CKD

SM－11477－A

INSTRUCTION MANUAL

SUPER DRYER UNIT
SU300E·400E
SU300D·400D

- Please read this instruction manual carefully before using this product, particularly the section describing safety.
- Retain this instruction manual with the product for further consultation whenever necessary.

APR-06 5th Edition
CKD Corporation

Thank you for adopting CKD's quality product.

For maximum result and the most effective unilization of the CKD Super dryer, it is recommended you read and understand this manual prior to installation.

This manual is edited consisting of the following six sections.

- ○ PRODUCT
- ○ CAUTION
- ○ OPERATION
- ○ INSTALLATION
- ○ MAINTENANCE
- ○ MODEL CODING

It is, of course, desireble that you read this manual through before start using the product. This manual is so edited that a certain ides will be conveyed by reading the related section only, first of all. For instance, just reading the section of the installation, in case that an immediate installation is mandatorily required.

Table of Contents

1. PRODUCT

1-1. Specifications

(1) SU300E・SU400E

Item \ Series			SU300E. 400E
Application conditions	Fluid used		Compressed air
	Inlet air pressure	MPa	0.4～1.0
	Withstanding pressure	MPa	1.5
	Inlet air temperature	℃	5～50
	Ambient temperature	℃	5～50
Standard rating	Outlet atmospheric dew point	℃	-15
	Inlet pressured dew point	℃	25
	Inlet air pressure	MPa	0.7
	Inlet air temperature	℃	25
	Ambient temperature	℃	25

Item / Model code	Inlet air flow ℓ/min(ANR)	Outlet air flow ℓ/min(ANR)	Purge air flow ℓ/min(ANR)	Filtration ratio μm	Pressure setting range MPa	Relief pressure MPa	Standard accessory
SU301E-※-C1	75	67	8	—	—	—	Bracket
SU302E-※-C1	150	135	15				
SU401E-※-C1	300	270	30				
SU402E-※-C1	450	405	45				
SU301E-※-C2	75	67	8	5			Differential pressure gauge, Bracket
SU302E-※-C2	150	135	15				
SU401E-※-C2	300	270	30				
SU402E-※-C2	450	405	45				
SU301E-※-C3	75	67	8		0.05～0.85	Setting pressure plus 0.05	Pressure gauge, Differential pressure gauge, Bracket
SU302E-※-C3	150	135	15				
SU401E-※-C3	300	270	30				
SU402E-※-C3	450	405	45				

Components

Model code	Air filter	Oil mist filter	Super Dryer	Regulator	Differential pressure gauge
SU301E-※-C1	—	M3000-10-F1	SD301E-※	—	—
SU302E-※-C1	—	M4000-10-F1	SD302E-※	—	—
SU401E-※-C1	—	M4000-10-F1	SD401E-※	—	—
SU402E-※-C1	—	SM4100	SD402E-※	—	—
SU301E-※-C2	F3000-10-F	M3000-10-F1	SD301E-※	—	GA400-8-P02
SU302E-※-C2	F4000-10-F	M4000-10-F1	SD302E-※	—	GA400-8-P02
SU401E-※-C2	F4000-10-F	M4000-10-F1	SD401E-※	—	GA400-8-P02
SU402E-※-C2	F4000-10-F	SM4100	SD402E-※	—	GA400-8-P02
SU301E-※-C3	F3000-10-F	M3000-10-F1	SD301E-※	R3000-10	GA400-8-P02
SU302E-※-C3	F4000-10-F	M4000-10-F1	SD302E-※	R4000-10	GA400-8-P02
SU401E-※-C3	F4000-10-F	M4000-10-F1	SD401E-※	R4000-10	GA400-8-P02
SU402E-※-C3	F4000-10-F	SM4100	SD402E-※	R4000-10	GA400-8-P02

(2) SU300D・SU400D

Item \ Series			SU300D. 400D
Application conditions	Fluid used		Compressed air
	Inlet air pressure	MPa	0.4～1.0
	Withstanding pressure	MPa	1.5
	Inlet air temperature	℃	5～50
	Ambient temperature	℃	5～50
Standard rating	Outlet atmospheric dew point	℃	-20
	Inlet pressured dew point	℃	25
	Inlet air pressure	MPa	0.7
	Inlet air temperature	℃	25
	Ambient temperature	℃	25

Item / Model code	Inlet air flow ℓ/min(ANR)	Outlet air flow ℓ/min(ANR)	Purge air flow ℓ/min(ANR)	Filtration ratio μm	Pressure setting range MPa	Relief pressure MPa	Standard accessory
SU301D-※-C1	125	100	25	—	—	—	Bracket
SU302D-※-C1	250	200	50				
SU401D-※-C1	500	400	100				
SU402D-※-C1	750	600	150				
SU301D-※-C2	125	100	25	5			Differential pressure gauge, Bracket
SU302D-※-C2	250	200	50				
SU401D-※-C2	500	400	100				
SU402D-※-C2	750	600	150				
SU301D-※-C3	125	100	25		0.05～0.85	Setting pressure plus 0.05	Pressure gauge, Differential pressure gauge, Bracket
SU302D-※-C3	250	200	50				
SU401D-※-C3	500	400	100				
SU402D-※-C3	750	600	150				

Components

Model code	Air filter	Oil mist filter	Super Dryer	Regulator	Differential pressure gauge
SU301D-※-C1	—	M4000-10-F1	SD301D-※	—	—
SU302D-※-C1	—	M4000-10-F1	SD302D-※	—	—
SU401D-※-C1	—	SM4100	SD401D-※	—	—
SU402D-※-C1	—	SM4100	SD402D-※	—	—
SU301D-※-C2	F4000-10-F	M4000-10-F1	SD301D-※	—	GA400-8-P02
SU302D-※-C2	F4000-10-F	M4000-10-F1	SD302D-※	—	GA400-8-P02
SU401D-※-C2	F4000-10-F	SM4100	SD401D-※	—	GA400-8-P02
SU402D-※-C2	F4000-10-F	SM4100	SD402D-※	—	GA400-8-P02
SU301D-※-C3	F4000-10-F	M4000-10-F1	SD301D-※	R4000-10	GA400-8-P02
SU302D-※-C3	F4000-10-F	M4000-10-F1	SD302D-※	R4000-10	GA400-8-P02
SU401D-※-C3	F4000-10-F	SM4100	SD401D-※	R4000-10	GA400-8-P02
SU402D-※-C3	F4000-10-F	SM4100	SD402D-※	R4000-10	GA400-8-P02

1-2.Model selection

(1) Model selection method

The performance curve of dew point as mentioned above are shown the relationship between output air pressured dew point on condition that inlet air pressure is 0.7 MPa and its temperature is 25℃(saturated). Select the model on the right of the intersection of the required dew point and the required flow.

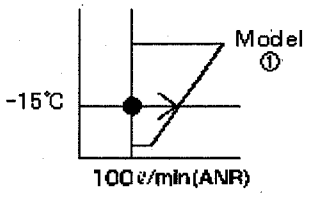
<Correction method of air flow>

It is necessary that output air flow shall be corrected by each correction curve, except for rated conditions.

(Rated output air flow) × (Correction factor) = (Output air flow)

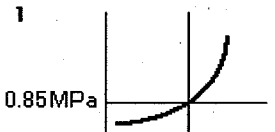
But, in the case of the air by which input air passed along the refrigerated drier, select inlet air temperature as 10 ℃ regardless of an actual temperature.

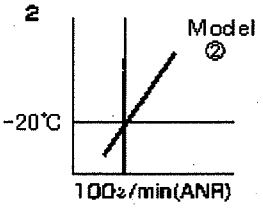
(例) Required dew point : −15℃
Required air flow : 100ℓ/min(ANR)
The model ① which is located on the right of the intersection shall be selected.



(例) Inlet air pressure : 0.85Mpa
Required dew point : −20℃
Required air flow : 120ℓ/min(ANR)

1. The correction factor 1.2 shall be read from outlet air flow correction curve against inlet air pressure.
2. The model ② shall be selected flow performance curve of dew point, since outlet air flow is 120ℓ/min ANR (=100ℓ/min ANR × 1.2)

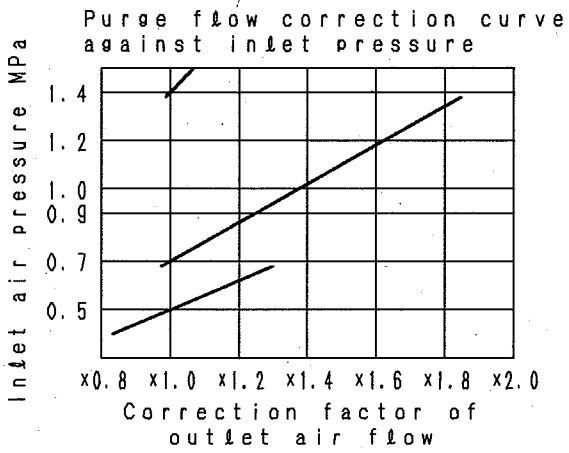




(2) Purge flow

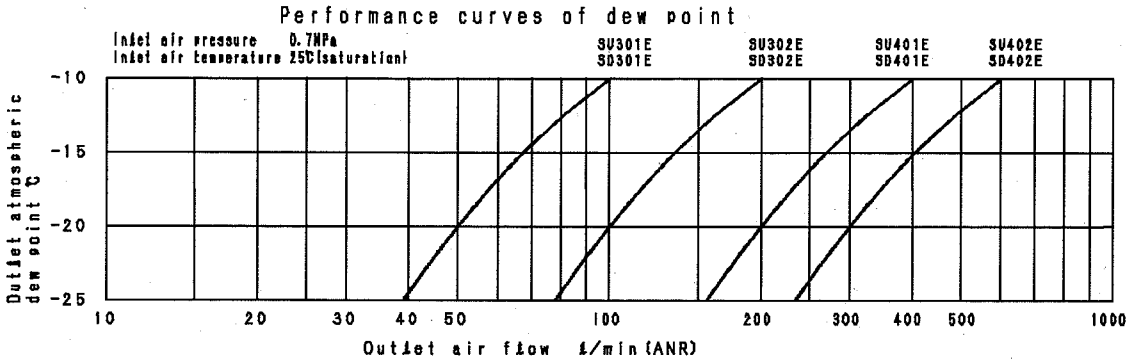
Purge flow is shown in each specification column. The flow which added purge flow to outlet side use air flow should be can be supplied from an inlet.

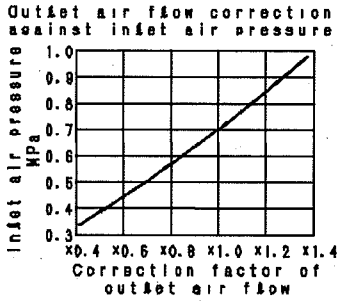
Purge flow in case inlet air pressure differs from rating turns into flow which applied the correction factor of the right to rated purge flux.

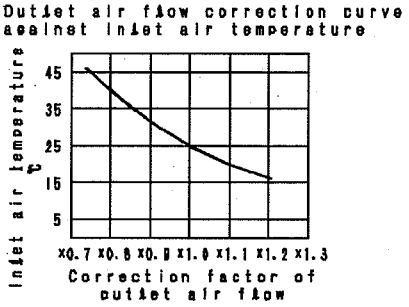


1-3. Dew point performance

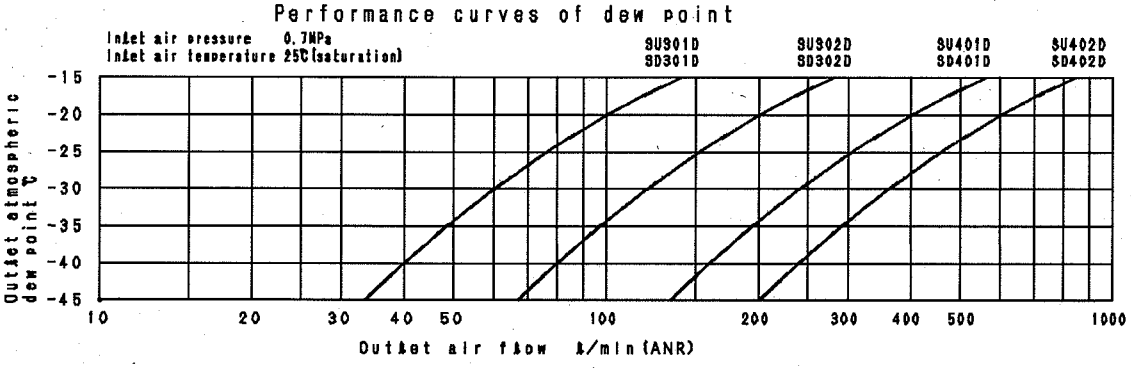
(1) SU300E・SU400E

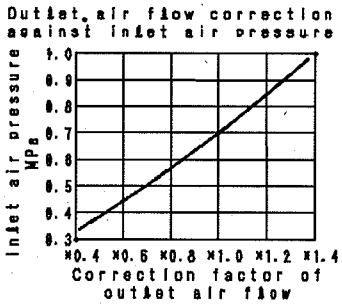


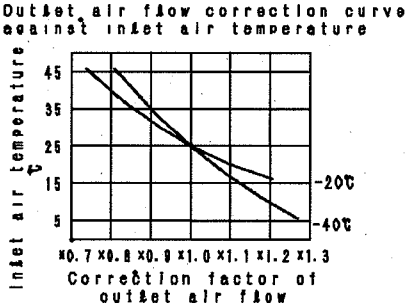




(2) SU300D・400D



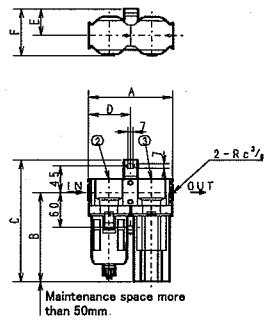




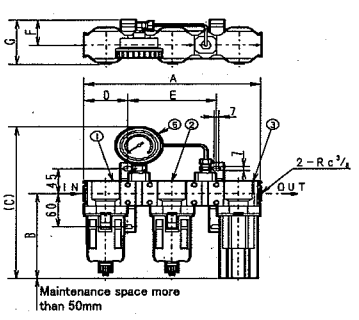
1-4. Outside drawing

(1) SU300E・400E

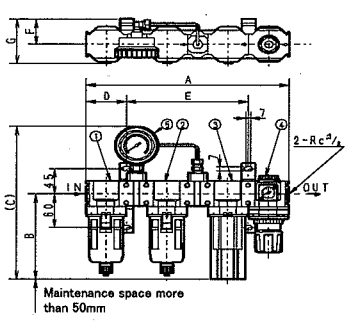
Unit C1 type



Unit C2 type



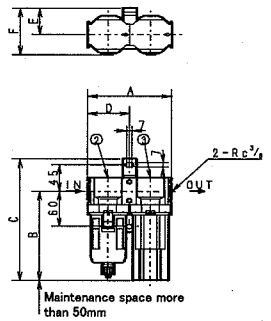
Unit C3 type



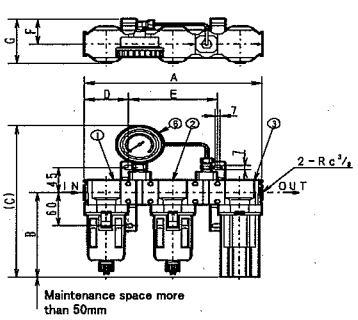
	A	B	C	D	E	F	Mass (kg)		A	B	C	D	E	F	G	Mass (kg)		A	B	C	D	E	F	G	Mass (kg)
SU301E※-C1	126	153	208	63	45	79	1.0	SU301E※-C2	252	153	273	63	126	45	79	2.0	SU301E※-C3	315	153	273	63	189	45	79	2.5
SU302E※-C1	143	223	278	80	55	97	1.6	SU302E※-C2	286	223	343	80	143	55	97	2.8	SU302E※-C3	366	223	343	80	206	55	97	3.5
SU401E※-C1	160	223	278	80	55	97	2.1	SU401E※-C2	303	223	343	80	143	55	97	3.3	SU401E※-C3	383	223	343	80	223	55	97	4.0
SU402E※-C1	160	328	383	80	55	95	3.5	SU402E※-C2	303	328	448	80	143	55	97	4.7	SU402E※-C3	383	328	448	80	223	55	97	5.4

(2) SU300D・400D

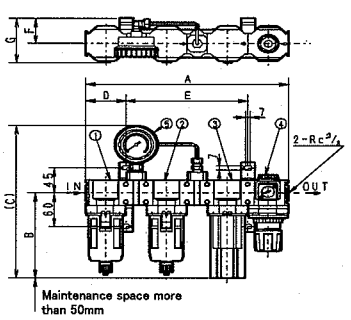
Unit C1 type



Unit C2 type



Unit C3 type



	A	B	C	D	E	F	Mass (kg)		A	B	C	D	E	F	G	Mass (kg)		A	B	C	D	E	F	G	Mass (kg)
SU301D※-C1	143	169	224	80	55	97	1.3	SU301D※-C2	286	169	289	80	143	55	97	2.5	SU301D※-C3	366	169	289	80	206	55	97	3.2
SU302D※-C1	143	223	278	80	55	97	1.6	SU302D※-C2	286	223	343	80	143	55	97	2.8	SU302D※-C3	366	223	343	80	206	55	97	3.5
SU401D※-C1	160	328	383	80	55	95	3.1	SU401D※-C2	303	328	448	80	143	55	97	4.3	SU401D※-C3	383	328	448	80	223	55	97	5.0
SU402D※-C1	160	328	383	80	55	95	3.5	SU402D※-C2	303	328	448	80	143	55	97	4.7	SU402D※-C3	383	328	448	80	223	55	97	5.4

No	Model
①	Air filter
②	Oil mist filter
③	Super dryer
④	Regulator
⑤	Differential pressure gauge

2. CAUTIONS

2-1. Chemical Resistance of Plastic Bowls

Prevent installation of bowls within the following chemical periphery because the bowls are made of polycarbonate.

Kind of chemicals	Classification of chemicals	Major products of each chemicals	Ordinal application
Inorganic compound	Acid	Hydrochloric acid·Sulfuric acid·Nitric acid·Fluoride acid·Phosphoric acid·Chromate acid, etc	Acid washing off metal parts·degreasing·Oil film washing
	Alkali	Canstic soda·Canstic potassium·Hydrated lime·Ammonia solvent·Carbonate soda	Alkali washing off metal parts
	Inorganic hydrochlorine	Sulfide soda · Potassium nitrate · Chromic potassium·Sulfa soda	
Organic compound	Aromatic hydrocarbons	Benzene·Toluene·Xylene·Ethyl benzene·Styrene	Contained in the thinner of painting meterial (Benzene·toluene·xylene)
	Chlorinated aliphatic hydrocarbons	Methyl chloride · Ethylene chloride · Methylene chloride · Acetylene chloride · Chloroform · Trichloroethylene·Perchlene·Carbon tetrachloride	Washing rinse of organic solvent off metal components (Trichloro ethylene·perchlene·carbon tetrachloride)
	Chlorinated aromatic hydrocarbons	Chlorobenzene·Dichloro benzene·Benzene hexachloride	Farm chemicals
	Petroleum solvent	Solvent·Naphtha Gasoline	
	Alcohol	Methyl alcohol·Ethyl alcohol Cyclohexanol·Benzyl alcohol	Anti-freezer
	Phenol	Carbolic acid·Cresol·Naphthol	Disinfectant
	Ether	Methyl ether·Methyl-ethyle ether Ethyl ether	Additive to brake fluid
	Ketones	Acetone·Methyl-ethyl keton·Cyclohexanone·Acetophenone	
	Carbonic acid	Formic acid·Acetic acid·Buthylene acid·Acrylic acid·Oxalic acid·Biphthalate acid	Dying ditargent. Oxalic acid as aluminum treatment compound. Biphthalate acid as basic compound of painting
	Phosphoric ester	Dimethyl phthalate (DMP)·Diethyl phthalate (DEP) Dibuthyl phethalate (DBP)· Diothyl phethalate (DOP)·	Additive to lubricant· Synthetic hydraulic fluid· Rust preventive oil and prasticizer to synthetic
	Oxy acid	Glycol acid·Lactic acid·Malic acid·Citrate acid·Tartaric acid	
	Nitro compound	Nitromethane·Nitro ethane·Nitro ethylene Nitro benzene	
	Amin	Methyl amin·Diothyl amin·Ethyl amin·Aniline·Aceto anilido	Additive to brake fluid
	Nitril	Acetonitrile·Acrylonitrile·Benzenitrile	Raw material of nitril rubber

2-2. Others

1) Use within ambient temperature of 5～50℃.

2) Avoid use in the state where inlet air temperature becomes higher than ambient temperature. (An inside may be covered with waterdrop if the main part of a super dryer is cooled.)

3) Avoid installation close to high radiated heat.

4) Keep operating pressure below 1.0MPa.

5) Avoid installation close to welding or spray painting areas.

6) Avoid installation in direct sunlight.

7) Avoid the counter flow and to apply the pressure suddenly, other wise the differential pressure gauge as well as the mantle may be damaged.

8) Super dryers reduce oxygen content, Do not use for breathing air.

3. OPERATION

3-1. Pressure setting

1) Pull down knob and rotate it after confirming not locked.

(Refer to Fig. 1)

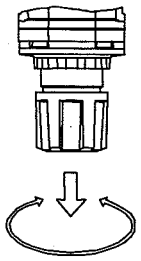


Fig.1

2) Rotating H-direction (Clockwise) increases pressure, while L-direction (Counter-Clockwise) for decrease.

(Refer to Fig. 2)

3) Knob can not be rotated when they are pushed to be locked.

(Refer to Fig. 2)

NOTE : Use in setting pressure range. Pressure setting higher than primarly pressure can not be obtained.

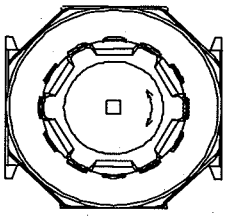


Fig.2

3-2. Drain discharge

1) Float type automatic discharger is built in the filter, so drain is discharged automatically when drain reaches a certain level.

2) When drain is discharged manually, rotate drain cock to O-side.

3) Confirm that cock is firmly closed after drain discharge by rotating to S-side.

(Refer to Fig. 3)

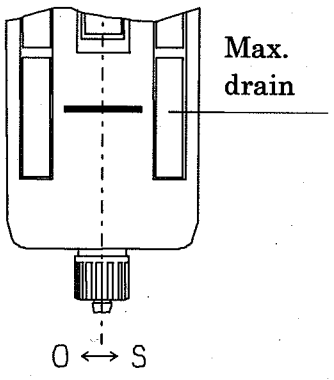


Fig.3

4. INSTALLATION

4-1. Piping

1) Ensure air flow coincides with the directional arrows on cover plate.
2) Use port size larger than that of air piping for air filter and Super dryer.
3) Flush air into the pipe to blow out foreign substances and chips before piping.
4) Refrain applying sealant or sealing tape approx. Two pitches of thread off the tip of pipe to avoid residual substances from falling into piping system.

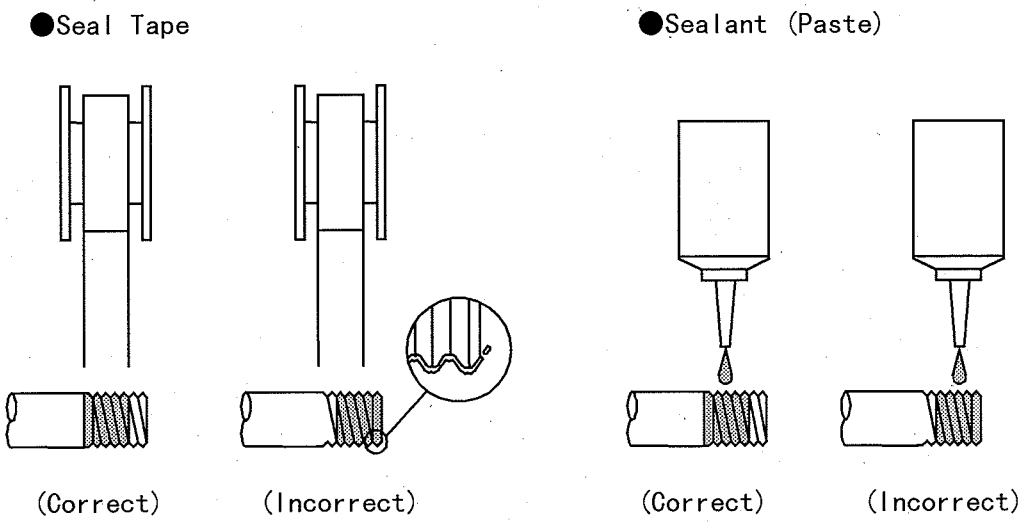
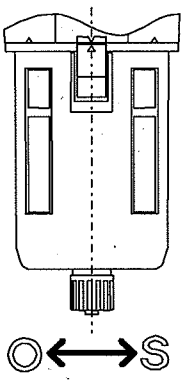


Fig. 4

5) Nylon tube of in dia. 6mm can be connected to drain discharge port directly. Max. length of the pipe is less than 5m, and avoid upward piping.
Connect tube, after confirming drain cock is firmly close, rotating cock to S-direction.



4-2. Installation

1) Installation is made with mounting hole of T type bracket. Refer to external Dimension drawing.

2) Install so that drain discharge port faces downward.

3) Install as close to the pneumatic equipment as possible.

4) Allow a minimum of 50mm over /below the unit for maintenance purpose.

(Refer to Fig. 6)

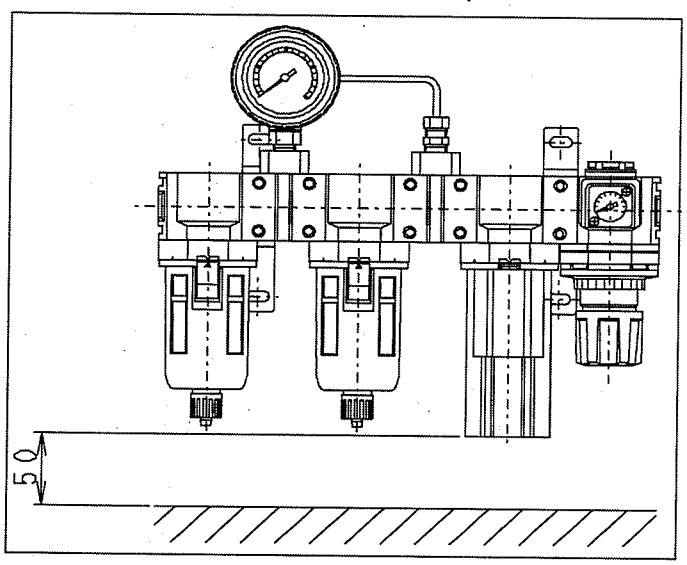


Fig. 6

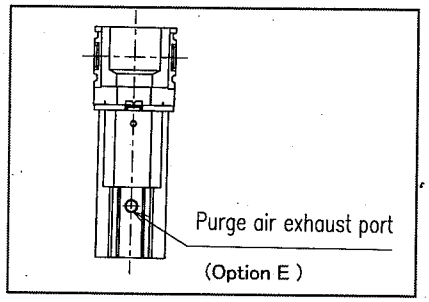


Fig.7

5) In case of the option E of SU300 series, piping of exhaust air should use the hose or piping material of I. D. 5. 7 mm or more, and give length as less than 3m. (Refer to Fig. 7)

5) In case of the option E of SU400 series, piping of exhaust air should use the hose or piping material of I. D. 7. 2 mm or more, and give length as less than 3m. (Refer to Fig. 7)

5. MAINTENANCE

5-1. Periodical inspection

1) Perform periodical check if drain level does not exceeds max drain level.
2) Pressure differential 0.07MPa shows life time for oil mist filter, then element to be replaced by new one. (Refer to 5-5. Maintenance parts). At is due for element to be replaced about one a year in case of unit type C1. Because it can not be estimated the lifetime by means of differential pressure.
3) Use house neutral detergent to clean plastic bowl. Do not use other detergent.

5-2. How to Remove Bowl

Shut off air, remove bowl in the following manner after confirming no air is in the bowl.

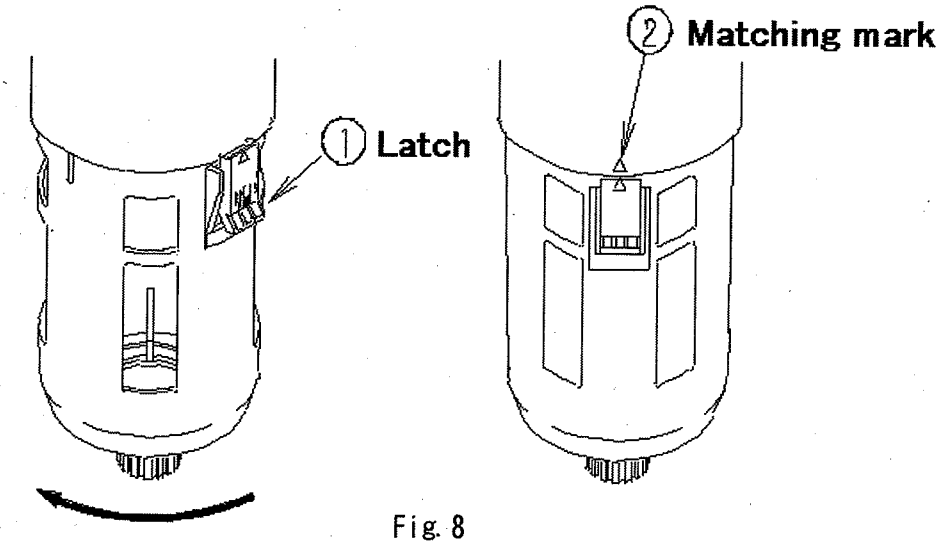


Fig. 8

Rotate bowl and bowl guard Clockwise, pushing the latch.

Match the matching mark of spacer and latch, then pull out bowl and bowl guard. Bowl and bowl guard can be detached at the same time.

NOTE :Remove the tube in case of oilmist filter SM4100. (Refer to 5.4 Membrane module replacement)

Follow above steps in reverse manner when assembled. Apply air after confirming latch is in the spacer recessed portion.

5-3. Element replacement

1) Air filter

Remove buffle by which element is fixed, after removing bowl. Use hex. Bar spanner as buffle has hex. hole at lower part. Buffle, element and louver are removed at the same time. Follow the reverse steps when assembled. (Hex. bar spanner to be used···F3000:Round nominated10, F4000:Round nominated14)

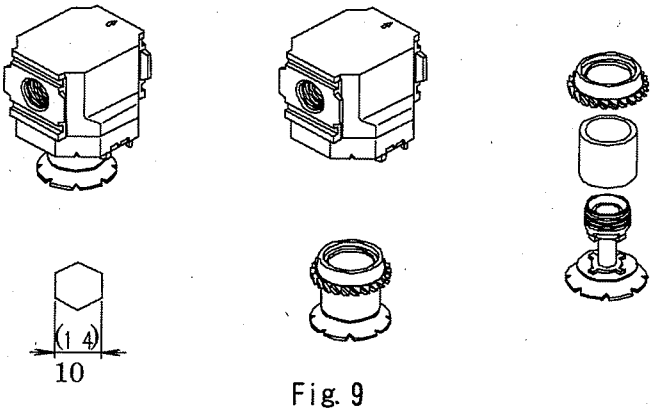


Fig. 9

NOTE : ( ) is for F4000.

2) Oil mist filter

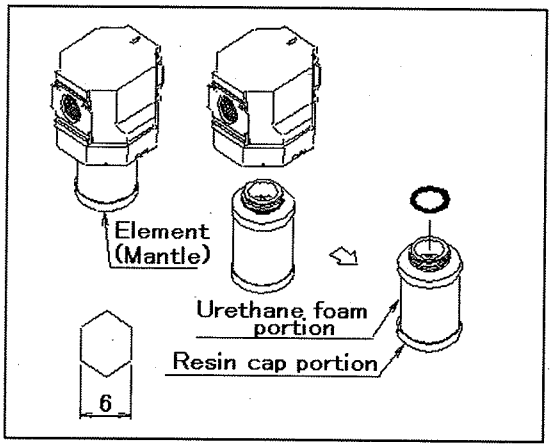
Remove element (Mantle) which is screwed into the body, after removing bowl. Use hex. bar spanner (Round nominated6) for hex. hole at lower part of element (Mantle)

Aplly grease (Equivalent to daphne eponex grease No. 1) to O-ring attached to element (Mantle) when assembled.

Hold resin cap portion when assembled to body, (Do not hold urethane foam portion)

Torque applied to element assembly is 2N·m for F3000, M3000, M4000, 3N·m for F4000.

Fig. 10



5-4. Membrane module replacement

1) Slide silencer downward by loosening set screw at silencer portion with hex. bar spanna. (Round nominated 2.5)
2) Turn the tube about 45 degrees in clockwise or in counter clockwise direction and pull it down to remove.
3) Remove the membrane module in the downward. It can be easily removed from the tube using by the side hole in which a tool such as screw driver is pushed.
4) Insert a new module to the bottom of the tube. Follow above steps in reverse manner when the tube and silencer is assembled.

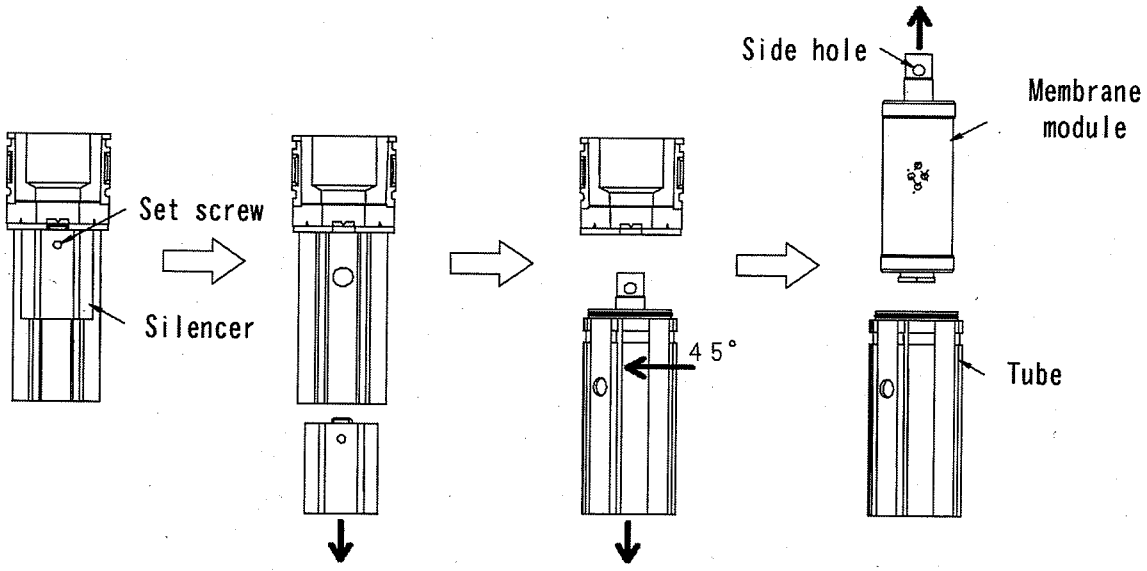


Fig. 11

5-5. Maintenance parts

●Element・Mantle

Part name / Model code	Air filter element	Oil mist filter Mantle ass'y
SU301E-※-C1	———	M3000-MANTLE-ASSY
SU302E-※-C1	———	M4000-MANTLE-ASSY
SU401E-※-C1	———	M4000-MANTLE-ASSY
SU402E-※-C1	———	SD-SM4100M-MANTLE-ASSY
SU301E-※-C2/C3	F3000-ELEMENT	M3000-MANTLE-ASSY
SU302E-※-C2/C3	F4000-ELEMENT	M4000-MANTLE-ASSY
SU401E-※-C2/C3	F4000-ELEMENT	M4000-MANTLE-ASSY
SU402E-※-C2/C3	F4000-ELEMENT	SD-SM4100M-MANTLE-ASSY
SU301D-※-C1	———	M4000-MANTLE-ASSY
SU302D-※-C1	———	M4000-MANTLE-ASSY
SU401D-※-C1	———	SD-SM4100M-MANTLE-ASSY
SU402D-※-C1	———	SD-SM4100M-MANTLE-ASSY
SU301D-※-C2/C3	F4000-ELEMENT	M4000-MANTLE-ASSY
SU302D-※-C2/C3	F4000-ELEMENT	M4000-MANTLE-ASSY
SU401D-※-C2/C3	F4000-ELEMENT	SD-SM4100M-MANTLE-ASSY
SU402D-※-C2/C3	F4000-ELEMENT	SD-SM4100M-MANTLE-ASSY

●Membrane module

Part name / Model code	Membrane module ass'y	O ring set
SU301E-05-※	SD301E-05-MEMBRANE-ASSY	SD-300-ORING-SET
SU301D-05-※	SD301D-05-MEMBRANE-ASSY	
SU301E-07-※	SD301E-07-MEMBRANE-ASSY	
SU301D-07-※	SD301D-07-MEMBRANE-ASSY	
SU302E-05-※	SD302E-05-MEMBRANE-ASSY	
SU302D-05-※	SD302D-05-MEMBRANE-ASSY	
SU302E-07-※	SD302E-07-MEMBRANE-ASSY	
SU302D-07-※	SD302D-07-MEMBRANE-ASSY	
SU401E-05-※	SD401E-05-MEMBRANE-ASSY	SD-400-ORING-SET
SU401D-05-※	SD401D-05-MEMBRANE-ASSY	
SU401E-07-※	SD401E-07-MEMBRANE-ASSY	
SU401D-07-※	SD401D-07-MEMBRANE-ASSY	
SU402E-05-※	SD402E-05-MEMBRANE-ASSY	
SU402D-05-※	SD402D-05-MEMBRANE-ASSY	
SU402E-07-※	SD402E-07-MEMBRANE-ASSY	
SU402D-07-※	SD402D-07-MEMBRANE-ASSY	

6. MODEL CODING

SU (イ) (ロ) – (ハ) – (ニ) – (ホ)

Product	(イ) Basic module	(ロ) Type		(ハ) Inlet air pressure		(ニ) Unit type		(ホ) Option	
Super dryer unit	301	E	Low purge type	05	0.5MPa	C1	Oil mist filter Super dryer	Blank	None
	302	D	Standard type	07	0.7MPa			X1	In・out is in opposite direction
	401					C2	Air filter Oilmist filter (Different pressure gauge attached) Super dryer	E	Common exhaust
	402					C3	Air filter Oil mist filter (Different pressure gauge attached) Super dryer Regulator		