



MDM SERIES

MODULAR MEMBRANE AIR DRYERS

OPERATOR MANUAL

MDM1	MDM4	MDM9
MDM13	MDM24	MDM49
MDM66	MDM106	MDM138



WARNING

Personal injury and/or equipment damage will result by failing to pay attention to the vital safety information and instructions in this manual. Carefully read, understand, and retain all safety information and instructions before operating this compressor.

1.0 SAFETY

All compressed gases, including air, can be dangerous. Know and follow all safety rules when using compressed air and especially when breaking into and blowing down compressed air lines to install or modify equipment.

Compressed air treated by this equipment may not be suitable for breathing without further purification. See OSHA standard 29 CFR 1910.134 for breathing air requirements.

Specific safety procedures, including training of all personnel, should be developed and implemented.

2.0 INSTALLATION, START-UP AND OPERATION

2.1 Filtration

Membrane dryers are specifically designed to remove water vapor. Dryer performance and life may be reduced if liquid water or liquid compressor oil enters the dryer. Filter(s) must be installed in front of the dryer to remove both liquid water and oil aerosols. Suitable filters are available from the factory.

The extended three year warranty on dryers requires use of factory supplied or approved coalescing filters. A written record of filter element changes every six months, and drain mechanism replacement yearly must be maintained.

2.2 Pre-Installation

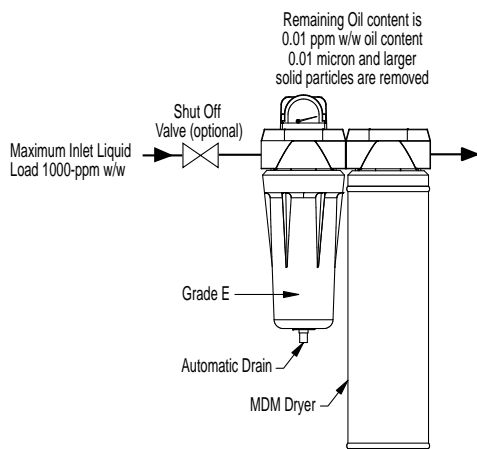
1. Membrane dryers can be used with oil lubricated, water lubricated or non-lubricated compressors.
2. Membrane dryers can be installed indoors or outdoors.
3. Always install a drainable drip leg prior to the inlet filtration to the dryer. This helps prevent the accumulation of water at low points that could overwhelm the water handling capability of the filter.

4. The inlet to the dryers should be as close as possible to the outlet of the filters. Long runs of piping and mounting the dryer inlet below the filter outlet may allow condensate to flow into the dryer and damage it.
5. Before installing the dryer verify that:
 - a) The maximum pressure that could be encountered is less than the dryer and filter rated pressure.
 - b) The compressed air supply temperature and ambient temperature at the dryer will not exceed 150°F (66°C) or the filter temperature rating if this is lower.
 - c) The dryer sweep air will not be obstructed.
6. Membrane dryers and any related Prefiltration equipment are designed to be mounted in a vertical position. In most cases, we do not recommend supporting the module with the process piping. We recommend piping supports be located on either side of, directly in front of, or behind the dryer and filters. Integral dryer support brackets are available from the manufacturer to simplify your installation.

NOTE: It is IMPORTANT for maximum membrane life, that the appropriate filtration system be included with the membrane dryer. Proper prefiltration will ensure the effective removal of particulates, water, compressor lubricant oil, and other types of contaminants. This is best accomplished by the use of our optional integrated pre-filtration. Damage to the membrane dryer or dew point degradation may result if the Prefiltration is removed or relocated at a distance away from the module.

7. Consult your supplier or refer to your Filtration Manual for specific details.

Prefilter Package - One Prefilter



Prefilter Package - Two Prefilters

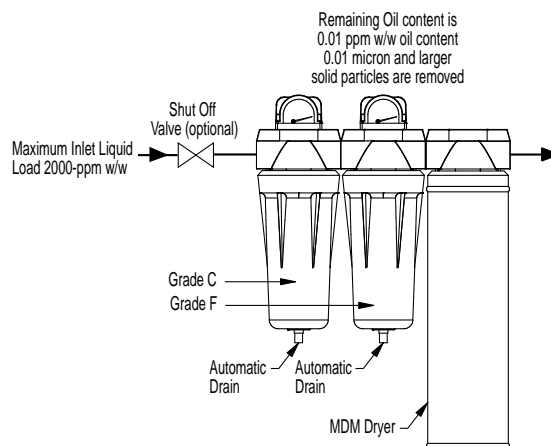


Figure 2.1

2.3 Installation (Continuous Operation)

1. A typical membrane dryer installation is shown schematically in Figure 2.1.
2. Prior to installing the dryer and filters, slowly open the compressed air line shut off valve and allow any accumulated water, oil, or particulates to blow out. Use extreme caution to prevent accidents and injuries during this operation.
3. If after blowing out the line, the compressed air is visibly contaminated with water, oil, or particulates, proper prefiltration, sized for the supply air flow and pressure, must be installed before the dryer to protect and prolong the dryer life. Prefilters are available from the factory. As referenced in Section 2.1.
4. Connect the compressed air supply to the filter and then to the dryer. The coalescing filter should be as close to the dryer as practical (less than one foot separation)(use connector kit) to prevent cooling of the air and condensation of water and oil between the coalescing filter and the dryer. A shut-off valve (ball or gate valve) the same size as the supply line should be installed before the filter and dryer so that the dryer and application can be isolated.
5. Connect the dry air outlet to the application.
6. The filter drains may discharge oil and water. Route the filter drain line to a suitable location in compliance with local regulations.
7. Multiple Dryers for Higher Capacities - Multiple dryers in parallel (see Figure 2.2) can be used to increase capacity beyond that available with a single dryer. All the dryers should be the same model. It is not necessary to provide any mechanism to balance flows between the dryers. Installing prefilters upstream is preferred (for pressure-drop balance and cost). Size prefilters for the combined flow. Figure 2.2 does not show valves that could be used to isolate one dryer; valves are not recommended, but if used, identical valves and configuration must be used for all dryers.

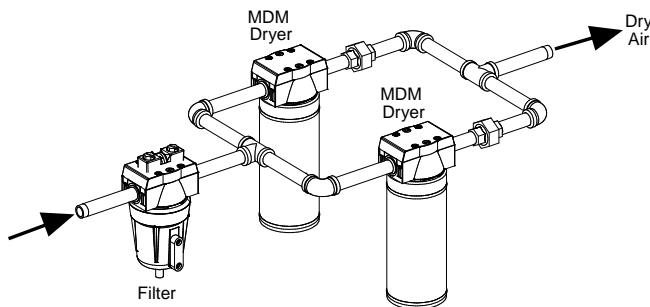


Figure 2.2

2.4 Start-up and Operation

1. Open the air supply to the dryer and check for any possible leaks. Maximum pressurization rate of 10 psi/sec.
- NOTE: Prefilters: The automatic drain may leak air until the pressure builds up to about 10 psig (0.7 kgf/cm²) and will then seal except when discharging accumulated water and oil.
2. The filter differential pressure indicator(s) and drain(s) should be inspected on a regular schedule, preferably at least weekly. If the filter differential pressure indicator enters the red area on either the prefilter or coalescing filter, both of the filter element(s) must be changed. It is recommended that replacement filter elements be kept on hand as spares for fast change-outs to eliminate down time.
- NOTE: If coalescing filter life is consistently less than six months, a prefilter should be installed. If filter life remains less than six months with a prefilter installed, compressor maintenance or excessive line corrosion and/or contamination is indicated.
- NOTE: If any decrease is observed in the drain rate, the filter should be depressurized and the bowl removed. If the liquid level in the bowl is above the automatic drain float, the automatic drain is not operating correctly and should be replaced.
3. Filter element(s) should be replaced on a regular schedule (preferably every six months). When replacing the filter element, the filter bowl and automatic drain should be washed with warm soapy water to remove any accumulated oil.
 4. To shutdown the dryer turn off the air supply and allow the pressure to decrease to atmospheric. Maximum de-pressurization of 10 psi/sec.

2.5 Intermittent or Cyclic Operation

When the dryer is operated in a cyclic or intermittent manner, the pressurization and depressurization rates must be 10 psi/sec (or less) to prevent damage to the membrane bundle.

See your membrane dryer distributor for details regarding installation.

3.0 MAINTENANCE AND TROUBLESHOOTING

The only routine maintenance required is replacement of the filter element(s) every six months and rebuilding or replacing the drain mechanism annually. There are no repairable components within the membrane dryer. Replacement of the membrane bundle can be performed if damaged or oil soaked.

To ensure performance of the membrane dryer and to obtain maximum compressor life, all compressor maintenance schedules recommended by the compressor manufacturer should be followed.

3.1 Filter Elements

If the filter differential pressure indicator shows red, filter element(s) must be changed. Continuing to operate for an extended period after the filter differential pressure indicator(s) have changed completely to red could result in low air pressure, high dew points; and eventually in failure of the filter element leading to contamination and damage of the dryer.

Filter element(s) should be changed at least every six months. See Section 2.1.

If the coalescing filter element life is consistently less than six months, a prefilter should be installed. If filter element life remains less than six months with a prefilter installed, compressor maintenance or excessive line corrosion or contamination is indicated.

Detailed instructions for element replacement are supplied with the filter(s) and replacement element(s).

3.2 Filter Automatic Drains

If a high water level is observed in a filter liquid level indicator, the automatic drain is not functioning correctly. The dryer should be shut down and the drain mechanism should be repaired or replaced before proceeding. Extended operation with malfunctioning automatic drain(s) could result in liquid water and oil entering the dryer, resulting in elevated dew points and damage to the dryer. See instructions supplied with the filter to replace the automatic drain.

3.3 High Dew Point

Before attempting to troubleshoot the membrane dryer verify that the dry air usage is at or below the design level. High air flow will result in high dew points.

The most likely cause of high dew point is low air supply pressure, due to either low pressure to the filters or high pressure drop across the filters. The latter will be indicated by the filter differential pressure indicator.

Another possible cause of high dew point is failure of the automatic drains as discussed in section 3.2.

3.4 Recovery From Water Flooding

Liquid water entering the membrane dryer will result in a fluctuating or elevated outlet dew point. Dryer performance will return to normal after the liquid water is eliminated.

Replacement Bundles

Model Number	Replacement Bundle Part Number
MDM1	MDMMK1-II
MDM4	MDMMK2-II
MDM9	MDMMK3-II
MDM13	MDMMK4-II
MDM24	MDMMK5-II
MDM49	MDMMK6-II
MDM66	MDMMK7-II
MDM106	MDMMK8-II
MDM138	MDMMK9-II

4.0 SIZING TABLES

Table 1 Inlet and Outlet Flow Capacities (scfm) at 100 psig

Inlet Temperature (1)			Outlet Pressure Dew Point					
			50°F (10°C)	40°F (4.4°C)	20°F (-6.7°C)	0°F (-17.8°C)	-20°F (-29°C)	-40°F (-40°C)
MDM1	40°F (4.4°C)	Inlet	-	-	-	1.48	1.07	0.81
		Outlet	-	-	-	1.29	0.88	0.62
	60°F (16°C)	Inlet	-	-	1.62	1.18	0.90	0.69
		Outlet	-	-	1.43	0.99	0.71	0.50
	80°F (27°C)	Inlet	-	1.76	1.29	0.99	0.77	0.60
		Outlet	-	1.57	1.10	0.80	0.58	0.41
	100°F (38°C)	Inlet	1.59	1.39	1.08	0.85	0.67	0.53
MDM4		Outlet	1.40	1.20	0.89	0.66	0.48	0.34
	120°F (49°C)	Inlet	1.31	1.17	0.94	0.75	0.60	0.48
		Outlet	1.12	0.98	0.75	0.56	0.41	0.29
	150°F (66°C)	Inlet	1.06	0.96	0.79	0.64	0.52	-
		Outlet	0.87	0.77	0.60	0.45	0.33	-
	40°F (4.4°C)	Inlet	-	-	-	4.80	3.56	2.75
		Outlet	-	-	-	4.20	2.96	2.15
MDM9	60°F (16°C)	Inlet	-	-	5.24	3.88	3.02	2.38
		Outlet	-	-	4.64	3.28	2.42	1.78
	80°F (27°C)	Inlet	-	5.67	4.23	3.30	2.63	2.10
		Outlet	-	5.07	3.63	2.70	2.03	1.50
	100°F (38°C)	Inlet	5.15	4.55	3.60	2.89	2.34	1.88
		Outlet	4.55	3.95	3.00	2.29	1.74	1.28
	120°F (49°C)	Inlet	4.29	3.88	3.16	2.58	2.10	1.70
MDM106		Outlet	3.69	3.28	2.56	1.98	1.50	1.10
	150°F (66°C)	Inlet	3.52	3.23	2.69	2.22	1.83	-
		Outlet	2.92	2.63	2.09	1.62	1.23	-
	40°F (4.4°C)	Inlet	-	-	-	10.04	7.21	5.38
		Outlet	-	-	-	8.72	5.89	4.06
	60°F (16°C)	Inlet	-	-	11.09	7.93	5.98	4.57
		Outlet	-	-	9.77	6.61	4.66	3.25
MDM138	80°F (27°C)	Inlet	-	12.07	8.73	6.62	5.11	3.97
		Outlet	-	10.75	7.41	5.30	3.79	2.65
	100°F (38°C)	Inlet	10.87	9.47	7.29	5.69	4.47	3.50
		Outlet	9.55	8.15	5.97	4.37	3.15	2.18
	120°F (49°C)	Inlet	8.88	7.92	6.29	4.99	3.96	3.13
		Outlet	7.56	6.60	4.97	3.67	2.64	1.81
	150°F (66°C)	Inlet	7.09	6.44	5.24	4.22	3.39	-
MDM13		Outlet	5.77	5.12	3.92	2.90	2.07	-
	40°F (4.4°C)	Inlet	-	-	-	14.41	10.83	8.46
		Outlet	-	-	-	12.63	9.05	6.68
	60°F (16°C)	Inlet	-	-	15.72	11.75	9.24	7.36
		Outlet	-	-	13.94	9.97	7.46	5.58
	80°F (27°C)	Inlet	-	16.96	12.76	10.07	8.10	6.53
		Outlet	-	15.18	10.98	8.29	6.32	4.75
MDM24	100°F (38°C)	Inlet	15.45	13.69	10.94	8.86	7.22	5.87
		Outlet	13.67	11.91	9.16	7.08	5.44	4.09
	120°F (49°C)	Inlet	12.95	11.74	9.65	7.93	6.52	5.33
		Outlet	11.17	9.96	7.87	6.15	4.74	3.55
	150°F (66°C)	Inlet	10.68	9.84	8.26	6.88	5.71	-
		Outlet	8.90	8.06	6.48	5.10	3.93	-
	40°F (4.4°C)	Inlet	-	-	-	25.7	18.4	13.3
MDM49		Outlet	-	-	-	22.4	15.1	10.0
	60°F (16°C)	Inlet	-	-	28.4	20.3	15.0	11.0
		Outlet	-	-	25.1	17.0	11.7	7.7
	80°F (27°C)	Inlet	-	30.8	22.4	16.8	12.6	9.3
		Outlet	-	27.5	19.1	13.5	9.3	6.0
	100°F (38°C)	Inlet	27.8	24.3	18.6	14.2	10.7	7.9
		Outlet	24.5	21.0	15.3	10.9	7.4	4.6
MDM66	120°F (49°C)	Inlet	22.8	20.3	15.9	12.2	9.3	6.8
		Outlet	19.5	17.0	12.6	8.9	6.0	3.5
	150°F (66°C)	Inlet	18.1	16.3	12.9	10.0	7.6	-
		Outlet	14.8	13.0	9.6	6.7	4.3	-
	40°F (4.4°C)	Inlet	-	-	-	42.6	32.4	25.3
		Outlet	-	-	-	37.5	27.3	20.2
	60°F (16°C)	Inlet	-	-	46.2	35.1	27.7	21.9
MDM106		Outlet	-	-	41.1	30.0	22.6	16.8
	80°F (27°C)	Inlet	-	49.6	37.9	30.2	24.2	19.3
		Outlet	-	44.5	32.8	25.1	19.1	14.2
	100°F (38°C)	Inlet	45.5	40.5	32.7	26.6	21.5	17.1
		Outlet	40.4	35.4	27.6	21.5	16.4	12.0
	120°F (49°C)	Inlet	38.5	35.0	28.9	23.7	19.2	15.3
		Outlet	33.4	29.9	23.8	18.6	14.1	10.2
MDM138	150°F (66°C)	Inlet	32.0	29.5	24.7	20.4	16.6	-
		Outlet	26.9	24.4	19.6	15.3	11.5	-
	40°F (4.4°C)	Inlet	-	-	-	113.0	79.8	57.6
		Outlet	-	-	-	98.3	65.1	42.9
	60°F (16°C)	Inlet	-	-	124.8	88.5	65.0	47.4
		Outlet	-	-	110.1	73.8	50.3	32.7
	80°F (27°C)	Inlet	-	135.9	97.8	72.7	54.2	39.8
MDM138		Outlet	-	121.2	83.1	58.0	39.5	25.1
	100°F (38°C)	Inlet	122.4	106.3	80.8	61.4	46.1	33.8
		Outlet	107.7	91.6	66.1	46.7	31.4	19.1
	120°F (49°C)	Inlet	99.5	88.4	68.8	52.7	39.7	29.2
		Outlet	84.8	73.7	54.1	38.0	25.0	14.5
	150°F (66°C)	Inlet	78.5	70.6	55.8	43.0	32.4	-
		Outlet	63.8	55.9	41.1	28.3	17.7	-
MDM138	40°F (4.4°C)	Inlet	-	-	-	146.5	104.8	76.6
		Outlet	-	-	-	127.7	86.0	57.8
	60°F (16°C)	Inlet	-	-	161.4	115.7	86.0	63.7
		Outlet	-	-	142.6	96.9	67.2	44.9
	80°F (27°C)	Inlet	-	175.3	127.4	95.8	72.4	53.8
		Outlet	-	156.5	108.6	77.0	53.6	35.0
	100°F (38°C)	Inlet	158.3	138.1	106.1	81.4	62.0	46.2
MDM138		Outlet	139.5	119.3	87.3	62.6	43.2	27.4
	120°F (49°C)	Inlet	129.6	115.5	90.9	70.4	53.8	40.1
		Outlet	110.8	96.7	72.1	51.6	35.0	21.3
	150°F (66°C)	Inlet	103.1	93.1	74.4	58.0	44.4	-
		Outlet	84.3	74.3	55.6	39.2	25.6	-

- (1) Use inlet air temperature if the air entering the dryer has not been dried upstream (air is saturated). If air has been dried. (e.g. in a refrigerated dryer) use the dew point temperature of the inlet air.
- (2) Flow capacities at 100 psig (7 kgf/cm²). For capacities at other pressures consult factory. Capacities are established in accordance with CAGI (Compressed Air and Gas Institute) Standard ADF 700: Membrane Compressed Air Dryers - Methods for Testing and Rating.

Table 2 Inlet and Outlet Flow Capacities (m³/min) @ 7 bar g (2)

Inlet Temperature (1)			Outlet Pressure Dew Point					
			10°C (50°F)	3°C (37°F)	-10°C (14°F)	-20°C (-4°F)	-30°C (-22°F)	-40°C (-40°F)
MDM1	5°C (41°F)	Inlet	-	-	-	0.038	0.029	0.023
		Outlet	-	-	-	0.033	0.024	0.017
	20°C (68°F)	Inlet	-	-	0.038	0.029	0.023	0.018
		Outlet	-	-	0.032	0.024	0.018	0.013
	30°C (86°F)	Inlet	-	0.044	0.032	0.025	0.020	0.016
		Outlet	-	0.039	0.026	0.020	0.015	0.011
	40°C (104°F)	Inlet	0.043	0.037	0.028	0.022	0.018	0.015
		Outlet	0.038	0.031	0.022	0.017	0.013	0.009
MDM4	50°C (122°F)	Inlet	0.036	0.032	0.025	0.020	0.016	0.013
		Outlet	0.031	0.026	0.019	0.015	0.011	0.008
	66°C (150°F)	Inlet	0.030	0.027	0.021	0.017	0.014	-
		Outlet	0.024	0.021	0.015	0.012	0.009	-
	5°C (41°F)	Inlet	-	-	-	0.126	0.097	0.077
		Outlet	-	-	-	0.108	0.080	0.060
	20°C (68°F)	Inlet	-	-	0.123	0.098	0.079	0.064
		Outlet	-	-	0.106	0.080	0.062	0.047
MDM9	30°C (86°F)	Inlet	-	0.143	0.105	0.086	0.070	0.057
		Outlet	-	0.126	0.088	0.068	0.053	0.040
	40°C (104°F)	Inlet	0.140	0.121	0.093	0.077	0.063	0.052
		Outlet	0.123	0.103	0.076	0.059	0.046	0.035
	50°C (122°F)	Inlet	0.120	0.106	0.083	0.069	0.058	0.048
		Outlet	0.102	0.088	0.066	0.052	0.040	0.031
	66°C (150°F)	Inlet	0.099	0.089	0.072	0.061	0.051	-
		Outlet	0.082	0.072	0.055	0.043	0.034	-
MDM13	5°C (41°F)	Inlet	-	-	-	0.261	0.196	0.151
		Outlet	-	-	-	0.223	0.158	0.113
	20°C (68°F)	Inlet	-	-	0.256	0.197	0.154	0.122
		Outlet	-	-	0.218	0.158	0.117	0.084
	30°C (86°F)	Inlet	-	0.302	0.214	0.170	0.135	0.108
		Outlet	-	0.264	0.177	0.132	0.097	0.070
	40°C (104°F)	Inlet	0.294	0.249	0.186	0.149	0.120	0.097
		Outlet	0.256	0.212	0.148	0.111	0.082	0.059
MDM24	50°C (122°F)	Inlet	0.247	0.215	0.164	0.133	0.108	0.088
		Outlet	0.209	0.177	0.126	0.095	0.070	0.050
	66°C (150°F)	Inlet	0.201	0.178	0.139	0.114	0.094	-
		Outlet	0.163	0.140	0.101	0.076	0.056	-
MDM49	5°C (41°F)	Inlet	-	-	-	0.379	0.296	0.238
		Outlet	-	-	-	0.328	0.245	0.186
	20°C (68°F)	Inlet	-	-	0.372	0.297	0.242	0.198
		Outlet	-	-	0.321	0.246	0.191	0.147
	30°C (86°F)	Inlet	-	0.430	0.320	0.262	0.216	0.179
		Outlet	-	0.379	0.269	0.211	0.165	0.128
	40°C (104°F)	Inlet	0.420	0.364	0.283	0.235	0.196	0.163
		Outlet	0.369	0.313	0.232	0.184	0.145	0.112
MDM106	50°C (122°F)	Inlet	0.361	0.320	0.255	0.214	0.179	0.150
		Outlet	0.310	0.269	0.204	0.163	0.128	0.099
	66°C (150°F)	Inlet	0.302	0.273	0.221	0.188	0.159	-
		Outlet	0.251	0.222	0.170	0.137	0.107	-
	5°C (41°F)	Inlet	-	-	-	0.669	0.498	0.374
		Outlet	-	-	-	0.575	0.403	0.279
	20°C (68°F)	Inlet	-	-	0.656	0.500	0.383	0.291
		Outlet	-	-	0.561	0.405	0.289	0.196
MDM138	30°C (86°F)	Inlet	-	0.773	0.548	0.426	0.329	0.250
		Outlet	-	0.678	0.453	0.331	0.234	0.155
	40°C (104°F)	Inlet	0.753	0.639	0.470	0.369	0.286	0.217
		Outlet	0.658	0.545	0.375	0.274	0.191	0.123
	50°C (122°F)	Inlet	0.633	0.548	0.410	0.323	0.251	0.191
		Outlet	0.538	0.453	0.315	0.229	0.156	0.096
	66°C (150°F)	Inlet	0.511	0.448	0.340	0.269	0.209	-
		Outlet	0.416	0.354	0.245	0.174	0.114	-
MDM138	5°C (41°F)	Inlet	-	-	-	1.123	0.887	0.711
		Outlet	-	-	-	0.976	0.740	0.565
	20°C (68°F)	Inlet	-	-	1.104	0.889	0.725	0.588
		Outlet	-	-	0.958	0.743	0.579	0.442
	30°C (86°F)	Inlet	-	1.266	0.955	0.786	0.646	0.526
		Outlet	-	1.120	0.809	0.639	0.500	0.379
	40°C (104°F)	Inlet	1.238	1.082	0.847	0.704	0.581	0.474
		Outlet	1.092	0.935	0.701	0.558	0.435	0.327
MDM138	50°C (122°F)	Inlet	1.073	0.956	0.763	0.638	0.527	0.430
		Outlet	0.927	0.810	0.617	0.491	0.381	0.284
	66°C (150°F)	Inlet	0.905	0.817	0.661	0.555	0.459	-
		Outlet	0.759	0.671	0.515	0.409	0.313	-

Inlet Temperature (1)			Outlet Pressure Dew Point					
			10°C (50°F)	3°C (37°F)	-10°C (14°F)	-20°C (-4°F)	-30°C (-22°F)	-40°C (-40°F)
MDM66	5°C (41°F)	Inlet	-	-	-	1.830	1.310	0.943
		Outlet	-	-	-	1.555	1.035	0.667
	20°C (68°F)	Inlet	-	-	1.789	1.315	0.971	0.705
		Outlet	-	-	1.513	1.040	0.696	0.430
	30°C (86°F)	Inlet	-	2.149	1.450	1.095	0.814	0.593
		Outlet	-	1.874	1.185	0.820	0.539	0.317
	40°C (104°F)	Inlet	2.087	1.739	1.226	0.928	0.692	0.504
		Outlet	1.812	1.464	0.951	0.653	0.417	0.229
MDM106	50°C (122°F)	Inlet	1.719	1.461	1.049	0.798	0.596	0.434
		Outlet	1.444	1.186	0.773	0.523	0.320	0.159
	66°C (150°F)	Inlet	1.349	1.162	0.844	0.644	0.481	-
		Outlet	1.074	0.887	0.569	0.369	0.206	-
	5°C (41°F)	Inlet	-	-	-	2.93	2.16	1.61
		Outlet	-	-	-	2.51	1.74	1.19
	20°C (68°F)	Inlet	-	-	2.87	2.17	1.66	1.25
		Outlet	-	-	2.45	1.75	1.23	0.83
MDM138	30°C (86°F)	Inlet	-	3.40	2.38	1.84	1.42	1.07
		Outlet	-	2.98	1.96	1.42	0.99	0.65
	40°C (104°F)	Inlet	3.31	2.80	2.04	1.59	1.23	0.93
		Outlet	2.88	2.37	1.62	1.17	0.81	0.51
	50°C (122°F)	Inlet	2.77	2.39	1.77	1.39	1.08	0.81
		Outlet	2.34	1.96	1.35	0.97	0.65	0.39
	66°C (150°F)	Inlet	2.22	1.94	1.46	1.15	0.89	-
		Outlet	1.80	1.52	1.04	0.73	0.47	-
MDM138	5°C (41°F)	Inlet	-	-	-	3.81	2.84	2.15
		Outlet	-	-	-	3.27	2.31	1.61
	20°C (68°F)	Inlet	-	-	3.73	2.85	2.20	1.68
		Outlet	-	-	3.19	2.32	1.66	1.14
	30°C (86°F)	Inlet	-	4.40	3.12	2.44	1.90	1.45
		Outlet	-	3.86	2.58	1.90	1.36	0.91
	40°C (104°F)	Inlet	4.28	3.64	2.69	2.12	1.66	1.27
		Outlet	3.74	3.10	2.15	1.58	1.12	0.73
MDM138	50°C (122°F)	Inlet	3.60	3.13	2.35	1.87	1.46	1.12
		Outlet	3.07	2.59	1.81	1.33	0.92	0.58
	66°C (150°F)	Inlet	2.92	2.57	1.96	1.56	1.22	-
		Outlet	2.38	2.03	1.42	1.02	0.68	-

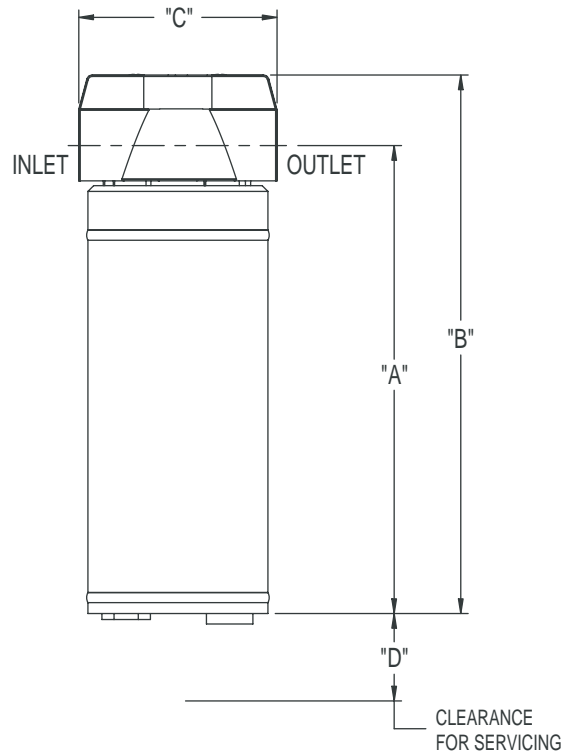
Inlet Temperature (1)			Outlet Pressure Dew Point					
			10°C (50°F)	3°C (37°F)	-10°C (14°F)	-20°C (-4°F)	-30°C (-22°F)	-40°C (-40°F)
MDM13	5°C (41°F)	Inlet	-	-	-	0.379	0.296	0.238
		Outlet	-	-	-	0.328	0.245	0.186
	20°C (68°F)	Inlet	-	-	0.372	0.297	0.242	0.198
		Outlet	-	-	0.321	0.246	0.191	0.147
	30°C (86°F)	Inlet	-	0.430	0.320	0.262	0.216	0.179
		Outlet	-	0.379	0.269	0.211	0.165	0.128
	40°C (104°F)	Inlet	0.420	0.364	0.283	0.235	0.196	0.163
		Outlet	0.369	0.313	0.232	0.184	0.145	0.112
MDM24	50°C (122°F)	Inlet	0.361	0.320	0.255	0.214	0.179	0.150
		Outlet	0.310	0.269	0.204	0.163	0.128	0.099
	66°C (150°F)	Inlet	0.302	0.273	0.221	0.188	0.159	-
		Outlet	0.251	0.222	0.170	0.137	0.107	-
	5°C (41°F)	Inlet	-	-	-	0.669	0.498	0.374
		Outlet	-	-	-	0.575	0.403	0.279
	20°C (68°F)	Inlet	-	-	0.656	0.500	0.383	0.291
		Outlet	-	-	0.561	0.405	0.289	0.196
MDM49	30°C (86°F)	Inlet	-	0.773	0.548	0.426	0.329	0.250
		Outlet	-	0.678	0.453	0.331	0.234	0.155
	40°C (104°F)	Inlet	0.753	0.639	0.470	0.369	0.286	0.217
		Outlet	0.658	0.545	0.375	0.274	0.191	0.123
	50°C (122°F)	Inlet	0.633	0.548	0.410	0.323	0.251	0.191
		Outlet	0.538	0.453	0.315	0.229	0.156	0.096
	66°C (150°F)	Inlet	0.511	0.448	0.340	0.269	0.209	-
		Outlet	0.416	0.354	0.245	0.174	0.114	-
MDM49	5°C (41°F)	Inlet	-	-	-	1.123	0.887	0.711
		Outlet	-	-	-	0.976	0.740	0.565
	20°C (68°F)	Inlet	-	-	1.104	0.889	0.725	0.588
		Outlet	-	-	0.958	0.743	0.579	0.442
	30°C (86°F)	Inlet	-	1.266	0.955	0.786	0.646	0.526
		Outlet	-	1.120	0.809	0.639	0.500	0.379
	40°C (104°F)	Inlet	1.238	1.082	0.847	0.704	0.581	0.474
		Outlet	1.092	0.935	0.701	0.558	0.435	

5.0 DIMENSIONS AND WEIGHTS

Table 3 Physical Description

Model	Dimensions & Connections in					Weight lb	Maximum Working Pressure psig	Maximum Operating Temp. °F
	A	B	C	D	Inlet / Outlet*			
MDM1	10	11	4	3	3/8" or 1/2"	5	200	150
MDM4	14	15	4	3	3/8" or 1/2"	6	200	150
MDM9	18	19	4	3	3/8" or 1/2"	7	200	150
MDM13	26	27	4	3	3/8" or 1/2"	8	200	150
MDM24	19	20	5	3	3/4" or 1"	11	200	150
MDM49	26	27	5	3	3/4" or 1"	14	200	150
MDM66	28	29	6	4	1"	17	200	150
MDM106	32	35	6	4	1"	35	200	150
MDM138	39	41	6	4	1"	40	200	150

- * NPT or BSP thread
- * Maximum Use Temperature: 150°F (65°C)
- * Maximum Use Pressure: 200 psig (13.8 bar)
- * Minimum Use Pressure: 60 psig (4 bar)



6.0 WARRANTY AND CONDITIONS OF SALE

The manufacturer warrants the product manufactured by it, when properly installed, operated, applied, and maintained in accordance with procedures and recommendations outlined in manufacturer's instruction manuals, to be free from defects in material or workmanship for a period of one (1) year from the date of shipment to the buyer by the manufacturer or manufacturer's authorized distributor, or eighteen months from the date of shipment from the factory, whichever occurs first, provided such defect is discovered and brought to the manufacturer's attention within the aforesaid warranty period. The manufacturer will repair or replace any product or part determined to be defective by the manufacturer within the warranty period, provided such defect occurred in normal service and not as a result of misuse, abuse, neglect or accident.

The warranty covers parts and labor for the warranty period. Repair or replacement shall be made at the factory or the installation site, at the sole option of the manufacturer. Any service performed on the product by anyone other than the manufacturer must first be authorized by the manufacturer. Normal maintenance items requiring routine replacement are not warranted. Unauthorized service voids the warranty and any resulting charge or subsequent claim will not be paid. Products repaired or replaced under warranty shall be warranted for the unexpired portion of the warranty applying to the original product. The foregoing is the exclusive remedy of any buyer of the manufacturer's product. The maximum damages liability of the manufacturer is the original purchase price of the product or part.

THE FOREGOING WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, WHETHER WRITTEN, ORAL, OR STATUTORY, AND IS EXPRESSED IN LIEU OF THE IMPLIED WARRANTY OF MERCHANTABILITY AND THE IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE. THE MANUFACTURER SHALL NOT BE LIABLE FOR LOSS OR DAMAGE BY REASON OF STRICT LIABILITY IN TORT OR ITS NEGLIGENCE IN WHATEVER MANNER INCLUDING DESIGN, MANUFACTURE OR INSPECTION OF THE EQUIPMENT OR ITS FAILURE TO DISCOVER, REPORT, REPAIR, OR MODIFY LATENT DEFECTS INHERENT THEREIN. THE MANUFACTURER, HIS REPRESENTATIVE OR DISTRIBUTOR SHALL NOT BE LIABLE FOR LOSS OF USE OF THE PRODUCT OR OTHER INCIDENTAL OR CONSEQUENTIAL COSTS, EXPENSES, OR DAMAGES INCURRED BY THE BUYER, WHETHER ARISING FROM BREACH OF WARRANTY, NEGLIGENCE OR STRICT LIABILITY IN TORT.

The manufacturer does not warrant any product, part, material, component, or accessory manufactured by others and sold or supplied in connection with the sale of manufacturer's products.

AUTHORIZATION FROM THE SERVICE DEPARTMENT IS NECESSARY BEFORE MATERIAL IS RETURNED TO THE FACTORY OR IN-WARRANTY REPAIRS ARE MADE.

3 Year Warranty

The standard one year warranty is extended to three years when the dryer is installed with an optional prefilter package. To keep the warranty in effect, elements must be replaced on six month intervals and the drain mechanism yearly.

Maintenance Schedule

	Service Performed	Date	By
Installation			
6 Month Maintenance			
12 Month Maintenance			
18 Month Maintenance			
24 Month Maintenance			
30 Month Maintenance			
36 Month Maintenance			



CURTIS-TOLEDO®, INC.

1905 KIENLEN AVENUE | ST. LOUIS, MO 63133

314-383-1300 OR 800-925-5431

WWW.FSCURTIS.COM | INFO@FSCURTIS.COM