Ingersoll Rand
Air Solutions

DRY STAR

REFRIGERATED AIR DRYERS

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DS Series Refrigerated Dryer Performance
Dryer Sizing Chart

Inlet Air Temperature		Inlet Air Pressure PSIG (BAR) Flow (% of Rated Capacity)										
		60	80	90	100	110	125	150	175	200	220	232
(°F)	(°C)	4.1	5.5	6.2	6.9	7.6	8.6	10.3	12.4	13.8	15.2	16
90	32.2	1.03	1.15	1.20	1.24	1.28	1.29	1.39	1.44	1.48	1.50	1.51
95	35.0	0.92	1.03	1.08	1.11	1.14	1.19	1.24	1.29	1.32	1.34	1.35
100	37.8	0.83	0.93	0.97	1.00	1.03	1.07	1.12	1.16	1.19	1.21	1.22
105	40.6	0.76	0.85	0.88	0.91	0.94	0.97	1.02	1.06	1.08	1.10	1.11
110	43.3	0.67	0.75	0.79	0.81	0.83	0.87	0.91	0.94	0.96	0.98	0.99
115	46.1	0.61	0.69	0.72	0.74	0.76	0.79	0.83	0.86	0.88	0.90	0.90
120	48.9	0.56	0.62	0.65	0.67	0.69	0.72	0.75	0.78	0.80	0.81	0.82
125	51.7	0.51	0.57	0.59	0.61	0.63	0.65	0.68	0.71	0.73	0.74	0.74
130	54.4	0.46	0.52	0.54	0.56	0.58	0.60	0.63	0.65	0.67	0.68	0.68
135	57.2	0.38	0.42	0.44	0.50	0.47	0.49	0.51	0.53	0.54	0.55	0.56
140	60.0	0.30	0.34	0.35	0.45	0.38	0.39	0.41	0.42	0.43	0.44	0.44

Inlet temperature, pressure, air flow, pressure dew point, and maximum ambient temperature must be established before a refrigerated air dryer can be specified for your application. Once these operating conditions are known, you can select the most economical refrigerated dryer using the **Dryer Sizing Chart and the Model Selection Chart.**

Example: Select a dryer for a compressor producing, 38 scfm (1.1 m^3/min), 90 psig (6.2 barg), 120°F (48.9°C) inlet temperature, 38°F (3.3°C) pressure dew point and 100°F (37.8°C) maximum ambient temperature.

Step 1. On the **Dryer Sizing Chart**, locate the inlet temperature 120°F (50°C).

Step 2. At 120°F (50°C) inlet air temperature, read across the chart to 90 psig (6.2 barg) operating pressure. At the operating temperature, pressure and 38°F (3°C) pressure dew point the correction factor will be 0.65 (65%) of dryer rated capacity.

Step 3. To adjust the required flow for rated conditions, divide the required flow by 0.65.

38 scfm/0.65 = 58.5 scfm

Step 4. Using the **Model Selection Chart**, select a dryer which has a rated capacity of at least 61.5 scfm (1.7 m^3/min) or larger. Select model DS75.

Dryer capacity will be affected if a dew point higher than 38°F (3°C) is specified. For accurate sizing, divide rated dryer capacity from step 3 by appropriate correction factor from table below. For 50°F (10°C) dew point, required dryer capacity is 61.5 scfm (1.7 m^3/min) divided by 1.46 or 42.1 scfm (1.2 m^3/min)

Dew Point Correction Factors

Dew Point		
(°F)	(°C)	Factor
38	3.3	1.00
41	5.0	1.12
45	7.2	1.24
50	10.0	1.46

Using the same **Model Selection Chart**, select a model DS50. An application that can tolerate a dew point higher than 38°F permits the selection of a smaller, more economical dryer.

Ambient temperatures other than 100°F (38°C) will affect dryer performance. Ambient temperatures higher than 100°F (38°C) reduce the refrigeration system capacity to provide sufficient cooling for dryer's rated capacity. Ambient temperatures lower than 100°F (38°C) increases the refrigeration system capacity and permits selection of a smaller, more economical dryer.

For accurate dryer sizing in various ambient temperatures, divide the rated dryer capacity determined in Step 3 by the appropriate correction factor from Ambient Temperature Correction Factor table. For ambient temperature of 80°F (27°C), required dryer capacity is 58.5 scfm (1.6 m^3/min) divided by 1.17 or 50.0 scfm (1.4 m^3/min). From the **Model Selection Chart** select DS50.

Ambient Temperature Correction Factors

Ambient Air Temperature		
(°F)	(°C)	Factor
60	16	1.34
70	21	1.26
80	27	1.17
90	32	1.09
100	38	1.00
110	43	0.94
115	46	0.91

Model Selection Chart

Flow (scfm)	Model
5	DS5
10	DS10
15	DS15
25	DS25
35	DS35
50	DS50
75	DS75
100	DS100