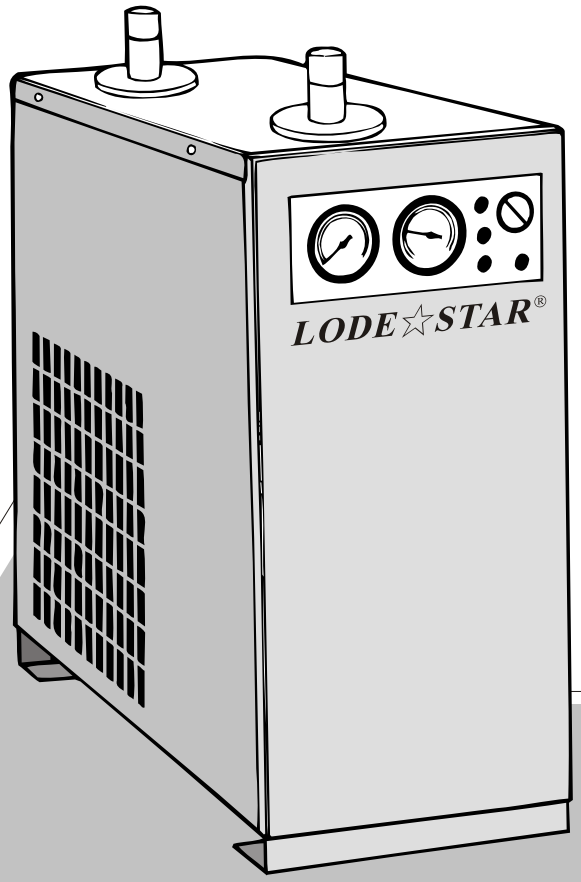
LODE☆STAR®

Compressed-Air Refrigeration Dryer

Operating Instructions



ISO9001:2000

CE

Star Compair Ind. Co., Ltd.

INDEX

The Manufacturer

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1. Preliminary

Thanks a lot to choose **LODE-STAR** Refrigeration Compressed-Air Dryer, it will be helpful to your production line.

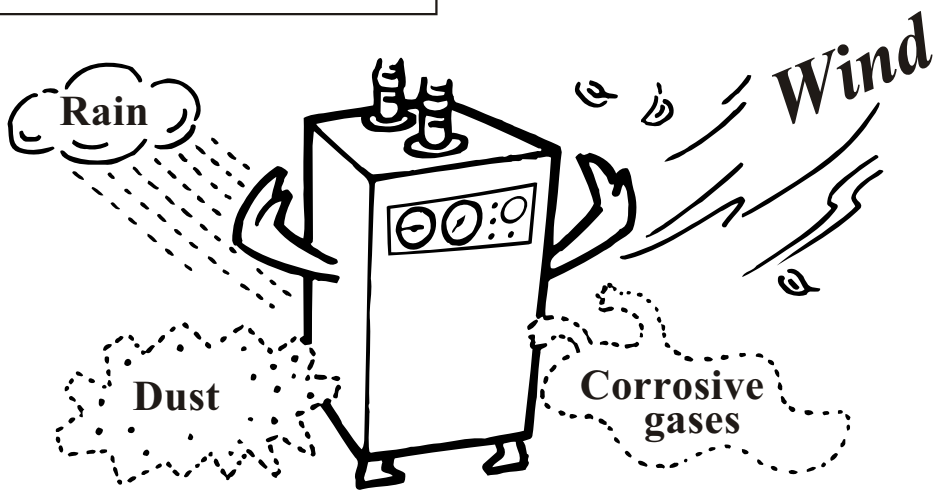
The operators should make familiar with this Operation Instructions in terms of the safety, construction, function, maintenance and troubleshooting of the Refrigeration Compressed-Air Dryer.

This Operation Instruction include the basic system flowchart, installation, operation, wiring diagram, and troubleshooting.

This Operation Instruction, is to be followed by all person working with the unit. It is imperative that this Instruction is made freely available at all times to serve personal and are to be kept at the place where the unit is installed.

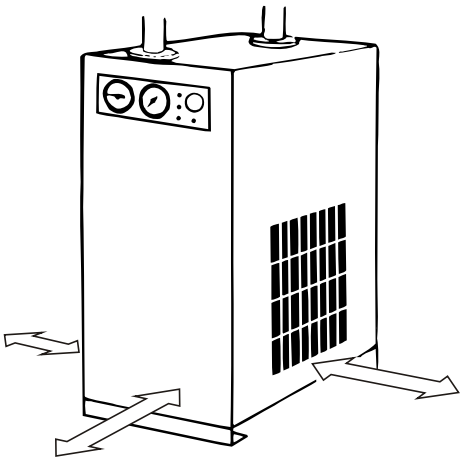
2. Important user information

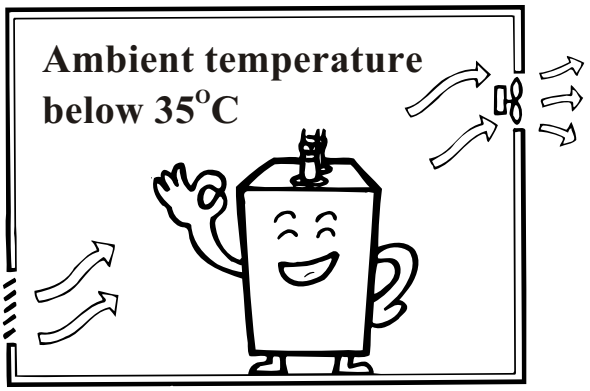
OPERATING ENVIRONMENT



Do not install the dryer in a place where it is likely to be exposed to rain.
Do not use the dryer in a place where humidity is high and condensation is likely to occur.
Do not use the dryer in a place where it is likely to be exposed to direct sunlight and where heat is likely to be generated.
Do not use the dryer in a place where corrosive gases exist.

Install the dryer on a strong, flat floor. Ensure the there is sufficient space for easy maintenance and inspection.



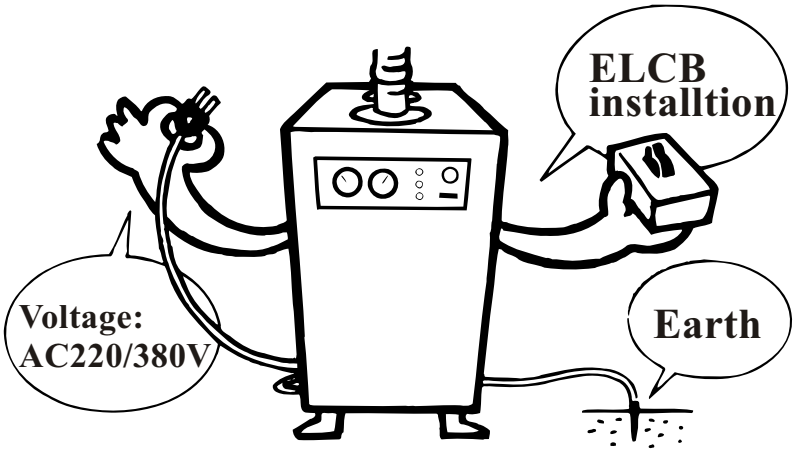


Install the dryer in a clean environment.
Install the dryer in a dust free environment.
Install the dryer in a good ventilation environment.

INSTALLATION

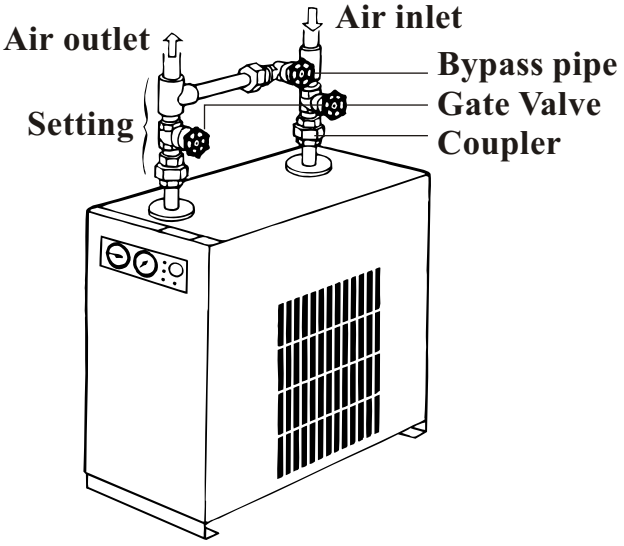
Check the power supply voltage specified on the model, and make sure that the voltage actually within the rating.

To prevent electric shock caused by leakage, the dryer should be grounded securely. Do not turn on or off too frequently, as this may cause breakdown.

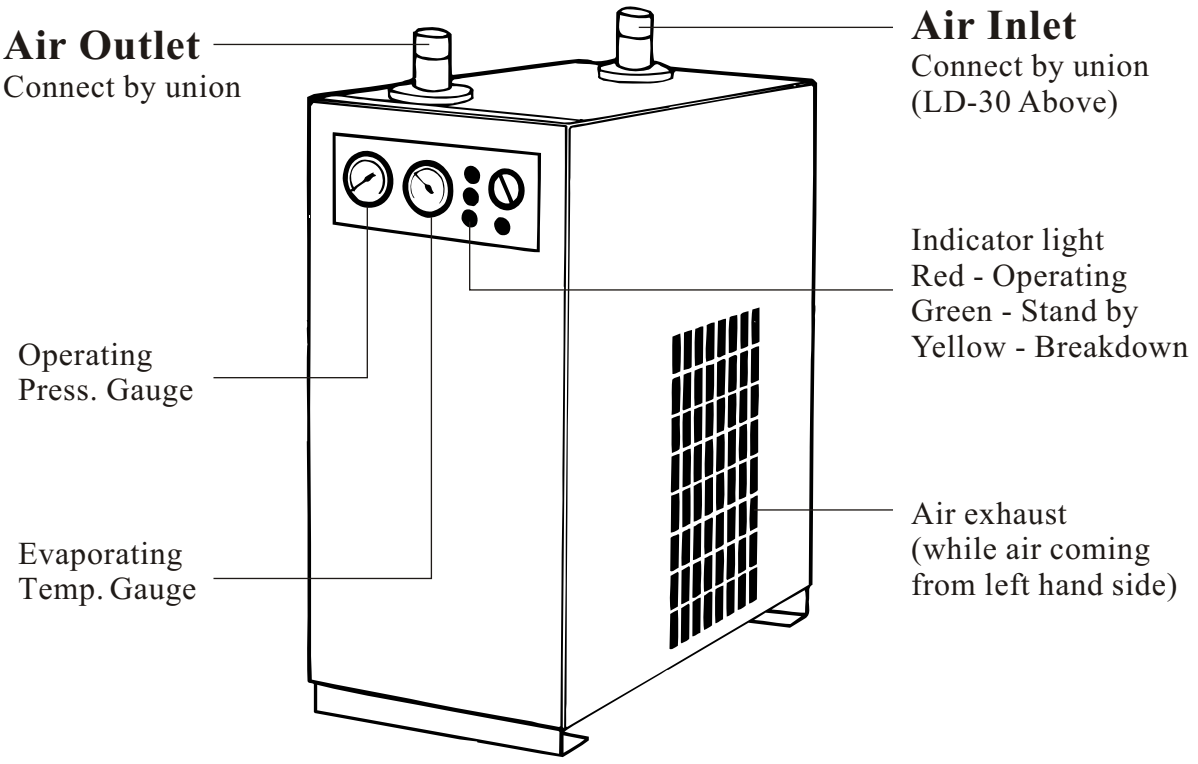


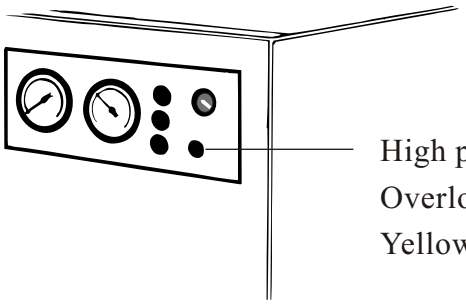
PIPING

1. Install a bypass pipe between the inlet and outlet of the dryer as shown below to enable maintenance to be carried out without stopping the supply of compressed air.
2. Make sure that vibration from the air compressor is not conveyed to the dryer. Piping must be durable enough to withstand working pressure.
3. Make sure there is no air leakage from connecting point.
4. Install a pre-filter at the primary side of the dryer to prevent entry of dirt and contamination.
5. Piping must be designed so those pipes do not weigh on main body.



3. Description





Above 75hp model
Red indicator light up
When the dryer is running

Green indicator light up
When the dryer stand by

Yellow indicator light up
When the dryer has breakdown

High pressure reset
Overload occurred
Yellow indicator LAMP light up

Remedy the trouble then
press down the reset botton.

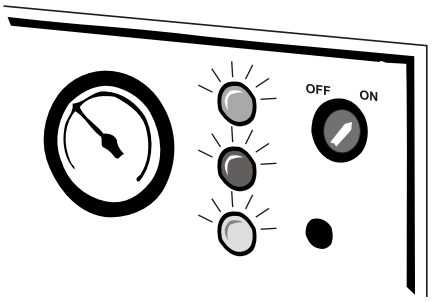
4. Operation

4.1 Startup

4.1.1 Make sure the location, power supply, piping and auto-drain are correct.

4.1.2 Set the star button to ON LD-50 below (include 50) or turn on the switch to ON position LD 75 above (include 75)

4.1.3 The red indicator light will be light up and the dryer will be running.
The warm air will be exhausted from left side air exhaust (LD-20 below air exhaust is at right side)



4.1.4 Supply the compressed air approximate to 5 minutes after starting. If supplied in shorter period, a wet air may enter piping resulting in generation of drain in the pipes.

4.1.5 According to the operating conditions the cooling fan will run or stop but the refrigerant compressor will run continually.

4.1.6 If the indicator of evaporating gauge show the pressure is higher, it may be overload running, please check troubleshooting chart to remedy the troubles.
(LD-50 below mode the pressure indicate at green area is normal)

4.1.7 Running after one hour it will start to drain accumulate automatically.

4.1.8 Keep the dryer running, (frequently ON, OFF the dryer is the cause to breakdown.)

4.2 Shutdown

4.2.1 Set the star button to OFF LD-50 below (include 50) or Turn the switch to the OFF position LD 75 above (include 75)

4.2.2 The red indicator light will be turned off and the dryer will stop running.
The cooling fan may be still running about 1~2minutes to take out the heat and to reduce the temperature. The protect apparatus is normal.

4.3 Restart

4.3.1 Interval of 3 minutes at least to restart to protect the dryer.

5. Inspection & Maintenance

5.1 Indicator lamp.

Set the start button to ON. Then the running lamp light up.

5.2 Auto-drain

5.2.1 Check the function of auto-drain. The auto-drain should be dismantled and cleaned whenever necessary.

5.3 Clean the Auto-drain

5.3.1 Stop the supply air and release the pressure then loosen the bowl.

5.3.2 Wash the bowl with neutral detergent.

5.3.3 If auto-drain kit is not function, replaced the components.

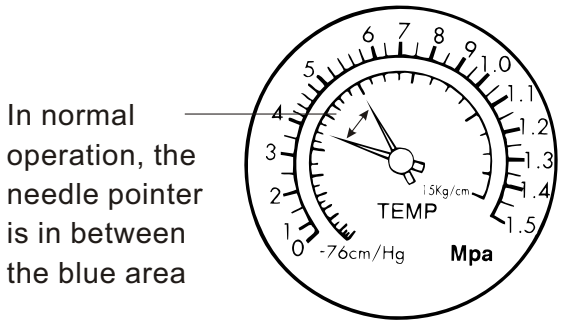
5.4 Inspect the evap. temperature gauge.

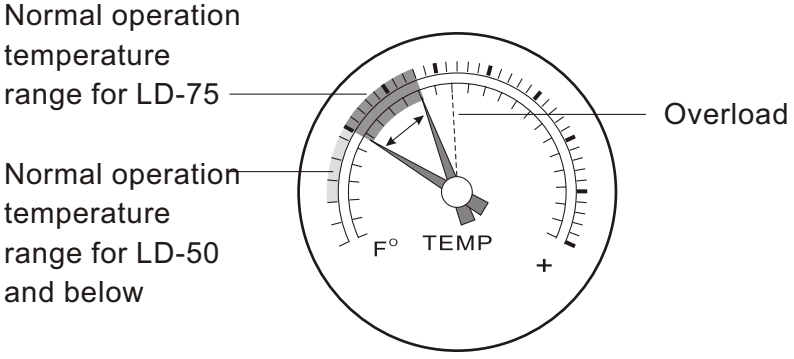
5.4.1 LD-75 and above using R22 Freon gas.

The needle pointer of the refrigerate pressure gauge approximately (3.8 kg/cm2-5.5 kg/cm2)

LD-50 and below :- using R134a Freon gas.

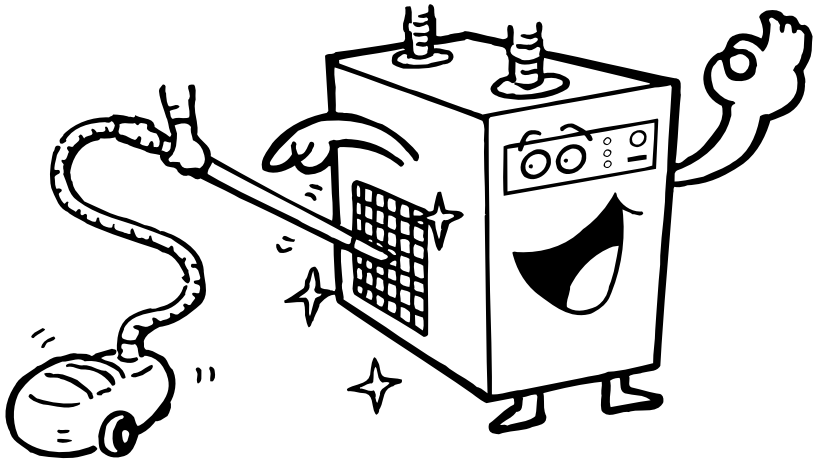
The needle pointer of the refrigerate pressure gauge approximately (1.5 kg/cm2-3 kg/cm2)





5.4.2

Every month we need to clean the side port by using vacuum cleaner, brushes, or air gun.



PRECAUTION

During the operation, if the thermometer points at the blue, overload is occurred. In normal operation, the pointer is in the green area.

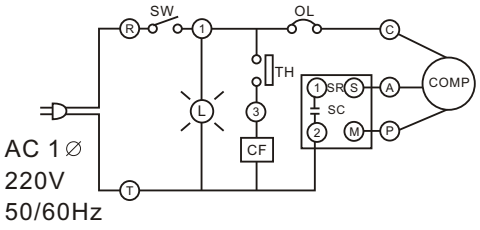
OVERLOAD

When overload occurred, indicator light will turned to yellow and the operation of the dryer is stop. Overload is occurred, if

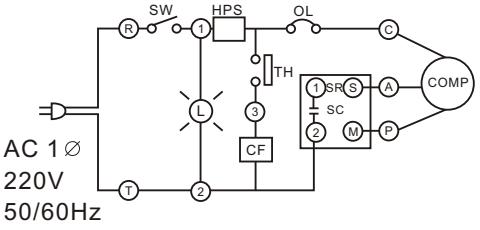
1. The temperature of the compressed air is high.
2. The quantity of flow is higher.
3. The ambient temperature is above 35^{o}C
4. Wall or full of dust blocks air comes in port at the side.

6. Wiring Diagrams

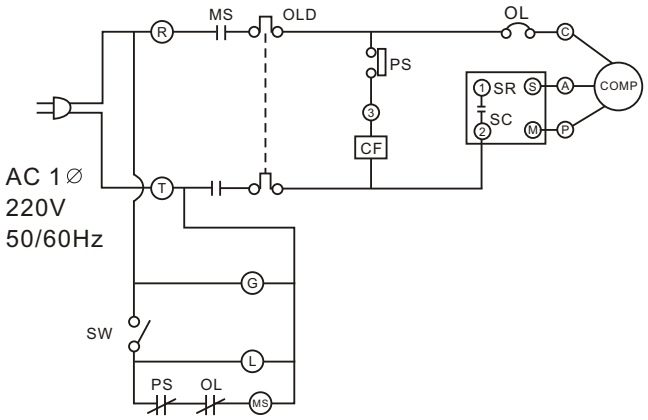
LD-5/10/15



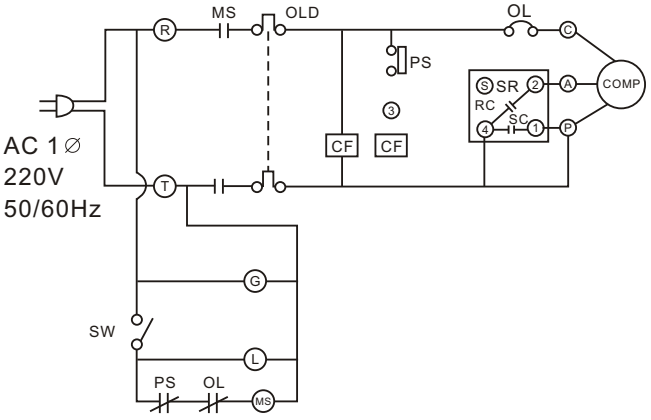
LD-20



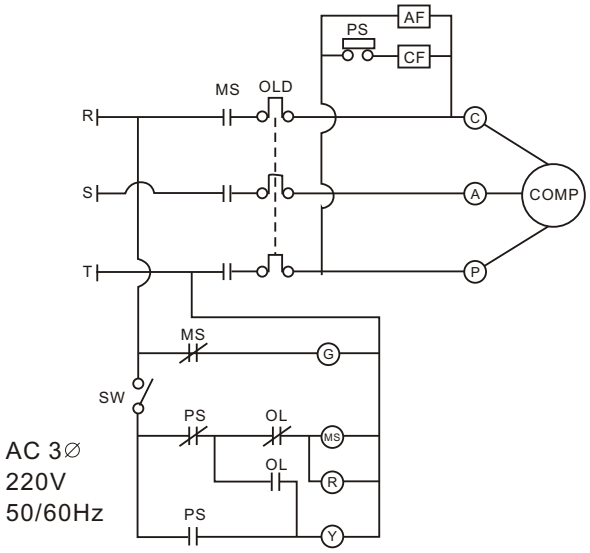
LD-30



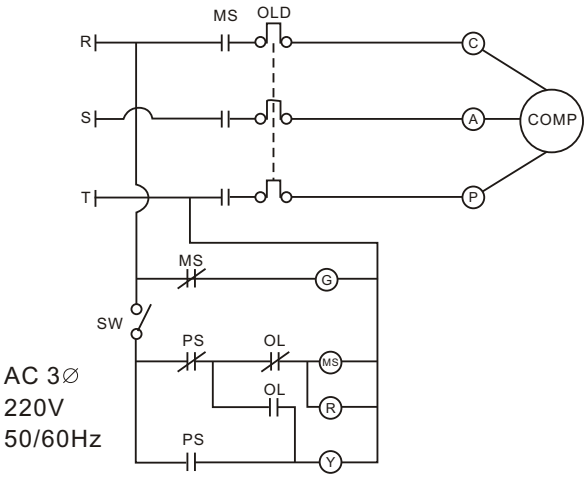
LD-50



LD-75~400(Air Cooled)



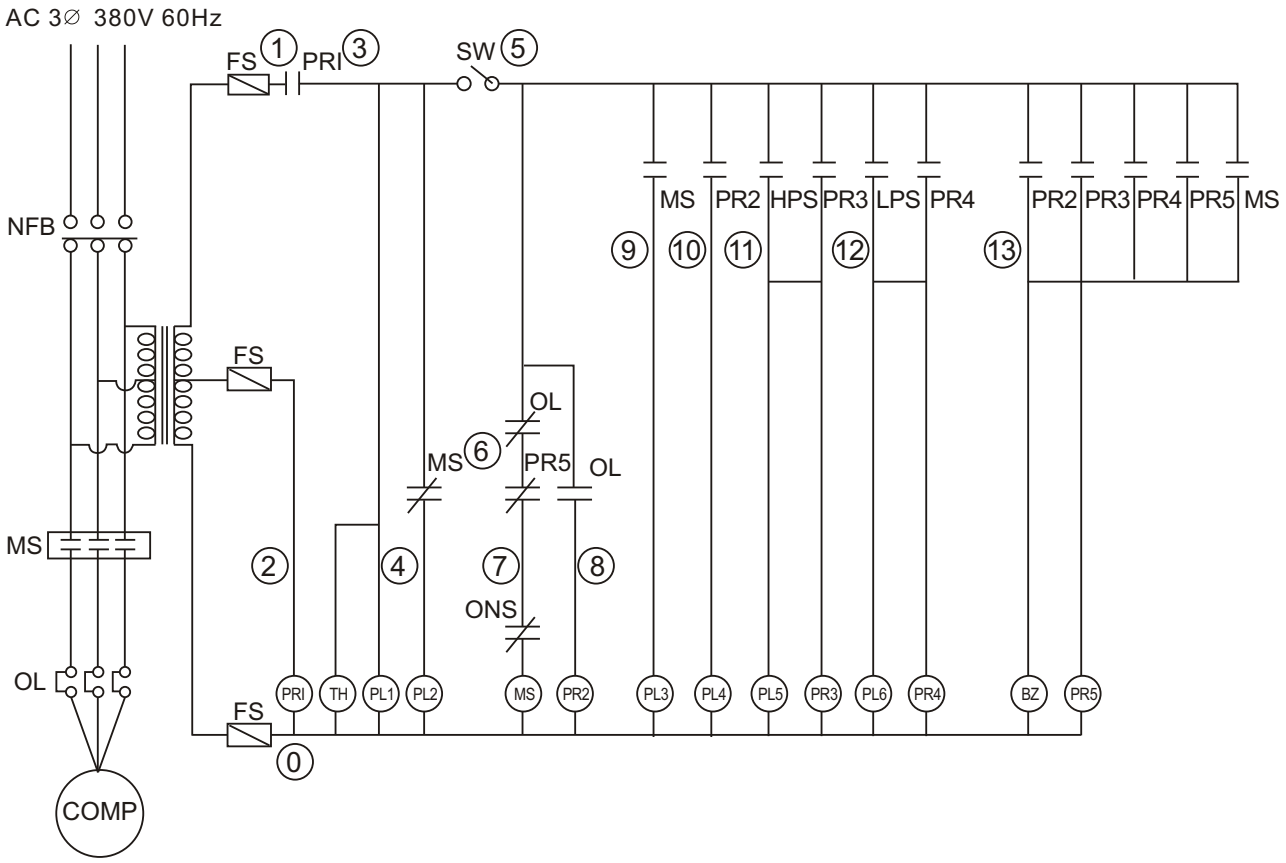
LD-75~600(Water Cooled)



COMP	Refriqerant compressor
AF	Air cooling fan motor
CF	Condenser cooling fan motor
SW	Power switch
HPS	High pressure protector
LPS	Low pressure protector
PS	Pressure control switch
OL	Over load
SR	Start relay

SC	Start capacitor
RC	Running capacitor
MS	Magnetic contactor
TH	Thermal switch
L	Switch with lamp
OLD	Overload relay
G	Power indicator
R	Operation indicator lamp
Y	Failures indicator lamp

LD-700 (Open System)

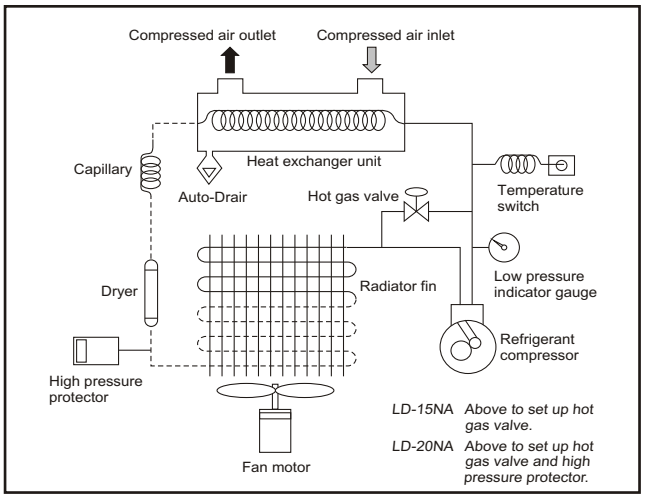


BZ	Breakdown alarm
C	Refrigerant solenoid valve
FS	Fuse
MS	Magnetic contactor
PL1	Power indicator lamp
PL2	Stop indicator lamp
PL3	Running indicator lamp
PL4	Overload indicator lamp
PL5	High temperature indicator lamp

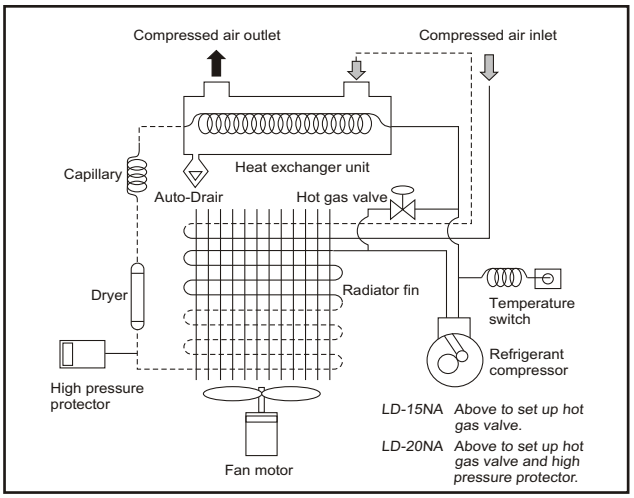
PL6	Lack of refrigerant indicator lamp
PR1	Lack of phase protector
NBF	Nofuse breaker
HPS	High pressure protector
LPS	Low pressure protector
ONS	Oil pressure protector
	Oil pressure switch heater

7. System Flowchart

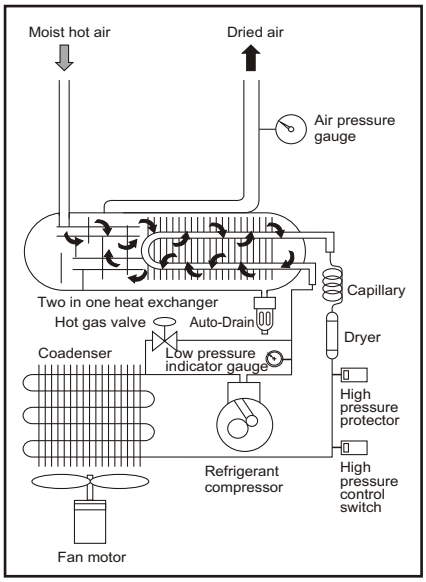
LD-05~20NA



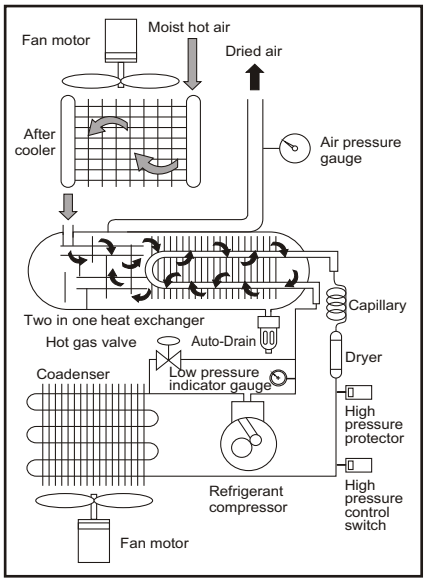
LD-05~20HA



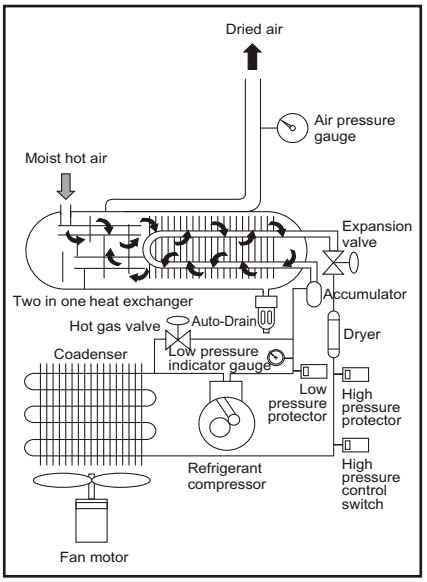
LD-30~100NA



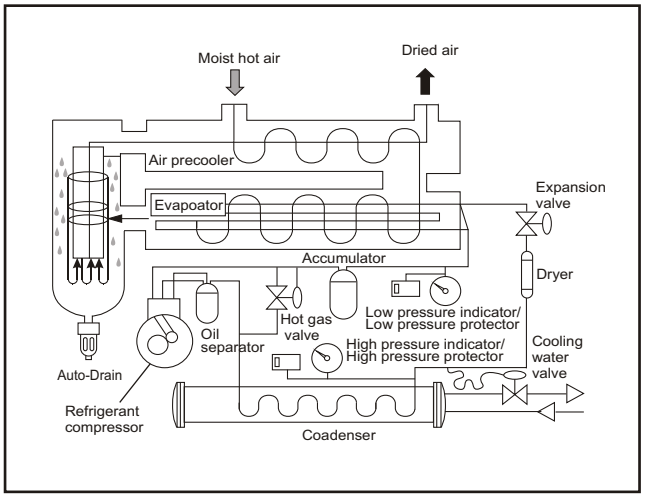
LD-30~100HA



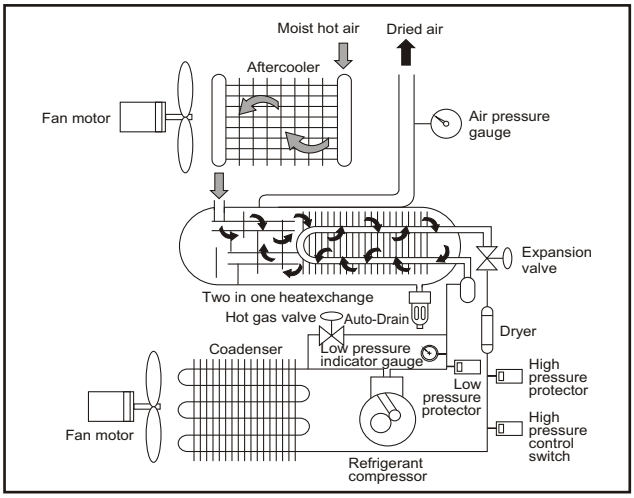
LD-150~300NA



LD-400W以上



LD-150~300HA



8. Troubleshooting

Breakdown of refrigerated type air dryer itself and those incurred by exterior factors can be listed into six factors and methods of elimination.

1. Difference of pressure is too large

Condition	Reason	Elimination of breakdown
Systematic error of piping	Valve gate of piping path is not fully opened	Open valve gate completely
	Piping diameter is too small	Enlarge piping diameter
	Piping path is too long and too much bending head and connectors	Redesign of piping path system
	More than two sets of air compressor and poor transfer	Redesign of piping path system
	Filter obstruction within piping path	Filter cleaning or replacement
	Too much leaking on the connection of piping path	Check up bending connector
Exceeding rated quantity of	Pressure is reduced naturally due to exceeding rated quantity of current over air compressor	1. Replace air compressor with A larger capacity 2. Reduce volume of air current
air treatment	Poor temperature switch or pressure switch	Replace
Condensed freezing water inside evaporator	Breakdown of expansion valve or hot gas by-pass valve	Replace
	Thermal diffusion set is exposed to direct breeze of cool wind	Improve ventilation

2. Poor drainage of air dryer

Condition	Reason	Elimination of breakdown
Extra-ordinary piping system	By-pass valve is not fully closed	Close by-pass valve tightly
	Air does not pass through dryer	Fully open valve gate of inlet of dryer
	Dryer is not placed horizontally on leveling	Adjustment
	Automatic drainer not aligned	Adjustment
Large volume of air	Too much reduction of pressure	Redesign air compressor power system
Extra-ordinary drainage system	Poor drainer or breakdown of automatic drainer	Clean or replace
	Front valve door of drainer is not fully open	Make sure to open valve door completely
Irregular indication of evaporation thermometer	Dew point temperature is too low or too high	Adjust capacity and height
	Too low temperature of environmental humidity and inlet	It does not matter. The dryer may be used continuously
	Inlet temperature is too high	Additional fixture of after cooler
	Drained path is higher than automatic drainer	Reinstall of draining pipe path
	Ambient environment air is dirty due to poor ventilation	Choose proper position or improve ventilation
	Leakage of freon, refrigerant efficiency is low	Diagnosis the leakage and add freon gas

3. Totally unable to operate

Condition	Reason	Elimination of breakdown
Is the electricity supply of power source normal	Fuse is burned down or switch skip non melt fuse	Check power source to see if it is lack of short circuit, grounding & check non-melt switch
	Line rupture	Find out the rupture and repair it
Have power source but can not start	Irregular voltage or wire of power source (large pressure reduction)	Do as indicated rating voltage on tag
	Poor switch	Replace
	Poor connector	Replace
	Poor over load relay	Replace
	Poor high and low pressure switch	Replace and reset R-134a 18kg/cm2, R-22 24kg/cm2
	Poor starting relay	Replace
	Poor capacitor Poor temperature switch and poor switch of	Replace Replace
	current volume	Replace
All switches are normal but are unable to start	Poor compressor High and low pressure do not set back after trip Electro-magnetic switch OL does not set back	Fund out reason of trip and reset Replace
	Poor compressor	

4. Poor operation after start

Condition	Reason	Elimination of breakdown
Irregular voltage	Short circuit of electric wire causing scorch	Redesign of circuit and switch
	odour soon after start	
Although high pressure is set back after skip, however, it is still unable to start	Poor pressure switch and fan is stopped	Replace pressure switch and reset R-134a 18kg/cm2 R-22 24kg/cm2
	Poor fan	Replace
	Over load and skip	Check relay
	Too much dust on condenser	Clean
Trip of overload relay	Poor starting relay	Replace
	Poor capacitor	Replace
	Poor pressure switch and fan is stopped	Replace
	Continuous start	Should keep 3 minutes interval between each start
	Over load of compressor Inlet temperature of dryer is too high or	When dryer is overload, reduce volume of air treatment
	ambient temperature is too high	Install additional cooler or enlarge horse power to improve ventilation
	Setting electric current value of relay is too low	Adjust electric current value
	Poor connection of relay	Adjust or replace it
	Power source	Fuse break or poor connection of power switch
	Poor connector and poor contacting point	Adjust or replace it

5. Operation is normal but the efficiency is not good

Condition	Reason	Elimination of breakdown
Too low indication of evaporating thermometer	Poor evaporating thermometer	Replace
	Breakdown of expansion valve or hot gas by-pass valve	Replace
	Freon leakage	Diagnosis leakage and add freon gas
	Freon obstruction	Replace dryer and vacuum
	Temperature switch or pressure switch setting is too low	Adjust setting of temperature
	Continuous running of fan	Temperature switch
Too high indication of evaporating thermometer	Inlet temperature is too high (over 45°C)	Fixing additional cooler or enforce horse power
	Ambient temperature is high	Fixing additional ventilation equipment
	Breakdown of expansion valve or hot gas by-pass valve	Replace
	Obstruction of condenser and poor ventilation	Wash and clean and improve ventilation of dryer
	Large volume of air treatment but pressure is low	Parallel circuit and additional installation of dryer
	Air suction and exhaust valve of freon compressor is worn off	Replace
Over load operation	Inlet temperature is too high (over 45°C)	Additional installation of cooler
	Air treatment volume is large but pressure is low	Parallel circuit and additional installation of dryer
	Freon leakage	Diagnosis the leakage and add freon gas

6. Poor automatic drainage system.

Condition	Reason	Elimination of breakdown
	Pressure application under 1.5 kg/cm2	The pressure under normal application for automation drainer is 2~10 kg/ cm2
	Obstruction of socket portion	Wash and clean
	Damage of drainer valve	Replace
	Damage of padding (tight)	Replace
	Automatic drainer broken	Rectify, fix or replace
	Obstruction of filter portion of drainer	Wash and clean
	Application pressure is too high	Please apply rated pressure of automatic drainer wash and clean
	Obstruction of draining exit	Wash and clean

Note:

※ Please note when wash and clean drainer, the application of eroding dissolvent such as petroleum, methyl benzene and rosin liquid etc. are strictly prohibited.

※ Please refer to the detail instructions of application and drawing of electric wire distribution for application and drawing of electric wire distribution for maintenance and repair on equal important position and to carry out the utmost function of refrigerated dryer.

GUARANTEE

We the manufacturer thank you to choose our products and will guarantee the unit against the following safeguards：

1. The unit is guaranteed for 12 months from date of delivery.
2. Providing the unit has been installed and operated in accordance with the instructions issued with the unit.
3. The guarantee is unsuitable for auto-drain, air filter...ect. Consumptive materials.
4. No responsibility for indirect damage.
5. The GUARANTEE has to be in safekeeping to protect your rights and interests.

PRODUCT：_____

MODEL：_____

SERIAL NR.：_____

DATE OF DELIVERY：_____

Q.C. APPROVED	
SUPERVISOR	INSPECTOR