AIRMAN

SC

SERVICE MANUAL

PACKAGED
SCREW COMPRESSOR

SAS4SD-5A/6A
SAS6SD-5A/6A
SAS8SD-5A/6A
SAS11SD-5A/6A
SAS15SD-5A/6A
SMS4ED-5A/6A
SMS8ED-5A/6A
SMS11ED-5A/6A
SMS15ED-5A/6A
(50Hz/60Hz)

HOKUETSU INDUSTRIES CO., LTD.

Preface

This service manual explains about the cautions for maintenance jobs and is to serve a guide for the electric system, and troubleshooting for service personnel. Fundamental matters and other things already mentioned in the “Instruction Manual” and the “Parts Catalogue” are omitted to avoid duplication. Therefore, for the operation and handling of this unit, we request you to refer to the instruction manual and caution plates, and further for the structure and components of the unit, please refer to the “Parts Catalogue” separately to be supplied with the unit.

If you should find any description which does not coincide with the instruction manual and parts catalog, we request you to make sure to start the job after clarifying it.

Service personnel is required to safely take quick and proper countermeasures as well as to use correct technology of maintenance in case of field services and periodical maintenance. It is important that service personnel should have proper and sufficient knowledge about the structure and function of the unit and should be well familiar with such technique mentioned in them.

Regarding the part numbers mentioned in this manual, we request you to refer to the Parts catalogue separately supplied together with the unit, because the parts numbers in this manual are sometimes changed.

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※ For the details of operation and installation, see Instruction Manual.

1. Specifications

1.1 Specifications

1.1.1 In-door type (SAS)

Model			SAS4SD -5A/6A	SAS6SD -5A/6A	SAS8SD -5A/6A	SAS11SD -5A/6A <SAS11S -5A/6A>	SAS15SD -5A/6A <SAS15S -5A/6A>
Compressor	Type		Rotary-twin screw, single stage, oil cooled				
	Free air delivery	m^3/min	0.44	0.72	1.1	1.6	2.4
	Working pressure	MPa	0.83				0.69
	Capacity control system		A.C.C.S.＋purge control＋Auto-start/stop				
	Lubrication system		Forced oil injection by compressed air pressure				
	Driving system		Ribbed belt				Automatic belt tensioner for flat belt
	Lubrication oil		See 5.4				
	Lubrication oil capacity	L	2.5	3.5	5.0	8.0	
	Tank capacity	m^3	0.0035	0.0081	0.0097	0.0157	
Motor	Type		Totally-enclosed fan cooled / three-phase squirrel cage induction				
	Power output	kW	3.7	5.5	7.5	11.0	15.0
	Starting system		Direct starting				
Discharge pipe diameter		A	10[3/8B]	20[3/4B]	20[3/4B]	25[1B] <20[3/4B]>	
Dryer	Dew-point of discharged air	℃	Under the ambient pressure less than 10				
	Power consumption	kW	0.20/0.20・0.21	0.33/0.31・0.34	0.34/0.32・0.35	0.51/0.60・0.60	
	Refrigerant		R407C (Control system: capillary tube)				
	Refrigerant capacity	g	150	320	320	470	
Approx. dimensions	Width	mm	760	900	950	1,160	
	Length	mm	510	580	630	670	
	Height	mm	750	900	1,050	1,200	1,270
Approx. dry weight		kg	142	217	260	353<318>	413<378>
Approx. weight for maintenance		kg	145	220	265	360<325>	420<385>

- Free air delivery is the valve calculated , being converted into suction conditions of compressor air end (at the primary stage of air filter).
- Dew point of discharge air is the value at the ambient temperature of 30℃. Working pressure 0.83MPa.
- When the dryer discharges sediment, the air quantity will decrease due to the deposit of sediment.

1. Specifications

1.1.2 In-door type (SAS-V)

Model			SAS11VD-A	SAS15VD-A
Compressor	Type		Rotary-twin screw, single stage, oil cooled	
	Free air delivery	m³/min	1.9－1.6	2.7－2.1
	Working pressure	MPa	0.4－0.83	
	Capacity control system		Inverter control＋purge control＋ Auto-start/stop	
	Lubrication system		Forced oil injection by compressed air pressure	
	Driving system		Ribbed belt	Automatic belt tensioner for flat belt
	Lubrication oil		See 5.4	
	Lubrication oil capacity	L	8.0	
	Tank capacity	m³	0.0157	
Motor	Type		Totally-enclosed fan cooled / three-phase squirrel cage induction	
	Power output	kW	11.0	15.0
	Starting system		Inverter starting	
Discharge pipe diameter		A	25[1B]	
Dryer	Dew-point of discharged air	℃	Under the ambient pressure less than 10	
	Power consumption	kW	0.51/0.60･0.60	
	Refrigerant		R407C (Control system: capillary tube)	
	Refrigerant capacity	g	470	
Approx. dimensions	Width	mm	1,160	
	Length	mm	670	
	Height	mm	1,200	1,270
Approx. dry weight		kg	363	423
Approx. weight for maintenance		kg	370	430

- Free air delivery is the valve calculated , being converted into suction conditions of compressor air end (at the primary stage of air filter).
- Dew point of discharge air is the value at the ambient temperature of 30℃. Working pressure 0.83MPa.
- When the dryer discharges sediment, the air quantity will decrease due to the deposit of sediment.

1. Specifications

1.1.3 Out-door type (SMS)

Model			SMS4ED-5A/6A	SMS8ED-5A/6A	SMS11ED-5A/6A	SMS15ED-5A/6A <SMS15E-5A/6A>
Compressor	Type		Rotary-twin screw, single stage, oil cooled			
	Free air delivery	m^3/min	0.44	1.1	1.6	2.4
	Working pressure	MPa	0.83			0.69
	Capacity control system		A.C.C.S.＋purge control＋Auto-start/stop			
	Lubrication system		Forced oil injection by compressed air pressure			
	Driving system		Ribbed belt			Automatic belt tensioner for flat belt
	Lubrication oil		See 5.4			
	Lubrication oil capacity	L	2.5	5.0	8.0	
	Tank capacity	m^3	0.0035	0.0097	0.0157	
Motor	Type		Totally-enclosed fan cooled / three-phase squirrel cage induction			
	Power output	kW	3.7	7.5	11.0	15.0
	Starting system		Direct starting			
Discharge pipe diameter		A	10[3/8B]	20[3/4B]	25[1B]	
Dryer	Dew-point of discharged air	℃	Under the ambient pressure less than 10			
	Power consumption	kW	0.20/0.20・0.21	0.34/0.32・0.35	0.51/0.60・0.60	
	Refrigerant		R407C (Control system: capillary tube)			
	Refrigerant capacity	g	150	320	470	
Approx. dimensions	Width	mm	860	1,070	1,320	
	Length	mm	560	670	700	
	Height	mm	780	1,130	1,240	1,310
Approx. dry weight		kg	162	285	393	452
Approx. weight for maintenance		kg	165	290	400	460

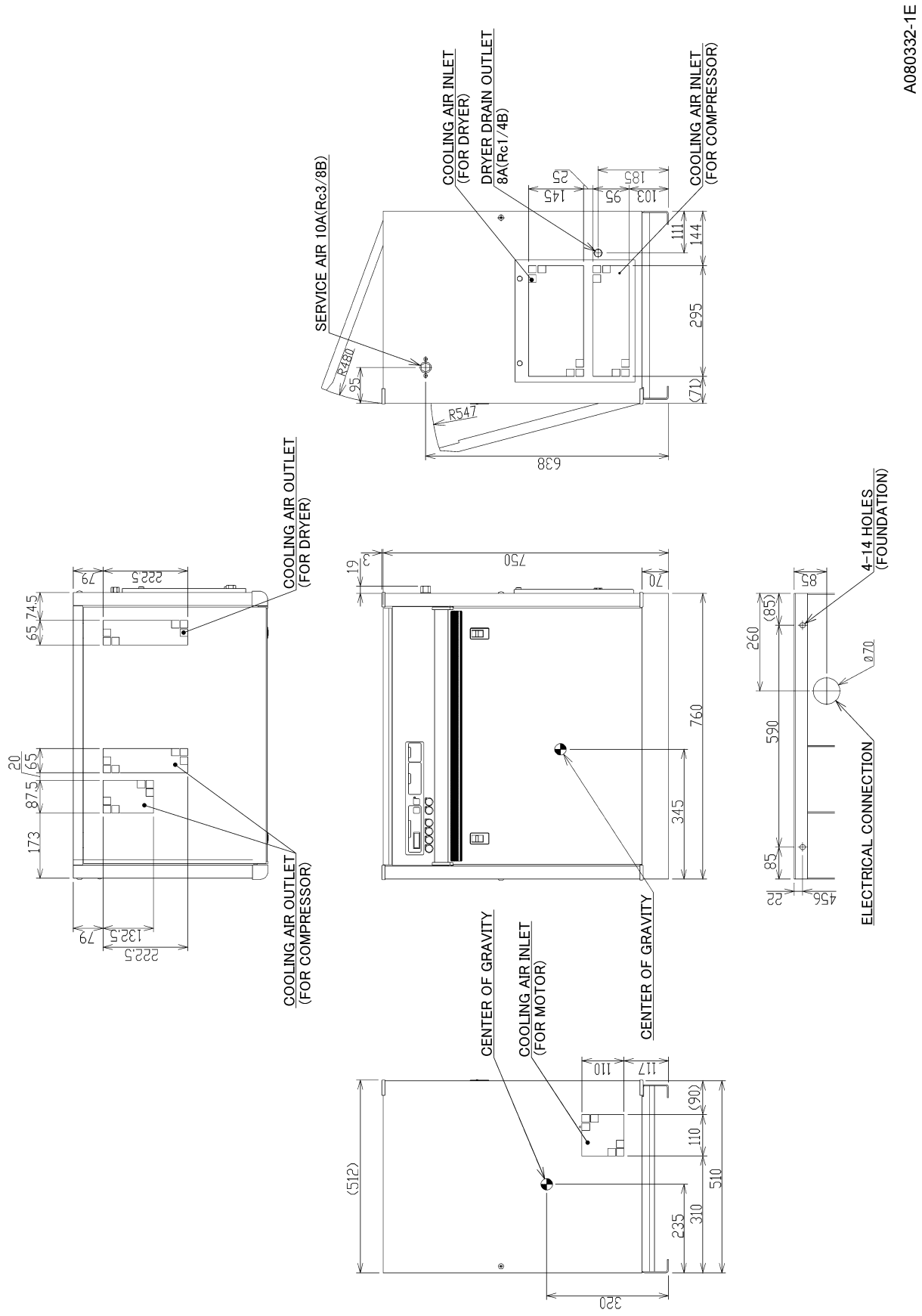
- Free air delivery is the valve calculated , being converted into suction conditions of compressor air end (at the primary stage of air filter).
- Dew point of discharge air is the value at the ambient temperature of 30℃. Working pressure 0.83MPa.
- When the dryer discharges sediment, the air quantity will decrease due to the deposit of sediment.

1. Specifications

1.3 Size and Dimensions

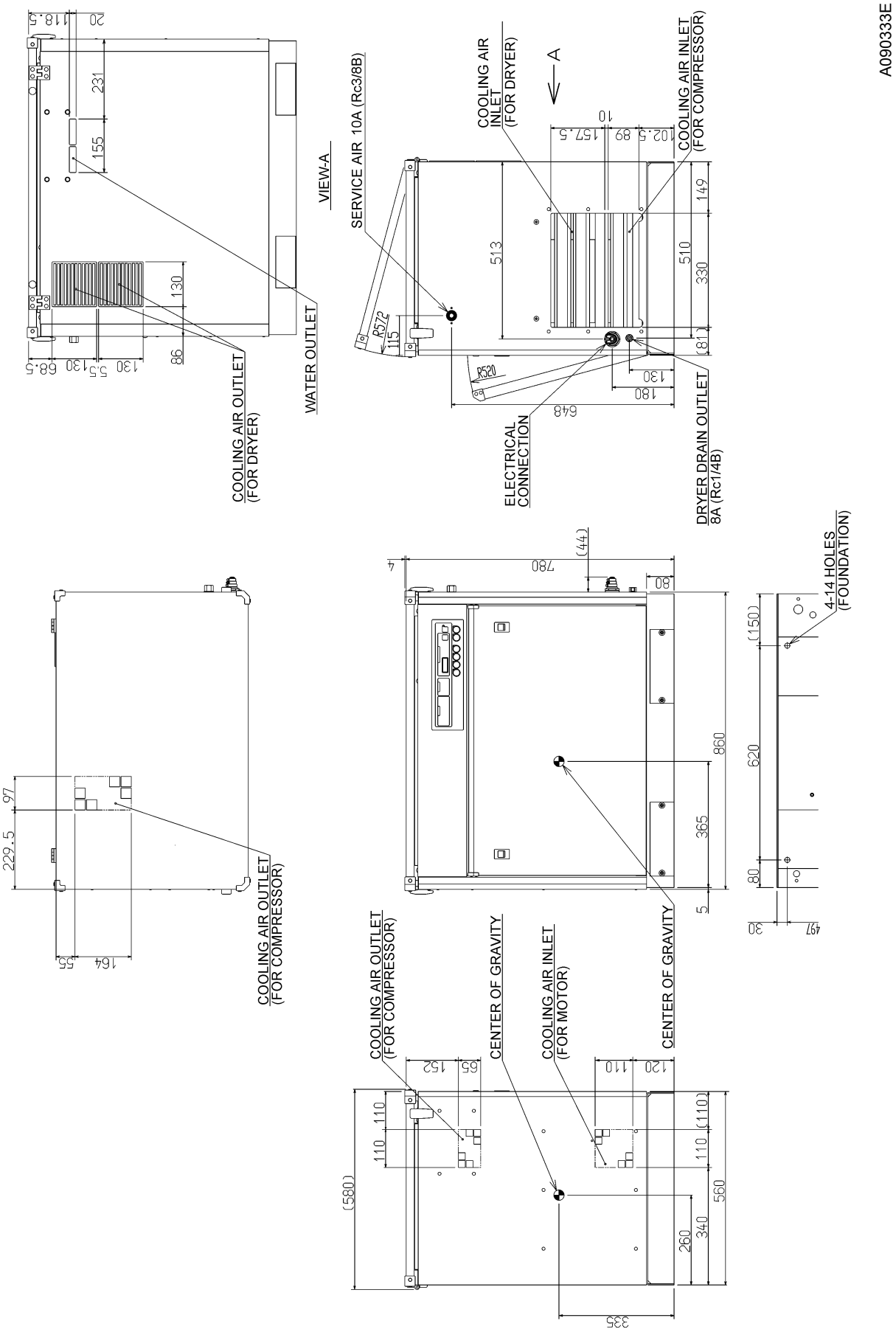
1.3.1 Dryer built-in type

(1) SAS4SD-5A/6A



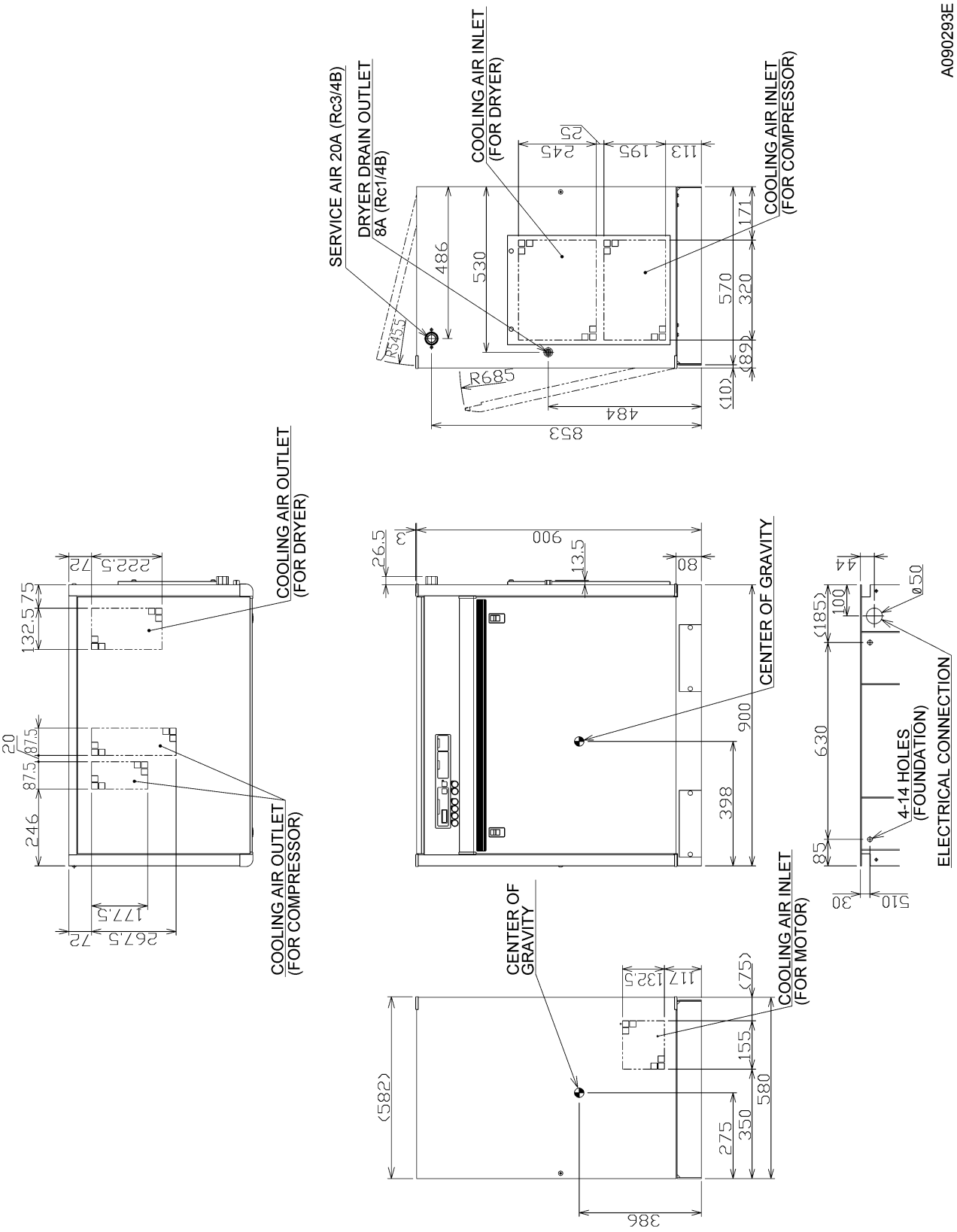
1. Specifications

(2) SMS4ED-5A/6A



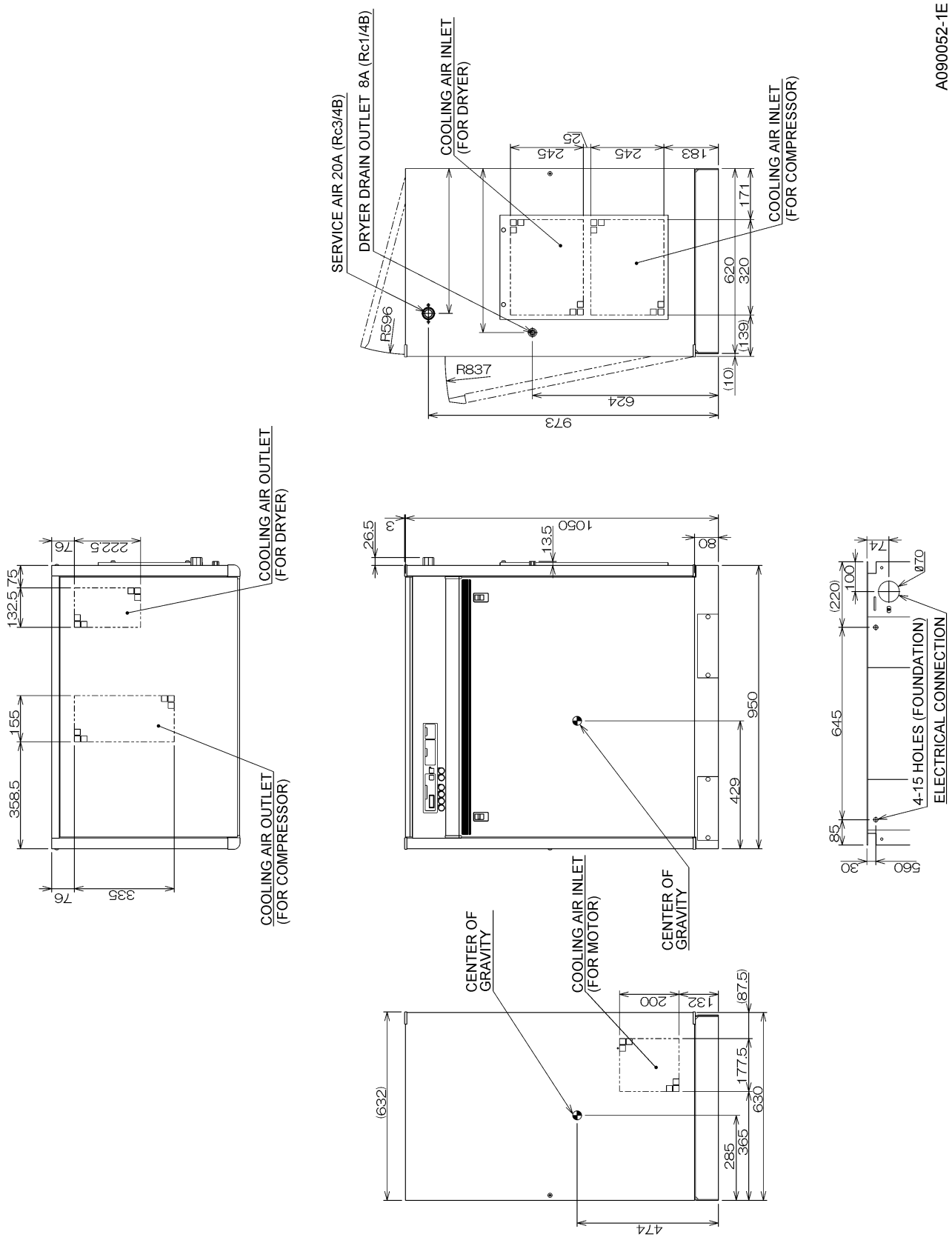
1. Specifications

(3) SAS6SD-5A/6A



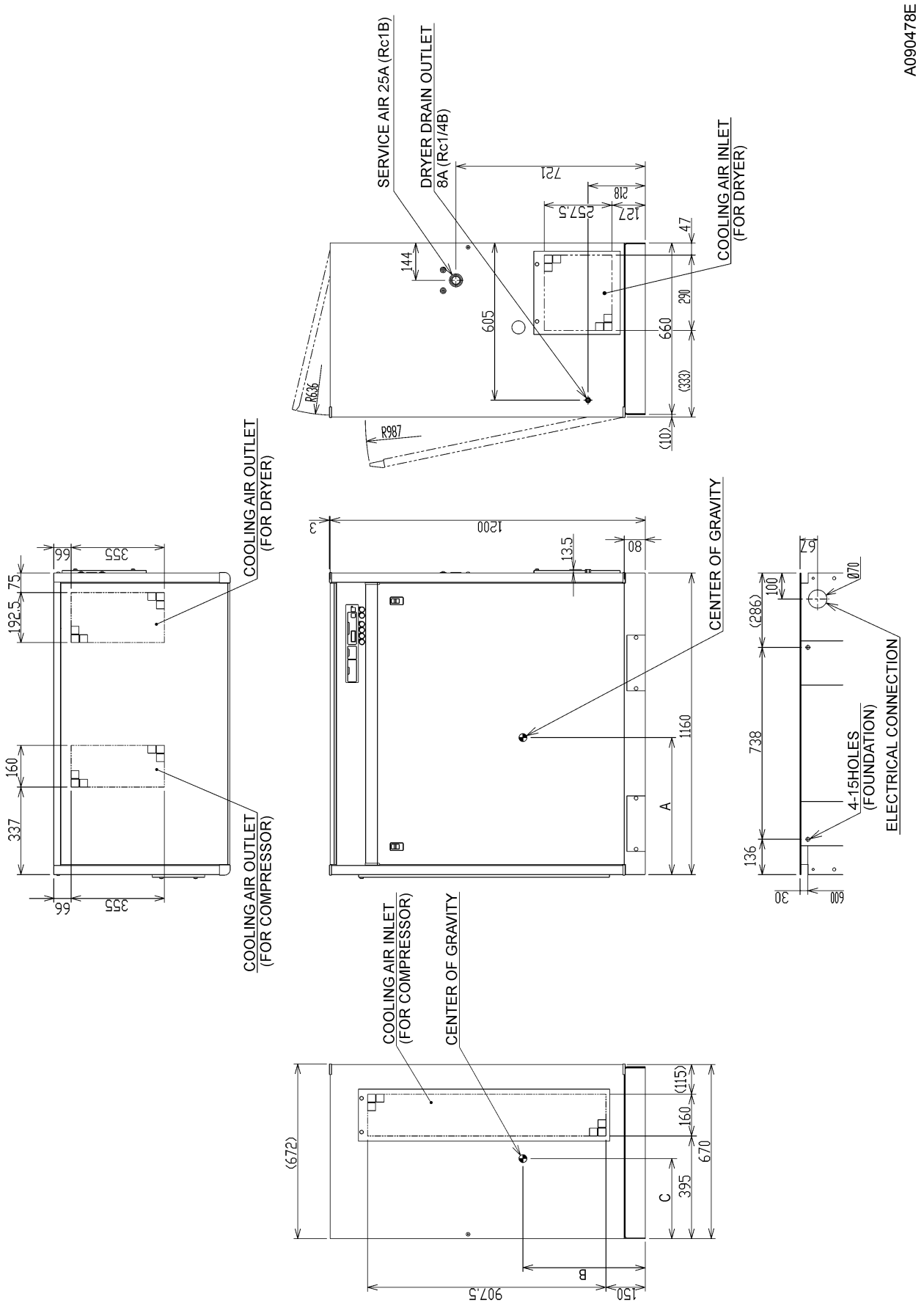
1. Specifications

(4) SAS8SD-5A/6A



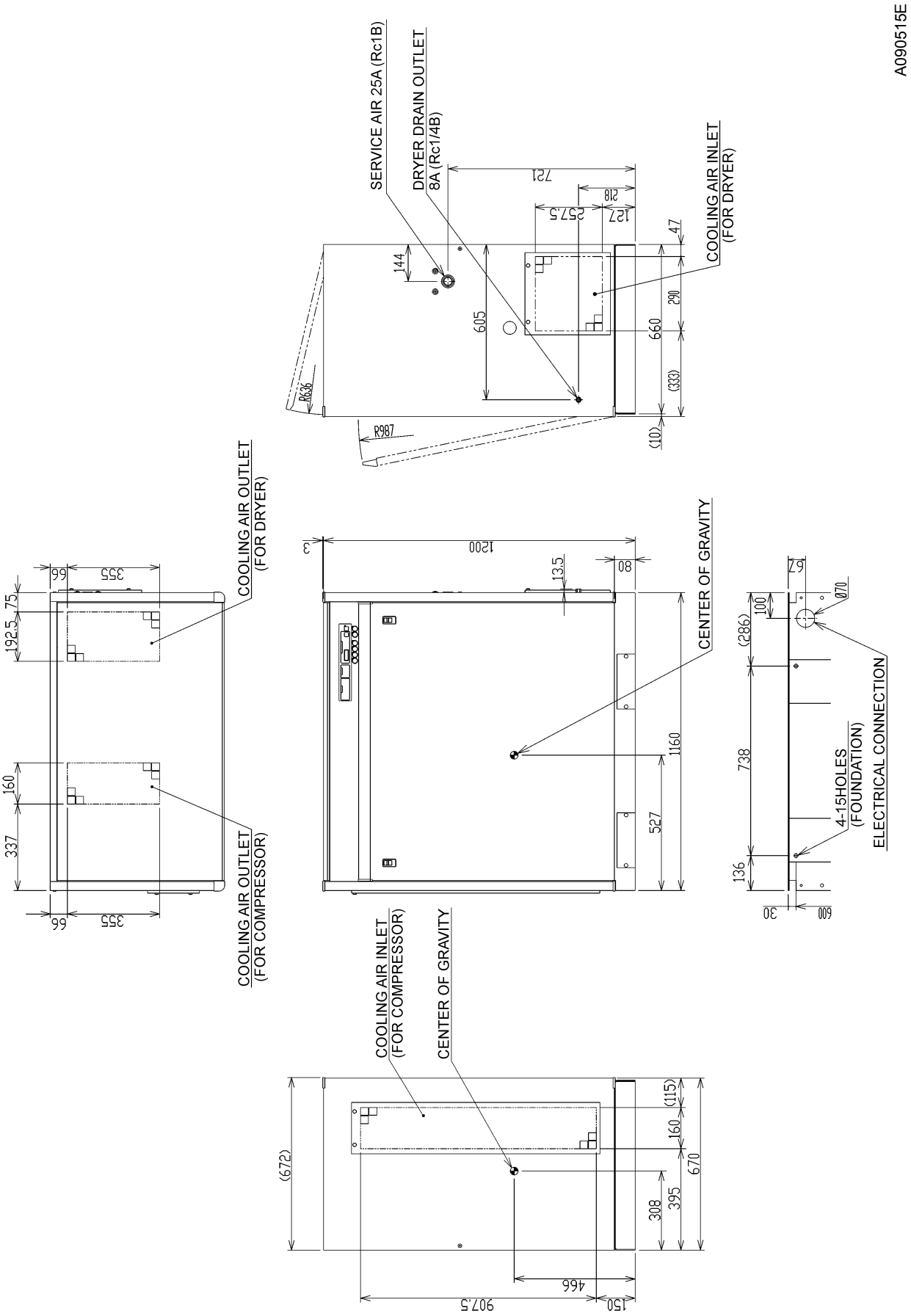
1. Specifications

(5) SMS8ED-5A/6A



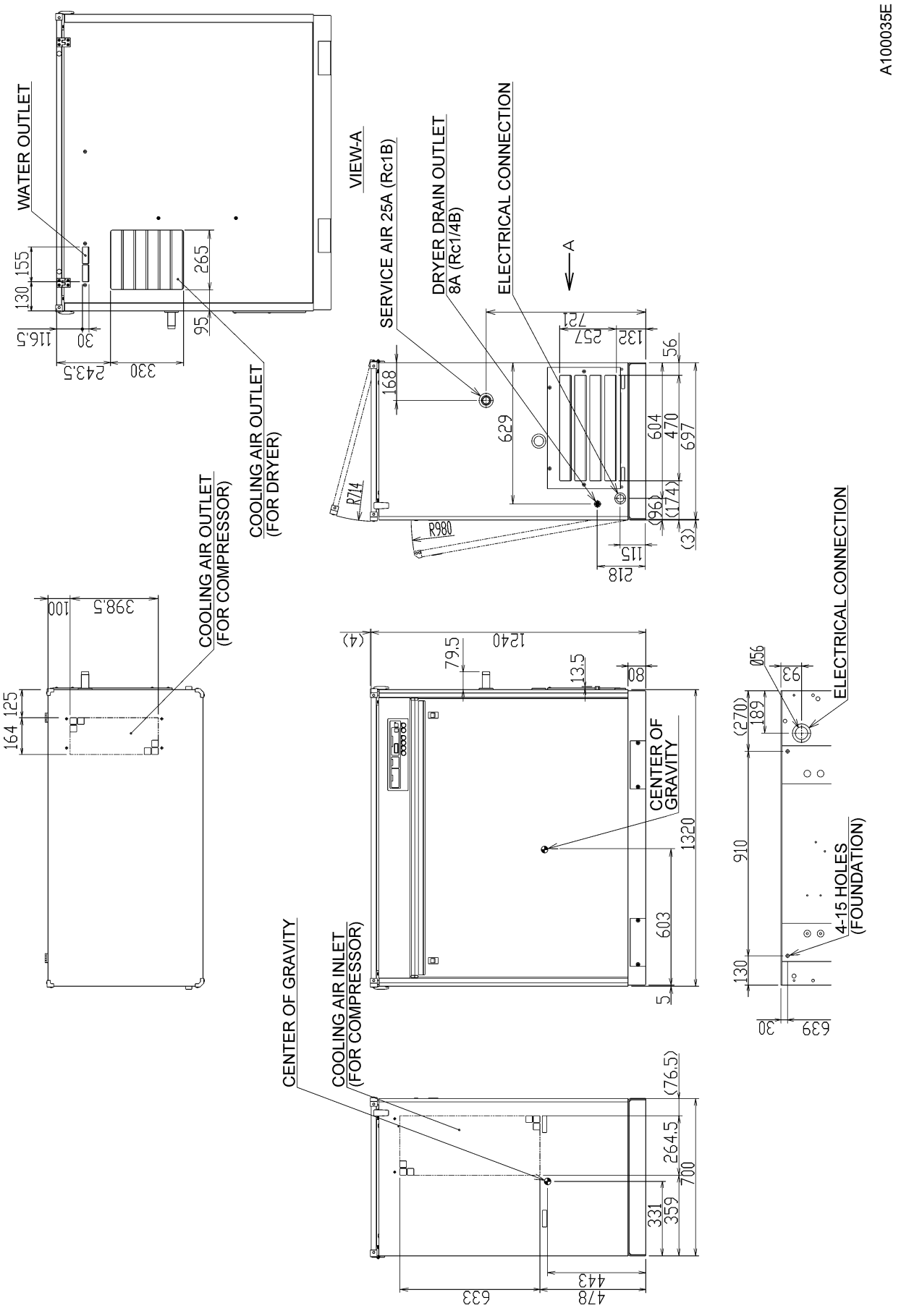
1. Specifications

(6) SAS11SD-5A/6A



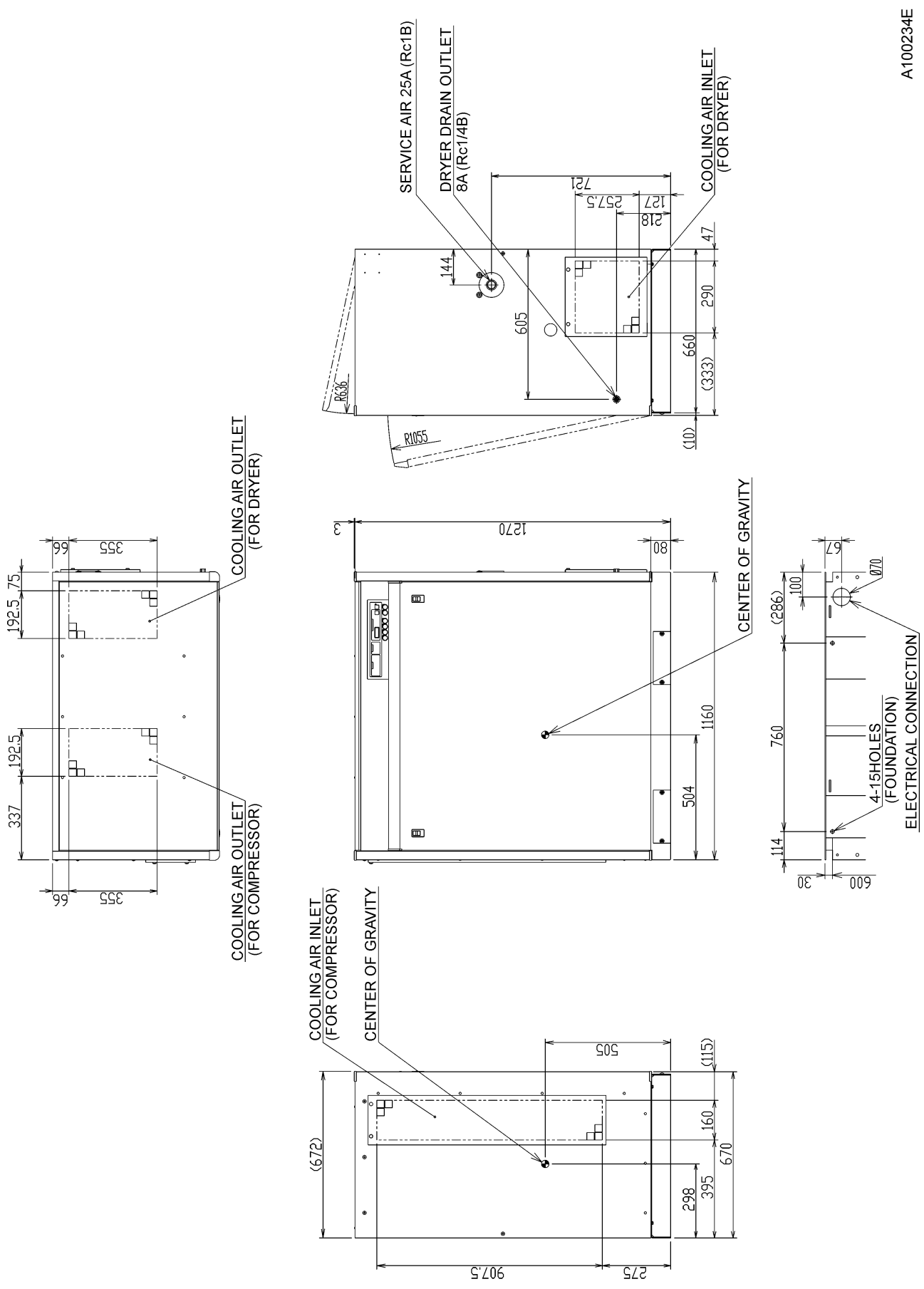
1. Specifications

(7) SMS11ED-5A/6A



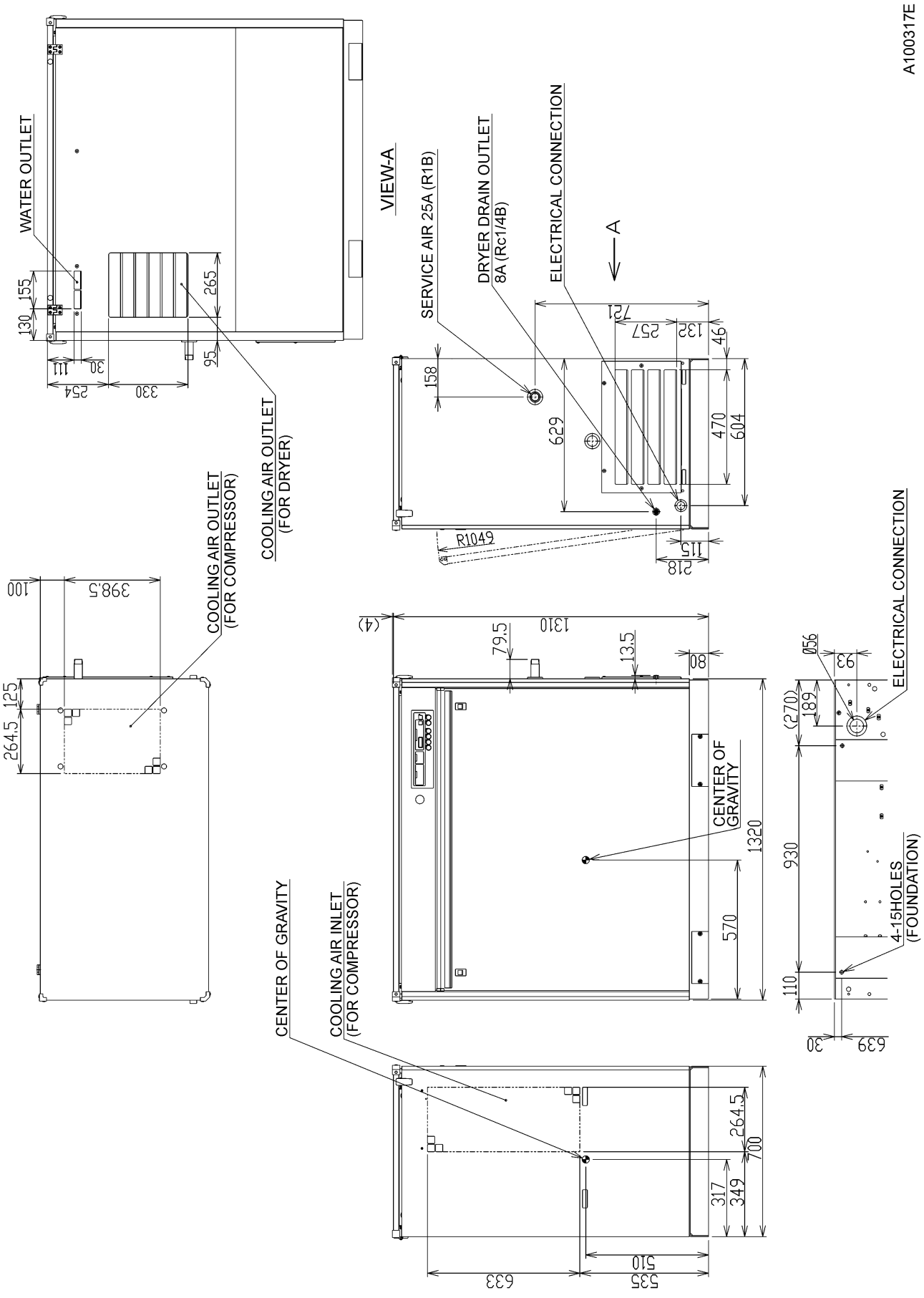
1. Specifications

(8) SAS15SD-5A/6A



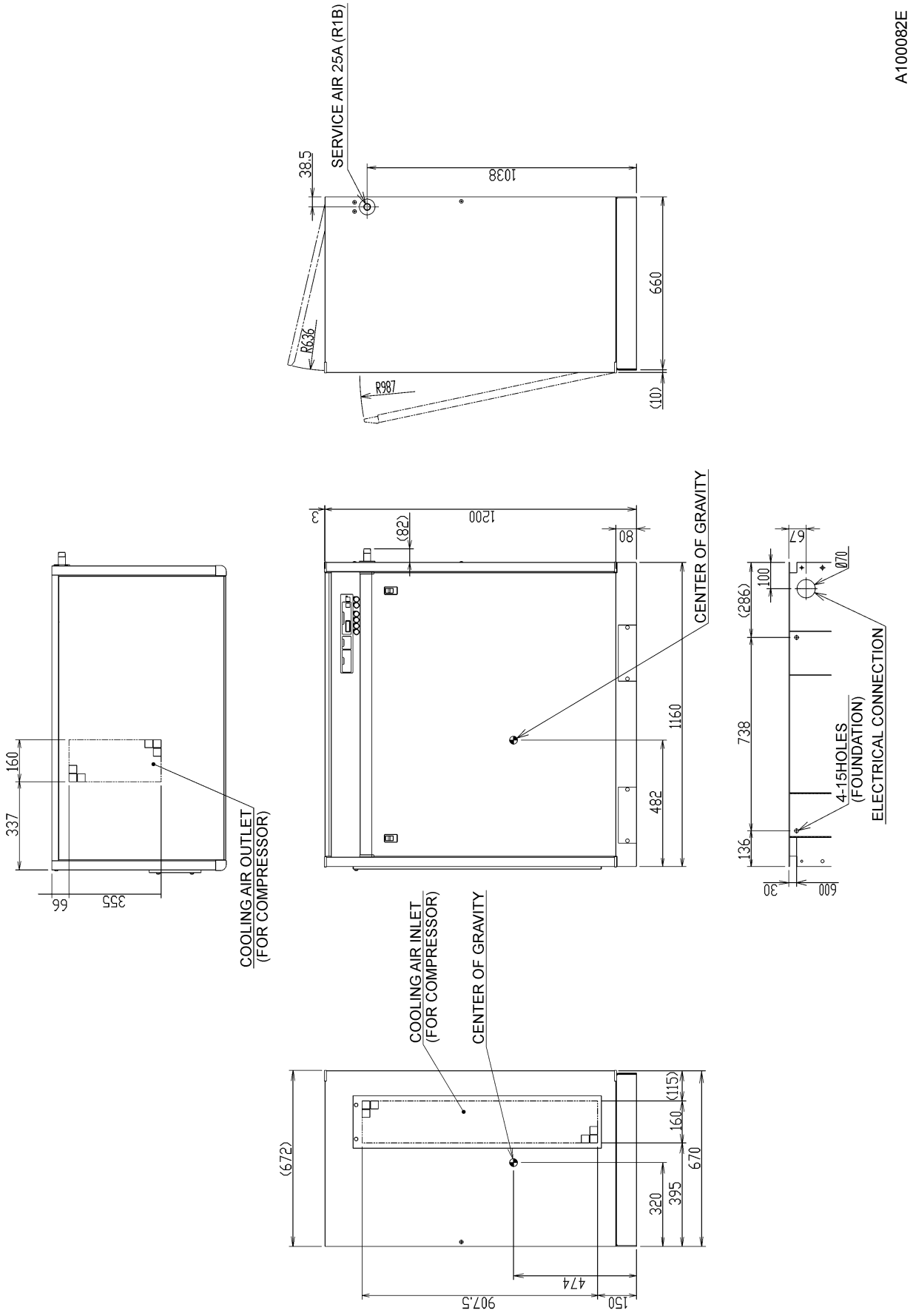
1. Specifications

(9) SMS15ED-5A/6A



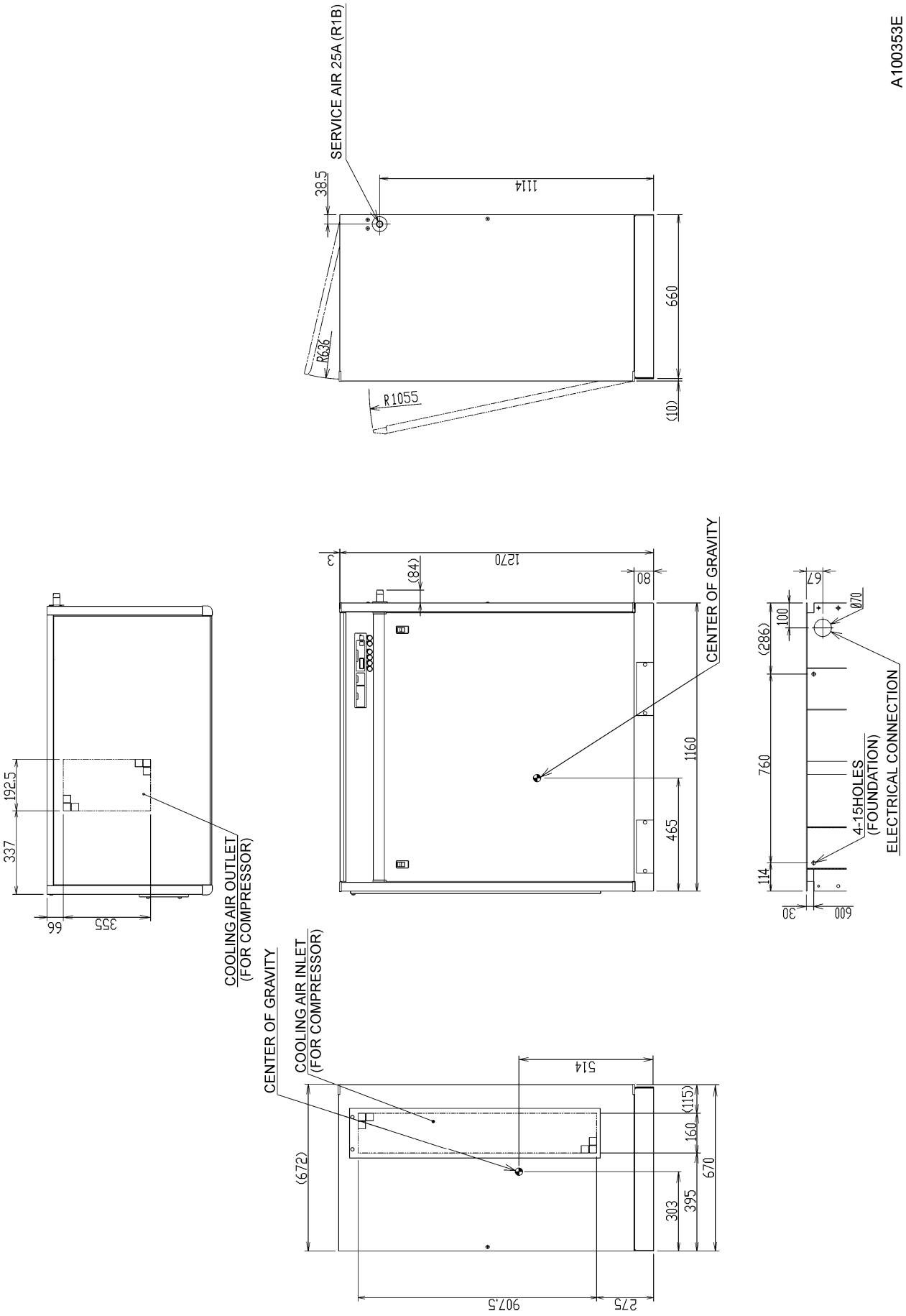
1.3.2 Without dryer type

(1) SAS11S-5A/6A



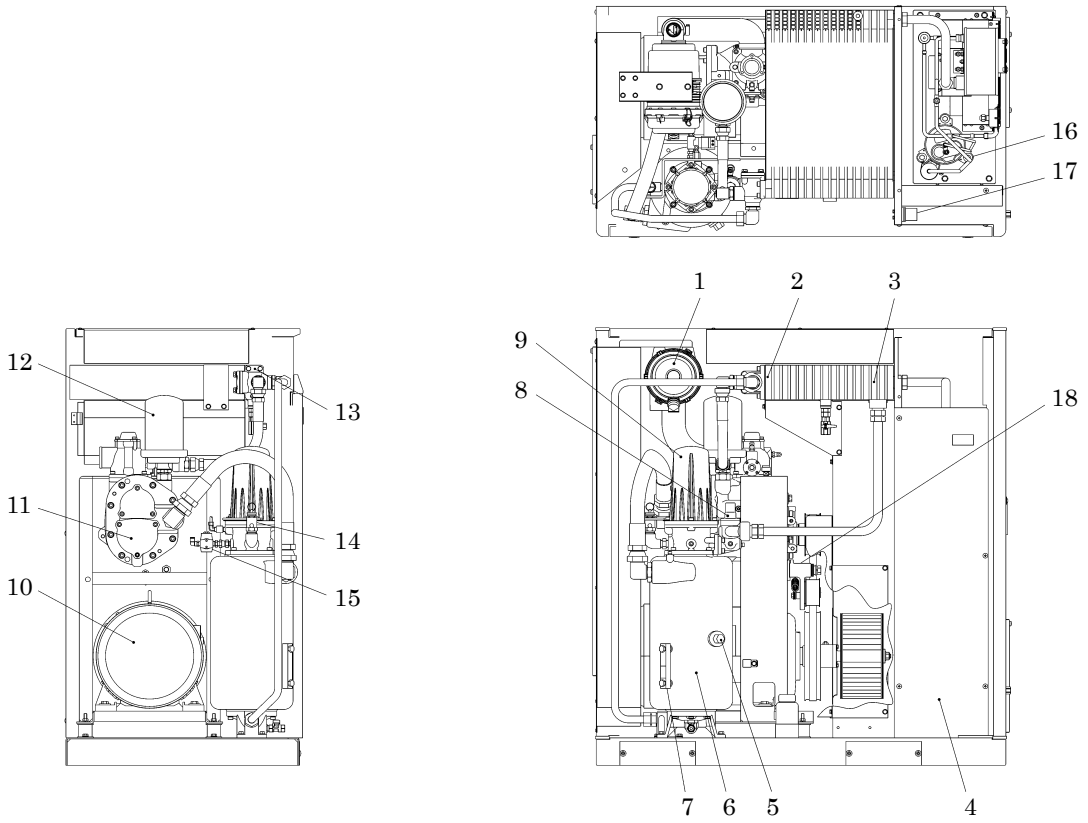
1. Specifications

(2) SAS15S-5A/6A



1. Specifications

1.4 Internal Components and Part Names



SAS15SD-5A/6A (Dryer built-in Type)

No.	Description	Function
1	Air filter	For filtering the dust floating in the intake air.
2	Oil cooler	For cooling compressor oil circulating in the system.
3	After cooler	For cooling compressed air.
4	Starter panel	For starting operation of compressor.
5	Compressor oil filler port	For supplying and replenishing compressor oil.
6	Separator receiver tank	For collecting oil mist mixed in compressed air and in compressing air and collecting it in the tank.
7	Oil level gauge	For showing the oil level inside receiver tank.
8	Pressure control valve	For keeping the receiver tank pressure higher than 0.39MPa in the tank.
9	Oil separator	For separating oil mist mixed in compressed air.
10	Motor	Driving compressor air end.
11	Air-end	For compressing intake air.
12	Oil filter	For filtering compressor oil.
13	By-pass valve	For keeping compressor oil at optimum temperature.
14	Safety valve	For releasing compressed air to the atmosphere when the pressure rises higher than the rated pressure.
15	Solenoid valve for capacity control	For controlling full load and unload operation.
16	Dryer	For removal of moisture mixed in compressed air.
17	Solenoid valve for draining condensate in dryer	For periodically draining condensed water by dryer.
※18	Automatic belt tensioner	To keep the belt from serpentine movement and keep it tight.

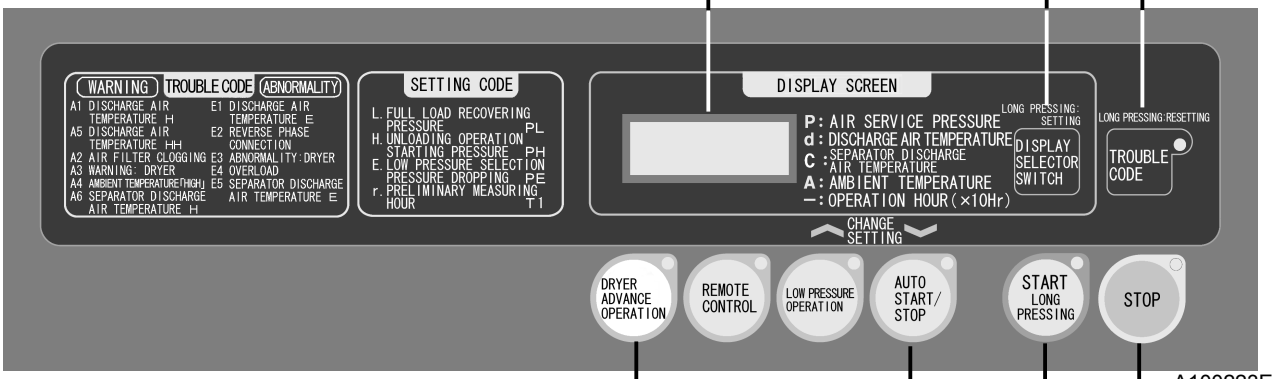
※Automatic belt tensioner is fitted to model SAS15SD,SMS15ED only.

1. Specifications

1.5 Operation Panel

Data setting switch
Set various data. Pressing the switch (longer than 3 seconds) goes to data setting mode.

Trouble code/Resetting switch
When pressing the switch while lamp flickering, trouble code is displayed. Pressing longer than 2 seconds, the display will be rest. (Please refer to an instruction manual for the details)



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SAS15SD-5A/6A

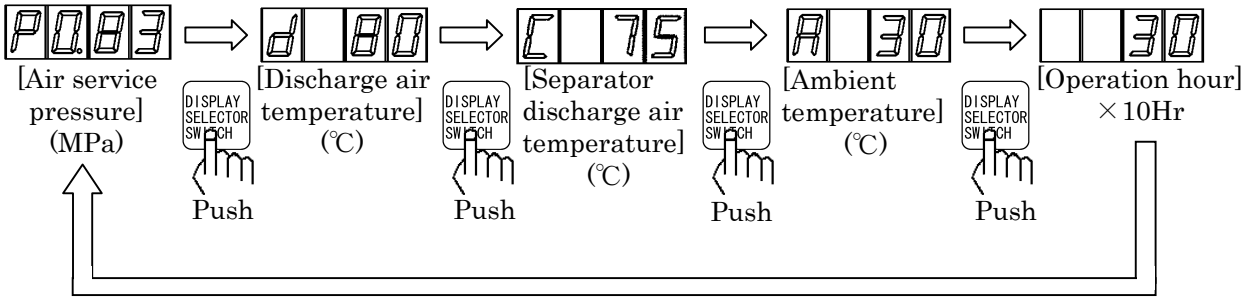
Operation mode display/Selector switch
Select various operation mode, according to demand of operation.

Start button
Pressing this button longer than 1 second, the machine starts.

Stop button
Stop the machine, using this button.

Digital monitor

At the time of the power supply injection, P: AIR SERVICE PRESSURE is displayed.
Each time display selector switch is pressed, the following is displayed by turns.



＊ When discharge air temperature and separator discharge air temperature are lower than 20℃, " ―――L " is displayed.
Ambient temperature is displayed at 0℃.

1. Specifications

■Trouble code

1. Trouble code lamp goes on whenever it happens.
2. Next, pushing trouble code key switch, following signals are displayed on screen.
3. Trouble display is re-set by pressing trouble code switch longer (2 seconds).

	Item	Indi-cation	Sensor	Time lag	Setting	Detection timing	SAS/SMS				
							4	6	8	11	15
Warning	Discharge air temperature H	A -1	Thermistor	1.0 second	105℃	Usually	○	○	○	○	○
	Discharge air temperature HH ※1	A -5	Thermistor	1.0 second	108℃	Usually	○	○	○	○	○
	Air filter clogging	A -2	A connect	10 seconds		Usually	—	—	○	○	○
	Warning: Dryer ※2	A -3	B connect	1.0 second		After dryer starts	○	○	○	○	○
	Ambient temperature「High」	A -4	Thermistor	120 seconds	45℃	After starting unloader stops	○	○	○	○	○
	Separator discharge air temperature H	A -6	Thermistor	1.0 second	105℃		—	—	—	○	○
Abnormality	Discharge air temperature E	E -1	Thermistor	1.0 second	110℃	Usually	○	○	○	○	○
	Reverse phase connection	E -2	B connect	1.0 second		Usually	○	○	○	○	○
	Abnormality: Dryer ※2	E -3	B connect	1.0 second		After dryer starts	○	○	○	○	○
	Overload	E -4	B connect	1.0 second		Usually	○	○	○	○	○
	Separator discharge air temperature E	E -5	Thermistor	1.0 second	110℃		—	—	—	○	○
	Disconnection of discharge air temperature sensor ※3	E -6	Thermistor	5.0 seconds		After starting unloader stops	○	○	○	○	○
	Disconnection of separator discharge air temperature sensor ※3	E -7	Thermistor	5.0 seconds		After starting unloader stops	—	—	—	○	○

※1. Unit with A.C.C.S. (automatic capacity control system) is only shown.

※2. Dryer trouble can be switched to warning or abnormality signal by using DIP switch on a printed circuit board (for details, see page 3-4).
(Unit is set as “Warning” ex. works)

※3. Resistance detecting disconnection is -20℃ or equivalent.

1. Specifications

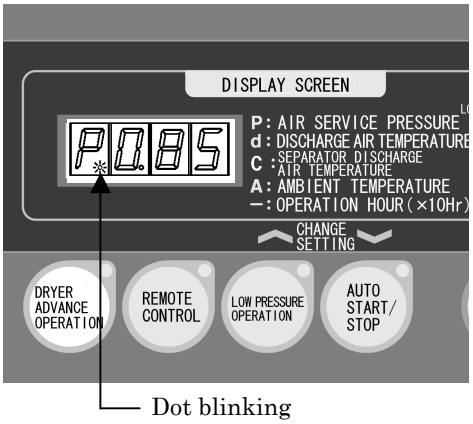
■Display

No.	Item	Indication		SAS/SMS				
		Code	Unit	4	6	8	11	15
1	Air service pressure	P	MPa	○	○	○	○	○
2	Discharge air temperature	d	℃	○	○	○	○	○
3	Separator discharge air temperature	C	℃	–	–	–	○	○
4	Ambient temperature	A	℃	○	○	○	○	○
5	Operation hour	No mark	×10Hr	○	○	○	○	○

Whenever “Display selector switch” key switch is ON , display is switched to : 1 → 2 → 3 ‥ → 1 ･･･

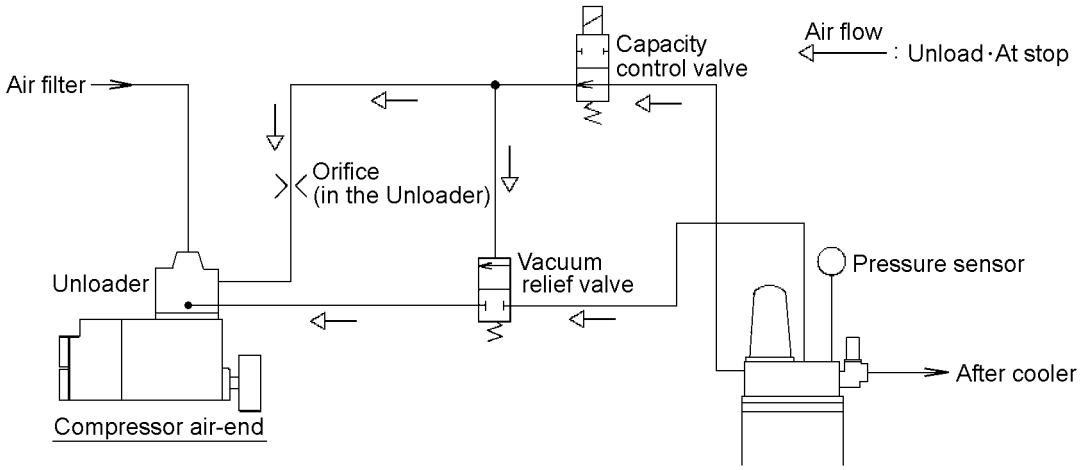
※ When power is supplied, “Air service pressure” is displayed.

※ During A.C.C.S. (automatic capacity control system) operation, dot blinking below “P” shows power saving operation.



1.6 Capacity Control

1.6.1 A.C.C.S. type



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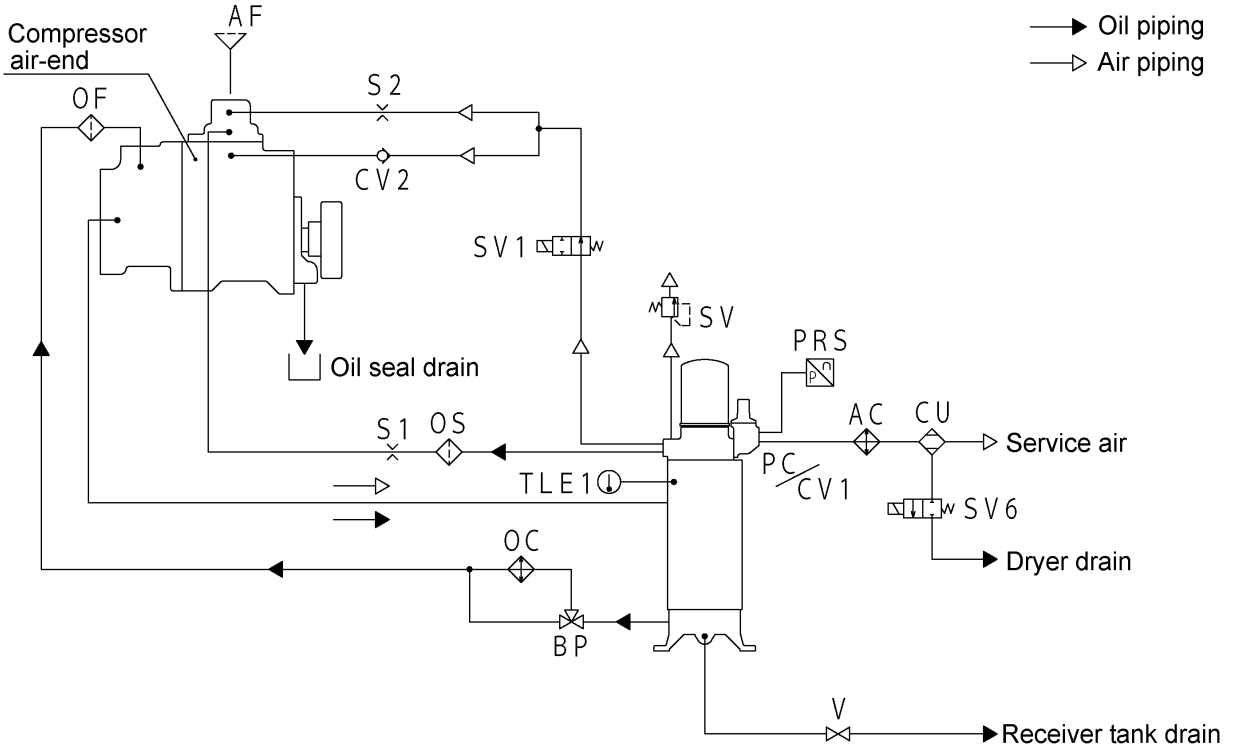
Conditions	Conditions of capacity control valve	Unloader valve
Start/Purge operation	Open	At a little open
Full-load	Close	At fully open
Stop	Open	At fully closed

Conditions	Function
Start	When it starts, capacity control valve opens and compressed air flows into unloader valve. Then, unloader valve is kept slightly open so that it reduces starting load.
Full-load	When 5 minutes passes after starting, capacity control valve is closed to block the passage between air receiver tank to unloader valve. Thus unloader valve is fully opened and then full load operation starts.
Purge operation	When air consumption decreases and discharge pressure exceeds set value (purge starting pressure PH), capacity control valve opens so that compressed air in air receiver tank can be sent to unloader valve. Thus, unloader valve is closed and at the same time compressed air in receiver tank is relieved to atmosphere through air filter and the pressure is lowered. Consequently power is saved. When air consumption increases and the pressure drops till set value (full load recovering pressure PL), capacity control valve closes to re-start loaded operation. Further, during unloaded operation, inside of compressor air-end becomes so highly vacuum that it causes vacuum noise. For prevention of this noise, the compressed air in the receiver tank is returned to compressor air-end. (Larger models than SAS/SMS8 are equipped with this operation mode.)
Stop	When stopping, capacity control valve is opened and then compressed air in the receiver tank is relieved through air filters to atmosphere.

1.7 Piping Diagram

1.7.1 SAS4SD-5A/6A･SMS4ED-5A/6A (A.C.C.S. type)

(1) Compressor



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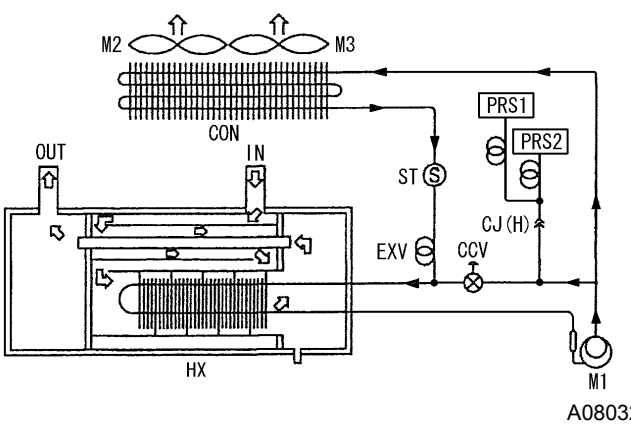
AC	Aftercooler	PC	Pressure control valve
AF	Air filter	PRS	Pressure sensor
BP	By-pass valve	S1	Orifice
CU	Dryer	S2	Orifice
CV1	Check valve	SV	Safety valve
CV2	Check valve	SV1	2-way solenoid valve (for capacity control)
OC	Oil cooler	SV6	2-way solenoid valve (for drain condensate)
OF	Oil filter	TLE1	Discharge air temperature sensor
OS	Strainer	V	Stop valve

(2) Dryer



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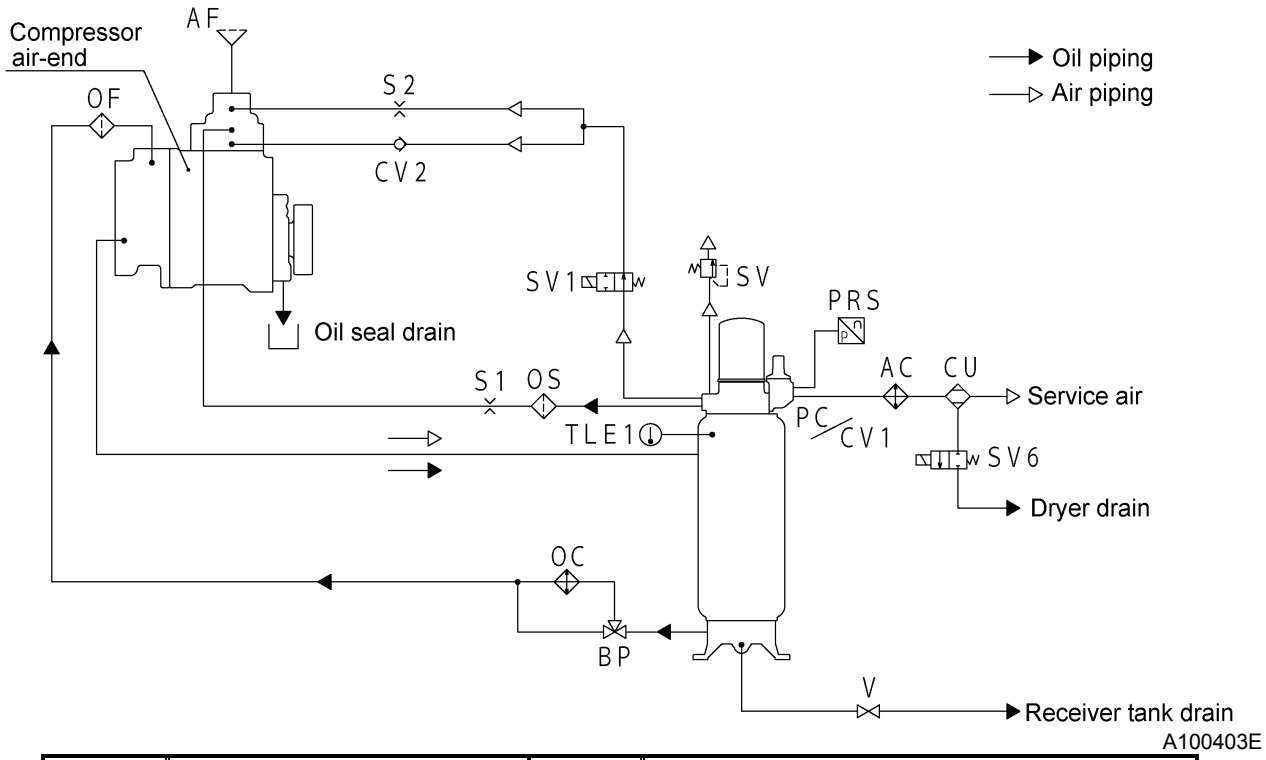
CCV	Capacity control valve
CON	Condenser
CJ(H)	High pressure side check joint
EXV	Capillary tube
HX	Cooler
PRS1	High pressure switch
PRS2	Pressure switch for fan control
ST	Strainer
M1	Refrigerating compressor
M2,M3	Fan motor

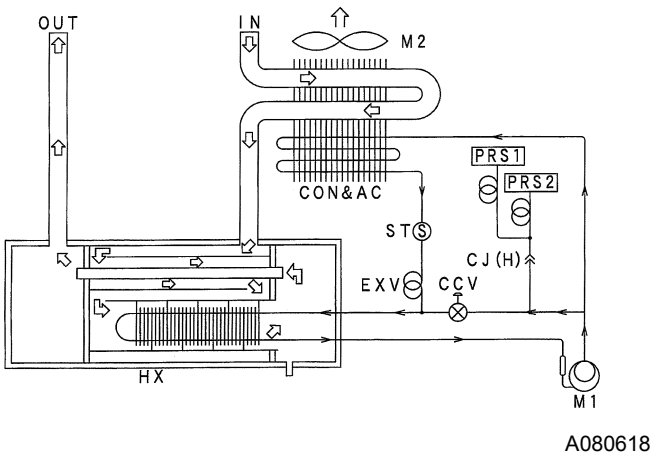
1.7.2 SAS6SD-5A/6A (A.C.C.S. type)

(1) Compressor



AC	Aftercooler	PC	Pressure control valve
AF	Air filter	PRS	Pressure sensor
BP	By-pass valve	S1	Orifice
CU	Dryer	S2	Orifice
CV1	Check valve	SV	Safety valve
CV2	Check valve	SV1	2-way solenoid valve (for capacity control)
OC	Oil cooler	SV6	2-way solenoid valve (for drain condensate)
OF	Oil filter	TLE1	Discharge air temperature sensor
OS	Strainer	V	Stop valve

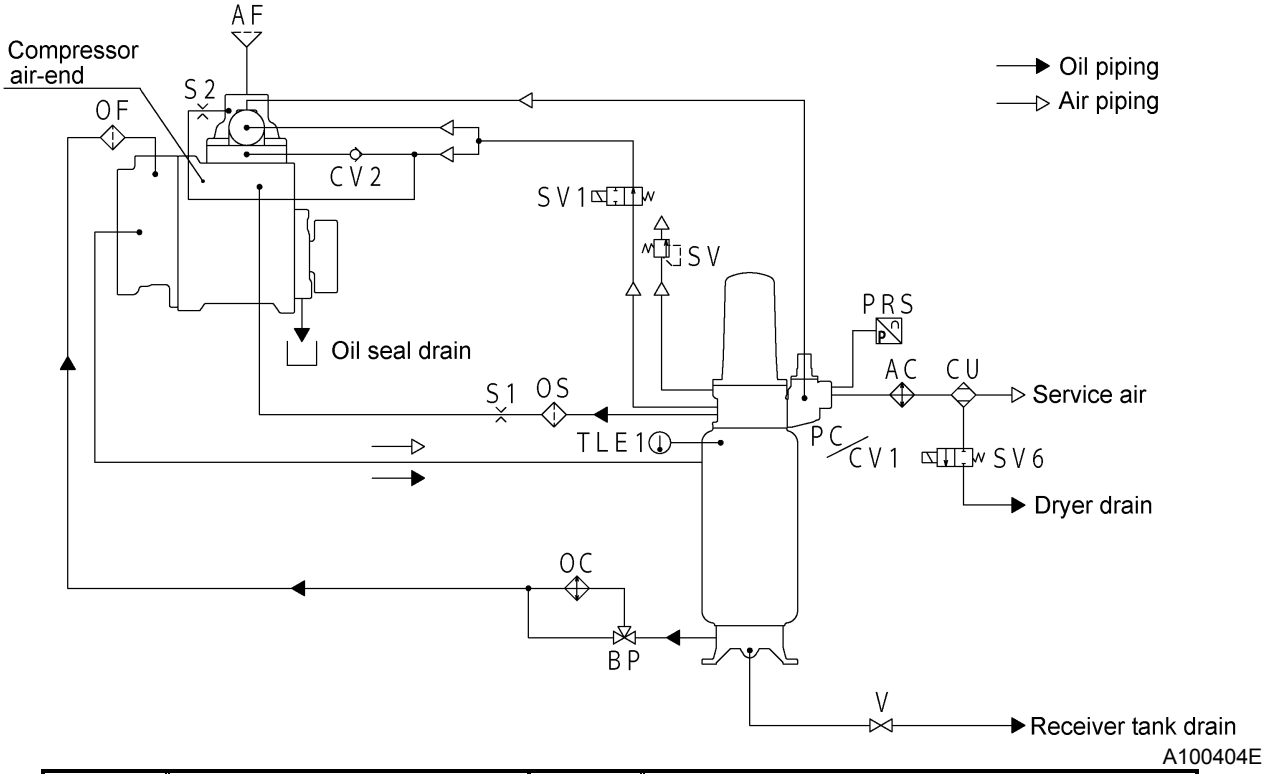
(2) Dryer



AC	Aftercooler
CCV	Capacity control valve
CON	Condenser
CJ(H)	High pressure side check joint
EXV	Capillary tube
HX	Cooler
PRS1	High pressure switch
PRS2	Pressure switch for fan control
ST	Strainer
M1	Refrigerating compressor
M2	Fan motor

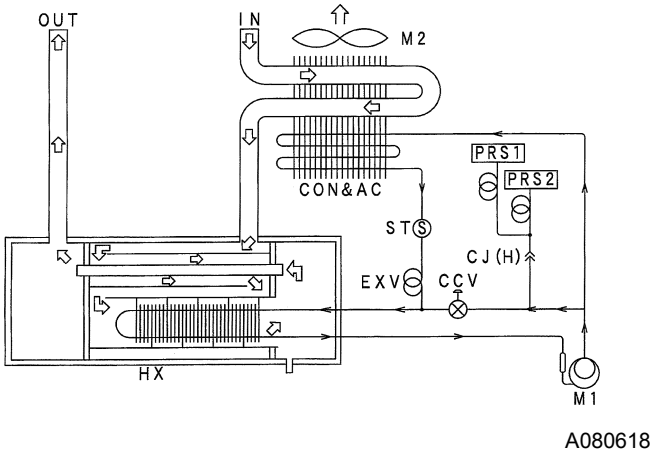
1.7.3 SAS8SD-5A/6A·SMS8ED-5A/6A (A.C.C.S. type)

(1) Compressor



AC	Aftercooler	PC	Pressure control valve
AF	Air filter	PRS	Pressure sensor
BP	By-pass valve	S1	Orifice
CU	Dryer	S2	Orifice
CV1	Check valve	SV	Safety valve
CV2	Check valve	SV1	2-way solenoid valve (for capacity control)
OC	Oil cooler	SV6	2-way solenoid valve (for drain condensate)
OF	Oil filter	TLE1	Discharge air temperature sensor
OS	Strainer	V	Stop valve

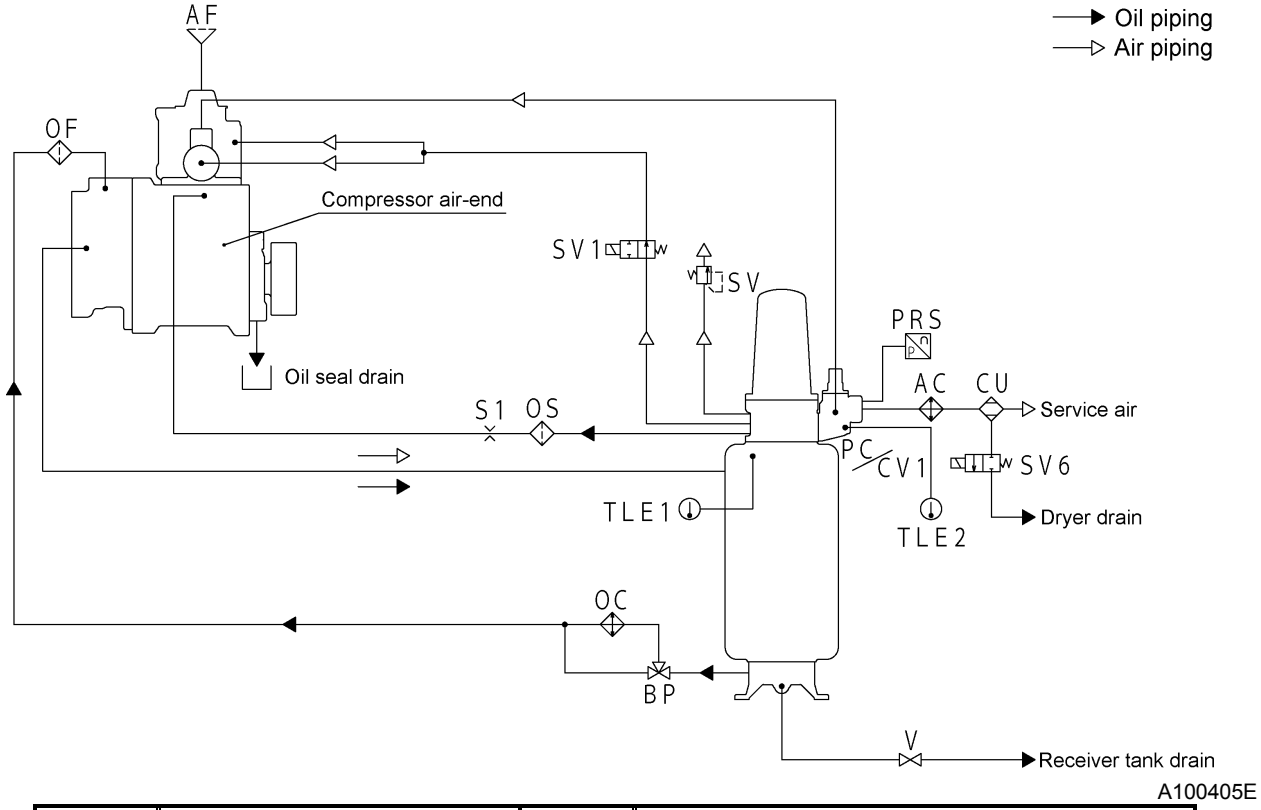
(2) Dryer



AC	Aftercooler
CCV	Capacity control valve
CON	Condenser
CJ(H)	High pressure side check joint
EXV	Capillary tube
HX	Cooler
M1	Motor (Refrigerating compressor)
M2	Motor (Fan motor)
PRS1	High pressure switch
PRS2	Pressure switch for fan control
ST	Strainer

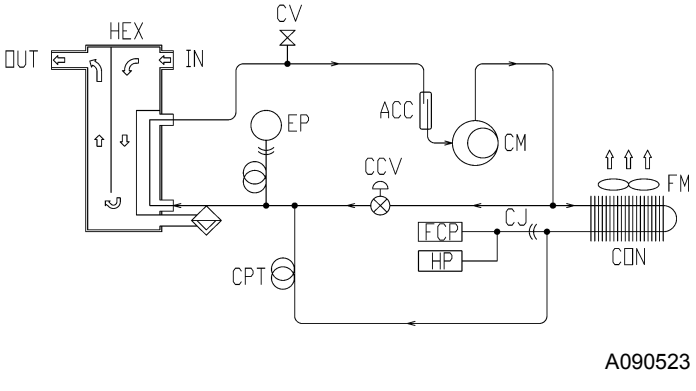
1.7.4 SAS11SD-5A/6A･SMS11ED-5A/6A (A.C.C.S. type)

(1) Compressor



AC	Aftercooler	PRS	Pressure sensor
AF	Air filter	S1	Orifice
BP	By-pass valve	SV	Safety valve
CU	Dryer	SV1	2-way solenoid valve (for capacity control)
CV1	Check valve	SV6	2-way solenoid valve (for drain condensate)
OC	Oil cooler	TLE1	Discharge air temperature sensor
OF	Oil filter	TLE2	Separator discharge air temperature sensor
OS	Strainer	V	Stop valve
PC	Pressure control valve		

(2) Dryer



ACC	Accumulator
CCV	Hot gas by-pass valve
CON	Condenser
CM	Compressor
CPT	Capillary tube
CJ	Check joint
CV	Charge valve
EP	Refrigerant evaporation pressure gauge
FCP	Fan control switch
FM	Condenser fan motor
HEX	Cooler
HP	High pressure switch

2. Maintenance

2.1 Cautions on Maintenance Job

2.1.1 Preparations before maintenance job

(1) How to perform maintenance job

It is important to perform maintenance jobs, always considering what kinds of equipments, tools, materials and oils should be used, what portions or parts of the machine should be inspected or adjusted or disassembled, and also what is the important points of the maintenance jobs.

(2) Prevention of oil overflow

In order to prevent oil from overflowing in case of compressor oil change and removal or installation of oil piping, make sure to prepare an oil reservoir. And also if an excessive oil flow is expected beforehand, it is necessary to empty the receiver tank beforehand.

[Follow the designated regulations to dispose of compressor oil.]

(3) On removal or installation of parts or assemblies

In case of removing complicated parts or components, mark the match mark for reinstallation.

(4) Equipments to be prepared beforehand

① Measuring instruments－Thickness gauge, torque wrench (Preset type or spanner type)
② General tools
③ Jigs, special tools and eyebolt (Bolt M12 2 pieces and M10 one piece or more)
④ Literature (Instruction manual, parts catalog and manual etc…)
⑤ Replacement parts
⑥ Auxiliary materials

Item	Name	Application
Cleaning agent	Cosmo Flush C	Compressor Air-end
Seal tape	Gaflon threaded sealing tape	Screwing section (Threebond 1212 is used together)
Grease	EPNOC AP(N)1	O-ring
Sealant for screwing-in	LOCTITE No.262	Unloader orifice installation portion
Compressor oil	See 5.4	Inside the cylinder (0.5L)
Diesel oil for cleaning		Cleaning
Thinner		Cleaning
Rag		

⑦ Equipments
Hot oil bath or bearing heater
Chain block
Impact wrench

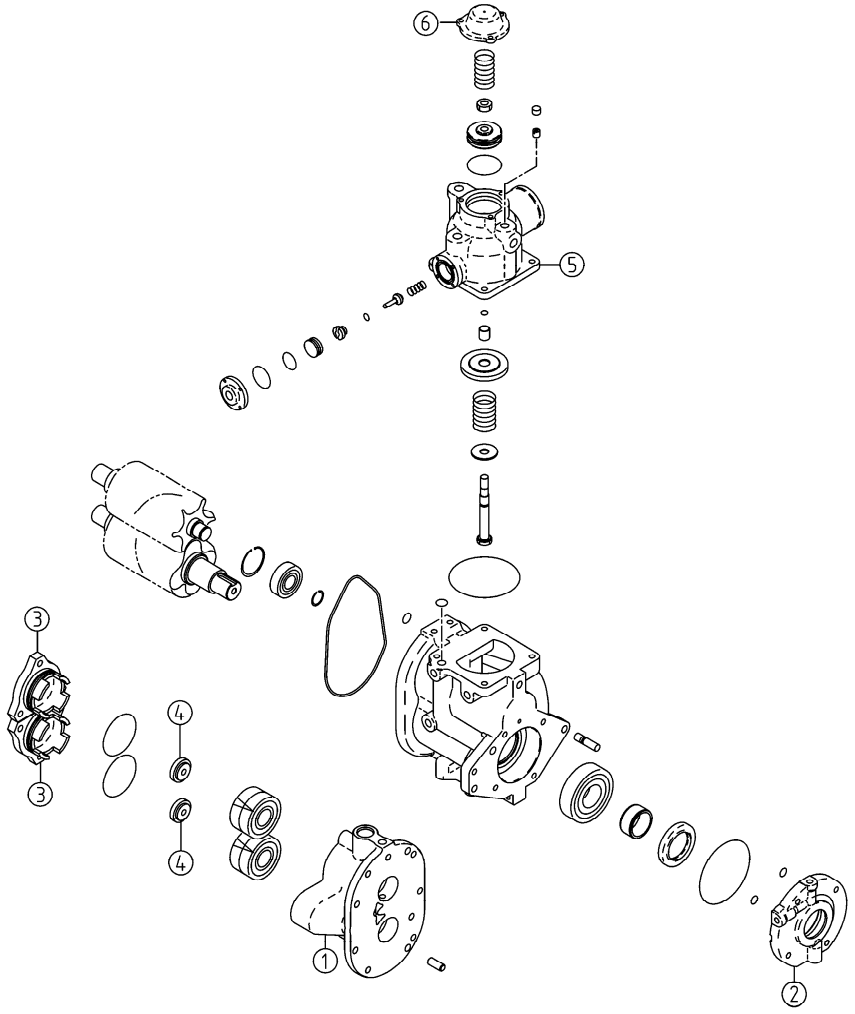
2.1.2 Cautions during disassembly and assembly

① Have to choose place where the machine is disassembled for maintenance job shall be clean, good ventilation and have much space to do it.
② Hove to clean and remove dust from disassemble equipment.
③ Pay attention ventilation and disaster prevention when cleaning disassembled parts by diesel oil.
④ Before removing nylon tubes or hoses, hove to clean dust and after removing them, make necessary treatment to prevent dust or foreign matters from entering inside.
⑤ Make sure to check the disassembled parts for any dirt and decoration, and then wash them by diesel oil. But, don't soak rubber sort to diesel oil absolutely.
⑥ After washing, put it on the clean paper or cloth to arrange in disassembled order and then do not damage them or do not make dirty.
⑦ As the parts or components are precision-made, do not damage them by falling or colliding.
⑧ Don't use disassemble O-ring, filter, oil. (have to abrogate it). Have to use new parts for re-assembling.
⑨ When reassembling, pace the parts according to the assembling turn and check to prepare all parts. (without any part left unused.)
⑩ If there are any contact parts used, use parts assemblies.
⑪ Be sure to coat the O-rings with the **"EPNOC AP(N)1"** grease. **Refrain from applying grease** to the sliding section of the oil seals as doing so will fill the screw grooves of the lip and impair its sealing ability.
⑫ Make sure to check tightening torque and clearance when assembling the disassembled parts.
⑬ When disassembling and reassembling the machine, hove to use jigs and tools correctly.
If you use it unfit, it is cause to break machine and tools or to get injured.
⑭ When stop disassembling halfway, it is cause to occur rust or soil them by humidity or rubbish.
If it is necessary to stop disassembling job on the way, make sure to protect them against rust and dirt.
⑮ After finishing assembling job, make sure to check following.
・Oil leakage
・To check tightening torque of every bolt
・The direction of rotation
・Part left behind to assembling
・Check oil level of receiver tank
⑯ After finishing re-assembling job, make sure to carefully perform trail operation so that it may not cause seizure or overheating to the unit.
⑰ When will perform disassembling or assembling by several person, hove to obey suggestion of leader.
And when go to next progress, to check safety to call out to each other.

2.2 Tightening

2.2.1 Tightening torque

Tightening place			Bolt diameter (mm)	Width of across flat (mm)	Tightening torque N·m (kgf·cm)
Compressor Air-end	①Cylinder and discharge casing socket bolt		8	6 (Hexagon haul)	25.0 (245)
	②Oil seal cover socket bolt		8	6 (Hexagon haul)	25.0 (245)
	③End cover	Socket bolt (4SD/4ED)	6	5 (Hexagon haul)	5.0 (51)
		Socket bolt (6SD－15SD/VD/ED)	8	6 (Hexagon haul)	12.0 (124)
	④Bearing pushing plate	Lock nut (4SD/4ED)	－	－	12.0 (124)
		Lock nut (6SD)	－	－	14.7 (150)
		Socket bolt (8SD－11SD/VD/ED)	8	6 (Hexagon haul)	25.0 (245)
		Socket bolt [male side] (15SD/VD/ED)	8	6 (Hexagon haul)	25.0 (245)
		Socket bolt [female side] (15SD/VD/ED)	10	8 (Hexagon haul)	49.0 (485)
	⑤Unloader socket bolt		8	6 (Hexagon haul)	25.0 (245)
	⑥Cover (for unloader) socket bolt (15SD/VD/ED)		8	6 (Hexagon haul)	25.0 (245)
Separator casing bolt			8	6 (Hexagon haul)	25.0 (245)
Level gauge bolt			10	17	6.0 (61)
Stopping bolt for cleaning hole for level gauge			10	17	6.0 (61)

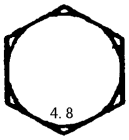
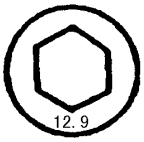
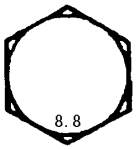


SC10001

SAS11SD-5A/6A

2.2.2 General bolts and nuts tightening torque

When reassembling or rebuilding, tighten bolts and nuts, according to the following torque values in the table.

Kind / Strength and sorting / Torque / Screw Nominal diameter (mm)	Low or Middle carbon steel bolt (SS400B etc…)	High tensile strength bolt (SCM435 etc…)	
	4.6－6.8（4T－6T）	8.8－12.9（7T－12T）	
			
	Hexagon bolts	Socket bolts	Hexagon bolts
	N・m (kgf・cm)	N・m (kgf・cm)	
6	5.0 (51)	10.0 (100)	
8	12.0 (124)	25.0 (245)	
10	25.0 (245)	49.0 (485)	
12	43.0 (425)	85.0 (845)	
14	68.0 (675)	135.0 (1,350)	
16	106.0 (1,055)	210.0 (2,100)	
18	145.0 (1,450)	290.0 (2,900)	
20	205.0 (2,050)	410.0 (4,100)	
22	280.0 (2,800)	560.0 (5,600)	
24	345.0 (3,450)	710.0 (7,100)	
Using place	Bonnet, flame etc…	Compressor air-end, receiver tank and other designation part	

IMPORTANT

- The above torque values in the table shall be applicable for the bolts and nuts used for machine.
- In general, the above torque values are applicable for the bolts and nuts used for compressor, but such parts used for special portions need be tightened according to the specified torque values indicated. (Please refer to the next and following pages)
- When tightening parts or components, make sure to remove rust and dust.

MEMO

2.2.3 Structure of compressor air-end

〖Standard clearance when assembling compressor air-end〗

Standard clearance when assembling compressor air-end (mm)	SAS4SD-5A/6A SMS4ED-5A/6A	SAS6SD-5A/6A	SAS8・11SD-5A/6A SMS8・11ED-5A/6A	SAS15SD-5A/6A SMS15ED-5A/6A
Clearance of discharge portion A	0.04-0.07	-	0.04-0.08	-
Clearance of discharge portion A'	-	0.04-0.10	-	0.04-0.12
Clearance of suction portion B	0.23-0.66	0.15-0.61	0.22-0.66	0.18-0.66
Clearance of circumference CM/CF	0.02-0.04	0.03-0.06	0.03-0.06	0.06-0.09

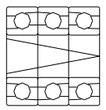
Note: Discharge clearance A should be measured with geared portion of rotor placed upward against discharge port.
Discharge clearance A' should be measured with geared portion of rotorplaced downward against discharge port.

〖Tightening torque〗

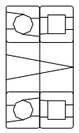
Tightening torque (N·m)	SAS4SD-5A/6A SMS4ED-5A/6A	SAS6SD-5A/6A	SAS8・11SD-5A/6A SMS8・11ED-5A/6A	SAS15SD-5A/6A SMS15ED-5A/6A
E	5.0	12.0	12.0	12.0
F	12.0	14.7	25.0	49.0
G	12.0	14.7	25.0	25.0
H	25.0	25.0	25.0	49.0

〖Assembly of bearing at discharge side〗

SAS4SD-5A/6A
SMS4ED-5A/6A

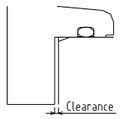


SAS6-15SD-5A/6A
SMS8-15ED-5A/6A



When assembling bearings at discharge side of male and female screw rotor, install bearings in the same directions of the marks shown above.

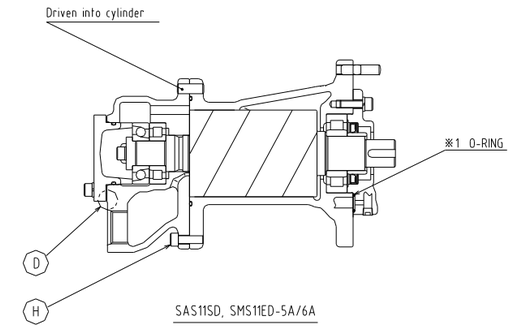
〖Clearance between discharge casing and end cover〗



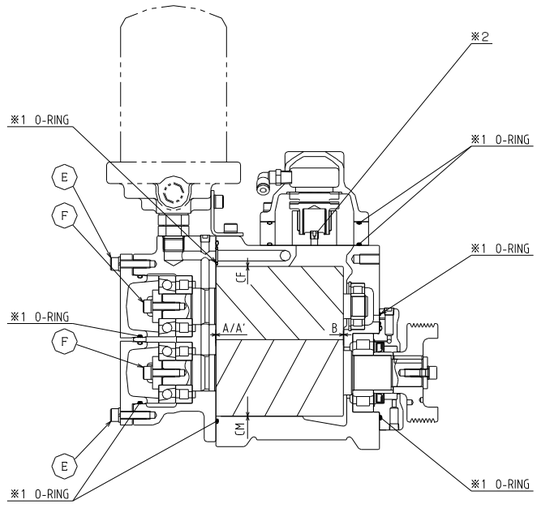
Note: Make sure that thickness gauge of 0.3 mm can be inserted into the above clearance between discharge casing and end cover as shown above. (both male and female)

Ⓓ detail

〖Sectional view〗



SAS11SD, SMS11ED-5A/6A



SAS11SD, SMS11ED-5A/6A

〖Common items〗

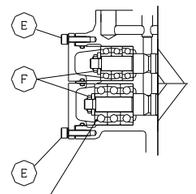
Note: 1. When assembling, check and make sure that no foreign matters such as dust, burrs and chips exist.
2. O-ring ※1: This O-ring should be installed, slightly coated with lithium base grease after checking and making sure that no dust is sticking on it.
3. Bearings should be changed as one set of inner and outer ring.
4. When changing oil seal, it is necessary to replace both oil seal and collar together.
5. Coat the threaded portion marked ※2 with LOCTITE No.242 and install it.
6. When starting first operation after it is assembled, it is necessary to fill 0.5 liters compressor oil.

〖Particular remarks on SAS6SD/15SD & SMS15ED only〗

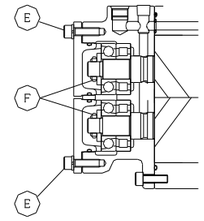
Note: 1. As it can not receive reverse thrust load, the pressure at suction side should not be kept higher than that at discharge side.

〖Fixing of bearing at discharge side〗

SAS4SD-5A/6A
SMS4ED-5A/6A

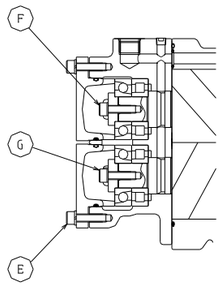


SAS6SD-5A/6A

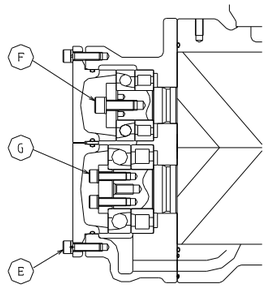


When pressing in bearings by using the bolt at the end of rotor, tightening torque should be less than 17,500N. (If it is stronger, it could damage rotor shaft.)

SAS8SD-5A/6A
SMS8ED-5A/6A
SAS11SD-5A/6A
SMS11ED-5A/6A

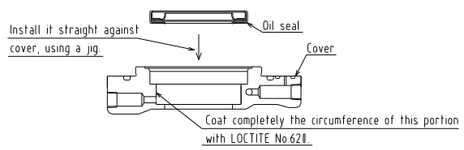


SAS15SD-5A/6A
SMS15ED-5A/6A

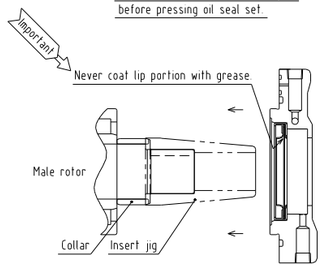


Note: 1. Ⓕ when assembling this portion, apply thin film of compressor oil on threaded portion.
2. Ⓕ when assembling this portion, never use impact wrench for tightening.

〖Detail of assembling oil seal and collar〗



Unpack oil seal set and use it just before pressing oil seal set.



Note: 1. Degrease internal circumference of collar and rotor shaft before installing collar to rotor shaft.
2. After coating LOCTITE No.621 on the internal circumference of collar or rotor shaft, install it. Make sure to wipe out any sealant that comes out after installing oil seal.
3. Install oil seal to rotor shaft, using insert jig the external circumference of which is completely coated with compressor oil and preventing the oil seal from inclining against the shaft.

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2.2.4 Special tools

[SAS4SD, SMS4ED-5A/6A]

No.	Part name	Part NO.	Q'ty	Remarks
1	Plate	00817 00124	1	Disassembly tool for rotor and discharge casing
2	Pin	00817 00125	1	Metal pad of puller edge
3	Bolt	00817 00126	1	Pulley installer press
4	Pipe	00817 00127	1	Pulley installer press
5	Bolt	00817 00128	2	Discharge side bearing installation tool
6	Pipe	00817 00129	1	Discharge side bearing installation tool
7	Pipe	00817 00130	1	Discharge side bearing installation tool
8	Pipe	00817 00131	1	Rotor bearing installation tool
9	Pipe	00817 00132	1	Oil seal installer

[SAS6SD-5A/6A]

No.	Part name	Part NO.	Q'ty	Remarks
1	Bolt	00817 00133	1	Pulley installer press
2	Pipe	00817 00134	1	Pulley installer press
3	Bolt	00817 00135	2	Discharge side bearing installation tool
4	Pipe	00817 00136	1	Discharge side bearing installation tool
5	Bolt	00817 00137	1	Rotor bearing installation tool
6	Pipe	00817 00138	1	Oil seal installer (used for these three models of SAS6,8,11)
7	Plate	00817 00139	1	Disassembly tool for rotor and discharge casing
8	Pin	00817 00140	1	Disassembly tool for rotor and discharge casing (Metal pad of puller edge)

[SAS8/11SD, VD, SMS8/11ED-5A/6A]

No.	Part name	Part NO.	Q'ty	Remarks
1	Pipe	00817 00138	1	Oil seal installer (used for these three models of SAS6,8,11)
2	Plate	00817 00141	1	Disassembly tool for rotor and discharge casing (used for these two models of SAS8,11)
3	Bolt	00817 00142	1	Pulley and discharge bearing installer press (used for these two models of SAS8,11)

[SAS15SD, VD, SMS15ED-5A/6A]

No.	Part name	Part NO.	Q'ty	Remarks
1	Pipe	00817 00211	1	Oil seal installer
2	Plate	00817 00162	1	Oil seal installer
3	Plate	00817 00152	1	Disassembly tool for rotor and discharge casing

2.2.5 Terminal tightening torque

Should be tighten terminal of electromagnet switch, thermal relay other electric equipment etc. according to following torque.

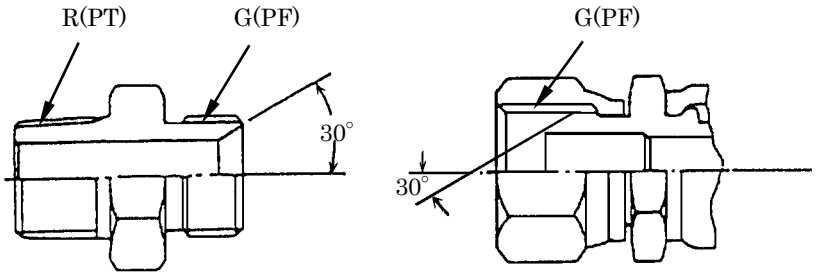
Screw size	Tighten torque N·m (kgf·cm)
M4	1.5 (15)
M5	2.9 (30)
M6	4.9 (50)
M8	9.8 (100)
M10	17.2 (175)
M12	34.0 (350)

2.2.6 Tightening torque for hose, joint etc…

(1) Union joint

Should be tighten union joint according to following torque.

Parallel thread for pipe		
Screw size G (PF)	Tool Width of across flat (mm)	Tightening torque N·m (kgf·cm)
1/4	19 (17)	25 (250)
3/8	22 (19)	50 (500)
1/2	27 (22)	59 (600)
3/4	36 (30)	120 (1,200)
1	41 (36)	140 (1,400)
1 1/4	50	170 (1,700)
1 1/2	60	210 (2,100)



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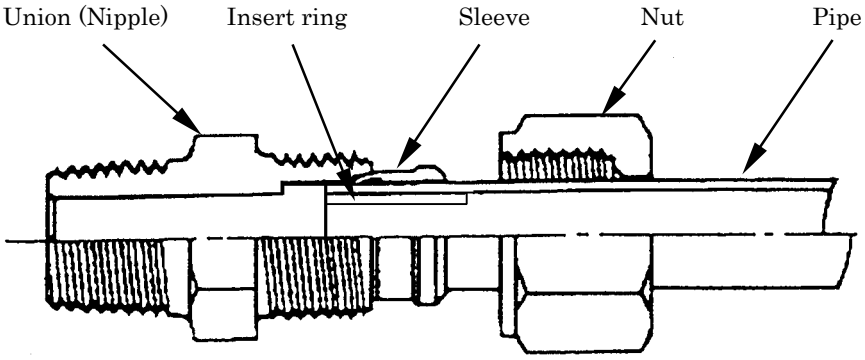
IMPORTANT

- Excessively tightening of union nut can cause excessive wedging action so that union nut can be broken. So tighten the nut, according to the specified torques.
- Damaged seating surface can cause oil leakage. So take special care when disassembling and reassembling.

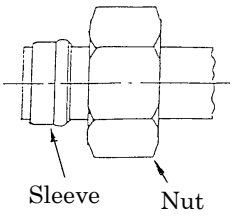
(2) Bite type union

Pipe have two kind of pipe, one is copper and other one is steel. The bite type union used for this pipe is to seal completely high pressure oil. Because the cutting edge of sleeve bites the steel pipe firmly and it is constructed to endure shock pressure and vibration. Therefore, this union is widely used for many hydraulic devices. But bear in mind that oil leak will occur if you are not familiar with the structure and usage of the union. Fit it according to the following steps.

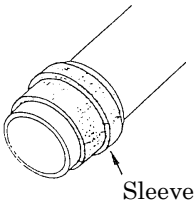


1) Check and confirm the pipe

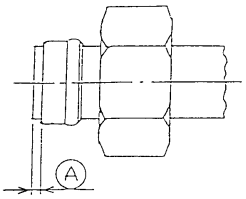
① Check whether this pipe is provided with insert ring, sleeve and nut. (Some insert rings are not used to be inserted, depending on the diameter.)



② Check the direction of the sleeve and make sure it is not caulked diagonally.



③ Visually make sure that there is a clearance of a few millimeters from the end of pipe to the sleeve (size A). 3-4 mm is recommended

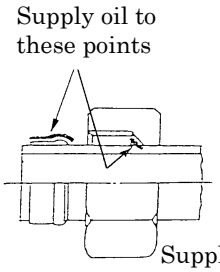


IMPORTANT

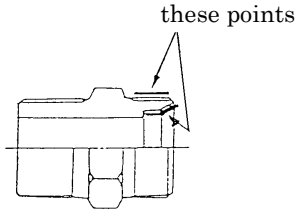
- When retightening the nut after loosening the tightened nut, mark “match-mark” on the location of the nut with white chalk before loosening it and then remove it.
  When tightening it again, tighten the nut a bit more tight than the position tightened before.

2) Coat pipe and nipple with lubrication oil

① Coat the sleeve and nut of pipe with lubricant (NICHIMORI LAP spray or equivalent).



② Coat the threaded portion and seat face of nipple with lubricant.

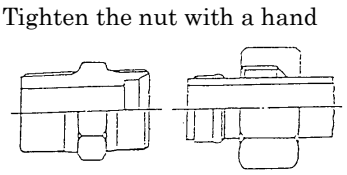


IMPORTANT

- When tightening it without coating lubricant, galling could take place. Therefore, the sleeve turns together. So then it can cause oil leak.

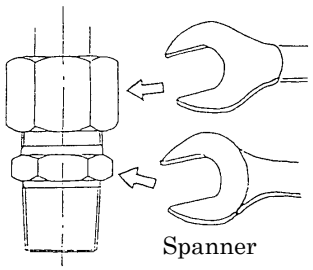
3) Tightening steps

① Tighten the pipe to the nipple.
Make sure to tighten the pipe nut with a hand till the nipple "Stop" position.



② Tighten the nut of pipe by one spanner with holding the nipple by another spanner.

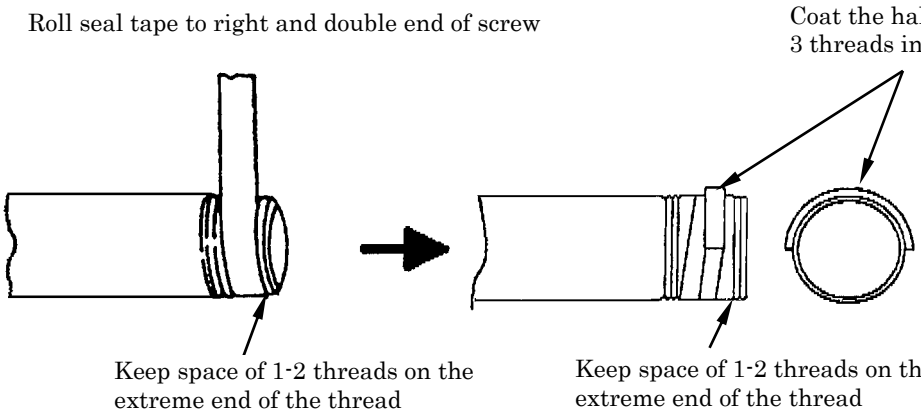
③ Continue to tighten the nut and when you will find sharp torque ruse point, tighten it 1/4 more to make the inside sleeve curves.



(3) Pipe tapered threads

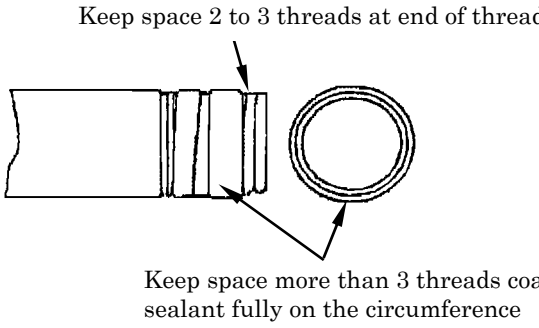
Sealing tapes are used to prevent any leakage of oil, water, fuel and air by stopping the space between female and male threads of metal pipe and fittings (PT thread for pipe).
Be noted that how to seal varies upon the diameter of thread.

1) How to seal for tube screw larger than R1(25A) of thread diameter.
① Wipe out oil and fat content with wasted cloth.
② Roll seal tape (Gaflon threaded sealing tape) .
③ Coat sealant "Threebond 1212" on the seal tape which is attached. According to the figure below.



S_M031

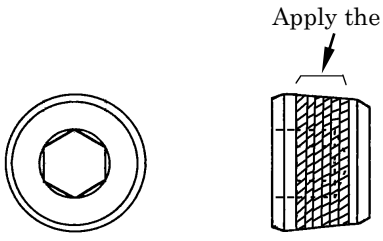
2) How to seal for tube screw of larger than 1 1/4 (32A) of thread diameter.
① Wipe up oil and fats content from the threaded portion with rag.
② Roll seal tape (Gaflon threaded sealing tape) . [same as 1) clause]
③ Coat sealant "Threebond 1212" on seal taped portion as shown below.



S_M032

3) Concerning Components with Screw Portions Coated with a Sealant

Components with their screw portions coated with a sealant are to be screwed in upon applying a sealant (ThreeBond 1212).



SC14001

(4) Standard tightening torque of piping PT screw (Reference value)

Unit:N・m(kgf・cm)

Nominal diameter	Tightening torque	Nominal diameter	Tightening torque	Nominal diameter	Tightening torque
1/8	11 (110)	3/4	65 (660)	2	216 (2,200)
1/4	22 (220)	1	108 (1,100)	2 1/2	270 (2,750)
3/8	32 (330)	1 1/4	129 (1,320)	3	323 (3,300)
1/2	43 (440)	1 1/2	162 (1,650)		

Note：Over torque tightening could lead to deforming of threads and resulting in oil leakage. (2 threads should be left as standard)

(5) Nylon tube

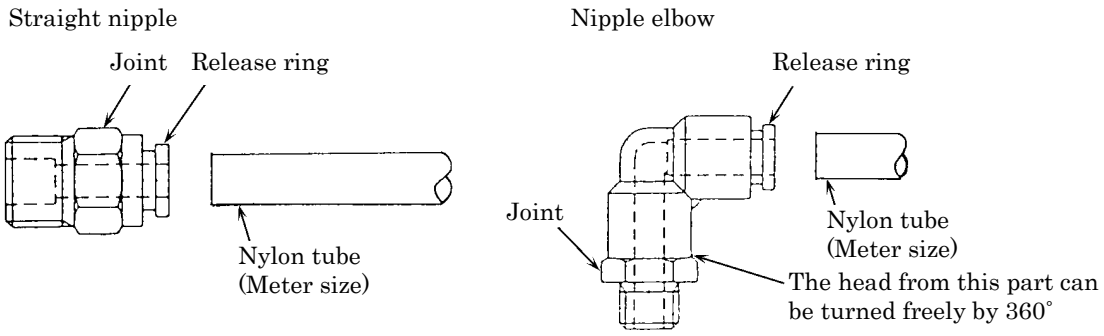
To size of nylon tube are used to this machine. One is inch size and other one is meter size.
Each nylon tubes are not compatible.
Inch size ····· It is use spanner when tightening sleeve nad nut to piping.
Meter size ····· Install to one tach joint.

- Some inch sized tubes can be inserted into one tough joint connectors…
  But sometimes it is difficult to remove them. Be careful not to use inch sized tubes.
- Circumference of each tube serves to prevent leaking. When any damage or deflectionon the circumference is found, cut such damaged portions of the tube.

Each tube is marked nominal size in a constant distance on it, and so it is easy to distinguish such portions... But the circumference of tube is quite same. So be careful not to make a mistake in its installation.

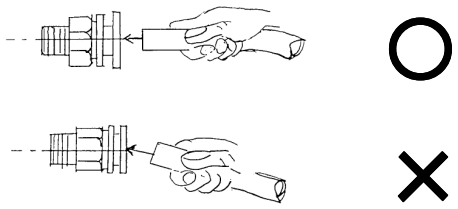
Specifications of one tough joint connector. Cautions on how to use it.

- Rubber seal is provided inside the joint connector. As the joint is repeatedly installed and removed many times, air leak sometimes can take place.
- Installation and/or removal must not be performed under pressurization.
- Installing any tube, you find it difficult to confirm whether it is fully and correctly installed, looking from outside. After it is installed, make sure to check that it is surely installed and cannot be pulled out, by poulling it.
- When removing the tube, push in the release ring evenly to release the lock and so it is possible to extract the tube.



IMPORTANT

- As shown in the sketch, put the nylon tube straight against the inlet of the fitting.
  If the tube is installed diagonally, the internal diameter of lock ring gets wider and it can not hold the tube and it drops.



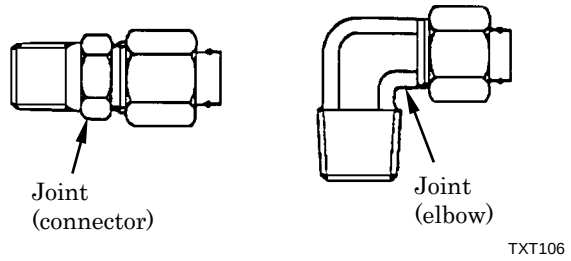
(6) Tightening for joint of nylon tube and sleeve nut

Following chart is for tightening torque of each size joint and sleeve nut.

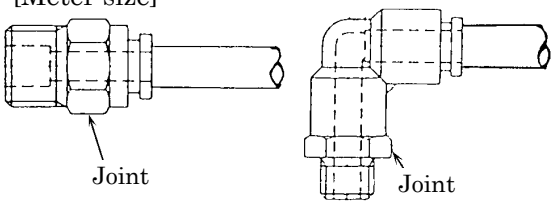
1) Tightening of Joint

Screw size R (PT)	Tightening torque N·m (kgf·cm)
1/8	7.8 (80)
1/4	13 (130)
3/8	23 (230)
1/2	28 (290)

[Inch size]



[Meter size]



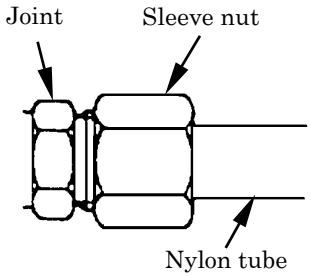
IMPORTANT

- Tightening torque is specified for each size thread.
- Nipple with their screw portions coated with a sealant are to be screwed in upon applying a sealant (ThreeBond 1212)

2) Tightening sleeve nut (Inch size only)

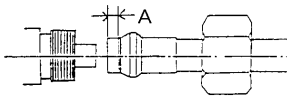
Installing new nylon tube, sleeve and sleeve nut, attach the nylon tube firmly to the joint connector and tighten the sleeve nut till proper revolutions by hand, and them tighten the sleeve nuts till proper turns, using a tightening tool such as spanner.

Tube nominal diameter	Tool width across flat (mm)	Sleeve nuts proper tightening turns (turn times)	Tightening torque N·m (kgf·cm)
1/8	8	1/2－1	3.8 (39)
3/16	10	1/2－1	6.3 (64)
1/4	12	1/2－1	6.4 (65)
3/8	17	1/2－1	18.0 (180)
1/2	19	1/2－1	23.0 (230)

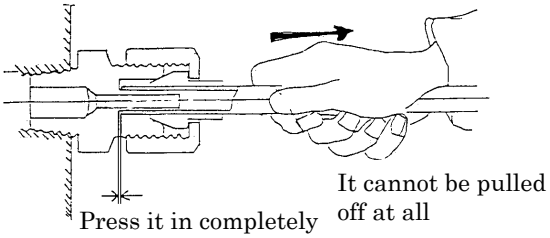


TXT107

Before installing nylon tube, check the size of A.
If you do not use caulking tool, check the size of A again after removing it once.



After having tightened it, make sure to confirm that the tube can not be removed by pulling it off.



SCTXT050

IMPORTANT

- In order to tighten sleeve nut correctly, keep the correct tightening turns of sleeve nut in accordance with the nut turning constant times.
  The optimum turning times mean the revolutions times after tightening the nuts fully by hand.
  The tightening torque of above chart is referent value.

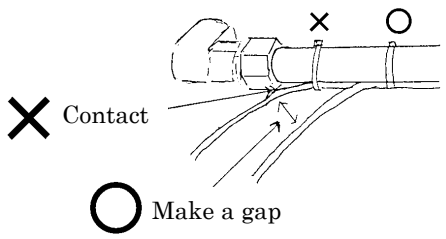
(7) How to install hose

Pay attation followig part when install hose and nylon tube.

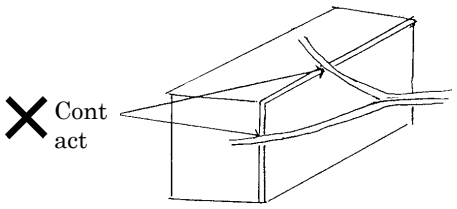
1) Nylon tube

① Check 1/8 and 3/16 size nylon tubes for any break. (Pipe for pressure gauge)

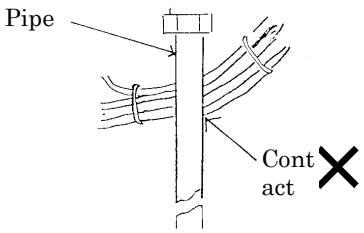
② Connect nylon tube, preventing it from contacting any edge of copper pipe and steel pipe nut.



③ Make connection of nylon tube, taking care not to touch the edge of bracket and plate etc.



④ Make connection of nylon tube, taking care not to touch any copper or steel pipe.
(If it is avoidably impossible, use it, being protected by felt)

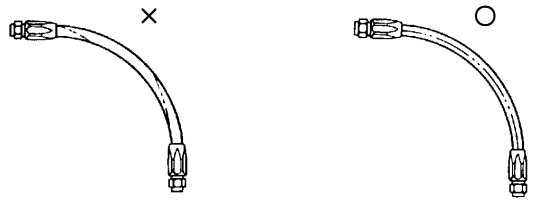


S_M121

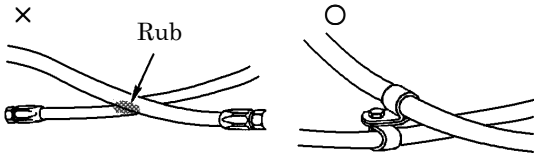
2) Hose

① Authentic hose when replacing it. If not, it will cause oil leakage, break and disconnection, and it leads to fire.

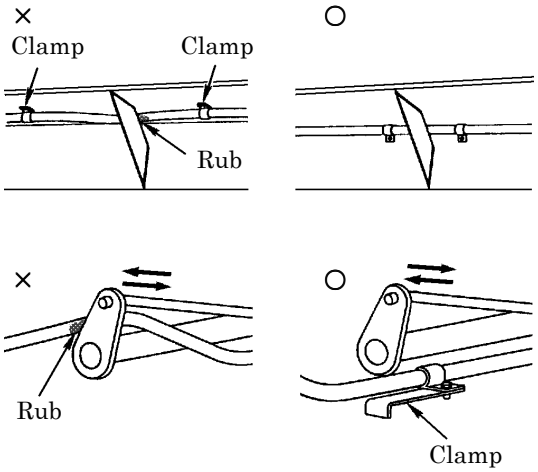
② Never use hose twisted. Twisted hose will cause oil leakage, break and fitting disconnection when they are loaded with high pressure, vibration and shock. The printed mark on outside surface of hose is a guide for prevention of twisted connection.



③ Avoid contact between hose. If the hose is rubbing each other continuously, it causes damages and also burst on hose.



④ Take care not to make hose touch sharp edge or moving part of the unit or component.



2. Maintenance

2.3 Periodic Inspection/Maintenance List

2.3.1 Periodic inspection/maintenance of compressor [SAS4SD-6SD-5A/6A,SMS4ED-5A/6A]

Inspection items		Inspection points	Maintenance interval							Remarks
			Daily	1 month	Every 1 year	Every 2 years	Every 4 years	Every 6 years (4SD.4ED)	Every 8 years (6SD)	
Indication of each gauge			○							See the item "Operating method"
Motor	Coil	Insulation resistance				●				Dry or change if less than 1MΩ.
	Bearing	Change						●	●	
	Sirocco fan	Check			○					Clean if too dirty.
Compressor air-end	Bearing	Change						●	●	
	Oil seal	Change						●	●	
	Collar	Change						●	●	
	O-ring	Change						●	●	Check for oil leak
	Consumable part of unloader	Change						●	●	
Air-filter element		Clean /Change		○ (Clean)		○ (Change)				
Dustproof air filter		Clean /Change	○ (Clean)		○ (Change)					SAS4･6SD only
Separator receiver tank	Compressor oil level	Check	○							In case of oil shortage, replenish it.
	Receiver tank drain	Drain	○ (Every week)							
	Compressor oil	Change			○					Change if too dirty.
	Oil level gauge	Change					●			Change if too dirty.
	O-ring of oil filler	Check			○					Re-usable after check, if normal.
	Oil separator	Change			○					
Pipe system	Scavenging orifice strainer	Clean strainer			○					
	Scavenging orifice o-ring	Check			○					Re-usable after check, if normal.
	Oil filter	Change			○					
	Rubber hose	Check/Change			○ (Check)		● (Change)			
	Nylon tube	Check/Change			○ (Check)	● (Change)				
Oil cooler/ After cooler		Clean				●				Clean if too dirty.
Safety equipment	Safety valve	Check performance		○						
	Consumable part of pressure control valve	Check/Change O-ring					●			
		Check/Change piston					●			Re-usable after check, if normal.
	Discharge air temp. / Ambient temp. sensor	Check					●			Re-usable after check, if normal.
	Bypass valve	Change Pellet					●			
Solenoid valve		Change					●			Re-usable after check, if normal.
Belt		Adjust tension			○					If abnormal, replace it.
		Change					●			Replace the pulley, depending on its conditions.

● 2.3.2 Periodic inspection of dryer [SAS4SD-6SD-5A/6A,SMS4ED-5A/6A]

Inspection items	Inspection points	Maintenance interval							Remarks
		Daily	1 month	Every 1 year	Every 2 years	Every 4 years	Every 6 years (4SD.4ED)	Every 8 years (6SD)	
Pressure switch for fan control	Check					●			
Refrigerating compressor	Check						●	●	
Fan motor	Check						●	●	
Draining condensate in dryer	Check		○						Make sure condensate is properly drained.

Regarding the items or parts marked ○ in the table of periodical maintenance customers or users should perform periodical maintenance of the items or parts marked ○ by themselves. For such items or parts marked ●, please contact us or distributor, because they need special technical knowledge.

● Also the maintenance interval in the table shall be based on the normal operation conditions.

● Regarding the periodical maintenance between inspection period and operation hours, maintenance or inspection should be performed, roughly according to 250 hours/month・3,000 hours/year・6,000 hours/2 years・12,000 hours/4 years, and 18,000 hours/6 years.

- ● Only main components are mentioned in the table.
- ● Maintenance interval means that periodical maintenance should be repeatedly carried out.
- ● Use AIRMAN genuine parts and recommended oil for replacement.
- ※ When such parts which are not mentioned in the table need inspection and or maintenance, please contact us or distributor.

2.3.3 Periodic inspection/maintenance of compressor [SAS8SD-5A/6A,SMS8ED-5A/6A]

Inspection items		Inspection points	Maintenance interval						Remarks
			Daily	2 month	Every 1 year	Every 2 years	Every 4 years	Every 8 years	
Indication of each gauge			○						See the item “Operating method”
Motor	Coil	Insulation resistance				●			Dry or change if less than 1M Ω.
	Bearing	Change						●	
	Sirocco fan	Check			○ (Every 3,000h)				Clean if too dirty.
Compressor air-end	Bearing	Change						●	
	Oil seal	Change					●		
	Collar	Check					●		Re-usable after check, if normal.
		Change						●	
	O-ring	Change						●	Check for oil leak
	Consumable part of unloader	Change						●	
	Consumable part of vacuum relief valve	Change				●			Belong to interior parts of unloader
Air-filter element		Clean /Change		○ (Clean)	○ (Change)				
Dustproof air filter		Clean /Change	○ (Clean)		○ (Change Every 3,000h)				SAS8SD only
Separator receiver tank	Compressor oil level	Check	○						In case of oil shortage, replenish it.
	Receiver tank drain	Drain	○ (Every week)						
	Compressor oil	Change			○				Change if too dirty.
	Oil level gauge	Change					●		Change if too dirty.
	O-ring of oil filler	Check			○				Re-usable after check, if normal.
	Oil separator	Change			○				
Pipe system	Scavenging orifice strainer	Clean strainer			○				
	Scavenging orifice o-ring	Check			○				Re-usable after check, if normal.
	Oil filter	Change			○				
	Rubber hose	Check/Change			○ (Check)		● (Change)		
	Nylon tube	Check/Change			○ (Check)	● (Change)			
Oil cooler/ After cooler		Clean				●			Clean if too dirty.
Safety equipment	Safety valve	Check performance		○					
	Consumable part of pressure control valve	Check/Change O-ring					●		
		Check/Change piston					●		Re-usable after check, if normal.
	Discharge air temp. / Ambient temp. sensor	Check					●		Re-usable after check, if normal.
	Bypass valve	Change Pellet					●		
Solenoid valve		Change					●		Re-usable after check, if normal.
Belt		Adjust tension			○				If abnormal, replace it.
		Change					●		Replace the pulley, depending on its conditions.

● 2.3.4 Periodic inspection of dryer [SAS8SD-5A/6A,SMS8ED-5A/6A]

Inspection items	Inspection points	Maintenance interval						Remarks
		Daily	2 month	Every 1 year	Every 2 years	Every 4 years	Every 8 years	
Pressure switch for fan control	Check					●		
Refrigerating compressor	Change					●		Re-usable after check, if normal.
Fan motor	Check			●				
Draining condensate in dryer	Check		○ (Every 250h)					Make sure condensate is properly drained.

Regarding the items or parts marked ○ in the table of periodical maintenance customers or users should perform periodical maintenance of the items or parts marked ○ by themselves. For such items or parts marked ●, please contact us or distributor, because they need special technical knowledge.

● Also the maintenance interval in the table shall be based on the normal operation conditions.

● Regarding the periodical maintenance between inspection period and operation hours, maintenance or inspection should be performed, roughly according to 250 hours/month・3,000 hours/year・6,000 hours/2 years・12,000 hours/4 years, and 24,000 hours/8 years.

- ● Only main components are mentioned in the table.
- ● Maintenance interval means that periodical maintenance should be repeatedly carried out.
- ● Use AIRMAN genuine parts and recommended oil for replacement.

※ When such parts which are not mentioned in the table need inspection and or maintenance, please contact us or distributor.

2.3.5 Periodical Inspection and maintenance (A): In case that total operation hours per one year are less than 3,000 hours [SAS11-15SD,SMS11-15ED-5A/6A]

Inspection items		Inspection points	Maintenance interval							Remarks
			Daily	1 months	Every 1 year	Every 2 years	Every 4 years	Every 6 years	Every 8 years	
Indication of each gauge			○							See the item "Operating method"
Motor	Coil	Insulation resistance			●					More than 1Ω at DC500V Mega.
	Bearing	Change					●			
	Sirocco fan	Check / clean			○					Clean if too dirty.
Compressor air-end	Bearing	Change						※2 ●	※1 ●	
	Collar	Check					●			Re-usable after check, if normal.
		Change						※2 ●	※1 ●	
	Oil seal	Change					●			
	Consumable part of unloader	Change					●			
	Consumable part of vacuum relief valve	Change					●			Belong to interior parts of unloader.
Air-filter element		Clean / change		○ (Clean)		○ (Change)				
Dustproof air filter		Clean / change	○ (Clean)		○ (Change)					SAS11・15SD only
Separator receiver tank	Compressor oil level	Check	○							Oil level to be between red lines at loaded operation.
	Receiver tank drain	Drain	○ (Every week)							
	Compressor oil	Change			○					Change if too dirty.
	Oil level gauge	Change					●			Change if too dirty.
	O-ring of oil filler	Check				○				Re-usable after check, if normal.
	Oil separator element	Change				○				
Pipe system	Scavenging orifice strainer	Clean			○					
	Scavenging orifice o-ring	Check			○					Re-usable after check, if normal.
	Consumable part of regulator	Change					●			Suction port closing type only
	Oil filter	Change			○					
	Rubber hose	Check / change			○ (Check)		● (Change)			
	Nylon tube	Check / change			○ (Check)	● (Change)				
Oil cooler/ After cooler		Clean				●				Clean if too dirty.
Safety equipment	Safety valve	Check performance		○						
	Consumable part of pressure control valve	Check / change o-ring					●			
		Check/change piston					●			Re-usable after check, if normal.
	Discharge air temp. / Separator discharge air temp. / Ambient temp. sensor	Check					●			Re-usable after check, if normal.
	By-pass valve	Change pellet					●			
Solenoid valve		Change					●			Re-usable after check, if normal.
Belt・Pulley		Check			○					If abnormal, replace it.
Belt		Change					●			Replace the pulley, depending on its conditions.
Auto-tensioner		Change					●			SAS15SD,SMS15ED only

2. Maintenance

Regarding the items or parts marked ○ in the table of periodical maintenance customers or users should perform periodical maintenance of the items or parts marked ○ by themselves.
For such items or parts marked ●, please contact us or distributor, because they need special technical knowledge.

- Also the maintenance interval in the table shall be based on the normal operation conditions.
- Regarding the periodical maintenance between inspection period and operation hours, maintenance or inspection should be performed, roughly according to 250 hours/month, 3,000 hours/year, 6,000 hours/2 years, 12,000 hours/4 years, 18,000 hours/6 years, and 24,000hours/8 years.

※1 shows the interval time of bearing replacement for the compressor of the pressure of 0.69 and 0.83MPa.
※2 shows the interval time of bearing replacement for the compressor of the pressure of 0.93MPa.

- Only main components are mentioned in the table.
- Maintenance interval means that periodical maintenance should be repeatedly carried out.
- Use AIRMAN genuine parts and recommended oil for replacement.

＊When such parts which are not mentioned in the table need inspection and or maintenance, please contact us or distributor.

2.3.6 Periodical Inspection and maintenance (B): In case that total operation hours per one year are less than 6,000 hours [SAS11-15SD,SMS11-15ED-5A/6A]

Inspection items		Inspection points	Maintenance interval							Remarks
			Daily	1 months	Every 1 year	Every 2 years	Every 4 years	Every 6 years	Every 8 years	
Indication of each gauge			○							See the item “Operating method”
Motor	Coil	Insulation resistance			●					More than 1Ω at DC500V Mega.
	Bearing	Change					●			
	Sirocco fan	Check / clean			○					Clean if too dirty.
Compressor air-end	Bearing	Change						※2 ●	※1 ●	
	Collar	Check					●			Re-usable after check, if normal.
		Change						※2 ●	※1 ●	
	Oil seal	Change					●			
	Consumable part of unloader	Change				●				
	Consumable part of vacuum relief valve	Change				●				Belong to interior parts of unloader.
Air-filter element		Clean / change		○ (Clean)	○ (Change)					
Dustproof air filter		Clean / change	○ (Clean)		○ (Change)					SAS11・15SD only
Separator receiver tank	Compressor oil level	Check	○							Oil level to be between red lines at loaded operation.
	Receiver tank drain	Drain	○ (Every week)							
	Compressor oil	Change			○ (Every 6month)					Change if too dirty.
	Oil level gauge	Change					●			Change if too dirty.
	O-ring of oil filler	Check				○				Re-usable after check, if normal.
	Oil separator element	Change			○					

2. Maintenance

Inspection items		Inspection points	Maintenance interval							Remarks
			Daily	1 months	Every 1 year	Every 2 years	Every 4 years	Every 6 years	Every 8 years	
Pipe system	Scavenging orifice strainer	Clean			○					
	Scavenging orifice o-ring	Check			○					Re-usable after check, if normal.
	Consumable part of regulator	Change				●				Suction port closing type only
	Oil filter	Change			○ (Every 6month)					
	Rubber hose	Check / change			○ (Check)		● (Change)			
	Nylon tube	Check / change			○ (Check)	● (Change)				
Oil cooler/ After cooler		Clean			●					Clean if too dirty.
Safety equipment	Safety valve	Check performance		○						
	Consumable part of pressure control valve	Check / change o-ring				●				
		Check/change piston				●				Re-usable after check, if normal.
	Discharge air temp. / Separator discharge air temp. / Ambient temp. sensor	Check					●			Re-usable after check, if normal.
	By-pass valve	Change pellet					●			
Solenoid valve		Change					●			Re-usable after check, if normal.
Belt･Pulley		Check			○					If abnormal, replace it.
Belt		Change					●			Replace the pulley, depending on its conditions.
Auto-tensioner		Change					●			SAS15SD,SMS15ED only

2.3.7 Periodic inspection of dryer (Dryer built-in type only) [SAS11-15SD,SMS11-15ED-5A/6A]

Inspection items	Inspection points	Maintenance interval							Remarks
		Daily	1 months	Every 1 year	Every 2 years	Every 4 years	Every 6 years	Every 8 years	
Pressure switch for fan control	Check					●			
Refrigerating compressor	Change					●			Re-usable after check, if normal.
Fan motor	Check			●					
Draining condensate in dryer	Check		○						Make sure condensate is properly drained.

Regarding the items or parts marked ○ in the table of periodical maintenance customers or users should perform periodical maintenance of the items or parts marked ○ by themselves. For such items or parts marked ●, please contact us or distributor, because they need special technical knowledge.

● Also the maintenance interval in the table shall be based on the normal operation conditions.

● Regarding the periodical maintenance between inspection period and operation hours, maintenance or inspection should be performed, roughly according to 500 hours/month, 6,000 hours/year, 12,000 hours/2 years, 24,000 hours/4 years, 36,000 hours/6 years, and 48,000hours/8 years.

※1 shows the interval time of bearing replacement for the compressor of the pressure of 0.69 and 0.83MPa.

※2 shows the interval time of bearing replacement for the compressor of the pressure of 0.93MPa.

- Only main components are mentioned in the table.
- Maintenance interval means that periodical maintenance should be repeatedly carried out.
- Use AIRMAN genuine parts and recommended oil for replacement.

＊When such parts which are not mentioned in the table need inspection and or maintenance, please contact us or distributor.

2.4 Inspection/Maintenance

Perform this job of inspection and maintenance safely, referring to the instruction manual for routine inspection/maintenance.

Herewith only such items which are not mentioned in the instruction manual supplied together with each unit shall be explained.

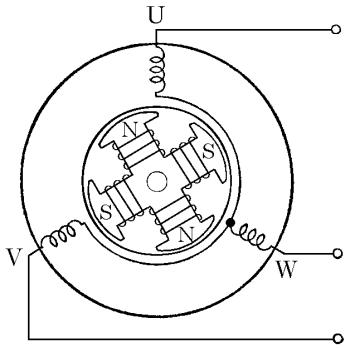
2.4.1 Electric motor

(1) Inspection of insulation resistance of motor coil

IMPORTANT

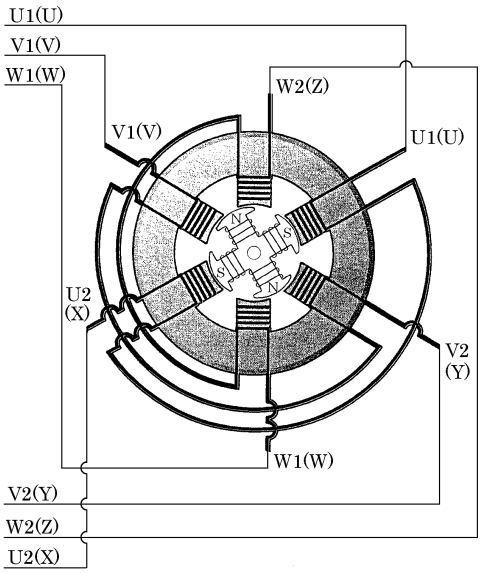
- Make sure to switch off power supply switch.
- Make sure to separate cables from contactor.
- Never touch any terminal of each cable because insulation resistance will be reduced if touched.

1. Insulation between ground and motor body
   ① Separate motor cable from contactor.
   ② Measure insulation resistance between each phase and motor body.
   SAS4－8SD-5A/6A,SMS4－8ED-5A/6A
   Make U, V and W terminal short-circuited and measure insulation resistance between each phase and motor body.
   SAS11－15SD-5A/6A,SMS11－15ED-5A/6A
   Measure insulation resistance between U1 and U2 (or U,X) terminal and motor body, between V1 and V2 (or V,Y) and motor body and also between W1 and W2 (or W,Z) and motor body.
   ③ Results of measurements:
   In case it is more than 1MΩ, normal.
   In case it is less than 1MΩ, abnormal.



Motor coil
[SAS8SD,SMS8ED]
SC09001

2. Check coiled wires for disconnection (For reference)
   ① Separate motor cable from contactor.
   ② Measure coil resistance of each phase, using a resistance tester.
   SAS4－8SD-5A/6A,SMS4－8ED-5A/6A
   Measure coil resistance between U and V terminal, V and W terminal and W and U terminal.
   SAS11－15SD-5A/6A,SMS11－15ED-5A/6A
   Measure coil resistance between U1 and U2 (or U and X) terminal, V1 and V2 (or V and Y) and W1 and W2 (or W and Z).
   ③ Results of measurements:
   For the coil resistance of each motor, refer to 1.2 “Motor Specifications”.
   In case it is infinite (∞), abnormal (disconnection).



Motor coil
[SAS11－15SD,SMS11－15ED]
SC09002

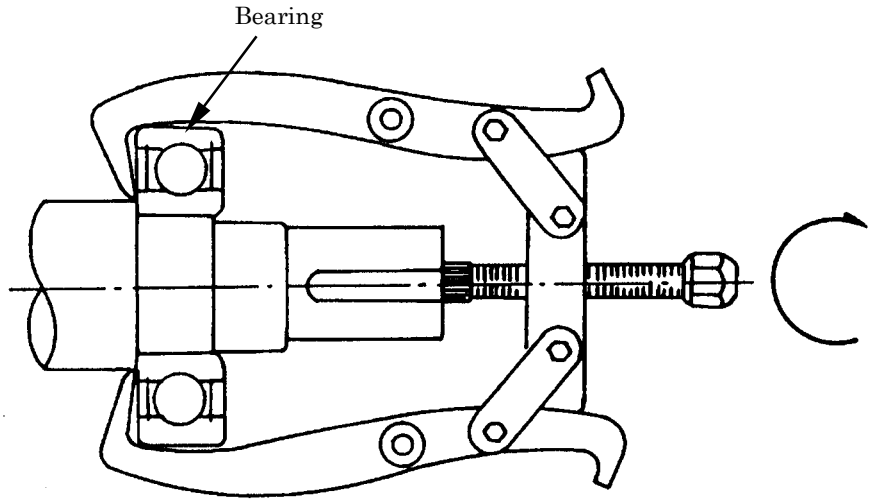
(2) Replacement of motor bearing

Perform the replacement of motor bearing according to the following procedures.

① Remove the fixing bolts for the brackets on both load and noload sides, and then remove the brackets from the frame, softly patting them with plastic hammer.

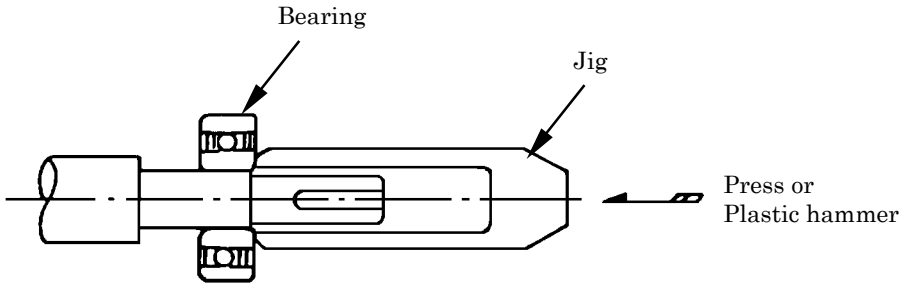
② Then pull out the rotor from the stator, preventing it from touching the stator.

③ Extract the motor bearing, using such tool as gear puller shown below.



TXT079

④ Install the bearing with the jig or pipe applied as shown below.
When no press is available, install it by patting a jig or pipe by a plastic hammer.



TXT080

IMPORTANT

- Never hammer directly the bearing with a metal hammer for inserting the bearing.
- Never insert bearing outer race by hammering it, holding it with a metal pad.
- It is impossible that the bearing is pushed in by heating.

2.4.2 Separator receiver tank

(1) Cleaning and replacing oil level gauge

① When oil level gauge is so soiled that oil level cannot be checked, remove it and spray the brake cleaning agent (used for automobiles) (components: toluene 40－45% and hexane 25－30%) into the gauge several times.

② Periodically replace it whenever the replacement time comes.

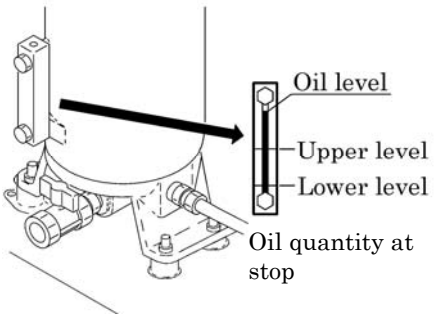
(2) How to install oil level gauge

Install the oil level gauge in the specified direction, namely with the red line downward.

Tighten the bolts for level gauge, applied by the following torques. Other torques than those specified below can cause damages and oil leakage trouble.

6N･m(61kgf･cm)

Oil level of compressor oil is proper if oil level gauge is higher than red line of upper limit when compressor is standstill.



A080628-1E

2.4.3 Discharge air temperature sensor and separator discharge air temperature sensor

(1) Checking the function

Check the function according to the following procedures.

① During operation, remove the sensor cable connected to the controller.

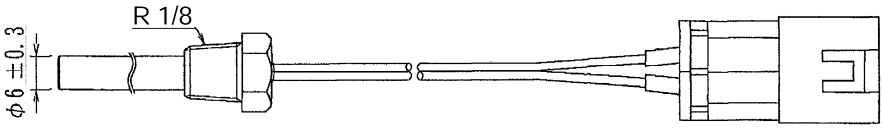
② Make sure to confirm that the unit is stopping and the lamp indicating abnormality glows.

(2) Checking the temperature and resistance

Check and confirm resistance value per each temperature, according to following.

① Separate the cable between controller and sensor.

② Confirm the relations between temperature and resistance according to the following table.



Part number : 44364 08200 Sensor

SC14066

《Note》 Take care not to tighten excessively.

Less than 2.0N･m(20kgf･cm)

Features of temperature and resistance

SAS4SD-5A (～0477) SAS4SD-6A (～0681)
SAS6SD-5A (～0221) SAS6SD-6A (～0265)
SAS8SD-5A (～0390) SAS8SD-6A (～0638)
SAS11SD-5A (～0331) SAS11SD-6A (～0452)
SAS15SD-5A (All unit) SAS15SD-6A (All unit)
SASG19SD-5A (All unit) SASG19SD-6A(All unit)
SMS4ED-5A (～0183) SMS4ED-6A (～0231)
SMS8ED-5A (～0193) SMS8ED-6A (～0228)
SMS11ED-5A (～0156) SMS11ED-6A (～0187)
SMS15ED-5A (All unit) SMS15ED-6A (All unit)
SMSG19ED-5A(All unit) SMSG19ED-6A(All unit)

Part number:44364 06500

Temperature (℃)	Resistance (Ω)	Permissible value (%)
20	11,600	±9
35	6,280	±8
50	3,580	±7
65	2,120	±7
80	1,300	±7
95	840	±6
110	560	±5
115	Ĩ 490	±6

SAS4SD-5A (0478～) SAS4SD-6A (0682～)
SAS6SD-5A (0222～) SAS6SD-6A (0266～)
SAS8SD-5A (0391～) SAS8SD-6A (0639～)
SAS11SD-5A (0332～) SAS11SD-6A (0453～)
SMS4ED-5A (0184～) SMS4ED-6A (0232～)
SMS8ED-5A (0194～) SMS8ED-6A (0229～)
SMS11ED-5A (0157～) SMS11ED-6A (0188～)

Part number:44364 08200

Temperature (℃)	Resistance (Ω)	Permissible value (%)
20	11,620	±10
35	6,270	±9
50	3,560	±8
65	2,120	±7
80	1,310	±6
95	840	±5
110	560	±4
115	490	±4

(Resistance values are rounded to one digit)

2.4.4 Ambient temperature sensor

(1) Checking the function

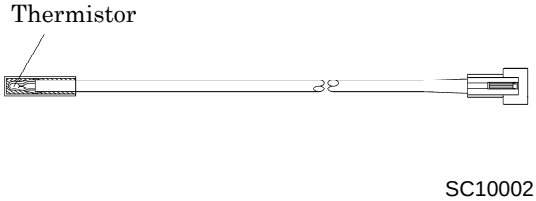
Check ambient temperature by display screen after selecting ambient temperature display screen by pressing selector switch three times. Then check and confirm that ambient temperature around machine is equal to the temperature value displayed.

(2) Checking the temperature and resistance

① Separate the cable between controller and sensor.
② Confirm the relations between temperature and resistance according to the following table.

Features of temperature and resistance

Temperature (℃)	Features of criteria resistance (Ω)	Permissible value (%)
0	15,000	±5
10	9,765	
20	6,517	
30	4,448	
40	3,100	



SC10002

2.4.5 By-pass valve

(1) Principle of function

The valve is provided with pellets.

The pellets shrink according to the temperature of flowing oil of the valve so that the oil flowing passage can be automatically changed.

When the oil temperature is low, the pellet is kept shrunken so that the oil flows through the by-pass passage of oil filter.

As the temperature rises, the pellet expands to close the oil passage to the by-pass passage and to open the flow outlet to oil cooler. Therefore, the oil flows to the oil cooler, thus preventing the oil temperature from abnormally rising.

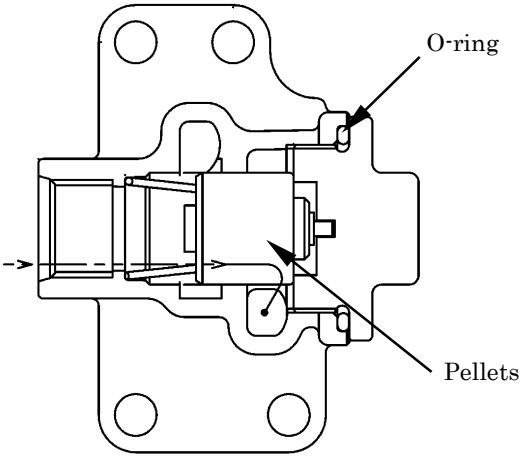
(2) Checking function

The by-pass valve functions correctly in case any abnormal rise of temperature and any other abnormalities are not found.

(3) Replacement of the pellets

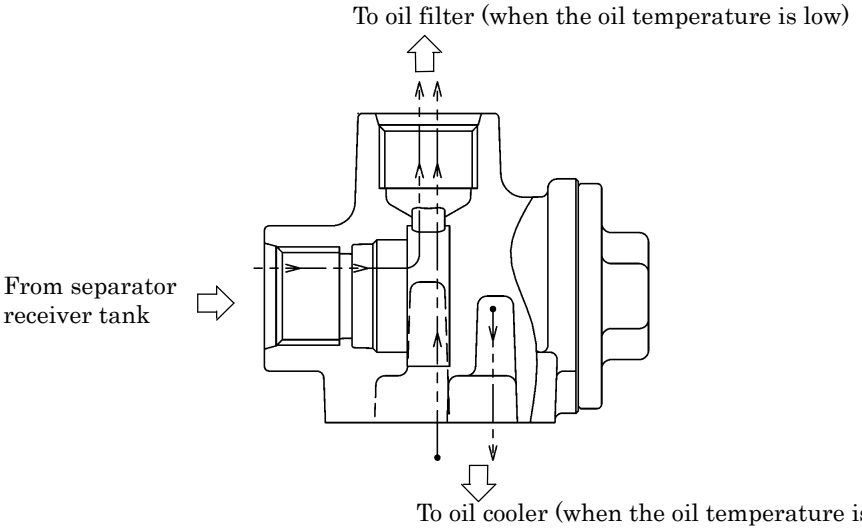
Remove the cover and replace the pellets and O-ring.

Coat the new O-ring with compressor oil and then tighten the cover.



SC10003

SAS11SD-5A/6A



SC10004

Sectional view

SAS11SD-5A/6A

3. Electrical System

3.1 Functions

3.1.1 Specifications

<table>
<tr><th colspan="2">Item</th><th colspan="3">Contents</th></tr>
<tr><td rowspan="8">Function of controller</td><td rowspan="2">Operation mode</td><td>S type</td><td colspan="2">・A.C.C.S. control operation
・Purge control operation</td></tr>
<tr><td colspan="3">・Dryer advance operation
・Remote control
・Low pressure operation (2 stages pressures selection function)
・Auto start/stop (Predicted stop time adjusting system)</td></tr>
<tr><td rowspan="3">Operation panel indicator</td><td>Display indicator</td><td colspan="2">・Air service pressure　・Discharge air temperature
・Ambient temperature　・Operation hour
・Separator discharge air temperature
[Larger models than SAS/SMS11]</td></tr>
<tr><td rowspan="2">Trouble indicator lamp (flicker)</td><td colspan="2">・Start　・Stop　・Dryer advance operation　・Remote control
・Low pressure operation　・Auto start/stop</td></tr>
<tr><td>Warning</td><td>・Discharge air temperature (105℃)
・Air filter clogging [Larger models than SAS/SMS8]
・Warning: Dryer (Dryer built-in type only)
・Ambient temperature (45℃)
・Separator discharge air temperature (105℃)
[Larger models than SAS/SMS11]</td></tr>
<tr><td>Abnormality</td><td>・Discharge air temperature (110℃)
・Reverse phase connection
・Abnormality: Dryer (Dryer built-in type only)
・Overload
・Separator discharge air temperature (110℃)
[Larger models than SAS/SMS11]</td></tr>
<tr><td>Remote side indicator lamp</td><td colspan="3">・Operating
・Abnormal indicator lamp
・Remote selection signal</td></tr>
<tr><td>Emergency stop (Start lock)</td><td colspan="3">・Discharge air temperature sensor disconnected or discharge air temperature rises up to 110℃
・Power supply is connected in reverse phase and T phase is missing
・When dryer trouble occurs
・Overload (When thermal relay functions)
・Separator discharge air temperature sensor disconnected or discharge air temperature rises up to 110℃ [Larger models than SAS/SMS11]</td></tr>
<tr><td rowspan="3">Adjusting range of pressure</td><td colspan="2"></td><td>A.C.C.S. type</td></tr>
<tr><td colspan="2">Control pressure (Full load recovering pressure)</td><td>0.50－0.85MPa
(5.1－8.6kgf/cm²)</td></tr>
<tr><td colspan="2">Purge starting pressure</td><td>Full load recovering pressure＋0.04－0.95MPa
(Full load recovering pressure＋0.4－9.6kgf/cm²)</td></tr>
<tr><td>Predicted stop time</td><td colspan="3">・30－120 seconds</td></tr>
<tr><td>Starting unload time</td><td colspan="3">・While 5±0.2 seconds pass</td></tr>
</table>

∗ Function of each output relay

Symbol	Function	Symbol	Function
RY0	・It switches ON by operation For main magnet (motor)	RY5	・Remote selection signal When it is switched ON, remote mode operation is selected, and when OFF, operation mode at machine side is selected.
RY1	・For dryer operation Switching it ON, it starts dryer operation. Switching it OFF, it stops	RY6	・External trouble signal (Remote) ON at emergency
RY2	・Capacity control signal Switching it ON, it starts full load operation. Switching it OFF, it starts unload operation	RY7	・External operation signal (Remote) It switches ON by operation
RY3	・For dryer draining condensate		
RY4	・Auxiliary		

3.1.2 Operation modes

Operation mode	Contents
A.C.C.S. control operation (Automatic capacity control system)	Free air delivery is automatically controlled to zero or 100%, according to increase or decrease of air consumption. But receiver tank pressure always loads on the rotors, and so power consumption of unit drops by 30% only at full load operation.
Purge control operation	When the discharge pressure exceeds the pressure at which purge starts, capacity control valve (solenoid valve for purge) opens to relieve the air in tank to atmosphere and the purge operation starts. During this operation mode, the little air taken in through unloader valve and the air volume discharged from receiver tank are so well balanced. Then the tank pressure drops to purge stabilized pressure and so the back pressure loaded to the rotors is a bit, and thus consumption increases and the pressure loaded on the consumer drops till full load recovering pressure, it releases or rests the purge control mode, and it starts full load operation.
Dryer advance operation	Pushing start button, dryer starts first, and then unit start 3 minutes later. ・When dryer is in disorder, it releases this mode. ・When dryer gets troubled during dryer advance operation, this unit starts at the time. **(Interior setting of controller is to be performed only when warning signal is set.)**
Condensate elimination operation	When discharge temperature exceeds the dew point temperature according to ambient temperature or when purge operation passes longer than 2 minutes in total, it accomplishes elimination of condensate caused at start-up and it prevents emulsification of oil. Thus, it can shorten condensate elimination operation and it prevents so frequently repeated start-stop operation. **[Draining dryer]** ・After completing starting unloader operation (5 seconds), condensate accumulated at dryer is automatically drained for 8 seconds. ・When unit operates, it reaches the draining interval according to ambient temperature by measuring total time of full load operation, it actuates solenoid valve for one second and makes it drain condensate. It operates condensate elimination and at the same time it prevents air from escaping. ・When unit stops, solenoid valve works four seconds to drain condensate from dryer so that freezing in winter and rust gathering can be prevented.

3. Electrical System

<table>
<tr><th>Operation mode</th><th>Contents</th></tr>
<tr><td>Low pressure operation
(2 stages pressures selection function)</td><td>When two units are wired to the remote control terminal plate, both units can be selected for use as one service unit and the other stand-by unit or they can be operated alternatively between them.</td></tr>
<tr><td>Auto start/stop operation</td><td>When this mode operation starts, it first performs condensate elimination operation. Later, when air consumption decreases, controller calculates predicted stop time, according to rate of drop of service pressure. Then when the calculated time is less than the predicted time, it stops.
[Conditions of judgment of auto start-stop mode operation]
・Discharge air temperature should reach dew point. (Condensate elimination operation should have been already completed.)
・Calculated on higher than dew point, accumulated unload operation should pass longer than two minutes.
・Operation time should pass longer than two minutes.
In order to re-start this mode operation, pressure at service side should drop to full load recovering pressure and at the same time, when stop time is longer than interlock time (20 seconds), this mode operation can be re-started.</td></tr>
<tr><td>Remote control operation</td><td>Wired to the remote control terminal plate, start/stop operation can be done remotely.
For your information, also it is possible to stop operation at machine side.
<table>
<tr><th rowspan="2">Remote control button</th><th colspan="2">Machine side</th><th colspan="2">Remote control</th></tr>
<tr><th>Start</th><th>Stop</th><th>Start</th><th>Stop</th></tr>
<tr><td>OFF</td><td>○</td><td>○</td><td>×</td><td>×</td></tr>
<tr><td>ON</td><td>×</td><td>○ ※1</td><td>○ ※2</td><td>○</td></tr>
</table>
※1 If stopped at machine side, remote control mode is reset.
In case remote control mode is selected again, remote control button ON.
※2 Even when the remote control button on the operation panel is made “ON” with remote control contact being kept “ON”, unit will not start. After the remote control starting contact is once made “OFF” make the remote control button “ON” again. Then it starts.</td></tr>
</table>

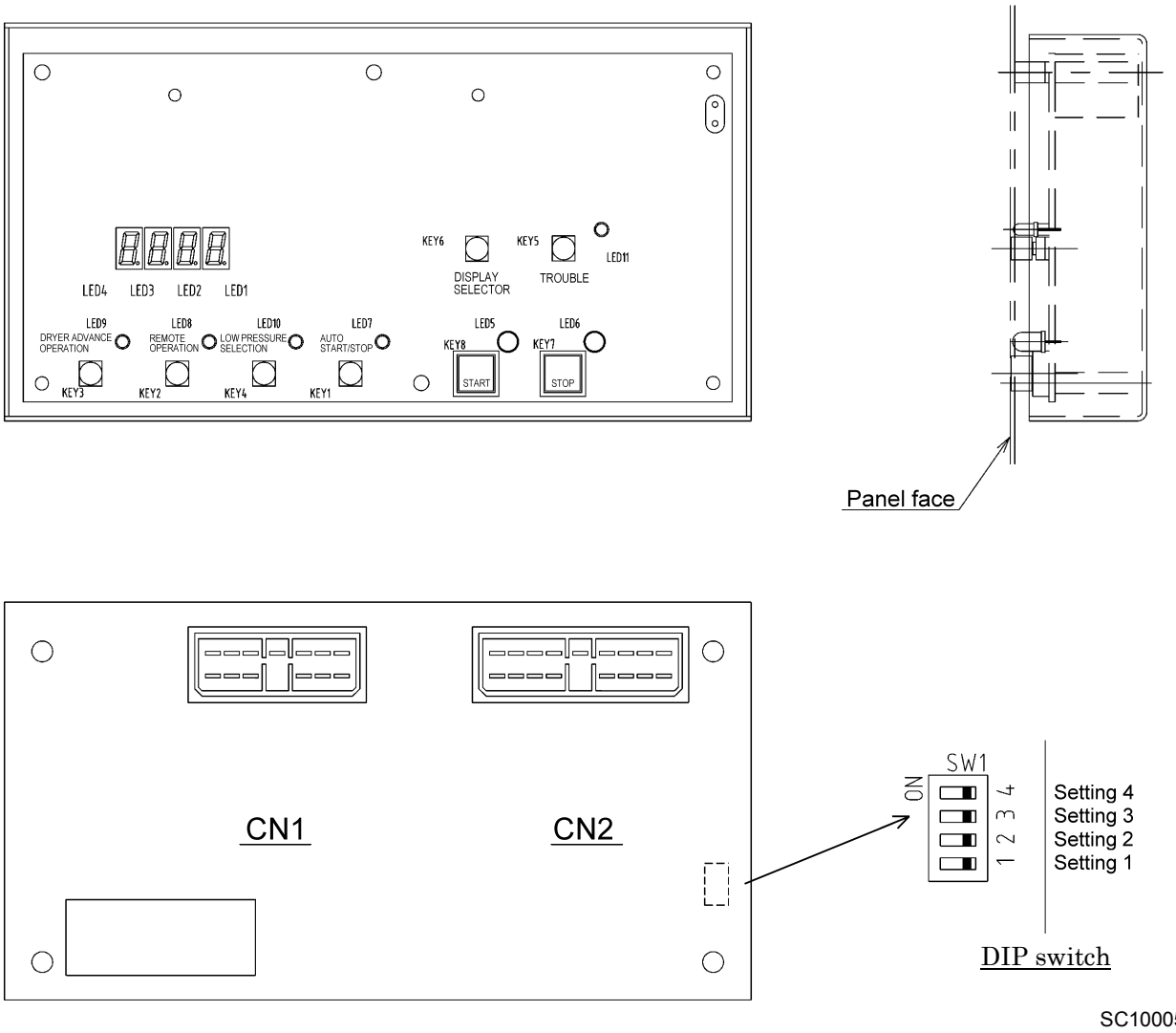
3.1.3 Controller

(1) Appearance

[A.C.C.S. type]

HOKUETSU part number:46870 49301 (SAS4－8SD-5A/6A･SMS4－8ED-5A/6A)

HOKUETSU part number:46870 50901 (SAS11－15SD-5A/6A･SMS11－15ED-5A/6A)



SC10005E

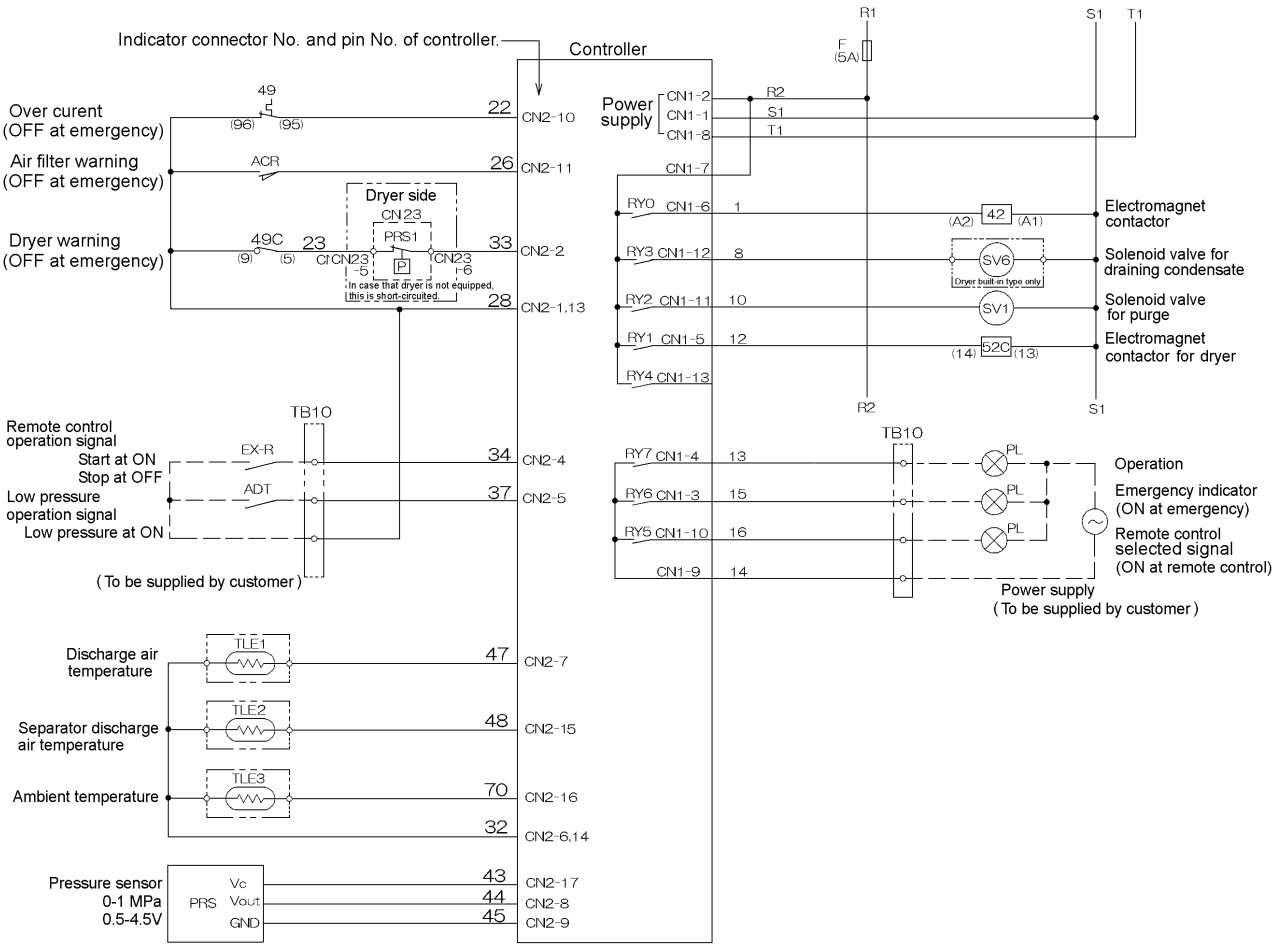
< Internal setting >

The following settings can be done by DIP switch on board.

NO.	Item	Details
Setting 1	Dryer trouble selection	ON at emergency OFF at warning
Setting 2	A.C.C.S. control selection	Switched ON, A.C.C.S. mode is not controlled. Unload pressure is not changed automatically.
Setting 3	In case of SAS/SMS11	In case of SAS/SMS11, switch ON DIP switch.
Setting 4	*Setting must not be changed	

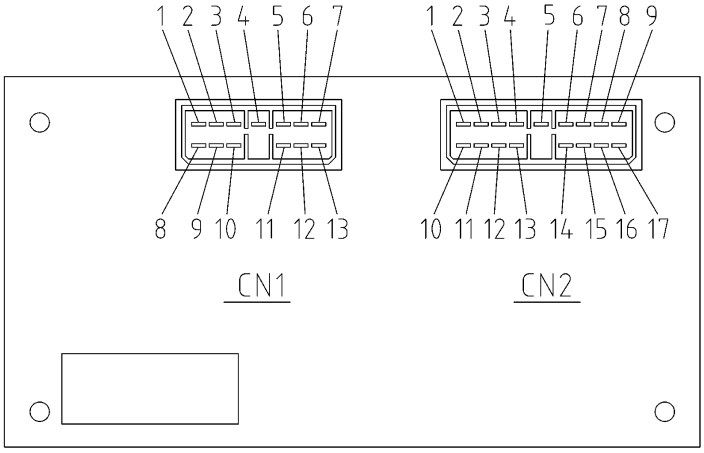
*DIP switch of setting 4 should not be changed because it is only for testing prior to delivery ex. factory.

(2) Exterior connection drawing
[A.C.C.S. type]



A100159-2E

(3) Circuit voltage
[A.C.C.S. type]



SC10009

Item			Circuit voltage (V)	Remark
CN1 For power supply	1	Power supply S1 (for controller)	AC200/200/220	
	2	Power supply R2 (for controller)	AC200/200/220	
	3	Remote abnormality/warning indicator lamp	AC100－220	Supplied by customer
	4	Remote operation indicator lamp	AC100－220	Supplied by customer
	5	Electromagnet switch of dryer	AC200/200/220	
	6	Electromagnet switch of compressor motor	AC200/200/220	
	7	Power supply R2 (Electromagnet switch, solenoid valve)	AC200/200/220	
	8	Power supply T1 (for detection of phase loss)	AC200/200/220	
	9	Remote indicator lamp power supply	AC100－220	Supplied by customer
	10	Remote selection signal indicator	AC100－220	Supplied by customer
	11	Solenoid valve for capacity control	AC200/200/220	
	12	Solenoid valve for draining condensate	AC200/200/220	
	13	Blank	－	

3. Electrical System

Item			Circuit voltage	Remark
CN2 For sensor	1	Sensor GND	—	Internal ground connection
	2	Dryer abnormality	Normal : 0V (between CN2-13) Abnormal : DC12V (between CN2-13)	Abnormal : OFF B connect Time lag : 1 second
	3	Blank	—	Auxiliary
	4	Remote start switch	During operation (ON) : 0V (between CN2-13) During stop condition (OFF) : DC12V (between CN2-13)	When remote control, supplied by customer
	5	Low pressure operation signal	During low pressure operation (ON) : 0V (between CN2-13) During normal operation : DC12V (between CN2-13)	Supplied by customer
	6	Sensor GND	—	
	7	Discharge air temperature sensor	Lass than DC5V (between CN2-14)	Detect abnormality Resistance : 543.0－576.5Ω
	8	Pressure sensor output	DC0.5－4.5V (between CN2-9)	When pressure 0MPa : 0.5V When pressure 0.98MPa : 4.5V
	9	Pressure sensor GND	—	
	10	Thermal relay	Normal : 0V (between CN2-13) Abnormal : DC12V (between CN2-13)	Abnormal : OFF B connect Time lag : 1 second
	11	Air filter differential pressure switch	Normal : DC12V (between CN2-13) Abnormal : 0V (between CN2-13)	Abnormal : ON A connect Time lag : 10 seconds
	12	Blank	—	Auxiliary
	13	Sensor GND	—	Internal ground connection
	14	Sensor GND	—	Internal ground connection
	15	Separator discharge air temperature sensor	Lass than DC5V (between CN2-14)	Detect abnormality Resistance : 543.0－576.5Ω
	16	Ambient temperature sensor	—	Detect ambient temperature Resistance : 3.1－15.0kΩ
	17	Pressure sensor power supply	DC5V (between CN2-9)	

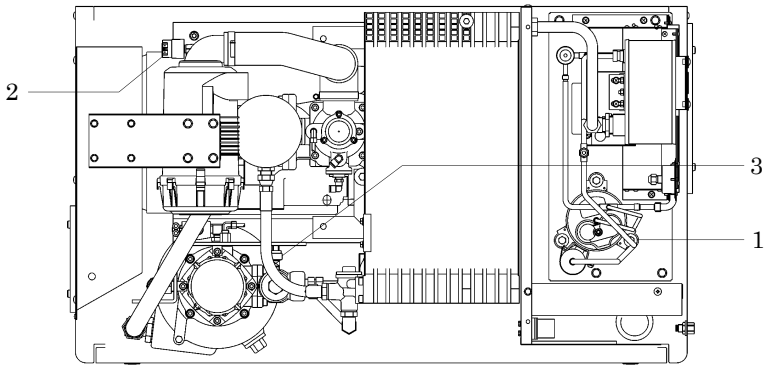
3.1.4 Checking indication of warning, abnormalities and also checking emergency stop

	Item	Trouble code	How to check	Normal function	Time lag
Warning	Discharge air temperature	A-1	Remove the sensor from controller and load resistance of 640±15Ω to controller with variable resistor.	Trouble code lamp flickers.	1 second
	Air filter clogging	A-2	During operation, short circuit the cable connected to the air filter differential pressure switch.	Trouble code lamp flickers.	10 seconds
	※ Warning: Dryer	A-3	During operation, trip thermal relay by hand. (Be careful about electric shock.)	Trouble code lamp flickers.	1 second
	Ambient temperature	A-4	Remove the sensor from controller and load resistance of 2,600±15Ω to controller with variable resistor.	Trouble code lamp flickers.	120 seconds
	Discharge air temperature	A-5	Remove the sensor from controller and load resistance of 620±15Ω to controller with variable resistor.	Trouble code lamp flickers.	1 second
	Separator discharge air temperature (Larger models than SAS/SMS11)	A-6	Remove the sensor from controller and load resistance of 640±15Ω to controller with variable resistor.	Trouble code lamp flickers.	1 second
Abnormality/Emergency stop	Discharge air temperature	E-1	・During operation, remove the sensor from controller. (Be careful about electric shock.) ・Remove the sensor from controller and load resistance of 560±15Ω to controller with variable resistor.	Trouble code lamp flickers and unit stops.	1 second
	Reverse phase connection	E-2	After cutting power supply, change R phase for T phase. After cutting power supply, remove T phase.	When power is supplied, trouble code lamp flickers, and unit will not start even by pushing start button.	1 second
	※ Abnormality: Dryer	E-3	During operation, trip thermal relay by hand. (Be careful about electric shock.)	Trouble code lamp flickers and unit stops.	1 second
	Overload	E-4	During operation, trip thermal relay by hand. (Be careful about electric shock.)	Trouble code lamp flickers and unit stops.	1 second
	Separator discharge air temperature	E-5	・During operation, remove the sensor from controller. (Be careful about electric shock.) ・Remove the sensor from controller and load resistance of 560±15Ω to controller with variable resistor.	Trouble code lamp flickers and unit stops.	1 second

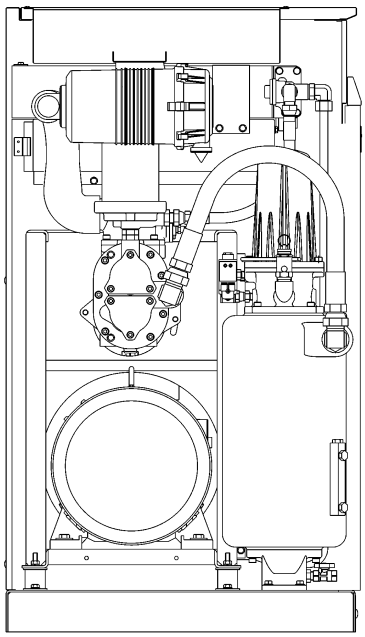
Item		Trouble code	How to check	Normal function	Time lag
Abnormality/Emergency stop	Disconnection of discharge air temperature sensor	E-6	During operation, remove the sensor from controller. (Be careful about electric shock.)	Trouble code lamp flickers and unit stops.	5 seconds
	Disconnection of separator discharge air temperature sensor (Larger models than SAS/SMS11)	E-7	During operation, remove the sensor from controller. (Be careful about electric shock.)	Trouble code lamp flickers and unit stops.	5 seconds

※ Dryer trouble can be switched to warning or abnormality signal by using DIP switch on a printed circuit board (see page 3-4).
(Unit is set as "Warning" ex. works.)

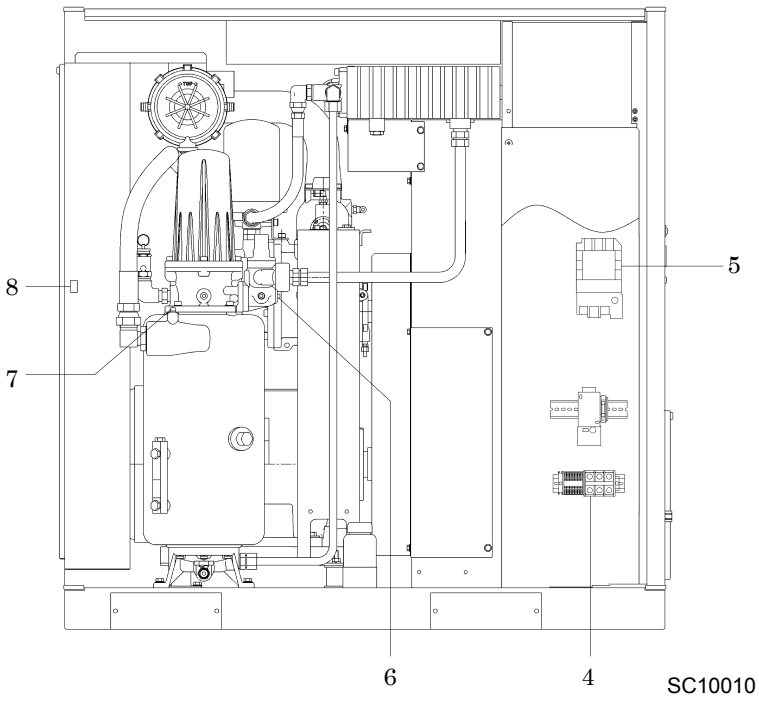
3. Electrical System



Upper side drawing



Side view



Front view

SAS11SD-5A/6A (Dryer built-in Type)

1. Dryer
2. Air filter differential pressure switch
3. Pressure sensor
4. Connection of power supply
5. Main motor thermal relay
6. Discharge air temperature sensor
7. Separator discharge air temperature sensor
8. Ambient temperature sensor

3. Electrical System

3.2 Electrical Parts

3.2.1 Specifications

(1) Starter, Solenoid valve

SAS4SD-5A/6A・SMS4ED-5A/6A

Symbol	Name	Maker	Model	Remarks
42(49)	Electromagnet switch	MITSUBISHI Electric	MSO-N18 AC200V, RC=15A(12－18A)	Thermal set value: 15.0/14.5/13.5A 200/220V type
F	Fuse holder	Sakazume	FH-15B(AC250V,10A)	
	Fuse	Not specified	φ6.4×30(AC250V,5A)	
52C, EMG1	Relay	Omron	MY2 (Socket PYF-08) (Spring PYC-A1)	52C:For dryer refrigerator EMR1: For dryer warning signal
SV1	Solenoid valve	CKD	FAB42-X0679	For capacity control
SV6	Solenoid valve	CKD	AB21-02-2-B-AC200V	For draining condensate

SAS6SD-5A/6A

Symbol	Name	Maker	Model	Remarks
42(49)	Electromagnet switch	MITSUBISHI Electric	MSO-N25 AC200V, RC=22A(18－26A)	Thermal set value: 23.0/22.5/20.5A 200/220V type
F	Fuse holder	Sakazume	FH-15B(AC250V,10A)	
	Fuse	Not specified	φ6.4×30(AC250V,5A)	
52C, EMG1	Relay	Omron	MY2 (Socket PYF-08) (Spring PYC-A1)	52C:For dryer refrigerator EMG1: For dryer warning signal
SV1	Solenoid valve	CKD	FAB42-X0679	For capacity control
SV6	Solenoid valve	CKD	AB21-02-2-B-AC200V	For draining condensate

SAS8SD-5A/6A・SMS8ED-5A/6A

Symbol	Name	Maker	Model	Remarks
42(49)	Electromagnet switch	MITSUBISHI Electric	MSO-N35 AC200V, RC=29A(24－34A)	Thermal set value: 32.5/29.5/27.5A 200/220V type
			MSO-N35 AC200V, RC=15A(12－18A)	Thermal set value: 16.5/15.0/14.0A 400/440V type
F	Fuse holder	Sakazume	FH-15B(AC250V,10A)	
	Fuse	Not specified	φ6.4×30(AC250V,5A)	
52C, EMG1	Relay	Omron	MY2 (Socket PYF-08) (Spring PYC-A1)	52C:For dryer refrigerator EMG1: For dryer warning signal
Tr1	Transformer	Toyogiken	TRH-750-42N AC400,440V/200,220V	400/440V type
Tr2	Transformer	Toyogiken	TRH-50-42N AC400,440V/200,220V	400/440V type
SV1	Solenoid valve	CKD	FAB42-X0679	For capacity control
SV6	Solenoid valve	CKD	AB21-02-2-B-AC200V	For draining condensate

3. Electrical System

SAS11SD-5A/6A・SMS11ED-5A/6A

Symbol	Name	Maker	Model	Remarks
42(49)	Electromagnet switch (Motor)	MITSUBISHI Electric	MSO- N50 AC200V, RC=42A(34－50A) MSO-N25 AC200V, RC=22A(18－26A)	Thermal set value: 47.0/44.5/41.0A 200/220V type Thermal set value: 23.5/22.5/20.5A 400/440V type
52C(49C)	Electromagnet switch (Dryer)	MITSUBISHI Electric	MSO-N10 AC200V, RC=3.6A(2.8－4.4A)	Thermal set value: 2.9/2.9/2.9A
F	Fuse holder	Sakazume	FH-15B(AC250V,10A)	
	Fuse	Not specified	φ6.4×30(AC250V,5A)	
Tr	Transformer	Toyogiken	TP1.5K-2×445 AC400,440V/200,220V	400/440V type
SV1	Solenoid valve	CKD	FAB42-X0679	For capacity control
SV6	Solenoid valve	CKD	AB21-02-2-B-AC200V	For draining condensate

SAS15SD-5A/6A・SMS15ED-5A/6A

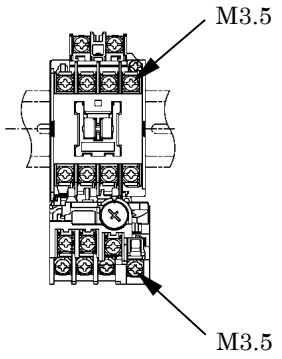
Symbol	Name	Maker	Model	Remarks
42(49)	Electromagnet switch (Motor)	MITSUBISHI Electric	MSO- N65 AC200V, RC=54A(43－65A)	Thermal set value: 62.0/59.0/54.0A 200/220V type
52C(49C)	Electromagnet switch (Dryer)	MITSUBISHI Electric	MSO-N10 AC200V, RC=3.6A(2.8－4.4A)	Thermal set value: 2.9/2.9/2.9A
F	Fuse holder	Sakazume	FH-15B(AC250V,10A)	
	Fuse	Not specified	φ6.4×30(AC250V,5A)	
SV1	Solenoid valve	CKD	FAB42-X0679	For capacity control
SV6	Solenoid valve	CKD	AB21-02-2-B-AC200V	For draining condensate

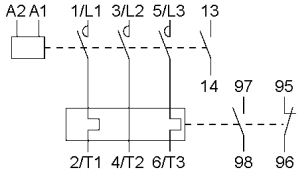
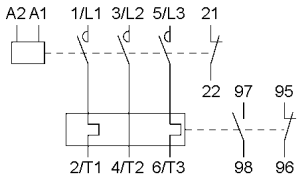
(2) Sensor, Switch

Name	Symbol	Trouble code	Indication	Maker	Remarks
Air filter differential pressure switch	ACR	Air filter clogging	A2	NIPPON DONALDSON, LTD.	6.2kPa(635mmAg) DC12V　A contact
Thermo sensor	TLE1	Discharge air temperature	A1/A5/E1	SAGINOMIYA	543.0－576.5Ω at 110℃
	TLE2	Separator discharge air temperature	A6/E5	SAGINOMIYA	543.0－576.5Ω at 110℃
	TLE3	Ambient temperature 「High」	A4	Shibaura Electronics	2,600－15Ω at 45℃
Pressure sensor	PRS	－	－	SAGINOMIYA	0.5－4.5V(0－0.98MPa)
Detecting reverse phase connection	－	Reverse phase connection	E2	－	Detect it with controller

(3) Electromagnet switch

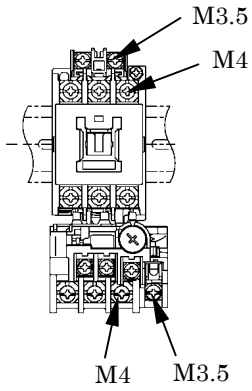
MSO-N10

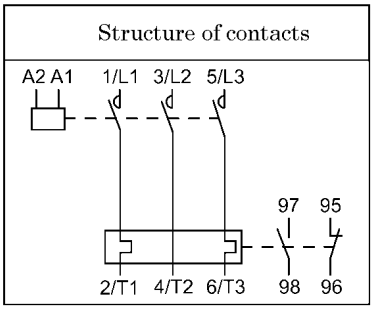


Auxiliary contact	Structure of contacts
1a	
1b	

SC10011E

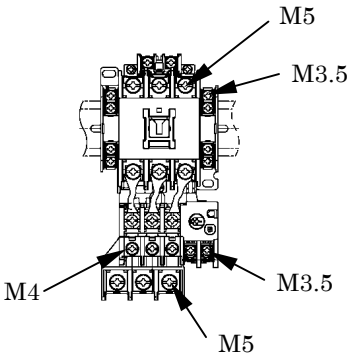
MSO-N18

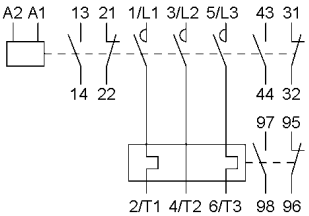




SC10012E

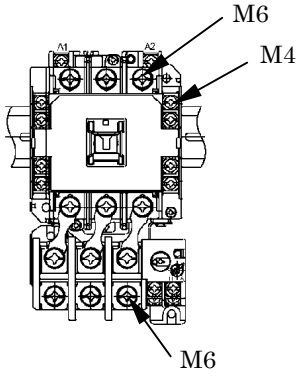
MSO-N25,N35

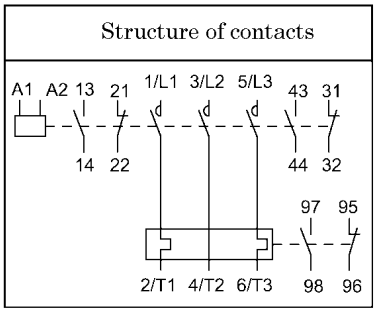


Auxiliary contact	Structure of contacts
2a2b	

SC10013E

MSO-N50,N65





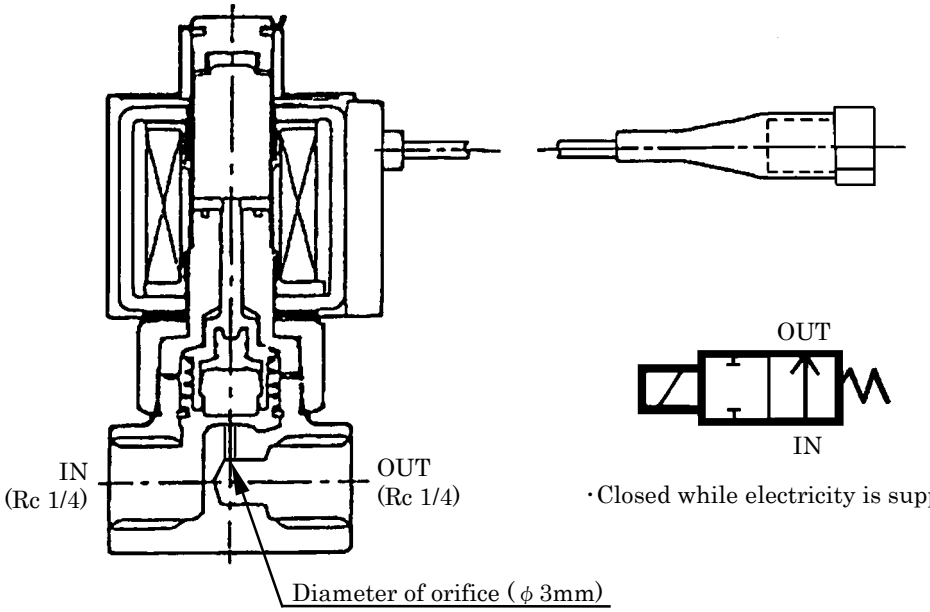
SC10014E

※2 mm longer in longitudinal direction toward power supply between N50 and N65. (L=158→160mm)

3.2.2 Solenoid valve

(1) For capacity control [For purge] (SV1)

HOKUETSU part number:46811 12200

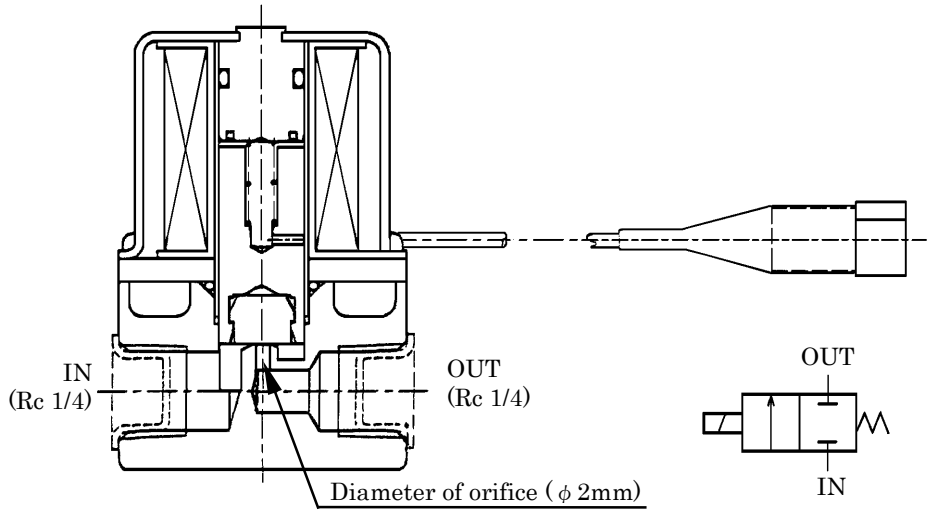


・Closed while electricity is supplied

S_M039

(2) For dryer draining condensate (SV6)

HOKUETSU part number:46811 25900



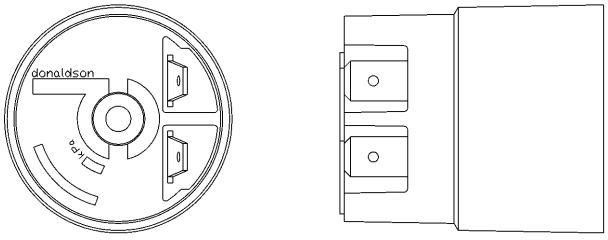
SC10015

・Opened while electricity is supplied

3.2.3 Air filter differential pressure switch

SAS8・11SD,SMS8・11ED-5A/6A

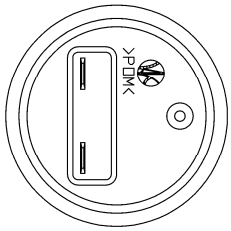
HOKUETSU part number:32148 03000

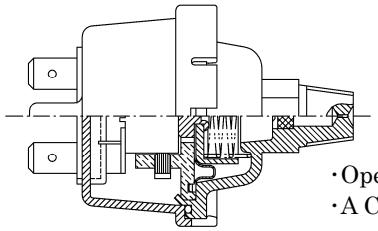


・Operating pressure : 6.2kPa
・A Contact

SC10016

SAS15SD,15VD,SMS15ED-5A/6A
HOKUETSU part number:32148 03100



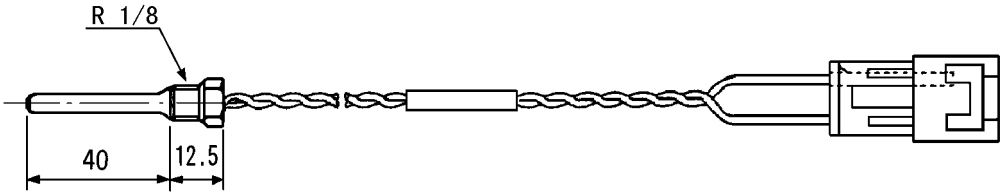


・Operating pressure：6.22kPa
・A Contact

SC10038

3.2.4 Thermo sensor

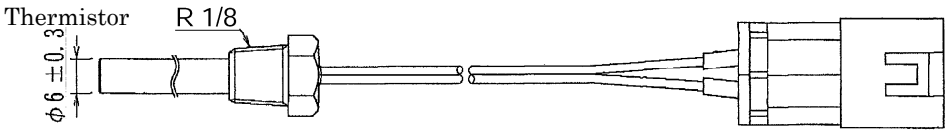
(1) Discharge air temperature sensor and separator discharge air temperature sensor
HOKUETSU part number: 44364 06500



SC10017

※ For the relation between temperature and resistance, refer to 2.4.3.

(2) Ambient temperature sensor
HOKUETSU part number: 44364 08200



SC14066

※ For the relation between temperature and resistance, refer to 2.4.4.

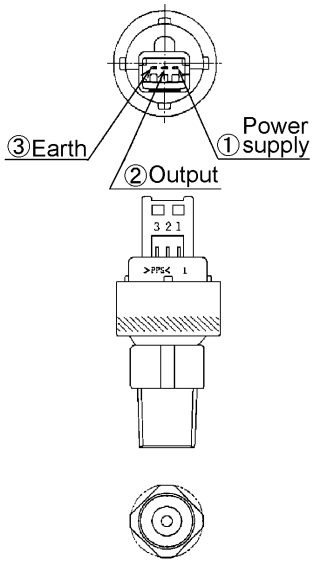
3.2.5 Pressure sensor

HOKUETSU part number: 44328 20600

Pressure and output voltage

Cable	Signal
①VCC	Power supply (5V)
②VOUT	Outlet At the pressure 0MPa(0kgf/cm²), DC0.5V At the pressure 0.1MPa(1kgf/cm²), DC0.9V At the pressure 0.6MPa(6kgf/cm²), DC2.9V At the pressure 0.69MPa(7kgf/cm²), DC3.3V At the pressure 0.98MPa(10kgf/cm²), DC4.5V
③GND	Earth

In case that, for trouble diagnosis, output voltage is checked for pressure sensor unit, the voltage between the terminals ② and ③ should be measured.

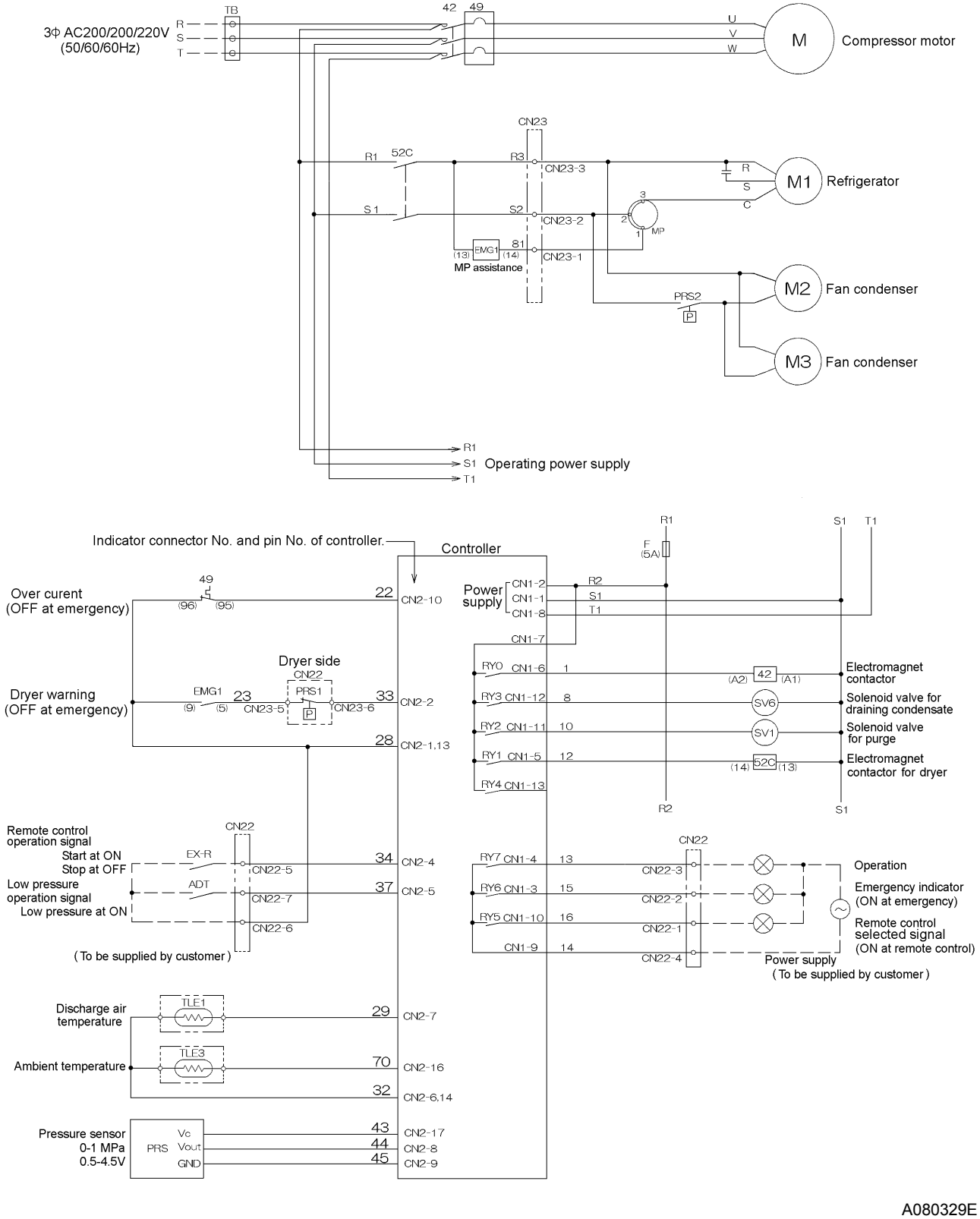


PC08035E

3. Electrical System

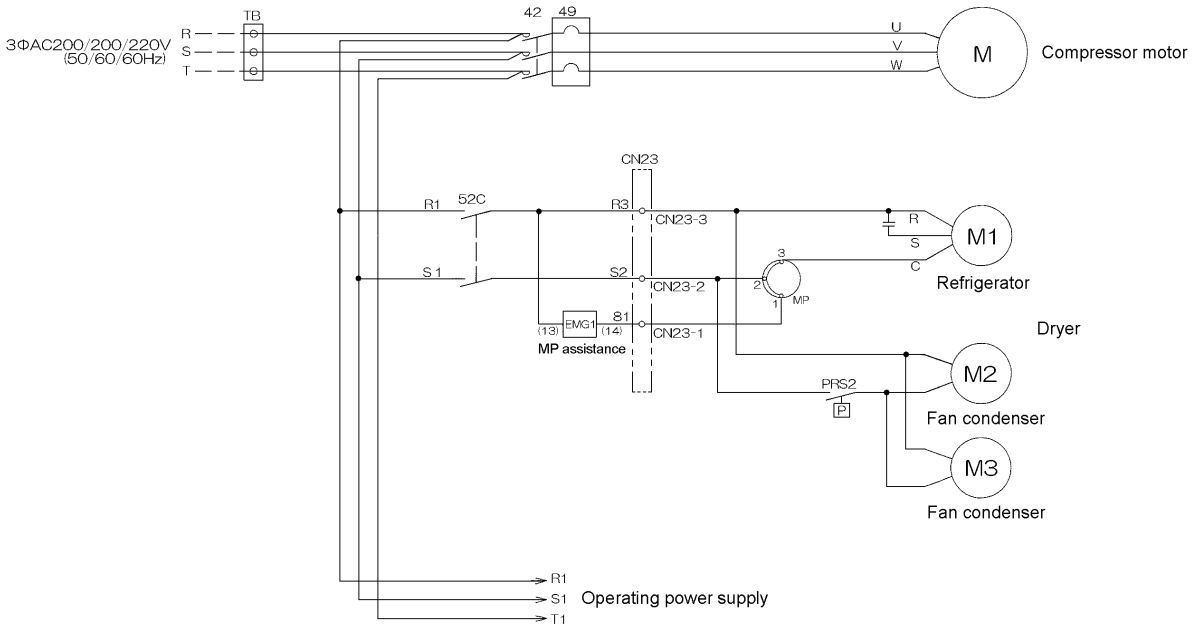
3.3 Electrical Wiring Diagram

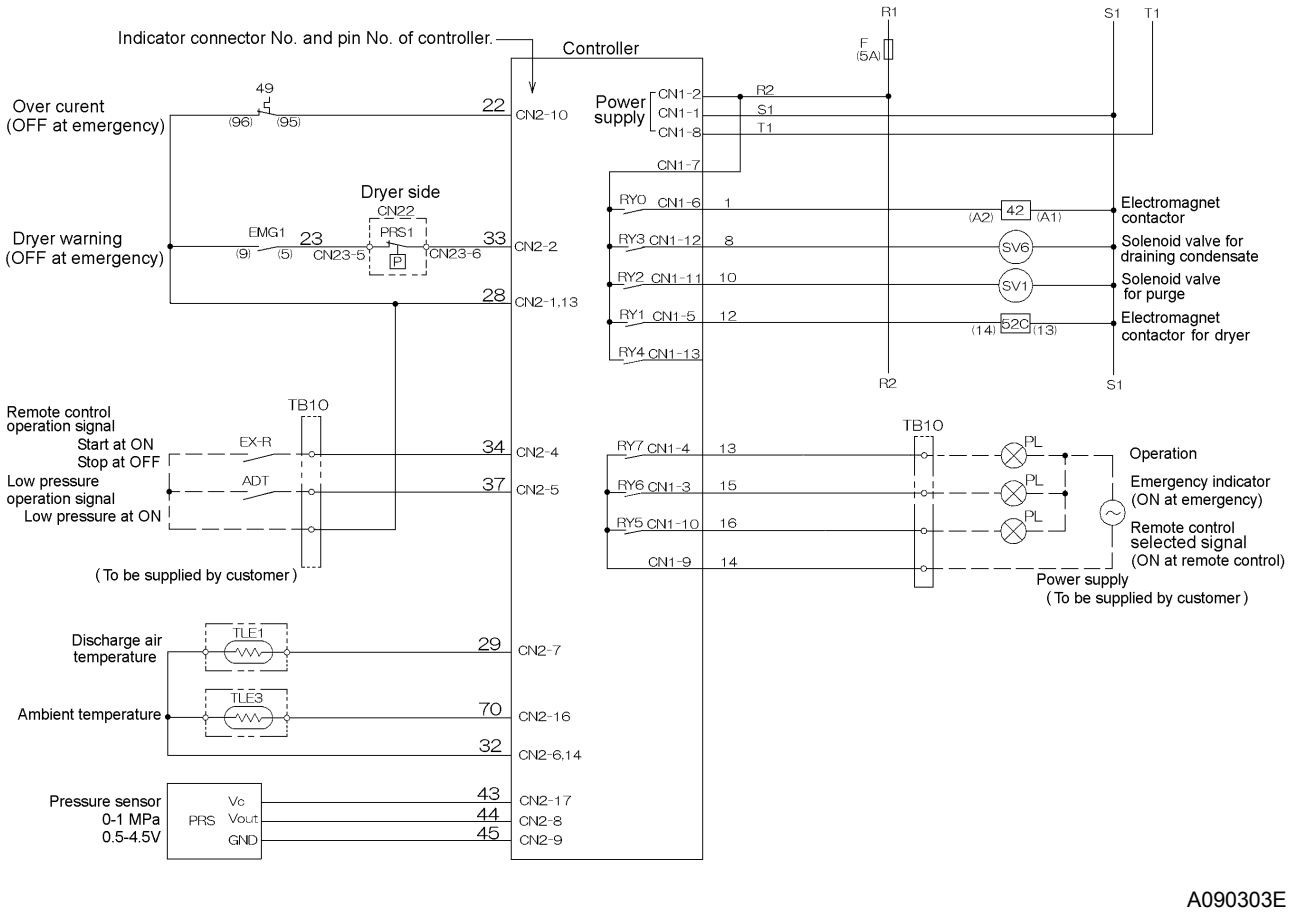
3.3.1 SAS4SD･SMS4ED-5A/6A (200/220V Type) [0051-]



A080329E

3.3.2 SAS6SD-5A/6A (200/220V Type) [0051-]





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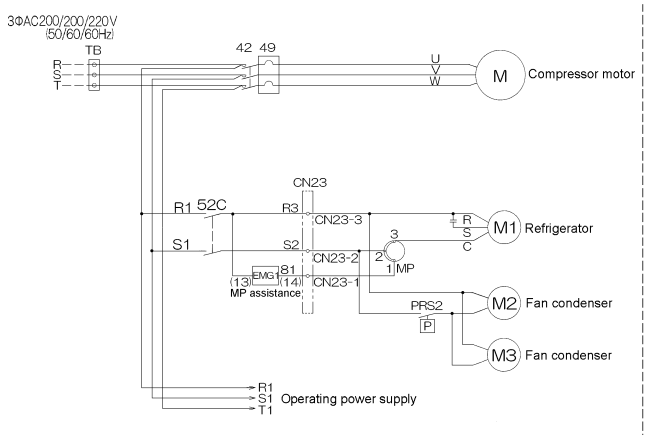
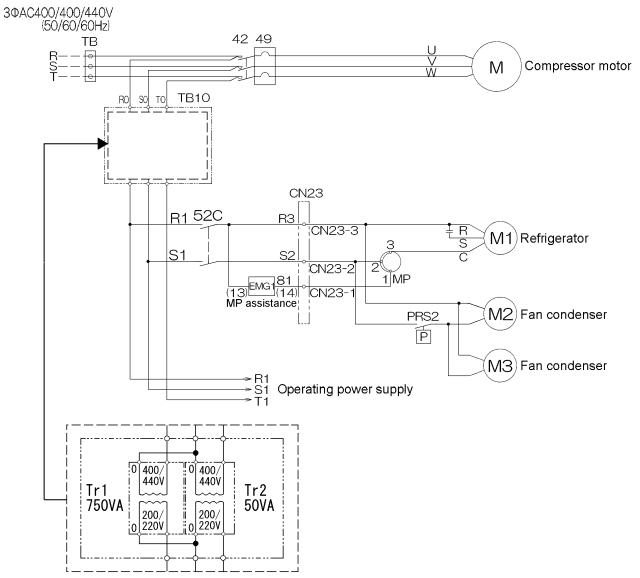
3.3.3 SAS8SD･SMS8ED-5A/6A [0051-]

(200/220V Type)



(400/440V Type)



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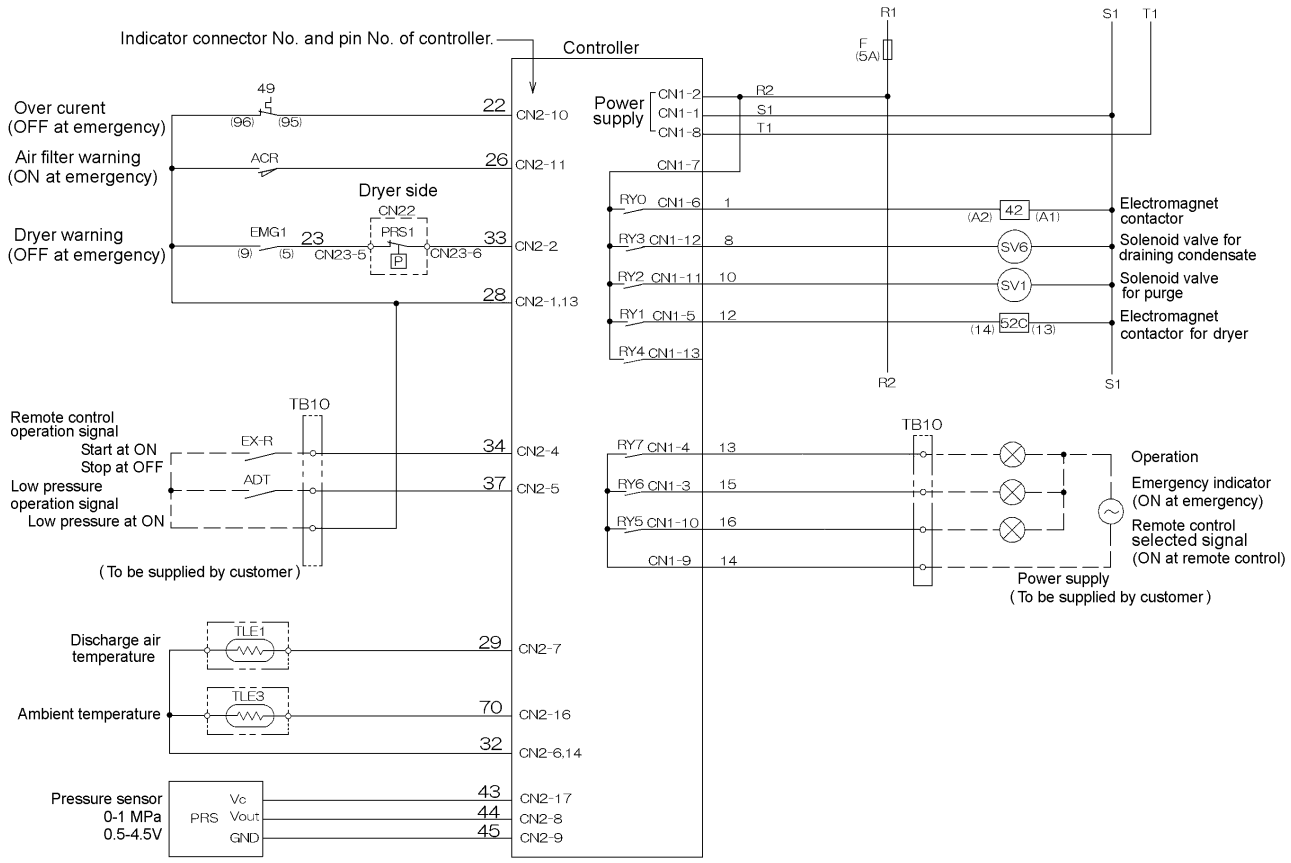
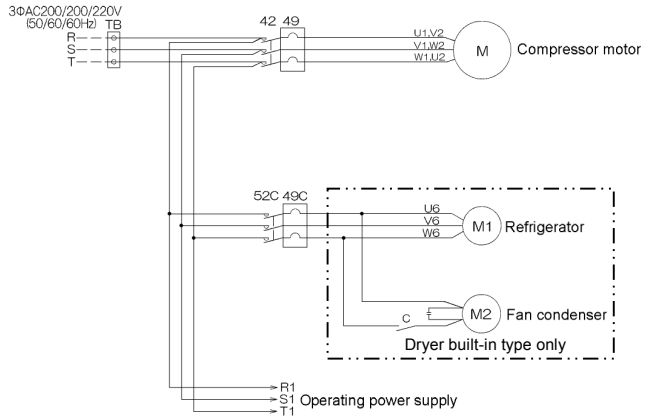


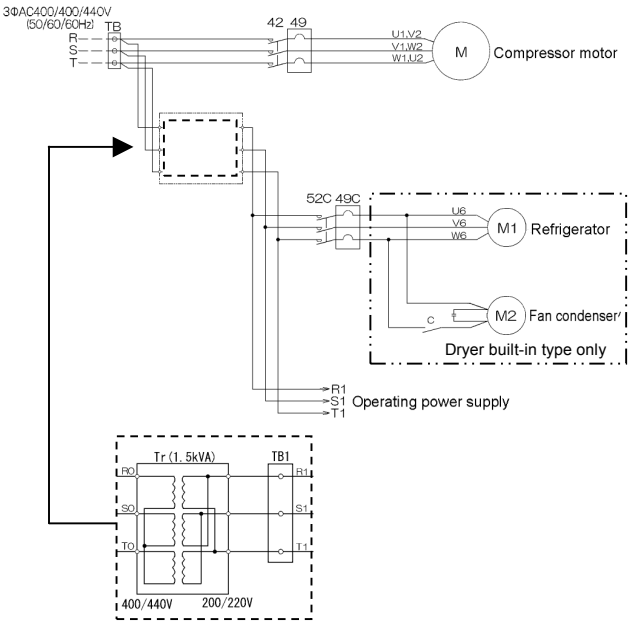
A090036-1E

3.3.4 SAS11SD･SMS11ED-5A/6A (A.C.C.S. type) [0051-]

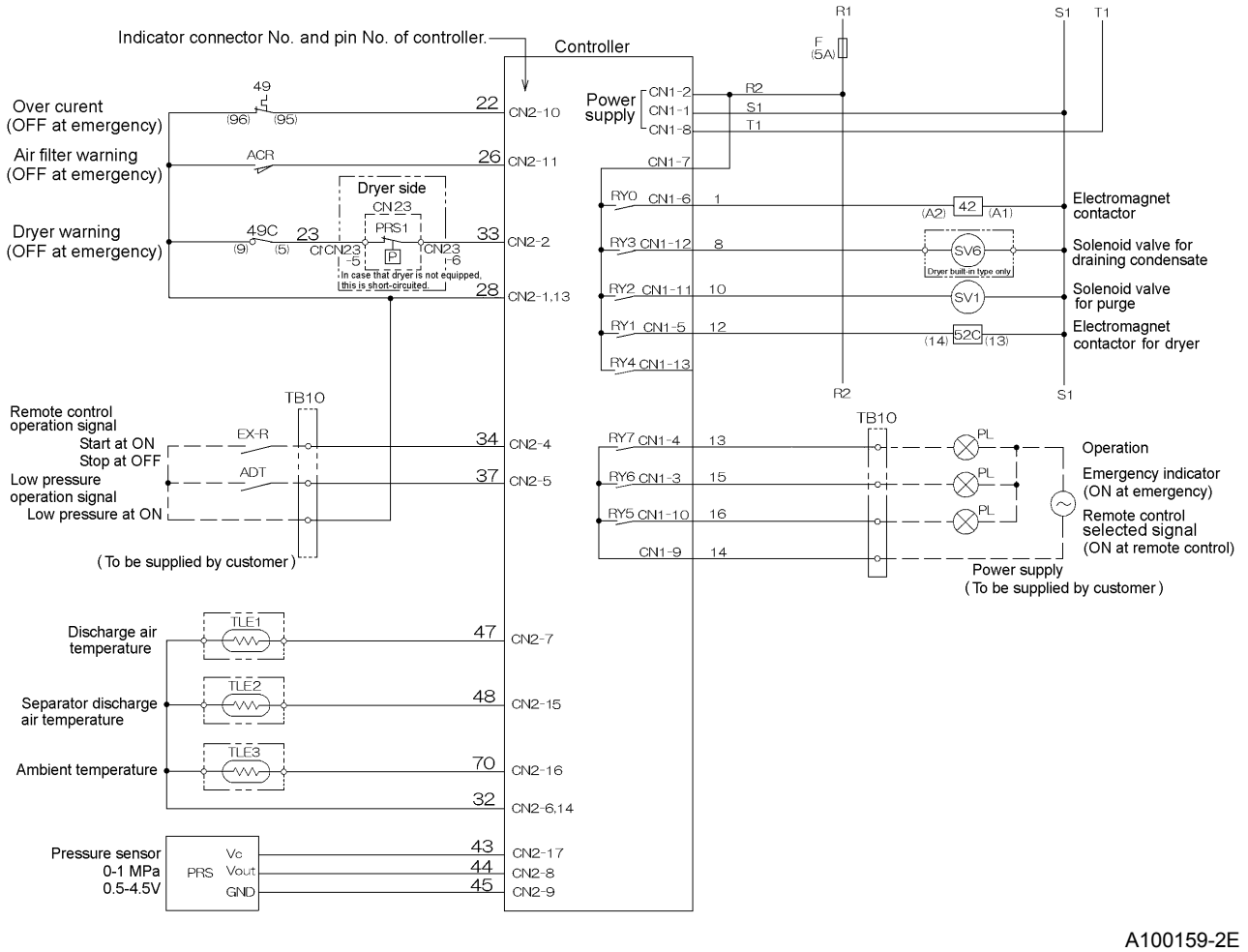
(200/220V Type)



(400/440V Type)



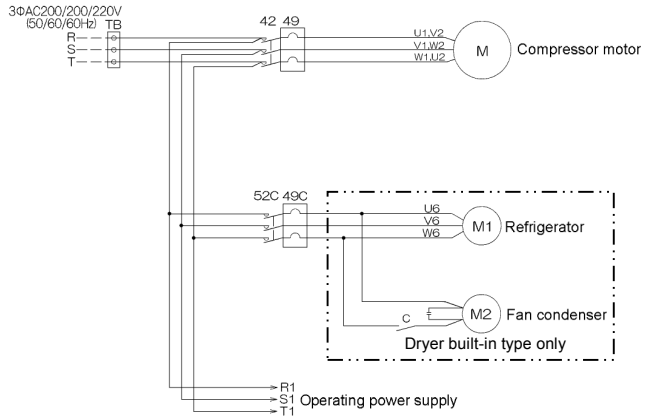
A100159E



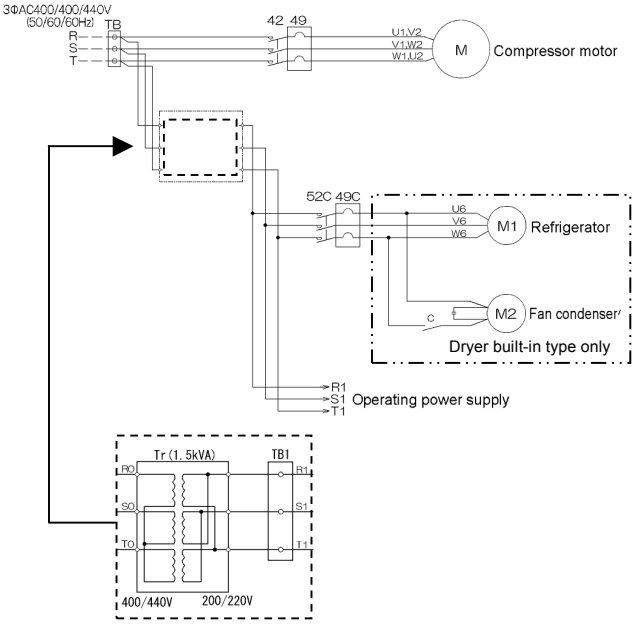
A100159-2E

3.3.5 SAS15SD･SMS15ED-5A/6A (A.C.C.S. type) [0051-]

(200/220V Type)



(400/440V Type)



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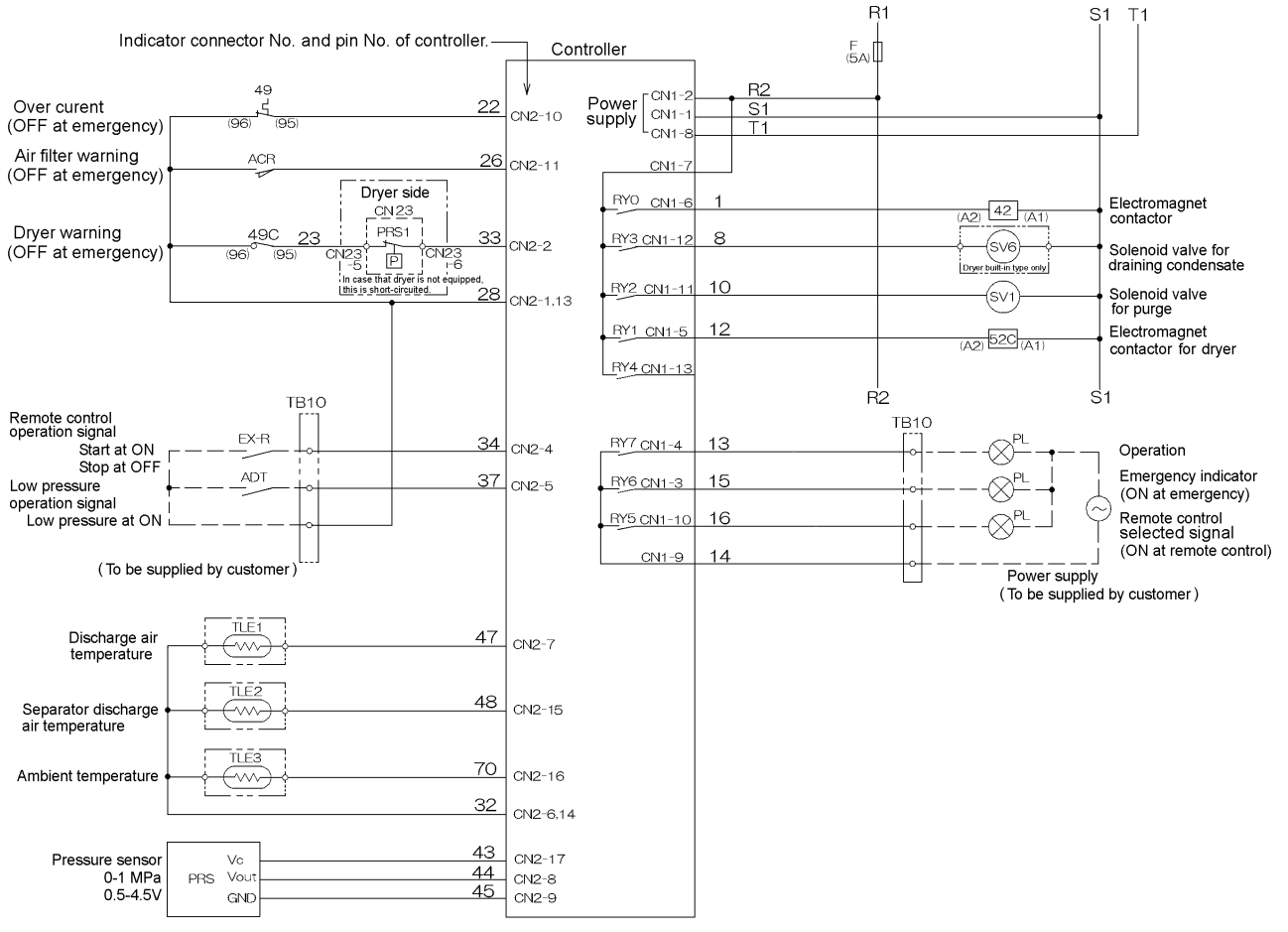


A100259-1E

3.4 Various Setting Methods

3.4.1 Table of various set values

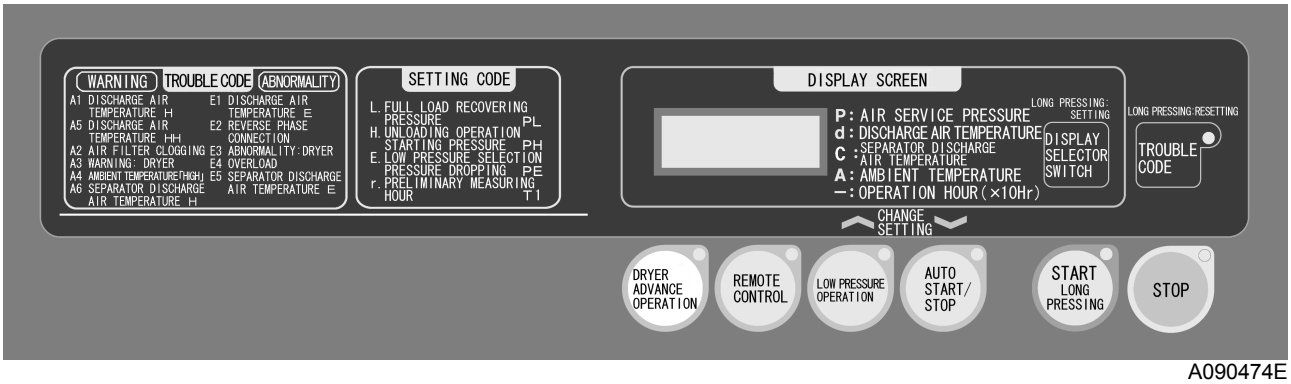
[A.C.C.S. type]

NO.	Item	Indi-cation	Primary set value			Range of set values	
			Discharge pressure			Set value	Pressure (MPa)
			0.69 MPa	0.83 MPa	0.93 MPa		
1	Full load recovering pressure	L	59	64	74	50－85	0.5－0.85
2	Purge starting pressure (Unloading operation starting pressure)	H	69	83	93	※ Full load recovering pressure set value＋4 －95	Full load recovering pressure＋0.04－0.95
3	Range of pressure drop (Low pressure selection pressure dropping)	E	4			2－20	0.02－0.2
4	Predicted stop time (Preliminary measuring hour)	F	30			30－120 sec	－

※Purge starting pressure should be set lower than the primary set value at each discharge pressure.

3.4.2 Changing procedures of various setting

[A.C.C.S. type]



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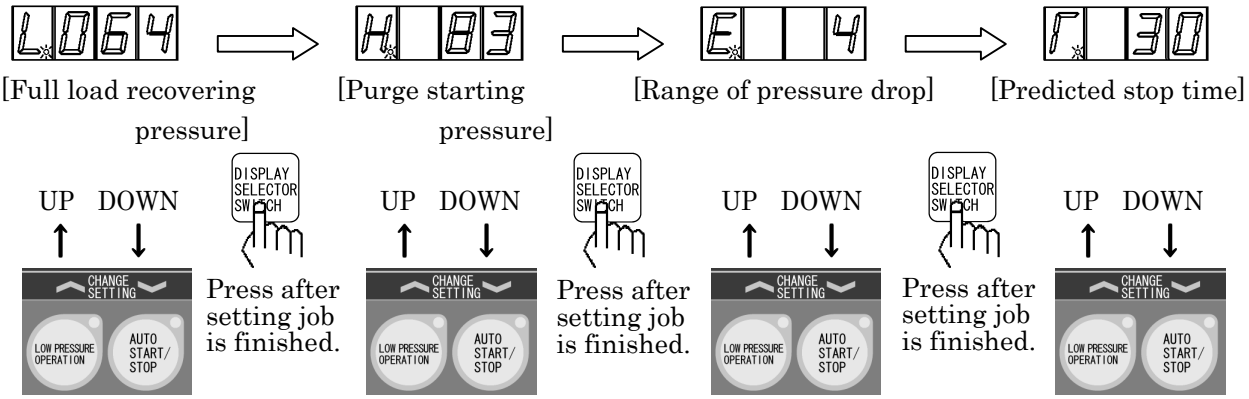
SAS11SD Operation panel

(1) When display selector switch is pressed longer (than 3 seconds), first L. (full load recovering pressure PL) is displayed.

(2) Each time display selector switch is pressed, each indication will be selected. Then each time it is pressed one time, H. (purge starting pressure PH) is switched to E. (range of pressure drop PE) and to T. (predicted stop time), according to the set orders.



4. Troubleshooting

4.1 How to Proceed Diagnosis

When performing failure diagnosis, pay special attention to the followings, observing general cautions.

4.1.1 Safety caution

(1) Removing such cap and/or plug for receiver tank, fuel tanks and pipes where pressure is loaded, stop the machine and relieve all the interior pressure. Install measuring instruments connected firmly.

(2) When doing the job with co-worker(s) together, make sure to give signal to the other person(s) and do not allow other persons to come near to the job site.

(3) Take care not to touch hot portions and not to be involved in turning portions.

4.1.2 Caution during failure diagnosis

(1) Do not make haste to disassemble the unit

If the unit is disassembled urgently.

①You may disassemble the other portions which are not related with the trouble.

②The cause of trouble may be missing.

The unnecessary reparations require more spare parts and man-hours, and reparation costs will increase more. What is worse, you will lose reliance or trust from clients, operators and users.

Therefore, it is absolutely necessary to investigate the trouble more carefully in advance and to follow the required procedures for failure diagnosis.

(2) Ask the clients about the trouble in details

In order to prevent misunderstanding and incorrect judgment about the trouble, it is necessary to ask users or operators about the following questions.

①Is there any other disorder than the trouble he has informed?

②Anything abnormal occurred before this trouble?

③Did this trouble happen unexpectedly? Or the unit had been operated in bad conditions before?

④When and how did this trouble occur?

⑤Had he repaired the unit before this trouble occurred?

⑥Did he not experience similar trouble before?

(3) Inspection items before starting diagnosis

Sometimes such trouble may be caused owing to routine mishandling of the unit. Before starting failure diagnosis, check the following items.

①Check whether compressor oil is lacking or dirty.

②Check each cable connection for any disconnection.

③Check the other portions for any damage.

(4) Confirmation of trouble

Discuss with user(s) and/or operator(s) sufficiently about the trouble. As a result, judge whether their judgment is based on the numerical comparison or sentimental basis. Make him (them) understand well the reparation or correction you have finished.

Then check and confirm by yourself the cause of the trouble.

Note) Never proceed any investigation or measurement which may cause further greater damage.

(5) Procedures of diagnosis

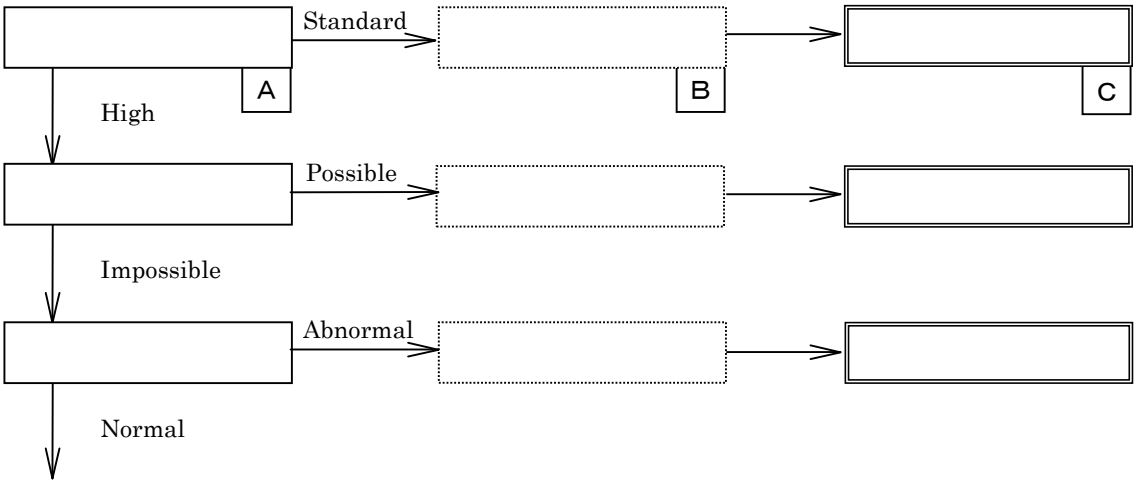
When you become well experienced, you can find out the cause easily during the process of confirmation (4). But easy understanding could cause unexpected failure. So check and judge it according to the following procedures.

①Check the easiest thing or portion first.
②Investigate the most possible cause.
③Check the other things connected to the trouble.
④Check for the possibility of any other troubles.
⑤Start proper and careful investigation on this trouble.

(6) Prevention of repeated occurrence of similar trouble

Even if you have repaired the trouble, unless you get rid of the fundamental cause of the trouble, it will repeatedly occur. Therefore, perform full investigation of the trouble, and it is absolutely necessary to remove the basis of the trouble.

4.1.3 How to use failure diagnosis table

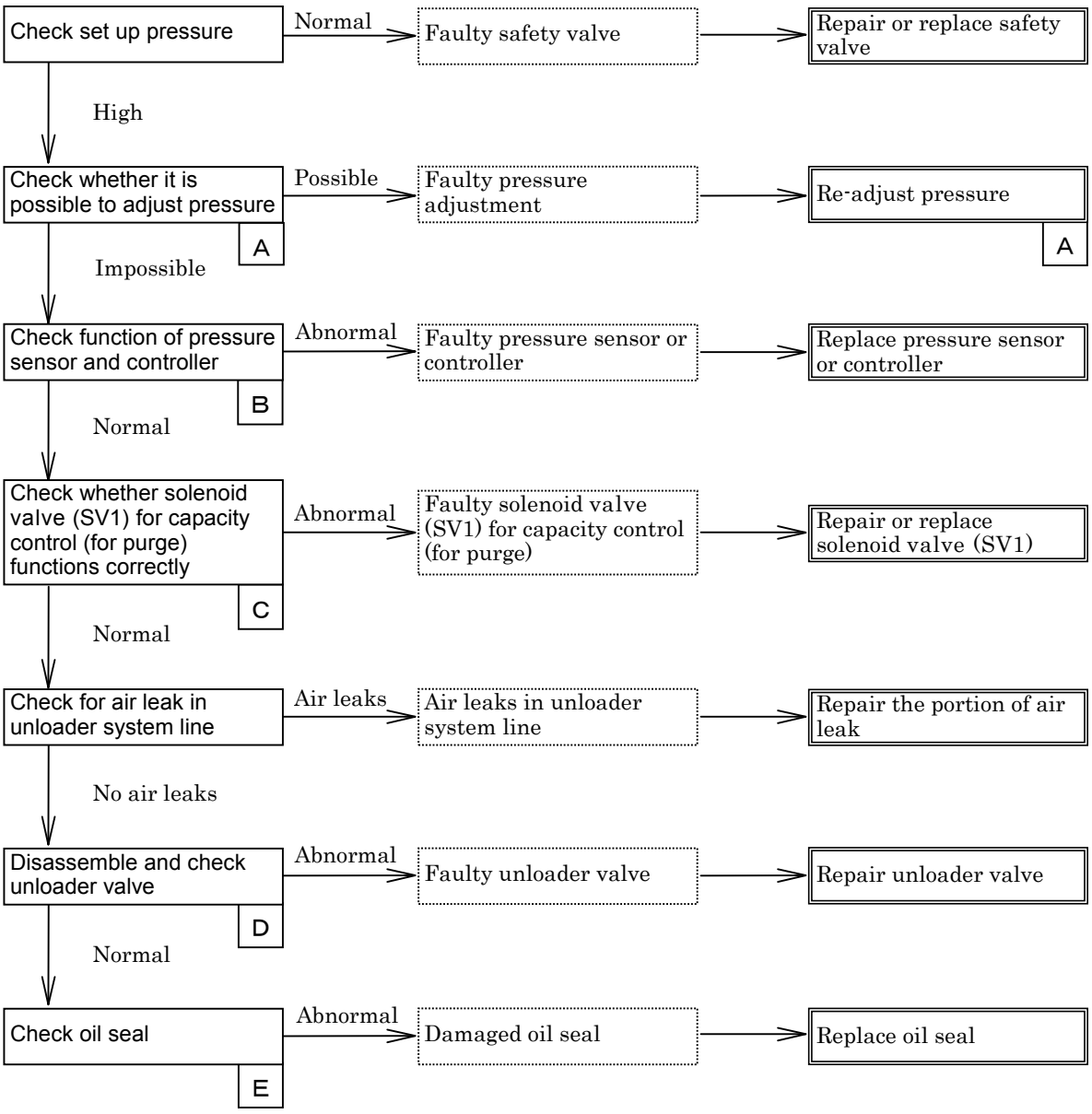


① In troubleshooting column [ ] The item in the column.
This item is mentioned confirmation of abnormal phenomena.
② In troubleshooting column [ ] The item in the column.
The cause is mentioned shows the cause of the said trouble.
③ In troubleshooting column [ ] The item in the column.
The measures and/or treatment shows the measures and or treatment the said cause.
④ [A] under each column shows the explanation of the column.

4.2 Failure of Capacity Control System

4.2.1 Unloader will not function and safety valve blows off.

[A.C.C.S. type]

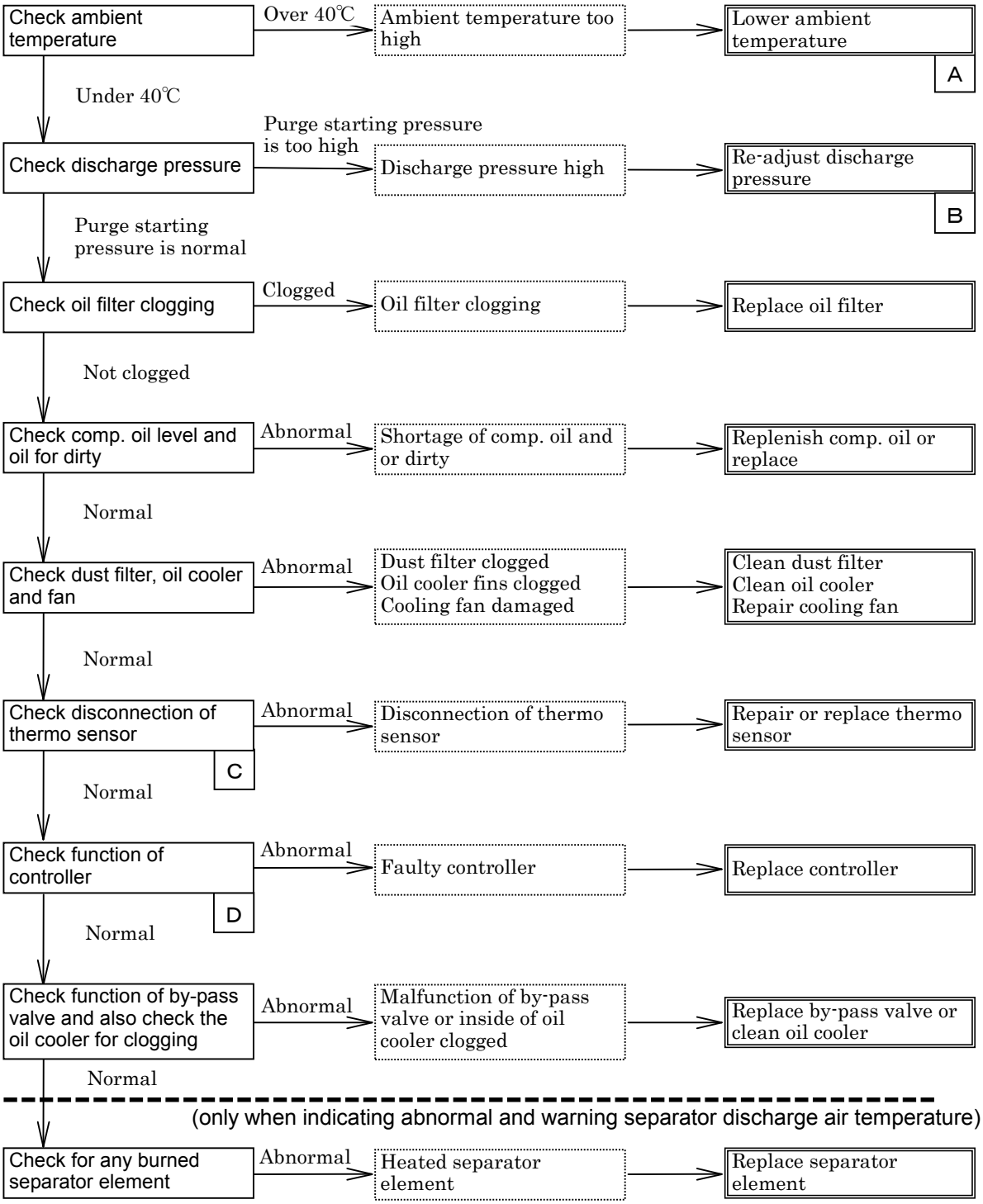


4. Troubleshooting

Mark	Item	Cause & Explanation	Countermeasures & Remarks
A	Check whether it is possible to adjust pressure	Method of adjustment…refer to 3.4.2	
B	Check function of controller	Check if the pressure sensor functions properly. If it does not indicate proper signal, the pressure sensor is faulty. If the pressure sensor is correct, check if the solenoid valve (SV1) shows correct volume control signal. ・When it starts…no conductivity is found ・About 5 seconds after it starts…conductivity is found ・When pressure is higher than purge starting pressure…no conductivity is found Even when service pressure is over purge starting pressure and if no conductivity is found, controller is faulty.	Check pressure sensor function (refer to 3.2.5) Check controller (refer to 3.1.3)
C	Check whether solenoid valve (SV1) for capacity control (for purge) functions correctly	Check and confirm that air comes when service pressure which is gradually raised with the pipe connected to unloader chamber being removed exceeds purge starting pressure (solenoid valve is switched to no conductivity). If not, the solenoid valve is faulty.	Repair or replace solenoid valve
D	Disassemble and check unloader valve	After disassemble unloader valve, check to function of piston moving condition and valve seal condition.	If you find some abnormal function or scratch, scar, should replace damage part
E	Check oil seal	If air is taken in through sealing portion, unloader valve is closed, but raise tank pressure and safety valve sometimes functions.	Replace oil seal

4.3 Function of Emergency Switch

4.3.1 Unit stops or trouble code indicator glows due to abnormality of discharge air temperature or separator discharge air temperature.

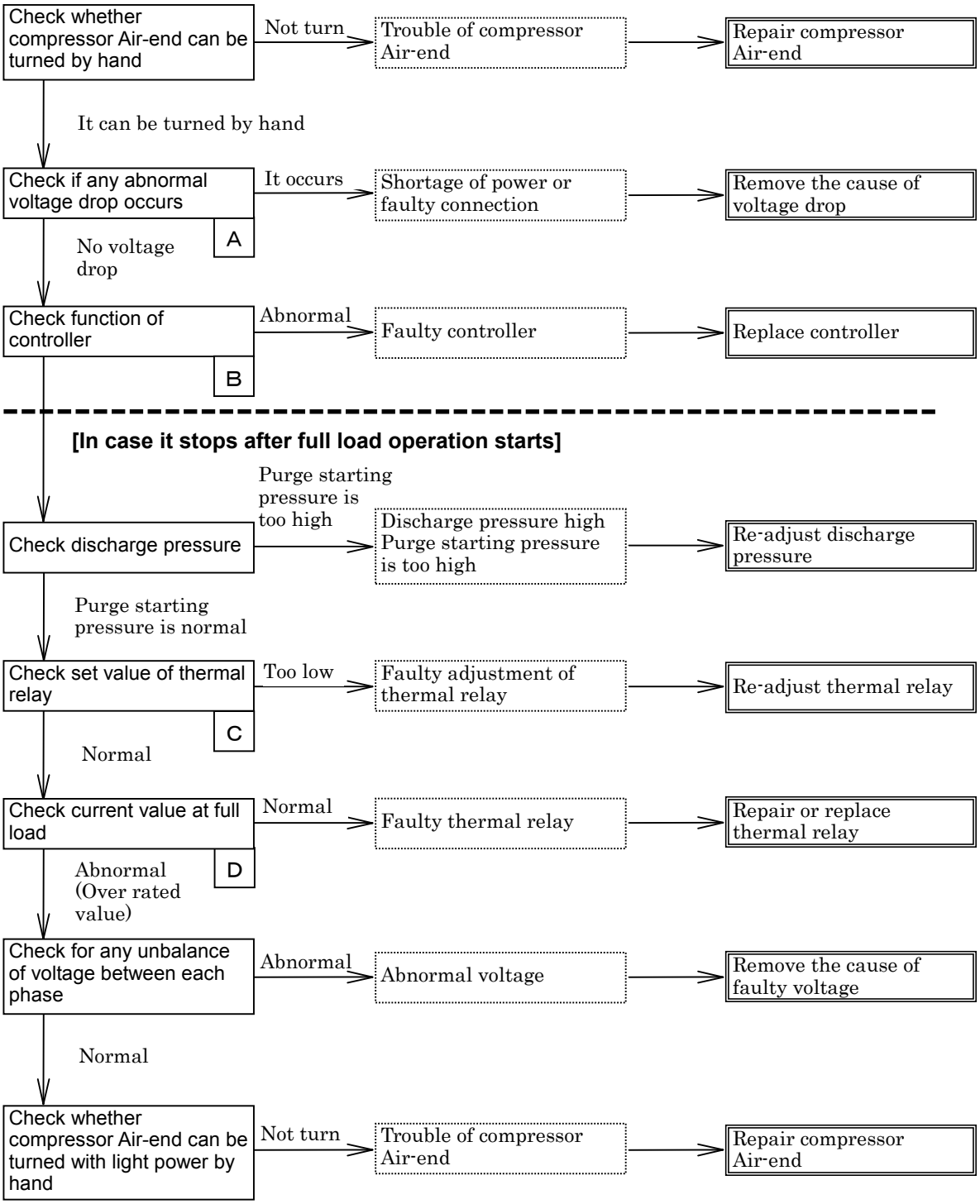


4. Troubleshooting

Mark	Item	Cause & Explanation	Countermeasures & Remarks
A	Lower ambient temperature	It sometime happen that temperature of the room is heated over 40℃ by compressor installed in poorly ventilated. It causes overheating.	Ventilate suction and discharge air fully of the room
B	Re-adjust discharge pressure	For adjustment…refer to 3.4	
C	Check disconnection of thermo sensor	It sometime happen that snapping of thermo sensor by vibration or faulty of fittings. So, check thermo sensor resistance by tester. (For the relation between temperature and resistance, refer to 2.4.3)	Repair or replace sensor
D	Check function of controller	Operate the compressor and check whether the discharge air temp. exceed 110℃. ・In case the unit stops even under normal temperature, the controller is faulty ・When temperature exceeds 110℃, the controller is normal. Instead of resistance value when it shows disorder. (For the relation between temperature and resistance, refer to 2.4.3)	

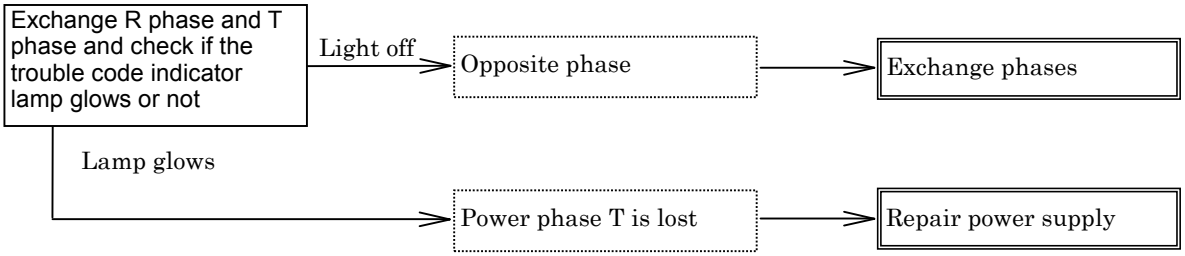
4.3.2 Trouble code indicator glows and unit stops due to overload.

[In case it stops before full load operation starts]

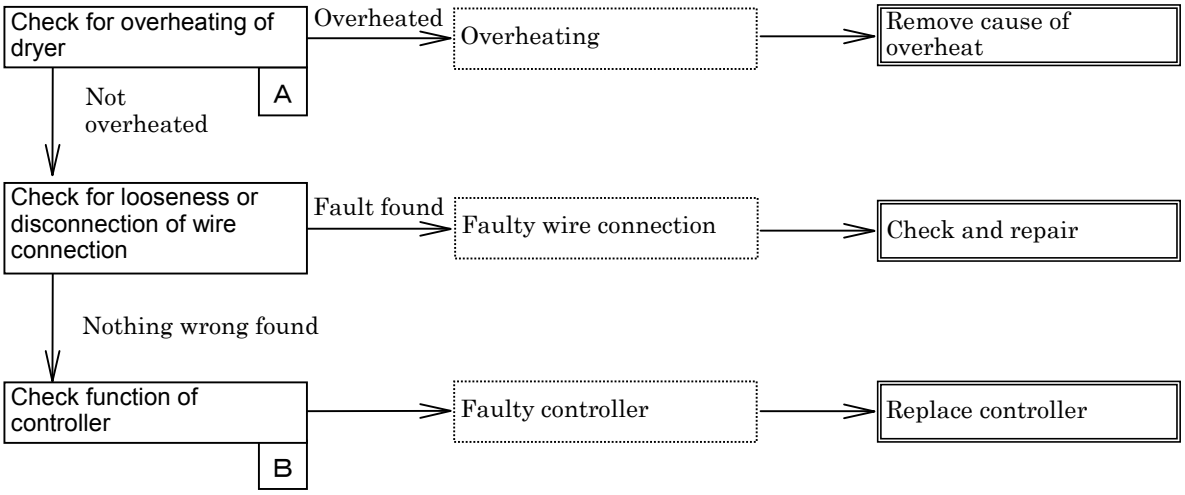


Mark	Item	Cause & Explanation	Countermeasures & Remarks
A	Check if any abnormal voltage drop occurs	Check such items as shortage of power supply, length of wiring, and cable size. They cause abnormal drop of voltage. 《Reference》 Allowable voltage drop rate shall be within 15%.	
B	Check function of controller	Check voltage between wire No.22 and 28. ・In case of emergency stop despite DC 0V, controller is faulty. ・Din case of emergency stop due to occurrence of DC12, controller is acceptable.	Replace controller
C	Check set value of thermal relay	For the set value, refer to 3.2.1	
D	Check current value at full load	For the current value, refer to 1.2	

4.3.3 Trouble code indicator glows and unit stops due to reverse phase connection.



4.3.4 Unit stops or trouble code indicator glows due to dryer trouble.

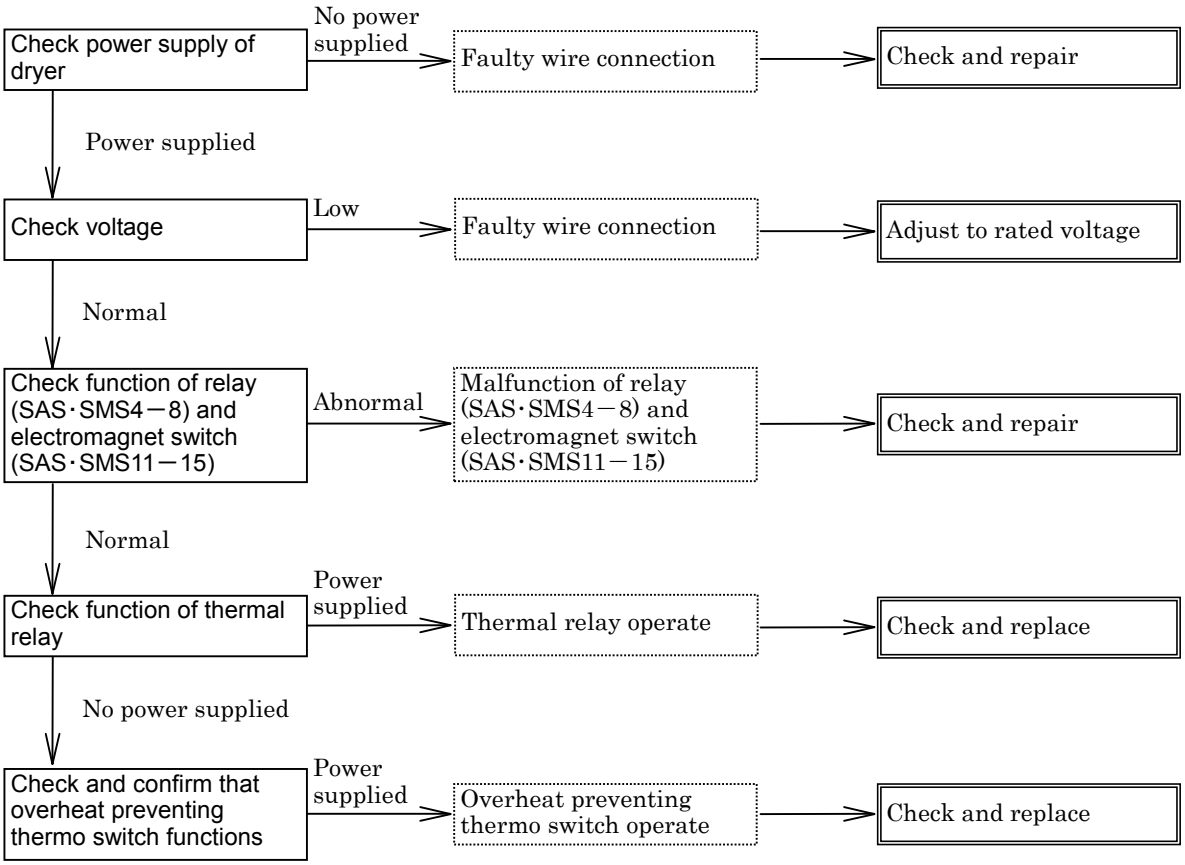


Mark	Item	Cause & Explanation	Countermeasures & Remarks
A	Check for overheating of dryer	Higher ambient temperature than 40℃ and poor ventilation of dryer may cause overheating. Pay carefully attention to them especially in summer season.	Suction of air and ventilation of the room shall be sufficient To reset, release the reset button inside dryer
B	Check function of controller	In case other causes can be found, check controller. Measure voltage between cable No.33 and 28. DC0V：under normal operation DC12V: when thermal relay functions When trouble code cannot be reset under normal operation, controller is faulty.	Replace controller

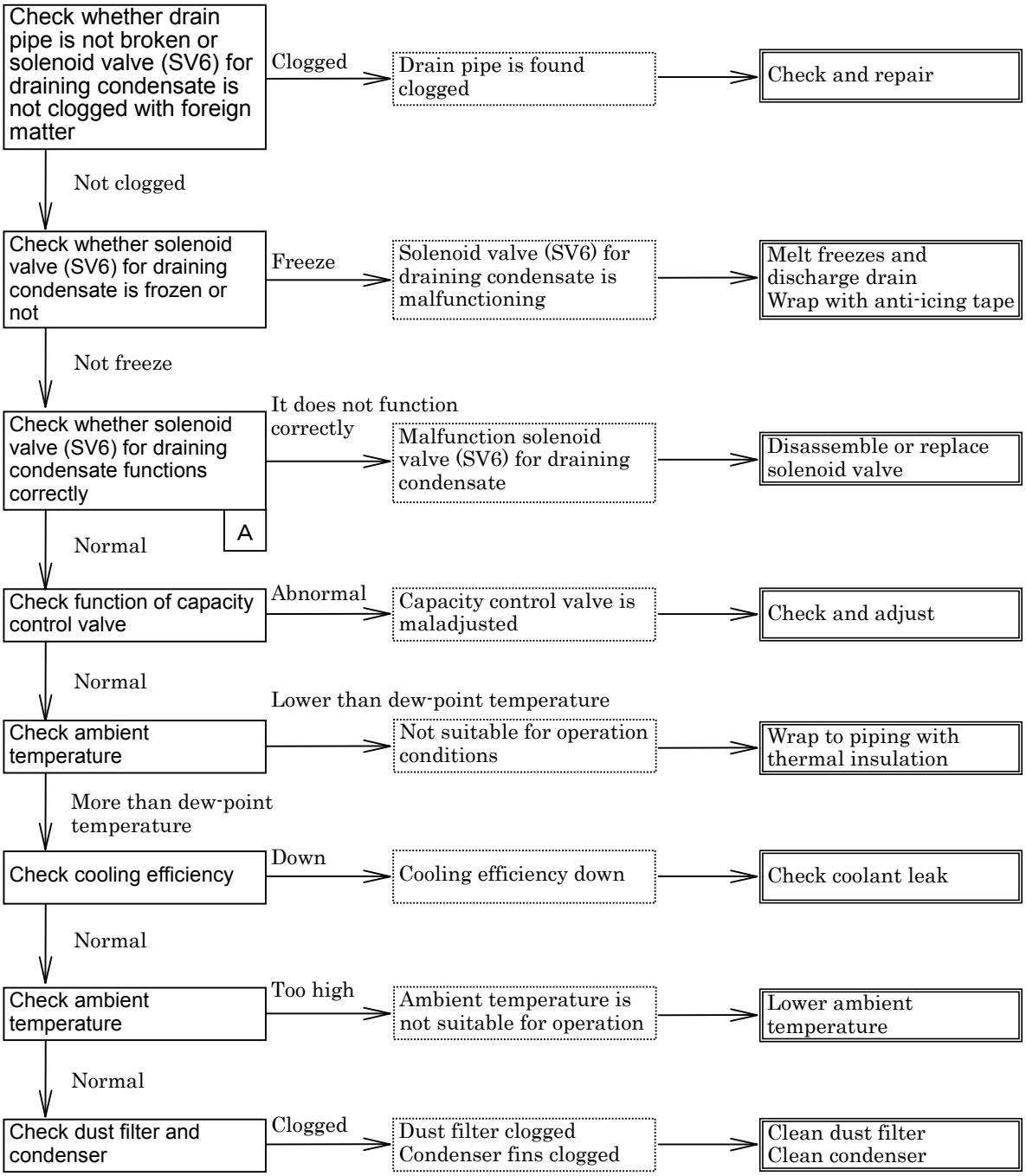
4. Troubleshooting

(1) Troubleshooting of dryer

1. Unable to run

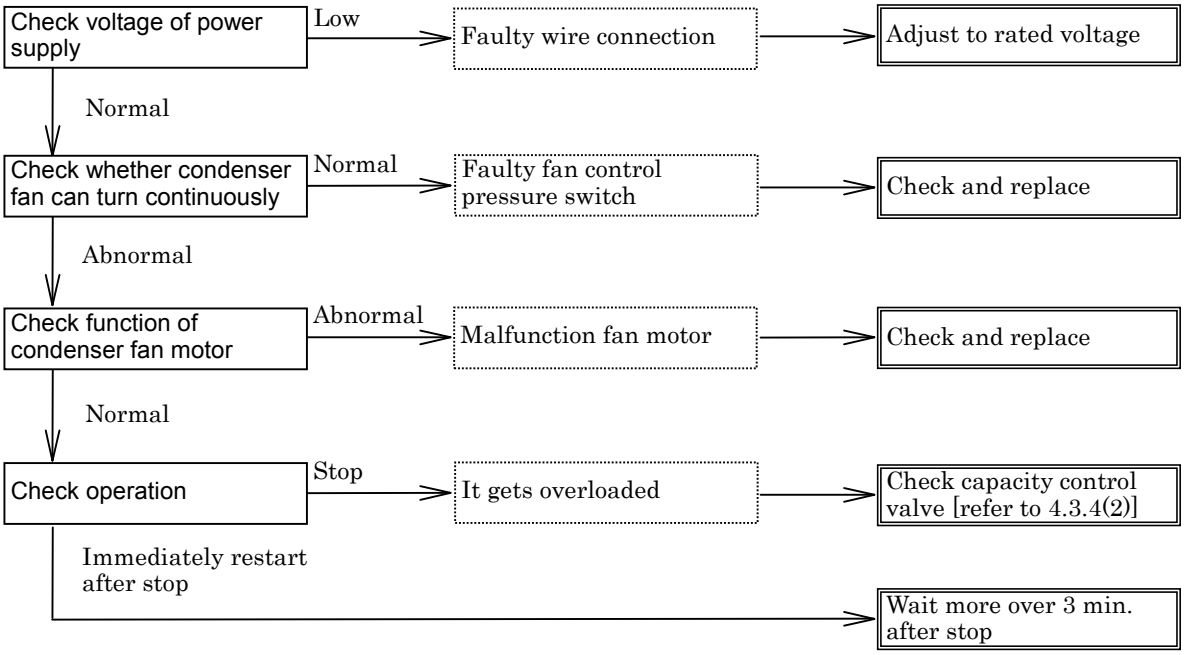


2. Water drained at outlet

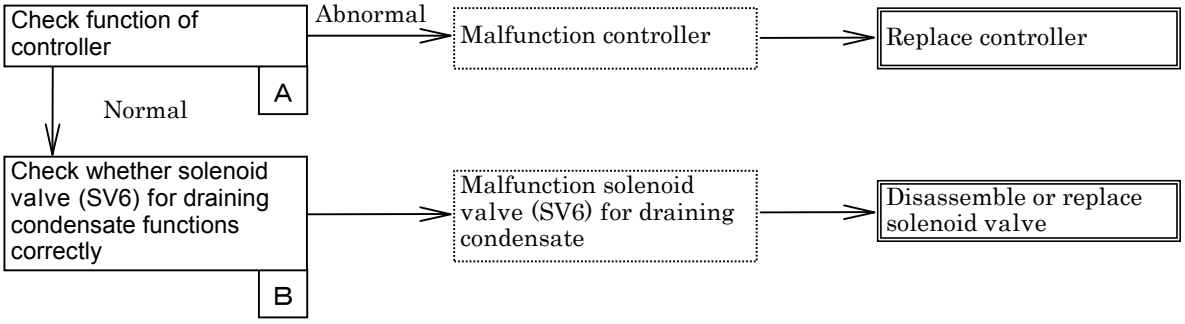


Mark	Item	Cause & Explanation	Countermeasures & Remarks
A	Check whether solenoid valve (SV6) for draining condensate functions correctly	It is good (normal) if the solenoid valve functions correctly, when DC12V is applied between line No.8 and S1 at the rate of one second at the interval of about 20－80 seconds (it changes, depending on operation conditions).	Check wiring

3. Able to start, but stop soon

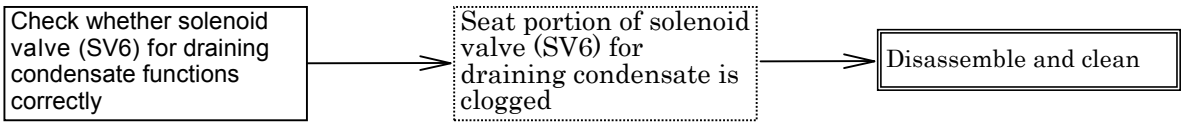


4. Air or drain blowing at drain outlet



Mark	Item	Cause & Explanation	Countermeasures & Remarks
A	Check function of controller	Check and confirm that correct signal is sent to solenoid valve (SV6). It is OK when power is supplied for one second at the internal of about 20 to 80 seconds (it varies upon operation conditions).	Check controller
B	Check whether solenoid valve (SV6) for draining condensate functions correctly	It is good (normal) if the solenoid valve functions correctly, when DC12V is applied between line No.8 and S1 at the rate of one second at the interval of about 20－80 seconds (it changes, depending on operation conditions).	Check wiring

5. Drain not discharge from drain outlet



(2) Countermeasures for dryer troubles (In case of example SAS/SMS11)

1. In case the interior of heat exchanger gets frozen when the dryer is operated with the indicator of refrigerant pressure gauge placed lower than the green zone.

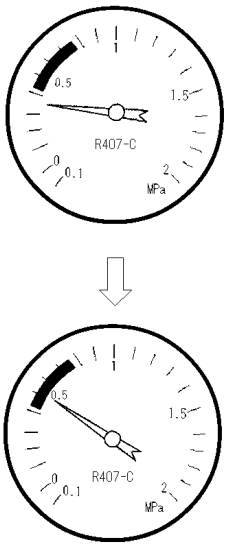
① Stop the compressor, and melt ice.

② Remove the rear panel, and take off the red-vinyl cap top of capacity control valve.

③ Power source on and operate the dryer only, after make short circuit between the coil (wire # 12) of electromagnet switch 52C for dryer and power source (wire # R2), what is installed in starter panel. At the time, be care and be sure on safety, as the dryer is start in a moment power source ON.

④ Turn the adjusting screw of capacity control valve clockwise generously by using (-) screwdriver, until hand is show between 0.42－0.47MPa on the refrigerant pressure gauge. After a moment, fan motor should be repeat "ON"・"OFF".

⑤ In case proper adjustment is impossible even after above adjustments have been done, the capacity control valve itself is defective. Replace it with a new one.



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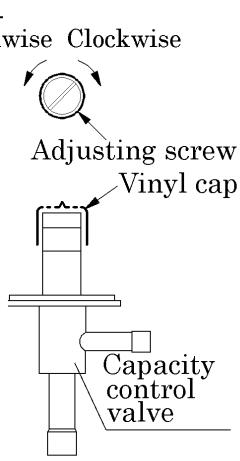


PK0459E

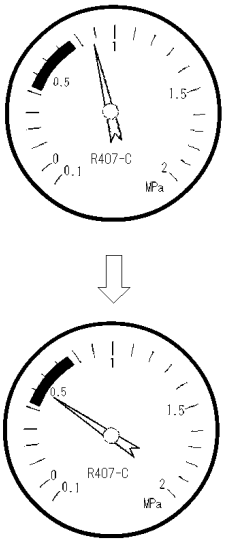
2. In case the dew point indicator of refrigerant pressure gauge shows unusually high temperature while the ambient temperature is not so high.

① Stop the compressor, and power source OFF. Remove the rear panel, and take off the red-vinyl cap top of capacity control valve.

② Operate the dryer only, as same as above 1. ③.

③ Turn the adjusting screw of capacity control valve anti-clockwise generously by using (-) screwdriver, until hand is show between 0.42－0.47MPa on the refrigerant pressure gauge. After a moment, fan motor should be repeat "ON"・"OFF".

④ In case proper adjustment is impossible even after above adjustments have been done, the capacity control valve itself is defective. Replace it with a new one.



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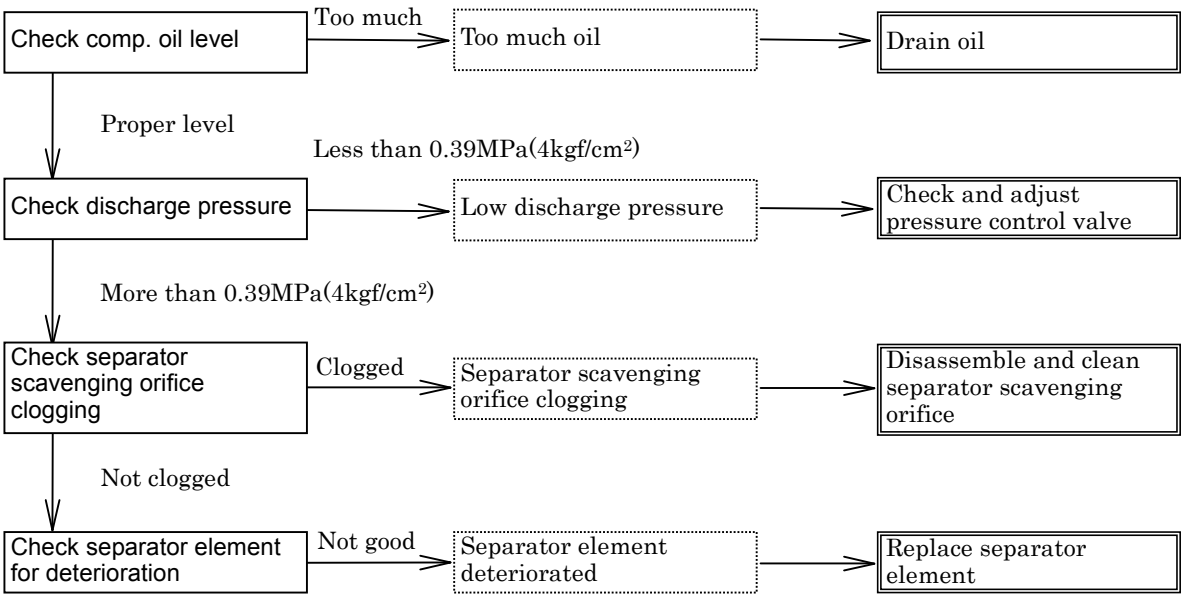
4.4 Others

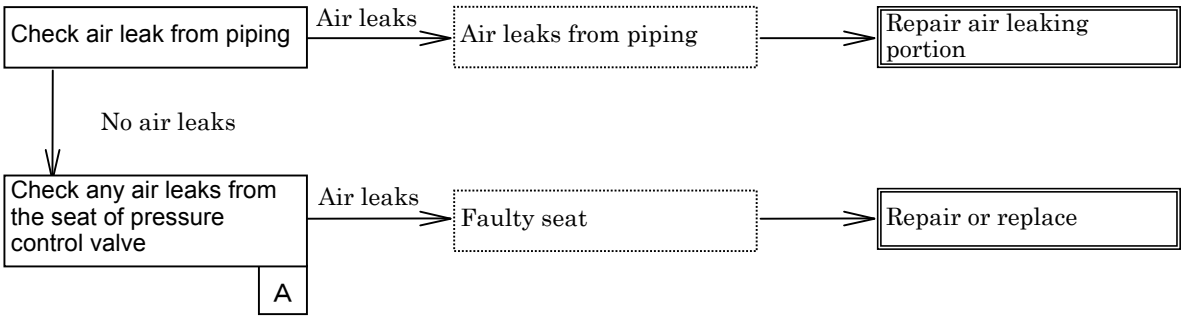
4.4.1 Oil is found mixed in discharge air. (Oil consumption increases)



4.4.2 Abnormal noise emission from belt.

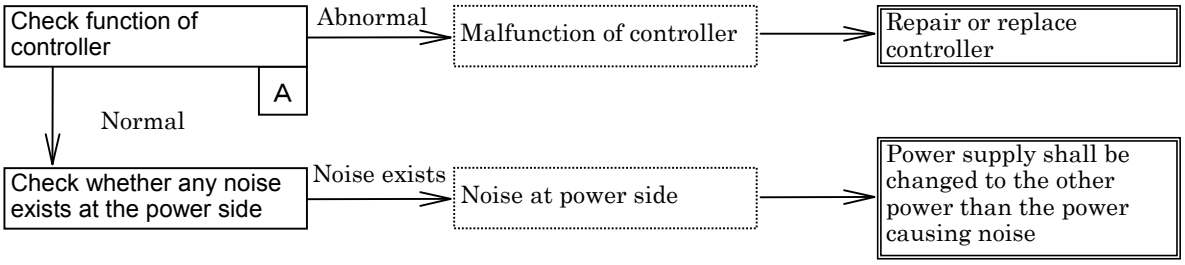
Mark	Item	Cause & Explanation	Countermeasures & Remarks
A	Check belts for slippage	Abnormal noise is emitted due to slippage by primary elongation or friction.	Adjust belt tension or replace

4.4.3 Compressor start and stops too frequently while no air is consumed. (Auto start/stop operation)



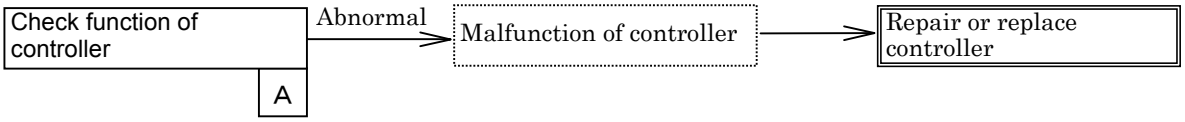
Mark	Item	Cause & Explanation	Countermeasures & Remarks
A	Check any air leaks from the seat of pressure control valve	The control valve functions as a check valve also. If air is leaking, the air in the second side is sent out through the piping of purge (auto relief), and accordingly automatically starts and stops.	Replace the seat of pressure control valve

4.4.4 Compressor often stops without trouble code indicator lamp glowing and knowing no reason of the phenomena.



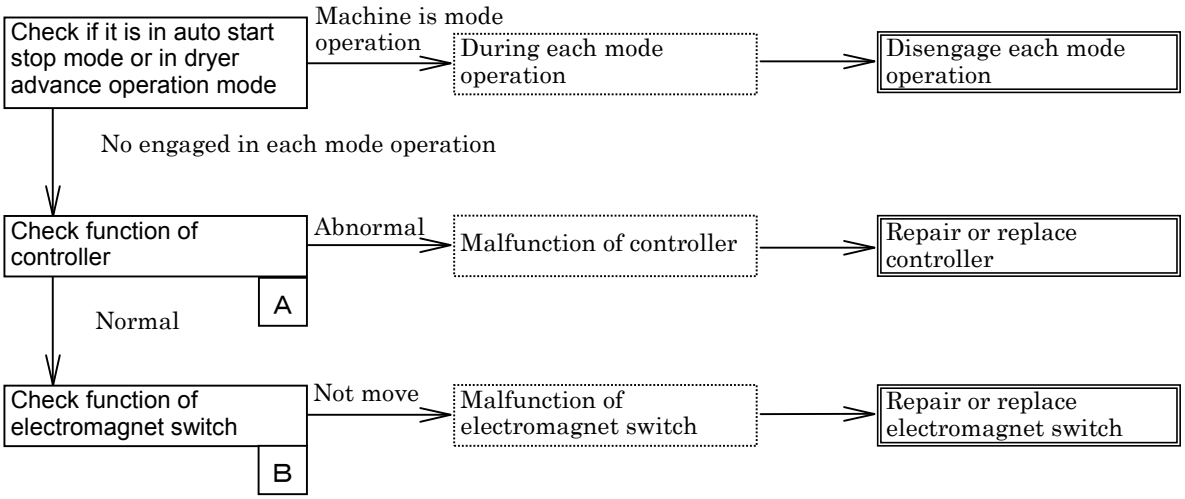
Mark	Item	Cause & Explanation	Countermeasures & Remarks
A	Check function of controller	When performing remote control operation, check wiring of terminal No.34 and 37 for any looseness or check the remote control switch for any faulty contact.	

4.4.5 Even when each control switch is pushed ON, the machine will not start.



Mark	Item	Cause & Explanation	Countermeasures & Remarks
A	Check function of controller	Check if any key is pushed due to incorrect installation of controller. If any, each operation becomes impossible. ・Faulty contact of each switch. ・Faulty contact of controller connector ・Damage of controller.	Check installation of controller Repair or replace the flat cable Repair or replace controller

4.4.6 Start indicator lamp glows, but the unit will not start.

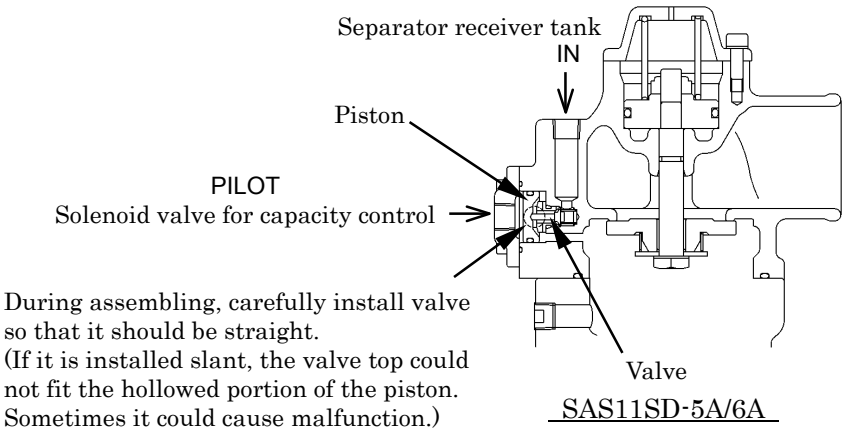


Mark	Item	Cause & Explanation	Countermeasures & Remarks
A	Check function of controller	If 200V is not generated under the following conditions, controller is found defective. ・Between line No.1 and S1	Replace controller
B	Check function of electromagnet switch	When the voltage between line No.1 and S1 is AC200V and electromagnet switch is disconnected or any line is disconnected. If motor does not functions with electromagnet switch moving, it is electromagnet switch or motor was disconnection or burning.	Repair or replace

5. Reference Data

5.1 Structure of Parts

5.1.1 Vacuum relief valve (Incorporated in unloader body [only for SAS/SMS8－11])



Function :

At unload condition, the piston is pushed by the compressed air from capacity control solenoid valve, and in combination with this function, the valve is opened so that the compressed air from separator receiver tank is sent to compressor air-end. Consequently, it prevents the interior of compressor air-end from becoming excessively vacuum and it can soften noise of vacuum.

5. Reference Data

5.2 Table of Reference Data

5.2.1 Table of set values

Item	Unit	SAS4SD -5A/6A SMS4ED -5A/6A	SAS6SD -5A/6A	SAS8SD -5A/6A SMS8ED -5A/6A	SAS11SD -5A/6A SMS11ED -5A/6A	SAS15SD -5A/6A SMS15ED -5A/6A
・Protection Devices						
Set value of main motor thermal relay	A	Please refer to 3.2.1.				
Set value of dryer thermal relay	A					
Discharge air temperature	℃	110				
Separator discharge air temperature	℃	110				
・Pressure						
Specifications of air service pressure	MPa (kgf/cm²)	0.83 (8.5)				0.69 (7.0)
Air filter differential pressure switch	kPa (mmAq)	6.2 (632)				
Pressure control valve	MPa (kgf/cm²)	0.39 (4.0)				
Safety valve	MPa (kgf/cm²)	0.98 (10.0)				0.85 (9.0)
Purge starting pressure (H)	MPa (kgf/cm²)	Please refer to 3.4.				
Full load recovering pressure (L)	MPa (kgf/cm²)					
・Timer						
Auto start/stop predicted stop time	sec	30－120				
Starting unload time	sec	5±0.2				

5. Reference Data

5.3 List of Belt Tension (for sonic tension meter)

Start testing belt tension, using sonic tension meter, according to the following procedures. This instruction is based on GATES Sonic Tension Tester.
(How to input data for sonic tension meter is referred to the manual provided together with the meter by GATES UNITTA ASIA.)

(1) Inputting data

Enter the following three items into the meter. (V ribbed belt/flat belt)

① Enter belt mass constant (MASS)
Enter unit mass per one ribbed portion.

② Enter belt width into meter
Pick up suitable one in the following table.

③ Enter belt span length into meter
Pick up suitable one in the following table.

(2) Measurement of belt tension

① To measure belt tension, a microphone connected to tester is placed firmly at 2 cm distance from belt center and then flip belt center near microphone with a finger or pat it lightly with a driver handle for measurement of belt tension.

② This measurement should be performed two times : primary stage on new belt (or upon replacement of belt) and second stage upon readjustment of belt tension (after two hours of full load operation because the belt is elongated during initial operation.)

③ Note that the value measured at primary stage and the one measured are different.

④ Belt tension value is shown in N (Newton). The measured value should be within the allowable range of N values, but it is better that the value should be as close as possible to the middle of the allowable range.

Model	Specifications	Frequency	Standard values of sonic tension meter			Belt tension values	
			Belt mass	Belt width	Belt span	New belt (N) (Allowable range)	Adjusted (N) (Allowable range)
SAS4SD-5A SMS4ED-5A	0.83MPa	50Hz	19.0g/m	4	201mm	371 (334－408)	321 (289－353)
SAS4SD-6A SMS4ED-6A		60Hz			206mm	359 (323－395)	311 (280－342)
SAS6SD-5A		50Hz		5	252mm	495 (445－544)	429 (386－472)
SAS6SD-6A		60Hz			260mm	489 (440－538)	424 (382－467)
SAS8SD-5A SMS8ED-5A		50Hz		7	270mm	979 (881－1,077)	848 (763－933)
SAS8SD-6A SMS8ED-6A		60Hz			275mm	947 (852－1,042)	821 (739－903)
SAS11SD-5A SMS11ED-5A		50Hz		8	269mm	1,030 (927－1,133)	892 (803－981)
SAS11SD-6A SMS11ED-6A		60Hz			280mm	973 (876－1,070)	843 (759－927)

5. Reference Data

Model	Specifications	Frequency	Standard values of sonic tension meter			Belt tension values	
			Belt mass	Belt width	Belt span	New belt (N) (Allowable range)	Adjusted (N) (Allowable range)
SAS15SD-5A SMS15ED-5A	0.69MPa	50Hz	3.2g/m	20	349mm	490 (466－530)	←
SAS15SD-6A SMS15ED-6A		60Hz			353mm	518 (492－570)	←

5.4 Table of Oil Supply (for reference)

Quantity of oil primarily supplied for each model is listed in the following table. For confirmation, quantity oil primarily supplied is not always same as that of oil replaced, because oil is residual in compressor air-end, oil cooler and pipes. Change oil as completely as possible, leaving no residual oil.

Model	Quantity of oil (L)	Brand
SAS4SD-5A/6A SMS4ED-5A/6A	2.5	Shell corena oil RS32 Mobil rarus 424 Compressor oil RA32
SAS6SD-5A/6A	3.5	
SAS8SD-5A/6A SMS8ED-5A/6A	5.0	
SAS11SD-5A/6A SMS11ED-5A/6A	8.0	
SAS15SD-5A/6A SMS15ED-5A/6A	9.0	

This text book contains the most recent information available at the time of printing, and the contents of the list are based on information in effect at that time and are subject to change without notice.

HOKUETSU INDUSTRIES CO., LTD.

8TH FLOOR SHINJUKU SAN-EI BLDG,
22-2 NISHI-SHINJUKU 1-CHOME,SHINJUKU-KU
TOKYO 160-0023 JAPAN
TEL:81-3-3348-7281
FAX:81-3-3348-7289
URL:http//www.airman.co.jp

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