

Air Dryer Stainless Steel Heat Exchanger Type Series **IDUS/IDFS** (220/240VAC 50Hz)

The models IDF1E to 11E and IDU3E to 6E have been revised. For details, refer to catalog no. ES30-8A. Similar updating for other IDF/IDU models is scheduled to follow shortly.

Air Flow Capacity

Increased up to

40%

(Compared to the previous model)

Power Consumption

Reduced by up to

38%

(Compared to the previous model)



Series IDUS

Model	Inlet air temperature °C	IDUS3E	IDUS4E	IDUS6E
Air flow capacity ℓ/min(ANR)	55	310	500	740
	60	295 (300)	475 (430)	703 (640)
Power consumption W	55	160	225	275
	60	165 (189)	230 (275)	280 (295)

() : Previous model IDU3D/4D/6D

Series IDFS

Model	Inlet air temperature °C	IDFS6E	IDFS8E	IDFS11E
Air flow capacity ℓ/min(ANR)	35	740	1200	1650
	40	614 (640)	996 (850)	1370 (1300)
Power consumption W	35	160	230	285
	40	170 (259)	240 (292)	295 (337)

() : Previous model IDF6D/8D/11D



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- Improved corrosion resistance with the use of stainless steel heat exchanger
- Standard evaporation thermometer facilitates daily inspection
- Compact heat exchanger reduces overall dimensions of the air dryer
- Environmentally friendly refrigerant R134a

The models IDF1E to 11E and IDU3E to 6E have been revised. For details, refer to catalog no. ES30-8A. Similar updating for other IDF/IDU models is scheduled to follow shortly.

Model Selection

- 1** Obtain the correction factor for the temperature from data A or B and the correction factor for the air pressure from data C.

Temperature Data A or B =

Series IDUS: Data A
Series IDFS: Data B

Air pressure Data C =
- 2** Calculate corrected air flow by using A or B and C.

Corrected air flow = (Air flow) ÷ (Data A x Data C)

Corrected air flow = (Air flow) ÷ (Data B x Data C)
- 3** Select a model having an air flow capacity that is higher than the corrected air flow.

IDUS Selection Example

The procedure for selecting the optimum model under the following conditions is shown below.

- Condition
- ① Inlet air temperature 55°C
 - ② Outlet air pressure dew point 10°C
 - ③ Ambient temperature 35°C
 - ④ Inlet air pressure 0.7MPa
 - ⑤ Air flow 350 ℓ/min (ANR)

- 1 A = 0.75 based on conditions ①, ② and ③
- 2 C = 1.00 based on condition ④
- 3 Based on condition ⑤, A and C
Corrected air flow = 350 ÷ (0.75 x 1.00) = 467 ℓ/min (ANR)
- 4 Based on condition ⑥;
IDUS4E is selected as the model to process an air flow larger than 467 ℓ/min (ANR) with a 50Hz power supply, according to data D-1.

Note) ℓ/min (ANR) is for reference conditions of 20°C, 1 ATM and 65% relative humidity.

IDFS Selection Example

The procedure for selecting the optimum model under the following conditions is shown below.

- Condition
- ① Inlet air temperature 35°C
 - ② Outlet air pressure dew point 10°C
 - ③ Ambient temperature 35°C
 - ④ Inlet air pressure 0.5MPa
 - ⑤ Air flow 1200 ℓ/min (ANR)

- 1 B = 0.95 based on conditions ①, ② and ③
- 2 C = 0.90 based on condition ④
- 3 Based on condition ⑤, B and C
Corrected air flow = 1200 ÷ (0.95 x 0.90) = 1400 ℓ/min (ANR)
- 4 Based on condition ⑥;
IDFS11E is selected as the model to process an air flow larger than 1400 ℓ/min (ANR) with a 60Hz power supply, according to data D-2.

Data A: Correction Factor for Temperature (Series IDUS)

Ambient temp. (°C) \ Inlet air temp. (°C) / Outlet air press. dew point (°C)	50			55			60			65			70			80		
	5	10	15	5	10	15	5	10	15	5	10	15	5	10	15	5	10	15
30	0.88	1.26	1.64	0.74	1.05	1.37	0.70	1.00	1.30	0.66	0.95	1.23	0.62	0.89	1.16	0.59	0.84	1.09
32	0.84	1.20	1.56	0.70	1.00	1.30	0.67	0.95	1.24	0.63	0.90	1.17	0.60	0.85	1.11	0.56	0.80	1.04
35	0.81	1.15	1.50	0.67	0.96	1.25	0.64	0.91	1.19	0.60	0.86	1.12	0.57	0.82	1.06	0.54	0.77	1.00
40	0.76	1.08	1.40	0.63	0.90	1.17	0.60	0.86	1.11	0.57	0.81	1.05	0.54	0.77	0.99	0.50	0.72	0.94

Data B: Correction Factor for Temperature (Series IDFS)

Ambient temp. (°C) \ Inlet air temp. (°C) / Outlet air press. dew point (°C)	30			35			40			45			50		
	5	10	15	5	10	15	5	10	15	5	10	15	5	10	15
30	0.92	1.31	1.71	0.74	1.05	1.37	0.59	0.84	1.09	0.48	0.68	0.89	0.40	0.58	0.75
32	0.88	1.25	1.63	0.70	1.00	1.30	0.46	0.83	1.04	0.46	0.65	0.85	0.39	0.55	0.72
35	0.84	1.20	1.56	0.67	0.96	1.25	0.37	0.77	1.00	0.44	0.62	0.81	0.37	0.53	0.69
40	0.79	1.13	1.46	0.63	0.90	1.17	0.28	0.72	0.94	0.41	0.59	0.76	0.35	0.50	0.64

Data C: Correction Factor for Air Pressure (Series IDUS)

Inlet air pressure (MPa)	0.15	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
Correction factor	0.65	0.68	0.77	0.84	0.90	0.95	1.00	1.03	1.06	1.08

Data D-1: Air Flow Capacity (Series IDUS)

Model	IDUS3E	IDUS4E	IDUS6E
Air flow capacity (ℓ/min (ANR))	310	500	740

Data D-2: Air Flow Capacity (Series IDFS)

Model	IDFS6E	IDFS8E	IDFS11E
Air flow capacity (ℓ/min (ANR))	740	1200	1650

Air Dryer

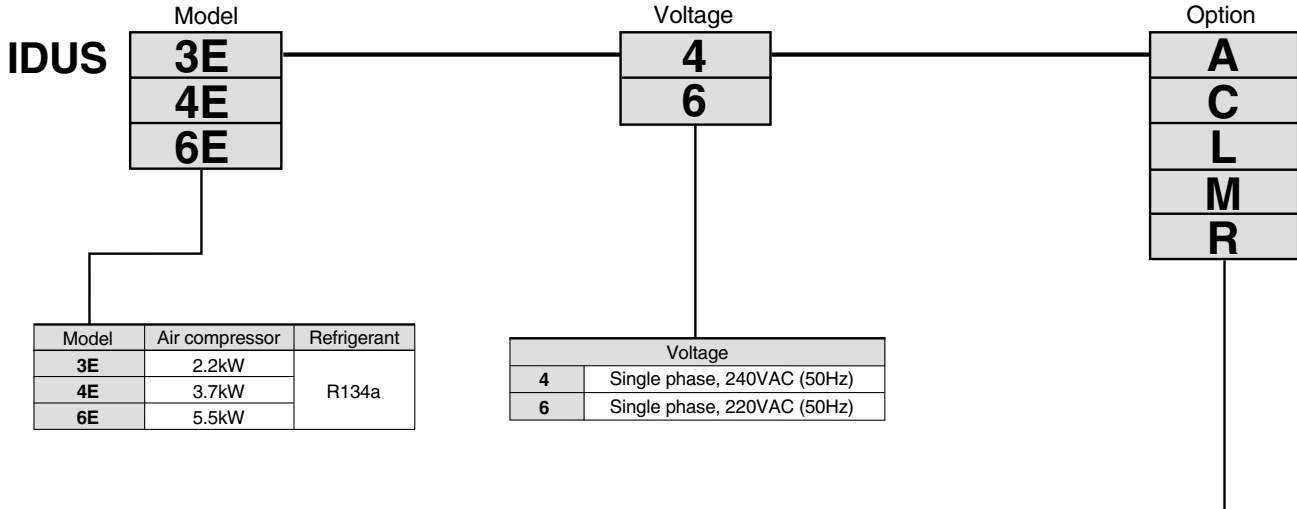
Stainless Steel Heat Exchanger Type

Series *IDUS*

3E, 4E, 6E

The models IDF1E to 11E and IDU3E to 6E have been revised. For details, refer to catalog no. ES30-8A. Similar updating for other IDF/IDU models is scheduled to follow shortly.

How to Order



Option	A	C	L	M	R
	With cool compressed air	With anti corrosive treatment	With heavy duty auto-drain	With motor operated auto-drain	With circuit breaker
IDUS3E	●	●	●	●	●
IDUS4E	●	●	●	●	●
IDUS6E	●	●	●	●	●

Note 1) All the options are not currently available. Please contact SMC if necessary.
 Note 2) Refer to page 14-18-9 for further information of options.
 Note 3) Combination of "L" and "M" is not available.

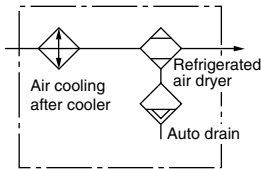
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- AMG
- AFF
- AM
- Misc.

Series IDUS

The models IDF1E to 11E and IDU3E to 6E have been revised. For details, refer to catalog no. ES30-8A. Similar updating for other IDF/IDU models is scheduled to follow shortly.



JIS Symbol

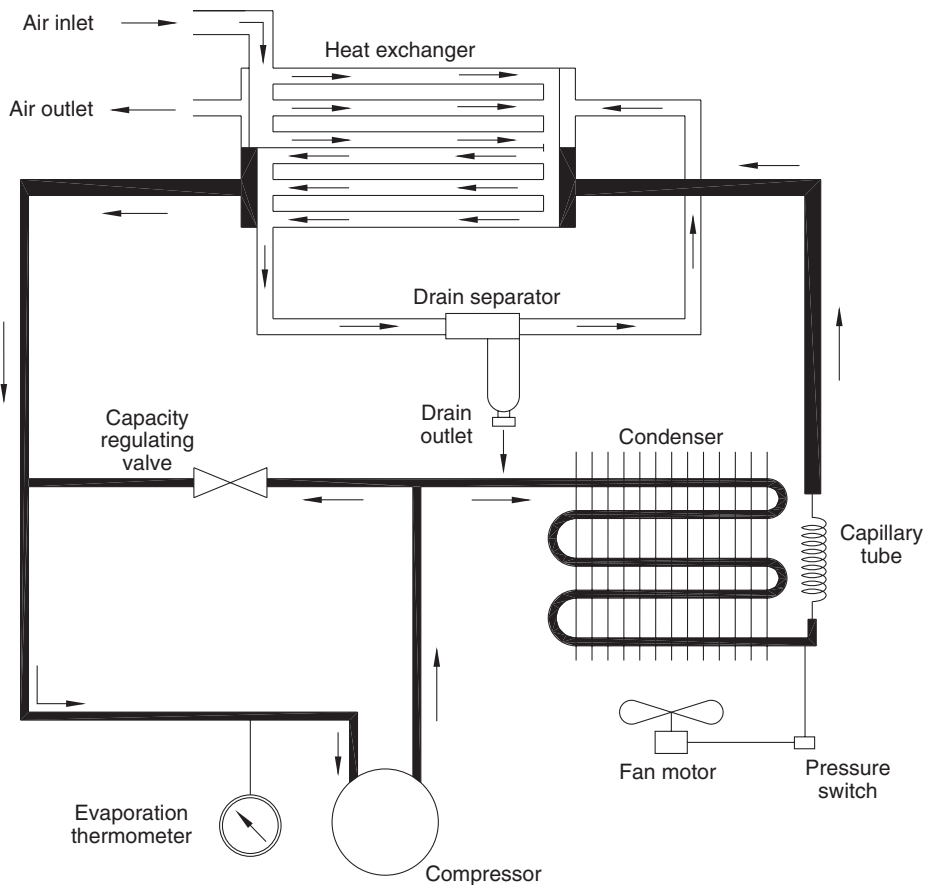


Model/Standard Specifications

Specifications		Model	IDUS3E	IDUS4E	IDUS6E
Rated conditions	Air flow rate ^{Note 2)}	ℓ/min (ANR)	310	500	740
	Operating pressure	MPa	0.7		
	Inlet air temperature	°C	55		
	Ambient temperature	°C	32		
	Pressure dew point	°C	10		
Operating ranges	Working fluid		Compressed air		
	Inlet air pressure	MPa	0.15 to 1.0		
	Inlet air temperature	°C	2 to 80		
	Ambient temperature	°C	2 to 40 (Relative humidity of 85% or less)		
Electrical specifications	Power source	V	Single phase, 220VAC (50Hz), 240VAC (50Hz)		
	Power consumption	W	160	225	275
	Circuit breaker ^{Note 3)}	A	5		
Condenser			Air cooled		
Refrigerant			R134a		
Air connection	Rc		1/2	3/4	
Drain connection			Outside diameter 10mm (One-touch fitting)		
Auto drain			AD44		
Weight	kg		27	33	35
Coating color			Munsell 10Y8/0.5 (White)		
Applicable compressor (screw type)	kW		2.2	3.7	5.5

Note 1) Select an air dryer according to the selection method and note the rated conditions.
 Note 2) The data for ℓ/min (ANR) refers to the conditions of 20nC, 1 atm. pressure and relative humidity of 65%.
 Note 3) Install a circuit breaker with sensitivity of ≤ 30mA.

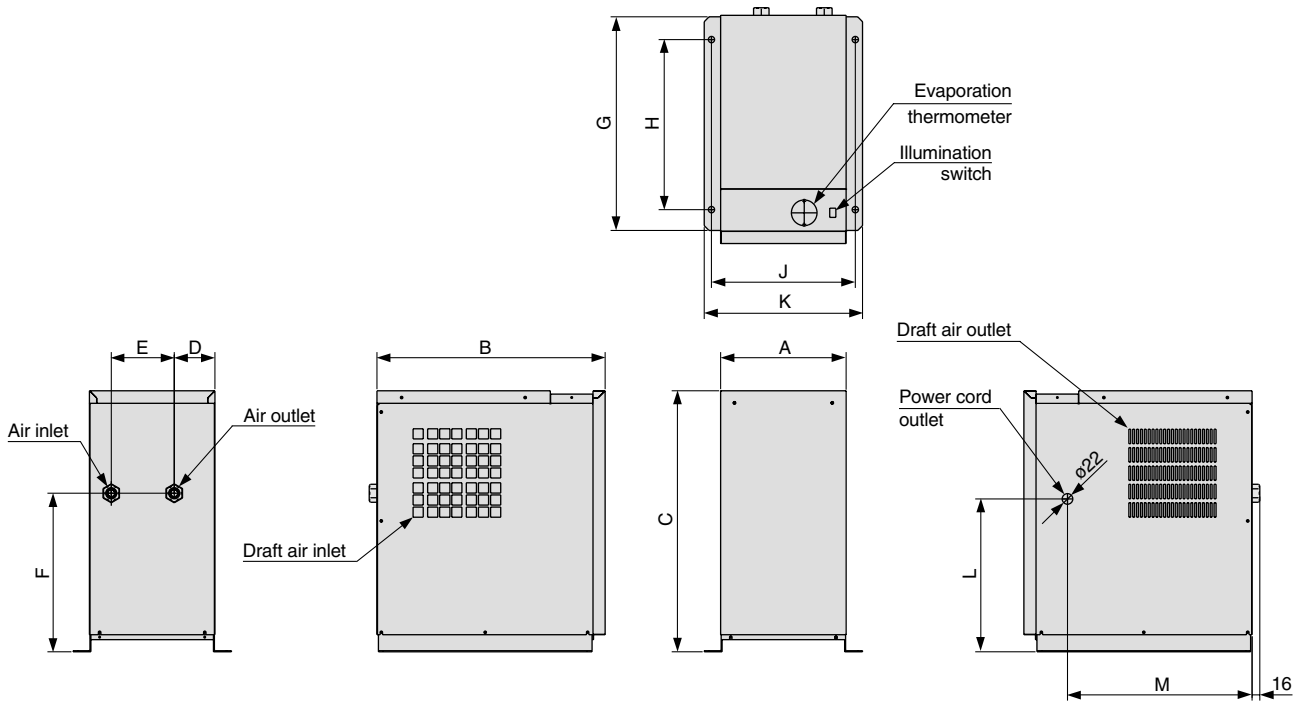
Working Principle



The models IDF1E to 11E and IDU3E to 6E have been revised. For details, refer to catalog no. ES30-8A. Similar updating for other IDF/IDU models is scheduled to follow shortly.

Air Dryer Stainless Steel Heat Exchanger Type **Series IDUS**

IDUS3E/4E/6E



Model	Port size	A	B	C	D	E	F	G	H	J	K	L	M
IDUS3E	Rc 1/2	260	470	540	85	130	325	440	350	297	330	315	380
IDUS4E	Rc 1/2	260	560	540	85	130	325	530	440	297	330	315	470
IDUS6E	Rc 3/4	285	605	540	110	130	325	575	485	325	355	315	515

Note: The diagram above is drawn base on IDUS3E dimension with scale 1:6.

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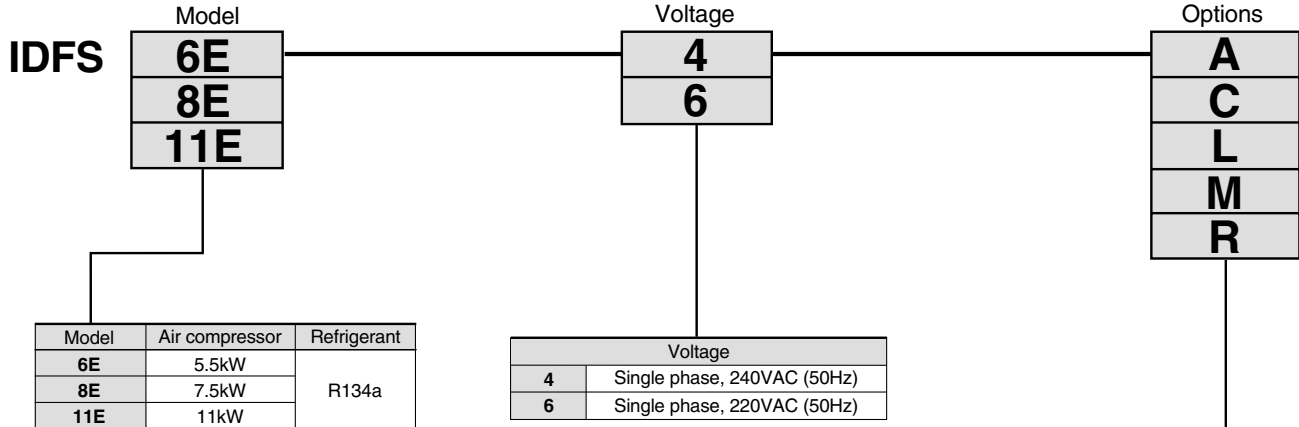
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Misc.

Air Dryer Stainless Steel Heat Exchanger Type Series *IDFS* 6E, 8E, 11E

The models IDF1E to 11E and IDU3E to 6E have been revised. For details, refer to catalog no. ES30-8A. Similar updating for other IDF/IDU models is scheduled to follow shortly.

How to Order



Option	A	C	L	M	R
	With cool compressed air	With anti corrosive treatment	With heavy duty auto drain	With motor operated auto drain	With circuit breaker
Model					
IDUF6E	●	●	●	●	●
IDUF8E	●	●	●	●	●
IDUF11E	●	●	●	●	●

Note 1) All the options are not currently available. Please contact SMC if necessary.
 Note 2) Refer to page 14-18-9 for further information of options.
 Note 3) Combination of "L" and "M" is not available.

The models IDF1E to 11E and IDU3E to 6E have been revised. For details, refer to catalog no. ES30-8A. Similar updating for other IDF/IDU models is scheduled to follow shortly.

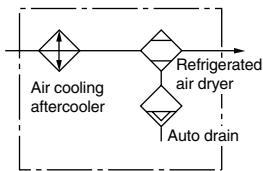
Air Dryer Stainless Steel Heat Exchanger Type Series IDFS

Model/Standard Specifications



Specifications		Model	IDFS6E	IDFS8E	IDFS11E
Rated conditions	Air flow rate ^{Note 2)}	ℓ/min (ANR)	740	1200	1650
	Operating pressure	MPa	0.7		
	Inlet air temperature	°C	35		
	Ambient temperature	°C	32		
	Pressure dew point	°C	10		
Operating conditions	Working fluid		Compressed air		
	Inlet air pressure	MPa	0.15 to 1.0		
	Inlet air temperature	°C	2 to 50		
	Ambient temperature	°C	2 to 40 (Relative humidity of 85% or less)		
Electrical specifications	Power source	V	Single phase, 220VAC (50Hz), 240VAC (50Hz)		
	Power consumption	W	160	230	285
	Circuit breaker	A	5		
Condenser ^{Note 3)}			Air cooled		
Refrigerant			R134a		
Air connection		Rc	3/4		
Drain connection			Outside diameter 10mm (One-touch fitting)		
Auto-drain			AD44		
Weight		kg	27	33	35
Coating color			Munsell 10Y8/0.5 (White)		
Applicable compressor (screw type)		kW	5.5	7.5	11

JIS Symbol

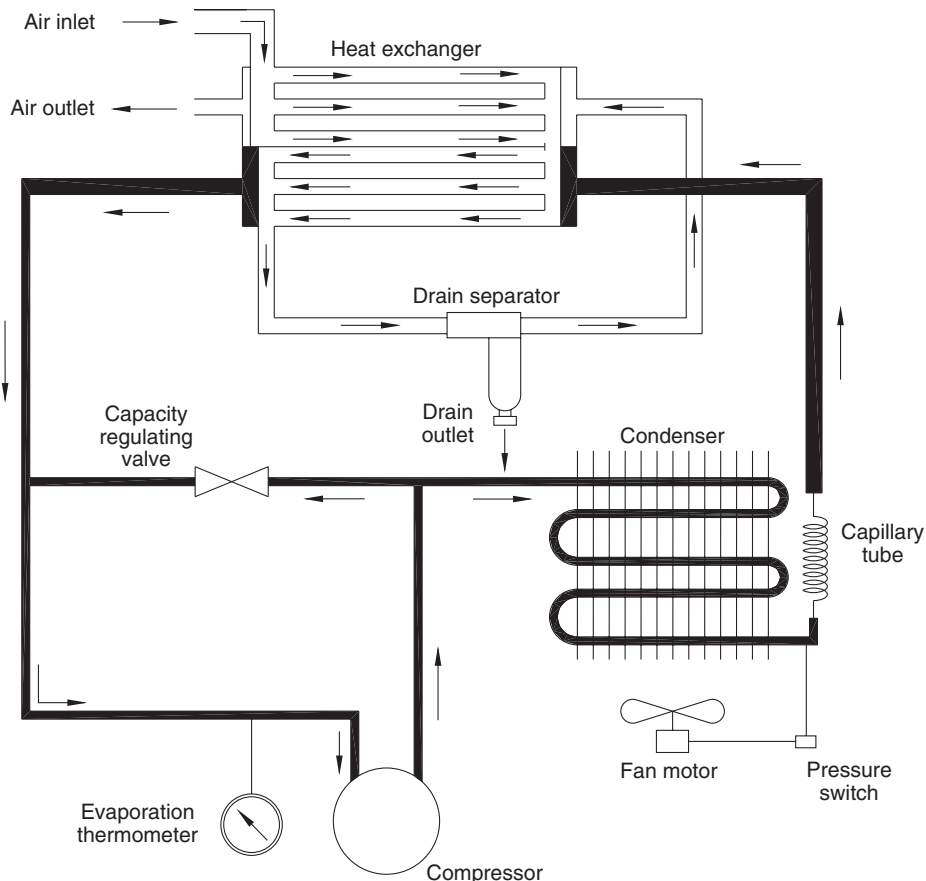


Note 1) Select an air dryer according to the selection method and note the rated conditions.

Note 2) The data for ℓ/min (ANR) refers to the conditions of 20nC, 1 atm. pressure and relative humidity of 65%.

Note 3) Install a circuit breaker with sensitivity of ≤ 30mA.

Working Principle



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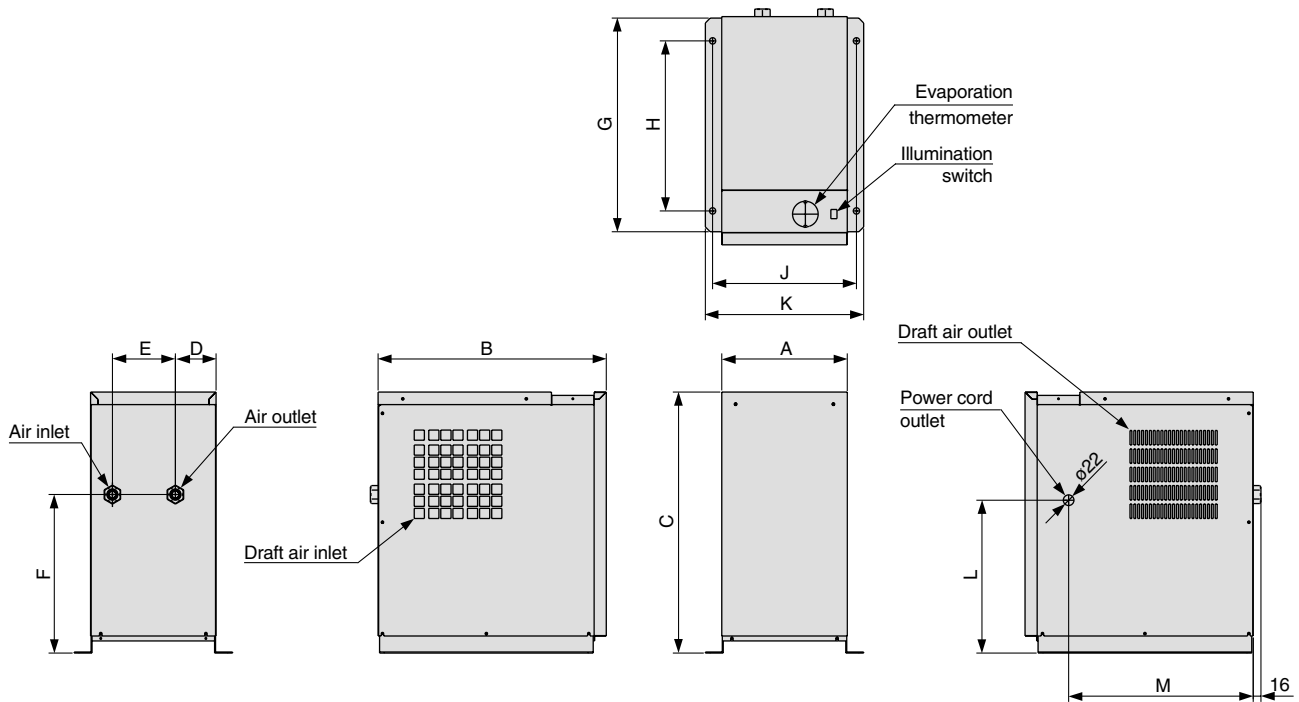
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Misc.

Series IDFS

The models IDF1E to 11E and IDU3E to 6E have been revised. For details, refer to catalog no. ES30-8A. Similar updating for other IDF/IDU models is scheduled to follow shortly.

IDFS6E/8E/11E



Model	Port size	A	B	C	D	E	F	G	H	J	K	L	M
IDFS6E	Rc 3/4	260	470	540	85	130	325	440	350	297	330	315	380
IDFS8E	Rc 3/4	260	560	540	85	130	325	530	440	297	330	315	470
IDFS11E	Rc 3/4	285	605	540	110	130	325	575	485	325	355	315	515

Note: The diagram above is drawn base on IDFS6E dimension with scale 1:6.

Series IDUS/IDFS Option

Refer to pages 14-18-3 and 14-18-6 for "How to Order" of options.

The models IDF1E to 11E and IDU3E to 6E have been revised. For details, refer to catalog no. ES30-8A. Similar updating for other IDF/IDU models is scheduled to follow shortly.

A Option symbol With cool compressed air

The air flow with this option is lower than that of the standard dryer.

Model	IDUS3E	IDUS4E	IDUS6E	IDFS6E	IDFS8E	IDFS11E
ℓ/min (ANR)	155	250	370	370	600	825

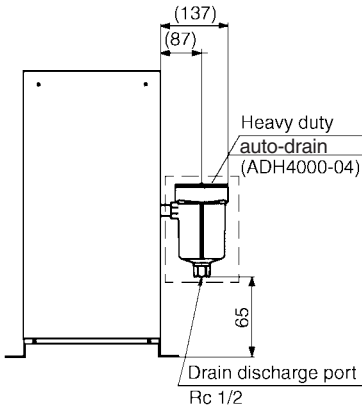
Condition
 Inlet air pressure: 0.7MPa
 Inlet air temperature: 35°C saturation
 Ambient temperature: 32°C
 Outlet air temperature: 10°C or less

C Option symbol With anti corrosive treatment

This minimizes the corrosion of the copper and copper alloy parts when the air dryer is used in an atmosphere containing hydrogen sulfide or sulfurous acid gas. This option extends the service life. Special epoxy coating of copper tube and copper alloy parts. The coating is not applied on the heat exchanger or around electrical parts, where operation may be affected by coating.

L Option symbol With heavy duty auto-drain

A dryer with heavy duty auto-drain (ADH4000-04) is installed instead of the float type auto-drain (AD44).

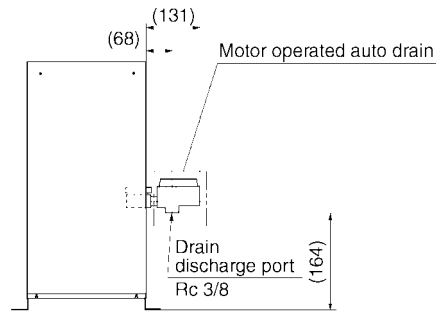


M Option symbol With motor operated auto-drain

This option changes the float style auto-drain (AD44) used by standard air dryers to a motor operated auto-drain (ADM200-04) where by drainage is discharged more precisely.

Operating air pressure	Air discharge if no drainage
0.3MPa	6 ℓ (ANR) each time
0.5MPa	10 ℓ (ANR) each time
0.7MPa	14 ℓ (ANR) each time

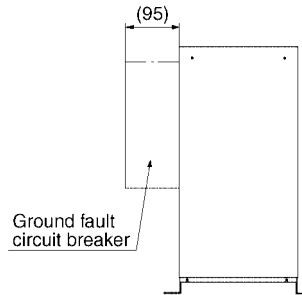
* Operation cycle: 1 cycle/min. Operation time: 2 sec./min.



* Motor operated auto-drain is packed together with main unit. Assembly is required.

R Option symbol With circuit breaker

A circuit breaker is attached to the side of the air dryer. This saves additional electrical wiring at the time of installation.



Breaker capacity	Sensitivity current
5A	15 to 30mA

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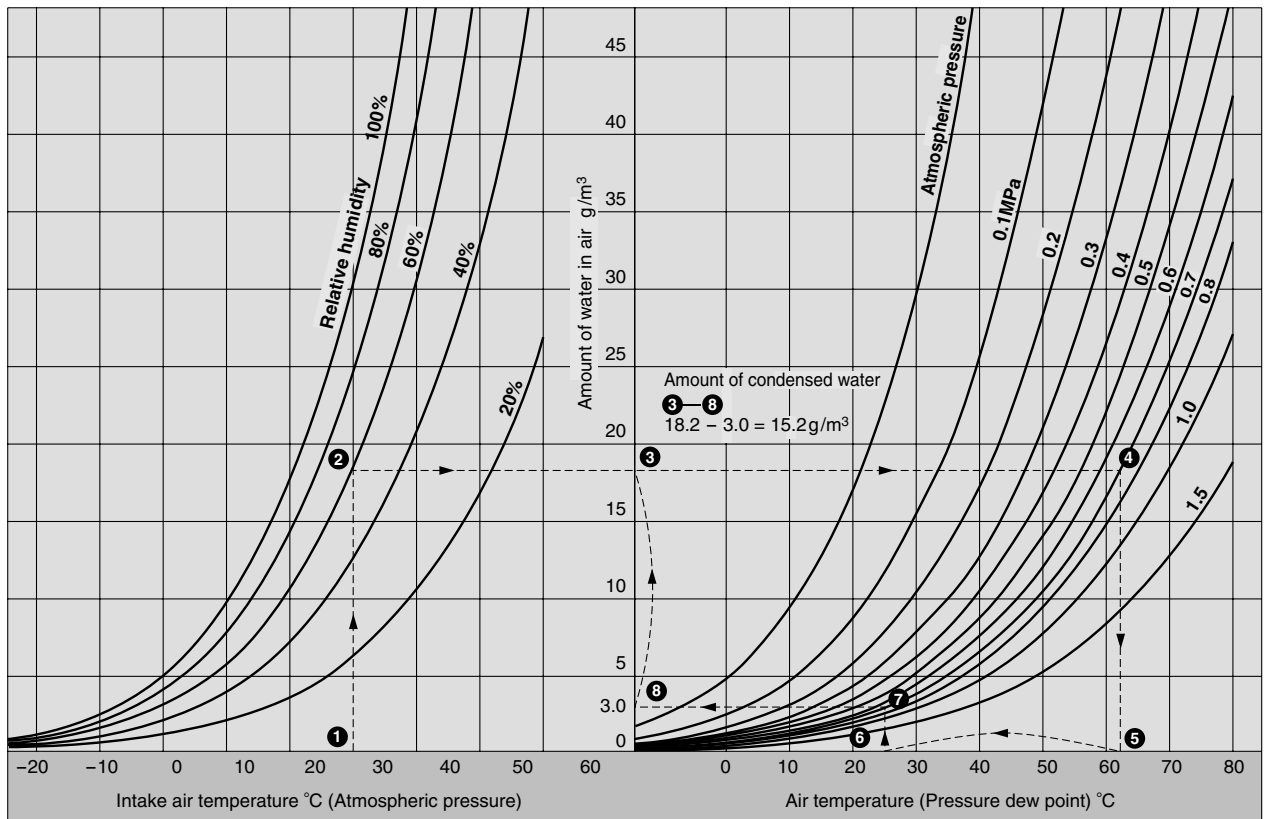
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The models IDF1E to 11E and IDU3E to 6E have been revised. For details, refer to catalog no. ES30-8A. Similar updating for other IDF/IDU models is scheduled to follow shortly.

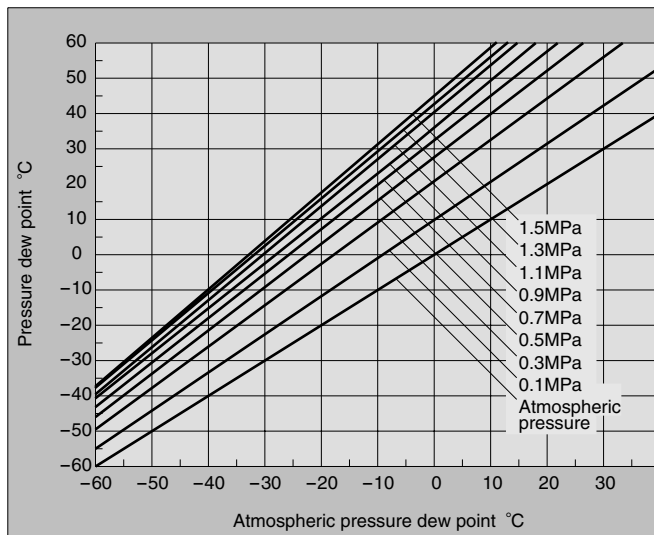
Technical Data

Pressure Dew Point — Condensed Water Calculation



[Example] If air at 30°C and 60% humidity is pressurized to 0.7MPa, the dew point of the air will be 62°C. (1→2→3→4→5) If this is cooled to 25°C, the amount of condensed water generated will be 15.2g/m³. (6→7→8→9) Therefore, with an air flow rate of 3m³/min (22kW equivalent compressor), the amount of condensed water per unit of time is 15.2 x 3 x 60 = 2736g/h.

Dew Point Conversion Chart



Series IDUS/IDFS

Specific Product Precautions 1

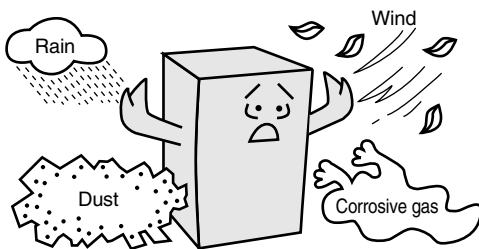
Be sure to read before handling.

Installation Location

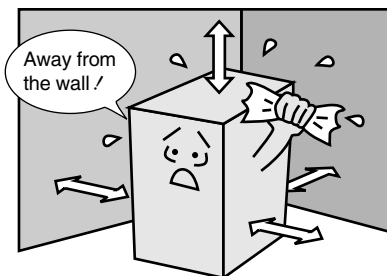
⚠ Caution

- Avoid locations where the air dryer will be in direct contact with wind and rain. (Places where relative humidity is more than 85%)
- Avoid exposure to direct sunlight.
- Avoid dusty or corrosive environments.

If it is used in the above environments, select option C (with anti-corrosive treatment).

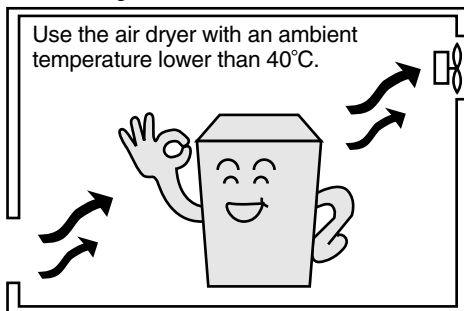


- Avoid places with poor ventilation and high temperature.



- Allow ample space around the air dryer.

- Avoid locations subjected to vibrations.
- Avoid locations where drainage can freeze.

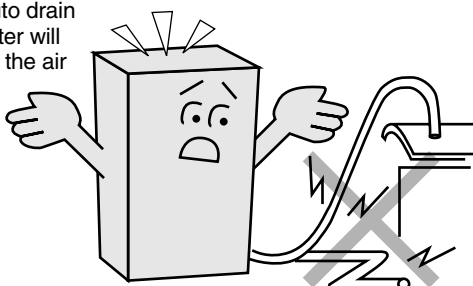


- Avoid installation on moving objects like trucks, ships, and so forth.

Drain Tube

⚠ Caution

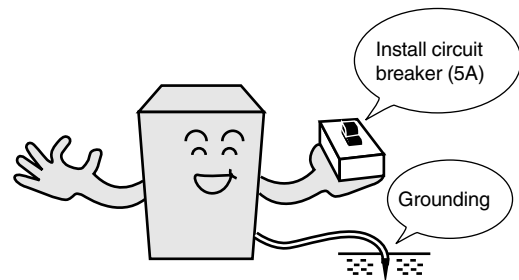
- A polyurethane tube of 10mm outer diameter is provided as the drain tube for IDFS6E to 11E and IDUS3E to 6E. Use this tube to discharge drainage.
- Do not use the drain tube in an upward direction. Do not bend or crush the drain tube. (Operation of auto drain will stop and water will flow out through the air outlet.)



Power Supply

⚠ Caution

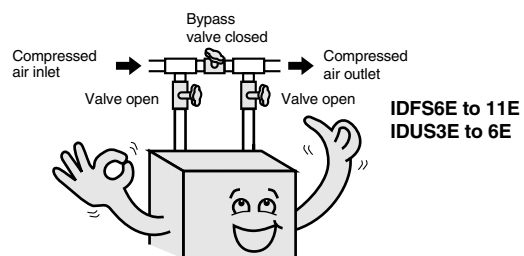
- Connect the power supply to the terminal block.
- Install a suitable circuit breaker applicable to each model.
- * Use a circuit breaker having a sensitivity current of 30mA or less and a rated current of 5A.



Air Piping

⚠ Caution

- Be careful to avoid errors in connecting the air piping to the compressed air inlet (IN) and outlet (OUT).
- Install bypass piping which it is needed for maintenance.



- When installing air piping at the air inlet/outlet of air dryer, the IN/OUT port's fitting of air dryer must be held firmly in place with a wrench.
- Variation of operating conditions may cause condensate to form on the surface of the outlet piping. Roll thermal insulation around piping to prevent condensate from forming.
- Vibration caused by the compressor should not be transmitted through air piping to the air dryer.
- Do not allow the weight of piping to be applied directly to the air dryer.

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Series IDUS/IDFS

Specific Product Precautions 2

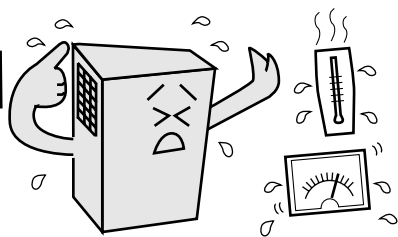
Be sure to read before handling.

Protection Circuit

⚠ Caution

When the air dryer is operated under the following conditions, the protection circuit is activated, the light goes off and operation stops.

- When compressed air temperature is too high
- When compressed air flow rate is too high
- When ambient temperature is too high (40°C or higher)
- When power supply is beyond rated voltage by $\pm 10\%$
- When ventilation port is obstructed by a wall or clogged with dust



Time Delay for Restarting

⚠ Caution

Allow at least three minutes before restarting the dryer. If the air dryer is restarted within three minutes after being stopped, the protection circuit will be activated, the operating light goes off and the dryer will not be activated.



Compressor Air Delivery

⚠ Caution

Strainer, attached as air dryer's accessories, must be installed to the inlet to prevent the foreign particles from flowing into air dryer, which leads to the choking air dryer.

Use an air compressor of 100 l/min or greater air delivery.

Since the auto-drain is designed in such a way that the valve remains open unless the air pressure rises to 0.15MPa or higher, air will blow out from the drain discharge port when the air compressor starts up until the pressure increases. Therefore, if an air compressor has a low air delivery, the pressure may not be sufficient.

Auto Drain

⚠ Caution

The auto-drain may not function properly, depending on the quality of compressed air. Check its operation once a day.

Cleaning of Ventilation Area

⚠ Caution

Remove dust from the ventilation area once a month using a vacuum cleaner or an air blow nozzle.

