WS RANGE

4, 5, 7, 11 and 15 kW

USER & PARTS MANUAL	E

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WARRANTY

Your SULLAIR compressor is guaranteed from the date of commissioning.

The warranty is only valid where the installation conditions and the conditions of use are respected, and where the maintenance operations set out in this manual are carried out.

The warranty is limited to the replacement of parts that are acknowledged as faulty by our services.

Your compressor has been factory tested and meets the operating conditions specified. Failure to respect these conditions may inflict abnormal effort or constraints on the machine.

Sullair Europe seminars are courses that provide hands-on instruction in the proper operation, maintenance and service of Sullair equipment. The seminars are recommanded for maintenance and service personnel.

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Chapter 1 Safety

1.1 General

Sullair Corporation and its subsidiaries design and manufacture all of their products so they can be operated safely. However, the responsibility for safe operation rests with those who use and maintain these products. The following safety precautions are offered as a guide which, if conscientiously followed, will minimize the possibility of accidents throughout the useful life of this equipment.

The compressor should be operated only by those who have been trained and delegated to do so, and who have read and understood this Operator's Manual. In certain cases, it may be necessary to follow Specific recommendations, or the presence of the manufacturer may be required.

Never start the compressor unless it is safe to do so. Do not attempt to operate the compressor with a known unsafe condition. Tag the compressor and render it inoperative by disconnecting and locking out all power at source or otherwise disabling its prime mover, so others who may not know of the unsafe condition, cannot attempt to operate it until the condition is corrected.

The compressor should be installed and used in compliance with the regulations, standards and directives in force in your country.

Do not modify the compressor and/or controls in any way except with written factory approval.

1.2 Personal protective equipment

Appropriate personal protective equipment should be selected according to working conditions.
Personal protective equipment is subject to European regulation (decrees 93-41 of 11/01/93, 92-765, 92-766, 92-768).

1.3 Pressure release

A. Do not use air tools that are rated below the maximum rating of the compressor. Select air tools, air hoses, pipes, valves, filters, and other fittings accordingly. Do not exceed manufacturer's rated safe operating pressures for these items.

B. Secure all hose connections by wire, chain or other suitable retaining devices to prevent tools or hose ends from being accidentally disconnected and expelled.

C. Open fluid filler cap only when compressor is not running and is not pressurised. Shut down the compressor and bleed the sump (receiver) to zero internal pressure before removing the cap.

D. Vent all internal pressure prior to opening any line, fitting, hose, valve, drain plug, connection or other component, such as filters.

E. Keep personnel out of line with and away from the discharge opening of hoses or tools or other points of compressed air discharge.

F. Use air at pressures less than 2.1 bar for cleaning purposes, and then only with effective chip guarding and personal protective equipment.

G. Do not engage in horseplay with air hoses as death or serious injury may result.

Check the operation of the relief valve of the separator, as indicated in its manual. Under no circumstances should you replace the valve with one set to a different relief pressure.

I. If the compressor is installed in an enclosed area, it is necessary to vent the relief valve to the outside of the structure or to an area of non-exposure.

1.4 Fire and explosion

A. Clean up spills of lubricant or other combustible substances immediately, if such spills occur.

B. When you check the level or add lubricant, first stop the compressor and let it cool down. Ensure that the compressor is not sited near any source of spark, flame or other source of ignition.

C. Do not permit fluids or fluid film to accumulate on, under, or around acoustical material, or on any external surfaces of the air compressor or on internal surfaces of the enclosure. If necessary, remove acoustical material, clean all surfaces and then replace acoustical material. Any acoustical material with a protective covering that has been torn or punctured should be replaced immediately to prevent accumulation of liquids or fluid film within the material. Do not use flammable solvents for cleaning purposes.

D. Disconnect and lock out all power at source prior to attempting any repairs or cleaning of the compressor or of the inside of the enclosure, if any.

E. Keep electrical wiring, including all terminals and pressure connectors in good condition. Replace any wiring that has cracked, cut abraded or otherwise degraded insulation, or terminals that are worn, discolored or corroded. Keep all terminals and pressure connectors clean and tight.

F. Keep grounded and/or conductive objects such as tools away from exposed live electrical parts such as terminals to avoid arcing which might serve as a source of ignition.

G. Remove any acoustical material or other material that may be damaged by heat or that may support combustion and is in close proximity, prior to attempting weld repairs.

H. Keep suitable fully charged fire extinguisher or extinguishers nearby when servicing and operating the compressor.

I. Keep oily rags, rubbish, leaves, litter or other combustibles out of and away from the compressor.

J. Only use the compressor if optimal functioning of its cooling system can be ensured. Check that there is nothing obstructing the cooling air flow. Also check that the compressor is running with the appropriate quality of lubricant and that this lubricant is not contaminated in any way.

K. Do not attempt to operate the compressor in any classification of hazardous environment unless the compressor has been specially designed and manufactured for that duty. In particular, the compressor is not designed to run in an explosive environment.

1.5 Moving parts

A. Keep hands, arms and other parts of the body and also clothing away from couplings, fans and other moving parts.

B. Do not attempt to operate the compressor with the fan, coupling or other guards removed.

C. Wear snug-fitting clothing and confine long hair when working around this compressor, especially when exposed to hot or moving parts.

D. Keep access doors, if any, closed except when making repairs or adjustments. These operations must be carried out by qualified personnel.

E. Make sure all personnel are out of and/or clear of the compressor prior to attempting to start or operate it.

F. Disconnect and lock out the mains supply before making any repairs or adjustments.

G. Keep hands, feet, floors, controls and walking surfaces clean and free of fluid, water, or other liquids to minimize the possibility of slips and falls.

1.6 Hot surfaces, sharp edges and sharps corners

A. Avoid bodily contact with hot fluid, hot coolant, hot surfaces and sharp edges and corners.

B. Keep all parts of the body away from all points of air discharge.

C. Wear personal protective equipment including gloves and head covering when working in, on or around the compressor.

D. Keep a first aid kit handy. Seek medical assistance promptly in case of injury. Do not ignore small cuts and burns as they may lead to infection.

1.7 Toxic and irritating substances

A. Do not use the air supplied by the compressor for respiratory purposes (respirators), unless you are certain of being in full compliance with all the regulations, standards and directives in force in your country.

DANGER !!
Death or serious injury can result from inhaling compressed air without using proper safety equipment.

B. Operate the compressor only in open or adequately ventilated areas.

C. Locate the compressor or provide a remote inlet so that it is not likely to ingest exhaust fumes or other toxic, noxious or corrosive fumes or substances.

D. Coolants and lubricants used in this compressor are typical of the industry. Care should be taken to avoid accidental ingestion and/or skin contact. In the event of ingestion, seek medical treatment promptly. Wash with soap and water in the event of skin contact. Consult the compressor operator's manual lubrication section for information pertaining to compressor fluid fill.

1.8 Electrical shock

A. The compressor should only be installed in compliance with all the regulations, standards and directives in force in your country, particularly as concerns the ground connection. This installation should only be carried out by personnel trained, qualified and designated for this work.

B. Never touch (with the body, a tool or with any other conductive object) any live part of the electrical power supply.

C. Attempt repairs in clean, dry and well lighted and ventilated areas only.

D. Do not leave the compressor unattended with open electrical enclosures. If necessary to do so, then disconnect, lock out and tag all power at source so others will not inadvertently restore power.

E. Disconnect, lock out, and tag all power at source prior to attempting repairs or adjustments to rotating machinery and prior to handling any ungrounded conductors.

F. Dry test all shutdown circuits prior to starting the compressor after installation.

G. Make sure a circuit breaker is installed on the general power supply of the machine.

1.9 Lifting

Find out the total weight of the machine before any handling.

The compressor must only be lifted by people authorized to do it.

A. The compressor should only be lifted with:

- a forklift truck, using the holes located in the frame intended for this purpose;
- a lifting beam. The lifting beam should be used with an overhead travelling crane or an suitable crane, and with slings.

In every case, the compressor should only be lifted in compliance with the regulations, standards and directives in force in your country.

B. Inspect points of attachment for cracked welds and for cracked, bent, corroded or otherwise degraded members and for loose bolts or nuts prior to lifting.

C. Make sure entire lifting, rigging and supporting structure has been inspected, is in good condition and has a rated capacity of at least the weight of the compressor. If you are unsure of the weight, then weigh compressor before lifting.

D. Make sure lifting hook has a functional safety latch or equivalent, and is fully engaged and latched on the bail or slings.

E. Use guide ropes or equivalent to prevent twisting or swinging of the compressor once it has been lifted clear of the ground.

F. Do not attempt to lift in high winds.

G. Keep all personnel out from under and away from the compressor whenever it is suspended.

H. Lift compressor no higher than necessary.

I. Keep lift operator in constant attendance whenever compressor is suspended.

J. Set compressor down only on a level surface capable of safely supporting at least its weight and its loading unit.

K. When moving compressors by forklift truck, utilise fork pockets if provided. Otherwise, utilise pallet if provided. If neither fork pockets or pallet are provided, then make sure compressor is secure and well balanced on forks before attempting to raise or transport it any significant distance.

L. Make sure forklift truck forks are fully engaged and tipped back prior to lifting or transporting the compressor.

M. Forklift no higher than necessary to clear obstacles at floor level and transport and corner at minimum practical speeds.

N. Never attempt to lift the compressor using the lifting eye supplied with any part of the compressor.

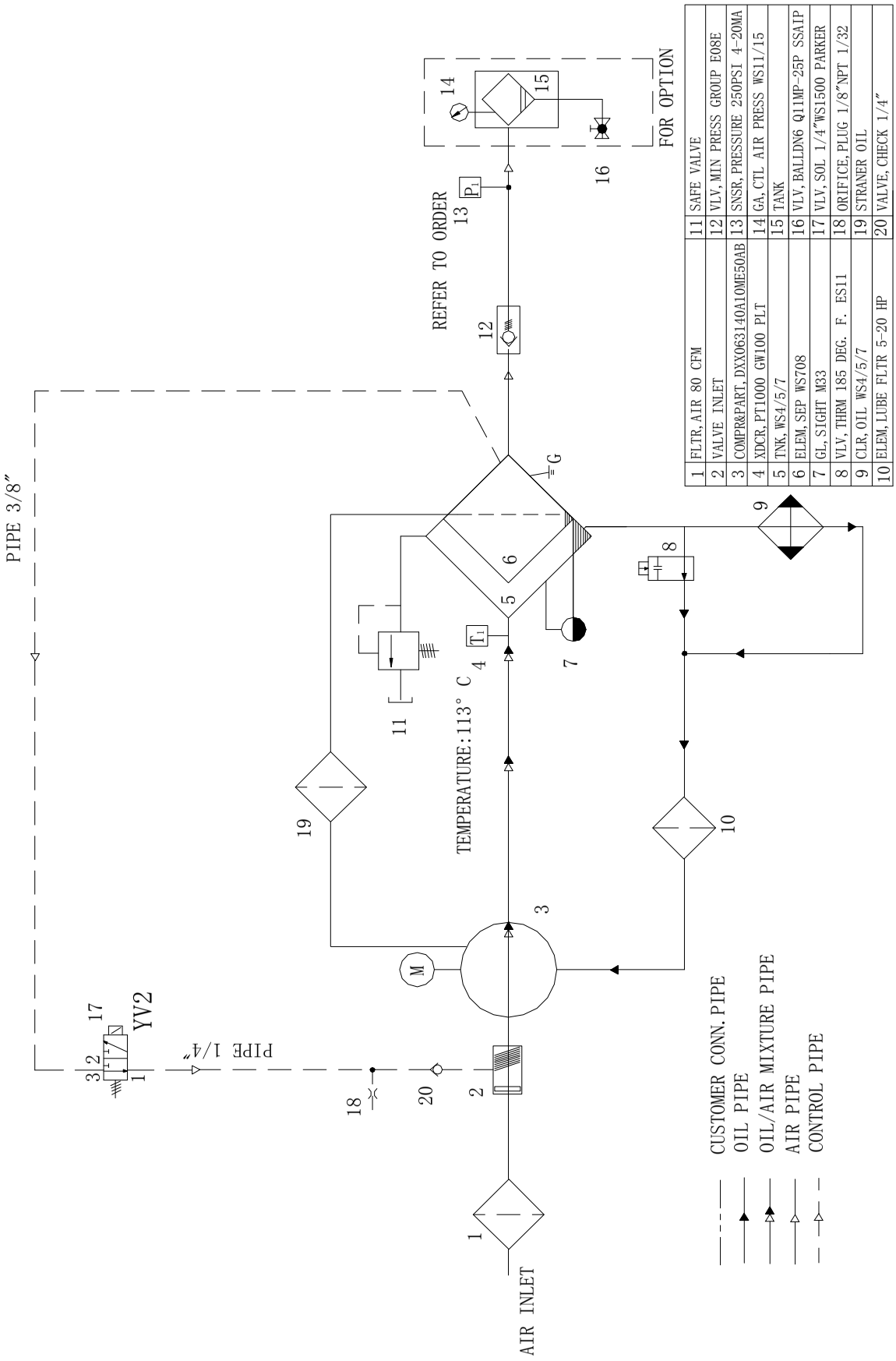
Chapter 2. Compressor

2.1 General Description

This type of compressor is a single-stage, oil-injected, air-cooled and motor-driven stationary screw compressor. The unit primarily consists of the compressor unit, motor, air/oil separator, oil cooler, aftercooler (depending on the model), cooling fan assembly and base, and is enclosed in a sound attenuating housing. On one side of the housing, there is electrical control cabinet.

Table1：Main Parameters Of WS0400、WS0500、WS0700 Compressors

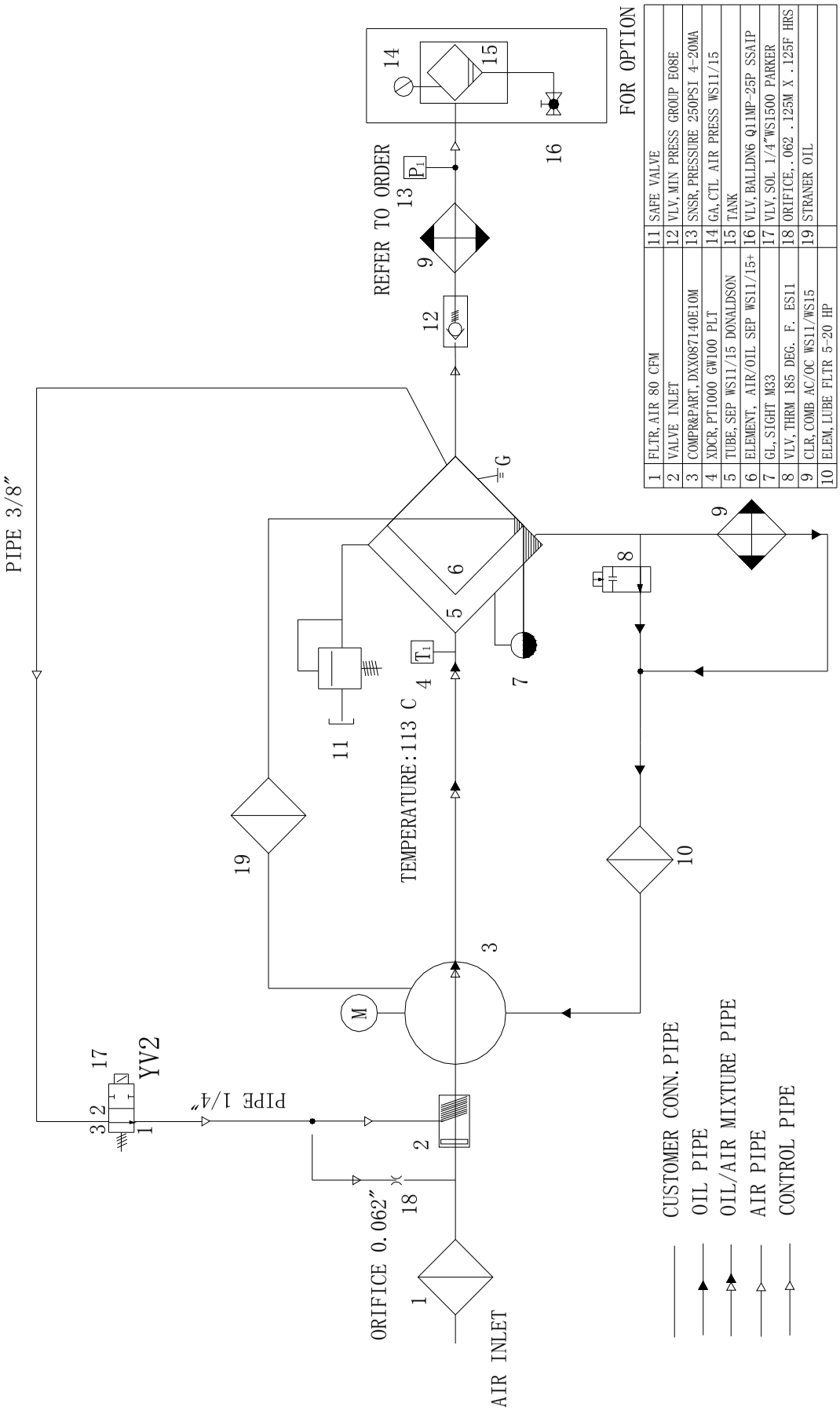
Model		WS0400 50hz	WS0500 50hz	WS0700 50hz		
Full Load Pressure	bar	10	10	8	10	13
Capacity At Full Load Pressure	cfm	17.6	27.4	37.8	37.4	33.2
	m^3/min	0.5	0.775	1.07	1.06	0.94
Weight	Kg	228	238	248		
Arrangement Plan	L×W×H（mm）without Air/Fluid Receiver	826×546×938				
Driver System	Belt Transmission	2 -XPZ	2 -XPZ	2 -XPZ		
Volume Of Oil	liter	4.0	4.0	4.0		
Noise Level	dB(A) @ 1m	64± 3	65± 3	66± 3		
Size Of Discharge Connection	BSPP	Rc 3/4	Rc 3/4	Rc 3/4		
Motor	HP/kW	5 / 4	7.5 / 5.5	10 / 7.5		
	RPM 50Hz	2930	2940	2940		
	IP	55	55	55		
	Starter Type	Full – Voltage	Full – Voltage	Y-△		
Oil		Sullube	Sullube	Sullube		



Fig, 3 System Schematic Diagram of WS0400、WS0500、WS0700 Compressor Units

Table 2 ： Main Parameters Of WS1100、WS1500 Compressors

Model		WS1100 50hz			WS1500 50hz		
Full Load Pressure	bar	8.0	10.0	13.0	8.0	10	13
Capacity At Full Load Pressure	cfm	63.6	55	43	80.6	72.4	60
	m^3/min	1.8	1.55	1.22	2.28	2.05	1.7
Weight	Kg	350			365		
Arrangement Plan	L×W×H（mm）without Air/Fluid Receiver	998×618×1035			998×618×1035		
Driver System	Belt Transmission	3 -XPZ			3 -XPZ		
Volume Of Oil	Liter	5.0			5.0		
Noise Level	dB(A) @ 1m	66± 3			68± 3		
Size Of Discharge Connection	BSPF	Rc 1			Rc 1		
Motor	HP/kW	15 / 11			20 / 15		
	RPM 50Hz	2940			2940		
	IP	55			55		
	Starter Type	Y-△			Y-△		
Oil		Sullube			Sullube		



Fig, 6 System Schematic Diagram of WS1100、WS1500 Compressor Units

2.2 Transmission System

In the compressor unit there are two counter rotating. The male rotor has four lobes and the female rotor has six lobes. The motor drives the male rotor and then the male rotor drives the female rotor, the two rotors rotate together. As the rotors intermesh, they reduce the volume of trapped air, so the air sucked through the air filter is compressed. When the inter-lobe space reaches the air outlet of the compressor, the compressed air is discharged and is delivered to the separator tank, where the air is separated from the oil.
The air discharged from the separator then flows through the minimum pressure valve, aftercooler (depending on the model) and then is delivered to the outside of the compressor package to be used by customer.
The separated lubricating oil settles at the bottom of the separator tank and under a pressure difference, returns to the working chamber of the compressor after cooling.

Transmission system consists of motor, compressor head, belt, belt pulley, and other parts allowing belt adjustment. The combination of the same compressor head and different belt pulley makes up different model of compressor unit. Refer to fig.7 &fig.8.

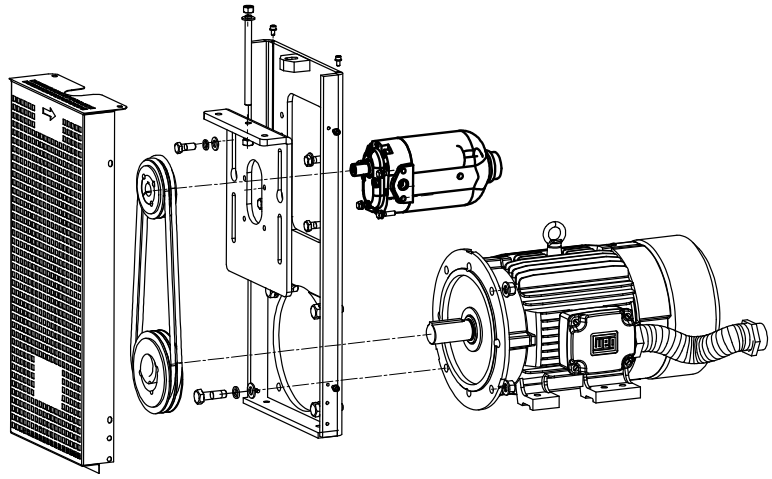
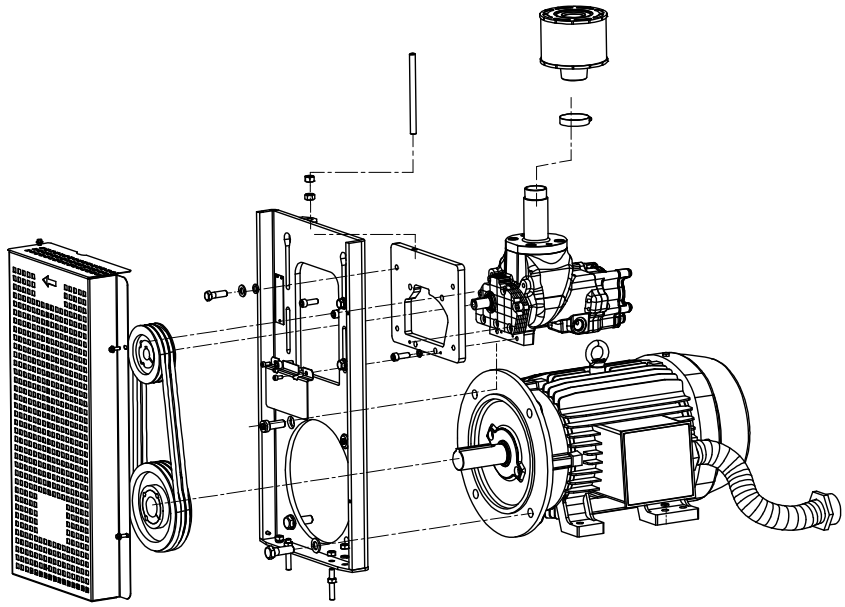


Fig7, transmission system of WS0400、WS0500、WS0700 compressor units



Fig,8 transmission system of WS1100、WS1500 compressor units

2.3 Air Suction System

The air inlet system mainly consists of air filter, air supply hose, inlet valve and compressor, (fig.9 & fig.10).
When the unit operates, air is sucked through the air filter inlet and after it is filtered, the air enters the compressor working chamber through the open inlet valve, where the rotors rotating at high speed compress the air. When the

inter-lobe space is connected with the discharge outlet, it is discharged to the separator tank.
The function of the air filter is to filter the suction air to ensure that clean air is supplied to the compressor.
The inlet valve is used to control the suction air volume.

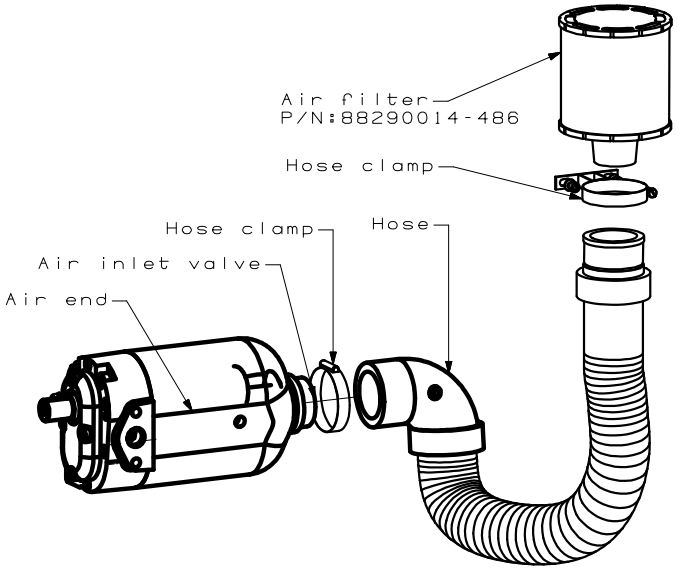


Fig.9 Air Suction System Of WS0400、WS0500、WS0700

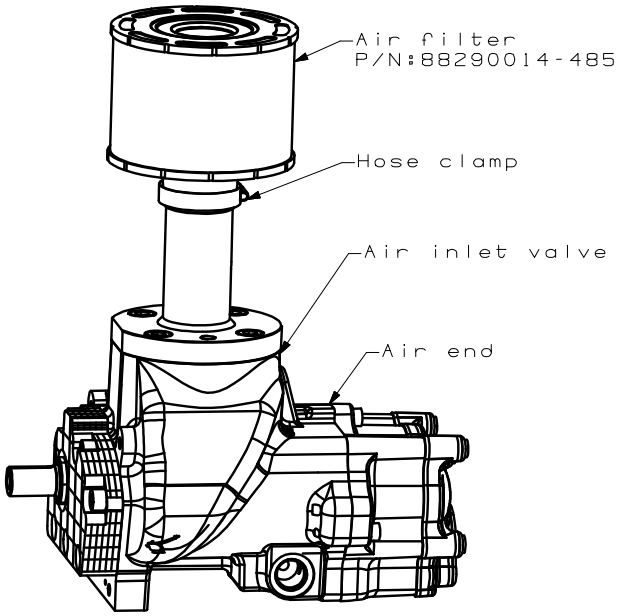


Fig.10 Air Suction System Of WS1100、WS1500

2.4 discharge system

The discharge system consists of the compressor, air/oil separator, aftercooler (only WS1100, WS1500) and connecting piping.
The separated compressed first flows through the minimum pressure valve and the aftercooler, and then drained to the outside of the compressor unit for customer use.

Warn

The dismantle operation is forbidden when compressor is running or with pressure in it. If necessary, shut down the compressor, cut off the electric power and evacuate all interior pressure.

2.5 Lubrication System

The lubrication system consists of the compressor, air/oil separator tank, oil cooler, oil filter and corresponding connecting piping.
The lubricating oil in the air/oil separator tank flows through the thermal valve and into the oil cooler. Cooled lubricating oil flows through the oil filter and into the working chamber of the compressor and is compressed together with the suction air. Then the lubricating oil is discharged to the outside of the compressor unit and flows into the air/oil separator tank, thus an operating cycle is completed.
The lubricating oil has the following three main functions:
(1) Cooling. The lubricating oil injected into the compressor can absorb most of the heat generated in the compression process of the air and thus cool down the compressed air.
(2) Lubricating. The lubricating oil forms an oil film layer between the two rotors to avoid direct contact between the male rotor and female rotor and thus prevents wearing on the rotor profiles.
Besides, the lubricating oil lubricates the bearings and gears.
(3) Sealing. The lubricating oil has specified viscosity and can fill in the gap between the rotors and between the rotor and housing, and thus reduces the leakage loss occurring in the unit and increases the volumetric efficiency of the compressor.

2.6 Cooling System

The cooling system consists of compressor lubrication oil cooling and compressor unit cooling. Cooling components include cooler, axial fan and motor fan.
The cooling air is supplied to the inside of the compressor unit through the louvers behind the motor. Most part of the cooling air goes through the axial fan, while the other part of air is sucked into main motor bypass the motor baffle, and then into the axial fan. At last the cooling air, pressured by the axial fan, is discharged to outside of the compressor unit through the louvers on the top of the enclosure.

2.7 Air/Oil Separation System

2.7.1 Function of the Air/Oil Separation System

The air/oil separation system consists of the tank and separator element. It has the following four functions:
(1) Used as primary separator
After air/oil mixture coming from the compressor enters the air/oil separator tank, and under the action of gravity, most of the oil in the air settles at the bottom of the separator tank.
(2) Used as an oil reservoir for the compressor, storing the lubricating oil.
(3) Used for installation of the separator element.
After the air/oil mixture enters the separator tank and air is separated from oil, it flows through the separator element so that the residual lubricating oil existing in the compressed air is separated from the air and accumulates at the bottom of the element. Then it returns to the compressor unit through the oil return line and is sucked into the working chamber.
(4) Used for stabilizing the pressure.
Since there is some air already stored in the receiver tank, the oil/air separator can effectively reduce pressure fluctuations in the user's pipeline and thus make the delivery pressure steady.

2.7.2 Replacement of Air/Oil Separator Element

Since foreign matter enters the oil line system through the compressor inlet, clogging is caused after the separator element has been in service for some time. This will increase the resistance when air flows through the element and affect normal operation of the unit. Therefore, the separator element should be replaced in time when an alarm signal is displayed on the monitor panel.
Note: the separator element should be replaced instead of being reconditioned.

2.7.3 Oil Fill Port and Level Sight Glass

There is an oil fill port and level sight glass on the side of the separator tank.
Since discharged compressed air contains a tiny amount of compressor oil, the oil level in separator tank will decrease after the compressor runs for some period, and adding oil will be necessary. If the oil level can be observed through the sight glass when the compressor runs at full load, the oil level is normal.

2.8 Air Volume Regulating System

The regulating system can adjust the suction air volume of the compressor according to the required air consumption. This system includes a solenoid valve, pressure regulator and inlet valve.
If the air consumption is equal to rated discharge capacity of the unit, the unit will run at full
load, and in this case the inlet valve regulating the suction air volume will be fully open.
If the air consumption is less than rated discharge capcity of the unit, this regulating system will automatically

regulate the position of the inlet valve and reduce the suction air volume accordingly to match demand. Refer to fig.12.
If the user does not consume the compressed air, the inlet valve will be closed automatically to stop air suction. In this case the unit will unload and deliver no air. Refer to fig.11.
Fig.11 & fig.12 showed the Air Volume Regulating System of WS1100, WS1500 compressor unit, and WS0400, WS0500, WS0700 compressor worked the same way.

2.9 Microcomputer Contpulley

This compressor is provided with a standard microprocessor contpulley. Refer to the “User’s Manual for MCC Microprocessor Contpulley I” (88290016-034) for the instructions for the contpulley.

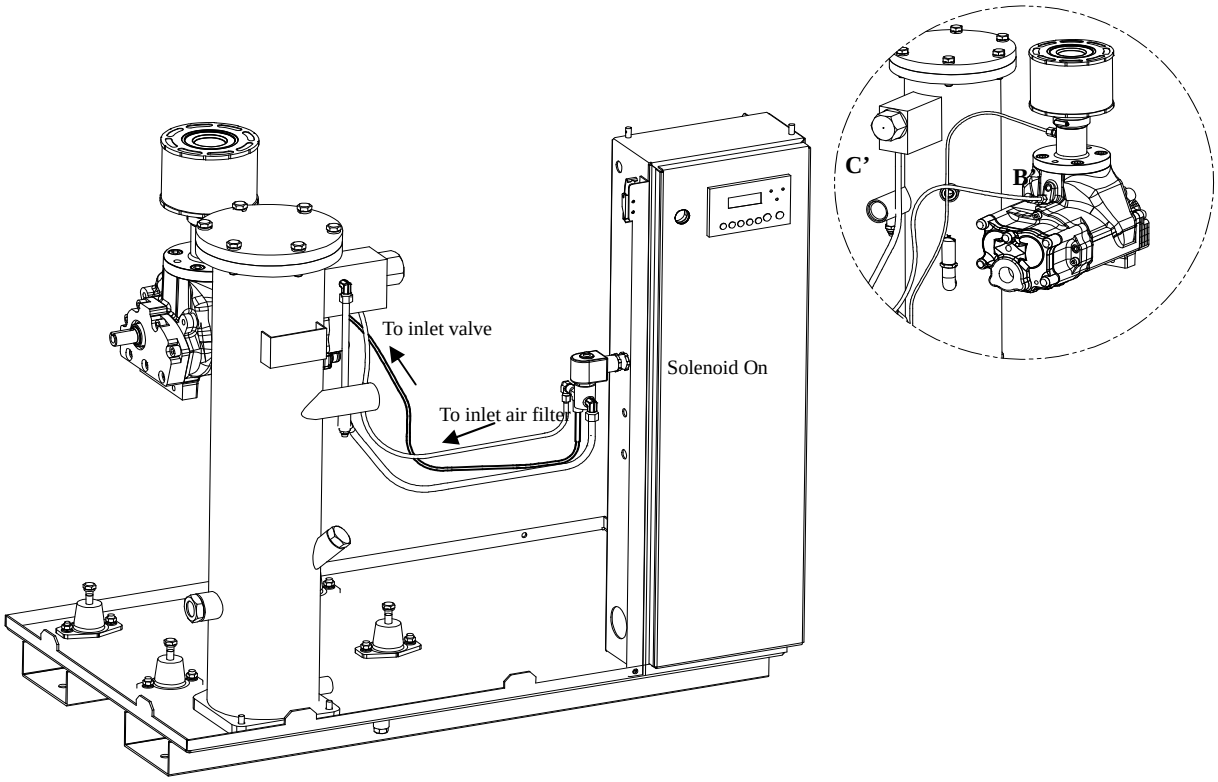


Fig.11 unloading condition

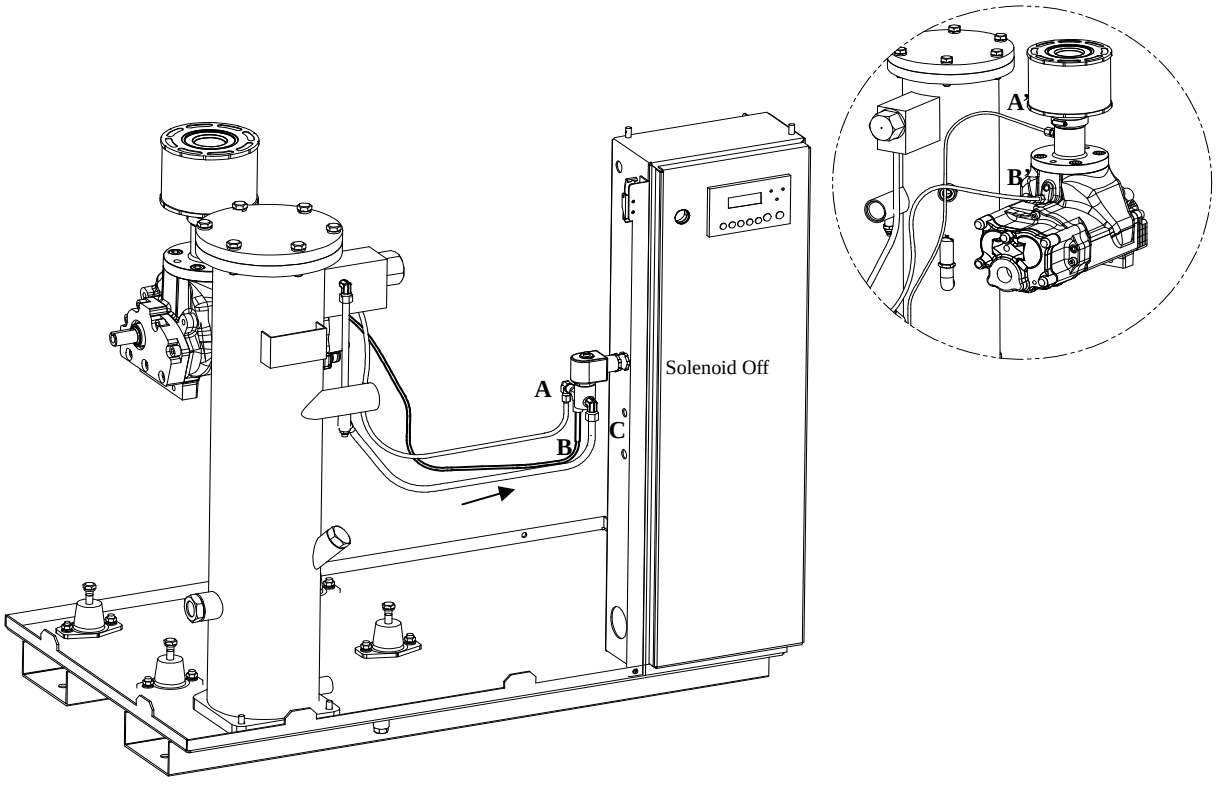


Fig.12 loading condition

Chapter 3. Compressor Installation

3.1 Mounting Foundation

The compressor should be mounted on a firm, solid and flat foundation, and must be placed firmly and in uniform contact on a level foundation surface in order to prevent possible vibrations.
Any load of connection line is not allowed being delivered to air/fluid junction of the units.

3.2 Ventilation and Cooling

In order to ensure normal operation of the compressor, the machine house must be well ventilated and room temperature must not exceed 40℃. There must not be any obstructions within at least one meter around the compressor and above its top to ensure good ventilation and easy maintenance. Besides, the machine house should be designed to have ambient temperature of 5℃ or higher.
Ventilation air ducts should be arranged according to actual conditions.
If you install a ventilation air duck on the top of the cooler to draw off the cooling air towards the outside of the building (or elsewhere), you will reduce the effectiveness of the cooling action. Two situations can then occur:

- either your conduit will create pressure loss on the ventilation air, which will alter the cooling action. In this case, you should install a fall in the conduit in order to draw off the ventilation air correctly.
- or your conduit will not create enough pressure loss on the cooling air to reduce its effectiveness. In this case, the compressor fan is enough to draw off the air in the conduit and you do not require an extra fan.

Whether or not you need to install an extra fan depends entirely on the conduit installed (length, shape, etc.).

3.3 Air Supply

Air supply connector of WS0400, WS0500 and WS0700 unit is Rc3/4 internal thread.
Air supply connector of WS1100 and WS1500 unit is Rc1 internal thread.

3.4 Check Belt Transmission

User should check belt tension before the first time of start.

3.5 Check the Volume of Lubrication Oil

In order to reduce maintenance work and cost, compressors supplied by Sullair are tested and long-life lubricating oil is filled into them before shipment
There is a sight glass on the air/oil separator. When compressor running on full load, it is abnormal if the oil level is observed or lower than the sight glass. Then user should stop the compressor and fill oil until oil level is equal to oil filler.

3.6 Check the Electric Source

Before start, check whether the electric source corresponds with the nominal voltage of the compressor.
Also check that there is a manual circuit breaker for your electrical supply.

3.7 Rotation Direction of the Motor

After the power supply for the compressor unit is turned on, check whether the motor rotates in the direction indicated on the motor/compressor adapter, and check whether the fan blades rotate in the direction indicated on the fan cover.
Check the rotation direction of the motor using the following the steps below: press Start key) and then immediately press Stop key. Let the motor run for a while. If it rotates in the direction indicated by the arrow on the motor/compressor adapter, the terminal connections are correct. If the rotation is incorrect, the power supply should be turned off and any two power lines should be exchanged. After connections are completed, start the motor to run once again.

WARNING
The motor should never rotate in the reverse direction!

3.8 Dismantle Transport Reinforcement

In the WS0400, WS0500 and WS0700 units, the base plate and compressor head mounting plate connected by a fixed plate and 3 screws (painted in red), to prevent the intensively librating of compressor head mounting plate.

In the WS1100 and WS1500 units, 2 thread stalks and nuts (painted in red) connect the base plate and compressor head plate also to prevent the intensively librating of compressor head mounting plate.
For this operation, protective frame must be dismantle.

These standard fastening pieces should be dismounted before the first time starting.

Fig.13 The Configuration And Installation Diagram Of WS0400, WS0500 And WS0700 Compressor

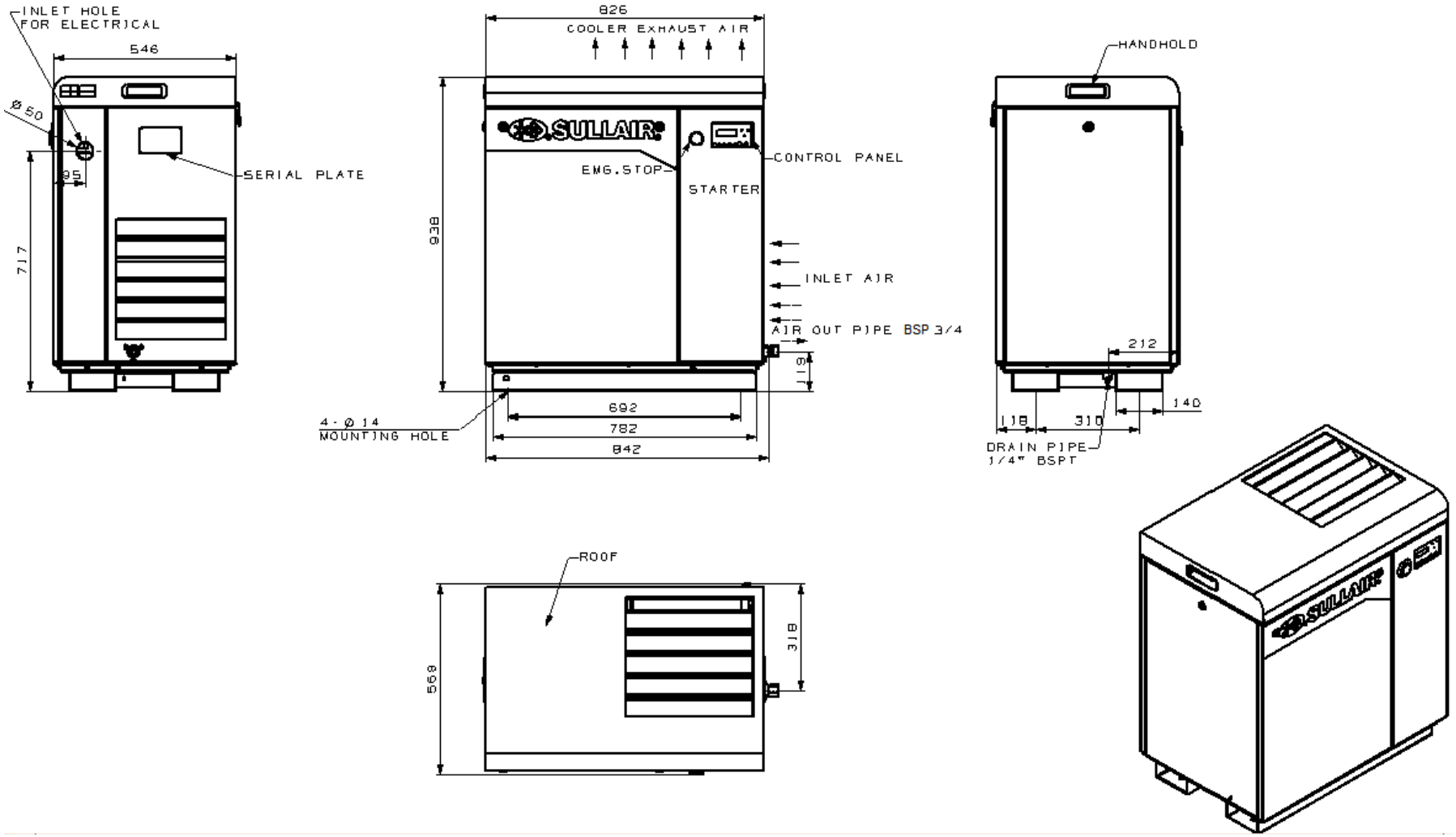
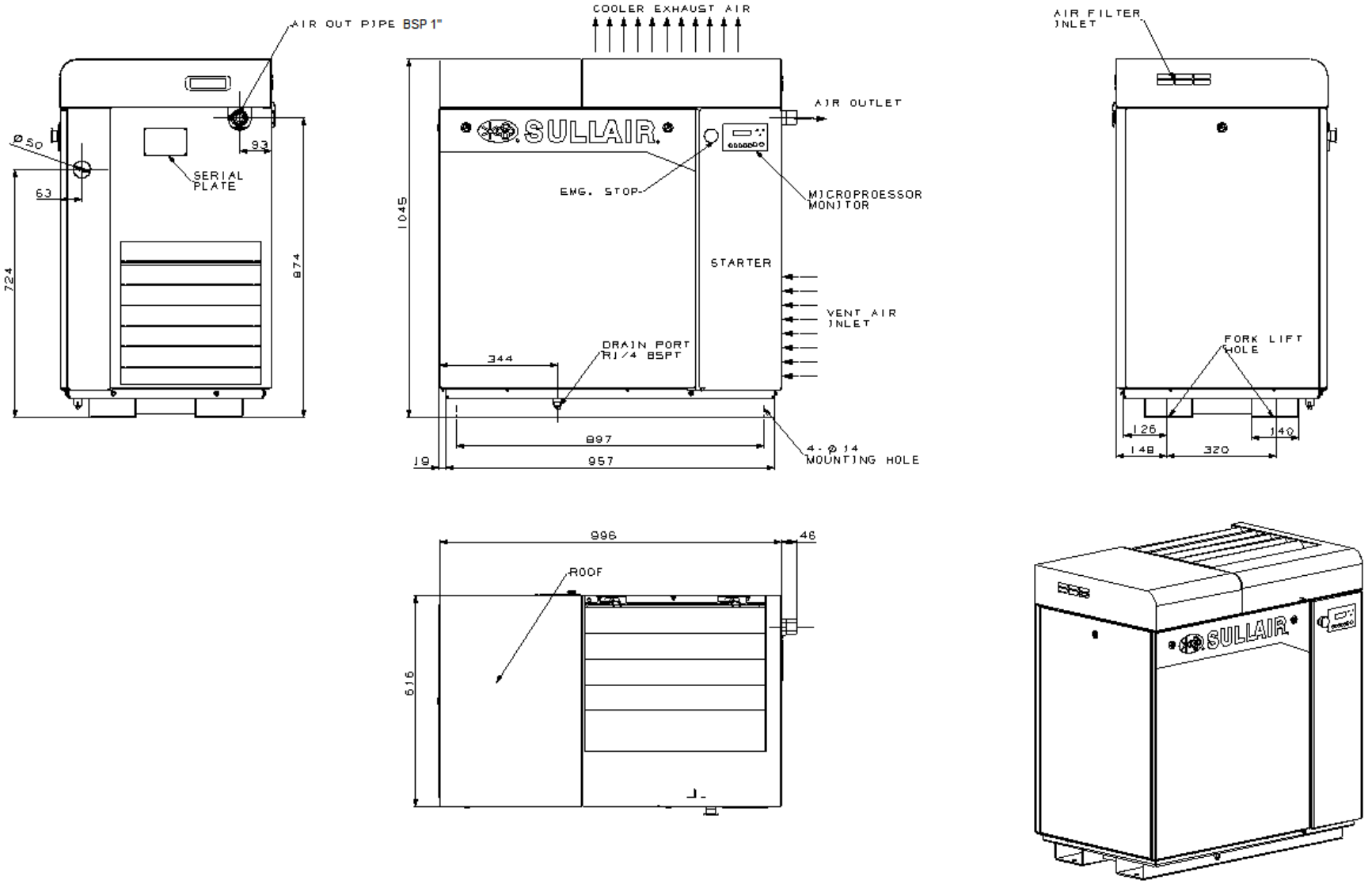


Fig.15 For The Configuration And Installation Diagram Of WS1100, WS1500 Compressor Unit



Chapter 4. compressor operation

4.1 Safety Rules for Operation

In order to avoid personal injury or/and equipment damage and accidents, users should define detailed set of safety rules for the compressor operation. The following rules are provided for user reference.
(1) The operators should be trained thoroughly and read through and understand this manual before operating the unit;
(2) The machine should be installed, used and operated according to the national and local related laws and regulations of the country;
(3) It is strictly prohibited to modify the construction and control mode of the machine unless approved in writing by the manufacturer;
(4) Shut down the machine immediately in case of any unusual conditions, and switch off all the power supplies;
(5) There should not be any inflammable, explosive, toxic or corrosive gases around the machine;
(6) Before any maintenance or adjustment, the machine must be stopped, internal pressure must be released completely and its power supply must be turned off;

4.2 Preparations Prior to Initial Startup

(1) Check if the electrical connections are safe, firm and steady;
(2) Observe the oil level separator tank. Normal oil level can be seen through the sight glass; (3) If ventilation air duct is installed, ensure that the inside of ventilation air duct is clean and unblocked;
(4) Open the discharge shutoff valve;
(5) Turn on the power supply. Start the compressor and stop it immediately after it is started. Check whether the motor rotates in the correct direction (see 3.7)
(6) Start the compressor again. Close the shutoff valve slowly and check if the unloading pressure is compliant with the setting.
(7) Check if all the systems operate normally and if there are any oil, air or water leaks or any unusual noises;
(8) If the ambient temperature is very low, users should increase the room temperature to a value higher than 0℃ so that the machine can start up and operates normally;
(9) Open the discharge shutoff valve;
(10) Stop the compressor.

4.3 Normal Operation

The new compressor can be put into normal operation after it is inspected by the above procedures for initial startup. Before it is started, first check its oil level and start the compressor.

4.4 Shutdown

By pressing “O” key, the compressor can be shut down.

Chapter 5 Maintenance

5.1 General Description

This compressor requires minimal maintenance work. The air filter, oil filter and air/oil separator element are monitored by the microprocessor contpulley. If any of them need maintenance, the microprocessor will send corresponding maintenance signal, which will be displayed through the LED on the panel system diagram.

Warn

All the power switches must be turned off before any maintenance or cleaning is carried out within the unit. Do not carry on any dismantle work if the compressor is running or there is pressure in compressor. Before dismantle, make sure to shut down the compressor, release all interior pressure and close shut of valve. It is necessary to use the parts supplied by Sullair for the compressor and follow the manual during maintenance. It is prohibited to use parts of different brands. Otherwise, all the warranty services of Sullair will become invalid automatically.

5.2 Dismantle and Install Frame

The frame of this compressor is designed to be well soundproof, simplified in exterior board quantity, easily dismantled and maintained. When customers dismantle the frame, please follow the order showed in following diagram.

For WS0400, WS0500, WS0700 units:

- dismantle frame: ①→②→③→④→⑤→⑥
- install frame: ⑥→⑤→④→③→②→①

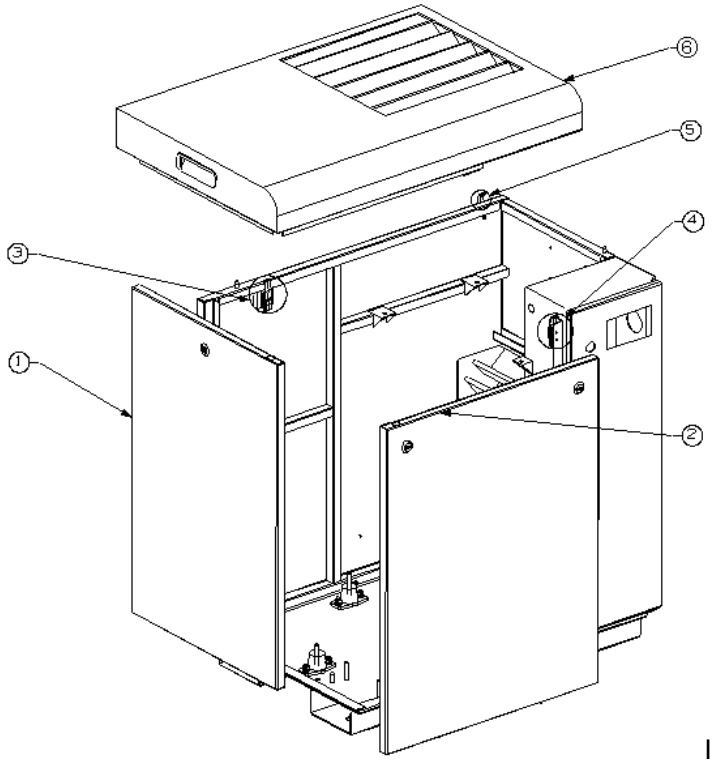


Fig17. Dismantle & Install Sequence Diagram For WS0400、WS0500、WS0700

For WS1100、WS1500 units:

- dismantle frame: ①→②→③→④→⑤→⑥;
- install frame: ⑥→⑤→④→③→②→①。

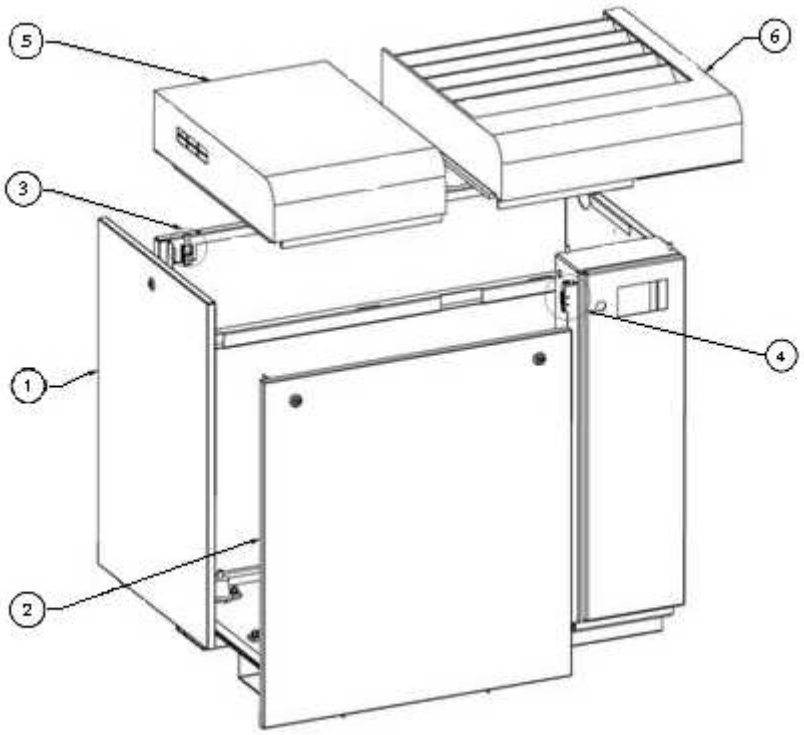


Fig18. Dismantle & Install Sequence Diagram For WS1100、WS1500

5.3 Maintenance and Release Pipeline Pressure

If the compressor is stopped, the solenoid valve send back compressed air to air filter and the air/oil separator evacuates until the internal pressure equals zero.
The line pressure after minimum pressure valve is showed on contpulley in order user to check if the pressure equals zero before maintaining the pipeline after minimum pressure valve.
If the solenoid valve is out of order, the air/oil separator can not be evacuated. At this time, it is very dangerous to dismantle the air line and oil line before minimum pressure valve. Make sure the pressure is completely evacuated before maintenance through the following operation:
Loosen the suction pipe connection on the solenoid valve slowly; if there is compressed air released, it indicates separator is not evacuated, then loosen more until the separator evacuates completely. Refer to fig.19 for operation position.

5.4 Daily Maintenance

Before starting the compressor unit, check its oil level. If the oil level is too low, add lubricating oil. After starting up, check whether all operation parameters are normal. After the temperature of the unit rises, check the operation of all the systems and check whether there are any leaks or unusual noises.

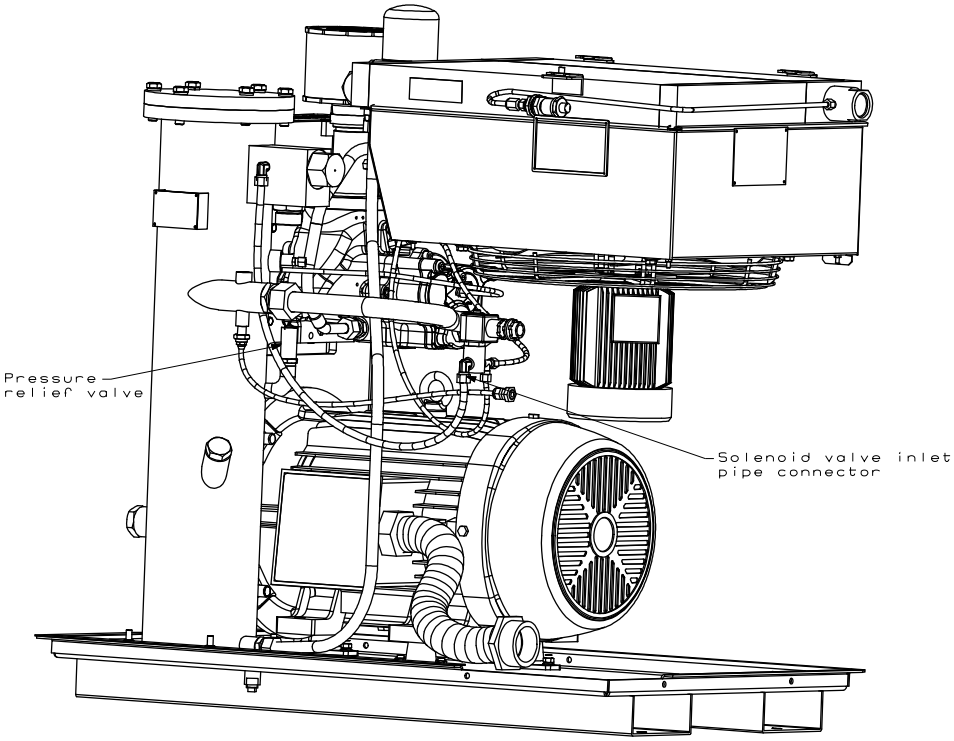


Fig.19 Operation Position to Ensure Pressure Completely Evacuated

5.5 Maintenance after Every 2000 Hours of Operation

1) Replace oil filter element and air filter element;
2) Check motor bearing lubrication;
3) Check electric parts;
4) Clean cooler if it is dirty;
5) Clean oil return filter after separator element;
6) Check oil level. When compressor running on full load, it is abnormal if the oil level is observed or lower than the sight glass. Then user should stop the compressor and fill oil until oil level is equal to oil filler.
7) Check belt tension according to 5.12 and adjust it if necessary;
8) Check belt running condition and replace if necessary.

5.6 Maintenance after Every 4000 Hours of Operation

1) Carry on the maintenance in 5.5;
2) Replace belt;
3) Replace air/oil separator element.

5.7 Maintenance after Every 8000 Hours of Operation

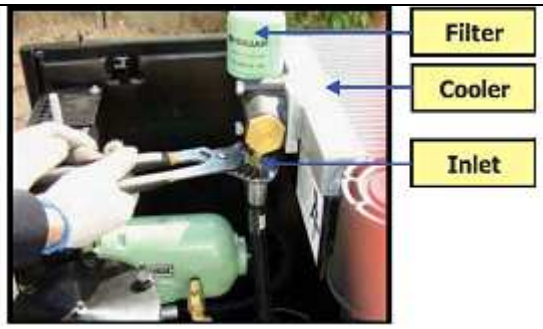
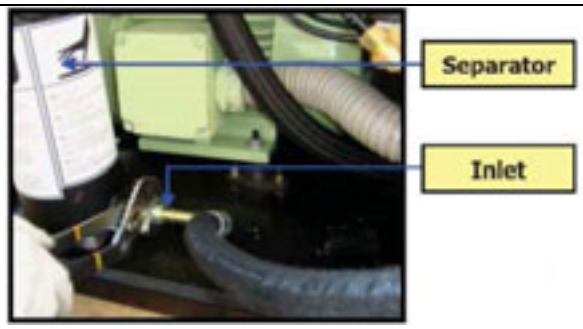
4) Carry on the maintenance in 5.6;
5) Replace compressor lubrication oil;

5.8 Fluid Replacement

1) In order to reduce maintenance work and cost, WS1100 and WS1500 series compressors are tested and long-life lubricating oil is filled into them before shipment; there is no need to add oil. Please refer to the label on oil filler for specific lubrication oil model.
2) If lubricating oil supplied by other manufacturers is filled into the compressor, all the warranty services of Sullair will become invalid automatically.
3) Do not use Sullair lubricating oil and other brand lubricating oils together. Mixing of mineral oils will result in poor running of the compressor and foam and the clogging of the filter element, orifices or pipeline during operation;
4) Fluid should be changed under the following conditions, whichever occurs first:
   a. Every 8000 hours.

b. Every year.
c. As indicated by fluid analysis.

5) Process:

<table>
<tr><td> 
</td><td> 
</td></tr>
<tr><td>1. Disconnect the oil hose from inlet of cooler</td><td>2. WS0400-0700: Loosen the screw (only 1/4~1/2 circle)
which connect oil hose to sump
WS1100-1500: No need to loose this screw.</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td colspan="2">3. Turn this oil hose to horizontal level and collect waste oil with a proper container
If necessary, disconnecting oil hose from sump to drain oil completely</td></tr>
</table>

5.9 Maintenance of Air Filter

After use for some time, the surface of air filter will be covered with dust and air flow resistance will be increased. In this case, the filter element should be dismantled and cleaned or replaced. The maintenance can be carried out as follows (refer to fig.20 and fig.21):

1) Rotate the rear cover counterclockwise and remove it;
2) Take out the filter element;
3) Clean the inlet and replace new air filter;
4) Install hose collar and confirm it's fastened.

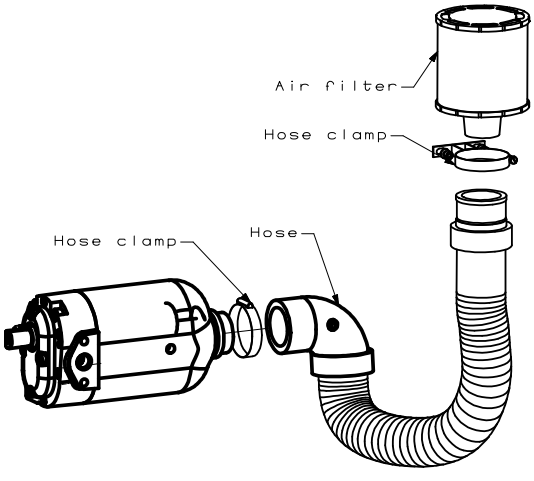


Fig.20 Air Filter System Of WS0400、WS0500、WS0700 Unit

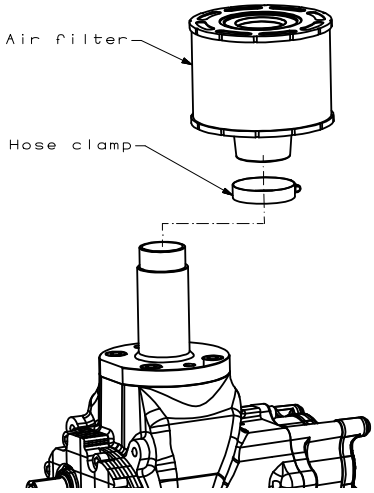


Fig.21 Air Filter System Of WS1100、WS1500 Unit

5.10 Maintenance of Oil Filter & Thermostatic Valve Element

Operating staff carry on the oil filter maintenance and replace filter element in time. If oil temperature is abnormal, it indicates the thermostatic valve malfunction, and need to replace valve element. The maintenance should be carried out as follows:

1) Remove the casing of the oil filter by using a band spanner;
2) Clean the sealing surface;
3) Coat clean compressor oil on the O-ring of the new filter element ;
4) Install the new filter element;
5) Retighten the casing of the oil filter;
6) Start the compressor to check whether oil leaks are present;
7) Caution: the filter element is a special product used for Sullair compressors, and no other alternative products can be used. The filter element must be replaced instead of being reconditioned.

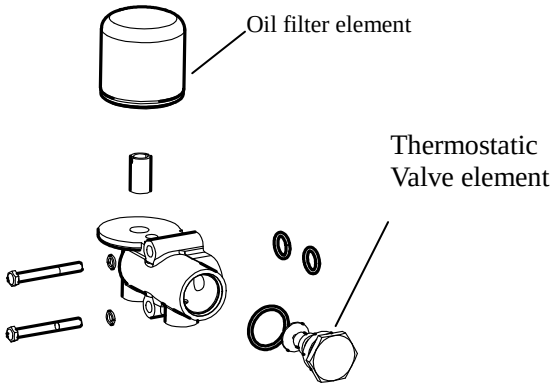


Fig.22 Oil Filter & Thermostatic Valve System

5.11 Maintenance of Air/Oil Separator

The maintenance of separator element is the replacement of the element. See Fig. 23&24.

The separator element should be replaced when compressor operating under the following circumstance:

1) Every 4000 hours;
2) Every half year.

Note: air/oil separator element must be replaced instead of being cleaned.

The separator element should be replaced by following the steps below:

1) Stop the compressor and release the pressure in the sump tank;
2) Disconnect the top cover; operating staff should not stay under top cover when top cover being opening or opened;
3) Take out the separator element and install a new one. Note: caution the O-ring operation state, if it is damaged, replace in time;
4) Clean the internal side of top cover and then install a new element. Tighten the bolts.
5) Correctly connect the pipeline connected with the cover.

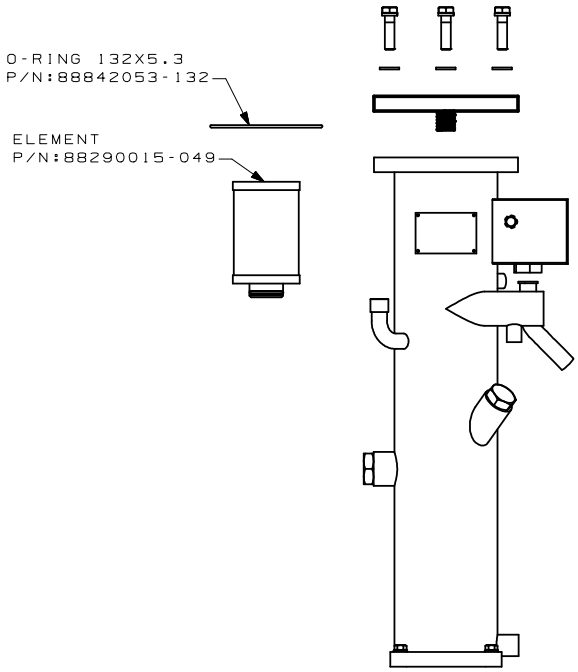


Fig.23 The Air/Oil Separator System Of WS0400、WS0500、WS0700 Unit

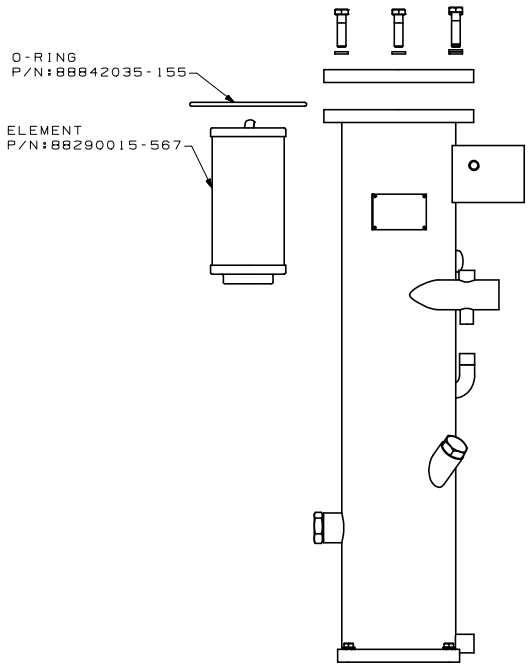


Fig.24 The Air/Oil Separator System Of WS1100、WS1500 Unit

5.12 Adjust Belt Tension

It is very important for the entire unit's proper transmission to tense the drive belt correctly. The belt tension can be adjusted by the belt tension adjusting screw.

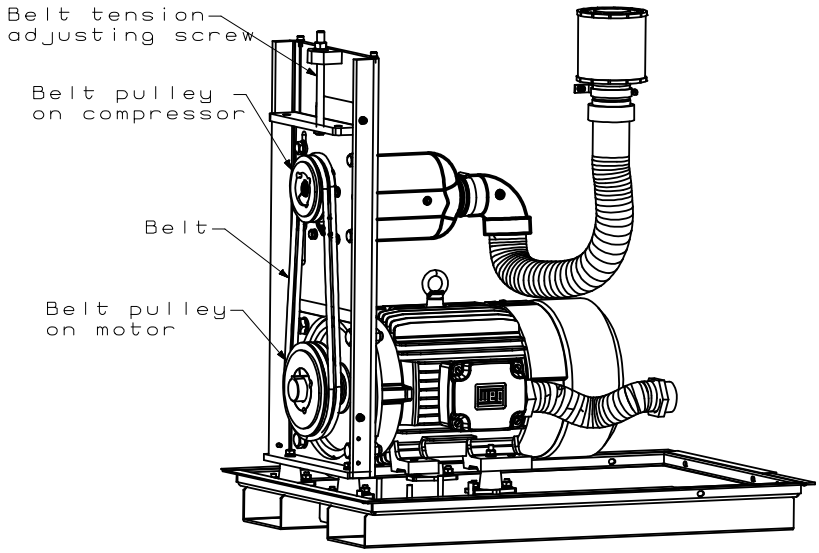


Fig.25 The Belt Transmission System Of WS0400、WS0500、WS0700 Unit

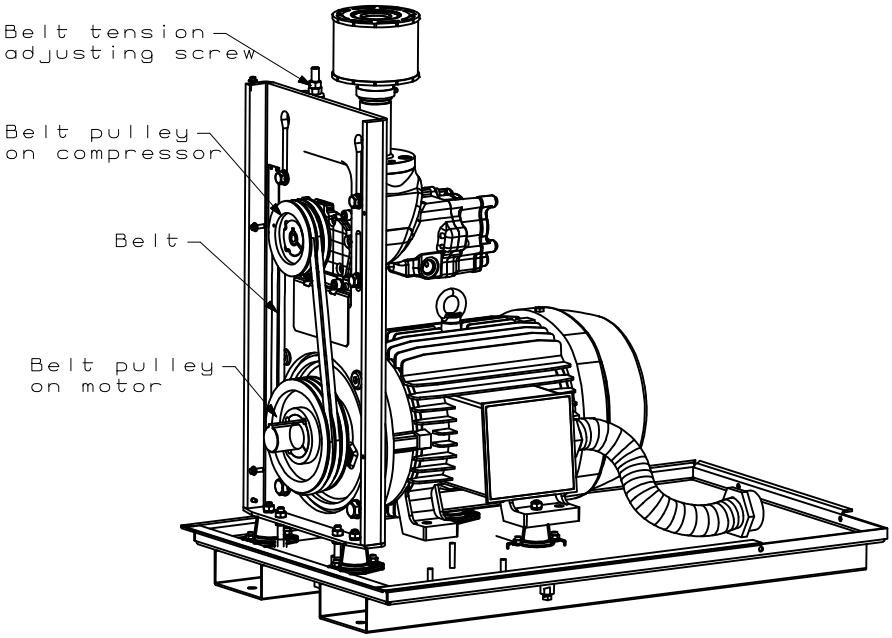


Fig.26 The Belt Transmission System Of WS1100、WS1500 Unit

The belt tension should be adjusted after new belt installed, the adjusting method will be introduced later.

Rotate it for a while by manual and check belt tension again; operating for 0.5~4 hours and check belt tension. Adjust it if necessary. Make sure the belt operates in steady status. Please ensure the belt is operating in the working lifetime, and check its operating status and tension every 1000 to 1500 hours.
Adjust the belt tension by tension tester. There are two recommended methods for checking belt tension. Test methods will be detailed as following, refer to fig.27, fig.28 and fig.29.

1) Belt tension measurement with Optirik tension meter

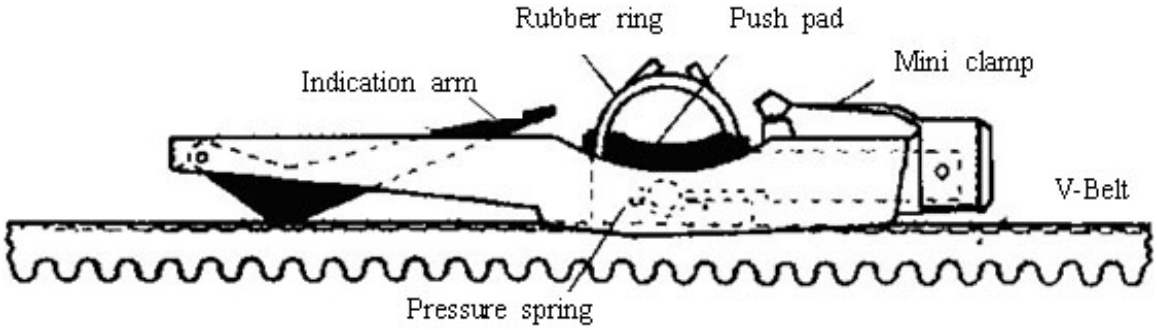


Fig.28 Optirik belt Tension meter

Direction for use:

A. Ensure the indicator arm is pushed down prior to starting.
B. Gently place the meter on the flat side of one belt at the midpoint between the motor and compressor unit pulleys.
C. Slowly press on the push pad.
D.Avoid contacting the meter with other fingers as this may affect the reading.
E. Once a definite click is detected, immediately release pressure and the indication arm will remain in the measuring position.
F. Carefully lift the meter without moving indicating arm and read the measurement at the exact point where the top surface of the indicator arm crosses the scale.
G. Rotate the motor pulley through at least one complete revolution and measure the tension again, recording the results. Repeat twice.
H. Compare the results to the belt tension specification in Table 3 and adjust if necessary.

2) Belt tension measurement with Frequency meter

A. Turn on the meter.
B. Hold the meter so that the probe is >10mm away from the belt being tested. Do not touch the belt with tester probe.
C. Pluck a single belt at the midpoint between the motor and compressor unit pulleys.
D.As the probe detects a vibration, the meter will display the frequency. Record data.
D. Rotate the motor pulley through at least one complete revolution and measure the belts again, recording the results.
E. Repeat twice. Average the three sets of numbers to indicate the belt tension.
F. Compare the results obtained to the belt tension specification in Table 3and adjust if necessary.

Table 3: Belt Tension requirements:

model	TT Mini		Optikrik	
	First time	Re-tightening	First time	Re-tightening
	Frequency Hz	Frequency Hz	Pressure N	Pressure N
50 Hz WS0410	82	71.9	232	178
50 Hz WS0510	81.9	71.8	214	164
50 Hz WS0708	89.8	78.7	237	182
50 Hz WS0710	85.4	74.9	230	177
50 Hz WS0713	85.4	79.3	230	191
50 Hz WS1108	92	81	249	191
50 Hz WS1110	87	76	245	188
50 Hz WS1113	89	78	255	196
50 Hz WS1508	92	81	261	201
50 Hz WS1510	97	85	277	213
50 Hz WS1513	91	80	274	210

5.13 Belt Tension Adjustment

Adjust belt tension according to the following procedure:
1) Shut down compressor and cut off electric power;
2) Open the side panel, remove belt guard;
3) Anti-clock wisely loosen the fastening nut on the head adjusting screw;
4) Loosen the four install bolts of head install plate;
5) Adjust belt tension through adjusting bolt, clock-wise for tightening, anti-clock-wise for loosen;
6) Ensure the belt tension meet the standards in Table 3;
7) Tighten the adjusting bolt for belt tension;
8) Tighten the four install bolts of head install plate;
9) Install belt guard and the side panel;
10) Start the machine, check whether sound of belt operating is steady;

5.14 Install & Adjust Belt Pulley

If the motor or host machine moved, or belt pulley need be replaced because of being worn down, the belt pulleys need reinstalling and readjusting. The setting up error can lead to the belt's excessive wear, and the belt and belt pulley lifetime will be reduced.
Only parallel alignment of the drive pulleys needs to be checked. Ensure misalignment is no greater than 0.5°.

Install belt pulley:
1. Clean all surfaces of shaft, pulley and taper lock bushing.
2. Spray oil or anti-seize compound on the grub screw threads and gently screw in.
3. Push the pulley with tapered hub to indicated position, check whether triangle wheel is aligned;
4. Refer to table 4, tighten the bolts and fillister head bolt
5. After a short time operation(0.5~1 hour), check the tightening torque of bolt, and re-tighten it if necessary;

Remove belt pulley:
1. Loosen and remove both grub screws.
2. Install one grub screw into the jacking/disassembly hole.

Refer to *Table 4.*
3. Tighten grub screw to release taper lock hub from pulley.
4. Slide pulley and bushing from shaft.

Table 4: tightening torque:

Tapered hub	Size of box spanner	Number of bolts	Tightening torque (N.m)
1210/1610	5	2	20.0
2012	6	2	30.0

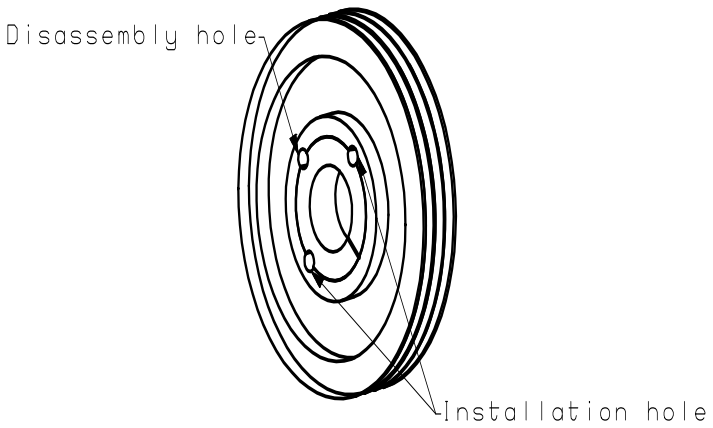


Fig.29 schematic diagram of belt pulley installation & dismantling

5.15 Maintenance of the main electrical motor

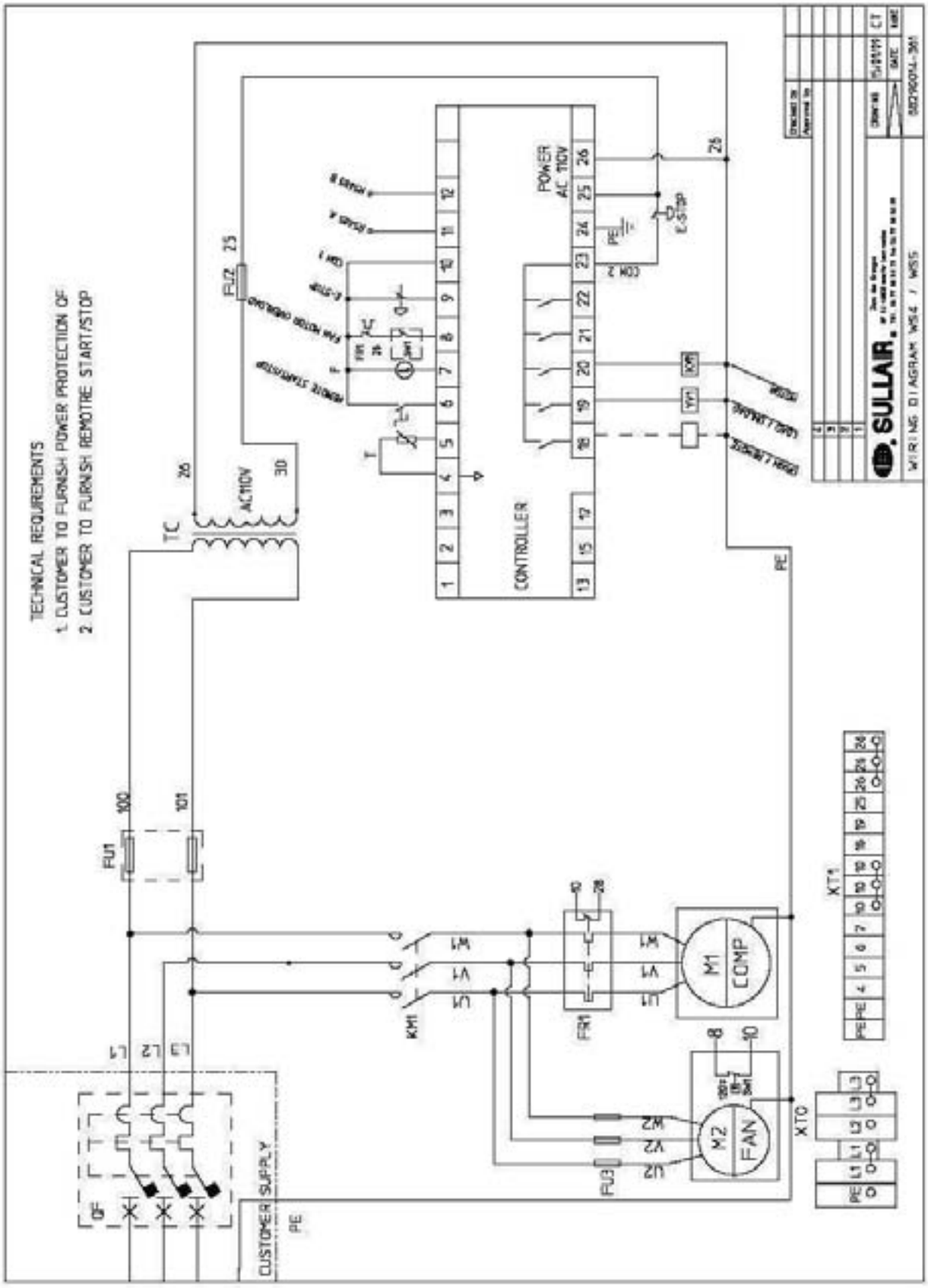
The bearings of the main electrical motor should be lubricated regularly.
Refer to the nameplate of the motor. This indicates:

- the type of lubricant to be used;
- how often it should be lubricated;
- the quantity of lubricant.

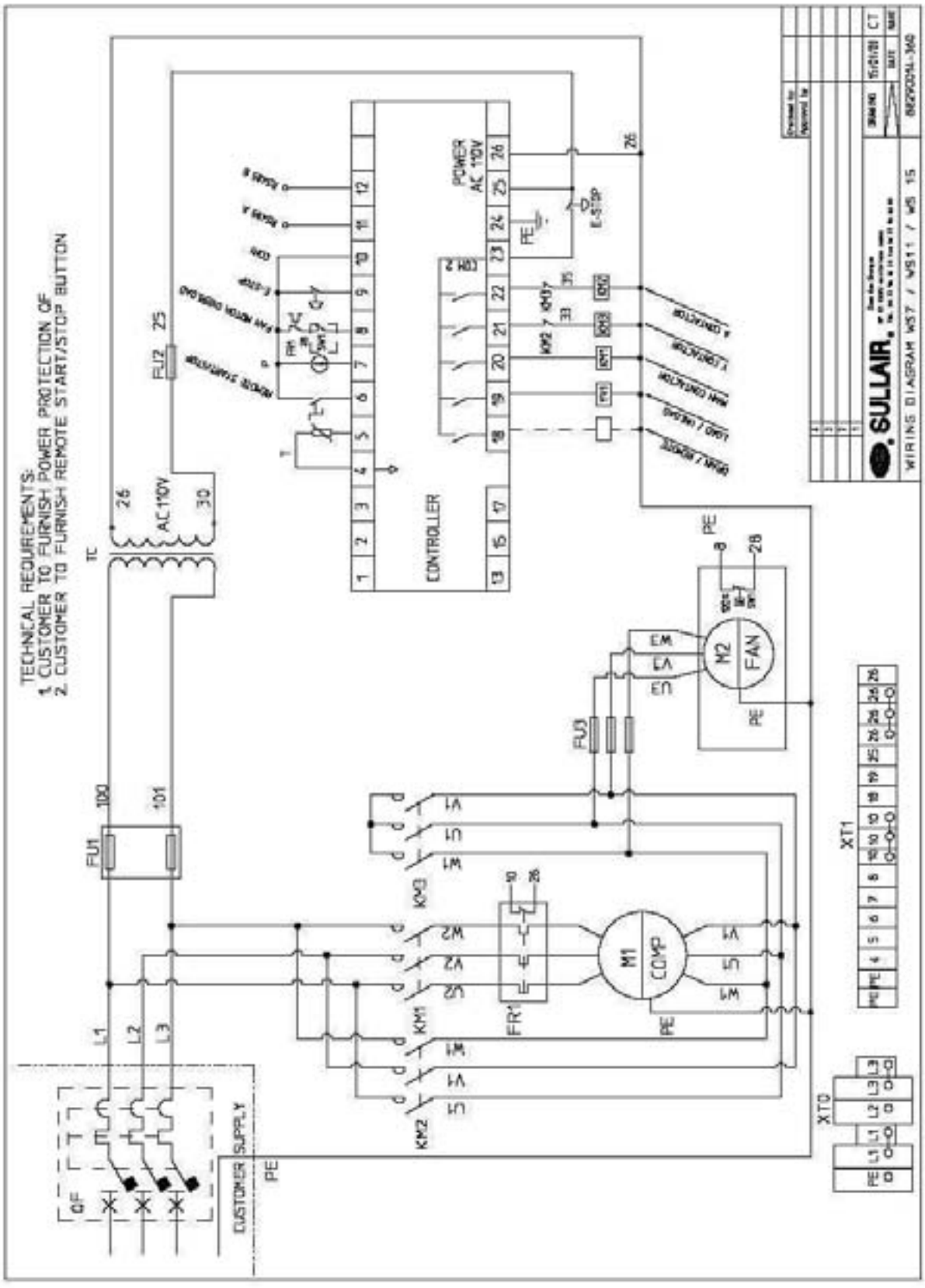
The lubrification schedule is given for an atmospheric temperature of 40℃.
For further information on this subject, please contact the manufacturer of the electrical motor or your Sullair representative.

Chapter 6 Electrical Connection Diagram

6.1 Electrical Connection Diagram WS0400 – WS0500



6.2 Electrical Connection Diagram WS0700 – WS1100 – WS1500



Chapter 7 Troubleshooting

Symptoms	Possible Causes	Solutions
Excessive Discharge temperature	Low oil level in the air/oil separator tank	Check the oil level, and add if necessary
	Dirty cooler fins	Clean the cooler fins
	Oil filter is clogged	Replace the oil filter element
	High ambient temperature	Improve the ventilation
	Excessive resistance in user's external air duct	Install an exhaust fan in the air duct
	Temperature sensor malfunctions	Check connection, if it is in good condition, replace sensor
	Axial fan rotates in reverse direction or is damaged	Re-connect the fan motor cables or repair it
	Thermostatic valve failure	Replace thermostatic valve
Excessive discharge pressure (tank pressure)	Unloading devices (such as blowdown valve, pressure regulator) do not work normally.	Check if the unloading devices are normal
	Unloading solenoid valve malfunctions	Check the solenoid valve
	Air leaks	Check the control tubing for any leaks
	Control line filter is clogged	Perform maintenance on the filter assembly
	Minimum pressure valve failure	Check/repair minimum pressure valve
Air supply pressure is lower than rated discharge pressure	Air consumption exceeds air supply	(1) Reduce the air consumption; (2) Check the delivery pipe for leakage
	Air filter is clogged	Replace the filter element
	Inlet valve cannot be fully open	Check the actuation of the inlet valve and pressure regulator
	Minimum pressure valve failure	Check/repair minimum pressure valve
	Oil/air filter is clogged	Check and replace the filter element
	Pressure sensor P2 has faults	Check the sensor connection. If it is normal, replace the sensor
Pipeline pressure is higher than	Pressure sensor P2 has faults	Check the sensor connection. If it is normal, replace the sensor
	Unloading devices (such as	Check if the unloading devices are

unloading pressure	blowdown, pressure regulator) do not work normally.	normal
	Unloading solenoid valve malfunctions	Check the solenoid valve
	Control air leaks	Check the control tubing for any leaks
Excessive oil consumption	Oil return line filter or throttling orifice is clogged	Clean the filter and orifice
	Separator filter element is damaged	Check the separator element and gasket. If they are damaged, replace them
	System leaks	Check the system for oil leaks
	Excessively high oil level	Drain the excess lubricating oil
	Too much oil foam	Change the oil

Chapter 8 List of Spare Parts

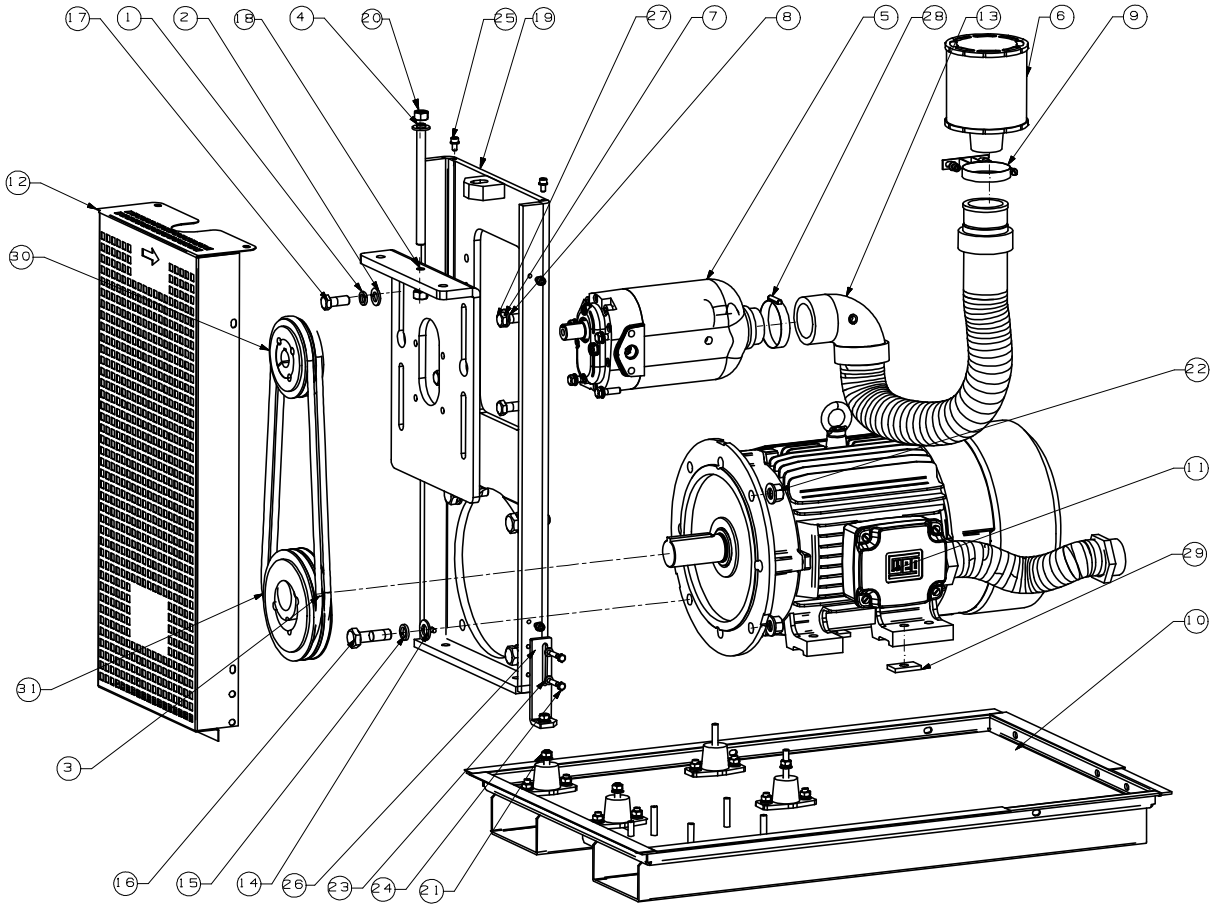
The following is the list of the parts and components required for maintenance of the compressor:

Description		Maintenance Kit Number	Quantity
Oil filter element		88290014-484	1
Air filter（WS0400、WS0500、WS0700）		88290014-486	1
Air filter（WS1100、WS1500）		88290014-485	1
Oil/air separator element（WS0400、WS0500、WS0700）		88290015-049	1
Oil/air separator element（WS1100、WS1500）		88290015-567	1
Air inlet valve maintenance kit（WS0400, WS0500, WS0700）		02250176-967	1
Air inlet valve maintenance kit（WS1100、WS1500）		02250176-856	1
Minimum pressure valve maintenance kit		02250050-612	1
Thermostatic valve maintenance kit (＜12BAR)		02250144-326	1
Thermostatic valve maintenance kit (≥12BAR)		02250144-327	1
Solenoid valve maintenance kit		88290016-030	1
Shaft seal maintenance kit（WS0400, WS0500, WS0700）		02250179-875	1
Shaft seal maintenance kit（WS1100、WS1500）		02250069-073	1
belts	All WS0400、WS0500 units	88290016-410	2
	All WS0700 units	88290015-901	2
	All WS1100 units	88290015-902	3
	All WS1500 units	88290017-056	3
Sullube Fluide		250032-483	0.25
Oil cooler WS0400, WS0500, WS0700		88290015-765	1
Oil/Air cooler WS1100, WS1500		88290014-225	1
Computer board EN, FR, ES, PO		88290018-640	1

Note: When ordering the spare parts, please indicate the model and serial number of your compressor so that we can provide better service to you.

Chapter 9 Spare Parts Manual

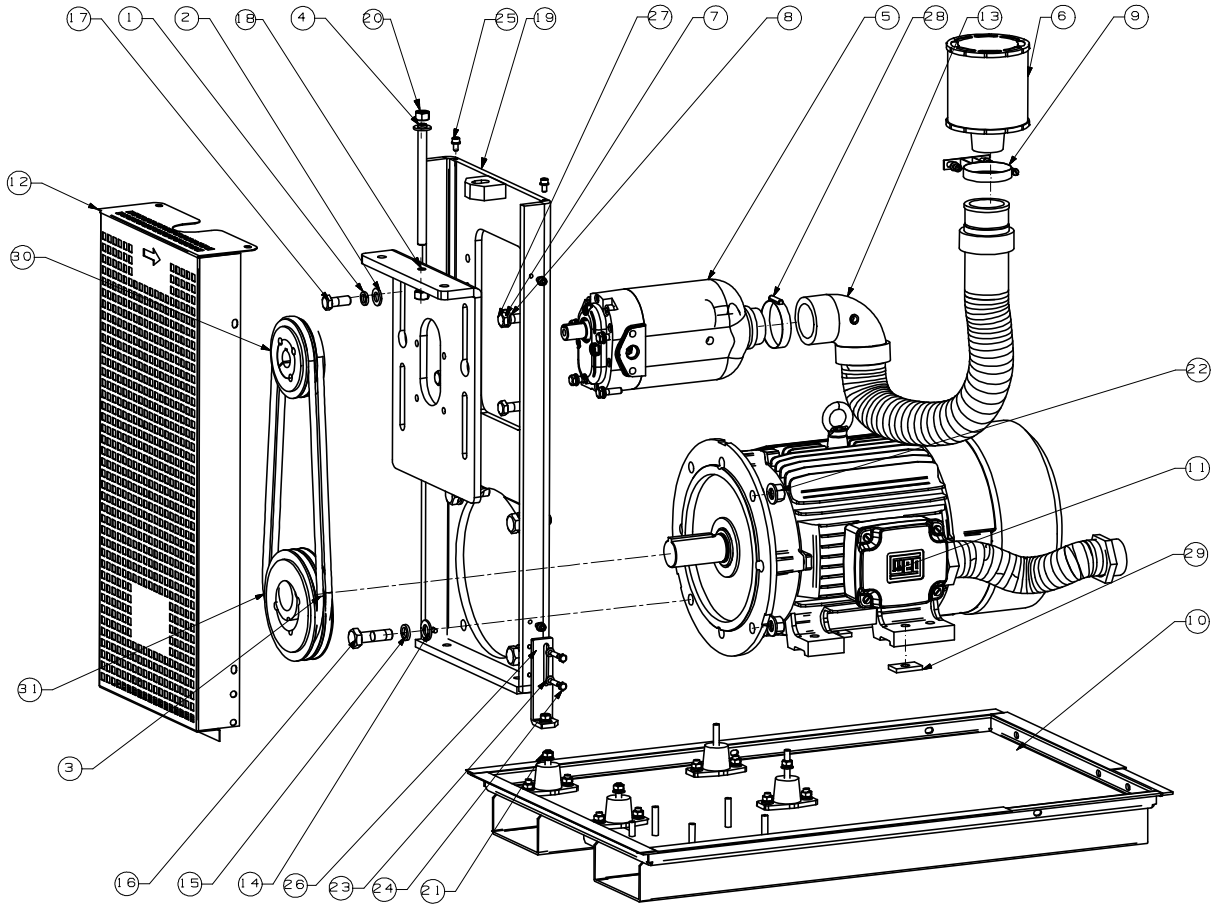
9.1 Motor, Compressor and Frame Assemblies Diagram of WS0400、WS0500、WS0700



Motor, Compressor and Frame Assemblies parts list of WS0400、WS0500、WS0700

Ref	Parts NO.	Specifications	Qty	Remarks
1	88832112-031	Spring washer 12	4	
2	88831112-025	Flat washer 12	5	
3	88290015-901	belt	2	WS7
	88290016-410		2	WS4/WS5
4	88290014-446	Screw M12*70	1	
5	02250171-669	Compressor head	1	
6	88290014-486	Air filter of inlet	1	
7	88831108-016	Flat washer 8	8	
8	88832108-021	Spring washer 8	8	
9	88290016-918	Clamp with bearer	1	
10	88290015-788	Base frame	1	WS5/WS7
	88290015-831		1	WS4
11	88290014-379	motor	1	WS4 50Hz 380-415V CE
	88290014-380		1	WS5 50Hz 380-415V CE
	88290014-331		1	WS7 50Hz 380-415V CE
12	88290015-786	Protective frame	1	
13	88290016-201	Air inlet hose	1	
14	88831114-025	Flat washer 14	8	
15	88832114-036	Spring washer 14	4	
16	88811114-050	Hex head bolt M14*50	4	
17	88811112-030	Hex head bolt M12*30	4	
18	88290016-246	Cover plate	1	
19	88290016-210	Compressor head install plate	1	WS5/WS7
	88290016-256		1	WS4
20	88821112-108	Hex nut M12	2	

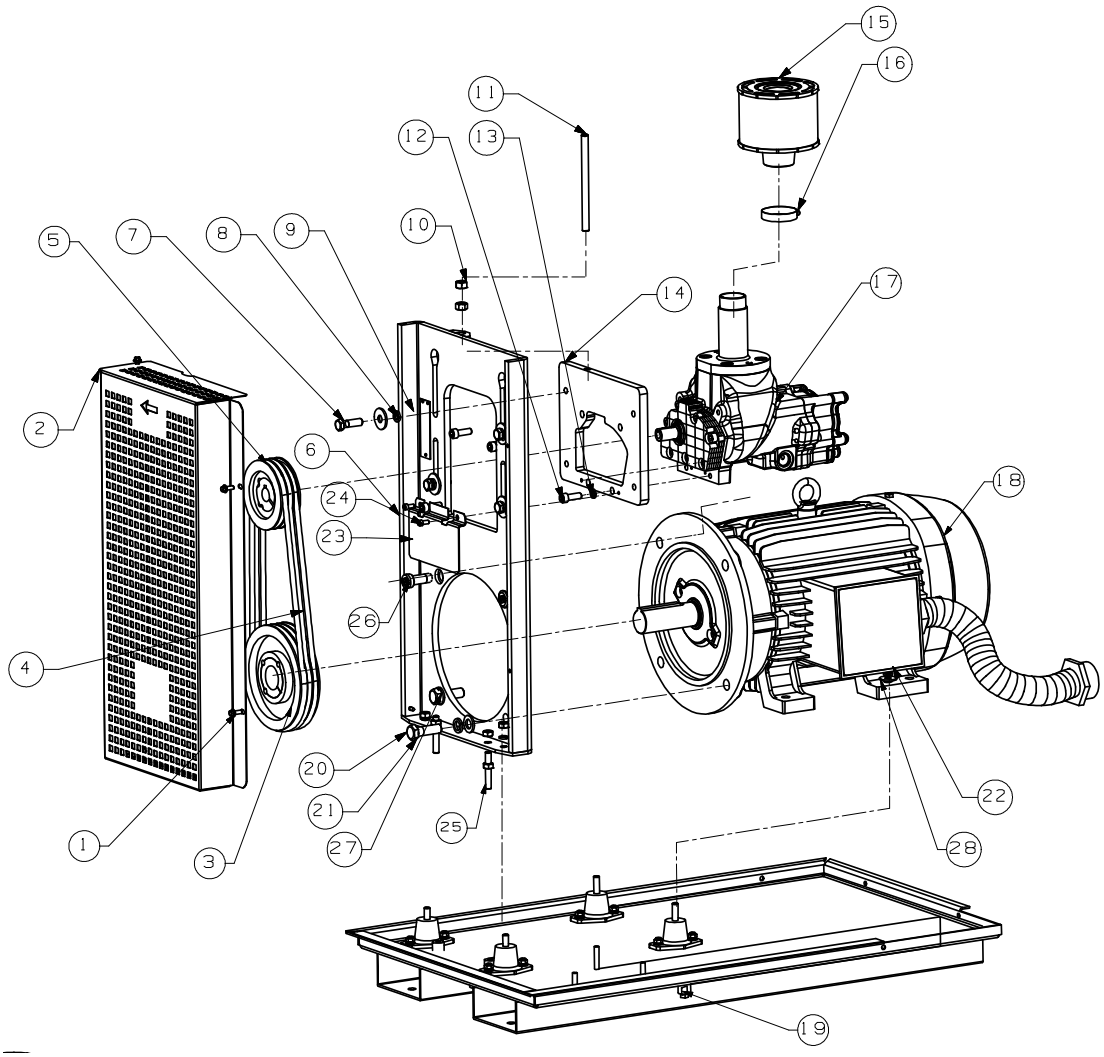
9.1 Motor, Compressor and Frame Assemblies Diagram of WS0400、WS0500、WS0700 (extend)



Motor, Compressor and Frame Assemblies parts list of WS0400、WS0500、WS0700 (extend)

Ref	Parts NO.	Specifications	Qty	Remarks
21	88821108-068	Hex nut M8	4	
22	88821114-128	Hex nut M14	4	
23	88831106-016	Flat washer 6	8	
24	88811106-030	Hex bolt M6X30	2	
25	88818206-012	Socket hex bolt M6X12	6	
26	88290016-209	Fixed plat	1	
27	88811108-030	Hex bolt M8X30	4	
28	88290004-734	Hose clamp	1	
29	88290017-099	Motor block	2	
30	88290017-065	Belt pulley of compressor head	1	50Hz WS7 8/10bar, 50Hz WS5 10bar
	88290017-066		1	50Hz WS7 13bar
	88290017-067		1	50Hz WS4 10bar
31	88290017-091	Belt pulley of motor	1	50Hz WS7 8bar
	88290017-114		1	50Hz WS7 10/13bar
	88290017-083		1	50Hz WS5 10bar
	88290017-111		1	50Hz WS4 10bar

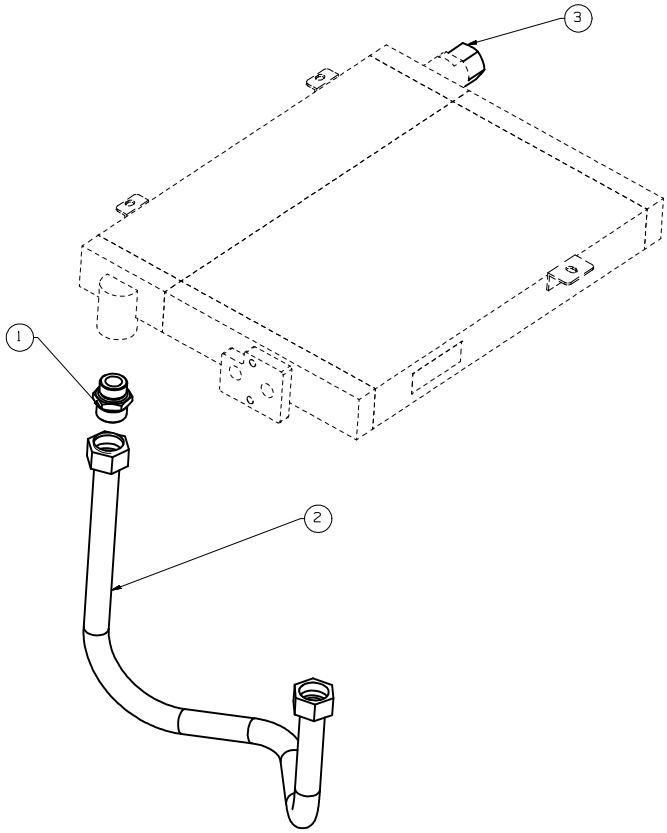
9.2 Motor, Compressor and Frame Assemblies Diagram of WS1100、WS1500



Motor, Compressor and Frame Assemblies parts list of WS1100、WS1500:

Ref	Parts NO.	Specifications	Qty	Remarks
1	88813106-016	Flanged hex bolt M6X16	3	
2	88290014-269	Protective frame	1	
3	88290017-087	Belt pulley of motor		50Hz WS11 8bar
	88290017-084		1	50Hz WS11 10bar
	88290017-082		1	50Hz WS11 13bar
	88290017-092		1	50Hz WS15 8/10bar
	88290017-090		1	50Hz WS15 13bar
4	88290015-902	belt	3	50Hz WS11
	88290017-056		3	50Hz WS15
5	88290017-070	Belt pulley of compressor head	1	50Hz WS11 8/10bar
	88290017-073		1	50Hz WS11 13bar、50Hz WS15 13bar
	88290017-069		1	50Hz WS15 8bar
	88290017-072		1	50Hz WS15 10bar
6	88290014-212	Install plate of compressor head	1	
7	88811112-040	Hex bolt M12X40	4	
8	88832112-031	Spring washer 12	4	
9	88833112-033	Flat washer 12	4	
10	88821112-108	Hex nut M12	2	
11	88290014-446	Screw M12X170	1	
12	88818210-030	Socket hex bolt M10X30	4	
13	88832110-026	Spring washer 10	4	
14	88290014-211	Cover plate of compressor head	1	
15	88290014-485	Air inlet filter	1	
16	88290004-733	Hose clamp	1	
17	88290015-893	Compressor head	1	
18	88290014-377	motor	1	WS11 50Hz 380-415V CE
	88290014-378		1	WS15 50Hz 380-415V CE
19	88290014-278	Base frame	1	
20	88831116-030	Plat washer 16	3	
21	88811116-050	Hex bolt M16X50	2	
22	88821110-084	Hex nut M10	7	
23	88290016-323	Cover plat of compressor head	1	
24	88818206-014	Socket hex bolt M6X14	2	
25	88817010-065	Screw M10X65	2	
26	88290016-975	Socket hex bolt M16X40	2	
27	88832116-041	Spring washer 16	2	
28	88833110-027	Flat washer 10	1	

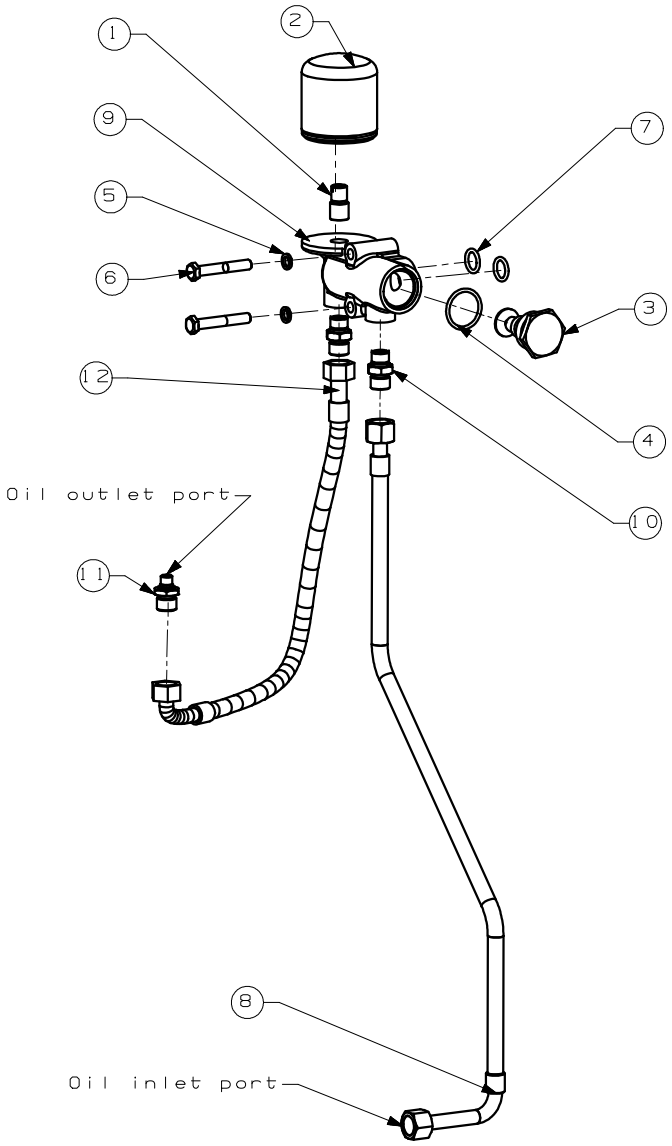
9.3 Discharge System-WS1100、WS1500



Parts list of discharge system:

Ref	Parts NO.	Specifications	Qty	Remarks
1	88290015-620	Nipple	1	
2	88290015-622	Discharge hose DN25	1	

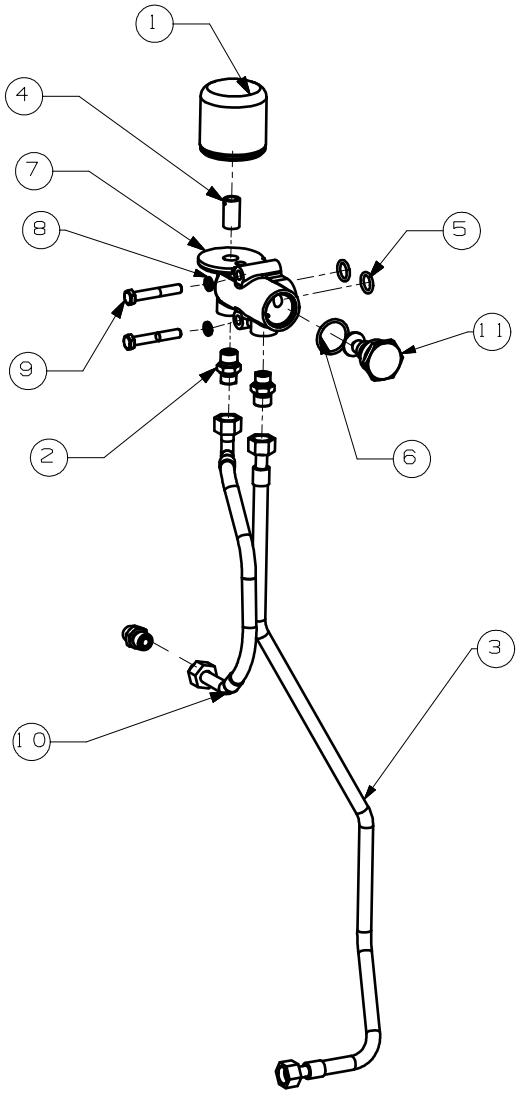
9.4 Oil Line System-WS0400、WS0500、WS0700



Parts list of oil line system-WS0400、WS0500、WS0700

Ref	Parts NO.	specifications	Qty	Remarks
1	88290016-175	Bolts 3/4 M16X1.5	1	
2	88290014-484	Oil filter	1	
3	02250078-204	Thermostatic valve block	1	Used when specified discharge pressure＜12bar
	02250092-081	Thermostatic valve block	1	Used when specified discharge pressure≥12bar
4	88842035-035	O-ring 35.5X3.55	1	
5	88832110-026	Spring washer 10	2	
6	88811110-065	Hex bolt M10X65	2	
7	88842035-019	O-ring 19X3.55	2	
8	88290016-248	Oil hose DN12	1	
9	88290014-210	Oil filter shell	1	
10	88290014-319	Nipple	2	
11	88290015-673	Nipple M12xUN13/16-16	1	
12	88290015-764	Oil hose DN12	1	

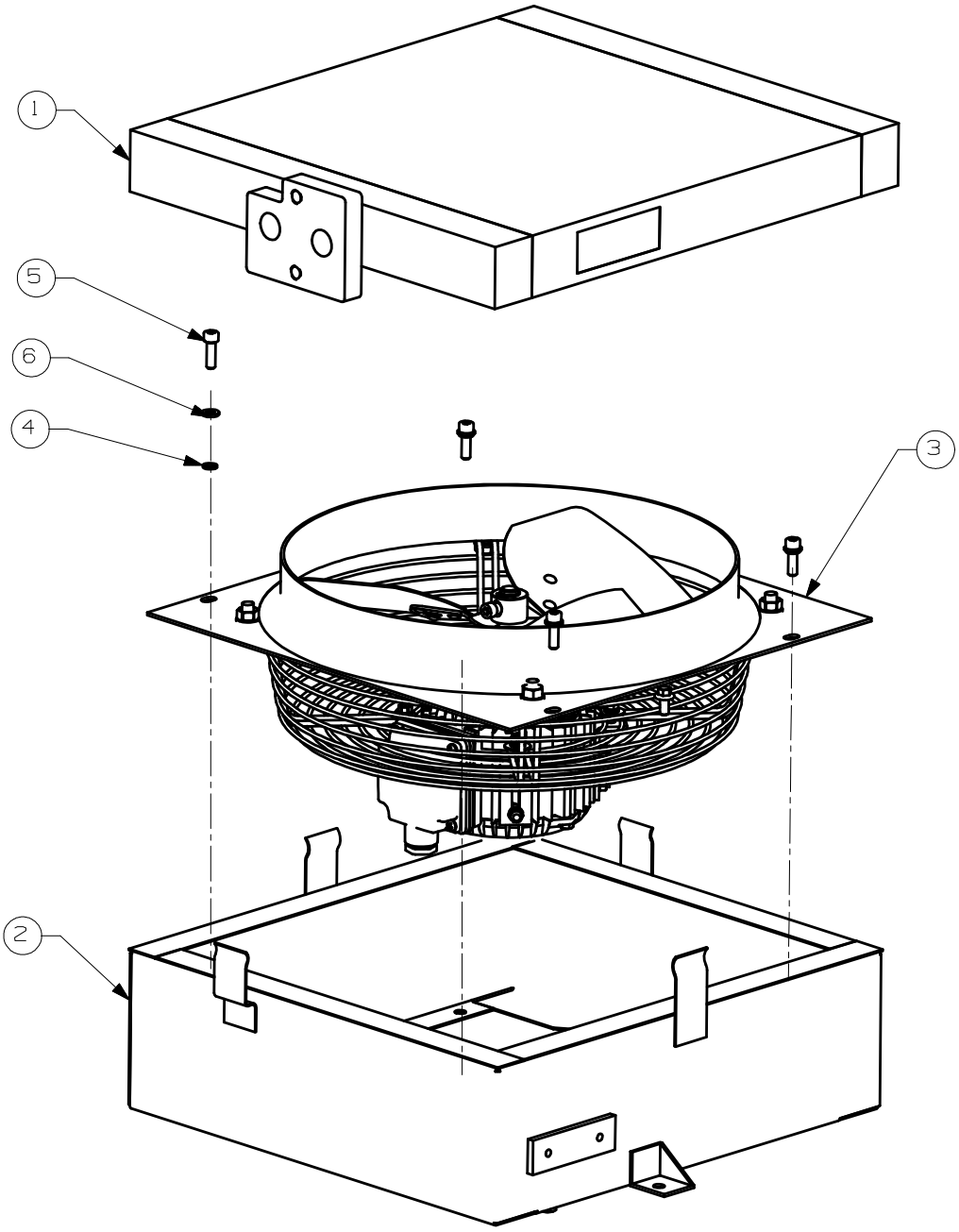
9.5 Oil Line System-WS1100、WS1500



Parts list of oil line system-WS1100、WS1500:

Ref	Parts NO.	Specifications	Qty	Remarks
1	88290014-484	Oil filter	1	
2	88290014-319	Nipple	3	
3	88290014-433	Oil hose DN12	1	
4	88290014-321	Bolts 3/4-16	1	
5	88842035-019	O-ring 19X3.55	2	
6	88842035-035	O-ring 35.5X3.55	1	
7	88290014-210	Oil filter shell	1	
8	88832110-026	Spring washer 10	2	
9	88811110-065	Hex bolt M10X65	2	
10	88290014-434	Oil hose DN12	1	
11	02250078-204	Thermostatic valve element	1	Used when specified discharge pressure＜12bar
	02250092-081	Thermostatic valve element	1	Used when specified discharge pressure≥12bar

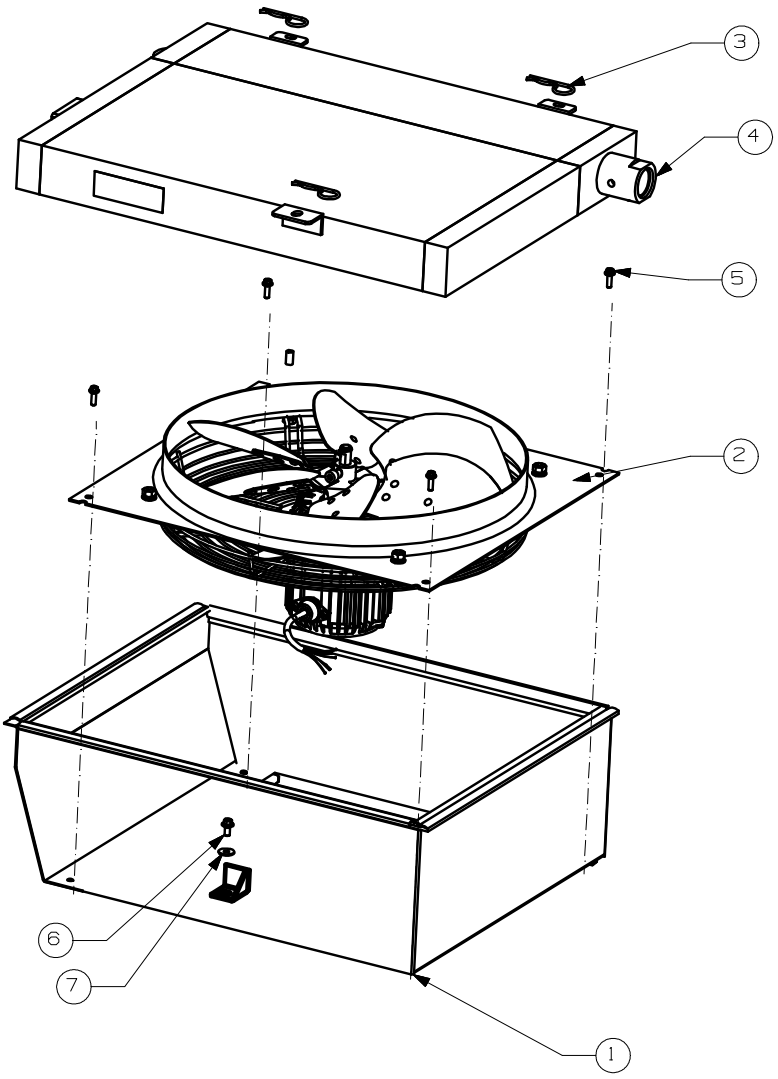
9.6 Cooling Fan System-WS0400、WS0500、WS0700



Parts list of cooling fan system-WS0400、WS0500、WS0700

Ref	Parts NO.	Specifications	Qty	Remarks
1	88290015-765	Oil cooler	1	
2	88290015-766	Fan housing	1	
3	88290015-783	axial fan	1	
4	88832106-016	Spring washer 6	4	
5	88818206-020	Socket hex bolt M6X20	4	
6	88831106-016	Flat washer 6	4	

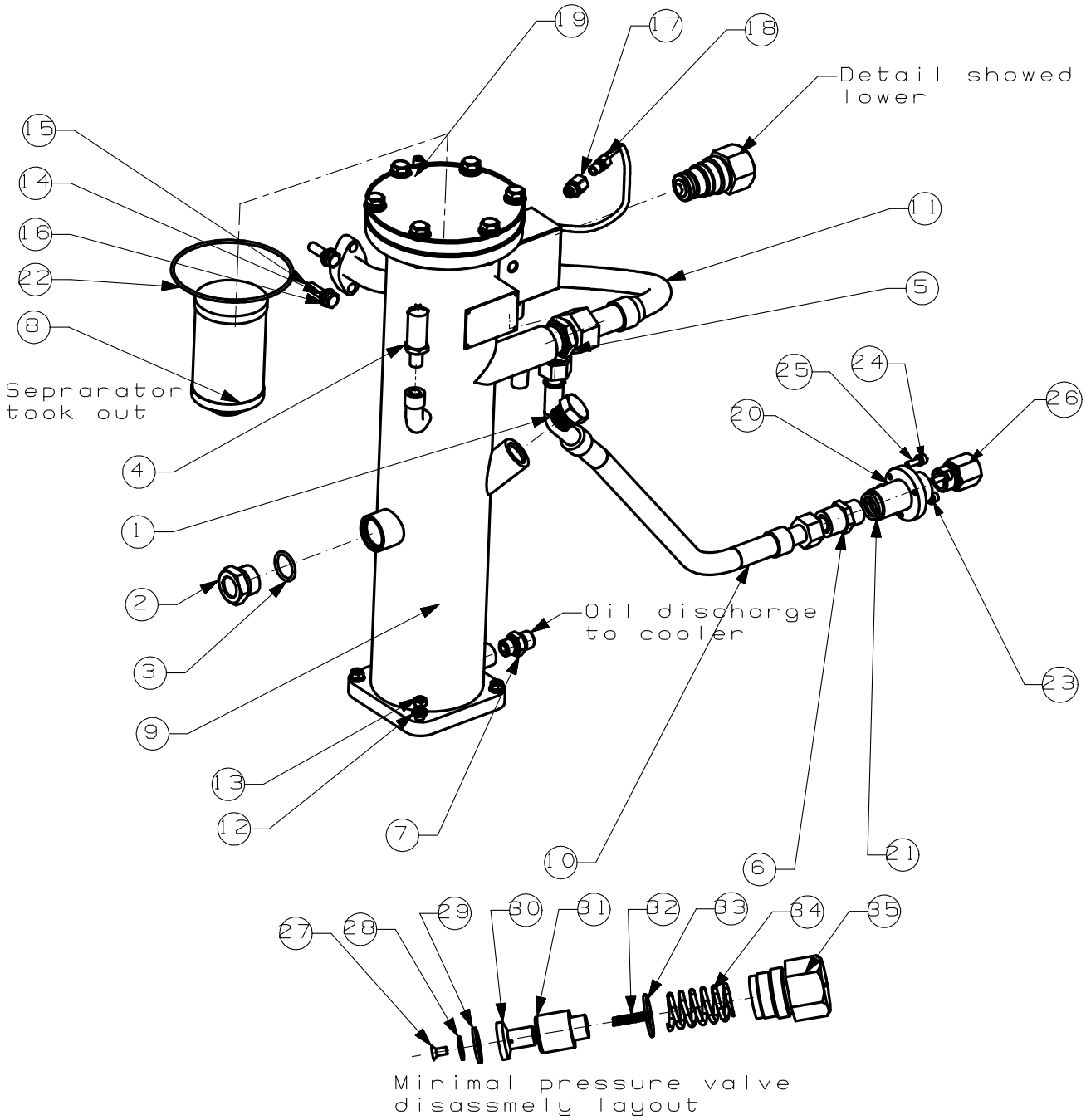
9.7 Cooling Fan System of WS1100、WS1500



Parts list of cooling fan system-WS1100、WS1500

Ref	Parts NO.	Specifications	Qty	Remarks
1	88290014-282	Fan housing	1	
2	88290014-231	Axial fan	1	
3	88290014-557	R-pin	3	
4	88290014-225	Oil cooler	1	
5	88813105-016	Flanged hex bolt M5X16	4	
6	88813106-012	Flanged hex bolt M6X12	1	

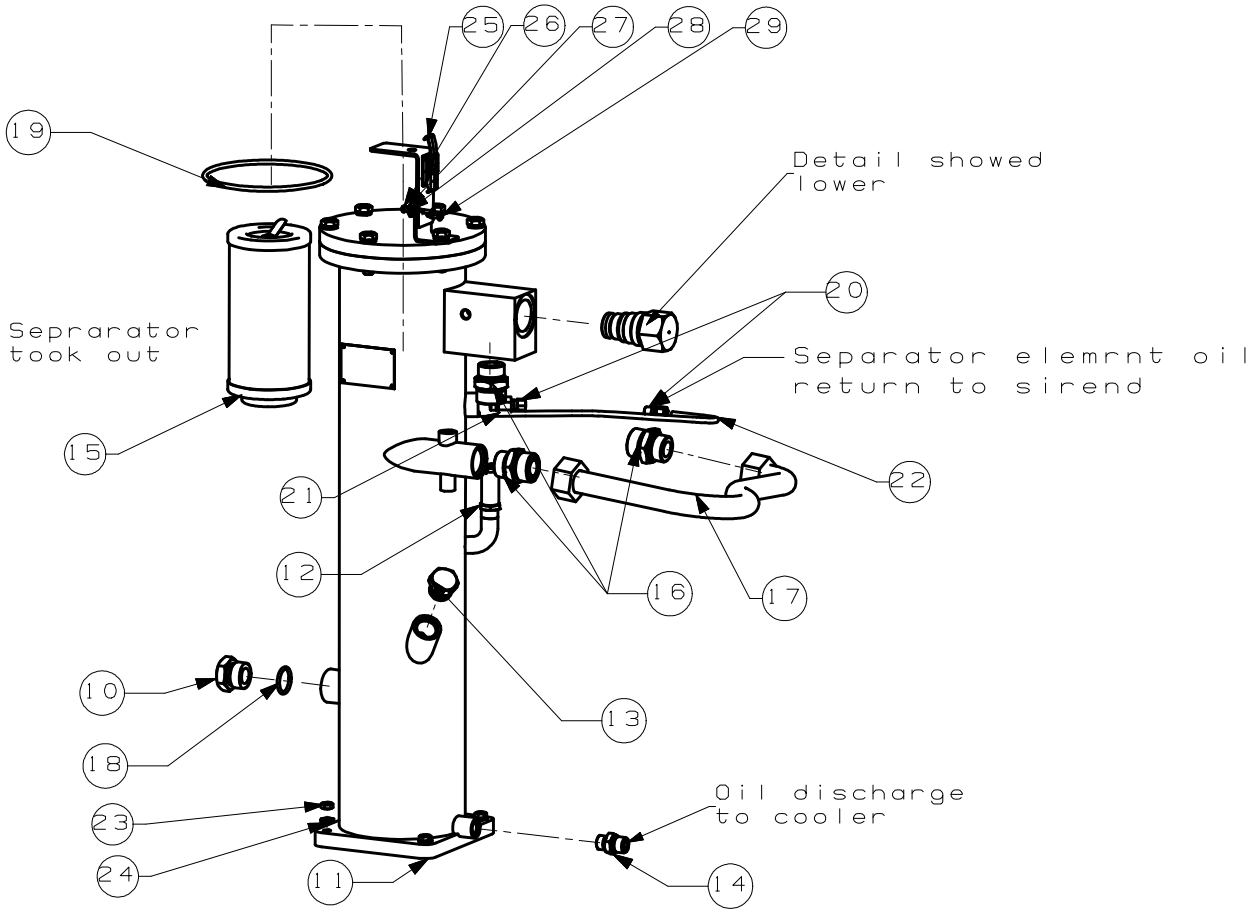
9.8 Oil/Air Separator System-WS0400、WS0500、WS0700

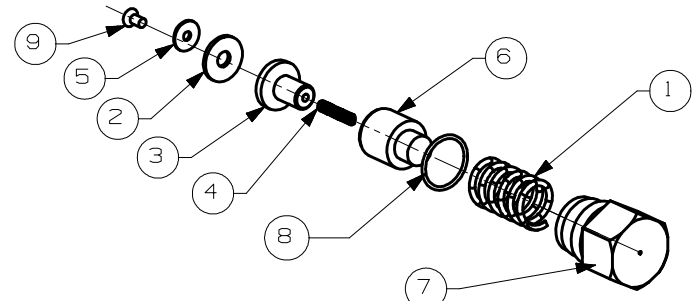


Parts list of oil/air separator system-WS0400、WS0500、WS0700

Ref	Parts NO.	Specifications	Qty	Remarks
1	88290014-294	Oil fill plug	1	
2	88290014-222	Oil return sight glass	1	
3	88842035-028	O-ring 25X3.55	1	
4	68562951	Safety valve	1	
5	88290015-620	Nipple	1	
6	883527-012	Nipple M27X1-3/16 UN	2	
7	88290014-319	Nipple	1	
8	88290015-049	Oil/air separator element	1	
9	88290015-814	Oil/ail separator tank	1	
10	88290015-807	Discharge hose DN20	1	
11	88290016-253	Discharge hose DN20	1	
12	88290015-923	Conductive laps	4	
13	88823008-095	Locking nut M8	4	
14	88831110-020	Flat washer 10	2	
15	88811110-035	Hex bolt M10X35	2	
16	88832110-026	Spring washer 10	2	
17	88290015-890	Return oil filter	1	
18	250018-427	Straight connector NPT1/8 X TUBE1/4	2	
19	88290015-891	Hose	0.5 m	
20	88290015-789	Hose nipple	1	
21	88842035-023	O-ring 23.6X3.55	1	
22	88842035-132	O-ring 132X3.55	1	
23	88831106-016	Flat washer 6	3	
24	88832106-016	Spring washer 6	3	
25	88818206-020	Socket hex bolt M6X20	3	
26	88290014-523	Connector M27X2-R3/4	1	Only used for units without receiver
27	865006-012	Bolt M6X12	1	
28	02250048-229	Washer	1	
29	02250047-162	Minimum pressure valve seating	1	
30	02250047-163	Minimum pressure valve connector arm	1	
31	02250048-908	Minimum pressure valve piston	1	
32	02250047-296	Minimum pressure valve assist spring	1	
33	826502-124	O-ring 1/4X3/32"	1	
34	02250047-161	Minimum pressure valve host spring	1	
35	250035-587	Minimum pressure valve bonnet	1	

9.9 Oil/Air Separator System of WS1100、WS1500



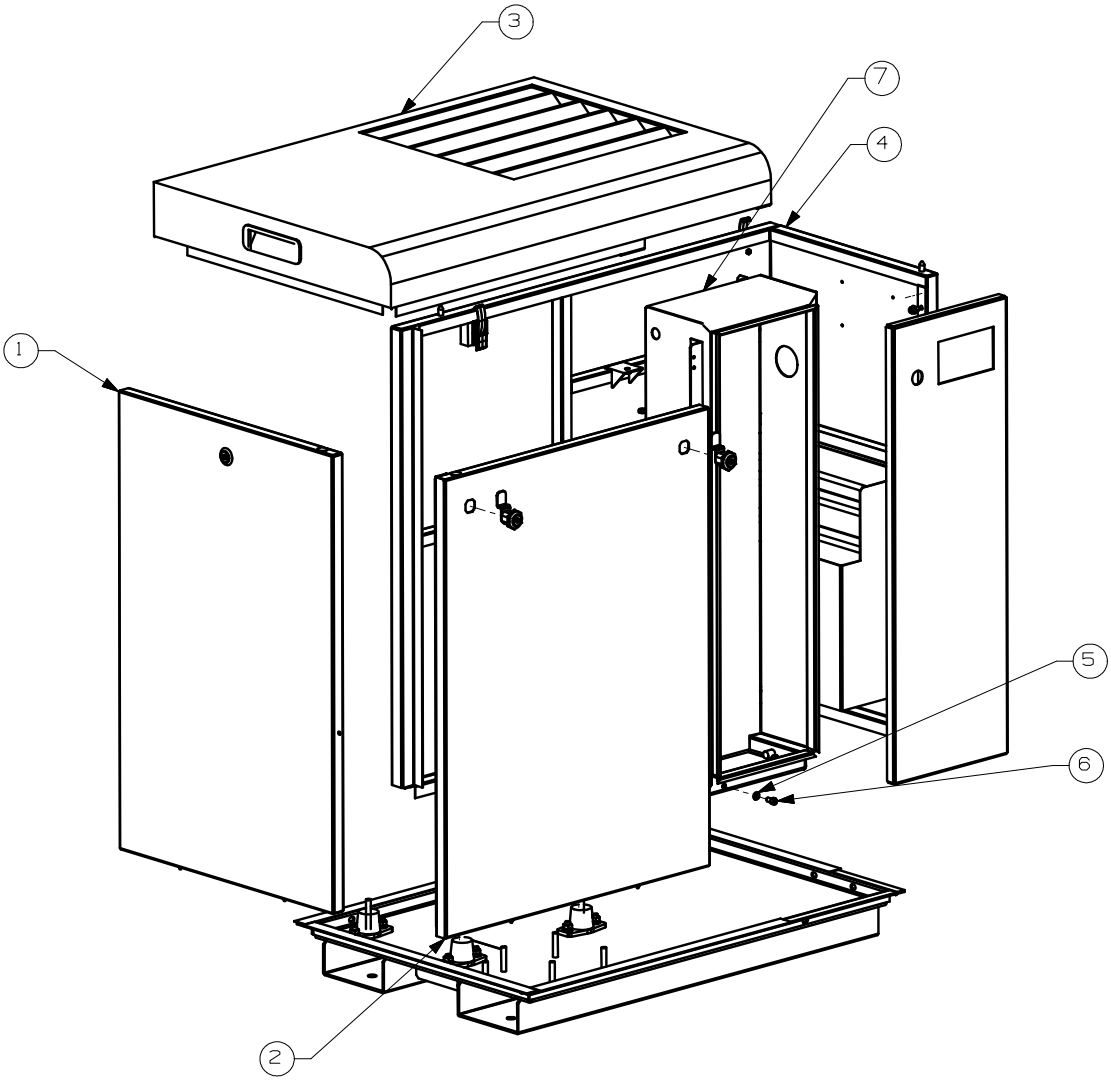


Minimal pressure valve disassmely layout

Parts list of oil/air separator system-WS1100、WS1500

Ref	Parts NO.	Specifications	Qty	Remarks
1	02250047-161	Minimum pressure valve host spring	1	
2	02250047-162	Minimum pressure valve seating	1	
3	02250047-163	Minimum pressure valve connector arm	1	
4	02250047-296	Minimum pressure valve assist spring	1	
5	02250048-229	Washer	1	
6	02250048-908	Minimum pressure valve piston	1	
7	250035-587	Minimum pressure valve bonnet	1	
8	826502-124	O-ring 1/4X3/32"	1	
9	865006-012	Bolt M6X12	1	
10	88290014-222	Oil sight glass	1	
11	88290014-226	Oil/air separator	1	
12	68562951	Safety valve	1	
13	88290014-294	Oil fill plug	1	
14	88290014-319	Connector	1	
15	88290015-567	Oil/air separator element	1	
16	88290015-620	Connector	3	
17	88290015-621	Discharge hose DN25	1	
18	88842035-028	O-ring 25X3.55	1	
19	88842053-155	O-ring 155X5.3	1	
20	250018-427	Straight connector NPT1/8 X TUBE1/4	2	
21	88290015-890	Oil return filter	1	
22	88290015-891	Hose	1	
23	88823008-095	Locking nut M8	3	
24	88290015-923	Conductive laps	3	
25	88290016-479	Air inlet plate frame	1	
26	88821104-032	Hex nut M4	2	
27	88832104-011	Spring wahser4	2	
28	88831104-008	Flat washer 4	2	
29	88818004-012	Cruciform slot screw M4X12	2	

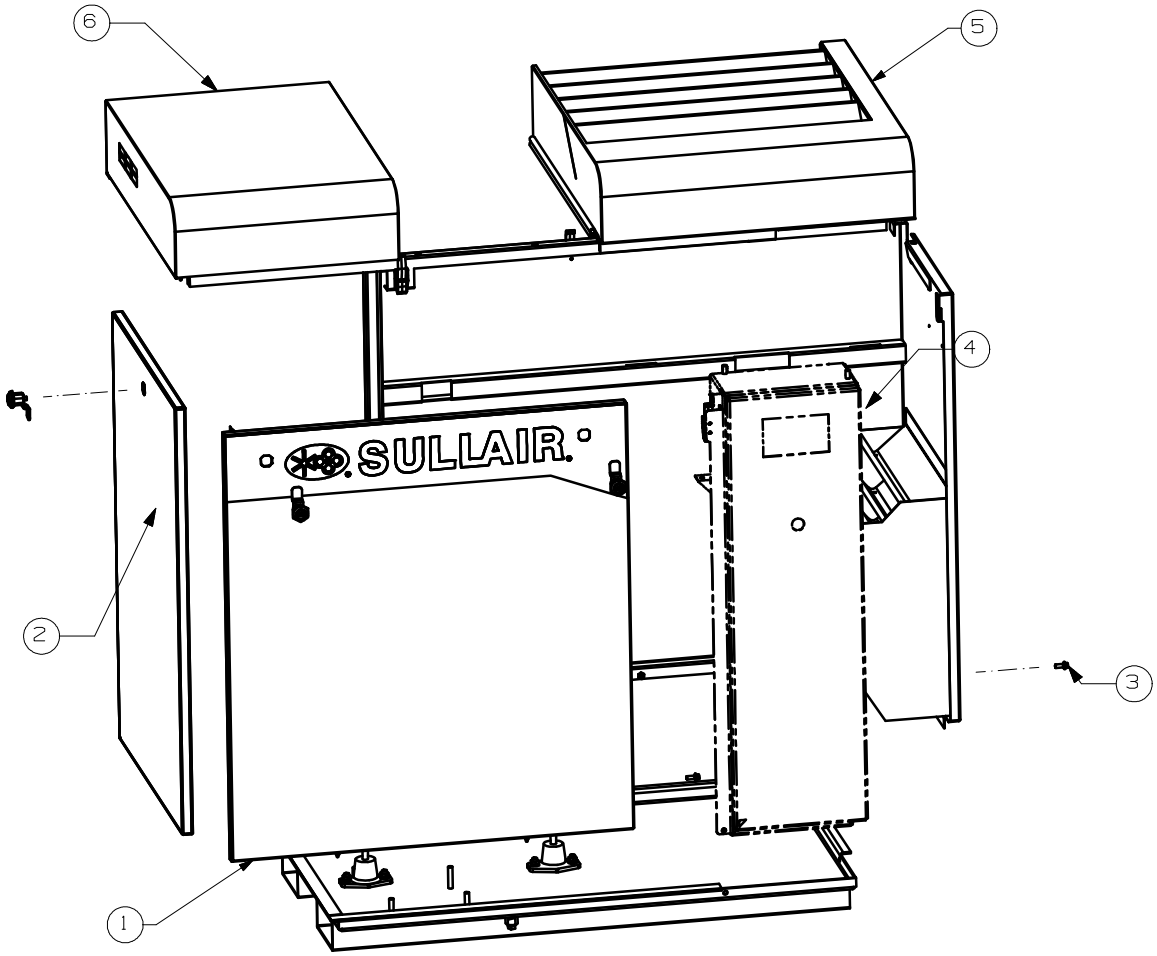
9.10 Frame Assembly -WS0400、WS0500、WS0700



Parts list of frame assembly:

Ref	Parts NO.	Specifications	Qty	Remarks
1	88290015-760	Side gate	1	
2	88290015-762	Front gate	1	
3	88290015-761	Top cover	1	
4	88290015-719	Side panel	1	
5	88831106-016	Flat washer 6	8	
6	88818206-012	Socket hex bolt M6X12	8	

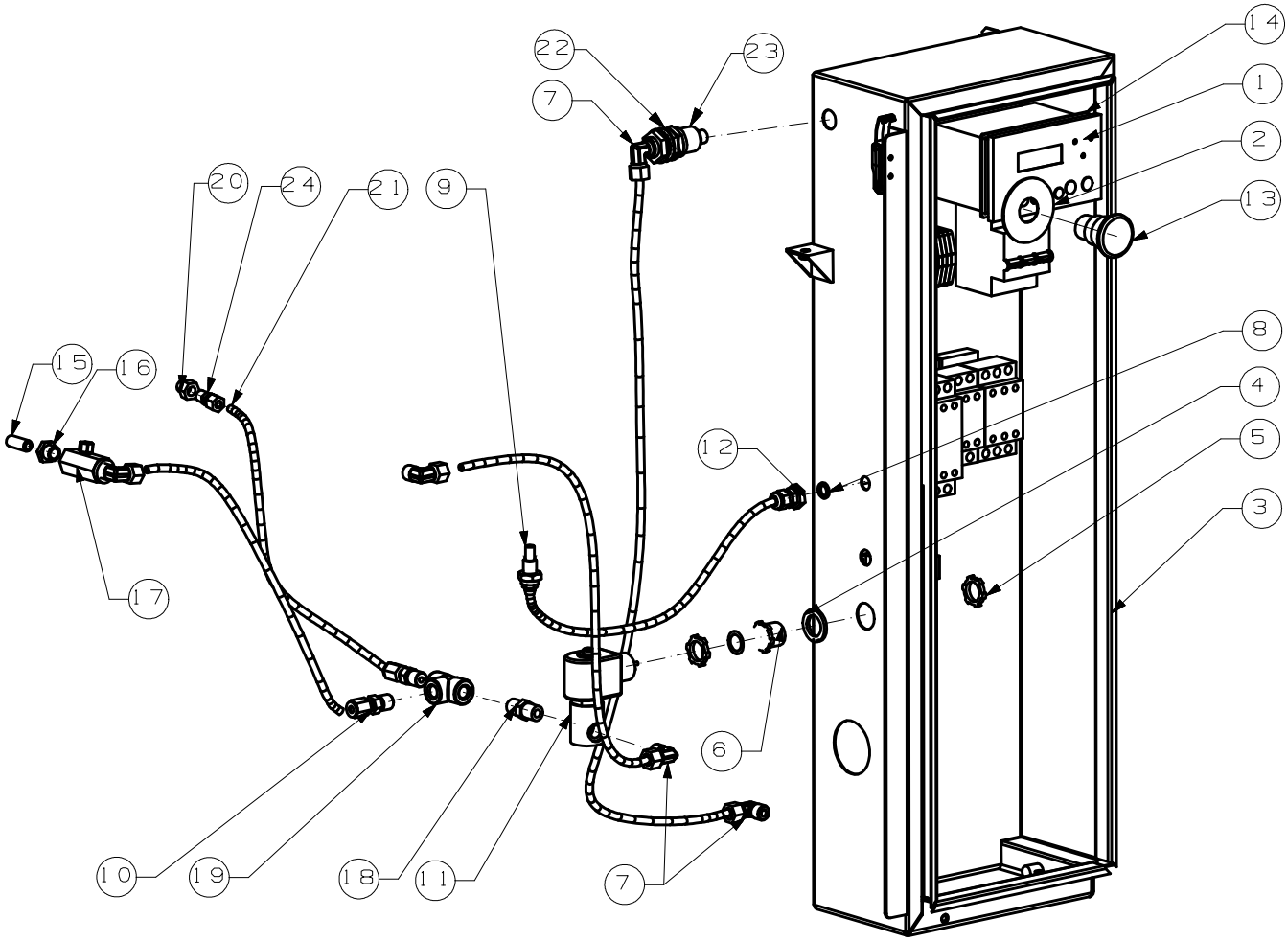
9.11 Frame Assembly of WS1100、WS1500



Parts list of frame assembly-WS1100、WS1500:

Ref	Parts NO.	Specifications	Qty	Remarks
1	88290014-281	Front gate	1	
2	88290014-280	Side gate	1	
3	88813106-016	Flanged hex bolt M6X16	6	
4	88290015-876	Side panel	1	
5	88290016-476	Air discharge top cover plate	1	
6	88290016-477	Air filter inlet plate	1	

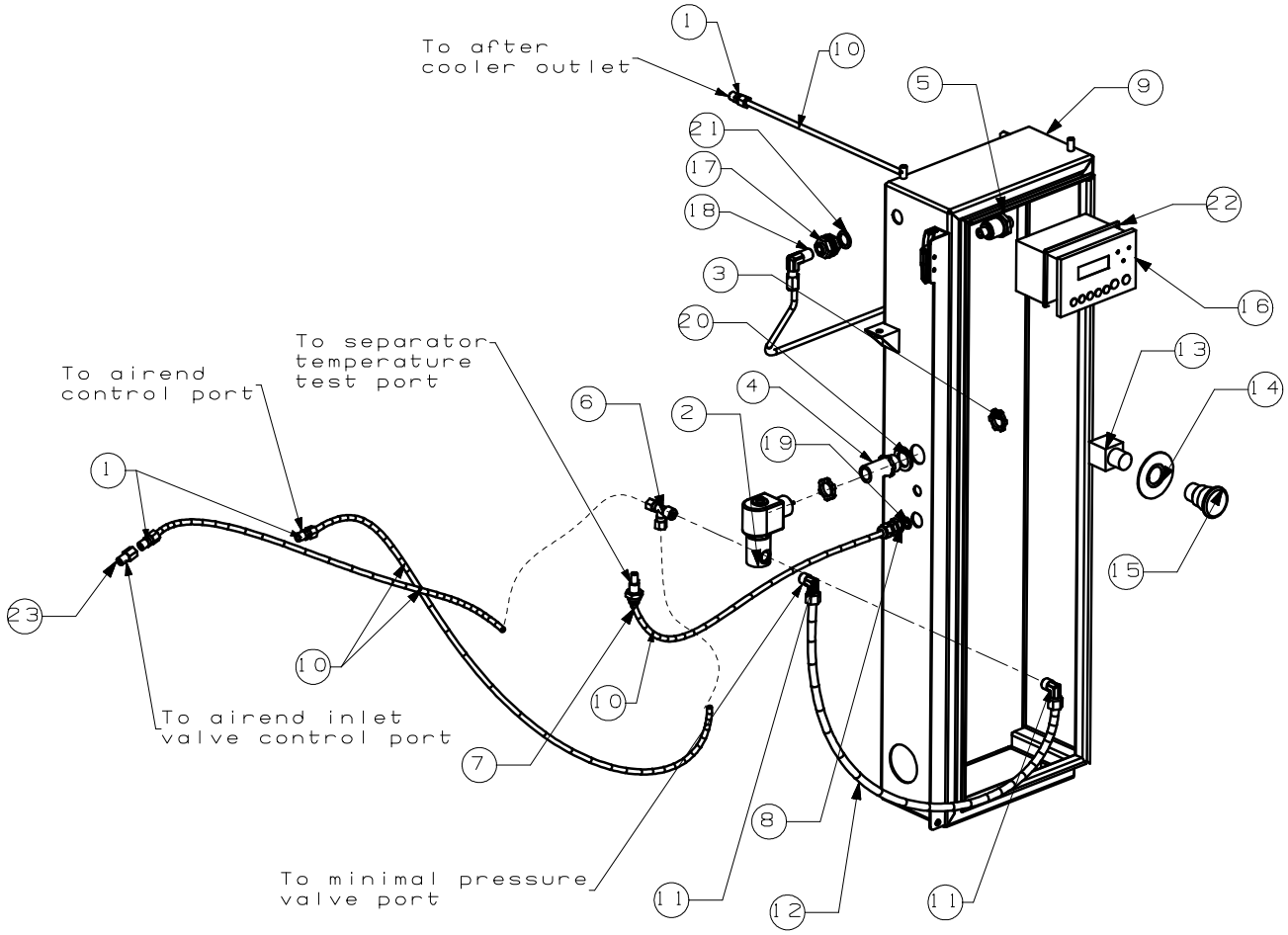
9.12 Control system of WS0400、WS0500、WS0700



Parts list of control system-WS0400、WS0500、WS0700

Ref	Parts NO.	Specifications	Qty	Remarks
1	88290014-903	Computer control panel	1	
2	88290004-495	Warning washer	1	
3	88290014-366	Cabinet assembly	1	WS4 380-420V MCC
	88290014-367			WS5 380-420V MCC
	88290018-340			WS7 380-420V Y-Δ MCC
4	88290015-924	Rubber washer 20	1	
5	847200-050	Locking nut	3	
6	846400-050	Connect hose	1	
7	02250099-626	Elbow connector	5	
8	88290015-926	Rubber washer 10	1	
9	88290014-534	Temperature probe	1	
10	810204-025	Connector NPT1/4 X NPT1/4	2	
11	88290015-219	Solenoid valve	1	
12	250023-496	Conduit lock nut	1	
13	88290001-535	Emergency Stop button	1	
14	88290015-928	Rubber washer	1	
15	823202-000	Connector 1/8NPT	1	
16	807600-005	Interior and exterior connector 1/4NPT X 1/8NPT	1	
17	02250110-557	Check valve	1	
18	868504-025	Connector	1	
19	804415-010	Tee NPT1/4	1	
20	040127	Orifice 0.062”	1	
21	250038-122	Nylon tubing 1/4"	95ft	
22	841500-004	Assembly connector NPT1/4	1	
23	88290014-514	Pressure probe	1	
24	250018-427	Straight connector NPT1/8 X TUBE1/4	1	

9.13 Control System of WS1100、WS1500



Parts list of control system-WS1100、WS1500

Ref	Parts NO.	Specifications	Qty	Remarks
1	250018-427	Straight connector NPT1/8 X TUBE1/4	3	
2	88290015-219	Solenoid valve	1	
3	847200-050	Locking nut	3	
4	250007-170	Connect hose	1	
5	88290014-514	Pressure probe	1	
6	250038-059	Tee	1	
7	88290014-534	Temperature probe	1	
8	250023-496	Conduit lock nut	1	
9	88290014-365	Cabinet assembly	1	WS11/15 380V Y-Δ
10	250038-122	Nylon tubing 1/4"	53ft	
11	02250099-626	Elbow connector	2	
12	88290017-053	Nylon tubing 3/8"	14ft	
13	88290001-536	Switch	1	
14	88290004-495	Warning washer	1	
15	88290001-535	Emergency stop button	1	
16	88290014-903	Computer control panel	1	
17	841500-002	Assembly connector NPT1/8	1	
18	810504-025	Connector NPT1/4 X NPT1/4	1	
19	88290015-926	Rubber washer 10	1	
20	88290015-924	Rubber washer 20	1	
21	88290015-925	Rubber washer 15.5	1	
22	88290015-928	Rubber washer	1	
23	040127	Orifice 0.062"	1	