

### PRODUCTS INFORMATION



## Adsorption dryers

## Compressed air: a great resource to know

Atmospheric air always contains water vapor and impurities. For the final user it is necessary to get a compressed air supply, free from condensate and contaminating particles, such as oil and dust. If such contaminations should come in direct contact with the final product, the resulting costs would be extremely high and a solution that could have been practical and inexpensive at the design stage would then be very costly.

The aim of Mattei's compressors is to provide **quality compressed air, clean and dry**, i.e. free from any element that might reduce the plant's efficiency and reliability. According to the customer's compressed air use and field of application, these substances can have a different impact on the production process.



Once the function of compressed air through the production process has been precisely identified, it is important to accurately and thoroughly select the best possible combination of air treatment accessories, in order to optimize the available resources and reduce waste.

In those cases where dry and clean compressed air is required, like food, pharmaceutical and hospital industries, galvanic systems or applications where a dewpoint down to -40°F or -94°F is required, installation of a **Mattei adsorption dryer** is the perfect choice to obtain the best product quality.

# ADSORPTION DRYERS

The use of Mattei's desiccant dryers removes the condensate from the air, preventing any damage to the compressed air distribution system. Mattei's range of desiccant dryers reliably give you:

- choice of heatless, externally heated or blower purge designs to match your requirements
- removal of water vapor be lowering the pressure dew point of your compressed air stream by 40°F (94° optional on MHL heatless range) to ensure a continuous supply of dry air
- moisture and particulate protection of your production process
- energy saving dew point monitoring (optional)
- · designed for the most demanding applications
- · peace of mind the most reliable product of its kind

With the flexibility to build a complete compressed air solution to match the requirements of the customer, Mattei desiccant dryers are an effective solution to the problems caused by contaminated compressed air.

0.01 micron pre filter removes all particulate liquid v	water and oil
aerosols to 0.01 ppm	

Clean, saturated air enters the inlet valve which directs it to column A

Compressed air travels through column A for 5 minutes and moisture vapor is adsorbed to -40°F pdp or better

A final filter removes paticulate to 1.0 micron or better

 $\sim\!15\%$  purge air expands through an orifice and regenerates column B (MHL heatless range)

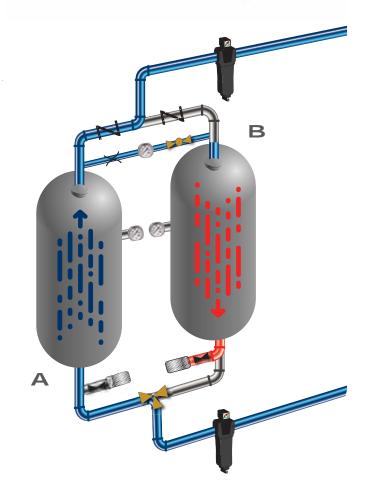
After 3.5 minutes, the purge exhaust valve closes and column B repressurizes and is ready for adsorption to begin

At the 5-minute mark (fixed cycle), column A exhaust valve opens to regenerate. A PLC controls all operations.

Compressed air is expensive but Mattei dryers can be fitted with an energy savings device to save air and save money. By measuring actual pressure dew point, the PLC will extend the dryer cycling reducing compressor energy, wasted purge air and valve wear and tear.

#### **PRINCIPLES OF OPERATION**

Twin tower desiccant dryers are the most common due to their simplicity and hence low cost. A heatless twin tower dryer (see figure below) operates by removing moisture through adsorption onto a granular desiccant bed from the feed air (typically at 100 psig) as it flows up through a packed bed of desiccant, column A. Column B (having been previously used in drying the inlet air) is at atmospheric pressure and dry purge air from the outlet of column A is fed through a purge valve, expanded to near atmospheric pressure, and flowed in contra flow direction down through column B to effect the regeneration of its granular desiccant bed. When the desiccant in column A becomes saturated with water vapor (usually determined by a simple timer controller) the feed air is switched back to column B, after it has been pressurized, and the cycle continues.



## MHL DRYERS

## Heatless desiccant air dryers

Using expanded purge arir to regenerate the desiccant beds, heatless desiccant dryers are the most common due to their simplicity and hence low cost.

- Lowest initial investment
- Require the most purge air at 15%
- -40°F dew point as standard for ISO 2 applications
- -94°F dew point available as option for ISO class 1 applications

#### FEATURES OF MATTEI MHL DRYERS

- PLC controlled operation with NEMA 4X control panel
- Low noise exhaust mufflers
- Pneumatically operated 3-way inlet valves (MHL 100 to MHL 800)
- High performance butterfly inlet valves (MHL 1000 and larger)
- Stainless steel spring check valves
- Precision purge control valve
- Energy saving dew point control option
- ASME coded pressure vessels
- UL/cUL compliant
- Lifting lugs and/or fork lift pockets on all products



## MHL RANGE

Flow range	100 - 3000 scfm				
Pressure dewpoint	-40°F standard -94F optional				
Nominal inlet temperature	100°F				
Nominal working pressure	100 psig				
Maximum inlet temperature	120°F				
Maximum working pressure	150 psig				
Maximum ambient temperature	120°F				

## MEH DRYERS

### Heated desiccant air dryers

Externally heated desiccant dryers use an electric heater to heat the dry purge air in order to regnerate the desiccant beds. This eliminates the use of valuable compressed air to be used for desiccant regeneration.

- Mid-priced investment
- Excellent ROI
- Use less purge air than heatless at approximately 6 8 %
- -40°F dew point as standard for ISO class 2 applications

#### FEATURES OF MATTEI MEH DRYERS

- PLC controlled operation with NEMA 4X control panel
- Low noise exhaust mufflers
- High performance butterfly inlet valves (MEH 1000 and larger)
- Stainless steel check valves
- Low watt density heater
- Secondary heater contactor
- Energy saving dew point control option
- ASME coded pressure vessels
- UL/cUL compliant
- Lifting lugs and/or fork life pockets on all products



### MEH RANGE

Flow range	100 - 5000 scfm				
Pressure dewpoint	-40°F				
Nominal inlet temperature	100°F				
Nominal working pressure	100 psig				
Maximum inlet temperature	120°F				
Maximum working pressure	150 psig				
Maximum ambient temperature	120°F				

# MBP DRYERS

# Blower purge desiccant air dryers

Blower purge desiccant dryers use a combination of an ambient blower and heater followed by dry purge air to regenerate the desiccant beds.

- Higher initial investment
- Fastest ROI
- Further reduces or even eliminates purge air usage to approximately 0 - 2 % averaged over a 4-hour cycle for dry air cooling

#### FEATURES OF MATTEI MBP DRYERS

- PLC controlled operation with NEMA 4X control panel
- Low noise exhaust mufflers
- High performance butterfly inlet valves (MBP 1000 and larger)
- Stainless steel check valves
- Field proven high efficiency regenerative blowers on models up to 3000 scfm and centrifgual design on models 4000 scfm and larger
- Low watt density heater
- Secondary heater contactor
- Energy saving dew point control option
- ASME coded pressure vessels
- UL/cUL compliant
- Lifting lugs and/or fork life pockets on all products

# **MBP RANGE**

Flow range	100 - 5000 scfm
Pressure dewpoint	-40°F
Nominal inlet temperature	100°F
Nominal working pressure	100 psig
Maximum inlet temperature	120°F
Maximum working pressure	150 psig
Maximum ambient temperature	120°F



FEATURES



PLC CONTROLLED OPERATION



PNEUMATICALLY OPERATED 3-WAY VALVES



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OPTIONS

REGNERATIVE BLOWER ON MODELS UP TO 3000 SCFM



HIGH PERFORMANCE BUTTERFLY VALVES



LOW NOISE EXHAUST MUFFLERS

COLUMN A: ONLINE ENERGY SAVING MODE HOURS IN ES: 00000 -043 DEG F PDP 1 ~ 2 3 4

ENERGY SAVING DEW POINT CONTROL OPTION

With this option, a dew point sensor is incorporated into the dryer providing the ultimate in energy and power savings. The energy savings option reduces valve attrition, increase service life and includes an extended 5-year valve warranty.



#### VALIDATED COMPRESSED AIR FILTER PACKAGES

Mattei MDSF pre and after filtration packages are available with 3, 7 and 9-valve bypass options. Flanged filters are floor mounted or skid mounted on models above 1500 scfm.

## MHL DRYERS

#### Heatless desiccant air dryers

MODEL		CONNECTION SIZE <sup>(2)</sup>	<b>-CE</b> VOLTAGE		DIMENSIONS (ins)		APPROX WEIGHT <sup>(3)</sup>	INCLI PRE ANI FILTRA	O AFTER
MHL	scfm	NPT(F) / Flg	V/ph/Hz	A - WIDTH	B - LENGTH	C - HEIGHT	lbs	PRE FILTER	AFTER FILTER
MHL 100	100	1″	115/1/60	27.5	30	83	300	MDSF 0135 M01	MDSF 0135 M1
MHL 150	150	1″	115/1/60	31.5	33	83	415	MDSF 0175 M01	MDSF 0175 M1
MHL 200	200	1 1/2″	115/1/60	40	40	83	540	MDSF 0290 M01	MDSF 0290 M1
MHL 250	250	1 1/2″	115/1/60	40.8	46	83	590	MDSF 0290 M01	MDSF 0290 M1
MHL 350	350	1 1/2″	115/1/60	44	42	83	735	MDSF 0400 M01	MDSF 400 M1
MHL 500	500	2″	115/1/60	48	42	83	1100	MDSF 0700 M01	MDSF 0700 M1
MHL 650	650	2″	115/1/60	52	46	85	1600	MDSF 0700 M01	MDSF 0700 M1
MHL 800	800	2 1/2″	115/1/60	52	46	88	2000	MDSF 0800 M01	MDSF 0800 M1
MHL 1000	1000	3″	115/1/60	59.2	48	92	2650	MDSF 1000 M01	MDSF 1000 M1
MHL 1250	1250	3″	115/1/60	66.7	49	107	3000	MDSF 1200 M01	MDSF 1200 M1
MHL 1500	1500	3″	115/1/60	72.8	56	97	3500	MDSF 1500 M01	MDSF 1500 M1
MHL 2000	2000	4″	115/1/60	72.8	56	111.1	4600	MFZ 2500 M01	MFZ Z2500 M1
MHL 2500	2500	4″	115/1/60	99	57.5	115.5	5100	MFZ 2500 M01	MFZ Z2500 M1
MHL 3000	3000	4″	115/1/60	99	57.5	125	6500	MFZ 3500 M01	MFZ Z3500 M1

SPECIFICATIONS	STANDARD	OPTIONAL
Maximum Particle Size (ISO class) (5)	class 2 (1 micron)	class 1 (0.01 micron)
Maximum water Content (ISO class) (5)	class 2 (-40F pdp)	class 1 (-94°F pdp)
Minimum / Design / Maximum Operating Pressure Range <sup>(6)</sup>	70 psig / 100 psig / 150 psig	-
Minimum / Design / Maximum Ambient Temperature	38°F / 100°F / 120°F	-
Minimum / Design / Maximum inlet temperature	38°F / 100°F / 120°F	-
Power Supply Requirements	115V/1Ph/60Hz	230V/1Ph/60Hz &12 VDC
CORRECTION FACTOR (7)		

CORRECTION FACTOR "									
psig	60	70	80	90	100	110	130	140	150
Factor Pressure F1	0.65	0.74	0.83	0.91	1	1.04	1.12	1.16	1.20
CORRECTION FACTOR (7)									
Inlet Temp. (°F)	70	80	90	10	0	105	110	115	120

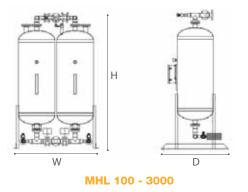
1.06

1.10

(1) In compliance with ADF 100 specifications for compressed air dryers. Inlet temperature: 100°F, ambient temperature: 100°F, inlet pressure dew point: -40°F. For all other conditions refer to the correction factors or contact info@matteicomp.com. (2) 3" and below are NPT(F) threaded. 4" and above are flanged. All united with 3" piping and above will be ANSI welded pipe. (3) Approximate weight for all models does not include desiccant installed. (4) Recommended for all applications and includes NPT pre and after filters mounted on the dryers. For flanged, consult factory (add For higher pressures, contact info@matteicomp.com. (7) To be used as a rough guide only. All applications should be confirmed by Mattei. Contact Mattei for sizing assistance. (8) All models are UL/cUL compliant. (9) All models have ASME coded pressure vessels. For other approvals, consult Mattei. (10) For sizes above 3000 scfm and pressure below 60 psig, please consult Mattei. (11) Technical specifications subject to change without notice. Direct inquiries to info@ matteicomp.com.

Factor Inlet F2

1.12



0.86

0.80

0.75

0.93

1

## MEH DRYERS

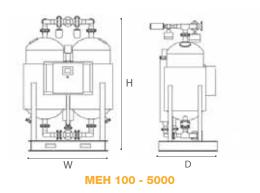
### Externally heated desiccant air dryers

			-0=							
MODEL	CAPACITY <sup>(1)</sup>	CONNECTION SIZE <sup>(2)</sup>	VOLTAGE	HEATER	DIMENSIONS (ins)			APPROX WEIGHT <sup>(3)</sup>	INCLUDES PR FILTRA	
MEH	scfm	NPT(F) / Flg	V/ph/Hz	KW	A - WIDTH	B - LENGTH	C - HEIGHT	lbs	PRE FILTER	AFTER FILTER
MEH 100	100	1″	460/3/60	2	44	42	83	700	MDSF 0135 M01	MDSF 0135 M1
MEH 175	175	1 <sup>1</sup> /2″	460/3/60	3	40	42	83	825	MDSF 0290 M01	MDSF 0290 M1
MEH 250	250	1 1/2″	460/3/60	4.5	44	42	83	900	MDSF 0290 M01	MDSF 0290 M1
MEH 350	350	2″	460/3/60	6	48	42	83	1500	MDSF 0450 M01	MDSF 0450 M1
MEH 500	500	2″	460/3/60	10	49.8	40	85	2400	MDSF 0700 M01	MDSF 0700 M1
MEH 700	700	2″	460/3/60	15	51	49.8	88	2900	MDSF 0700 M01	MDSF 0700 M1
MEH 850	850	3″	460/3/60	18	71	58.3	92	3350	MDSF 1000 M01	MDSF 1000 M1
MEH 1000	1000	3″	460/3/60	18	71	58.3	107	3800	MDSF 1000 M01	MDSF 1000 M1
MEH 1350	1350	3″	460/3/60	25	70.8	53.7	105.5	5000	MDSF 1500 M01	MDSF 1500 M1
MEH 1700	1700	4″	460/3/60	30	83.1	56.7	95.5	5500	MFZ 2500 M01	MFZ 2500 M1
MEH 2100	2100	4″	460/3/60	38	83.1	56.7	106	7200	MFZ 2500 M01	MFZ 2500 M1
MEH 2400	2400	4″	460/3/60	50	83.1	55.7	114	8750	MFZ 2500 M01	MFZ 2500 M1
MEH 3100	3100	6″	460/3/60	60	102.4	68	117.5	11000	MFZ 3500 M01	MFZ 3500 M1
MEH 3800	3800	6″	460/3/60	67	108.4	71	115.5	14200	MFZ 4000 M01	MFZ 4000 M1
MEH 4300	4300	6″	460/3/60	75	108.4	71	122.8	16300	MFZ 5000 M01	MFZ 5000 M1
MEH 5000	5000	6″	460/3/60	100	116	83	119.5	17600	MFZ 5000 M01	MFZ 5000 M1

SPECIFICATIONS			STAND/	\RD		OPTIONAL				
Maximum Particle Size (ISO class) (5)			class 2 (1 m	nicron)		class 1 (0.01 micron)				
Maximum Water Content (ISO class) <sup>(5)</sup>			class 1 (-94°F pdp)							
Minimum / Design / Maximum Operating Pressure Ra	nge (6)	80 psig / 100 psig / 150 psig 58 to 250 psig						0 psig		
Minimum / Design / Maximum Ambient Temperature		38°F / 100°F / 120°F -								
Minimum / Design / Maximum Inlet Temperature		38°F / 100°F / 120°F -								
Power Supply Requirements			/60Hz	575V/60Hz or 380 V						
CORRECTION FACTOR (7)										
psig	60	70	80	90	100	110	130	140	150	
Factor Pressure F1	0.65	0.74	0.83	0.91	1	1.04	1.12	1.16	1.20	
-										

CORRECTION FACTOR "								
Inlet Temp. (°F)	70	80	90	100	105	110	115	120
Factor Inlet F2	1.12	1.10	1.06	1	0.93	0.86	0.80	0.75

(1) In compliance with ADF 100 specifications for compressed air dryers. Inlet temperature: 100°F, ambient temperature: 100°F, inlet pressure dew point: -40°F. For all other conditions refer to the correction factors or contact info@matteicomp.com. (2) 3″ and below are NPT(F) threaded. 4″ and above are flanged. All united with 3″ piping and above will be ANSI welded pipe. (3) Approximate weight for all models does not include desiccant installed. (4) Recommended for all applications and includes NPT pre and after filters mounted on the dryers. For flanged, consult factory (add -F2 suffix). (5) Per ISO 8573.1:2010. (6) Maximum working pressure for all models is 150 psig. For higher pressures, contact info@matteicomp.com. (7) To be used as a rough guide only. All applications should be confirmed by Mattei. Contact Mattei for sizing assistance. (8) All models are UL/cUL compliant. (9) All models have ASME coded pressure below 60 psig, please consult Mattei. (11) Technical specifications subject to change without notice. Direct inquiries to info@ matteicomp.com.



## **MBP DRYERS**

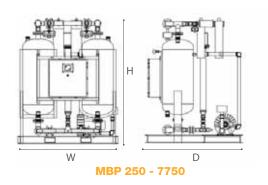
#### Blower purge desiccant air dryers

MODEL		CONNECTION SIZE <sup>(2)</sup>	<b>-CE</b> Voltage	HEATER	BLOWER	DIMENSIONS (ins)			APPROX WEIGHT <sup>(3)</sup>	INCLUDES PR FILTRA	
MBP	scfm	NPT(F) / Flg	V/ph/Hz	KW	hp	A - WIDTH	B - LENGTH	C - HEIGHT	lbs	PRE FILTER	AFTER FILTER
MBP 250	250	1 <sup>1</sup> /2″	460/3/60	4.5	1.5	44	56	83	1200	MDSF 0290 M01	MDSF 0290 M1
MBP 350	350	2″	460/3/60	6	3	44	56	83	1850	MDSF 0450 M01	MDSF 0450 M1
MBP 500	500	2″	460/3/60	10	2.75	50	60	85	2750	MDSF 0700 M01	MDSF 0700 M1
MBP 700	700	2″	460/3/60	15	3.42	51	62	88	3650	MDSF 0700 M01	MDSF 0700 M1
MBP 850	850	3″	460/3/60	18	4.6	71	67	92	4200	MDSF 1000 M01	MDSF 0850 M1
MBP 1000	1000	3″	460/3/60	18	6.16	71	70	107	4800	MDSF 1000 M01	MDSF 1000 M1
MBP 1350	1350	3″	460/3/60	25	10	70.8	70	105.5	6300	MDSF 1500 M01	MDSF 1500 M1
MBP 1700	1700	4″	460/3/60	30	15	83.1	89	95.5	7000	MFZ 2500 M01	MFZ 2500 M1
MBP 2100	2100	4″	460/3/60	38	15	83.1	93	106	9000	MFZ 2500 M01	MFZ 2500 M1
MBP 2400	2400	4″	460/3/60	50	15	83.1	95	114	11000	MFZ 2500 M01	MFZ 2500 M1
MBP 3100	3100	6″	460/3/60	60	15	102.4	95	117.5	13700	MFZ 3500 M01	MFZ 3500 M1
MBP 3800	3800	6″	460/3/60	67	15	108.4	95	115.5	17800	MFZ 4000 M01	MFZ 4000 M1
MBP 4300	4300	6″	460/3/60	75	15	116	100	120	20500	MFZ 5000 M01	MFZ 5000 M1
MBP 5000	5000	6″	460/3/60	100	15	116	100	121.5	22300	MFZ 5000 M01	MFZ 5000 M1
MBP 6250	6250	8″	460/3/60	125	30	122	107	129.8	25500	MFZ 7500 M01	MFZ 7500 M1
MBP 7750	7750	CF	460/3/60	CF	CF	CF	CF	CF	CF	MFZ 8500 M01	MFZ 8500 M1
SPECIFICATIO	NS				ST	ANDARD				OPTIONAL	

SPECIFICATIONS			STANDA	RD		OPTIONAL						
Maximum Particle Size (ISO class) <sup>(5)</sup>			class 2 (1 m	icron)		class 1 (0.01 micron)						
Maximum Water Content (ISO class) (5)			class 2 (-40°	'F pdp)		-						
Minimum / Design / Maximum Operating Pressure Range (6) 80 psig / 100 psig / 150 psig -												
Minimum / Design / Maximum Ambient Temperature	/ Design / Maximum Ambient Temperature 38°F / 100°F / 1							-				
Minimum / Design / Maximum Inlet Temperature			38°F / 100°F	/ 120°F		•						
Power Supply Requirements			460V/3Ph/	60Hz		575V/60z & 380 VAC/50Hz						
CORRECTION FACTOR <sup>(7)</sup>												
psig	60	70	80	90	100	110 130 140 150						
Factor Pressure F1	0.65	0.74	0.83	0.91	1	1.04	1.12	1.16	1.20			

CORRECTION FACTOR (7)								
Inlet Temp. (°F)	70	80	90	100	105	110	115	120
Factor Inlet F2	1.12	1.10	1.06	1	0.93	0.86	0.80	0.75

(1) In compliance with ADF 100 specifications for compressed air dryers. Inlet temperature: 100°F, ambient temperature: 100F, inlet pressure dew point: -40°F. For all other conditions refer to the correction factors or contact info@matteicomp.com. (2) 3" and below are NPT(F) threaded. 4" and above are flanged. All united with 3" piping and above will be ANSI welded pipe. (3) Approximate weight for all models does not include desiccant installed. (4) Includes NPT pre and after filters mounted on the dryers. Flanged filters..... (5) Per ISO 8573.1:2010. (6) Maximum working pressure for all models is 150 psig. For higher pressures, contact info@matteicomp.com. (7) To be used as a rough guide only. All applications should be confirmed by Mattei. Contact Mattei for sizing assistance. (8) All models are UL/cUL compliant. (9) All models have ASME coded pressure vessels. For other approvals, consult Mattei. (10) For sizes above 7750 scfm and pressure below 60 psig, please consult Mattei. (11) Technical specifications subject to change without notice. Direct inquiries to info@matteicomp.com.



# ISO

### Compressed air quality standards

The ISO 8573 group of international standards is used for the classification of compressed air purity. The standard provides the test methods and analytical techniques for each type of contaminant. ISO 12500-1:2007 specifies the test layout and test procedures required for testing coalescing filters used in compressed air systems to determine their effectiveness in removing oil aerosols. Our filter element performance has been tested to international ISO 12500 to provide filtered compressed air to ISO 8573-1. The table below summarizes the maximum contaminant levels specified in ISO 8573.1: 2010 for the various compressed air quality classes. Each compressed air classification can be achieved by installing a specific selection of Mattei products depending upon the required performance.

ISO PURITY CLASS		SOLID PA	ARTICLES	WATER		OIL	
	MAXIMUM	NO. OF PARTICL	ES PER m <sup>3</sup>	CONCENTRATION	VAPOR	LIQUID	TOTAL OIL <sup>(1)</sup>
	0.1 - 0.5 MICRON	0.5 - 1 MICRON	1 - 5 MICRON	mg/m³	PRESSURE DEW POINT	g/m³	mg/m³
0	as specified by the equipment user or supplier						
1	≤ 20,000	≤ 400	≤ 10	-	≤ -94°F	-	≤ 0.01
2	≤ 400,000	≤ 6,000	≤ 100	-	$\leq$ -40°F	-	≤ 0.1
3	-	≤ 90,000	≤ 1,000	-	≤ -4°F	-	≤ 1
4	-	-	≤ 10,000	-	≤ 37°F	-	≤ 5
5	-	-	≤ 100,000	-	≤ 45°F	-	-
6	-	-	-	≤ 5	≤ 50°F	-	-
7	-	-	-	5 - 10	-	≤ 0.5	-
8	-	-	-	-	-	0.5 - 5	-
9	-	-	-	-	-	5 - 10	-

## SPECIFICATIONS

(1) all forms of oil including liquids, aerosols and vapor

## **PRODUCT SELECTION**

ISO PURITY CLASS	SOLID PARTICLES	WA	OIL	
0				
1	WS + M1 + M01	desiccant dryer	≤ -94°F	AC
2	WS + M1	desiccant dryer	≤ -40°F	M01
3	WS + M1	desiccant dryer	≤ -4°F	-
4	WS + M1	refrigerated dryer	≤ 37°F	-
5	WS + M1	refrigerated dryer	≤ 45°F	-
6	WS + M5	refrigerated dryer	≤ 50°F	-
7	WS + M25	n,	/a	-
8	WS	n,	/a	-
9	WS	n,	/a	-



Mattei Compressors, Inc. 9635 Liberty Road, Suite E Randallstown, MD 21133 USA Sales: (410) 521-7020 www.matteicomp.com E-mail: info@matteicomp.com

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