

UA Series Air Dryers

(10 - 3000 SCFM)



**10 Year
Warranty**
Limited



For Clean, Dry, Contaminate Free Compressed Air

- Non - cycling refrigerated air dryers
- Compressed air filters
- MAC-PAC filtration system
- Condensate drains



H Series Compressed Air Filters

- 40 - 1300 SCFM
- 1/2" NPT to 3" NPT
- External Drain

See page 8.



Setting a new standard in Quality and Reliability

www.macair1.com



All dryers are handcrafted by dedicated skilled craftsman in Walled Lake, MI USA.

All components are sourced from only the best North American suppliers.

Water, dirt and oil **MUST** be removed from your compressed air system

As your air compressor produces compressed air there is moisture, dirt and oil that is present in the air stream. Untreated compressed air is the unseen killer in all compressed air systems. Premature tool failure, product spoilage, failed instrumentation, damaged actuators and cylinders, are only part of the long list of casualties in the battle for increased productivity. Without proper treatment of your compressed air this vital source of work turns into a wet, gritty, acidic brew, silently destroying all that it comes into contact.

MACAIR air dryers, filters and drains are key components to solving the contamination problem in your compressed air system. Your investment in MACAIR air treatment products will have a very quick payback period in the form of high productivity and less downtime. You can not afford to operate your air system with out MACAIR air treatment products.

Energy Efficiency

Pressure drop increases your operating costs. ULTRA Series dryers have an average of 2.0 PSID pressure drop. Many competitive dryers have as high as a 5.0 PSID pressure drop across their heat exchangers. High pressure drops cause your air compressor to work harder to overcome the restriction thereby driving up the consumption and cost of electricity. Electricity costs accounts for approximately 50% of the air dryers total operating cost over the first 5 years of ownership. Every 2 psi of pressure drop across your dryer will increase your systems electrical costs by 2%. Low pressure drop equals low electrical costs. Example: A competitor's 500 SCFM dryer that has a 5.0 PSID pressure drop will cost over \$1098.00 more annually.



Long-lasting Peace of Mind

When a product is truly built to exacting standards of quality and durability, the manufacturers' confidence is reflected in its warranty. The MACAIR UA Series refrigerated air dryers offer one of the best warranties in the business. The 1st year 100% of all parts and labor are covered. All major components are covered for 5 years (Parts replacement only).

10 Year warranty

UA Series dryers major components are covered for 10 years when you: (Parts replacement only)

1. Purchase a UA Series dryer with the matching H Series filters or a MAC-PAC filter system.
2. Properly register the dryer at www.macair1.com
3. Purchase the UA Series annual maintenance kit

Major components that are covered:

- Compressed Air Heat Exchanger
- Refrigerant Compressor
- Condenser Coil
- Thermostatic Expansion Valves
- Hot Gas Bypass Valve
- Pressure Gauges

Warranty only applies to UA Series dryers shipped after January 1, 2017.

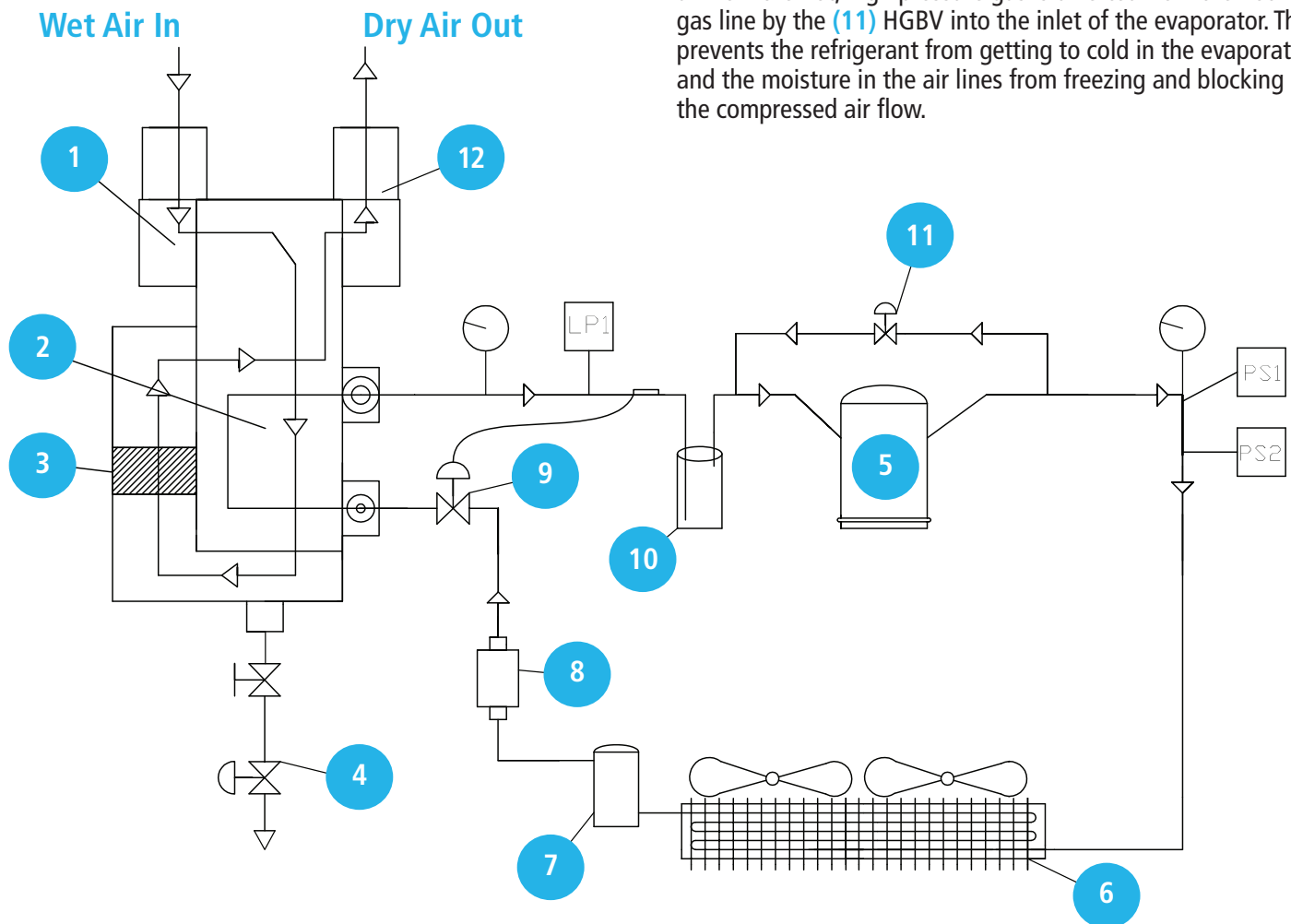
How the Ultra Series Dryer Works

The Compressed Air Side

UA Series refrigerated compressed air dryers use refrigeration cooling to condense entrained moisture out of the compressed air stream. Warm saturated air enters the (1) precool/reheater heat exchanger at the dryer inlet. In the precool/reheater the inlet air is pre-cooled by the outgoing cold air. The pre-cooled air then enters the (2) air to refrigerant heat exchanger where it is cooled to its lowest point in the evaporator. As the air is cooled moisture in the air changes from a vapor to a liquid. The liquid condensate is removed from the airstream by the (3) stainless steel mesh moisture separator and discharged from the dryer by the (4) automatic drain valve. The cold air is reheated by incoming warm air as it passes back through the precool/reheater heat exchanger. Pre-cooling the inlet air reduces the heat load on the refrigerant compressor, permitting the use of a smaller refrigerant compressor. The out going cold air is re-heated by the incoming hot air. As a result the outlet air is warmed up as it leaves the dryer. This prevents the outlet pipe from sweating. The air exits the dryer and is now clean and dry, ready for use.

The Refrigeration Circuit

Cool, low pressure refrigerant gas enters the (5) compressors suction port where it is compressed into a hot, high pressure gas. It then exits the compressor and enters the (6) condenser where the heat is removed from the high pressure gas. As the heat is removed it changes state from a hot high pressure gas into a cool high pressure refrigerant liquid. The refrigerant then enters the (7) liquid receiver where it is stored until it is needed down stream. The refrigerant then passes through the (8) filter drier where any moisture and contaminants are removed and then enters the (9) expansion valve (TXV). As the high pressure refrigerant passes through the TXV the pressure drops and the refrigerant is now a cold low pressure liquid and it enters the evaporator (Air to Refrigerant Heat Exchanger). As the heat from the compressed air is absorbed into the colder refrigerant in the evaporator it again changes state from a low pressure cold liquid into a low pressure coil gas. The refrigerant exits the evaporator where it then passes through a (10) suction accumulator where any liquid refrigerant that might be present drops out. This protects the compressor from getting damaged by slugging it with liquid. The cool, low pressure refrigerant gas then enters the compressor suction port and the process continues. During periods of low compressed air flow the hot, high pressure gas is diverted from the hot gas line by the (11) HGBV into the inlet of the evaporator. This prevents the refrigerant from getting too cold in the evaporator and the moisture in the air lines from freezing and blocking the compressed air flow.



Quality Features - Built To Last

UA Series dryers are built to withstand the harshest industrial environments using only the highest quality components assembled by highly skilled craftsman.

The following quality features are built into every dryer:

- **Compressed Air Heat Exchanger Module**

Includes the precool/reheater, air to refrigerant heat exchangers and stainless steel mesh moisture separator all in one compact all aluminum module. Because of the compact design and no interconnecting piping pressure drops average 2.0 PSIG, the lowest in the industry.

- **Top Mounted Air In & Out Connections**

Allows for easy installation and mounting of filters and bypasses.

- **Digital Dewpoint Indicator (UA40 and above)**

Large 3/4" LED readout provides easy and constant monitoring of your air systems dew point. (level of dryness).

- **Suction Pressure Gauge**

Monitors the low side of the refrigeration system (UA75 and up)

- **Discharge Pressure Gauge**

Monitors the high side of the refrigeration system (UA400 and up)

- **Thermostatic Expansion Valve**

Assures the proper refrigerant flow to the air to refrigerant heat exchanger (Evaporator). Controls the Superheat of the suction gas returning to the compressor.

- **Hot Gas Bypass Valves**

Bypasses hot gas from the compressor discharge port to the evaporator inlet. This allows the dryer to operate at a constant dew point from 0 to 100% load without the possibility of freeze ups.

- **Rotalock Valves**

Allows for easy access to the refrigeration system for maintenance and repair.

- **On-Off Switch & Dryer On Light**

Easy on-off control.

- **Programmable Electronic Drains**

Time proven, extremely reliable, fully adjustable timer mechanism, and large orifice for trouble free operation. Y strainer with isolation valve and screen to prevent clogging and easy maintenance.

- **8 Foot Power Cord & Plug**

Allows for quick and easy hook up. (UA10A—UA150A 115-1-60)

- **Cleanable & Ambient Air Filter**

The filter is attached to the dryer with magnets and made from a washable fiber. Protects the air cooled condenser from dirt and debris.

- **Environmentally Friendly Refrigerants**

All UA dryers use only R134a & R404a refrigerants.



THERMOSTATIC
EXPANSION VALVE



HOT GAS BYPASS VALVE



DRYER ON LIGHT
DIGITAL DEW POINT
INDICATOR



ELECTRONIC AUTO DRAIN

Quality features continued:

- **Industrial Grade Hermetic Refrigeration System**

Includes components only from industry leading North American manufactures including the following features:

- **Hermetic Refrigeration Compressor**

All UA dryers have time proven reciprocating and scroll style refrigeration compressors

- **Oversized Air Cooled Condensers**

Allows dryer to operate in higher than normal ambient condition with no adverse effects.

- **Industrial Grade Condenser Fan Motors**

Made to withstand the harshest industrial environments.

- **Suction Accumulator (UA400 and up)**

Prevents liquid refrigerant from migrating into the compressors suction port causing damage.

- **Condenser Fan Cycling Control**

Allows dryer to operate in lower ambient conditions without freezing up. (Minimum ambient operating temp is 40 F)

- **Receiver Tank (UA200 and up)**

Stores liquid refrigerant during low load operating conditions.



HERMETIC REFRIGERATION COMPRESSOR

- **Filter Drier**

Removes unwanted contaminants from the system.

- **Refrigerant Sightglass**

Allows easy monitoring of the refrigeration system operation.

- **High & Low Refrigerant Pressure Shut Down**

Protects the compressor in the event of system failure or lack of maintenance.

- **Crankcase Heaters**

Prevents liquid refrigerant from migrating to the compressors crankcase during periods of system shutdown. (UA400 and larger)

UA Series Available Options

- | | |
|-----------------------------|-------------------------------------|
| • MAC-PAC Filtration System | • Low Ambient Shutdown |
| • Nema 4 Electrics | • Fused Disconnect Switch |
| • Water-Cooled Condensers | • High Or Low Temp Warning Light |
| • Zero Air Loss Drains | • Additional Temp & Pressure Gauges |
| • Dryer On Hour Meter | |

Selection Guide & Correction Factors

UA Series dryers flow rates are in accordance with the CAGI standard design conditions of 100 F inlet temperature, 100 PSIG inlet pressure and 100 F ambient temperatures and ISO7183 rating conditions.

Determine the following operating conditions and use the correction factors and formula below to select the right dryer for your application.

1. Inlet Air Flow Rate (SCFM) (Air Compressor Output Flow Rate)
2. Inlet Air Temperature (F) (Air Temp Leaving The Air Compressor)
3. Inlet Air Operating Pressure (PSIG) (Air Pressure Leaving The Air Compressor)
4. Ambient Air Temperature (F) (Maximum Air Temp Surrounding The Dryer)
5. Dew point Temperature (F) (How Dry Do You Need Your Air)

INLET PRESSURE	50	75	100	120	150	250
CORRECTION FACTOR	1.30	1.10	1.0	.93	.86	.79

INLET TEMP	80	90	100	110	120
CORRECTION FACTOR	.61	.79	1.0	1.23	1.51

AMBIENT TEMP	80	90	100	110	115
CORRECTION FACTOR	.80	.89	1	1.16	1.31

DEWPOINT TEMP	38	45	50
CORRECTION FACTOR	1	1.24	1.29

Example

What is the right dryer for the following conditions?

Out put from the air compressor: 150 SCFM, Inlet Air Pressure: 75 PSIG, Inlet Air Temp: 110 F, Ambient Temp: 110 F, Dew point Temp: 38 F.

Inlet Air Flow Rate 150 SCFM x 1.10 x 1.23 x 1.16 x 1=235 SCFM (Corrected Capacity).

Select the model that matches or exceeds the corrected capacity of 235 SCFM.

For this application the UA250A would be the correct choice.



UA10A, UA20A, UA25A, UA40A, UA55A



UA400A, UA500A, UA625A



UA800A, UA1000A, UA1200A



UA2500A, UA3000A



UA75A, UA100A, UA125A

Specifications and Dimensions

MODEL	38 F	50 F	PRESSURE DROP PSID	W	D	H	SHIP WGT	IN/OUT CONN	REF COMP HP	DRAIN CONN	POWER Kw	REF TYPE	MAX PRESSURE
UA10A	10	12	1.2	13	20	15	70	1/2	1/6	1/4	.22	R134a	232
UA20A	20	25	1.3	13	20	15	75	1/2	1/5	1/4	.26		
UA25A	25	31	1.4	13	20	15	80	1/2	1/4	1/4	.39		
UA40A	40	50	1.2	14	21	21	95	3/4	1/4	1/4	.39		
UA55A	55	69	1.9	14	21	21	98	3/4	1/3	1/4	.50		
UA75A	75	103	1.3	18	26	26	165	1	1/2	1/4	.94		
UA100A	100	136	1.5	18	26	26	169	1	1/2	1/4	.94		
UA125A	125	171	1.8	18	26	26	205	11/2	3/4	1/4	1.04		
UA150A	150	204	1.95	18	26	26	210	11/2	3/4	1/4	1.04		
UA200A	200	275	1.6	23	33	32	250	2	1	1/4	1.36		
UA250A	250	350	2.0	23	33	32	295	2	11/2	1/4	2.03	R404a	
UA300A	300	425	2.3	23	33	32	310	2	11/2	1/4	2.03		
UA400A	400	525	2.85	29	46	33	486	2	2	3/8	4.54		
UA500A	500	700	2.25	29	46	33	526	2	3	3/8	4.99		
UA625A	625	799	3.0	29	46	33	549	2	3	3/8	4.99		
UA700A	700	875	3.0	38	55	57	825	21/2	4	3/8	5.00		
UA800A	800	1005	3.2	38	55	57	855	3	4	3/8	5.00		
UA1000A	1000	1375	3.0	38	55	57	875	3	5	1/2	7.26		
UA1200A	1200	1640	3.2	38	55	57	900	3	6	1/2	7.9		
UA1600A	1600	2103	3.1	40	56	72	1400	4	8	1/2	8.5		
UA2000A	2000	2650	3.5	40	56	72	1595	4	10	1/2	10.8		
UA2500A	2500	3300	3.6	40	62	68	1755	4	12	1/2	12.2		
UA3000A	3000	3750	3.8	40	62	68	1945	6	15	1/2	15.9		

Notes

- Capacity is based on CAGI Standard No. ADF100. Inlet Temp 100 F, Inlet Pressure 100 PSIG, Ambient Temp 100 F at 38 F PDP. For conditions other than standard use the correction factors on page 6.
- Dryers maximum operating pressure is 232 PSIG for higher pressures consult factory.
- Air-cooled condensers are standard on all models. Water-cooled condensers are available.
- Information in this catalog is subject to change without notice.
- H Series pre filters are recommended before the UA SERIES dryers.
- For Larger Sizes Consult Factory.



UA200A, UA250A, UA300A



UA200A, UA250A, UA300A
WITH AMBIENT FILTER



UA40A, UA55A

H Series Compressed Air Filters

High efficiency filtration for cleaning compressed air systems.

H Series pre filters are recommended before the UA Series dryers.

Why Install Compressed Air Filters?

There are millions of dirt particles and moisture in a cubic foot of compressed air and over 80% of these particles are less than 2 micron in size. When this air is compressed to 100 PSIG the ratio of particles and moisture to air increases dramatically. During the compression process these particles and moisture are drawn into the compressor intake, mixed with lubricants from your compressor and the temperature of the air increases up to 350 F. This mixture of particles, moisture, lubricants and heat form an acidic substance that will, over time destroy pneumatic equipment, tools and components and cause expensive down time and loss of production. Compressed air filters will eliminate these contaminants from your compressed air system.

H Series Filters Standard Features

- Die Cast Aluminum Housings
- Differential Pressure Gauges
- Initial Filter Elements
- Internal Corrosion Resistant Coating
- External Float Drain
- Particle filter protects drain
- 232 PSIG working pressure
- 180 F Max Working Temp



H250

MODEL	IN/OUT	CAPACITY SCFM	M.A.W.P. PSIG	WEIGHT LBS	DIMENSIONS			ELEMENT MODEL	USE WITH DRYER MODEL
					L	W	H		
H40*	1/2	40	200	2.2	3.62	3	12.5	E40*	UA10-UA40
H60*	3/4	60	200	2.5	3.62	3	12.5	E60*	UA55-UA75
H100*	1	100	200	2.7	3.62	3	12.5	E100*	UA100
H250*	1 1/2	250	200	10.8	4.72	3	16.5	E250*	UA125-UA250
H385*	2	385	200	26	5.98	3	26	E385*	UA300
H635*	2 1/2	635	200	36	6.45	3	36	E635*	UA400-UA625
H1000*	3	1000	200	55	9.84	3	55	E1000*	UA800-UA1000
H1300*	3	1300	200	60	9.84	3	65	E1300*	UA1200

Air Quality Specifications

SPECIFY FILTRATION TYPE & GRADE CODE	PARTICULATE PRE-FILTER	OIL REMOVING GENERAL PURPOSE	OIL REMOVING HIGH EFFICIENCY	OIL REMOVING ADSORBED
	GRADE P	GRADE C	GRADE E	GRADE A
Particulate Removal (Micron)	3 um	1 um	0.01 um	0.01 um
Max. oil carry over at 70 F (PPM)	NA	0.01	0.01	0.003
Max. working temp	175 F	180 F	180 F	180 F
Initial pressure loss (PSIG)	.58	.725	1.45	1.15
PSI loss for element change	10	10	10	0
Max. working pressure (PSIG)	200	200	200	200
Element end cap material	Plastic			
Element media type	Stainless Steel			
Element support material	Pleated Cellulose			

Working Pressure Correction Factors

PRESSURE	72	87	100	116	130	145	160	175	188	203	217	232
FACTOR	.75	.88	1	1.13	1.25	1.38	1.5	1.63	1.75	1.88	2	2.13

Technical Notes

1. Threaded filters are made of aluminum
2. Connections are NPT
3. Grade A absorber elements must not operate in oil saturated conditions and will not remove certain types of gases including carbon monoxide and carbon dioxide.
4. Grade A absorber elements must be changed periodically to suit application but at least every 6 months.
5. All filters come with differential pressure gauges standard equipment.
6. All filters come with external float drains that contain stainless steel particle screens that makes them clog resistant.
7. All filters contain initial element.
8. low rates are based on 100 PSIG operating pressure. For actual capacity use correction factors.

MD50 Zero Loss Float Standard On All H Series Filters

- Stainless Steel mesh screen protects the float mechanism from particles.
- 1/2" NPT Inlet connection
- 1/8" NPT outlet



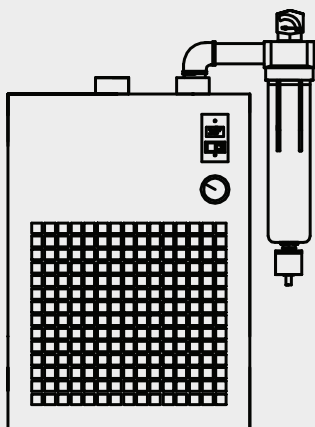
ADF-1 Electric Programmable Drain valve with Y strainer - Optional

- Adjustable ON/OFF time
- Y strainer & isolation valve for easy maintenance.
- 1/8" NPT outlet
- 115v



MAC-PAC Filtration System

H Series filters mounted on the dryer.

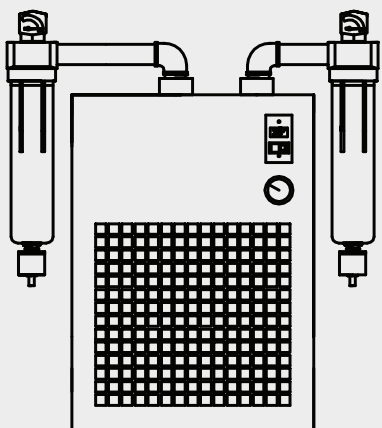


MAC-PAC 1

Includes (1) H Series General Purpose Coalescer Filter (Grade C) mounted on the inlet of the dryer.

Air Quality

PARTICULATE REMOVAL	1 micron
MAX. OIL CARRY OVER	0.1 ppm
PRESSURE DEW POINT F	38 F



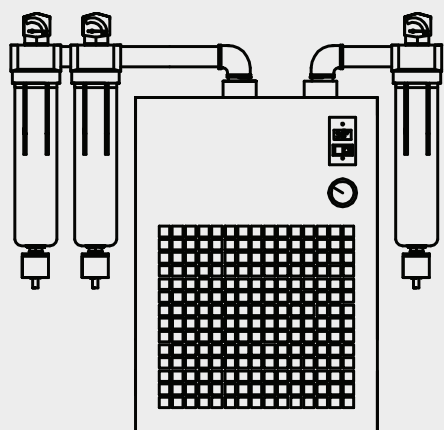
MAC-PAC 2

Includes (1) H Series Particulate Filter (Grade P) and (1) H series General Purpose Coalescer Filter (Grade C) mounted on the inlet of the dryer

Air Quality

PARTICULATE REMOVAL	1 micron
MAX. OIL CARRY OVER	0.1 ppm
PRESSURE DEW POINT F	38 F

Note: H Series Particulate filter extends the element life of the Coalescer elements



MAC-PAC 3

Includes (1) H Series Particulate Filter (Grade P) and (1) H Series General Purpose Coalescer filter (Grade C) mounted on the inlet of the dryer and (1) H series High Efficiency Coalescer (Grade E) mounted on the outlet of the dryer.

Air Quality

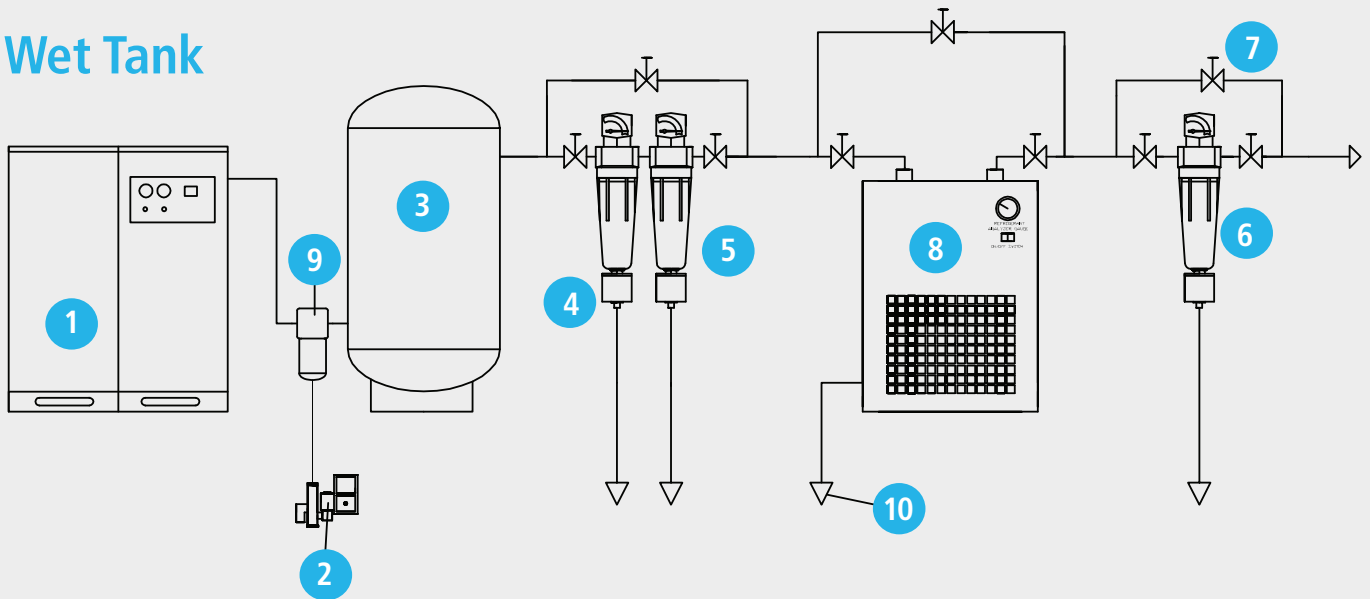
PARTICULATE REMOVAL	.01 micron
MAX. OIL CARRY OVER	0.1 ppm
PRESSURE DEW POINT F	38 F

Note: H Series Particulate filter extends the element life of the Coalescer elements

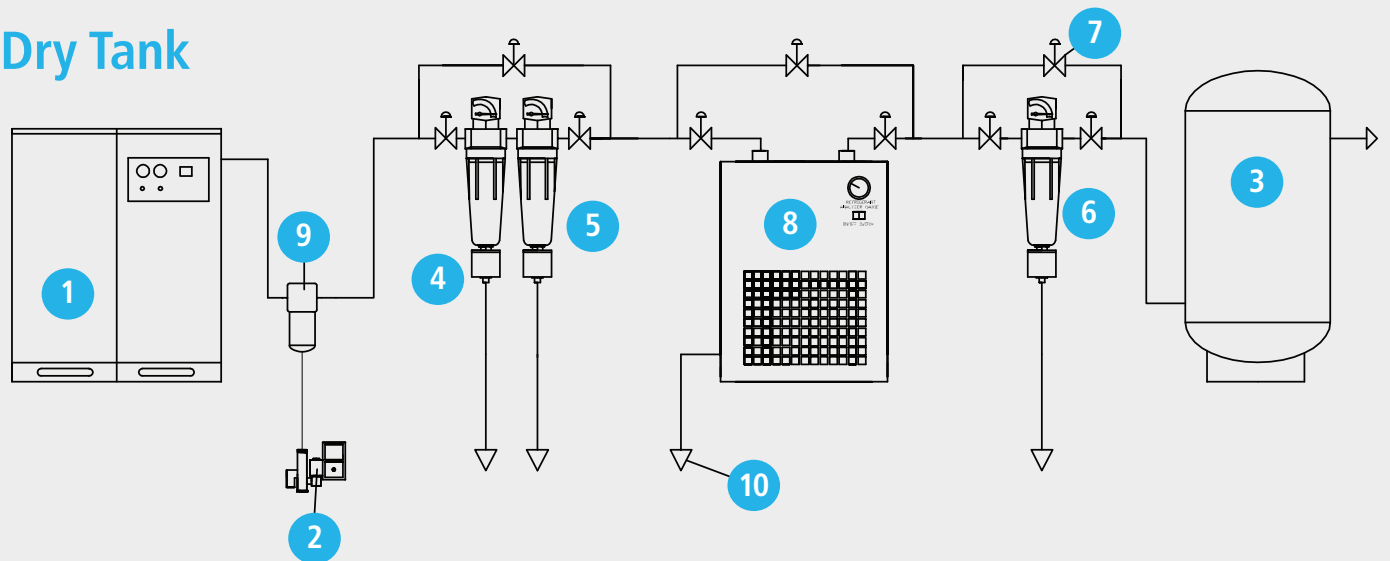
Recommended Installations

The following are two basic schools of thought on how to install MACAIR air dryers, filters and drains for the best moisture and contaminate removal results.

Wet Tank



Dry Tank



Wet Tank

The receiver tank is installed before the dryer. Recommended for systems that consume less than or equal to the maximum capacity of the air compressor.

Dry Tank

The receiver tank is installed after the dryer. Recommended for systems that consume more than the maximum capacity of the air compressor.

- (1) Air Compressor
- (2) ADF Series Drain Valve
- (3) Air Receiver Tank
- (4) H Series Grade P Pre-filter
- (5) H Series Grade C Pre-filter
- (6) H Series Grade E After filter
- (7) 3 Valve Bypass
- (8) UA Series non-cycling air dryer
- (9) Moisture separator
- (10) Centrifugal separator

The following are a few companies that have chosen MACAIR equipment to protect their compressed air systems from moisture and contaminants:

Federal Aviation Association
Ford Motor Company
General Motors
Chrysler Corp
Copeland Corporation
Federal Reserve
U.S. Air Force
Whirlpool Corporation

Meijer
Detroit Chrome
Jiffy Mix (Chelsea Milling Company)
Amtrak
Dana Corp
3 M
Walmart
U.S. Navy

Other products available from MACAIR:



MHR Heatless Dryers



UA Series
High Capacity



MHT Series
High Temp Dryers



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