ENVIRONMENTALLY FRIENDLY REFRIGERANTS
R134a Refrigerant: EMD 051 – 801
R404A Refrigerant: EMD 1001 – 1651

REFRIGERATION COMPRESSORS FULLY HERMETIC
Piston compressors (EMD 051 – 1401) ensure high reliability and long service life. Scroll compressors (EMD 1651) offer reduced energy consumptions, low vibrations, less moving parts and high reliability.

ROBUST CABINET AND STRUCTURE
Heavy duty structure with panels protected by an epoxy polyester power coating RAL 2002. Simple and safe handling by forklift or pallet truck.



HIGH EFFICIENCY 3-IN-1 HEAT EXCHANGER
3-in-1 compact aluminium heat exchanger including an Air-Air heat exchanger, the evaporator and a separator combined in a single module.

ELECTRIC POWER AND CONTROL PANEL
The control section is electrically isolated from the power section through a transformer. On EMD 1001 – 1651 the power section is fitted with an interlocked door main switch to prevent access while power supply is ON. Electrical equipment is compliant with EN 60204-1 and electrical panel protection degree IP54 compliant with EN 60529 (EMD 1001 – 1651) . The dryer is tested for electromagnetic compatibility in accordance with applicable EMC standards. A phase monitor (EMD 1651) provides protection against phase loss and phase reversal.

CONDENSATE DRAINS
All the dryers have microprocessor controlled drains. The drain open time and cycle time are fully adjustable and the settings can be locked in to avoid tampering. Zero loss drain (option): a level sensor measures the level of the condensed moisture and automatically opens a valve to drain it off, preventing any pressure loss.

IMPULSE TECHNOLOGY
The microprocessor adapts the working cycle to the real working conditions by controlling through "impulses" the opening and closing of the solenoid valve.

Reliable operation
The simple refrigeration circuit, without hot gas by-pass valve, and the careful selection of the materials and components assure long, trouble free service life. The condenser coil is generously sized to maintain efficiency in all environments even at high ambient temperatures.

Easy serviceability
Removable frontal panel assures easy access to the main refrigeration components, thus facilitating maintenance operations also with dryer ON. There is no need of seasonal adjustments unlike hot gas by-pass dryers. Condenser filters standard (EMD 1001–1651) prevent mechanical equipment fouling by stopping debris.

Respect of environment
EMD's energy savings coupled with R134a and R404A non ozone depleting refrigerants, reduce the environment impact minimizing the energy waste. Recyclable and high quality materials ensure respect of environment. and reduced carbon footprint.

High efficiency heat exchanger

NEW ADVANCED 3-IN-1 HEAT EXCHANGER

3-in-1 compact aluminium heat exchanger including an Air-Air heat exchanger, the evaporator and a separator combined in a single module. This advanced heat exchanger has been engineered specifically to maximize the heat transfer coefficient and to guarantee industry leading pressure drops.

AIR-TO-AIR HEAT EXCHANGER

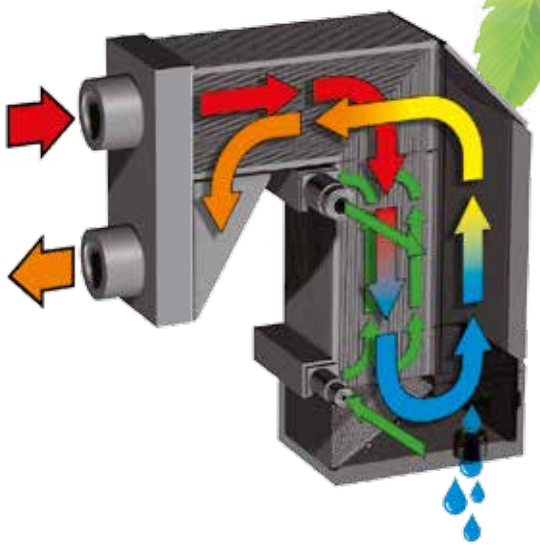
Hot and moist air enters the Air-to-Air heat exchanger where it exchanges heat in total counter flow with the outgoing cold air. Precooling saves energy by reducing the heat load on the evaporator section.

EVAPORATOR (AIR-TO-REFRIGERANT HEAT EXCHANGER)

The pre-cooled air enters the evaporator where it is cooled to the required dew point by exchanging heat in counter flow with the evaporating refrigerant, allowing maximum thermal exchange. The dew point temperature is held within its optimum performance range by the microprocessor even under differing ambient conditions.

DEMISTER SEPARATOR

After cooling the cold air enters the high efficiency stainless steel separator where the condensate is removed by a demister falling into the generously dimensioned drainage chamber or sump for disposal through the microprocessor controlled drain.
The cold dry compressed air passes through the secondary side of the Air-to-Air heat exchanger where it is reheated by the hot inlet air it is precooling. Reheating prevents down-stream pipe sweating.



Guaranted quality
All models are individually tested: refrigerant charge and leakage control, microprocessor and safety device setting verification. Leading brand components are used throughout, ensuring long term reliability.

High operating limits
High maximum inlet temperature +70 °C (EMD 051-801) +60 °C (EMD 1001-1651) and maximum ambient temperature (+50°C) ensure a fail - safe operation at all times.
High maximum operating pressure (16 barg).

Easy installation
Advanced design makes this dryer extremely compact and lightweight.
Small footprint and frontal access for all controls and refrigeration components save valuable plant floor space.

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IMPULSE TECHNOLOGY

Energy saving

This revolutionary design matches energy consumption to the work load to achieve energy savings while in operation.
Thanks to some sensors placed on the refrigeration and on the compressed air circuits, the microprocessor controls the dryer operation granting the most energetically effective method of compressed air drying.

- For high/medium flows, the dryer applies the Impulse Technology to regulate its drying capacity.
- For low air flows, the dryer utilizes the thermal storage operation.

IMPULSE TECHNOLOGY FOR HIGH/MEDIUM AIR FLOWS

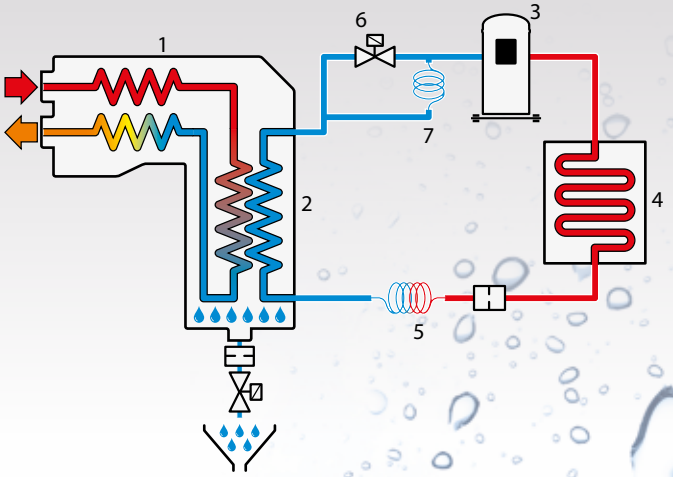
The refrigerant compressor is permanently ON to achieve a perfect control of the dew point. The microprocessor controls through "impulses" the opening and closing of a solenoid valve installed on the suction pipe of the refrigerant compressor, in partial load conditions then only a small portion of the nominal refrigerant flows through a by-pass capillary to the compressor.
In partial load conditions the compressor compresses less refrigerant than at peak load and therefore it consumes less energy (refrigerant flow control technology).

THERMAL STORAGE OPERATION FOR LOW AIR FLOWS

The refrigerant compressor cycles ON/OFF for maximum savings and reliability. Since the refrigeration capacity is greater than the load, the excess capacity cools the all-in-one exchanger that acts like a thermal storage.

How it works

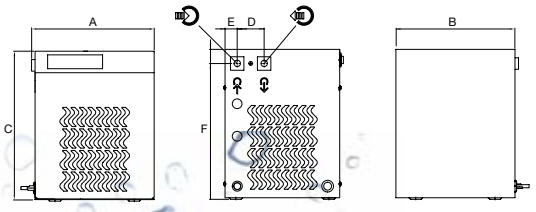
Hot moist compressed air enters the Air-to-Air heat exchanger (1) where it is precooled by the dry air leaving the dryer. The refrigerant compressor (3) compresses the refrigerant gas and push it through the condenser (4) where it is condensed in high pressure liquid.
The refrigerant liquid then passes through a capillary (5) that meters it into the evaporator (2) as a low pressure liquid. The microprocessor adapts the working cycle to the real working conditions by controlling through "impulses" the opening and closing of the solenoid valve (6). In partial load conditions only a small portion of the refrigerant flows through the by-pass capillary (7) to the compressor that therefore consumes less energy.
The precooled air enters the evaporator (2) where it is cooled to the required dew point by the incoming refrigerant liquid that changes phase and becomes a low pressure gas suitable to continue the process as it returns to the suction side of the refrigerant compressor (3). The exiting cold dry compressed air then returns to the Air-to-Air heat exchanger (1) where it is reheated by the incoming air, to prevent sweating in your plant.



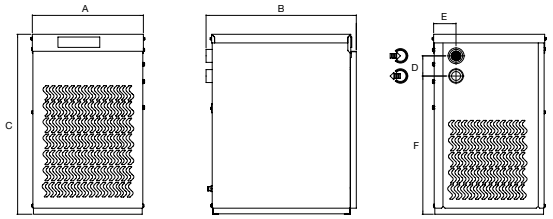
MODEL	FLOW RATE		ABSORBED POWER	COOLANT	POWER SUPPLY	CONNECTIONS	DIMENSIONS (MM)						WEIGHT	
							A - LENGTH		B - WIDTH		C - HEIGHT			
EMD	m³/min	cfm	KW (nom.)	Tipe	V/Hz/ph	Inch (IN-OUT)	mm	inch	mm	inch	mm	inch	kg	lbs
EMD 051	0,5	17,7	0,15	R134a	230/50/1	Rp 3/8"	319	12,6	298	11,7	390	15,4	18	39,6
EMD 071	0,7	24,7	0,18	R134a	230/50/1	Rp 3/8"	319	12,6	298	11,7	390	15,4	19	41,8
EMD 091	0,9	31,8	0,18	R134a	230/50/1	Rp 1/2"	359	14,1	298	11,7	415	16,4	22	48,4
EMD 121	1,2	42,4	0,19	R134a	230/50/1	Rp 1/2"	359	14,1	298	11,7	415	16,4	22	48,4
EMD 181	1,8	63,6	0,35	R134a	230/50/1	Rp 1"	380	15	514	20,3	625	24,6	35	77
EMD 261	2,6	91,8	0,47	R134a	230/50/1	Rp 1"	380	15	514	20,3	625	24,6	39	85,8
EMD 321	3,2	113	0,56	R134a	230/50/1	Rp 1"	380	15	514	20,3	625	24,6	42	92,4
EMD 401	4,0	141,2	0,74	R134a	230/50/1	Rp 1"	680	26,8	511	20,1	860	33,9	68	149,6
EMD 501	5,0	176,6	0,78	R134a	230/50/1	Rp 1 1/2"	680	26,8	511	20,1	860	33,9	75	165
EMD 601	6,0	211,9	0,84	R134a	230/50/1	Rp 1 1/2"	680	26,8	511	20,1	860	33,9	76	167,2
EMD 701	7,0	247,2	0,95	R134a	230/50/1	Rp 1 1/2"	755	29,7	555	21,9	995	39,2	93	204,6
EMD 801	8,0	282,5	1,10	R134a	230/50/1	Rp 1 1/2"	755	29,7	555	21,9	995	39,2	94	206,8
EMD 1001	10,0	353,1	1,53	R404A	230/50/1	Rp 2"	1031	40,6	799	31,5	1039	40,9	180	396
EMD 1201	12,0	423,7	1,84	R404A	230/50/1	Rp 2"	1031	40,6	799	31,5	1039	40,9	190	418
EMD 1401	14,0	494,3	2,11	R404A	230/50/1	Rp 2 1/2"	1170	46,1	939	37	1180	46,5	235	517
EMD 1651	16,5	582,6	2,24	R404A	400/50/3	Rp 2 1/2"	1170	46,1	939	37	1180	46,5	246	541,2

Data refers to the following nominal conditions: ambient temperature 25 °C, with inlet air at 7 bar and 35 °C and with a pressure dewpoint of 3 °C.
Maximum working conditions: ambient temperature 50 °C, air inlet temperature 70 °C (EMD 051 - 801), 60 °C (EMD 1001 - 1651) and maximum working pressure 16 bar.

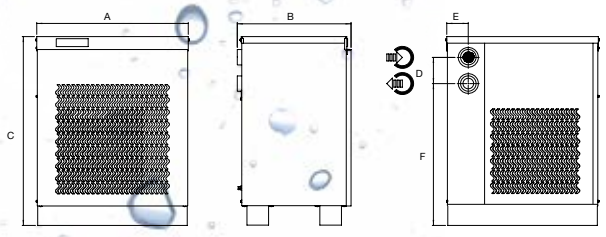
EMD 051 – 121



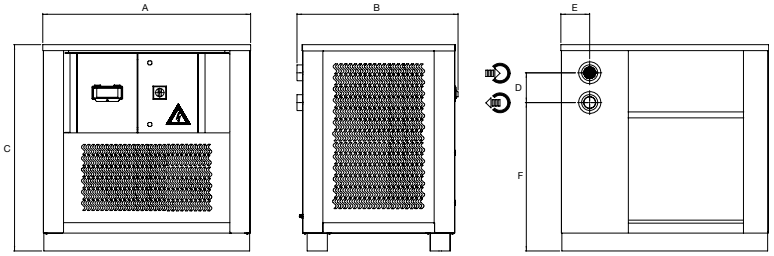
EMD 181 – 321



EMD 401 – 801



EMD 1001 – 1651



CORRECTION FACTOR FOR WORKING PRESSURE CHANGES															
Inlet Air Pressure	barg	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Factor		0,71	0,82	0,9	0,96	1	1,04	1,07	1,09	1,11	1,13	1,15	1,16	1,18	1,19

CORRECTION FACTOR FOR AMBIENT TEMPERATURE CHANGES							
Ambient Temperature	°C	20	25	30	35	40	45	50
Factor		1,05	1	0,95	0,89	0,84	0,78	0,72

CORRECTION FACTOR FOR INLET AIR TEMPERATURE CHANGES										
Air Temperature	°C	30	35	40	45	50	55	60	65	70
Factor		1,23	1	0,81	0,66	0,57	0,52	0,48	0,44	0,4

CORRECTION FACTOR FOR DEWPOINT CHANGES					
Dewpoint	°C	3	5	7	9
Factor		1	1,12	1,24	1,38

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