Air Preparation Equipment

Model Selection Guide

Class	Solid particle: Max. number of particles/1 m³ — Particle size d μm: ≤ 0.10	0.10 < d ≤ 0.5	0.5 < d ≤ 1.0	1.0 < d ≤ 5.0	Particle size μm	Concentration mg/m³
1	Not specified	100	1	0	NA	NA
2	Not specified	100000	1000	10		
3	Not specified	Not specified	10000	500		
4	Not specified	Not specified	Not specified	1000		
5	Not specified	Not specified	Not specified	20000		
6	NA				≤ 5	≤ 5
7	NA				≤ 40	≤ 10

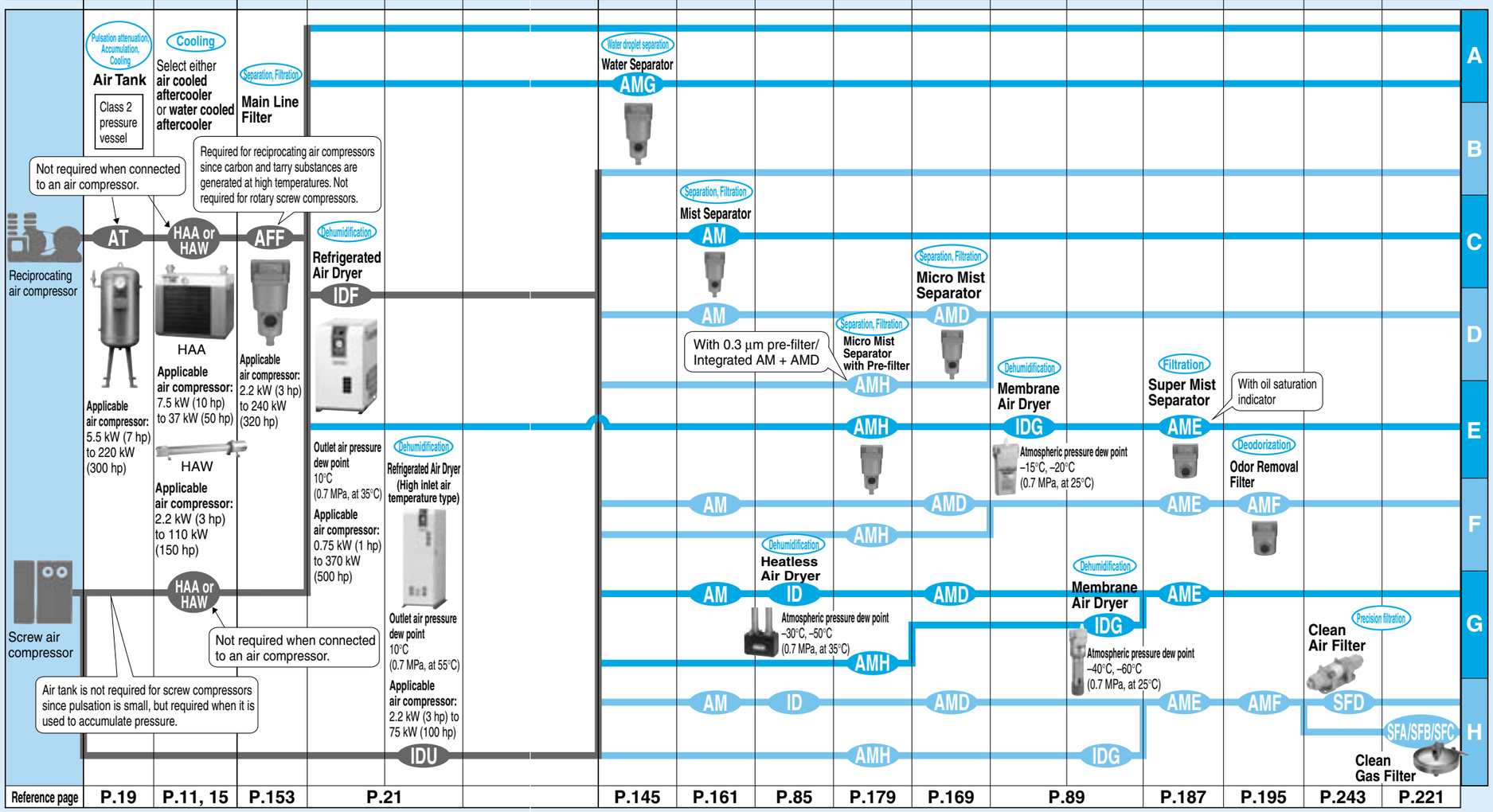
Class	Moisture: Pressure dew point (At air pressure of 0.7 MPa) °C
1	≤ −70
2	≤ −40
3	≤ −20
4	≤ +3
5	≤ +7
6	≤ +10

Class	Oil: Oil concentration mg/m³
1	≤ 0.01
2	≤ 0.1
3	≤ 1
4	≤ 5

Indication: The degree of quality is indicated with 1, 4 and 2 for systems with solid particle “class 1,” moisture “class 4” and oil “class 2.”

System no.	Application	Impurity in compressed air: Moisture — Dew point	Moisture contents	Filtration	Oil mist concentration (1)	Cleanliness	Oil odor	Quality grade as system (2)
A	Water drop removed air • Air blowing (Simple removal of particles) • General pneumatic tools	Atmospheric pressure dew point 6°C 0.7 MPa Pressure dew point 40°C	7 g/m³ (ANR) (0.7 MPa, at 25°C)	3 μm (Filtering efficiency 99%)	—	—	—	3, -, -
B	Dry air • Used for the same applications as A, when temperature drop in the middle of piping is large.							3, 4, - 3, 5, - 3, 6, -
C	Dry air • General pneumatic equipment • General painting	Atmospheric pressure dew point −14 to −23°C 0.7 MPa Pressure dew point 15 to 3°C	1.7 g/m³ (ANR) to 0.8 g/m³ (ANR)	0.3 μm (Filtering efficiency 99.9%)	Max. 1 mg/m³ (ANR) 0.8 ppm	Particles with 0.3 μm or more: 100 or less/ft³ (35 or less/10 ℓ (ANR))	Yes	2, 4, 3 2, 5, 3 2, 6, 3
D	Dry clean air • High grade painting • Sequence control • Measurement device • Instrumentation • Drying and cleaning (Precision parts) • Machine tools (Pneumatic bearing)				Max. 0.1 mg/m³ (ANR) 0.08 ppm			1, 4, 2 1, 5, 2 1, 6, 2
E	Dry clean air • Without refrigerated air dryer on the sub line • Built-in with equipment (With machine tools, 3-D measurement device, etc.)			0.01 μm (Filtering efficiency 99.9%)	Max. 0.01 mg/m³ (ANR) 0.008 ppm			1, 4, 1 1, 5, 1 1, 6, 1
F	Deodorant air • Stirring, transporting, drying and packaging • Food industry (Except direct blowing to foods)				Max. 0.004 mg/m³ (ANR) 0.0032 ppm		No	
G	Low dew point clean air • Drying electric and electronic parts • Drying a filling tank • Transporting powders • Ozone generator • Low temperature actuated equipment	Atmospheric pressure dew point −30 to −60°C 0.7 MPa Pressure dew point −6 to −42°C	0.5 g/m³ (ANR) to 0.02 g/m³ (ANR)		Max. 0.01 mg/m³ (ANR) 0.008 ppm		Yes	(3) 1, 1, 1 1, 2, 1 1, 3, 1
H	Low dew point clean air (For clean room) • Blowing semi-conductor parts in the clean room			0.01 μm (Filtering efficiency 99.99%)	Max. 0.004 mg/m³ (ANR) 0.0032 ppm	Particles with 0.1 μm or more: 0/6 ℓ	No	

Description	Air Tank	Air Cooled Aftercooler / Water Cooled Aftercooler	Main Line Filter	Refrigerated Air Dryer		Water Separator	Mist Separator	Heatless Air Dryer	Micro Mist Separator with Pre-filter	Micro Mist Separator	Membrane Air Dryer		Super Mist Separator	Odor Removal Filter	Clean Air Filter	Clean Gas Filter
Model	AT	HAA, HAW	AFF	IDF	IDU	AMG	AM	ID	AMH	AMD	IDG		AME	AMF	SFD	SFA, SFB, SFC
Flow capacity (ℓ/min (ANR))	Capacity 100 to 3,000 ℓ	1,000 to 5,700 300 to 18,000	300 to 42,000	100 to 65,000	320 to 12,500	300 to 12,000		80 to 780	200 to 12,000	200 to 40,000	10 to 1,000	75 to 300 50 to 150	200 to 12,000	200 to 40,000	100 to 500	26 to 300
Max. inlet air temperature	100°C	70°C 70°C, 180°C (Varies by model)	60°C	50°C	80°C	60°C		50°C	60°C		50°C, 55°C (Varies by model)	50°C	60°C		45°C	80°C, 120°C (Varies by models)
Filtration (Filtering efficiency)			3 μm (99%)			Water droplet removal ratio 99%	0.3 μm (99.9%)		0.01 μm (With 0.3 μm pre-filter)	0.01 μm (99.9%)			0.01 μm (99.9%)		0.01 μm (99.99%)	0.01 μm (99.99%)
Outlet oil mist concentration (Max.) (1)							1 mg/m³ (ANR) [≅ 0.8 ppm]		0.1 mg/m³ (ANR) [≅ 0.08 ppm]				0.01 mg/m³ (ANR) [≅ 0.008 ppm]	0.004 mg/m³ (ANR) [≅ 0.0032 ppm]		
Outlet cleanliness													Particles with 0.3 μm or more: 100 or less/ft³ (35 or less/10 ℓ (ANR))			Particles with 0.1 μm or more: 0/6 ℓ
Atmospheric pressure dew point [At inlet air pressure of 0.7 MPa]				−17°C At inlet temperature 35°C	−17°C At inlet temperature 55°C			−30°C −50°C At inlet temperature 35°C			−15°C −20°C At inlet temperature 25°C	−40°C −60°C At inlet temperature 25°C				
Reference page	P.19	P.11, 15	P.153	P.21		P.145	P.161	P.85	P.179	P.169	P.89		P.187	P.195	P.243	P.221



Note 1) When the inlet oil mist concentration (compressor discharge concentration) is approx. 30 mg/m³ (ANR) or less.
Note 2) This describes the grade of compressed air quality based on ISO8573-1: 2001 (JIS B8392-1: 2003), which is the maximum quality grade for the system. It varies, however, depending on the inlet air conditions.
Note 3) Please contact SMC since this can be manufactured as a special order (depending on the operating conditions).

Air Preparation Equipment

Quick Reference Guide to Air Preparation Equipment

* Shows standard combinations. The suffix numbers of the model indicate port size, power supply, etc. Refer to pages described to each equipment for detail.
* The symbol "—" in the table indicates that no such equipment exists.
* The figures for air flow capacity corresponding to air compressor output are provided for reference only.
* Combine equipment as necessary. (Refer to pages 2 and 3.)

● For Reciprocating Compressors (Aftercooler inlet: 180°C or 70°C, Refrigerated air dryer inlet temperature: 35°C or 40°C, Membrane air dryer inlet temperature: 25°C)

Air compressor			Main line			Sub line			Local line					
Output (kW)	Air flow capacity (m³/min) Note 1)		Air tank	Aftercooler Note 2)		Main line filter	Refrigerated air dryer Note 3)		Mist separator	Micro mist separator with pre-filter	Micro mist separator	Membrane air dryer Note 5)	Super mist separator	Odor removal filter
	Suction condition (32°C)	ANR conversion (20°C)		Air-cooled	Water-cooled		50 Hz	60 Hz						
0.75	0.1	0.10	AT6C-04	HAA7-06	HAW2-04	AFF2C-02	IDF1E	IDF1E	AM150C-02	AMH150C-02	AMD150C-02	IDG10-02	AME150C-02	AMF150C-02
1.5	0.2	0.19	AT6C-04	HAA7-06	HAW2-04	AFF2C-02	IDF2E	IDF2E	AM150C-02	AMH150C-02	AMD150C-02	IDG20-02	AME150C-02	AMF150C-02
2.2	0.3	0.29	AT6C-04	HAA7-06	HAW2-04	AFF2C-02	IDF3E	IDF3E	AM150C-02	AMH250C-02	AMD250C-02	IDG30-02	AME250C-02	AMF250C-02
3.7	0.5	0.48	AT6C-04	HAA7-06	HAW7-06	AFF4C-03	IDF4E	IDF4E	AM250C-03	AMH250C-03	AMD250C-03	IDG50-03	AME250C-03	AMF250C-03
5.5	0.7	0.67	AT6C-04	HAA7-06	HAW7-06	AFF4C-03	IDF6E	IDF6E	AM250C-03	AMH350C-03	AMD350C-03	IDG75-04	AME350C-03	AMF350C-03
7.5	1.0	0.96	AT11C-06	HAA7-06	HAW7-06	AFF8C-04	IDF8E	IDF8E	AM350C-04	AMH350C-04	AMD350C-04	IDG100-04	AME350C-04	AMF350C-04
11	1.5	1.44	AT11C-06	HAA15-10	HAW22-14	AFF8C-04	IDF11E	IDF11E	AM350C-04	AMH450C-04	AMD450C-04	—	AME450C-04	AMF450C-04
15	2.0	1.92	AT22C-14	HAA15-10	HAW22-14	AFF11C-06	IDF15E	IDF15E	AM450C-06	AMH450C-06	AMD450C-06	—	AME450C-06	AMF450C-06
22	3.0	2.88	AT22C-14	HAA22-14	HAW37-14	AFF22C-10	IDF22E	IDF15E	AM550C-10	AMH550C-10	AMD550C-10	—	AME550C-10	AMF550C-10
27	3.5	3.36	AT37C-14	HAA37-14	HAW37-14	AFF22C-10	IDF22E	IDF22E	AM550C-10	AMH550C-10	AMD550C-10	—	AME550C-10	AMF550C-10
37	5.0	4.8	AT37C-14	HAA37-14	HAW55-20	AFF37B-14	IDF37E	IDF37E	AM650-14	AMH650-14	AMD650-14	—	AME650-14	AMF650-14
55	7.5	7.2	AT55C-20	—	HAW75-20	AFF75$^{A}_{B}$-20	IDF55E	IDF55E	AM850-20	AMH850-20	AMD850-20	—	AME850-20	AMF850-20
75	10.0	9.6	AT75C-20	—	HAW110-30	AFF75$^{A}_{B}$-20	IDF75E	IDF75E	AM850-20	AMH850-20	AMD850-20	—	AME850-20	AMF850-20
110	15.0	14.4	AT125C-30	—	—	AFF125A-30	IDF120D	IDF120D	—	—	AMD910-30	—	—	AMF910-30
150	20.0	19.2	AT150C-40	—	—	AFF125A-30	IDF120D	IDF120D	—	—	AMD910-30	—	—	AMF910-30
220	30.0	28.8	AT220C-40	—	—	AFF220A-40	IDF190D	IDF150D	—	—	AMD1010-40	—	—	AMF1000-40

● For Screw Compressors (When an aftercooler is installed, Refrigerated air dryer inlet temperature: 35°C or 40°C, Membrane air dryer inlet temperature: 25°C)

Air compressor			Main line		Sub line		Local line						
Output (kW)	Air flow capacity (m³/min) Note 1)		Aftercooler Note 2)		Refrigerated air dryer Note 3)		Mist separator	Micro mist separator with pre-filter	Micro mist separator	Membrane air dryer Note 5)	Super mist separator	Odor removal filter
	Suction condition (32°C)	ANR conversion (20°C)	Air-cooled	Water-cooled	50 Hz	60 Hz						
1.5	0.16	0.15	HAA7-06	HAW2-04	IDF2E	IDF2E	AM150C-02	AMH150C-02	AMD150C-02	IDG20-02	AME150C-02	AMF150C-02
2.2	0.245	0.24	HAA7-06	HAW2-04	IDF3E	IDF3E	AM150C-02	AMH250C-03	AMD250C-03	IDG30-02	AME250C-03	AMF250C-03
3.7	0.44	0.42	HAA7-06	HAW7-06	IDF4E	IDF4E	AM250C-03	AMH250C-03	AMD250C-03	IDG50-03	AME250C-03	AMF250C-03
5.5	0.72	0.69	HAA7-06	HAW7-06	IDF6E	IDF6E	AM250C-03	AMH350C-04	AMD350C-04	IDG75-04	AME350C-04	AMF350C-04
7.5	1.2	1.15	HAA15-10	HAW22-14	IDF8E	IDF8E	AM350C-04	AMH450C-06	AMD450C-06	—	AME450C-06	AMF450C-06
11	1.8	1.7	HAA15-10	HAW22-14	IDF15E	IDF11E	AM450C-06	AMH450C-06	AMD450C-06	—	AME450C-06	AMF450C-06
15	2.6	2.5	HAA15-10	HAW22-14	IDF15E	IDF15E	AM550C-10	AMH550C-10	AMD550C-10	—	AME550C-10	AMF550C-10
22	4	3.8	HAA37-14	HAW37-14	IDF22E	IDF22E	AM650-14	AMH650-14	AMD650-14	—	AME650-14	AMF650-14
37	6.6	6.3	—	HAW55-20	IDF55E	IDF37E	AM850-20	AMH850-20	AMD850-20	—	AME850-20	AMF850-20
55	9.5	9.1	—	HAW75-20	IDF75E	IDF55E	AM850-20	AMH850-20	AMD850-20	—	AME850-20	AMF850-20
75	13	12.5	—	HAW110-30	IDF120D	IDF75E	—	—	AMD910-30	—	—	AMF900-30
110	19	18.3	—	—	IDF120D	IDF120D	—	—	AMD910-30	—	—	AMF900-30
150	28.5	27.4	—	—	IDF190D	IDF150D	—	—	AMD1010-40	—	—	AMF1000-40
220	45	43.2	—	—	IDF240D	IDF240D	—	—	—	—	—	—

● For Screw Compressors (When an aftercooler is not installed, Refrigerated air dryer inlet temperature: ambient temperature +15°C, Membrane air dryer inlet temperature: 25°C)

Air compressor			Sub line		Local line						
Output (kW)	Air flow capacity (m³/min) Note 1)		Air-cooled aftercooler integrated type refrigerated air dryer Note 4)		Mist separator	Micro mist separator with pre-filter	Micro mist separator	Membrane air dryer Note 5)	Super mist separator	Odor removal filter
	Suction condition (32°C)	ANR conversion (20°C)	50 Hz	60 Hz						
1.5	0.16	0.15	IDU3E	IDU3E	AM150C-02	AMH150C-02	AMD150C-02	IDG20-02	AME150C-02	AMF150C-02
2.2	0.245	0.24	IDU3E	IDU3E	AM150C-02	AMH250C-03	AMD250C-03	IDG30-02	AME250C-03	AMF250C-03
3.7	0.44	0.42	IDU4E	IDU4E	AM250C-03	AMH250C-03	AMD250C-03	IDG50-03	AME250C-03	AMF250C-03
5.5	0.72	0.69	IDU6E	IDU6E	AM250C-03	AMH350C-04	AMD350C-04	IDG75-04	AME350C-04	AMF350C-04
7.5	1.2	1.15	IDU8E	IDU8E	AM350C-04	AMH450C-06	AMD450C-06	—	AME450C-06	AMF450C-06
11	1.8	1.7	IDU15E	IDU11E	AM450C-06	AMH450C-06	AMD450C-06	—	AME450C-06	AMF450C-06
15	2.6	2.5	IDU15E	IDU15E	AM550C-10	AMH550C-10	AMD550C-10	—	AME550C-10	AMF550C-10
22	4	3.8	IDU22E	IDU22E	AM650-14	AMH650-14	AMD650-14	—	AME650-14	AMF650-14
37	6.6	6.3	IDU55E	IDU37E	AM850-20	AMH850-20	AMD850-20	—	AME850-20	AMF850-20
55	9.5	9.1	IDU75E	IDU55E	AM850-20	AMH850-20	AMD850-20	—	AME850-20	AMF850-20
75	13	12.5	—	IDU75E	—	—	AMD910-30	—	—	AMF900-30
110	19	18.3	—	—	—	—	AMD910-30	—	—	AMF900-30
150	28.5	27.4	—	—	—	—	AMD1010-40	—	—	AMF1000-40
220	45	43.2	—	—	—	—	—	—	—	—

Note 1) Air flow capacity conditions
Suction condition ..... 32°C, Atmospheric pressure, relative humidity 65%
ANR conversion ..... 20°C, Atmospheric pressure, relative humidity 65%

Note 2) Air-cooled aftercooler
Inlet air temperature ..... 70°C
Ambient temperature ..... 32°C

Water-cooled aftercooler
Inlet air temperature ..... 70°C (Screw compressors), 180°C (Reciprocating compressors, 70°C for HAW2,7)
Cooling water inlet temperature ..... 30°C

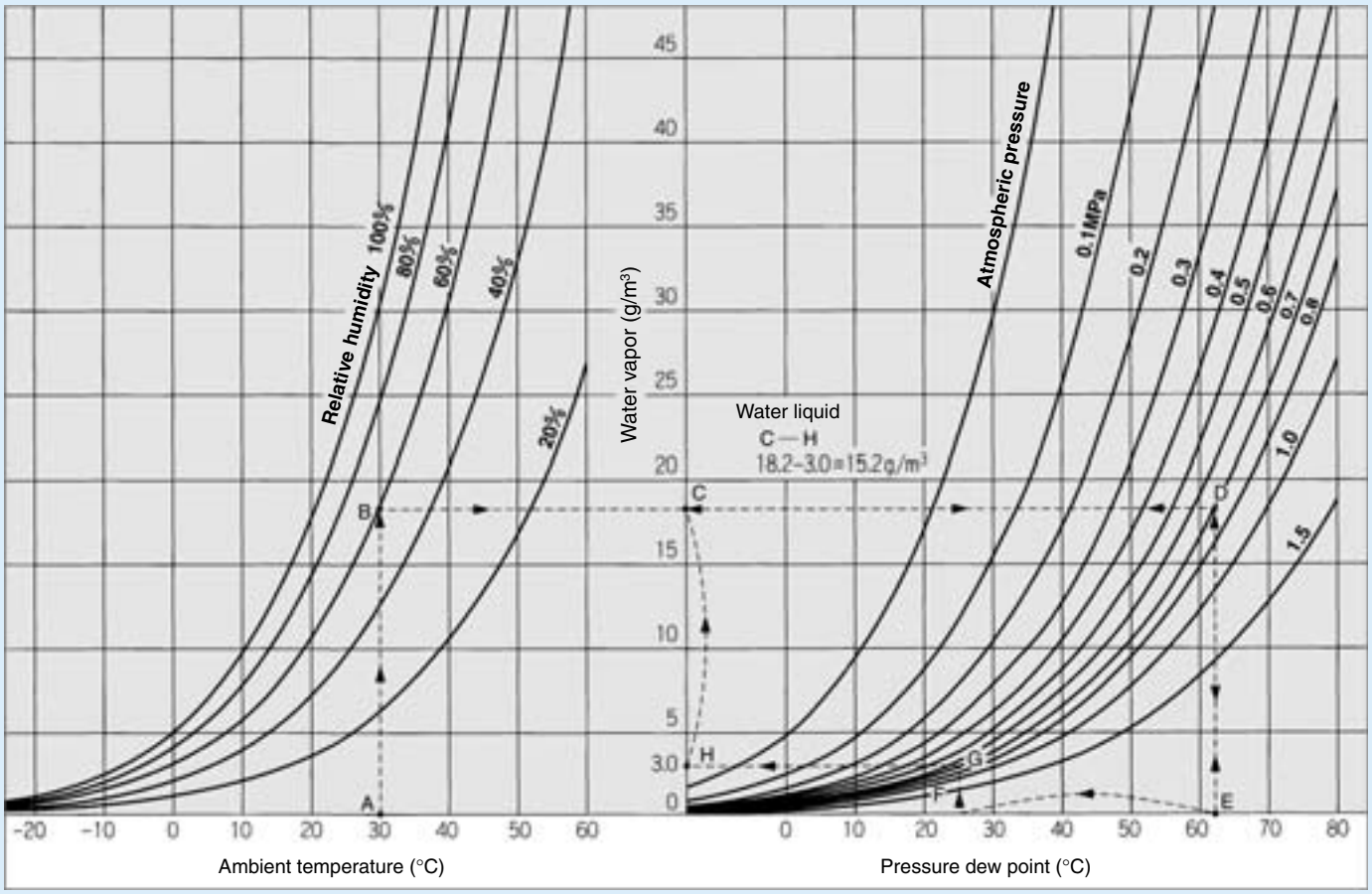
Note 3) Series IDF
Inlet air temperature ..... 35°C saturation (IDF1E to 37E), 40°C saturation (IDF55E to 75E, IDF120D to 240D)
Ambient temperature ..... 32°C

Note 4) Series IDU
Inlet air temperature ..... 55°C saturation (IDU3E to 75E)
Ambient temperature ..... 32°C

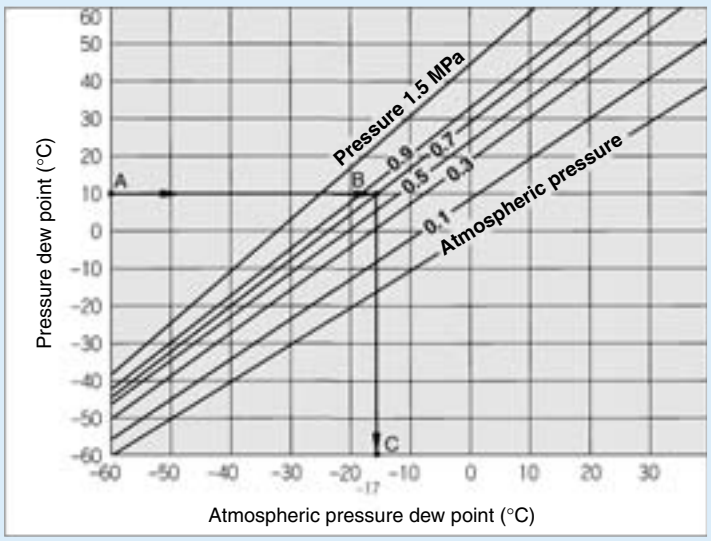
Note 5) Series IDG
Inlet air temperature ..... 25°C
Ambient temperature ..... 25°C

Data: Calculation of Condensed Water Amount & Dew Point Conversion Chart

Calculation of Condensed Water Amount



Dew Point Conversion Chart B



<How to read the dew point conversion chart>
(Example)
In the case of seeking the atmospheric pressure dew point at the pressure dew point 10°C and the pressure of 0.7 MPa.

1. Trace the arrow mark →, starting with the point A at the pressure dew point 10°C to find the intersection B on the pressure characteristic line for 0.7 MPa.
2. Trace the arrow mark →, starting with the point B to find the intersection C at the atmospheric pressure dew point.
3. The intersection C is the conversion value –17°C under atmospheric pressure dew point.

<How to Calculate Amount of Condensed Water>
(Example)
In the case of calculating the amount of condensed water by applying the pressure up to 0.7 MPa with an air compressor installed under the ambient temperature 30°C and the relative humidity 60% and then having that compressed air cooled down to 25°C.

1. Trace the arrow mark, starting with the point A of ambient temperature 30°C to obtain the intersection B on the curved line for the relative humidity of 60%.
2. Trace the arrow mark, starting with the intersection B to obtain the intersection D on the curved line for the 0.7 MPa pressure characteristics.
3. Trace the intersection D to obtain the intersection E.
4. The intersection E is the dew point under pressure 0.7 MPa with the ambient temperature of 30°C and the relative humidity of 60%. Value for E is at 62°C.
5. Trace the intersection E upward, and C leftward to obtain the intersection D.
6. The intersection C is the amount of water included in the compressed air 1 m³ at 0.7 MPa with the pressure dew point of 62°C. The amount of water is 18.2 g/m³.
7. Trace the arrow mark, starting with F for cooling temperature 25°C (pressure dew point 25°C) to find the intersection G on the pressure characteristic line for 0.7 MPa.
8. From the intersection G, trace the arrow mark to obtain the intersection H on the vertical axis.
9. The intersection H is the amount of water included in the compressed air 1 m³ at 0.7 MPa, pressure dew point of 25°C. The amount of water is 3.0 g/m³.
10. Therefore, the amount of condensed water is as following. (Per 1 m³)
    The amount of water at the intersection C – The amount of water at the intersection H = The amount of condensed water 18.2 – 3.0 = 15.2 g/m³