Refrigerated Air Dryer Large Size Series New

IDF125F/150F are added! New

Tolerant of high temperature environment!

Top of its class in the industry for the large air-cooled type

Ambient temperature **45**°C at max. [Conventional large type: 40°C]

Inlet air temperature **60**°C at max. [Conventional large type: 50°C]

Doesn't stop even in high-temperature environments such as compressor rooms!

Energy saving design with secondary heater (SMC's original new design!)

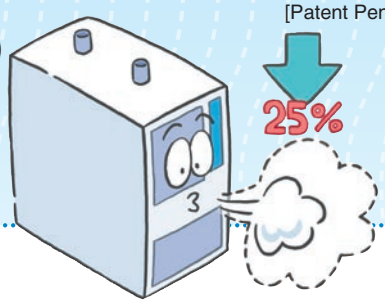
[Patent Pending]

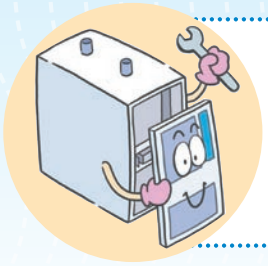
Exhaust heat reduced by **25**% at max. (12 kW → 9 kW)

Ambient temperature increase suppressed (Air-cooled type)

Facility water reduced (Water-cooled type)

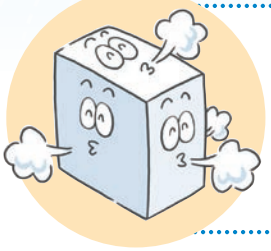
Employs a heat exchanger made of high corrosion-resistant stainless steel.





Maintenance

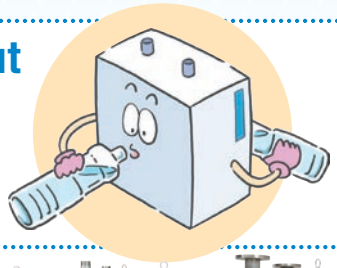
- Dustproof filter
- With a lamp to indicate when to check the dustproof filter
- Only access from front side is required to check electrical equipment and dustproof filter.



Selection of layout

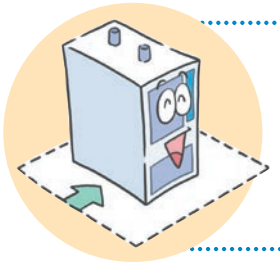
[Air-cooled type]

Exhausting direction can be selected from **four directions**!!



[Water-cooled type]

Facility water piping port can be selected from **two directions**!!



Space saving

One side can be installed flat against a wall!

Installation space reduced by **1.5 m²** at max!! (IDF100F)

Air-cooled type　　Water-cooled type

Model	Refrigeration method	Rated inlet condition	Air flow capacity (m³/min [ANR])				Applicable air compressor (kW)	Refrigerant	Port size
			Standard condition (ANR)		Compressor intake condition				
			50 Hz	60 Hz	50 Hz	60 Hz			
IDF100F-30	Air-cooled	40°C 0.7 MPa	16	18.8	16.7	19.6	100	R407C (HFC)	R2
IDF100F-30-W	Water-cooled								
IDF125F-30	Air-cooled		20.1	23.7	20.9	24.7	125		65A flange
New IDF125F-30-W	Water-cooled								
IDF150F-30	Air-cooled		25	30	26	31.2	150		80A flange
IDF150F-30-W	Water-cooled								

Series IDF100F/125F/150F

Refrigerant R407C (HFC)

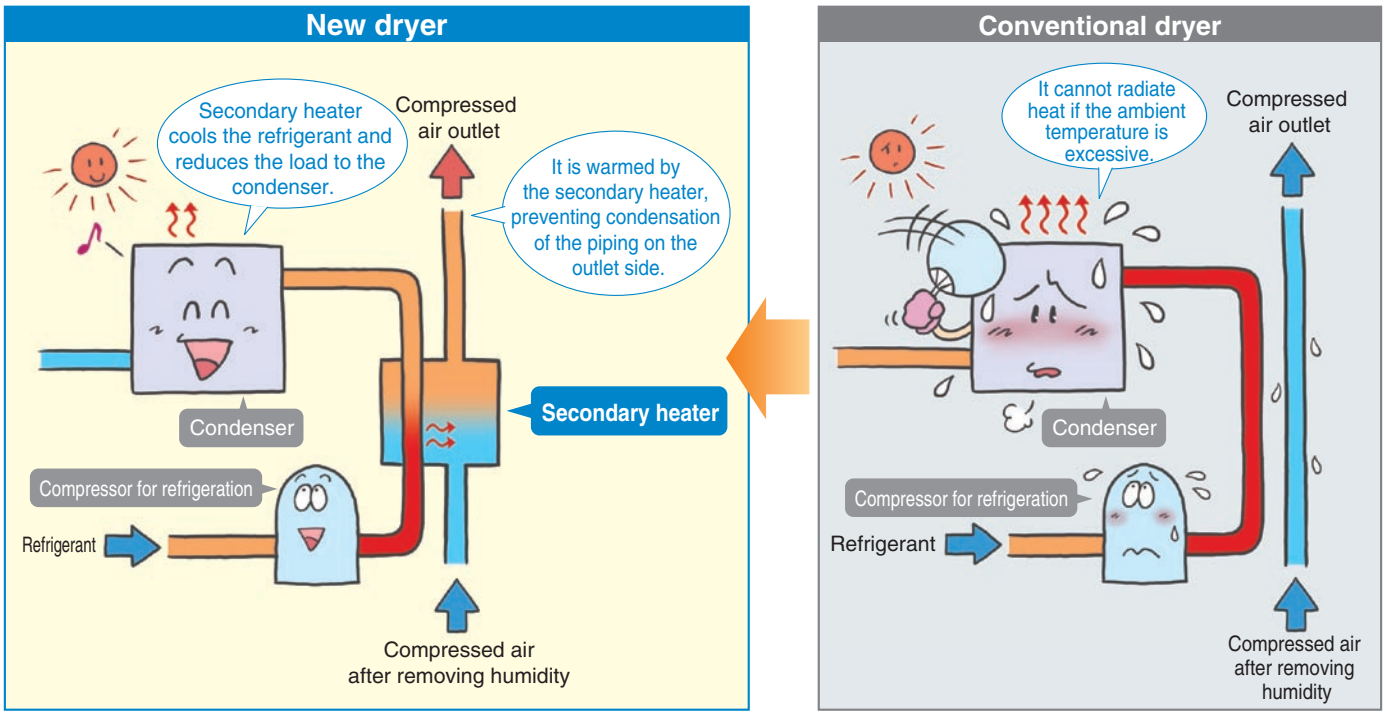
SMC

CAT.ES30-13B

Tolerant of high temperature environment (ambient temperature 45°C), Energy saving design!

Air-cooled type can be used at ambient temperature 45°C.

Secondary heater helps the heat radiation of the condenser allows use at ambient temperature 45°C.



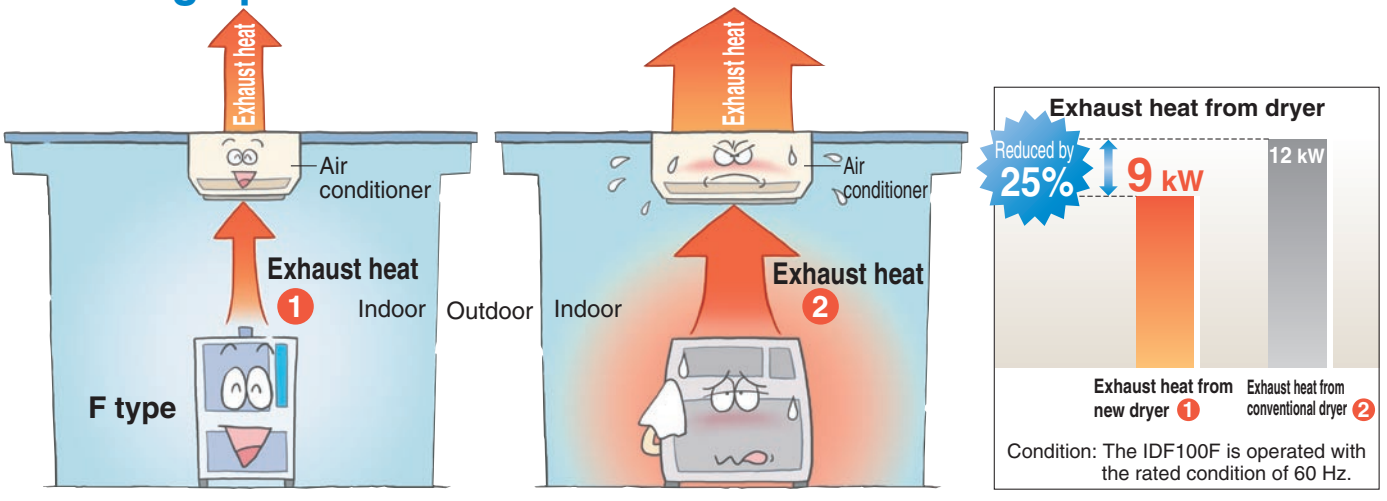
[Patent Pending]

Energy saving design: Reduces exhaust heat from dryer by 25% at max.

Suppresses ambient temperature increase (air-cooled type), Reduces amount of facility water (water-cooled type)!

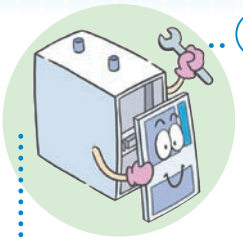
Secondary heater reduces the load to the condenser, and reduces exhaust heat from dryer by 25% at max. (comparison with other SMC products)

Reduction of exhaust heat achieves downsizing and energy saving operation of the air conditioner!



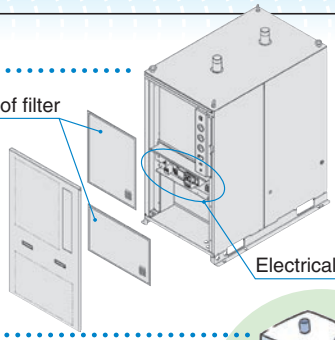
New dryer
(With secondary heater)

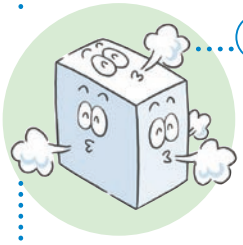
Conventional dryer
(Without secondary heater)



Maintenance

- Dustproof filter
- Only access from front side is required to check electrical equipment and dustproof filter.

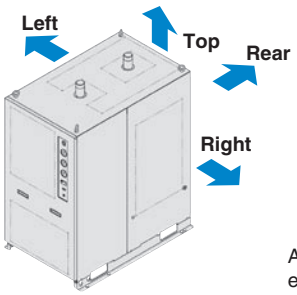




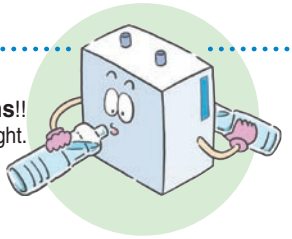
Selection of layout

[Air-cooled type]

Exhausting direction can be selected from **four directions**!!
Auto drain tube can be connected in **two directions**, left or right.

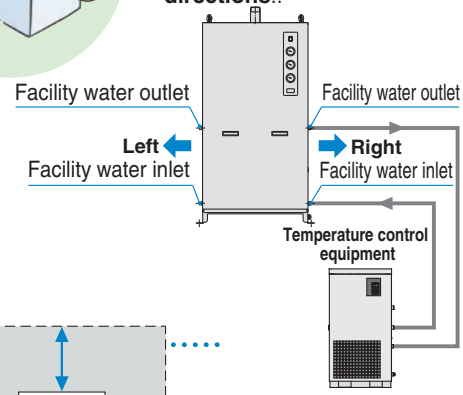


Avoid exhausting air onto adjacent equipment.

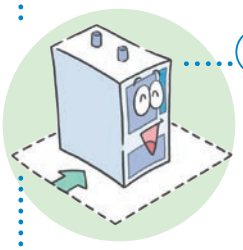


[Water-cooled type]

Facility water piping port can be selected from **two directions**!!

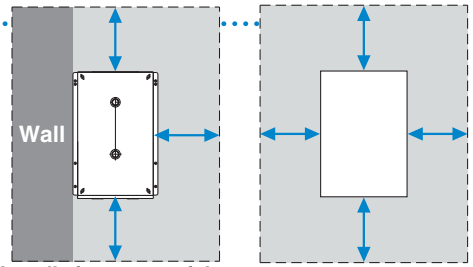


Series HRG



Space saving

Either the left or right can be installed flat against a wall! Note)
Installation space reduced by **1.5 m²** at max!!



Installation space of the IDF100F (Example: Installed flat against the wall on the left)

Installation space of the conventional type

Note) For air-cooled type, leave a space of at least 600 mm between the heat exhausting face and the wall.
For water-cooled type, leave a space at least 600 mm between the facility water piping side and the wall.
Leave at least 600 mm on the sides indicated with ↔.

SMC Air Dryer Variations

Large size Series IDF□F/D/B

Tolerant of high temperature environment!

Can be used with **ambient temperature 45°C at max. and inlet air temperature 60°C at max.**, making it top of its class in the industry for the large air-cooled type.

Air-cooled type　Water-cooled type

Energy saving design

Exhaust heat reduced by 25% at max.
Ambient temperature increase suppressed (Air-cooled type)
Facility water reduced (Water-cooled type)
Employs a heat exchanger made of high corrosion-resistant stainless steel.

Model	Rated inlet condition	Applicable air compressor (kW)	Port size
IDF100F	40°C 0.7 MPa	100	R2
IDF125F		125	65A flange
IDF150F		150	80A flange

∗ The separate catalog for dryer models conforming with foreign standards (CE) is available.

Model	Rated inlet condition	Applicable air compressor (kW)	Port size
IDF190D	40°C 0.7 MPa	190	80A flange
IDF240D		240	100A flange
IDF370B	35°C 0.7 MPa	370	150A flange

Standard Series IDF□E/IDU□E

- Air flow capacity **Increased by 40% at max.** (SMC comparison)
- Power consumption **Reduced by 40% at max.** (SMC comparison)
- Employs a heat exchanger made of high corrosion-resistant stainless steel. **(IDF4E to 75E / IDU3E to 75E)**

Model	Rated inlet condition	Applicable air compressor (kW)	Port size
IDF1E	35°C 0.7 MPa	0.75	Rc3/8
IDF2E		1.5	
IDF3E		2.2	
IDF4E		3.7	Rc1/2
IDF6E		5.5	Rc3/4
IDF8E		7.5	
IDF11E		11	
IDF15E1		15	Rc1
IDF22E		22	R1
IDF37E		37	R1 1/2
IDF55E	40°C 0.7 MPa	55	R2
IDF75E		75	
IDU3E	55°C 0.7 MPa	2.2	Rc3/8
IDU4E		3.7	Rc1/2
IDU6E		5.5	Rc3/4
IDU8E		7.5	
IDU11E		11	
IDU15E1		15	Rc1
IDU22E		22	R1
IDU37E		37	R1 1/2
IDU55E		55	R2
IDU75E		75	

IDF□E

IDU□E

∗ The separate catalog for dryer models conforming with foreign standards (CE and UL) is available.

Series IDF100F/125F/150F
Model Selection

The corrected air flow capacity, which considers the user's operating conditions, is required for selecting air dryer. Select using the following procedures.

1 Read the correction factors.

Obtain the correction factors Ⓐ to Ⓓ suitable for your operating condition from the below table.

IDF100F/125F/150F Selection Example

Condition		Data symbol	Correction factor Note)
Inlet air temperature	45°C	Ⓐ	0.92
Ambient temperature	40°C	Ⓑ	0.98
Outlet air pressure dew point	10°C	Ⓒ	1
Inlet air pressure	0.5 MPa	Ⓓ	0.93
Air flow rate	12 m³/min	—	—
Power supply frequency	50 Hz	—	—

Note) Values obtained from the below "Correction Factors"

2 Check the coefficient.

Correction factor = 0.92 x 0.98 x 1 x 0.93 = 0.84
Max. coefficient value is 1.5 Correction factor is 1.5 when the calculation result is 1.5 or greater.

3 Calculate the corrected air flow capacity.

Obtain the corrected air flow capacity from the following formula.
Corrected air flow capacity = Air flow rate ÷ (correction factor ⒶxⒷxⒸxⒹ)

Corrected air flow capacity = 12 m³/min ÷ (0.92 x 0.98 x 1 x 0.93)
= 14.3 m³/min

4 Select the model.

Select the model with air flow capacity which exceeds the corrected air flow capacity from the specification table. (For air flow capacity, refer to the below data Ⓔ.)

From the corrected air flow capacity 14.3 m³/min, the IDF100F which processes air 16 m³/min at 50 Hz will be selected.

5 Options

Refer to page 7.

6 Finalize the model number.

Refer to page 2.

7 Select the optional accessories.

Refer to page 8.

Correction Factors

Data Ⓐ: Inlet Air Temperature

Inlet air temp. (°C)	Correction factor
5 to 30	1.41
35	1.21
40	1
45	0.92
50	0.75
55	0.63
60	0.53

Data Ⓑ: Ambient Temperature Note)

Ambient temp. (°C)	Correction factor
2 to 25	1.06
30	1.02
32	1
35	0.99
40	0.98
45	0.92

Note) For water-cooled type, the correction factor should be 1 for 2 to 45°C.

Data Ⓒ: Outlet Air Pressure Dew Point

Outlet air pressure dew point (°C)	Correction factor
3	0.55
5	0.7
10	1
15	1.4

Data Ⓓ: Inlet Air Pressure

Inlet air pressure (MPa)	Correction factor
0.2	0.84
0.3	0.87
0.4	0.9
0.5	0.93
0.6	0.96
0.7	1
0.8	1.03
0.9	1.06
1 to 1.6	1.09

Data Ⓔ: Air Flow Capacity

Model		IDF100F	IDF125F	IDF150F
Air flow capacity (m³/min [ANR])	50 Hz	16	20.1	25
	60 Hz	18.8	23.7	30

Refrigerant R407C (HFC)

Series IDF100F/125F/150F

Applicable Compressor Size: 100 kW, 125 kW, 150 kW
(Max. inlet air temperature: 60°C, Max. ambient temperature: 45°C)

How to Order

Air-cooled **IDF 100 F – 30 –** [Option: Nil, B, C, K, P, R, V] [Heat exhausting direction: Nil, 1, 2, 3]

Size

Size	Air compressor size Note)
100	100 kW
125	125 kW
150	150 kW

Note) Note that the above value is for reference only. Check the actual compressor capacity.

Voltage

Symbol	Voltage
30	Three-phase 200 VAC (50 Hz) 200/220 VAC (60 Hz)

Option

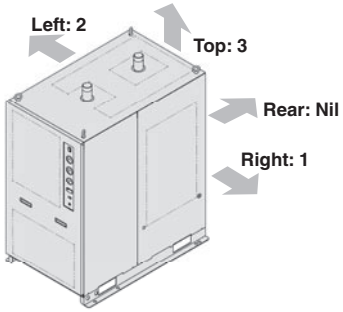
Symbol Note 1)	Description
Nil	None
B	Easy outdoor installation specification (Air-cooled type only) Note 2)
C	Anti-corrosive treatment for copper tube
K	Moderate pressure specification
P	With a metal name plate
R	With a circuit breaker
V	With a timer controlled solenoid valve type auto drain

Note 1) Enter alphabetically when multiple options are combined.
Note 2) The following combination is not available.
- The option B and heat exhausting direction 3 (Heat exhaust from the top cannot be achieved with easy outdoor installation specification.)

Heat exhausting direction

Symbol	Description
Nil	Heat exhaust from the rear
1	Heat exhaust from the right Note)
2	Heat exhaust from the left Note)
3	Heat exhaust from the top Note)

Note) The combination of 1, 2 and 3 is not available. (Heat exhausting face can be specified on one side only.)



Water-cooled **IDF 100 F – 30 –** [Option: Nil, C, D, K, P, R, V] **W** [Piping direction: 4, 5]

Size

Size	Air compressor size Note)
100	100 kW
125	125 kW
150	150 kW

Note) Note that the above value is for reference only. Check the actual compressor capacity.

Voltage

Symbol	Voltage
30	Three-phase 200 VAC (50 Hz) 200/220 VAC (60 Hz)

Option

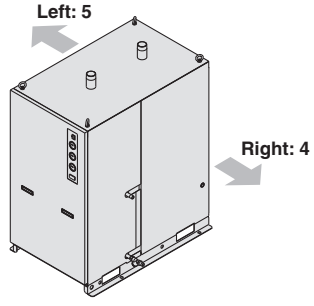
Symbol Note)	Description
Nil	None
C	Anti-corrosive treatment for copper tube
D	Easy outdoor installation specification (Water-cooled type only)
K	Moderate pressure specification (1.6 MPa)
P	With a metal name plate
R	With a circuit breaker
V	With a timer controlled solenoid valve type auto drain

Note) Enter alphabetically when multiple options are combined.

Piping direction

Symbol	Description
4	Facility water piping direction: Right Note)
5	Facility water piping direction: Left Note)

Note) The combination of 4 and 5 is not available. (Piping direction can be specified on one side only.)



Cooling method

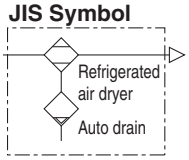
Symbol	Cooling method
W	Water-cooled condenser

Standard Specifications: Air-cooled Type

Specifications \ Model				IDF100F-30	IDF125F-30	IDF150F-30
Operating range Note 3)	Fluid			Compressed air		
	Inlet air temperature		°C	5 to 60		
	Inlet air pressure		MPa	0.15 to 1.0/0.15 to 1.6 for option K		
	Ambient temperature (humidity)		°C	2 to 45 (Relative humidity 85% or less)		
Rated conditions	Air flow capacity m³/min	Standard condition (ANR) Note 1)	50 Hz	16	20.1	25
			60 Hz	18.8	23.7	30
		Compressor intake condition Note 2)	50 Hz	16.7	20.9	26
			60 Hz	19.6	24.7	31.2
	Inlet air pressure		MPa	0.7		
	Inlet air temperature		°C	40		
	Ambient temperature		°C	32		
	Outlet air pressure dew point		°C	10		
	Exhaust heat from condenser (50/60 Hz)		kW	8.0/9.0	10.0/11.5	12.0/15.0
	Dryer outlet air temperature		°C	37		
Electric specifications	Power supply voltage (frequency)			Three-phase 200 VAC (50 Hz), 200/220 VAC (60 Hz)		
	Power consumption (50/60 Hz)		kW	2.9/3.5	4.0/4.7	4.0/4.8
	Operating current (50/60 Hz)		A	10.5/11.5	15.4/15.6	15.7/16.0
Applicable circuit breaker capacity Note 4)			A	30		
Refrigerant				R407C (HFC)		
Auto drain				Heavy duty auto drain (Normally open)		
Port size				R2	JIS flange 65A 10K	JIS flange 80A 10K
Weight			kg	245	270	350
Coating color				Body panel: White 1 Base: Gray 2		
Applicable air compressor output (Reference) For screw type			kW	100	125	150

Note 1) Air flow capacity under the standard condition (ANR) [atmospheric pressure 20°C, relative humidity 65%]
Note 2) Air flow capacity converted by the compressor intake condition [atmospheric pressure 32°C]
Note 3) The operation range does not guarantee the use with normal air flow capacity. When operating conditions are different from the rated specifications, please select a model in accordance with Model Selection (page 1).
Note 4) Install a circuit breaker with a sensitivity 30 mA.

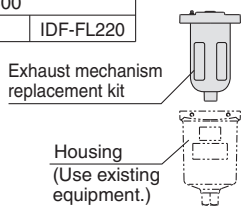
JIS Symbol



Replacement Parts

Air dryer model	IDF100F	IDF125F	IDF150F
Heavy duty auto drain replacement part no. Note 5)	ADH-E400		
Dustproof filter set for condenser	IDF-FL219		IDF-FL220

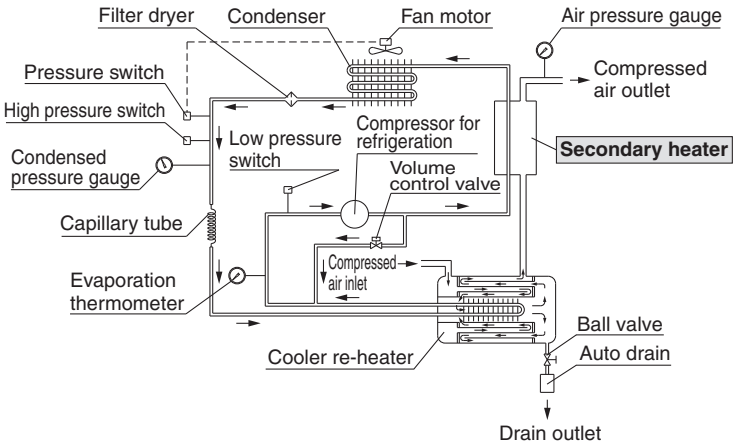
Note 5) Part number of only the exhaust mechanism replacement kit excluding the housing



Construction (Air/Refrigerant Circuit)

Hot and humid air entering the air dryer is cooled down by the cooler re-heater (heat exchanger). The moisture which is condensed and separated is automatically exhausted by the auto drain. The air which has had its moisture removed is heated in two stages by the re-heater (heat exchanger) in the cooler re-heater and by the secondary heater, and is supplied to the outlet side as warm and dry air.

IDF100F/125F/150F



Secondary heater

Compressed air from which drainage has been exhausted exchanges heat with refrigerant which has been compressed by the refrigerator, to give the following effects:

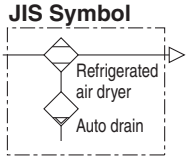
1. The outlet air temperature increases, preventing condensation of the piping on the outlet side.
2. The amount of heat exhausted from the condenser is reduced.
3. Energy saving operation of the dryer is achieved by reducing the amount of heat exhausted from the condenser.

Standard Specifications: Water-cooled Type

Specifications				Model	IDF100F-30-W	IDF125F-30-W	IDF150F-30-W
Operating range Note 3)	Fluid				Compressed air		
	Inlet air temperature			°C	5 to 60		
	Inlet air pressure			MPa	0.15 to 1.0/0.15 to 1.6 for option K		
	Ambient temperature (humidity)			°C	2 to 45 (Relative humidity 85% or less)		
Rated conditions	Air flow capacity m³/min	Standard condition (ANR) Note 1)	50 Hz		16	20.1	25
			60 Hz		18.8	23.7	30
		Compressor intake condition Note 2)	50 Hz		16.7	20.9	26
			60 Hz		19.6	24.7	31.2
	Inlet air pressure			MPa	0.7		
	Inlet air temperature			°C	40		
	Ambient temperature			°C	32		
	Outlet air pressure dew point			°C	10		
	Dryer outlet air temperature			°C	37		
	Facility water flow rate Note 4) (50/60 Hz)			m³/h	1.29/1.56	1.74/1.98	2.16/2.52
	Facility water inlet temperature			°C	32		
	Facility water pressure drop Note 5) (50/60 Hz)			MPa	0.07/0.1		
	Cooling tower capacity Note 6)			kW (RT)	9 (2)	11.5 (2.5)	14.5 (3.2)
	Recommended chiller model Note 6) (made by SMC)				HRG010-A	HRG015-A	
Electric specifications	Power supply voltage (frequency)				Three-phase 200 VAC (50 Hz), 200/220 VAC (60 Hz)		
	Power consumption Note 7) (50/60 Hz)			kW	2.4/2.8	2.4/2.8	2.8/3.3
	Operating current Note 7) (50/60 Hz)			A	8.5/9.0	8.5/9.0	10.2/11.5
Facility water pressure range				MPa	0.2 to 0.98		
Required facility water flow rate (50/60 Hz)				m³/h	1.29/1.56	1.74/1.98	2.16/2.52
Facility water inlet temperature range				°C	5 to 40		
Facility water port size					R1/2		R3/4
Facility water amount adjusting equipment					Pressure type water control valve		
Condenser					Plate type		
Applicable circuit breaker capacity Note 8)				A	20		30
Refrigerant					R407C (HFC)		
Auto drain					Heavy duty auto drain (Normally open)		
Port size					R2	JIS flange 65A 10K	JIS flange 80A 10K
Weight				kg	226	250	322
Coating color					Body panel: White 1 Base: Gray 2		
Applicable air compressor output (Reference) For screw type				kW	100	125	150

Note 1) Air flow capacity under the standard condition (ANR) [atmospheric pressure 20°C, relative humidity 65%]
Note 2) Air flow capacity converted by the compressor intake condition [atmospheric pressure 32°C]
Note 3) The operation range does not guarantee the use with normal air flow capacity. When operating conditions are different from the rated specifications, please select a model in accordance with Model Selection (page 1).
Note 4) Facility water flow rate that satisfies the conditions in which the facility water inlet temperature is 32°C and the outlet temperature is 37°C (Δt = 5°C) when the rated load is applied.
Note 5) Value with the rated load, facility water flow rate at rated flow rate and the facility water inlet pressure 0.2 MPa
Note 6) Value with the rated load (1 RT = 4.535 kW)
Note 7) Value with the power supply voltage 200 V
Note 8) Install a circuit breaker with a sensitivity 30 mA.

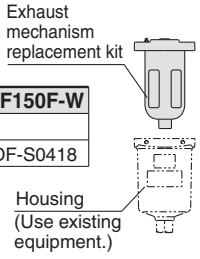
JIS Symbol



Replacement Parts

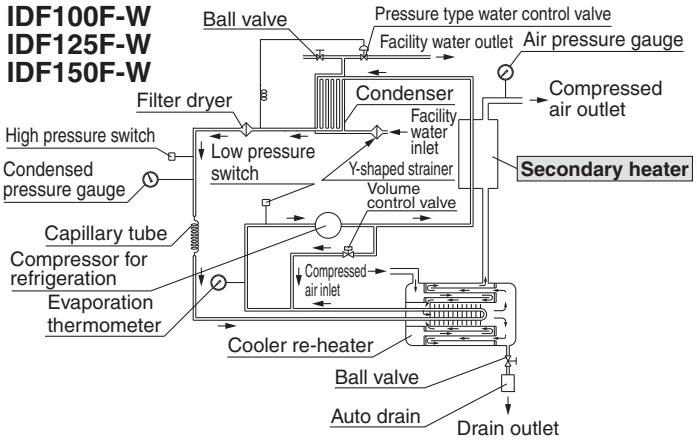
Air dryer model	IDF100F-W	IDF125F-W	IDF150F-W
Heavy duty auto drain replacement part no. Note 9)	ADH-E400		
Facility water piping strainer	IDF-S0406		IDF-S0418

Note 9) Part number of only the exhaust mechanism replacement kit excluding the housing



Construction (Air/Refrigerant Circuit)

IDF100F-W
IDF125F-W
IDF150F-W



Hot and humid air entering the air dryer is cooled down by the cooler re-heater (heat exchanger). The moisture which is condensed and separated is automatically exhausted by the auto drain. The air which has had its moisture removed is heated in two stages by the re-heater (heat exchanger) in the cooler re-heater and by the secondary heater, and is supplied to the outlet side as warm and dry air.

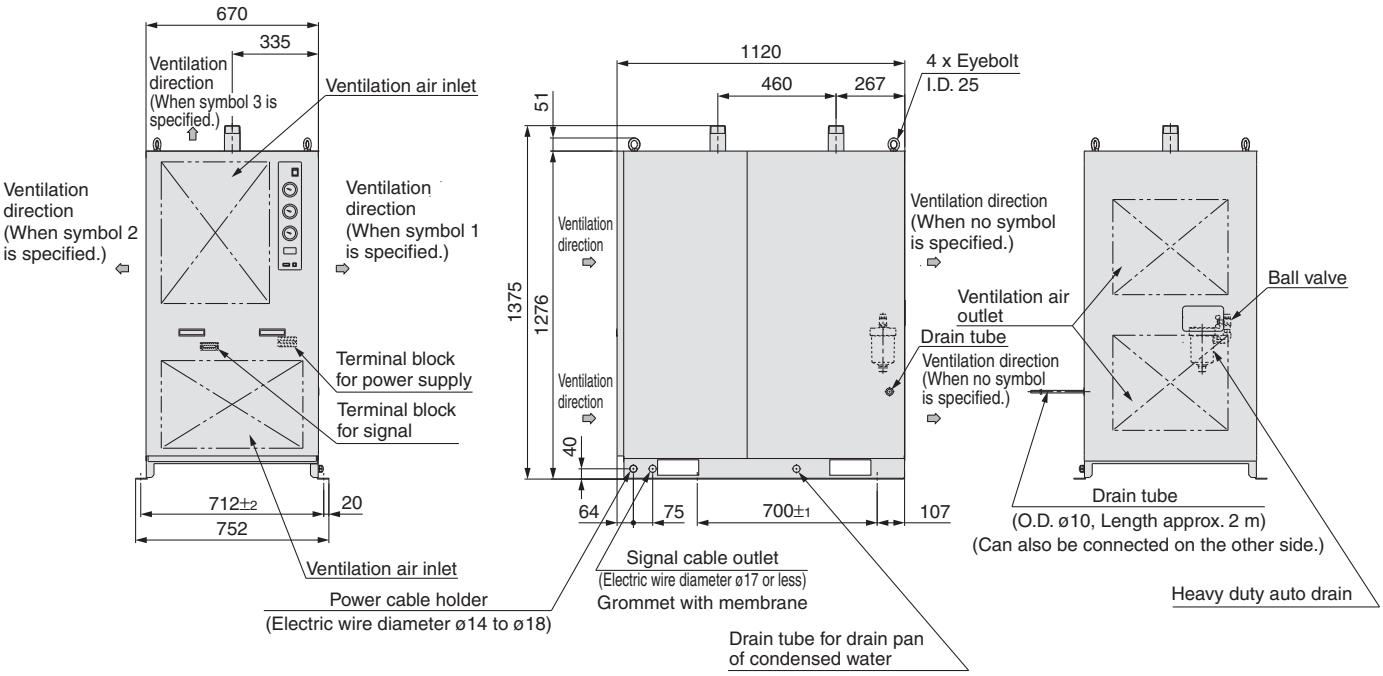
Secondary heater

Compressed air from which drainage has been exhausted exchanges heat with refrigerant which has been compressed by the refrigerator, to give the following effects:

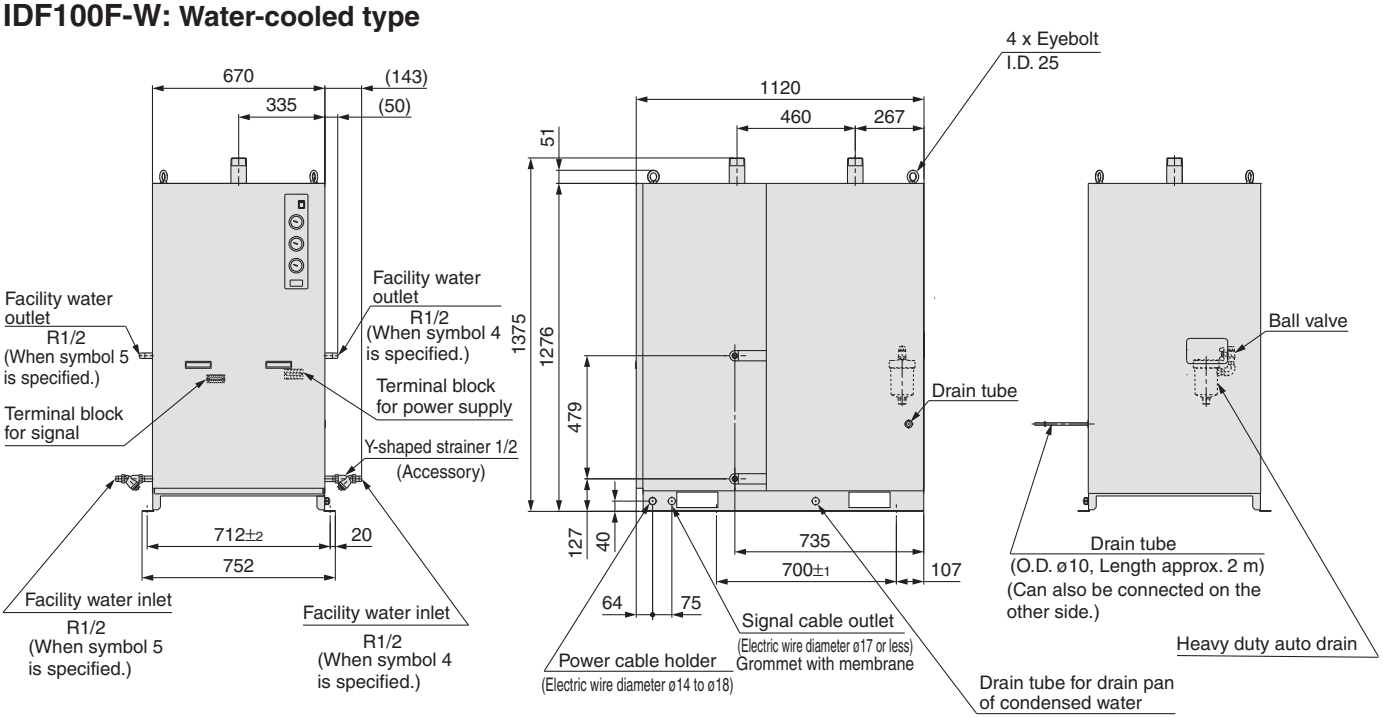
1. The outlet air temperature increases, preventing condensation of the piping on the outlet side.
2. The amount of heat exhausted from the condenser is reduced.
3. Energy saving operation of the dryer is achieved by reducing the amount of heat exhausted from the condenser.

Dimensions

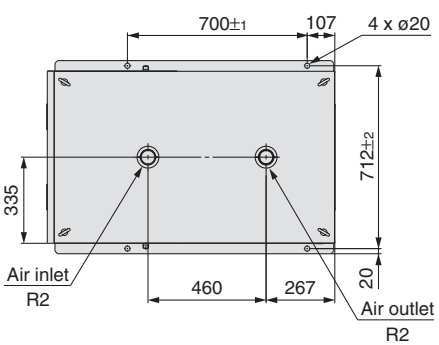
IDF100F: Air-cooled type



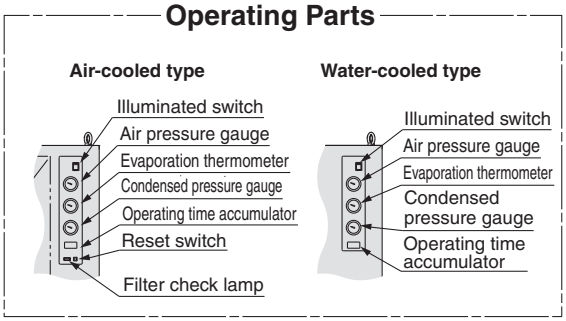
IDF100F-W: Water-cooled type



Top view (Air-cooled/Water-cooled)

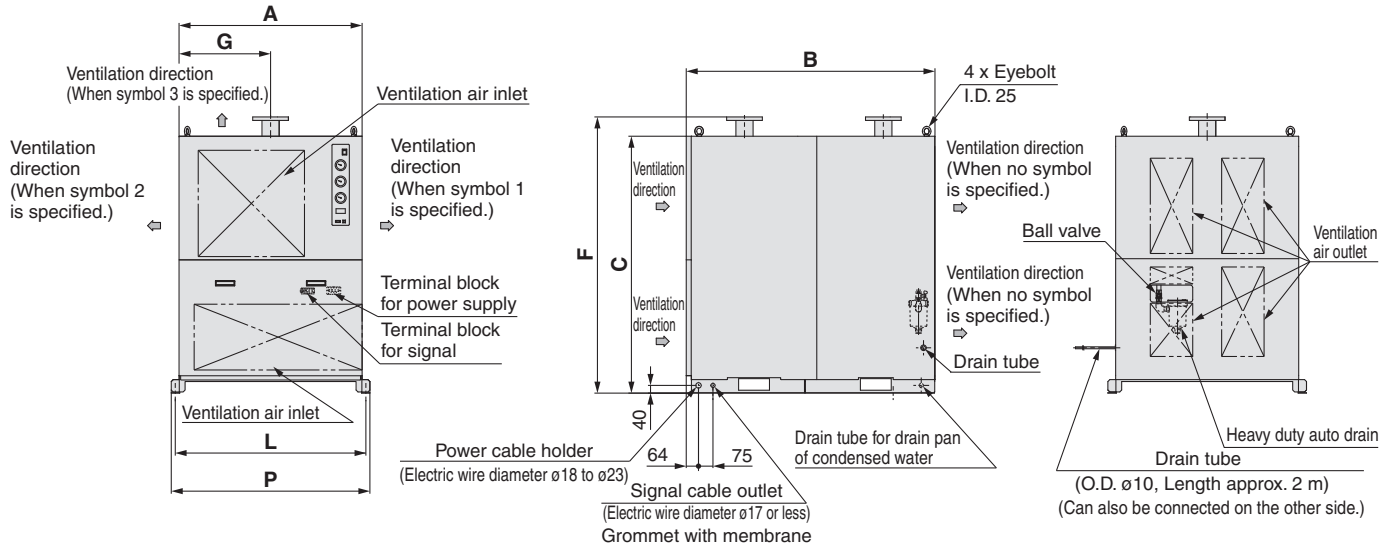


Operating Parts

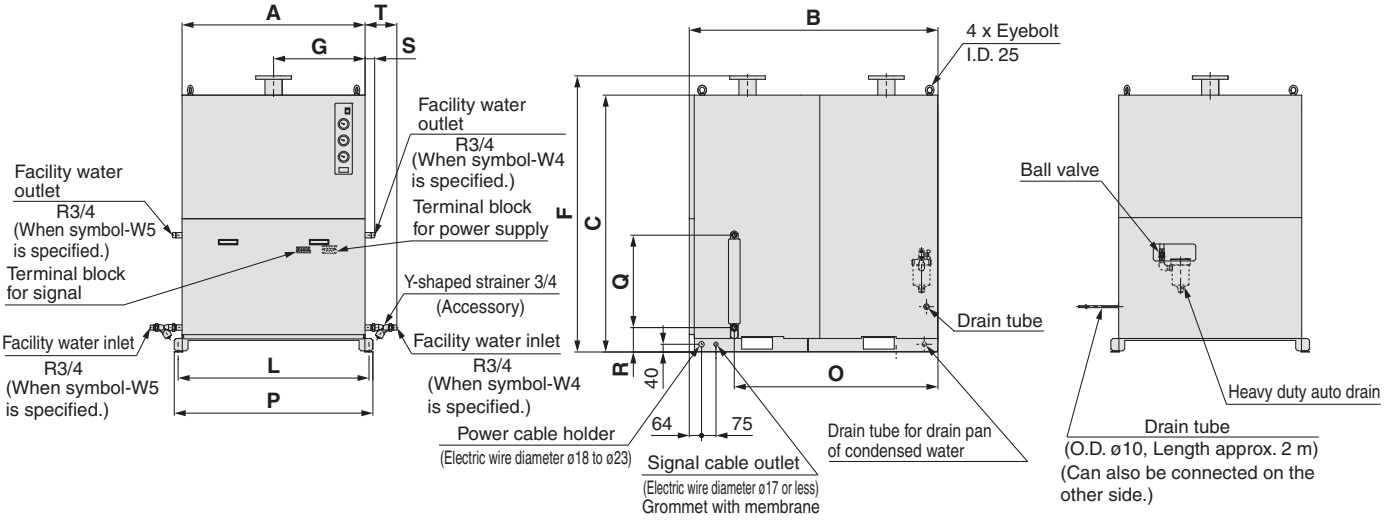


Dimensions

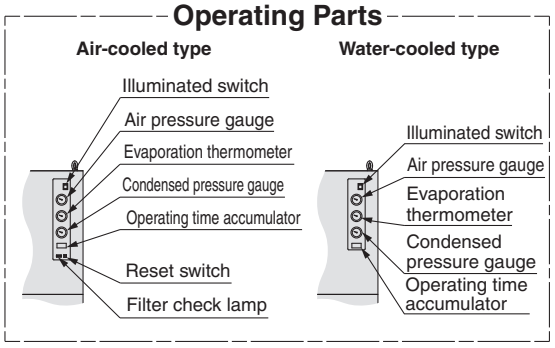
IDF125F/150F: Air-cooled type



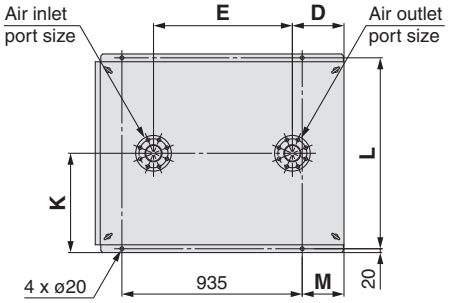
IDF125F-W/150F-W: Water-cooled type



Operating Parts



Top view (Air-cooled/Water-cooled)



Dimensions

(mm)

Model	Port size	A	B	C	D	E	F	G	K	L	M	O	P	Q	R	S	T
IDF125F	JIS flange 65A 10K	700	1120	1276	267	655	1375	350	376	712	78	—	752	—	—	—	—
IDF125F-W												885		479	127	36	129
IDF150F	JIS flange 80A 10K	950	1290	1332	268	720	1432	475	515	990	217	—	1030	—	—	—	—
IDF150F-W												1056		479	127	50	165

Series IDF100F/125F/150F
Options

Refer to "How to Order" page 2 for optional models.

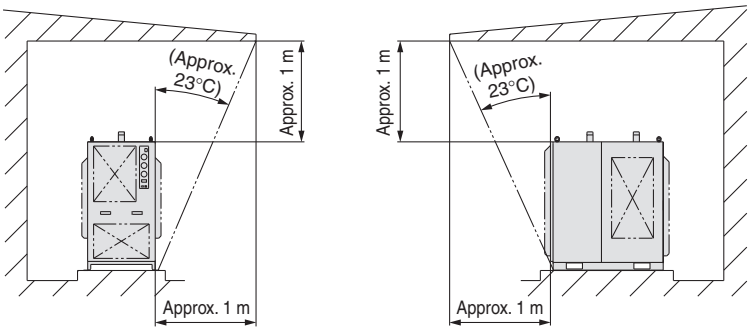
(Air-cooled type only) (Water-cooled type only)

B **D** Option symbol

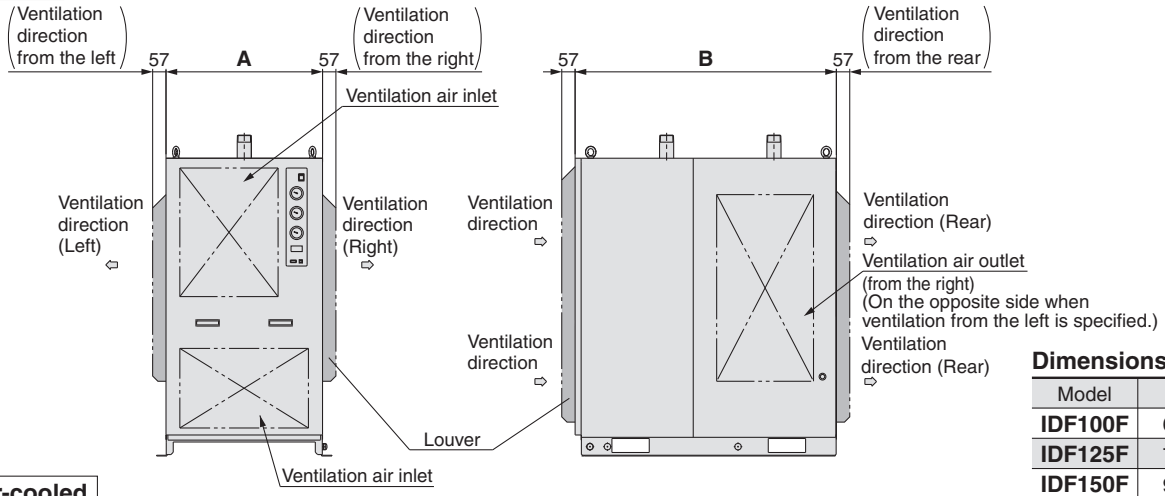
Easy outdoor installation specification

It can be installed outdoors under the eaves of a building, by mounting louvers at the ventilation air inlet and on the side in the heat exhausting direction and drip proof covers over the switch, etc. However, the product should be installed in a location where it will not come into direct contact with rain or snow.

Dimensions for installation under the eaves <Reference>



Air-cooled type only



Dimensions

Model	A	B
IDF100F	670	1120
IDF125F	700	1120
IDF150F	950	1290

Water-cooled type only

Same dimensions as the standard specifications

C Option symbol

Anti-corrosive treatment for copper tube

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. (Corrosion cannot be completely prevented.)
Special epoxy coating: 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 the coating.

∗ Corrosion is not covered under warranty.

K Option symbol

Moderate pressure specification

The maximum operating pressure is 1.6 MPa.
The internal drain piping material is changed from nylon to metal.

Specifications

1. Maximum operating pressure: 1.6 MPa
2. Dimensions ··· same as standard products

P Option symbol

With a metal name plate

The label identifying the model and specifications of the product is changed to a metal plate which has better endurance.

R Option symbol

With a circuit breaker

A circuit breaker is installed in the air dryer.
This saves additional electrical wiring at the time of installation.

Air dryer model	**IDF100F-30-R** **IDF125F-30-R** **IDF150F-30-R**	**IDF100F-30-RW** **IDF125F-30-RW** **IDF150F-30-RW**
Breaker capacity	30 A	20 A

Sensitivity current: 30 mA

V Option symbol

With a timer controlled solenoid valve type auto drain

Float type heavy duty auto drain is changed to the solenoid valve type auto drain. Drainage is discharged by controlling a solenoid valve with a timer. A strainer for solenoid valve protection and stop valve are also included.

Replacement Parts

Description	Part no.	Note
Timer type solenoid valve	IDF-S0405	200 VAC

Series IDF100F/125F/150F
Optional Accessories

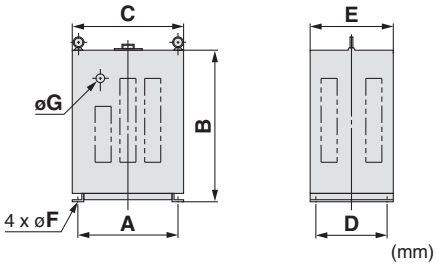
Specifications

Description	Features	Specifications
Separately installed power transformer 	Power supply and voltage for those other than the standard	Max. ambient temperature 40°C (Relative humidity 85% or less)
Foundation bolt set 	For fixing the air dryer to the foundations Easy to secure by striking the axle	Stainless steel
Piping adapter 	For converting the thread type of an IN/OUT fitting for air dryers from Rc to NPT	Copper alloy
Panel for changing heat exhausting direction	For changing the heat exhausting direction of the air-cooled type on site. A slit panel and a panel without slit are used in combination.	Refer to the operation manual for details.

Dimensions

[Separately installed power transformer]

IDF-TR7000-8



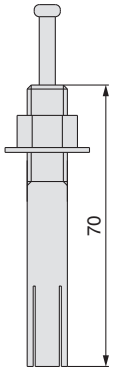
Specifications/Dimensions

Transformer	Applicable dryer	Capacity	Type	Inlet voltage	Outlet voltage	A	B	C	D	E	F	G	Weight
IDF-TR7000-8	IDF100F	7 kVA	Three-phase Compound winding	220, 240 380, 400, 415 440 V (50/60 Hz)	200 V (50/60 Hz)	360	540	400	260	300	11	30	94 kg
IDF-TR9000-8	IDF125F IDF150F	9 kVA				400	650	450	300	350	13	40	109 kg

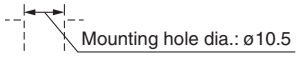
[Foundation bolt set]

Specifications

Part no.	Applicable dryer	Nominal thread size	Material	Number of 1 set
IDF-AB501	IDF100F to 150F	M10	Stainless steel	4

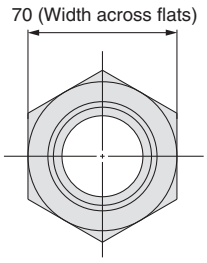


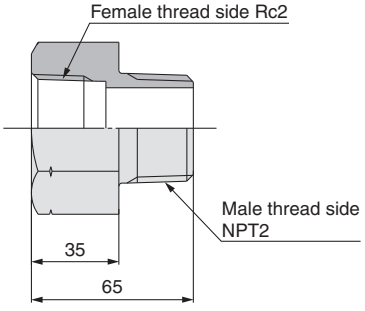
* Use a large flat washer when it is used.



[Piping adapter]

IDF-AP607

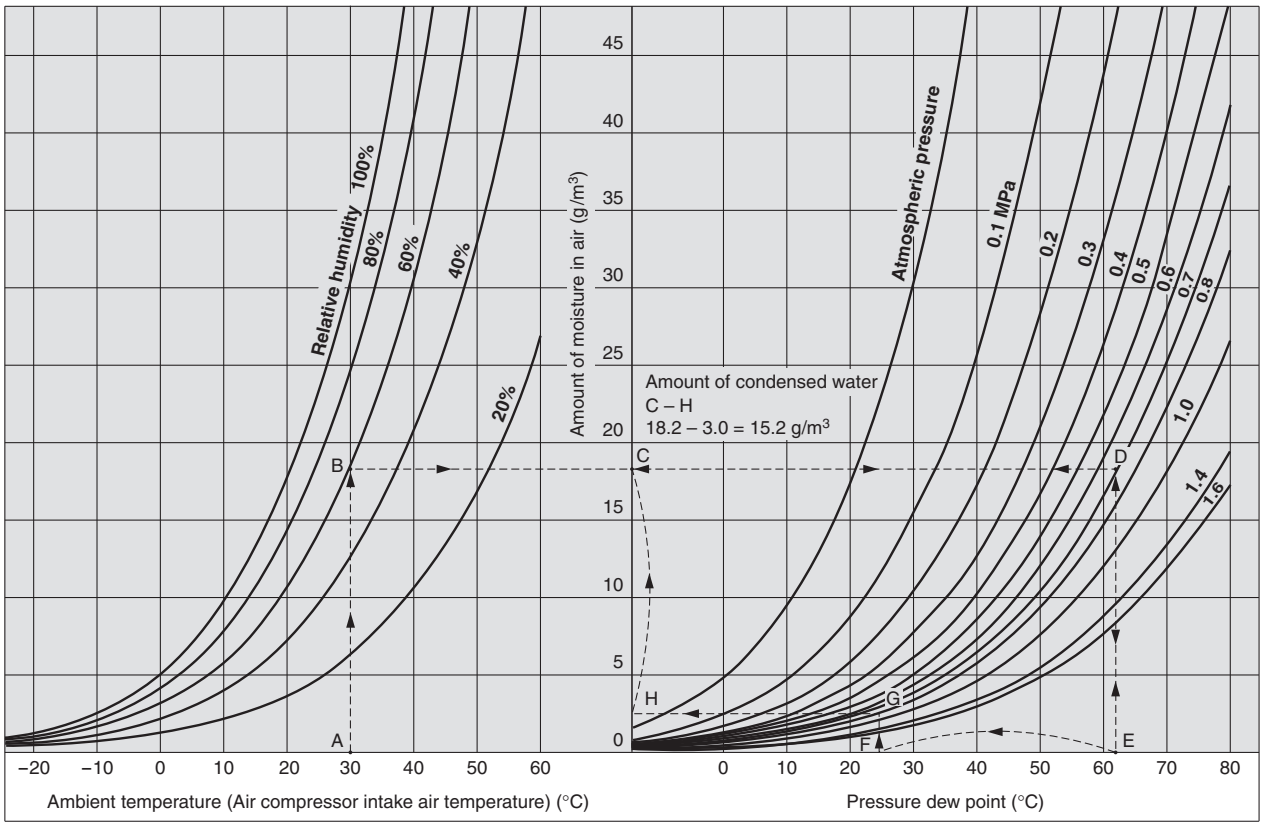




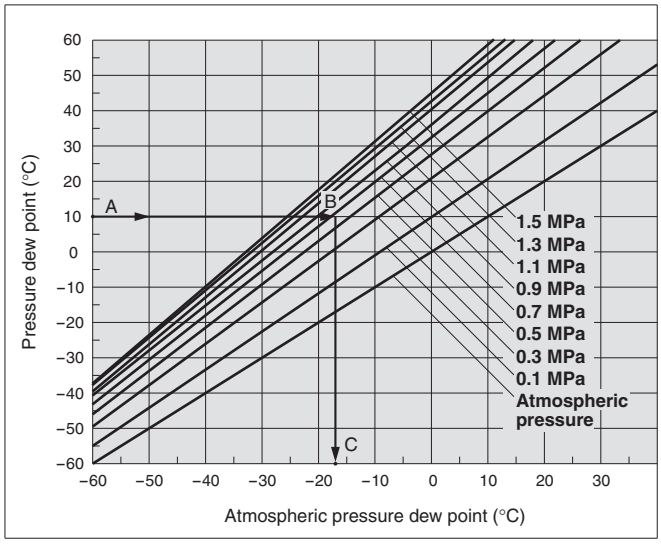
* 1 set (2 pcs.) is attached.
* Material: Copper alloy

Data

Condensed Water Calculation



Dew Point Conversion Chart



How to read the dew point conversion chart

Example) To obtain the atmospheric pressure dew point at a pressure dew point 10°C and a pressure 0.7 MPa.

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

How to calculate the amount of condensed water

Example) To obtain the amount of condensed water when the pressure is applied to air up to 0.7 MPa with an air compressor, then cooled down to 25°C. Given an ambient temperature at 30°C and a relative humidity 60%.

1. Trace the arrow mark from the point A at an ambient temperature 30°C to obtain the intersection B on the curved line for the relative humidity 60%.
2. Trace the arrow mark from the intersection B to obtain the intersection D on the pressure characteristic line for 0.7 MPa.
3. Trace the arrow mark from the intersection D to obtain the intersection E.
4. The intersection E is the dew point under pressure 0.7 MPa with an ambient temperature 30°C and a relative humidity 60%. The value for E is 62°C.
5. Trace the intersection E upward, and trace from the intersection D leftward to obtain the intersection C.
6. The intersection C is the amount of moisture included in the compressed air 1 m³ at 0.7 MPa and a pressure dew point 62°C. **The amount of moisture is 18.2 g/m³.**
7. Trace the arrow mark, starting from F for cooling temperature 25°C (pressure dew point 25°C) to obtain 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 moisture included in the compressed air 1 m³ at 0.7 MPa, and a pressure dew point 25°C. **The amount of moisture is 3.0 g/m³.**
10. Therefore, the amount of condensed water is as follows (per 1 m³):

The amount of moisture at the intersection C – the amount of moisture at the intersection H = the amount of condensed water
18.2 – 3.0 = 15.2 g/m³

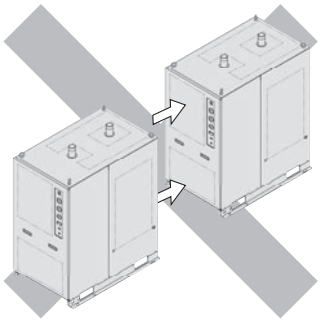
Series IDF100F/125F/150F
Specific Product Precautions 1

Be sure to read before handling. Refer to back cover for Safety Instructions, "Handling Precautions for SMC Products" (M-E03-3) for Air Preparation Equipment Precautions.

Installation

⚠Caution

- Avoid locations where the air dryer will be in direct contact with wind and rain. (Avoid locations where relative humidity is 85% or more.)
- Avoid exposure to direct sunlight.
- Avoid locations that contain much dust, corrosive gases, or flammable gases. Failure due to corrosion is not covered under warranty. However, when the risk of corrosion is high, select the option C (anti-corrosive treatment for copper tube).
- Avoid locations of poor ventilation and high temperature.
- Avoid locations where the air dryer is too close to a wall, etc. Leave a sufficient space between the air dryer and the wall according to the "Maintenance Space" in the operation manual.
- Avoid locations where the air dryer could draw in high temperature air discharged from an air compressor or other dryer.



Check that the exhaust air does not flow into the neighboring equipment.

- Avoid locations subjected to vibration.
- Avoid possible locations where the drain can freeze.
- Avoid locations with an ambient temperature over 45°C.
- Avoid installation on machines for transporting, such as vehicles, ships, etc.

Drain Tube

⚠Caution

- A polyurethane tube is attached as a drain tube for this product. Use this tube to discharge drainage to a drain tank, etc.
- Do not use the drain tube in an upward direction. Do not bend or crush the drain tube. (Operation of the auto drain will stop water vapor from discharging through the air outlet.)
  If it is unavoidable that the tube goes upwards, make sure it only goes as far as the position of the auto drain.

Power Supply

⚠Caution

<200 VAC>

- Connect the power supply to the terminal block.
- Install a circuit breaker Note) suitable to each model for the power supply.
- Maintain voltage fluctuation within ±10% of the rated voltage.

Note) Select a circuit breaker with a sensitivity current of 30 mA. As regards rated current, refer to "Applicable circuit breaker capacity" on pages 3 and 4.

When the voltage is different from the standard specifications, use a separately installed power transformer. (Page 8)

Air Piping

⚠Caution

- Be careful to avoid an error in connecting the air piping at the compressed air inlet (IN) and outlet (OUT).
- Install bypass piping since it is needed for maintenance.
- When tightening the inlet/outlet air piping, hold the dryer-side piping firmly in place with a pipe wrench.
- The piping surface may reach temperatures around 60°C depending on usage conditions. When adjusting valves or performing other such operations, a temperature check is necessary, wear gloves before proceeding.
- Check that vibrations resulting from the compressor are not transmitted through the air piping to the air dryer.
- Do not allow the weight of the piping to lie directly on the air dryer.

Protection Circuit

⚠Caution

When the air dryer is operated in the following cases, which will activate the protection circuit and turn off the lamp, the air dryer will come to stop.

- The compressed air temperature is too high.
- The compressed air flow rate is too high.
- The ambient temperature is too high. (over 45°C)
- The fluctuation of the power supply is beyond the rated voltage ±10%.
- The air dryer is drawing in high temperature air that is exhausted from an air compressor or other dryer.
- The ventilation port is obstructed by a wall or clogged with dust.

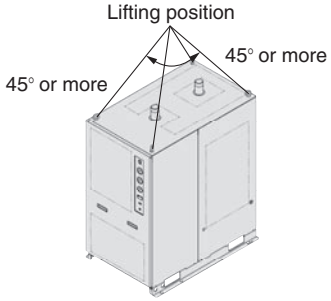
Transportation and Installation

⚠Warning

Be sure to follow the below instructions for transporting the product.

- The product is filled with refrigerant. Transport it (by land, sea or air) in accordance with laws and regulations specified.
- When carrying the product, be careful not to let it drop or fall over. Lift it by using a fork lift or rope and lifting hook. The lifting angle should be 45° or more.
- Do not lift the product by holding the panel, fittings or piping.
- Never lay the product down for transportation. This may lead to damage to the product.

- The product is heavy and has potential dangers in transportation. Be sure to follow the above instructions.
- Be sure to use a fork lift or lifting hook for transporting the product.



Series IDF100F/125F/150F
Specific Product Precautions 2

Be sure to read before handling. Refer to back cover for Safety Instructions, "Handling Precautions for SMC Products" (M-E03-3) for Air Preparation Equipment Precautions.

Compressor Air Delivery

⚠ Caution

Use an air compressor with an air delivery of 50 L/min or larger.

Since the auto drain is designed in such a way that the valve remains open unless the air pressure rises to 0.05 MPa or higher, air will blow out from the drain outlet at the time of air compressor start up until the pressure increases. Therefore, if an air compressor has a small air delivery, the pressure may not be sufficient.

Auto Drain

⚠ Caution

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

Cleaning of Ventilation Area (Air-cooled Type)

⚠ Caution

Remove dust from the ventilation area once a month using a vacuum cleaner or an air blow nozzle. The dustproof filter cleaning indication lamp indicates the timing for cleaning. (It turns on after 300 hours of operation.)

Time Delay for Restarting

⚠ Caution

Allow at least three minutes before restarting the air dryer. Otherwise, the protection circuit will activate, the lamp will be turned off and the air dryer will not start up.

Modifying the Standard Specifications

⚠ Caution

The heat exhausting direction of the air-cooled type can be changed using the "panel for changing heat exhausting direction" which is sold separately. Refer to the operation manual.
The other optional specifications cannot be modified once the product has been supplied to a customer. Check the specifications carefully before selecting an air dryer.

Facility Water Supply (Water-cooled Type)

⚠ Warning

1. Be certain to supply the facility water.

1. Prohibition of water-cut operation, very little flow rate of water operation.
   Do not operate under the condition that there is no facility water or where there is very little flow rate of water is flowing.
   In this kind of operation, facility water temperature may become extremely higher. It is dangerous enough the material of hose may soften and burst when the piping supplying the facility water is connected with hose.
2. Actions to be taken when an emergency stop occurs due to high temperature.
   In case a stop occurs due to extremely high temperature resulting from a decrease in the facility water flow rate, do not immediately flow facility water. It is dangerous enough the material of hose may soften and burst when the piping supplying the facility water is connected with hose.
   First, naturally let it cool down by removing the cause of the flow rate reduction. Secondly, confirm that there is no leakage again.

⚠ Caution

1. Facility water quality

1. Use the facility water within the specified range as shown below. When using with other fluid than facility water, consult with SMC.
2. When it is likely that foreign matter may enter the fluid, install a filter (20 mesh or equivalent).

Facility Water Quality Standard

The Japan Refrigeration and Air Conditioning Industry Association
JRA GL-02-1994 "Cooling water system – Circulation type – Circulating water"

	Item	Unit	Standard value
Standard item	pH (at 25°C)	–	6.5 to 8.2
	Electrical conductivity (25°C)	[μS/cm]	100* to 800*
	Chloride ion (Cl^-)	[mg/L]	200 or less
	Sulfuric acid ion (SO_4^{2-})	[mg/L]	200 or less
	Acid consumption amount (at pH4.8)	[mg/L]	100 or less
	Total hardness	[mg/L]	200 or less
	Calcium hardness ($CaCO_3$)	[mg/L]	150 or less
	Ionic state silica (SiO_2)	[mg/L]	50 or less
Reference item	Iron (Fe)	[mg/L]	1.0 or less
	Copper (Cu)	[mg/L]	0.3 or less
	Sulfide ion (S_2^-)	[mg/L]	Should not be detected.
	Ammonium ion (NH_4^+)	[mg/L]	1.0 or less
	Residual chlorine (Cl)	[mg/L]	0.3 or less
	Free carbon (CO_2)	[mg/L]	4.0 or less

* In the case of [MΩ·cm], it will be 0.00125 to 0.01.

⚠ Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of **"Caution," "Warning"** or **"Danger."** They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)*1), and other safety regulations.

⚠ Caution: **Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

⚠ Warning: **Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.

⚠ Danger : **Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

*1) ISO 4414: Pneumatic fluid power – General rules relating to systems.
ISO 4413: Hydraulic fluid power – General rules relating to systems.
IEC 60204-1: Safety of machinery – Electrical equipment of machines. (Part 1: General requirements)
ISO 10218-1: Manipulating industrial robots - Safety.
etc.

⚠ Warning

1. **The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.**
   Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.
2. **Only personnel with appropriate training should operate machinery and equipment.**
   The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.
3. **Do not service or attempt to remove product and machinery/equipment until safety is confirmed.**
   1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
   2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
   3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.
4. **Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.**
   1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
   2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalog.
   3. An application which could have negative effects on people, property, or animals requiring special safety analysis.
   4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

⚠ Caution

1. **The product is provided for use in manufacturing industries.**
   The product herein described is basically provided for peaceful use in manufacturing industries.
   If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.
   If anything is unclear, contact your nearest sales branch.

Limited warranty and Disclaimer/ Compliance Requirements

The product used is subject to the following "Limited warranty and Disclaimer" and "Compliance Requirements".
Read and accept them before using the product.

Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered.*2)
   Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.
   This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.

*2) **Vacuum pads are excluded from this 1 year warranty.**
A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.
Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

Revision history		
Edition B	* Addition of Refrigerated Air Dryers IDF125F, 150F.	OX

⚠ Safety Instructions Be sure to read "Handling Precautions for SMC Products" (M-E03-3) before using.

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Specifications are subject to change without prior notice and any obligation on the part of the manufacturer.
D-DN
1st printing OP printing OX 12450SZ Printed in Japan.