



# Air Quality in Your Hands

Manufacturer of Filtration System



## The Company

Welcome to M-Plus Filtration, With 15 year of experience in air filtration products and solutions; We become a leader in the development and production of clean air solutions. We are also one of the most global air filtration specialists in the world with quality filtration systems standards product ranges.

Our plant and headquarter in Thailand. We provide customers with sustainable best in class air filtration products. We delivery value to customers all over the world while contributing to something ssential to everyone clean air for health, well-being and performace.

Our innovative filtration technology improves the performance of equipment around the world. With us, you gets a wide choice of media that you can choose what the best suits your particular environment. You won't always see our filters, But you can breathe easier knowing they're everywhere.



## ISO9001:2015

M-PLUS Filtration is accredited to ISO9001:2015. This certification is based on the plan-do-check-act methodology and provides a process-oriented approach to documenting and reviewing the structure, responsibilities, and procedures required to achieve effective quality management in an organization. Specific sections of the standard contain information on topics such as:

- Requirements for a quality management system, including documented information, planning and determining process interactions
- Responsibilities of management
- Management of resources, including human resources and an organization's work environment
- Product realization, including the steps from design to delivery
- Measurement, analysis, and improvement of the QMS through activities like internal audits and corrective and preventive action



Certificate Number QMS10027/1323  
Since 15 Jan 2010



M-Plus Filtration's filter housings and elements performance has been tested to international standard ISO12500 series by IBR laboratory in U.S.A.

## ISO12500 series

M-PLUS Filtration's filter housings and elements has been tested the performance according international standard ISO12500 series, This standard is a new series of compressed air filter quality.

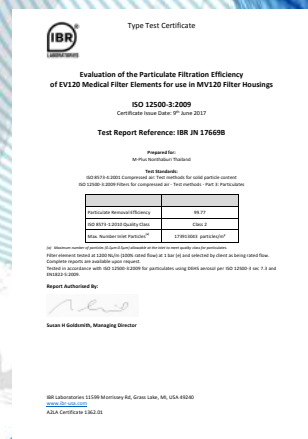
- ISO 12500-1 Oil Aerosols
- ISO 12500-2 Oil Vapours
- ISO 12500-3 Particles
- ISO 12500-4 Water



Validated to ISO 12500-1:2007  
Filters for Compressed Air  
Test Methods - Part 1 : Oil Aerosols

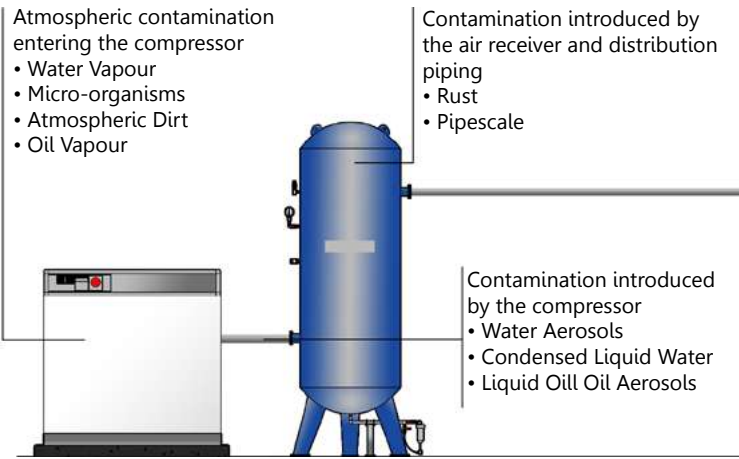
## ISO8573 Part 1

M-PLUS Filtration's the group of international standards relating to the quality of compressed air and consists of nine separate parts. Part 1 specifies the quality requirement of the compressed air and Part 2-9 specify the methods of testing for a range of contaminants. In 2010, the ISO 8573-1 air quality standard was amended in an effort to provide a more stringent air quality specifications for critical applications and the latest revision is expressed as ISO8573-1:2010. Within ISO8573-1:2010, a number of quality classes are shown in tabular form, each specifying the maximum amount of solid particulate, water and oil allowable per cubic metre of compressed air. This document provides an introduction to ISO8573-1 the international standard for compressed air quality, purification equipment required to achieve the standards and how to apply the standard to typical applications.



Validated to ISO 12500-3:2009  
Filters for Compressed Air  
Test Methods - Part 3 : Particulates

## Contaminants and sources in a compressed air system



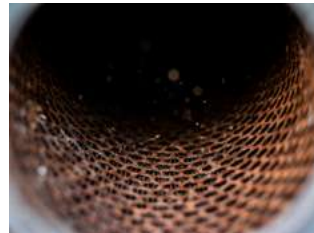
## Total contamination entering the compressed air distribution system



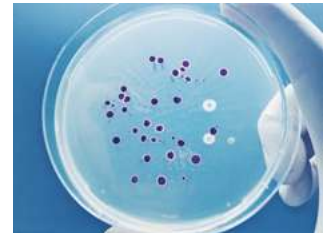
- Water vapour
- Condensed water
- Water aerosols



- Liquid oil
- Oil aerosols
- Oil vapour



- Atmospheric dirt
- Rust
- Pipescale



- Micro-organisms

## Compressed Air Quality

Compressed air leaving an air compressor is not normally of a quality suitable for the intended use. This is due to several factors:

- Atmospheric air, especially in an industrial environment, contains particulate matter, moisture and hydrocarbons.
- The inlet filter on an air compressor is a particulate filter, designed to protect the compressor rather than downstream equipment.
- The air compressor itself will contribute contaminants in the form of wear particles and compressor oil carry-over.
- The discharge temperature from the compressor may be too high for distribution and use.
- Cooling after compression results in condensation of moisture vapor and saturated air leaving the aftercooler. Moisture has a harmful effect on pneumatic tools, air operated equipment and processes.



### Moisture Related Compressed Air Problems following is a summary of some of the problems that can be caused by moisture in compressed air:

1. Washing away required oils.
2. Rust and scale formation within pipelines and vessels.
3. Increased wear and maintenance of pneumatic devices.
4. Sluggish and inconsistent operation of air valves and cylinders.
5. Malfunction and high maintenance of control instruments and air logic devices.
6. Product spoilage in paint and other types of spraying.
7. Rusting of parts after sandblasting.
8. Freezing in exposed pipelines during cold weather.
9. Further condensation and possible freezing of moisture in mufflers whenever air devices are rapidly exhausted in applications like rock drilling and mining



### Applications Requiring Clean, Dry Air

Most compressed air applications require some air treatment. Following are some examples of the negative impact of moisture in a compressed air system and the reasons that applications require clean, dry air.

## Compressed Air Quality Classes According to ISO8573-1:2001 (E)

ISO8573-1:2001(E) details the following classifications for specifying the purity of compressed air.

Example: Compressed air to air purity class 1.2.1 (Particle removal to 0.01 micron, Water to -40 °C PDP and Oil to 0.01 mg/m<sup>3</sup>)

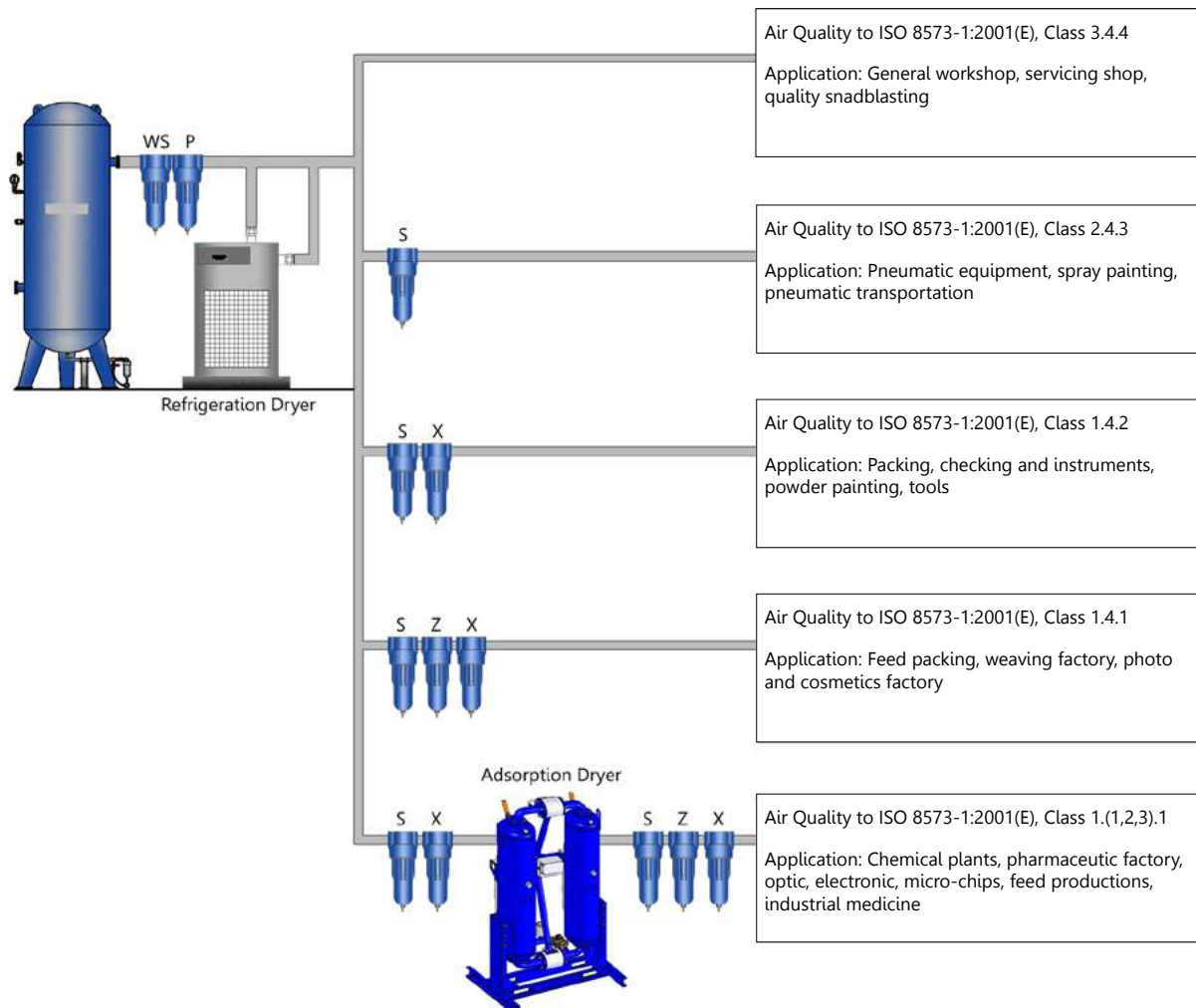
CLASS	SOLID PARTICLES Maximum number of particles per m <sup>3</sup>			HUMIDITY & LIQUID WATER pressure dewpoint	OIL (including aerosol, liquid & vapour)
	0.1 - 0.5 micron	0.5 - 1.0 micron	1.0 - 5.0 micron	°C	mg/m <sup>3</sup>
1	100	1	0	-70	0.01
2	100,000	1,000	10	-40	0.1
3	-	10,000	500	-20	1
4	-	-	1,000	+3	5
5	-	-	20,000	+7	-
6	-	-	-	+10	-

## Why is compressed air treatment important?

### Compressed Air Treatment (Dryers and Filters)

To ensure the expected performance and reliability of a compressed air system, the selection of all components within a compressed air system must be considered carefully. The increased use of compressed air and the development of many

new and more sophisticated devices and controls have accelerated the need for clean, dry air. This chapter will provide information on the importance of clean, dry air and the various air treatment technologies that are available to obtain it.



For medicinal and chemical applications is better if compressed air tank is protected by internal anticorrosive paint.

Note: These are only general rules. User of the equipment must comply with all local and national pressure equipment legislation in the country of installation.



## Replacement for "Atlas Copco"

M-PLUS Model	Replaces	Conn. Ø	Flow-rate (m <sup>3</sup> /min)
MAC009*	9	3/8"	0.54
MAC017*	17	1/2"	0.90
MAC032*	32	1/2"	1.92
MAC044*	44	3/4" or 1"	2.64
MAC060*	60	1"	3.60
MAC120*	120	1.1/2"	7.20
MAC150*	150	1.1/2"	9.00
MAC175*	175	1.1/2"	10.50
MAC280*	280	2 or 2.1/2"	16.80
MAC390*	390	3"	23.40
MAC520*	520	3"	31.20
MAC780*	780	FLANGE	46.80

M-PLUS Grade	Atlas Copco Grade	Particles removal	Oil carryover at 20°C
S	DDp/DD	1 micron	0.1 mg/m <sup>3</sup>
X	PDp/PD	0.01 micron	0.01 mg/m <sup>3</sup>
Z	QD	-	0.003 mg/m <sup>3</sup>



## Replacement for "Domnick Hunter (Advantage)"



M-PLUS Model	Replaces	Conn. Ø	Flow-rate (m <sup>3</sup> /min)
MD009*	K009	1/4" or 3/8"	0.50
MD017*	K017	3/8" or 1/2"	1.00
MD030*	K030	1/2" or 3/4"	1.80
MD058*	K058	3/4"	3.60
MD145*	K145	1" or 1.1/2"	4.80 - 8.70
MD220*	K220	1.1/2" or 2"	12.0 - 13.0
MD330*	K330	2"	20.0
MD430*	K430	2.1/2" or 3"	24.0 - 26.0
MD620*	K620	3"	37.0

M-PLUS Grade	Domnick Hunter Grade	Particles removal	Oil carryover at 20°C
Q	PF	25 micron	-
S	AO / AR	1 micron	0.6 mg/m <sup>3</sup>
X	AA / AAR	0.01 micron	0.01 mg/m <sup>3</sup>
Z	AC / ACS	-	0.003 mg/m <sup>3</sup>



## Replacement for "FRIULAIR"

M-PLUS Model	Replaces	Conn. Ø	Flow-rate (m <sup>3</sup> /min)
T*008	9	3/8"	0.54
T*012	17	1/2"	0.90
T*018	32	3/4"	1.92
T*030	44	1"	2.64
T*055	60	1.1/2"	3.60
T*080	120	1.1/2"	7.20
T*120	150	1.1/2"	9.00
T*160	175	2"	10.50
T*250	280	2.1/2"	16.80
T*400	390	3"	23.40
F*220	520	FLANGE	31.20

M-PLUS Grade	FRIULAIR Grade	Particles removal	Oil carryover at 20°C
P	P	3 micron	-
S	S	1 micron	0.1 mg/m <sup>3</sup>
X	X	0.01 micron	0.01 mg/m <sup>3</sup>
Z	Z	-	0.003 mg/m <sup>3</sup>



Alternative elements

## Replacement for "HIROSS"



M-PLUS Model	Replaces	Conn. Ø	Flow-rate (m <sup>3</sup> /min)
MH004*	004	3/8"	0.4
MH007*	007	3/4"	0.7
MH015*	015	3/4"	1.5
MH024*	024	1"	2.4
MH035*	035	1.1/2"	3.5
MH060*	060	1.1/2"	6.0
MH090*	090	2"	9.0
MH120*	120	2"	12.0
MH150*	150	2"	15.0
MH240	240	DN65	24.0

M-PLUS Grade	HIROSS Grade	Particles removal	Oil carryover at 20°C
P	Q/D	3 micron	
S	P	1 micron	0.1 mg/m <sup>3</sup>
X	S	0.01 micron	0.01 mg/m <sup>3</sup>
Z	C	-	0.003 mg/m <sup>3</sup>



## Replacement for "HANKISON (HF series)"

M-PLUS Model	Replaces	Conn. Ø	Flow-rate (m <sup>3</sup> /min)
MHK*-12	12	3/8"	0.58
MHK*-16	16	1/2"	1.0
MHK*-20	20	1/2"	1.75
MHK*-24	24	3/4"	2.83
MHK*-28	28	1"	4.83
MHK*-32	32	1.1/2"	7.08
MHK*-36	36	1.1/2"	10.66
MHK*-40	40	2"	13.75
MHK*-44	44	2.1/2"	17.66
MHK*-48	48	2.1/2"	22.08
MHK*-54	54	DN80	28.33
MHK*-PV	PV	DN100+	18.50

M-PLUS Grade	HANKISON Grade	Particles removal	Oil carryover at 20°C
PP	E11	10 micron	-
P	E9	3 micron	5 mg/m <sup>3</sup>
S	E7 / E6	1 micron	0.1 mg/m <sup>3</sup>
X	E5 / E3	0.01 micron	0.01 mg/m <sup>3</sup>
Z	E1	-	0.003 mg/m <sup>3</sup>



## Replacement for "SWAN / bea"



M-PLUS Model	Replaces	Conn. Ø	Flow-rate (m <sup>3</sup> /min)
MARS30*	*30	1/4"	0.5
MARS100*	*100	1/2"	1.8
MARS180*	*180	3/4"	3.1
MARS290*	*290	1"	5.0
MARS460*	*460	1.1/2"	11.7
MARS610*	*610	2"	16.7
MARS930*	*930	2.1/2"	20.0
MARS1050*	*1050	3"	25.0
MARS1400*	*1400	3"	37.0

M-PLUS Grade	SWAN / bea Grade	Particles removal	Oil carryover at 20°C
Q	ARM	10 micron	-
S	ARF	1 micron	0.1 mg/m <sup>3</sup>
A	ARB	0.1 micron	0.1 mg/m <sup>3</sup>
X	ARA	0.01 micron	0.01 mg/m <sup>3</sup>
Z	ACA	-	0.003 mg/m <sup>3</sup>





## Replacement for "SMC"



M-PLUS Model	Replaces		Conn. Ø	Flow-rate (m <sup>3</sup> /min)
MEL*-150	*-EL150	AFF-EL2B	3/8"	0.2 - 0.3
MEL*-250	*-EL250	AFF-EL4B	1/2"	0.5 - 0.8
MEL*-350	*-EL350	AFF-EL8B	3/4"	1.0 - 1.5
MEL*-450	*-EL450	AFF-EL11B	1"	2.0 - 2.2
MEL*-550	*-EL550	AFF-EL22B	1"	3.5
MEL*-650	*-EL650	AFF-EL37B	1.1/2"	6.0
MEL*-850	*-EL850	AFF-EL75B	2"	12.0

M-PLUS Grade	SMC Grade	Particles removal	Oil carryover at 20°C
Q	AMG	25 micron	-
P	AFF	3 micron	-
S	AMD / AM	1 micron	0.1 mg/m <sup>3</sup>
X	AME / AMH	0.01 micron	0.01 mg/m <sup>3</sup>
Z	AMF	-	0.003 mg/m <sup>3</sup>



## Replacement for "Donaldson Ultrafilter"

M-PLUS Model	Replaces	Conn. Ø	Flow-rate (m <sup>3</sup> /min)
MU*02/05	*02/05	1/4"	0.3
MU*03/05	*03/05	3/8"	0.7
MU*03/10	*03/10	3/8"	1.0
MU*04/10	*04/10	1/2"	1.5
MU*04/20	*04/20	1/2"	2.0
MU*05/20	*05/20	3/4"	3.0
MU*05/25	*05/25	1"	4.5
MU*07/25	*07/25	1.1/4"	6.0
MU*07/30	*07/30	1.1/2"	8.0
MU*10/30	*10/30	2"	12.0
MU*15/30	*15/30	2"	18.0
MU*20/30	*20/30	2.1/2"	24.0
MU*30/30	*30/30	3"	32.0
MU*30/50	*30/50	3"	48.0

M-PLUS Grade	Donaldson Grade	Particles removal	Oil carryover at 20°C
Q	PE	25 micron	-
P	SB	5 micron	-
S	FF	0.01 micron	0.1 mg/m <sup>3</sup>
A	MF	0.01 micron	0.03 mg/m <sup>3</sup>
X	SMF	0.01 micron	0.01 mg/m <sup>3</sup>
Z	AK	-	0.003 mg/m <sup>3</sup>



## Replacement for "ORION"

M-PLUS Model	Replaces	Conn. Ø	Flow-rate (m <sup>3</sup> /min)
MO*400	*400	1"	3.7
MO*700	*700	1.1/2"	6.2
MO*1000	*1000	1.1/2"	10.0
MO*1500	*1500	2" or 2.1/2"	13.0 - 24.4

M-PLUS Grade	ORION Grade	Particles removal	Oil carryover at 20°C
S	EL	1 micron	0.1 mg/m <sup>3</sup>
X	EM	0.01 micron	0.01 mg/m <sup>3</sup>
Z	EK	-	0.003 mg/m <sup>3</sup>





## Replacement for "ORION (Super filter)"

M-PLUS Model	Replaces	Conn. Ø	Flow-rate (m <sup>3</sup> /min)
MOR*75C	*75	3/8"	0.35
MOR*150C	*150	1/2"	1.2
MOR*200C	*200	3/4"	1.8
MOR*400C	*400	1"	3.9
MOR*700C	*700	1.1/2"	6.6
MOR*1000C	*1000	1.1/2"	10.6
MOR*1300C	*1300	2"	13.8
MOR*2000C	*2000	2"	20.0

M-PLUS Grade	ORION Grade	Particles removal	Oil carryover at 20°C
P	EDS	5 micron	-
S	ELS	1 micron	0.1 mg/m <sup>3</sup>
X	EMS	0.01 micron	0.01 mg/m <sup>3</sup>
Z	EKS	-	0.003 mg/m <sup>3</sup>



Alternative elements

## Replacement for "ZANDER"



M-PLUS Model	Replaces	Conn. Ø	Flow-rate (m <sup>3</sup> /min)
MZ1030*	MZ1030*	1/4"	0.5
MZ1050*	MZ1050*	1/4"	0.8
MZ1070*	MZ1070*	3/8"	1.2
MZ1140*	MZ1140*	1/2"	1.7
MZ2010*	MZ2010*	3/4"	3.0
MZ2020*	MZ2020*	1"	5.0
MZ2030*	MZ2030*	1.1/2"	7.8
MZ2050*	MZ2050*	1.1/2"	11.7
MZ3050*	MZ3050*	2"	15.7
MZ3075*	MZ3075*	2"	24.2
MZ5060*	MZ5060*	2.1/2"	32.3
MZ5075*	MZ5075*	3"	40.0

M-PLUS Grade	ZANDER Grade	Particles removal	Oil carryover at 20°C
P	V	3 micron	-
S	ZP	1 micron	0.1 mg/m <sup>3</sup>
X	XP	0.01 micron	0.01 mg/m <sup>3</sup>
V	XP4	0.01 micron	0.001 mg/m <sup>3</sup>
Z	A	-	0.003 mg/m <sup>3</sup>



## Oil Separators for Vacuum pumps

M-Plus Filtration is a leading manufacturer of filter element and vacuum pump separator technology supplying one of the most comprehensive ranges on the market today. Our products are designed to offer the best performance in a range of applications including industrial, laboratory and medical.

We believe in continual development of the highest quality filtration products, capable of the very highest performance. With our in-house experience and expertise, we continually research and develop new technologies to improve filtration techniques and media advances in order to enhance product performance. This ensures that the M-Plus Filtration product is the best available.

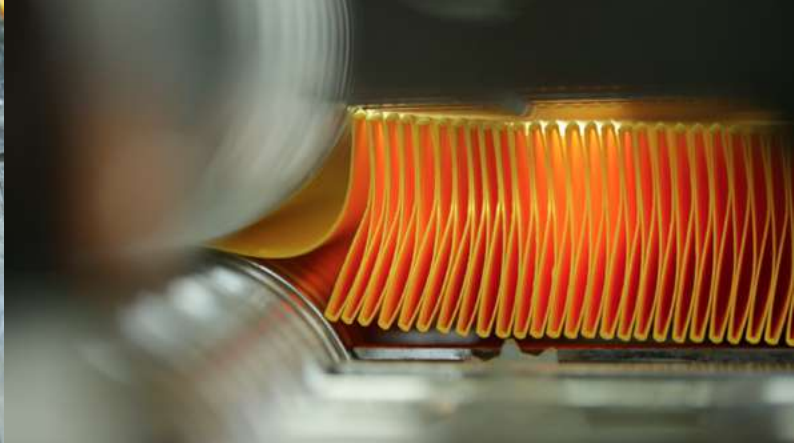
In a recent development M-Plus Filtration has improved its vacuum products further by enhancing the media used on their full range of alternative air/oil separators. This has been achieved by the joint development of a proprietary new borosilicate glass fibre media which will be used in conjunction with a new coalescing outer sleeve material. The contents of the exhaust is approx 1 to 3mg/m<sup>3</sup> depends on oil values and other factors, the service life at nominal operation is 1,500 to 2,000 operating hours.

Our related oil separator filters for vacuum pumps:-

- Becker
- Busch
- Leybold
- Mils
- PVR Rotant
- Rietschle

We also can manufacture customised product for you.





## Air and Oil filters

We supply filters for Industrial applications. At present we have over 2000 different oil, air, fuel and hydraulic filters in our range with more being developed on a continuous basis. If you require a specific filter or filters not currently available from us we can manufacture a new filter to meet your requirements.

Our filters are supplied to both OEM and aftermarket customers around the world. With the latest technology, we also supply various types of the new generation ecological oil, air and fuel filters. These new types of metal-free filters are more environment-friendly than the old types of filters that cause waste disposal problems all around the world.

- Oil Filters
- Air Filters
- Fuel Filters
- Suction Filters
- Gas Filters



Air&Oil filters





## Air Pollution Control Filters

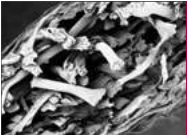

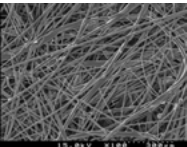




## Industrial dust & fume collections



### Wide variety of filter media and filter material for dust types.

Filter media code	Features & Benefits	Applications	Efficiency
<b>GD62</b> 	Blended cellulose media contains 20% PET fibers with water repellent and flame retardant treatment for a long service life.	<ul style="list-style-type: none"> <li>• General dust collector</li> <li>• Gas turbine intake air filters</li> <li>• Powder coating</li> <li>• Dry dust collector</li> </ul>	Efficiency Class : M6 according to EN779-2012 (>65% @0.4 micron)
<b>GD70</b> 	Blended of high strength synthetic fibers coated with electrospun Nanofibers. This structure results in excellent reverse-pulsing behavior and high mechanical efficiency at the lowest possible pressure drop for a longer life. It also with water repellent and flame retardant treatment respecting F1 request (DIN53438)	<ul style="list-style-type: none"> <li>• Laser/Plasma cutting</li> <li>• Welding</li> <li>• Grinding</li> <li>• Pulsing dust collector</li> </ul>	Efficiency Class : F9 according to EN779-2012 (>95% @0.4 micron)
<b>TR21</b> 	High performance composite media with new technologies combined of fine fibers, long fibers, various binder fibers. Much more filter area with no filtration dead, Low pressure drop for a continuous cycling.  Washable: Yes	<ul style="list-style-type: none"> <li>• Wet dust collector</li> <li>• Gas turbine intake air filters (High humidity)</li> <li>• Powder coating</li> <li>• Blasting filters</li> <li>• Chemical/Mineral</li> <li>• Pool filters</li> </ul>	Efficiency Class : F7 according to EN779-2012 (>85% @0.4 micron)
<b>PF26</b>	Polyester spunbond media. For a high strength and moist condition.  Washable: Yes	<ul style="list-style-type: none"> <li>• Cement/Mineral</li> <li>• Plastic</li> <li>• Chemicals</li> <li>• Powder coating</li> </ul>	Efficiency Class : M6 according to EN779-2012 (>65% @0.4 micron)
<b>PF26F3</b>	Polyester spunbond media with PTFE coated  Washable: Yes	<ul style="list-style-type: none"> <li>• Paper industry</li> <li>• Woodworking</li> <li>• Chemicals</li> </ul>	Efficiency Class : E10 according to EN1822 (95% @0.3 micron)
<b>PF26LF3</b>	Polyester spunbond media with PTFE coated and antistatic  Washable: Yes	<ul style="list-style-type: none"> <li>• Paper industry</li> <li>• Woodworking</li> <li>• Chemicals</li> <li>• Food&amp;Beverage</li> </ul>	Efficiency Class : E10 according to EN1822 (95% @0.3 micron)
<b>PF26F4</b>	Polyester spunbond media with ePTFE membrane coated. For a high filtration efficiency or dust cake release requirement.  Washable: Yes	<ul style="list-style-type: none"> <li>• Chemicals</li> <li>• Food&amp;Beverage</li> </ul>	Efficiency Class : H13 according to EN1822 (99.9% @0.3 micron)



# Medical Vacuum Filters

## | MV series

M-Plus Filtration manufacture a comprehensive range of medical vacuum filters for centralized hospital vacuum plant installations as specified in the UK standard HTM02-01\*.



The M-Plus ranges of medical vacuum filters are designed to protect these installations from liquid, solid and bacterial contamination. Liquids are collected in a transparent drain flask which can be easily removed for sterilization.



- Manual drain valves are fitted to all models.
- Sterilisable glass drain flasks are supplied as standard
  - 100ml for models MV020 to MV120
  - 150ml for models MV185 to MV335
  - 250ml for models MV420 to MV500

### Corrosion Protection



M-PLUS filter housing adopts aluminium alloy die-cast, have tight construction and long time use. The internal and external of housing undergo cleaning, degreasing, anodic oxidation treatment before painting. Increasing anti-corrosion and durability.

\*HTM02-01 is Health Technical Memorandum 02-01 : Medical gas pipeline systems





# Filter elements

## Performance guarantee



We use high efficiency borosilicate glass microfibre media to remove all dirt particles. All elements include stainless steel metalwork and are fitted with an external pre filter layer of 80 p.p.i., open cell reticulated polyester foam. These filters are a proven success and now include such features as differential pressure indicators which are a specific requirement of the HTM02-01 medical gas pipeline specification.

Filter Models MV020-MV500 incorporates the unique M-Plus designed 'push-on' filter element. This reduces maintenance time and allows the filter to be located in the most confined spaces.



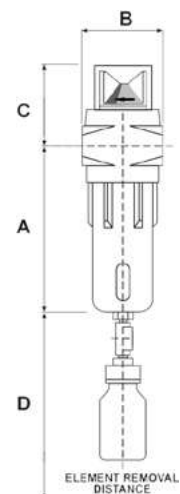
The efficiency of the installed filter elements exceeds the 0.005% penetration specified in HTM02-01 for infectious disease unit, when tested in accordance with BS3928.

## Technical Specifications

Model	IN-OUT	Free Air Capacity at atmospheric			Rarified Air Capacity at 500mm Hg Vacuum			Dimensions (mm)				Weight	Element model
	Ø	Nl/min	Nm <sup>3</sup> /hr	SCFM	Nl/min	Nm <sup>3</sup> /hr	SCFM	A	B	C	D	(Kg)	
<b>MV020</b>	G 1/2"	200	12	7	600	36	21	194	89	60	120	1.1	EV020
<b>MV055</b>	G 3/4"	550	33	19	1,650	99	58	251	120	100	120	2.4	EV055
<b>MV120</b>	G 1"	1,200	72	42	3,600	216	126	351	120	100	120	2.9	EV120
<b>MV185</b>	G 1.1/2"	1,850	111	65	5,550	333	195	351	120	100	150	3.1	EV185
<b>MV275</b>	G 2"	2,750	165	96	8,250	495	288	441	162	109	150	6.6	EV275
<b>MV335</b>	G 2"	3,350	201	118	10,050	603	354	770	162	109	150	10.8	EV335
<b>MV420</b>	G 3"	4,200	252	147	12,600	756	440	509	200	123	200	12.5	EV420
<b>MV500</b>	G 3"	5,000	300	177	15,000	900	531	786	200	123	200	17.5	EV500

### Specifications

Particle removal efficiency	>99.995% @ 0.01 micron HTM 02-01 specifies >99.995% in accordance with BS 3928 Test particle size: 0.02 to 2 micron	
Maximum temperature	80°C (176°F)	
Minimum temperature	1.5°C (34.7°F)	
Pressure loss - clean & dry	≤3 kPa	(30 mbar / 0.44 psi)
Maximum working pressure	7 barg	100 psig
Maximum working vacuum	Full vacuum	
Element end cap	Black	
Flow direction	Outside to inside	
Element changed	At least 6 months	



In factories,  
Compressed air must be

**FREE OF WATER**

## Applications

- Automotive
- Electronics
- Food and beverage
- Chemical
- Petrochemical
- Plastics
- Paint
- General industrial applications

**Bulk water can be found in all compressed air systems. This can be very costly, resulting in corrosion, damage to tools and machinery downtime.**

The best solution to remove the condensation generated during the compression process.

## Water Separator Filter (Cyclone filter) | MWS series

### Features of our product

- Eliminating 99% of bulk water
- Continuously LOW differential pressure
- Cost-saving
- No maintenance, Element is unnecessary
- Stainless steel cyclone blade (screw type)
- Patent product proved by practice
- High grade aluminum-silicon (screw type) and carbon-steel cartridge (flange type)
- Water and corrosion resistance surface covered with epoxy resin



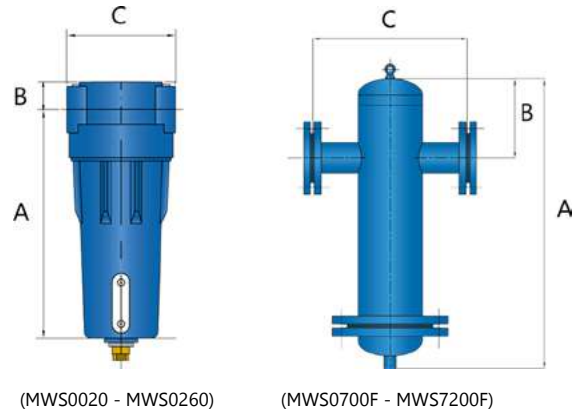
(Screw type)

(Flange type)

# Technical Specifications

## Working conditions:

- Maximum operating temperature 120°C (248°F)
- Minimum operating temperature 2°C (36°F)
- Maximum operating pressure 16 barg (screw type); 10 barg (flange type)



Model	Connection	Flow-Rate			Dimensions (mm)			Weight	STD. Drainage
	Ø	Nl/min	Nm³/hr	SCFM	A	B	C	(Kgs)	(model)
<b>MWS 0020</b>	G 1/2"	1,700	102	60	217	26	104	1.2	Automatic drain (AD402)
<b>MWS 0040</b>	G 1"	3,500	210	124	287	26	104	1.5	
<b>MWS 0070</b>	G 1-1/2"	7,100	426	251	385	39	138	3.0	
<b>MWS 0110</b>	G 1-1/2"	10,600	636	374	585	39	138	3.6	
<b>MWS 0140</b>	G 2"	13,800	828	487	639	46	148	9.5	Electronic timer drain (SCE02)
<b>MWS 0180</b>	G 2"	17,500	1,050	618	779	46	148	11.8	
<b>MWS 0220</b>	G 2-1/2"	22,100	1,326	780	800	50	150	12.0	
<b>MWS 0260</b>	G 2-1/2"	26,000	1,560	918	1,000	50	150	13.6	

<b>MWS 0700F</b>	FLG. 2.5"	42,000	2,520	1,483	713	195	380	30.0	Electronic timer drain (SCE02)
<b>MWS 0800F</b>	FLG. 3"	50,000	3,000	1,766	713	195	380	31.0	
<b>MWS 1000F</b>	FLG. 4"	60,000	3,600	2,119	913	230	449	92.0	
<b>MWS 1300F</b>	FLG. 5"	80,000	4,800	2,825	1,141	263	493	145.0	
<b>MWS 1800F</b>	FLG. 6"	120,000	7,200	4,238	1,210	301	545	160.0	
<b>MWS 3000F</b>	FLG. 8"	180,000	10,800	6,357	1,423	361	750	348.0	
<b>MWS 4800F</b>	FLG. 10"	288,000	17,280	10,171	1,250	410	740	510.0	
<b>MWS 7200F</b>	FLG. 12"	432,000	25,920	15,256	1,269	485	1,000	662.0	

<b>Pressure (psi)</b>	43	71	100	128	156	185	213	228
<b>Pressure (bar)</b>	3	5	7	9	11	13	15	16
<b>Correction factor</b>	0.65	0.85	1.00	1.13	1.25	1.36	1.46	1.51



# Compressed Air Filters | MP series

A comprehensive range of thread filters with 8 models offering connections from 1/2" to 2.1/2" or requirement and capacities up to 26 Nm<sup>3</sup>/min (918 CFM).

## Features of our product

- Extended current route to decrease pressure drop
- High grade aluminum-silicon cartridge
- Water and corrosion resistance surface covered with epoxy resin
- Combined inlet and outlet with screw threads for easy installation
- Various compact designs to fit different pipe sizes
- Reliable automatic drainage
- 6 filtration grades (40 - 0.01 micron) or specific filter elements\*  
\*on customer request



Do surface treatment OK    No surface treatment NG

Furthermore, we adopted an advance technology of surface treatment used in the production process of our filter housing, both internal and external components, which can assure extended usage period.

## Accessories



- Internal float drain (MI01) is fitted to models MP0020 - MP0110 as standard.



- External float drain (HAD20B) is fitted to models MP0140 - MP0260 as standard.





## Filter elements

### Performance guarantee

All M-PLUS compressed air filters carry a guarantee for one year under normal recommended use. The filter elements should be changed at least 12 months (6 months for activated carbon filter).



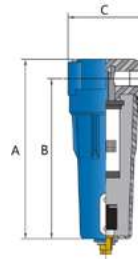
- **More filter media, more efficiency...**  
M-PLUS's filter elements increased performance to aerosol removal efficiency with deep bed filter media that improved filter area for high oil removal efficiency on lifetime.
- **Perforated stainless steel cylinders and extreme bonding,** provide corrosion resistance and elements strength.
- **Outer drainage layer,** high tensile strength and withstands temperatures up to 120°C

Filter Grade	R	Q	P	S	X	Z	
Particle removal	40 micron	25 micron	5 micron	1 micron	0.01 micron	-	
Maximum particle size class to ISO8573-1:2010	-	-	4	3	1	-	
Maximum oil content	-	-	4	3	1	1	
Maximum oil carry over at 20°C	-	10 mg/m <sup>3</sup>	5 mg/m <sup>3</sup>	0.1 mg/m <sup>3</sup>	0.01 mg/m <sup>3</sup>	0.003 mg/m <sup>3</sup>	
Pressure loss: clean and dry	-	30 mbar (0.4 psi)	40 mbar (0.6 psi)	75 mbar (1.1 psi)	100 mbar (1.5 psi)	75 mbar (1.1 psi)	
Pressure loss: saturated	55 mbar (0.8psi)	50 mbar (0.7 psi)	75 mbar (1.1 psi)	150 mbar (2.2 psi)	300 mbar (4.4 psi)	-	
Element changed	8000 hours / 12 months (Washable)	8000 hours / 12 months				1000 hours / 6 months	
Flow direction	Outside to In		Inside to Out				

## Technical Specifications

### Working conditions:

- Maximum operating temperature 120°C (248°F)
- Minimum operating temperature 2°C (36°F)
- Maximum operating pressure 228 psig (16 barg)



Model	Connection	Flow-Rate			Dimensions (mm)			Weight	Element Model
	Ø	Nl/min	Nm <sup>3</sup> /hr	SCFM	A	B	C	(Kgs)	
<b>MP0020*</b>	G 1/2"	1,700	102	60	243	217	104	1.2	P0020*
<b>MP0040*</b>	G 1"	3,500	210	124	313	287	104	1.5	P0040*
<b>MP0070*</b>	G 1.1/2"	7,100	426	251	385	424	138	3.0	P0070*
<b>MP0110*</b>	G 1.1/2"	10,600	636	374	585	624	138	3.6	P0110*
<b>MP0140*</b>	G 2"	13,800	828	487	685	639	148	9.5	P0140*
<b>MP0180*</b>	G 2"	17,500	1,050	618	825	779	148	11.8	P0180*
<b>MP0220*</b>	G 2.1/2"	22,100	1,326	780	850	800	150	12.0	P0220*
<b>MP0260*</b>	G 2.1/2"	26,000	1,560	918	1,000	950	150	13.6	P0260*

<b>Pressure (psi)</b>	29	43	57	71	85	100	114	128	142	156	171	185	199	213	228
<b>Pressure (bar)</b>	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
<b>Correction factor</b>	0.36	0.50	0.63	0.75	0.88	1.00	1.13	1.25	1.38	1.50	1.63	1.75	1.88	2.00	2.13

### Technical notes

- 1) Internal float drain (MI01) is fitted on models MP0020 - MP0110 as standard.
- 2) External float drain (HAD20B) is fitted on models MP0140 - MP0260 as standard.
- 3) Activated carbon must not operate in oil saturated conditions and will not remove certain types of gases including carbon monoxide (CO) and carbon dioxide (CO<sub>2</sub>).



# Compressed Air Flange Filters | MT series

A comprehensive range of flange filters with 5 models offering connections from 3" to 6" or requirement and capacities up to 200 Nm<sup>3</sup>/min (7,063 CFM).

## Features of our product

- Easy to change element from top flange
- High grade carbon-steel cartridge or Stainless steel\*
- Water and corrosion resistant surface covered with epoxy resin (Inside & Outside)
- 6 filtration grades (40 - 0.01 micron) or specific filter elements\*
- Level indicator to monitor the critical level of downstream pollution prevention
- Reliable automatic drainage (Floating drain as standard or electronic timer drain as optional)
- Can provide as customer required



**10** ★★★★★  
**YEARS**  
WARRANTY

## MT housings, Guaranteed for 10-years life

The internal and external of housing undergo cleaning, degreasing, anodize oxidation treatment before painting. Increasing anti-corrosion and durability.

\*on customer request

For the filter housing under normal recommended use. The high quality traceable pressurised components ensure peace of mind and trouble free use.

# Filter elements

## Performance guarantee

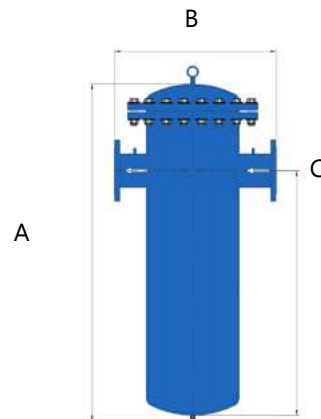
All M-PLUS Superfine compressed air filters carry a guarantee for one year under normal recommended use. The filter elements should be changed every year (8,000 hours) or earlier if the indicator/gauge changes to red. Activated carbon filter elements (grade Z) should be changed every 6 months or 1000 hours (whichever comes first).

Filter Grade	R	Q	P	S	X	Z
Particle removal	40 micron	25 micron	5 micron	1 micron	0.01 micron	-
Maximum particle size class to ISO8573-1:2010	-	-	4	3	1	-
Maximum oil content	-	-	4	3	1	1
Maximum oil carry over at 20°C	-	10 mg/m <sup>3</sup>	5 mg/m <sup>3</sup>	0.1 mg/m <sup>3</sup>	0.01 mg/m <sup>3</sup>	0.003 mg/m <sup>3</sup>
Pressure loss: clean and dry	-	30 mbar (0.4 psi)	40 mbar (0.6 psi)	75 mbar (1.1 psi)	100 mbar (1.5 psi)	75 mbar (1.1 psi)
Pressure loss: saturated	55 mbar (0.8psi)	50 mbar (0.7 psi)	75 mbar (1.1 psi)	150 mbar (2.2 psi)	300 mbar (4.4 psi)	-
Element changed	8000 hours / 12 months (Washable)	8000 hours / 12 months				1000 hours / 6 months
Flow direction	Outside to In	Inside to Out				

## Technical Specifications

### Working conditions:

- Maximum operating temperature 80°C (176°F)
- Minimum operating temperature 2°C (36°F)
- Maximum operating pressure 174 psig (12 barg)



Model	Connection	Flow-Rate			Dimensions (mm)			Weight	Filter Element
	Ø	Nl/min	Nm <sup>3</sup> /hr	SCFM	A	B	C	(Kgs)	(No. x Model)
<b>MT0450F*</b>	FLG. 3"	45,000	2,700	1,589	1118	336	908	86	1 x ET680*
<b>MT0550F*</b>	FLG. 4"	55,000	3,300	1,942	1131	550	935	119	3 x ET680*
<b>MT0950F*</b>	FLG. 5"	95,000	5,700	3,355	1250	600	930	148	5 x ET680*
<b>MT1300F*</b>	FLG. 6"	130,000	7,800	4,591	1380	660	1006	204	6 x ET780*
<b>MT2000F*</b>	FLG. 6"	200,000	12,000	7,063	1400	942	963	317	11 x ET680*

<b>Pressure (psi)</b>	29	43	57	71	85	100	114	128	142	156	171
<b>Pressure (bar)</b>	2	3	4	5	6	7	8	9	10	11	12
<b>Correction factor</b>	0.36	0.50	0.63	0.75	0.88	1.00	1.13	1.25	1.38	1.50	1.63

### Technical notes

- 1) Direction of air flow is inside to out through the filter element.
- 2) Pipe differential pressure gauge (PG02) is an optional.
- 3) External float drain (HAD30B) is standard on all models.
- 4) Activated carbon filter elements must not operate in oil saturated conditions and will not remove certain types of gases including carbon monoxide (CO) and carbon dioxide (CO<sub>2</sub>).



# Compressed Air Filters | MS series

In today's modern production equipments, the use of compressed air is so important to manufacturing processes. Irrespective of whether the compressed air comes into direct contact with the product or is used to automate a process, provide motive power, or even to generate other gases on-site, a clean, dry, Reliable compressed air supply is essential to maintain cost effective production.

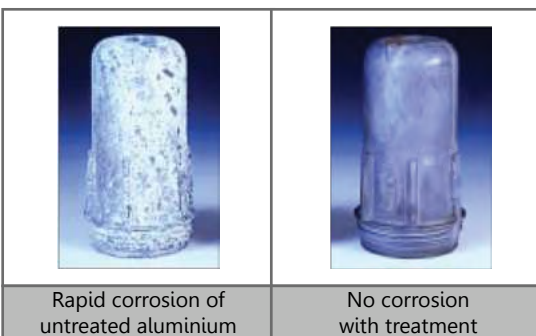
Typically there are different conta-minations from the below sources and even more in critical applications that need to be removed or reduces to acceptable levels. Such as: Atmospheric dirt, Water vapour, Oil vapour and Micro-organisms.

## Die-cast filter housing

M-PLUS filter housing adopts aluminium alloy die-cast, have tight construction and long time use. The internal and external of housing undergo cleaning, degreasing, anodic oxidation treatment before painting. Increasing anti-corrosion and durability.



## The comparison of anti-corrosion treatment



For the filter housing under normal recommended use. The high quality traceable pressurised components ensure peace of mind and trouble free use.



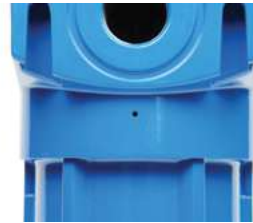
# Accessories benefits



Differential pressure indicator (SPI01) is fitted as standard on filters MS020 (½”).



Differential pressure gauge (SPG01) is fitted as standard on filters MS040 (¾”) and larger.



Pressure relief hole gives an audible warning if any attempt is made to remove filter bowl whilst under pressure.



Maintenance simple and quick.



Automatic drain (SD01) valve is fitted as standard on filters MS020 (½”) to MS070 (1½”).



Automatic float drain (HAD20B) is fitted as standard on filters MS130 (2”) and larger



Manual drain (SD02) valve is fitted as standard on filter MS040 (¾”) and larger for rapid depressurisation and autodrain function check.



Sight glass (SG01) gives a visual check of liquid collection and drain function.

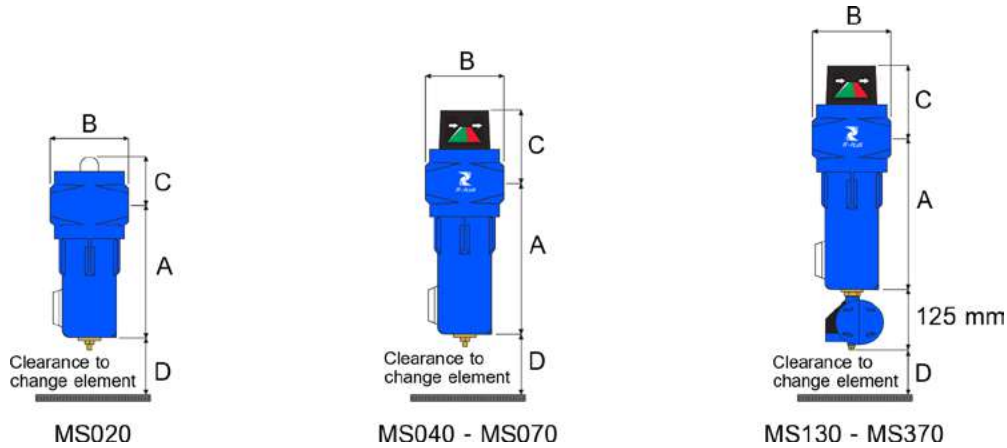
## Filter elements

### Performance guarantee

All M-PLUS Superfine compressed air filters carry a guarantee for one year under normal recommended use. The filter elements should be changed every year (8,000 hours) or earlier if the indicator/gauge changes to red. Activated carbon filter elements (grade Z) should be changed every 6 months or 1000 hours (whichever comes first).

Filter Grade	R	Q	P	S	X	Z
Particle removal	40 micron	25 micron	5 micron	1 micron	0.01 micron	-
Maximum particle size class to ISO8573-1:2010	-	-	4	3	1	-
Maximum oil content	-	-	4	3	1	1
Maximum oil carry over at 20°C	-	10 mg/m <sup>3</sup>	5 mg/m <sup>3</sup>	0.1 mg/m <sup>3</sup>	0.01 mg/m <sup>3</sup>	0.003 mg/m <sup>3</sup>
Pressure loss: clean and dry	-	30 mbar (0.4 psi)	40 mbar (0.6 psi)	75 mbar (1.1 psi)	100 mbar (1.5 psi)	75 mbar (1.1 psi)
Pressure loss: saturated	55 mbar (0.8psi)	50 mbar (0.7 psi)	75 mbar (1.1 psi)	150 mbar (2.2 psi)	300 mbar (4.4 psi)	-
Element changed	8000 hours / 12 months (Washable)	8000 hours / 12 months				1000 hours / 6 months
Flow direction	Outside to In	Inside to Out				
Element end cap colour	Black	Black	Green	Red	Yellow	Black

# Technical Specifications



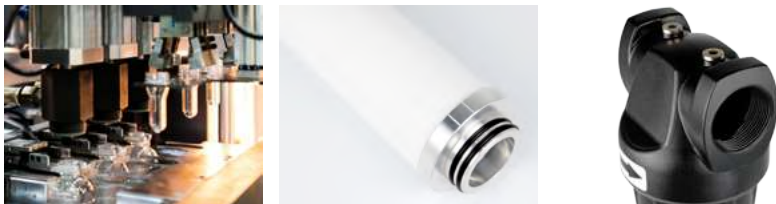
Model	Connection	Flow-Rate			Dimensions (mm)				Weight	Filter Element
	Ø	Nl/min	Nm <sup>3</sup> /hr	SCFM	A	B	C	D	(Kgs)	(No. x Model)
MS020*	G 1/2"	2,000	120	71	194	89	60	130	1.1	1 x SE020*
MS040*	G 3/4"	3,600	216	127	251	120	100	172	2.4	1 x SE040*
MS050*	G 1"	4,800	288	170	351	120	100	272	2.9	1 x SE050*
MS070*	G 1.1/2"	8,700	522	307	351	120	100	272	3.1	1 x SE070*
MS130*	G 2"	13,800	828	487	441	162	109	320	6.6	1 x SE130*
MS200*	G 2"	20,800	1,248	735	770	162	109	625	10.8	1 x SE200*
MS260*	G 3"	27,000	1,620	954	509	200	123	400	12.5	1 x SE260*
MS370*	G 3"	38,000	2,280	1,342	786	200	123	625	17.5	1 x SE370*

Pressure (psi)	29	43	57	71	85	100	114	128	142	156	171
Pressure (bar)	2	3	4	5	6	7	8	9	10	11	12
Correction factor	0.36	0.50	0.63	0.75	0.88	1.00	1.13	1.25	1.38	1.50	1.63

Standard Accessories						
Accessories	Differential Pressure Indicator (SPI01)	Differential Pressure Gauge (SPG01)	Automatic Internal Float Drain (SD01)	Automatic External Float Drain (HAD20B)	Manual Drain (SD02)	Sight Glass (SG01)
Filter model (Conn. size)						
MS020 (G 1/2")	✓		✓			✓
MS040 (G 3/4")		✓	✓		✓	✓
MS050 (G 1")		✓	✓		✓	✓
MS070 (G 1.1/2")		✓	✓		✓	✓
MS130 (G 2")		✓		✓	✓	✓
MS200 (G 2")		✓		✓	✓	✓
MS260 (G 3")		✓		✓	✓	✓
MS370 (G 3")		✓		✓	✓	✓

# High Pressure 40BARG | MHP

The strong mechanical resistance makes this filter the ideal initial protection of a compressed air system to retain impurities and, for example, it is suitable as a post-filter for adsorption dryer.

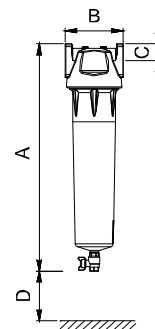


## ELEMENT FILTER GRADES

<b>C</b>	Cyclone type condensate separators. Downstream of an air compressor/Booster/After cooler/Receiver
<b>Q</b>	Filter capable to separate emulsion and particles down to 25 micron.
<b>P</b>	Filter capable to separate emulsion and particles down to 3 micron.
<b>S</b>	Filter capable to separate emulsion and particles down to 1 micron. Maximum contents of residual oil 0.1 mg/m <sup>3</sup> .
<b>X</b>	Oil removing filter capable to separate residual oil and extremely small particles down to 0.01 micron. Maximum contents of residual oil 0.01 mg/m <sup>3</sup> .
<b>Z</b>	Activated carbon filter for the elimination of oil vapours and odour. When installed, before X grade filter, It lowers the maximum contents of residual oil 0.003 mg/m <sup>3</sup> .

## Technical Specifications

- Ambient temperature: 25°C
- Working pressure: 40bar
- Inlet air temperature: 20°C
- Max.inter air temperature 100°C (60°C on Z)



Model	Connection	Flow-Rate @40BAR			Dimensions (mm)				Weight	Filter Element
	Ø	Nl/min	Nm <sup>3</sup> /hr	SCFM	A	B	C	D	(Kgs)	(No. x Model)
<b>MHP0075</b>	G 1"	12,500	750	441	435	120	36	170	2.8	1 x MHE0075*
<b>MHP0150</b>	G 1"	25,000	1,500	883	435	120	36	170	2.8	1 x MHE0150*
<b>MHP0250</b>	G 1.1/2"	41,667	2,500	1,471	435	120	36	170	2.8	1 x MHE0250*
<b>MHP0400</b>	G 2"	66,667	4,000	2,354	705	170	52	170	7.5	1 x MHE0400*
<b>MHP0500</b>	G 2"	83,333	5,000	2,943	705	170	52	170	7.7	1 x MHE0500*
<b>MHP0650</b>	G 2.1/2"	108,333	6,500	3,826	755	200	68	170	12.2	1 x MHE0650*
<b>MHP1000</b>	G 3"	166,667	10,000	5,886	1035	200	68	170	15.7	1 x MHE1000*
<b>MHP1350</b>	G 3"	225,000	13,500	7,946	1035	200	68	170	15.8	1 x MHE1350*

Pressure (bar)	7	10	13	16	20	24	28	32	36	40
Correction factor	0.20	0.27	0.35	0.42	0.52	0.61	0.71	0.81	0.90	1.00



# Oil Mist Eliminator Compressed Air Filters | MEL series

Extra protection compressed air quality from piston or oil flooded air compressors/oil separator failure.

Designed to provided the excellent filtration and low pressure drop of 0.5 to 1 psid.



## Features of our product

- LONG LIFE SERVICE
- LOW PRESSURE DROP
- CAPTURES LARGE SLUGS OF OIL
- PROTECTS DOWNSTREAM EQUIPMENT



## Mist Eliminator Elements

A fiber bed design innovation is the addition of a second more coarse fiber layer on the downstream side. This additional layer expedites drainage and prevents reentrainment of the liquid back into the gas/air stream

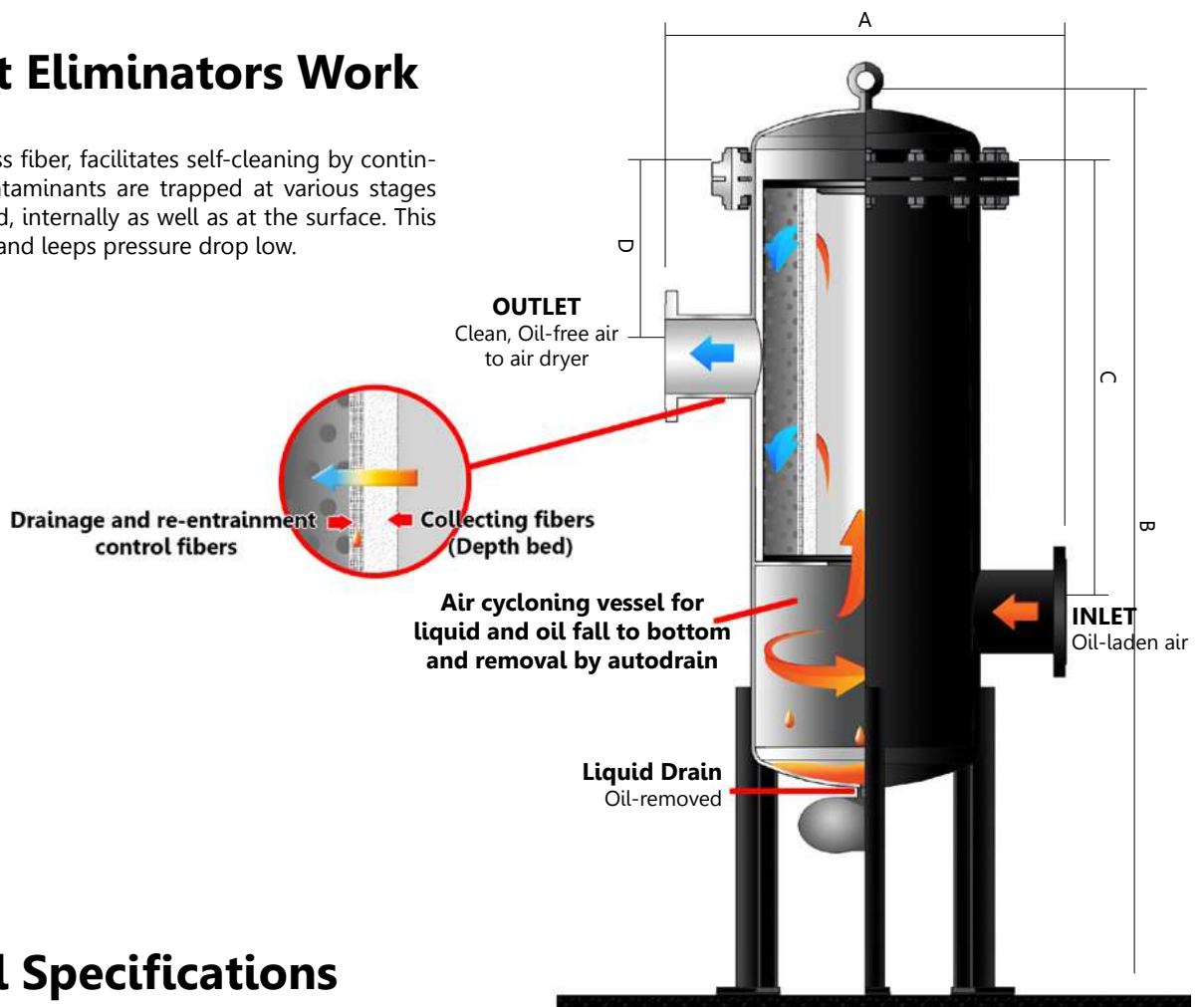


- Removal of particles down to 0.01 micron including coalesced liquid water and oil providing a maximum remaining oil aerosol content of 0.01 ppm
- 5 years element warranty
- Extended element life 10 years in normal use



# How Mist Eliminators Work

A Thick bed of glass fiber, facilitates self-cleaning by continuous draining; contaminants are trapped at various stages within the filter bed, internally as well as at the surface. This prevents clogging and keeps pressure drop low.



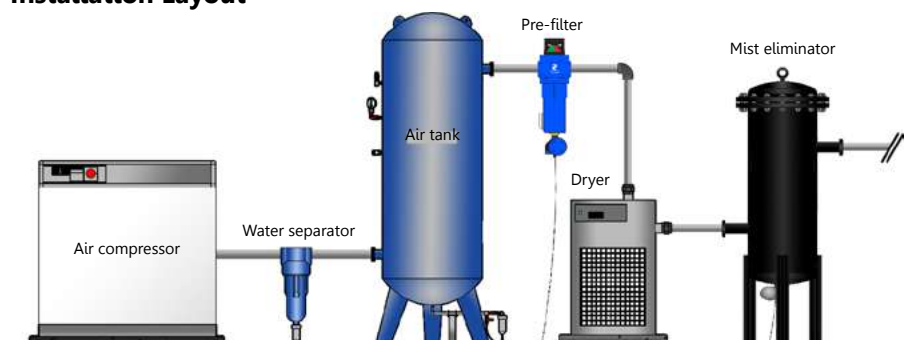
## Technical Specifications

Model	IN-OUT	Flow-rate			Dimensions (mm)				Pressure	Element
	Ø	NI/min	Nm <sup>3</sup> /h	SCFM	A	B	C	D	bar (max)	model
MEL0150	2" FLG.	4,250	255	150	500	1,060	430	170	14	EM0150
MEL0300	2" FLG.	8,500	510	300	500	1,160	530	170	14	EM0300
MEL0600	2" FLG.	17,000	1,020	600	500	1,520	840	170	14	EM0600
MEL0800	3" FLG.	22,650	1,359	800	500	1,705	1,010	250	14	EM0800
MEL1200	3" FLG.	34,000	2,040	1,200	600	1,605	910	250	14	EM1200
MEL1600	3" FLG.	45,300	2,718	1,600	600	1,705	1,010	250	14	EM1600
MEL2100	4" FLG.	59,500	3,570	2,100	700	1,670	910	300	14	EM2100
MEL2750	4" FLG.	77,900	4,674	2,750	700	1,770	1,010	300	14	EM2750
MEL4200	6" FLG.	119,000	7,140	4,200	800	1,755	860	350	14	EM4200
MEL6000	6" FLG.	170,000	10,200	6,000	800	2,005	1,110	350	14	EM6000

### Technical notes

- 1) Pipe differential pressure gauge (PG02) fitted as standard.
- 2) External float drain (HAD30B) fitted as standard.
- 3) Filter element change out differential 2.5 psid.

### Installation Layout





## > Refrigeration dryer is the most worldwide used

- Cost-effective technology
- Low pressure loss
- Intelligent control
- Reliable system



## We are make a dry air

Our air dryer plant was established in 1989 in Italy and in just over 10 years became a leading international company in the production of dryers, filters, aftercoolers and accessories for the treatment of compressed air.

Quality, versatility, respect for the environment and reliability are the characteristics of all our products. The wealth of experience found in company departments, and strict intermediate/final inspections carried out with the most advanced equipment, are the company's distinguishing features.

Our designs, develops and sells a wide range of products for the treatment of compressed air and industrial refrigeration with professionalism and commitment.



### Research & Development

The test workshop in the compressed air department was recently modernised and extended, whereas the test workshop in the water treatment department is brand new.

The dryers for compressed air and the water coolers are tested in the workshops under actual design conditions.

It is also possible to test the machines under extreme operating conditions, adjusting capacities, pressure, and fluid inlet temperature in addition to ambient temperature.

Dedicated software and new instrumentation created ad hoc enable automatic data acquisition 24 hours a day, meeting the most demanding technical requirements.

## Quality

### Certifications & Environmental

To supply a high quality product with outstanding reliability is a major objective of us.

At our technical staff ensure that quality standards are maintained and new technologies developed to be applied to our products.

Every day we provide our clients with a modern laboratory and innovative programs for design and planning.

The technical and management procedures applied to all areas of product and production have been certified in accordance with ISO 9001.



CERTIFICATE ISO 9001  
CERTIFICATE CE PED  
CERTIFICATE EAC  
CERTIFICATE 303/2008

Our products are CE marked and in compliance with directive 97/23/CE-PED EAC and other international standards are also available.



# Refrigeration Dryers

## Premium Dry Air

Efficient, Long-term and maintenance-friendly

### | MAC-T

Flow-rate 0.85 to 1.2 m<sup>3</sup>/min [Max. pressure 16 bar]

Flow-rate 1.8 to 300 m<sup>3</sup>/min [Max. pressure 14 bar]



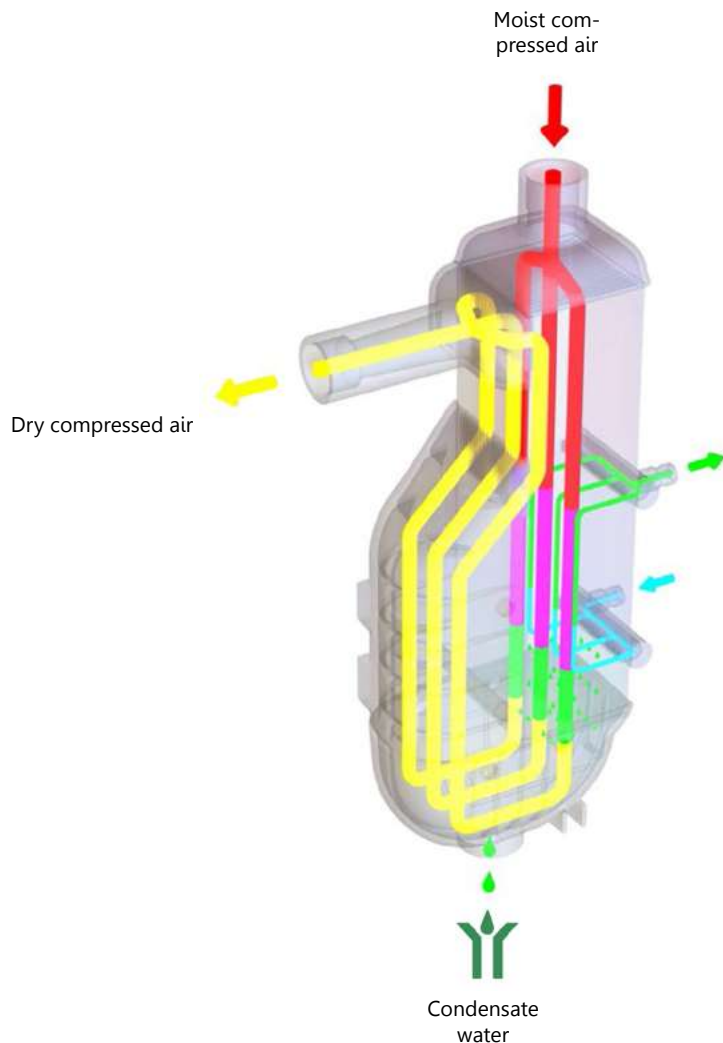
# LARGE CAPACITY | LOW PRESSURE DROP



The air-to-air and the air-to-refrigerant heat exchangers plus the demister type condensate separator are housed in an unique module. The vertical arrangement ensures the wet compressed air flows down to the automatic drain. The counter flows of compressed air ensure maximum heat transfer.

The large capacity separator is designed to hold condensate also at high humidity in compressed inlet air. And the large cross section of flow channels leads to low air velocities and reduced pressure drop.

## ALU-DRY HEAT EXCHANGER



### AIR/AIR HEAT EXCHANGER

Or economizer, pre-cools the air entered into the dryer, in order to reduce the cooling power required when the air subsequently passes into the evaporator. The air exiting the dryer is heated in the same way in order to prevent condensation from forming in the factory pipes.

### EVAPORATOR

The generous dimensions of the air-to-refrigerant heat exchanger plus the counter flow gas streams allow full and complete evaporation of the refrigerant (preventing liquid returning to the compressor).

### DEMISTER TYPE CONDENSATE SEPARATOR

The high efficiency condensate separator is located within the heat exchanger module. No maintenance is required and the coalescing effect results in a high degree of moisture separation.

# TECHNICAL DETAILS



## CONTROL AND PROTECTION DEVICES

All models are fitted with a fan pressure switch to control the refrigerant condensing. MAC30-T and larger, come equipped with some specific devices to protect the components of the unit:

- re-set high refrigerant pressure cut-out (for MAC 80...160-T);
- low refrigerant pressure cut-out (for MAC 80...160-T);
- re-set high temperature cut-out (for MAC 30...160-T), which stops the refrigerating compressor when discharge temperature is too high (e.g. clogged or blocked condenser).

## HOT GAS BY-PASS VALVE

The precise and accurate hot gas by-pass valve, which prevents the formation of ice inside the evaporator at any load condition, is a recent development unavailable in the past. The valve is set during final test and no further adjustments are necessary.



## CONTROL PANEL



### DMC35 CONTROLLER (Standard)

Operation of the MAC8...160 dryer are monitored by DMC35 electronic controller which indicates the DewPoint temperature digitally, controls the condensate drain valve via a timer and the condenser fan via a probe.



### DMC34 CONTROLLER (Optional)

Operation of the MAC8...160-T are controlled and monitored by DMC34 digital controller. Featuring a 3-digit display for the visualization of the DewPoint temperature (in °C or °F) and the dryer total operating hours. DMC34 includes as well the condenser fan control, scheduled maintenance reminder, timer for the condensate drain valve and detection of any dryer malfunction (also reported on the potential free alarm contact)



### DMC 24 CONTROLLER

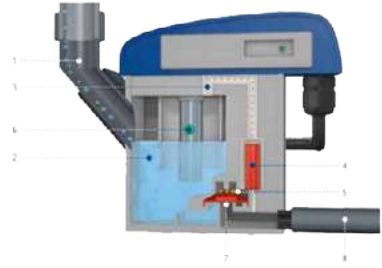
In addition to the characteristics already present in the DMC24 model, this new controller features a new client-protection function, which allows the user to plan maintenance operations, a working meter and a RS485 interface for connection to a PC.

The four temperature probes and pressure transducer record and display the parameters of the dryer when in use and enable the functions AFC (Advanced Fan(s) Control) for the control of refrigerant condensing, and the ASW (Advance Service Warning) to receive advance warning of defects. Control and protective devices are now included in the DMC24 controller and interfaced to the operator through the functions ADS (Advance Draining System) for the control of the zero loss drain and AAL (Advanced Alarm Log). The DMC24 includes the protection for monitoring the sequence of the supply phase and the stopping of the compressor in conditions of high or low refrigerant pressure and/or high discharge temperature.



## CONDENSATE DRAIN

MAC8...160-T models are fitted with an electronic system to drain the condensate interfaced to the controller. Discharge and pause times are adjustable. Drainage group includes also a ball isolation valve and a strainer. A zero loss drain is available as an option.



MAC180-T dryer and largers are equipped with a zero loss drain system, interfaced to the DMC24, to assure the drainage of the condensed water only with no air loss.

## CONDENSER

Generous sizing of the condenser ensures maximum performance of the refrigerant circuit and the ability to operate with changes in ambient conditions. Access to the condenser for leaning and maintenance is straightforward. MAC180...3000-T condensers are equipped with a stainless steel protective filter. It can be removed and cleaned. Water cooling option available from MAC180-T model at no charge. Water regulating valve included.

## COMPRESSOR

**RECIPROCATING TYPE** - Models MAC8...23-T are fitted with high efficiency piston compressors sourced from major producers.

**ROTARY** - For models MAC30...160-T (with single-phase power supply). This is a new technology applied to refrigerants as an alternative to the traditional piston compressor. Compression of the refrigerant is achieved by way of interaction between a cylindrical stator and a rotating eccentric nucleus. In this method, the parts which come into contact with one another are wear-resistant and therefore more reliable.

**SCROLL** - From model MAC180-T on, the type of compressor used is the scroll. Widely used in the air conditioning and refrigeration sectors, the scroll compressor performs well and has low energy consumption. Compression of the refrigerant is achieved by way of two concentric coils: one fixed and the other mobile. The scrolls are wear-resistant, highly reliable and guarantee a high level of noise reduction.



## EASY MAINTENANCE

The MAC series has been designed and built to facilitate any inspection and maintenance operations that may prove necessary. The hoods are easily removed and offer immediate access to all parts of the system. The clear layout of the components, the simple composition of the refrigerant circuit and the numbering of the wires in the electrical system, facilitate the operator when carrying out standard controls.



# Technical Specifications

Flow-rate are based on the following nominal conditions:  
 Ambient temperature of 35°C, with inlet air at 7barg and 42°C and 3°C pressure Dew Point  
 (-22°C atmospheric pressure Dew Point).  
 Maximum working conditions: Ambient temperature 50°C, inlet air temperature 70°C and  
 inlet air pressure 14barg (16barg for MAC3 - 12)



Model	Refrig.	Flow-rate at Nominal conditions			Pressure Drop	Connections IN-OUT	Power Supply	Dimensions [mm]			Weight
	Type	L/min	m³/h	SCFM	bar	[Ø]	[Ph/V/Fr]	A	B	C	[+kg]
MAC8-T	R134.a	850	51	30	0.04	G 1/2"	1/230/50-60	345	420	740	31
MAC12-T	R134.a	1,200	72	42	0.06	G 1/2"	1/230/50-60	345	420	740	34
MAC18-T	R134.a	1,800	108	64	0.07	G 1"	1/230/50	485	455	825	39
MAC23-T	R134.a	2,500	150	88	0.10	G 1"	1/230/50	485	455	825	41
MAC30-T	R407C	3,400	204	120	0.10	G 1.1/4"	1/230/50	485	455	825	46
MAC40-T	R407C	4,100	246	145	0.19	G 1.1/4"	1/230/50	485	455	825	53
MAC55-T	R407C	6,100	366	215	0.13	G 1.1/2"	1/230/50	555	580	885	55
MAC60-T	R407C	6,800	408	240	0.16	G 1.1/2"	1/230/50	555	580	885	63
MAC80-T	R407C	9,000	540	318	0.08	G 2"	1/230/50	555	625	975	92
MAC100-T	R407C	10,800	648	382	0.13	G 2"	1/230/50	555	625	975	94
MAC120-T	R407C	12,500	750	441	0.08	G 2.1/2"	1/230/50	665	725	1,105	141
MAC140-T	R407C	14,500	870	512	0.11	G 2.1/2"	1/230/50	665	725	1,105	150
MAC160-T	R407C	16,000	960	565	0.15	G 2.1/2"	1/230/50	665	725	1,105	158
MAC180-T	R407C	18,000	1,080	636	0.12	DN80-PN16	3/400/50	790	1,000	1,465	240
MAC210-T	R407C	21,000	1,260	742	0.18	DN80-PN16	3/400/50	790	1,000	1,465	242
MAC250-T	R407C	28,000	1,680	990	0.10	DN80-PN16	3/400/50	790	1,000	1,465	275
MAC300-T	R407C	34,000	2,040	1,202	0.17	DN80-PN16	3/400/50	790	1,000	1,465	276
MAC360-T	R407C	39,000	2,340	1,378	0.18	DN80-PN16	3/400/50	790	1,000	1,465	311
MAC400-T	R407C	42,000	2,520	1,484	0.19	DN100-PN16	3/400/50	1,135	1,205	1,750	463
MAC500-T	R407C	52,000	3,120	1,837	0.11	DN100-PN16	3/400/50	1,135	1,205	1,750	538
MAC600-T	R407C	63,000	3,780	2,226	0.19	DN100-PN16	3/400/50	1,135	1,205	1,750	540
MAC720-T	R407C	78,000	4,680	2,755	0.18	DN100-PN16	3/400/50	1,135	1,205	1,750	612
MAC900-T	R407C	90,000	5,400	3,178	0.20	DN150-PN16	3/400/50	1,300	1,750	1,810	830
MAC1100-T	R407C	110,400	6,624	3,900	0.26	DN150-PN16	3/400/50	1,300	1,750	1,810	940
MAC1200-T	R407C	120,000	7,200	4,238	0.20	DN200-PN16	3/400/50	1,400	2,200	1,870	1,055
MAC1500-T	R407C	147,200	8,832	5,200	0.26	DN200-PN16	3/400/50	1,400	2,200	1,870	1,200
MAC1800-T	R407C	180,000	10,800	6,537	0.20	DN200-PN16	3/400/50	1,450	2,165	2,430	1,650
MAC2200-T	R407C	220,000	13,200	7,769	0.26	DN200-PN16	3/400/50	1,450	2,165	2,430	1,750
MAC2400-T	R407C	240,000	14,400	8,476	0.20	DN250-PN16	3/400/50	1,450	2,455	2,455	1,950
MAC3000-T	R407C	300,000	18,000	10,594	0.26	DN250-PN16	3/400/50	1,450	2,455	2,455	2,100

On request with 60Hz power supply.

Correction factor for operating pressure changes:										
Inlet air pressure	barg	4	5	6	7	8	10	12	14	
	Factor (F1)	0.77	0.86	0.93	1.00	1.05	1.14	1.21	1.30	

Correction factor for ambient temperature changes:										
Ambient temperature	°C	4	5	6	7	8	10	12	14	
	Factor (F2)	0.77	0.86	0.93	1.00	1.05	1.14	1.21	1.30	

Correction factor for inlet air temperature changes:										
Air temperature	°C	38	42	45	50	55	60	65	70	
	Factor (F3)	1.11	1.00	0.92	0.80	0.70	0.61	0.53	0.46	

Correction factor for Dew Point changes:										
Dew Point	°C	3	5	7	10					
	Factor (F4)	1.00	1.09	1.19	1.37					



# Refrigeration Dryers

## High compressed air inlet temperatures up to 90°C | MHA-T

Flow-rate 0.5 to 7.5 m<sup>3</sup>/min [Max. pressure 16 bar for MHA8 - MHA18; 14 bar for largers]

# AIR DRYER WITH AFTERCOOLER | MHA-T



M-PLUS is keen to respond to the special needs of its customers and has developed a new range of dryers with an intergral aftercooler in order to remove water from pipelines. The dryer range can be selected when the compressed air inlet temperature is greater than 50°C to 60°C, and the floor space is limited. There is no need for a separate free-standing aftercooler which saves both space and installation costs.

M-PLUS has continued using its design philosophy to allow quick and easy access for routine maintenance.

The system provides a pressure dew point of +3°C to +7°C AT 7 barg working pressure. Since most production processes operate at temperatures well above these levels, your compressed air will be clean and dry at all times.

## TECHNICAL DETAILS

### CONTROL PANEL



#### DMC35 CONTROLLER (Standard)

Operation of the MHA-T dryer is monitored by DMC35 electronic controller which indicates the DewPoint temperature digitally, controls the condensate drain valve via a timer and the condenser fan via a probe.



#### DMC34 CONTROLLER (Optional)

Operation of the MHA-T dryer is controlled and monitored by DMC34 digital controller. Featuring a 3-digit display for the visualization of the DewPoint temperature (in °C or °F) and the dryer total operating hours. DMC34 includes as well the condenser fan control, scheduled maintenance reminder, timer for the condensate drain valve and detection of any dryer malfunction (also reported on the potential free alarm contact)

### HOT GAS BY-PASS VALVE



The precise and accurate hot gas by-pass valve, which prevents the formation of ice inside the evaporator at any load condition, is a recent development unavailable in the past. The valve is set during final test and no further adjustments are necessary.

### CONDENSATE DRAIN

MHA-T models are fitted with an electronic system to drain the condensate interfaced to the controller. Discharge and pause times are adjustable. Drainage group includes also a ball isolation valve and a strainer.

### COMPRESSOR

MHA-T are fitted with high efficiency piston compressors sourced from major producers.



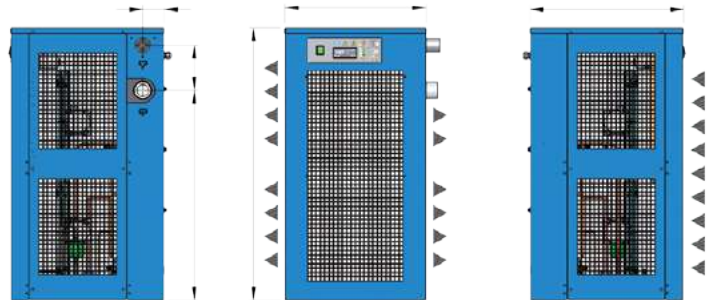
## TECHNICAL FEATURES

Data refers to the following nominal conditions

Ambient temperature: 35°C  
 Inlet air temperature: 80°C  
 Inlet air pressure: 7 barg  
 Pressure Dew Point: 7°C

Maximum working conditions

Ambient temperature: 45°C  
 Inlet air temperature: 90°C  
 Inlet air pressure: 14 barg (16 barg for MHA 5 - MHA 18)



Model	Refrig.	Flow-rate at Nominal conditions			Pressure Drop	Connections IN-OUT [Ø]	Power Supply [PhV/Fr]	Dimensions [mm]			Weight [+kg]
	Type	L/min	m³/h	SCFM				bar	A	B	
MHA5-T	R134.a	500	30	18	0.07	G 1/2"	1/230/50	650	426	416	33
MHA8-T	R134.a	800	48	28	0.11	G 1/2"	1/230/50	650	426	416	33
MHA12-T	R134.a	1,200	72	42	0.22	G 1/2"	1/230/50	650	426	416	34
MHA18-T	R134.a	1,800	108	64	0.38	G 1/2"	1/230/50	650	426	416	37
MHA25-T	R134.a	2,500	150	88	0.37	G 1"	1/230/50	900	444	440	45
MHA32-T	R134.a	3,200	192	113	0.41	G 1.1/4"	1/230/50	900	444	440	49
MHA45-T	R407C	4,500	270	159	0.45	G 1.1/4"	1/230/50	900	469	511	61
MHA65-T	R407C	6,500	390	230	0.43	G 1.1/2"	1/230/50	1,287	602	583	89
MHA75-T	R407C	7,500	450	265	0.45	G 1.1/2"	1/230/50	1,287	602	583	91

On request with 60Hz power supply.

Correction factor for operating pressure changes:										
Inlet air pressure	barg	4	5	6	7	8	10	12	14	
	Factor (F1)	0.77	0.86	0.93	1.00	1.05	1.14	1.21	1.30	

Correction factor for ambient temperature changes:						
Ambient temperature	°C	32	35	38	40	45
	Factor (F2)	1.05	1.00	0.95	0.91	0.83

Correction factor for inlet air temperature changes:				
Inlet air temperature	°C	70	80	90
	Factor (F3)	1.11	1.00	0.89

Correction factor for Dew Point changes:				
Pressure Dew Point	°C	5	7	10
	Factor (F4)	0.85	1.00	1.05



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