



# Operation Manual

PRODUCT NAME

Membrane Air Dryer

MODEL / Series / Product Number

IDG1-C06  
IDG1-C06-P

**SMC Corporation**

# Contents

Safety Instructions	2
Limitations of Use	4
Maintenance	6
Specifications	6



# 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)<sup>\*1)</sup>, and other safety regulations.

\*1) ISO 4414: Pneumatic fluid power - General rules and safety requirements for systems and their components  
ISO 4413: Hydraulic fluid power - General rules and safety requirements for systems and their components  
IEC 60204-1: Safety of machinery - Electrical equipment of machines - Part 1: General requirements  
ISO 10218-1: Robots and robotic devices - Safety requirements for industrial robots - Part 1: Robots  
etc.



## **Danger**

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



## **Warning**

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



## **Caution**

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



## **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. Our products cannot be used beyond their specifications. Our products are not developed, designed, and manufactured to be used under the following conditions or environments. Use under such conditions or environments is not covered.**

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Use for nuclear power, railways, aviation, space equipment, ships, vehicles, military application, equipment affecting human life, body, and property, fuel equipment, entertainment equipment, emergency shut-off circuits, press clutches, brake circuits, safety equipment, etc., and use for applications that do not conform to standard specifications such as catalogs and operation manuals.
3. Use for interlock circuits, except for use with double interlock such as installing a mechanical protection function in case of failure. Please periodically inspect the product to confirm that the product is operating properly.



# Safety Instructions

## **Caution**

**We develop, design, and manufacture our products to be used for automatic control equipment, and provide them for peaceful use in manufacturing industries.**

**Use in non-manufacturing industries is not covered.**

Products we manufacture and sell cannot be used for the purpose of transactions or certification specified in the Measurement Act.

The new Measurement Act prohibits use of any unit other than SI units in Japan.

## **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, whichever is first.\*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.

## 2. Limitations of Use

### Design

#### Warning

1. **Do not exert intermittent pressure on this product.**  
(Example: Frequently operating solenoid valves installed on the primary side) Intermittent pressure damages the product.

#### Caution

1. **Install a regulator on the outlet side of the membrane air dryer.**  
If it is installed on the inlet side, dehumidification performance will be reduced.
2. **Devise a layout which considers the position of purge air discharge ports.**  
Purge air is humid air. Devise a layout in which purge air will not cause trouble such as corrosion or malfunction of peripheral equipment.
3. **When highly purified air is required**  
(Supply to the air bearing, semiconductor blow etc.)  
Connect micro mist separator or super mist separator to the outlet (in the end) of this product.
4. **Time to reach the standard dew point**  
A certain amount of time is required to achieve the standard dew point after the air begins flowing into the membrane air dryer. Using the times below as a guide, begin operating outlet side equipment after the standard dew point is achieved.  
  
Standard dew point -20°C: about 10 minutes.
5. **Do not use for applications such as repeatedly bending or stretching. This may cause damage to the product.**

### Selection

#### Caution

1. **Consider the purge air flow rate in total flow rate requirements.**  
Find the purge air flow rate from the charts and calculate the "required outlet air flow rate + purge air flow rate". The air supply capacity must be at least equal to the calculated flow or the required outlet air flow rate cannot be obtained.
2. **With fitting for purge air discharge (Semi-standard: P)**  
The dehumidification capacity decreases in proportion to the length of the tube for discharging purge air. Use a tube of the specified size and keep its length within 5 meters.

### Mounting

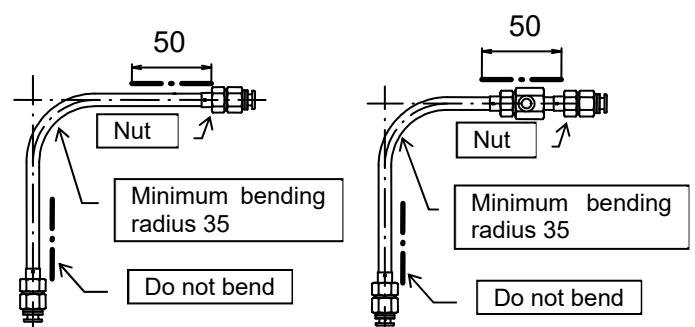
#### Caution

1. **Do not obstruct the purge air discharge ports.**  
The product may be damaged. And if purge air back pressure becomes too high or purge air stops flowing, dehumidification performance will decrease or may become impossible.
2. **Be sure to install a mist separator and micro mist separator or a micro mist separator with pre-filter on the inlet side of the membrane air dryer.**  
If the inlet air contains oil, performance will be reduced.
3. **Remove water droplets from the inlet air.**  
Take appropriate measures so that water droplets do not flow into the membrane air dryer. If water droplets flow into the membrane air dryer, the performance may lower, causing malfunction.
4. **Large quantities of dust (solid foreign matter) are contained in the supply air.**  
When there are large quantities of dust (solid foreign matter), install an air filter or main line filter to the inlet side of the mist separator in addition to 2 above.
5. **Take sufficient care in handling.**  
There is a danger of damage if dropped.
6. **Do not use fixtures to the tubes.**  
Using fixtures on tubes may cause damage to the product.

### Piping

#### Warning

1. **Minimum bending radius**  
Maintain a minimum bending radius of 35 mm or more and do not bend the sections that are within 50 mm from the nuts. Furthermore, do not twist the product.



2. **Refer to the catalog how to install / remove tube.**  
When you install / remove tube, follow the Fittings and Tubing Precautions on catalog. Use tubes in the catalog.

## Piping



### Caution

#### 1. Before piping is connected, flush the piping.

Be sure to remove chips, cutting oil and other debris. If they get into the product, unexpected malfunction or damage to the product may occur.

## Air Supply



### Caution

#### 1. Compressed air supply capacity

An air source that has a supply capacity that is larger than the "required outlet air flow rate (dry air flow rate) + purge air flow rate" is required. Verify the purge air flow rate in "Purge Air Flow Rate Characteristics."

#### 2. Chemicals with a negative effect on this product

Chemicals listed in the table below in the compressed air can lower performance and damage the element. Do not use the product in environments including these chemicals.

Category	Chemicals not to be included
Solvents	Acetone, benzene, phenol, toluene, trichloroethylene, xylene, cresol, thinner, aniline, chloroform, chlorobenzene, trichloroethane, ethylbenzene, ethyl alcohol, methyl alcohol, isopropyl alcohol, dioxin, tetrahydrofuran, methylene chloride, cyclohexane, carbon tetrachloride, methyl ketone, ethyl ketone, hexafluoroisopropanol, and others
Acids	Sulfuric acid, nitric acid, hydrochloric acid, acetic acid, lactic acid, chromic acid, and others
Gases	Chlorine gas, sulfurous acid gas, hydrogen chloride, bromine, ozone, ammonia, and others
Oils	Phosphoric-ester hydraulic oil, fuel oil, water soluble cutting oil (alkaline), kerosene, and others
Strong bases	Lithium hydroxide, sodium hydroxide, potassium hydroxide, calcium hydroxide, and others
Others	Anaerobic adhesive, anaerobic sealant, and others

## Operating Environment



### Caution

#### 1. Do not use at temperatures (fluid or ambient temperatures) higher than the prescribed operating conditions.

Resin is used in the membrane module, and it can be damaged by operation at high temperatures. Especially when installed immediately after a reciprocating type air compressor, confirm that the fluid temperature does not exceed the range of operating conditions during use.

#### 2. Keep the inlet air temperature lower than the ambient temperature.

If the membrane air dryer body is cooled by the surrounding air, water drops may accumulate inside and reduce its dehumidification capacity.

#### 3. Do not use in the following environments, as this can cause failure.

- 1) In locations having corrosive gases, organic solvents, and chemicals, or in locations where these elements are likely to adhere to the equipment.
- 2) In locations where salt water, water, or water vapor could come in contact with the equipment.
- 3) In locations that is exposed to shocks and vibrations.

### 3. Maintenance

#### Caution

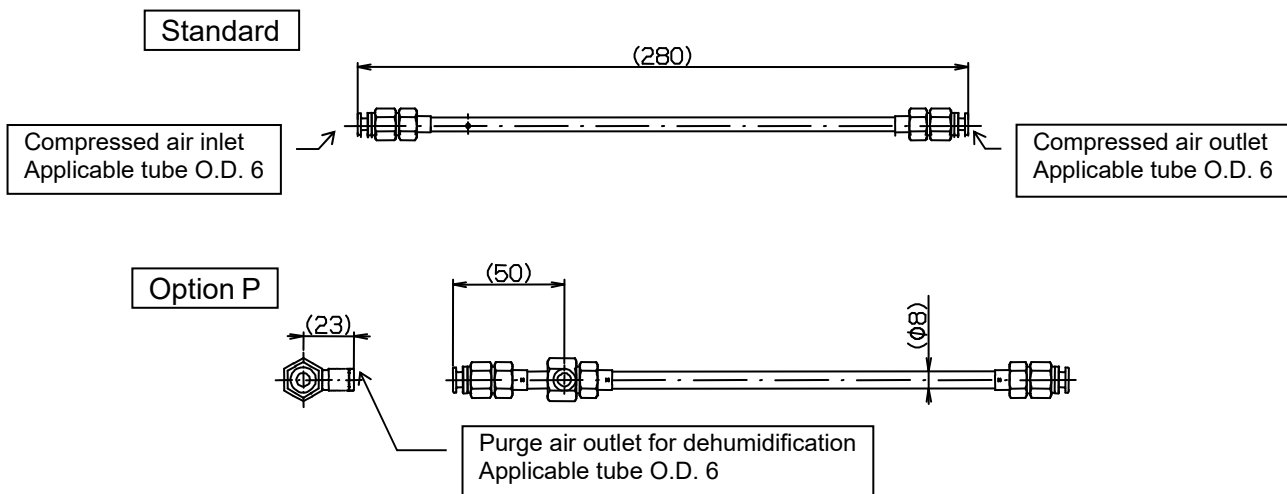
1. Confirm that the equipment's pressure is at zero and no longer in a pressurized state before removing any parts or piping. Performing any work while pressure remains in the equipment may lead to injury or product damage.
2. Mount pressure gauge.  
During a maintenance, mount pressure gauges to both inlet / outlet sides for confirming the residual pressure.
3. Membrane module cannot be replaced by part.  
Replace the whole product when replacement is necessary.

### 4. Specifications

Model		IDG-C06	IDG-C06-P
Range of operating conditions	Fluid <sup>*Note1)</sup>	Compressed air	
	Inlet air pressure (MPa)	0.3 to 0.85	
	Inlet air temperature (°C)	-5 to 55 (No freezing)	
	Ambient temperature (°C)	-5 to 55 (No freezing)	
Standard performance	Outlet air atmospheric pressure dew point (°C)	-20	
Standard performance conditions	Inlet air flow rate (L/min [ANR]) <sup>*Note2)</sup>	12.5	
	Outlet air flow rate (L/min [ANR])	10	
	Purge air flow rate (L/min [ANR])	2.5	
	Inlet air pressure (MPa)	0.7	
	Inlet air temperature (°C)	25	
	Inlet air saturation temp. (°C)	25	
	Ambient temperature (°C)	25	
Applicable tube O.D.		ø6	
Weight (kg)		45	77

\*Note1) Prevent water droplets from entering the inlet port

\*Note2) "ANR" indicates the flow rate converted to the value at 20°C, under the atmospheric pressure and the state of relative humidity 65%.



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Note: Specifications are subject to change without prior notice and any obligation on the part of the manufacturer.  
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