DETROIT AIR

SCREW COMPRESSOR OPERATING MANUAL

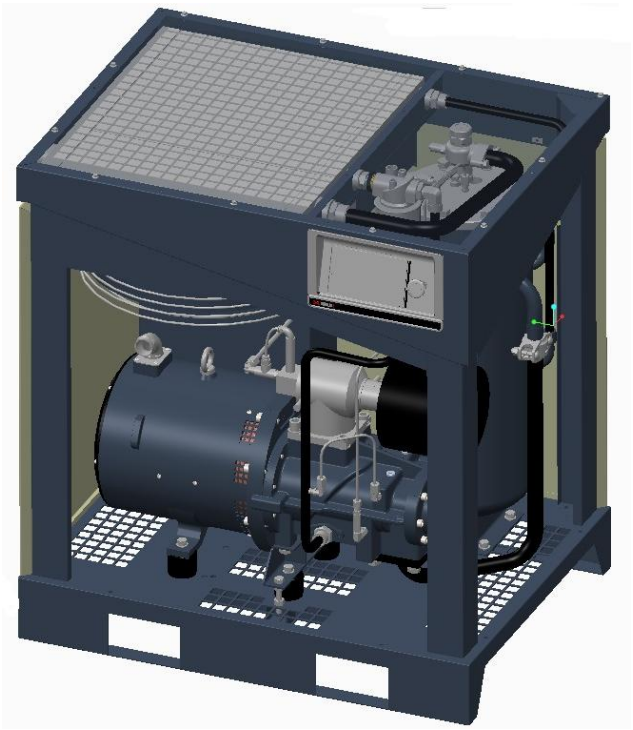
MODELS DT-10 to DT-100

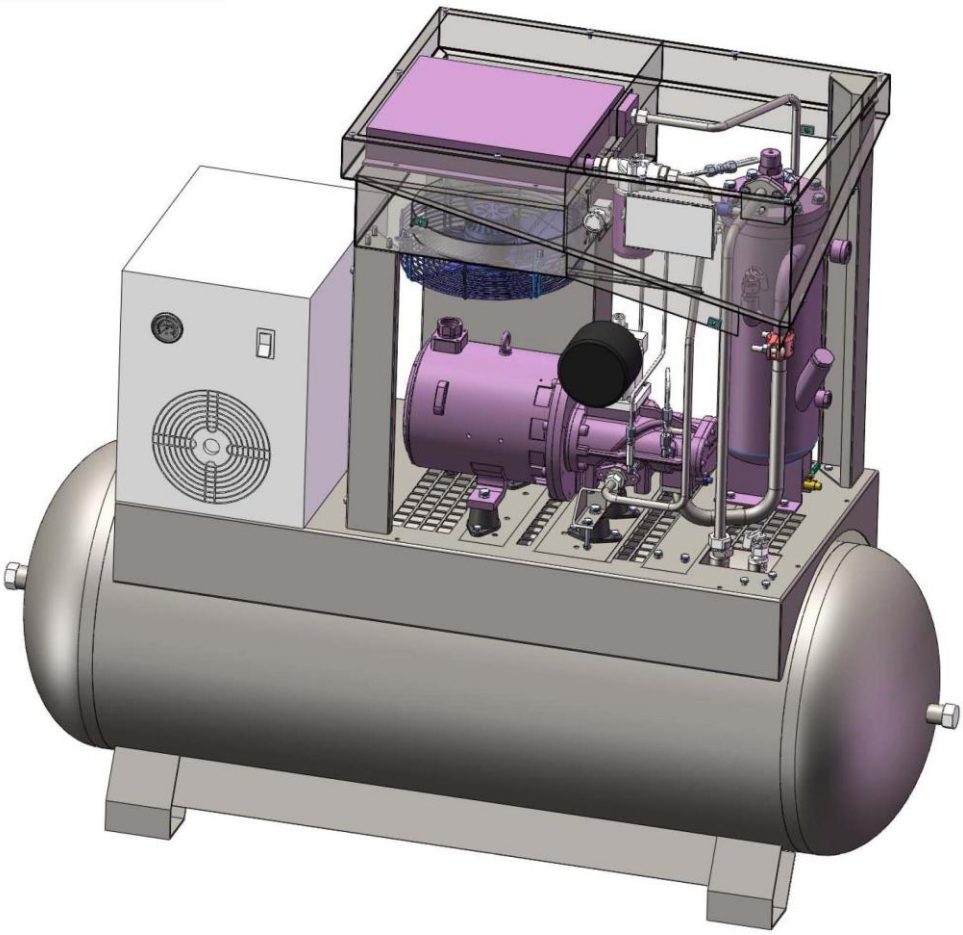
BELT/DIRECT DRIVE

DT-SERIES | EUROPEAN DESIGN AND MANUFACTURING TECHNOLOGY

PARTS AND SPECIFICATION SUBJECT TO CHANGE WITHOUT PRIOR NOTICE. PICTURES AND DRAWINGS ARE FOR ILLUSTRATION PURPOSES ONLY.

DT SERIES – Creating affordable and reliable compressed air.





	—— Do not dismantle any part of the machine while in operation, risk of death or personal injury is very probable.
	—— Pay attention to hot surfaces, risk of burns.
	—— Do not exceed the machines rated pressure, this may lead to machine failure or shut-down. Only use the machine at the factory-set pressure.
	—— Ensure proper cable connection and grounding. Use of under-rated power cable will result in damage to the cables and machine.
	—— Do not breathe compressed air, it contains oil and other contaminants and is toxic.

Caution

*****Please read the maintenance manual carefully before maintaining or using the machine*****

Regular maintenance interval schedule

Every 50 hours or weekly

--- Check oil level.

--- Check intake filter, if necessary clean it.

--- Drain condensation water from oil reservoir.

Every 500 hours

--- Check and adjust belt tension if necessary (belt driven only)

Every 1000 hours

--- Replace lubricants (for mineral oil)

--- Replace oil filter.

--- Replace intake filter.

Every 2000 hours

--- Replace lubricants (for synthetic oil)

--- Replace oil separator.

--- Clean the after cooler.

Attention:

1. Replace oil filter element and lubricant after the first 500 hours of operation.

2. Use of incorrect lubricant and spare parts will cause compressor damage, only use original manufacturer oil and parts. Use of non-original parts will void your warranty.

3. The service life of the compressor depends on the environmental conditions such as dust, heat, frequency of service, quality of service parts and lubricant.

Warranty card

Product name		**Reference**		**Purchase date**	
Customer name		**Contact person**		**Telephone**	
Address：					

Maintenance date	**Maintenance content**	**Maintenance man signature**	**Customer signature**

Warranty period

Our products enjoy 1-year warranty calculated from the purchase date for the complete machine and two-year warrantee on the air-end. The warrantee covers only parts. Labor, transport and any other cost of repair incurred will not be covered by the warrantee. Our company will not offer free of charge service or parts to repair damages due to installation errors, incorrect usage, maintenance errors and use of non-original manufacturer parts. Use of non-original service parts will void all warranties as will late or skipped servicing.

For routine or unscheduled maintenance note that Detroit Technical Service is able to provide you with assistance and spare parts as and when required.

CONTENTS

1. General

DETROIT screw air compressors adopt up-to-date European design and technology . All key parts such as screw air-end, electric motor, cabinet and pressure vessels are manufactured in house by Detroit Air. Compressors are built to European standards with focus on high-efficiency, low cost, long service life and low power consumption. Detroit air-screws are computer controlled, monitored and protected to ensure best performance, efficiency and service life.

1.1 Operating principles

Compression: The air end sucks air through air intake filter and intake control valve, dual rotary shafts compress the air. Oil is injected into the air compressing cavity providing lubrication and cooling for the air-end.

Separation: The mixture of air and oil generated in the compression stage is exhausted into an air and oil separation cartridge. Most of the oil is separated from the air under the influence of gravity and mechanical centrifugal force. Almost all oil mist is separated out of the air in this stage by means of the separator cartridge core. Remaining oil content is below 3PPM. The oil separated through the separation cartridge core is fed back to the screw through an oil return tube. A valve is mounted on the oil return tube in order to keep the loss of compressed air to a minimum. The clean oil flows into the air end internal cavity after being filtered.

Cooling: After oil is separated, compressed air flows out of the separation element through a minimum pressure valve then into the after-cooler. The cooler cools the compressed air into a temperature range 7-10 degrees Celsius higher than ambient before it is discharged through the discharge pipe. The minimum pressure valve guarantees the minimum pressure needed to keep circulation of oil on start-up or when running normally. Due to the check valve on minimum pressure valve, the compressed air cannot flow back into the separation element.

1.2 System control

The aim of having a control system is to control the intake valve correctly to control air intake. The system is comprised of the intake valve, loading piston, solenoid valve and pressure gauge.

Start-up: the intake valve shuts under the influence of spring force. Hence only a little air is sucked through a single-direct valve on the intake valve to generate cartridge pressure to keep up circulation of oil when the screw air compressor is started up from no-load state.

Load: when the compressor is running in a load state, it creates a vacuum within the compressor. This creates a difference of pressure between the intake filter and the air end. A solenoid controlling the loading-head piston opens the intake valve and allows air to be drawn in and compressed. The air pressure on the compression side thus increases.

Full load: when the pressure of the oil separation cartridge reaches 0.4MPa, the minimum pressure valve opens to let compressed air flow out. (When the system pressure is lower than the rated pressure, intake valve will stay open.)

No-load: when the discharge pipe's pressure reaches the maximum pressure rated by the pressure switch, the switch cuts the solenoid valve's power. As there is no pressure difference, the Intake valve shuts and the discharge solenoid valve releases pressure, thus reducing pressure in the separation cartridge. When the discharge pressure drops below the rated operating pressure, the cycle will repeat. A minimum pressure is maintained in the system to ensure lubrication of the system.

Stop: when the compressor is shut down, all solenoid valves will be powered off. The intake valve will close and the discharge solenoid will release any remaining pressure in the machine.

1.3 Operating temperature

DETROIT Screw air compressors can operate in ambient temperatures ranging from 5 degrees centigrade to 40 degrees centigrade. Intake point is the measurement point.

Condensation---low temperature

When the ambient temperature is low water will condense in oil at a higher rate. This screw compressor is equipped with a thermostatic valve set to open at 70℃. Water vaporizes at 70℃. Oil will not pass through the oil cooler until the rated temperature is reached, thus preventing water condensation in the oil.

In areas of temperatures below 5℃ anti-condensation apparatus should be mounted and a heater should be installed under the separation element.

Overheating---high temperature

In environments with high ambient temperatures, air intake should be via ducting directly from outside the compressor room/location. For example: compressors installed in boiler rooms or high temperature environments must get their air intake for outside the room where normal ambient temperatures exist.

Discharge temperature

The measure point of discharge temperature is located in the vent/air-outlet of the compressor. Discharge temperature would vary according to environmental temperatures, load percentage, cleanliness of cooler, cleanliness of intake filter and the cleanliness of oil filter. The normal operating temperature is between 70℃ and 90℃. When the compressor is started up from a cool condition the discharge temperature will increase to 85℃ quickly. The thermostatic valve will open fully at 70℃. The thermostatic valve controls the temperature accurately by constantly varying the oil-flow through the oil-cooler. Detroit compressors can safely run up to 109℃ after which the automatic overheat protection function will shut the machine down.

1.4 Lubricant features

Properties of Detroit Airs crew oil:

- Low degree of blister, non- volatile.
- High degree of anti-emulsification. High degree of anti-oxidation.
- Motion viscosity (40℃) ㎟/s 46.
- Pour point temperature -35℃ anti-solidification, low energy-consumption.
- Flash temperature 230℃, anti-carbon-deposit, and low-energy-consumption.

Oil for electric motor bearings:

Recommended: Shell Alvania RL 3

S.N.	Name	Symbol	Description
1	Safety in electricity utilization		Make sure the working supply voltage is off during operation
2	Danger! Electricity !		Watch out charged body ,leakage body and other electrical parts
3	Danger warning		Pay attention to and be careful about relevant warning information
4	Reading the instruction		Read the instruction before operation
5	Ignition hazard		Inflammable and explosive materials must kept be away from the machine
6	Explosion hazard		Please don't weld or repair the air storage tank
7	Electric shock hazard		Please don't place the equipment in wet places or outdoors to avoid electricity leakage due to reduction in electrical insulation resistance
8	No air leakage		No air leakage here
9	Caution, hand injury		Don't touch transmission part
10	Rotational direction of the motor		Check rotational direction of the motor during the process of first starting up or changing wire to avoid serious breakdown to the machine
11	Danger, hot!		Hot surface, avoid burns

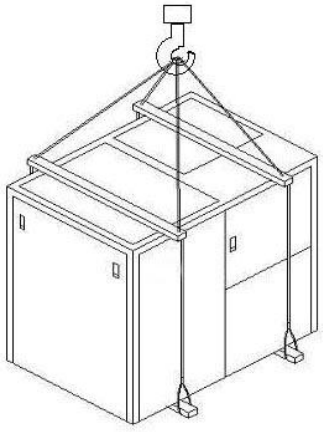
Installation information

2. Installation requirements and inspection before running machine

Examine the machine for any damage whatsoever cause by installation or transport. Do not run this machine if it has been damaged. Please report damage to your agent before commissioning.

2.1 Hoist and transportation

• Guide ropes should be used when compressor is being hoisted to avoid damage. Check for welding cracks and loose bolts after it is lifted. As the below figure shows a supporting board is needed when the compressor is being hoisted.



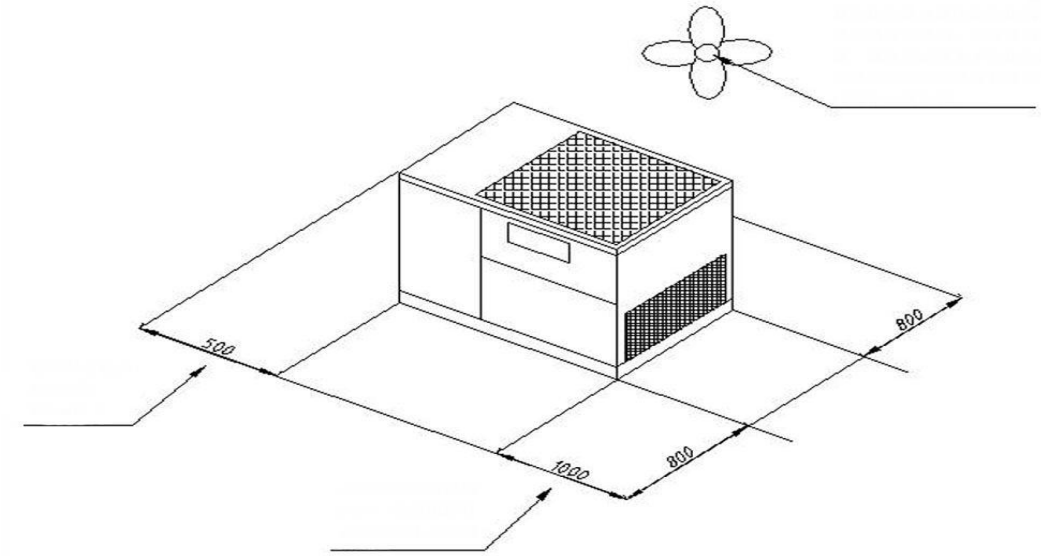
• When using a forklift to move the compressor, ensure the forks can cover the entire base length of the compressor. Never use under-rated lifting or towing equipment to move machinery. Ensure the machine is secure when being lifted or towed on a trailer.

The length of fork should not be less than the length of the base of compressor.

2.2 Installation requirements

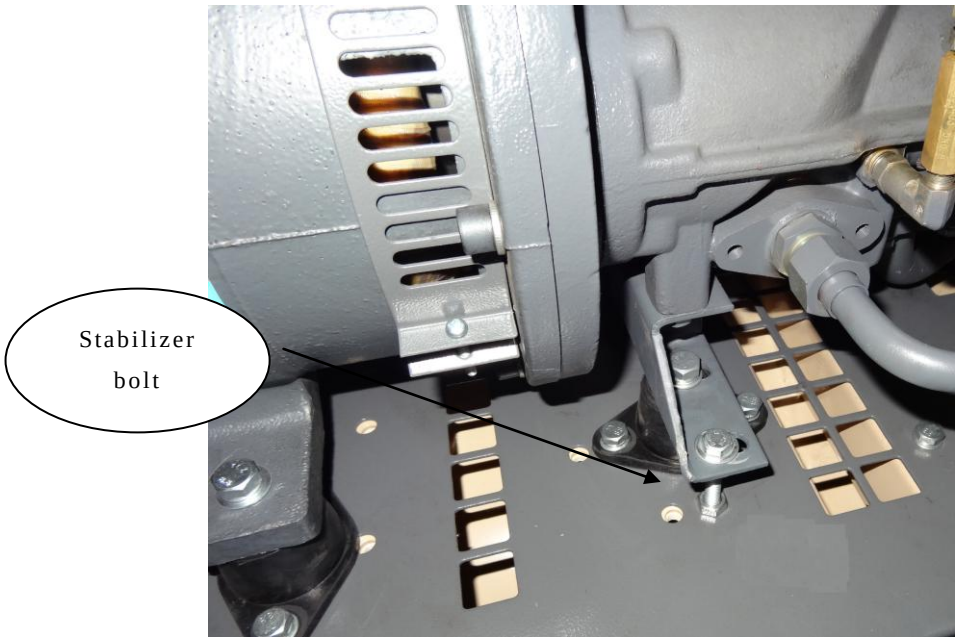
- The compressor should be located in a clean, dust-free, well-ventilated location. Air should not contain toxic or flammable gasses.
- The compressor should not be placed outside unless well protected from the elements. Should the environment be dusty, dust filters should be placed on the intake vents.
- Environmental temperature should be above 5°C to guarantee normal lubricant cycle.
- Some space (1m between the wall and compressor) must be set aside in order to make daily maintenance work convenient and allow for sufficient airflow. See figure3.
- Compressor should be placed on a solid level surface. Do not bolt it down.

If compressor is mounted in an enclosed room, an exhaust fan must be mounted in this room to keep the room cool. The extractor fan should be able to cope with a higher volume of air than the air compressor after-cooler system can produce.



WARNING:

In order to avoid damage caused by transportation safety bolts have been installed. The user must lock in the bolt before transportation and loosen it before usage, shown below.



2.4 Discharge pipe connection requirements

• The diameter of discharge pipe should be at least the same as that of the compressors outlet. All pipes and connectors should be able to bear the rated pressure. The configuration should meet the requirements for flowing velocity of the produced compressed air and the pressure drop of pipeline must not exceed the set pressure by 5%. Try to avoid using restrictive bends of small diameter piping. If the pipeline is relatively long, use pipes with a diameter exceeding the discharge pipe diameter on the compressor.

• Never let condensate flow into a working machine from the air compressor. Always put a water filter and separator system that removes water, oil and solid particles before it reaches production line machinery.

Install the pipeline leading to the pre-filter system at a 1 to 2 degree down slope. This will make water drainage more efficient.

- A one-way stop valve should be mounted at the air outlet of the compressor to allow for simple shut-off and maintenance of the system.

- Due to the anti-vibration design and rubber mounted after-cooler, all external pipelines should be supported externally. In order to prevent water condensate from flowing back into the machine after shut-down, configure the out-going pipe suitably.

- When compressor is used with an air dryer an air reservoir should be installed in between compressor and drier. This allows the air to cool and water to condensate inside the pressure vessel. This configuration greatly reduces load on the drying system thus saving energy.

- Installation of a ring-main system is recommended as it reduces pressure drop when load increases. Ring –mains also allow for easy maintenance of the distribution system without the need to shut-down air supply.

2.5 Electric installation requirements

All internal electrical systems of the compressor are thoroughly tested during the manufacturing process.

All external power connections should be to proper specification for the electric motor power requirements. Ensure the electrical systems are installed by competent persons only and that the length and gauge of power cable have been taken into consideration. No warranty will be given for electrical damage of any kind. Each compressor should be on its own circuit breaker system. Make sure that power supply voltage meets the rated working voltage of the compressor before running it. Reliable grounding of the compressor set is needed to avoid earth leakage.

Power supply

Minimum cross area of power cable (Copper wire mm^2)

Model	Motor power (Kw)	Cross-section (mm^2)
DT-30	22	16
DT-50	37	35
DT-75	55	50
DT-100	75	70
DT-10	7.5	6
DT-15	11	10
DT-20	15	16

Rotational direction of the motor

Power must be linked to the compressor correctly to guarantee the correct rotation of the electric motor. DETROIT screw air compressors are equipped with a rotation monitoring system. The electric motor will not start-up unless the phases are in the correct order.

Commission as follows: First - switch on power. Second - loosen the emergency button. Third - press the stop button. The machine will then run a self-test. Press the start button. If the machine runs normally the 3 phases are correct. Should the motor stop automatically swap any 2 phases. Do not change any wiring on the machine to force a start. This may damage your machine.

2.6 Machine inspection

Inspection of screw air end

- Revolve the belt pulley (belt drive) or shaft coupling (direct drive) of gear end by hand. Rotate the drive shaft by hand in both directions back and forth to ensure the rotors are free.
- Should the compressor be out of use for more than 2 months open the intake valve and pour about half a litre of oil into the loading-head. Rotate the drive shaft back and forth and ensure the oil enters the air-end.
- When reconnecting the inlet pipe make sure the nozzle is sealed.

Inspecting oil level

When opening the side door, you will see the oil inspection tube. The maximum oil level must not be above the upper part of oil inspection tube, the minimum oil level must not be lower than the bottom of the oil inspection tube. The oil level will differ when the machine is running. Check oil level only 30 minutes after the machine has been turned off.
Add the rated amount of oil. Make sure the lid to the nozzle is screwed on well and the seal ring is in good condition.

Tip: Too much oil will cause compressed air to contain excess oil, too little oil will lead to high operating temperatures.

Inspection of transmission system

- Inspect belts

Check if all belts are in the pulley grooves. Adjust the tightness of belts through the adjusting bolt on motor.

- Inspect the flexible coupling on the drive shaft.

Check the bolt of the flexible shaft coupling is properly tightened.

Inspection for all valves in the system

Check valves for leaks and proper operation.

3. Daily operation

The procedure below is for starting up for the first time or for the start-up procedure for the compressor after not being in use for more than two months.

3.1 Preparation before running

DETROIT screw air compressors have an advanced delay-start/delay-stop function. This function protects the motor, air-end and electromagnetic starter so as to optimize operating performance.

Delay-start: This function is to avoid starting up continuously after power cuts or emergency shut downs.

During this period, the compressor cannot be started-up. Make sure there is no pressure in the system to avoid start-up when there is backpressure. Press the start button and wait for the delay-time to elapse, then the machine will start automatically.

Delay-stop: This is a soft stop function. This function makes the compressor unload and shut-down. Press the stop button, the shut-down procedure will begin and the compressor will unload. The machine will continue to run for a few moments and then turn-off once the system pressure has been reduced. If the start button is pressed during the unload procedure, the system will cancel the shut-down and continue to operate normally.

3.2 Start-up procedure for the first start

- Check if the stop valve on the outlet is open. (If the stop valve is open, this pressure is the pressure of the compressor system)
- Turn power on, the power indicator light will illuminate. The compressor begins the delay-start procedure. Starting instantly is not possible.
- Press start button to run the compressor, the delay-start procedure will complete and the compressor will load.
- Check the operating temperature and pressure are stable and correct.
- Once the compressor has reached the operating pressure it will continue to run but will unload.
- Check that the output pressure is correct, ensure the machine is running as it should, without vibration.

3.3 Daily start-up procedure

- Check if oil level is correct. The oil level must be in the center of the oil gauge.
- Drain the water condensate from the external pressure vessel.
- Confirm the stop valve is open.
- Press start button. (If the compressor does not start up automatically and the run light is flashing, it means compressor is in a delay-start state.)

Attention: Do not start up within 60 seconds of shut-down. The system must not start up under pressure.

3.4 Shut-down procedure

Press the stop button, the compressor will commence the shut-down procedure, the stand-by indicator light will be flashing. After some time, the compressor stops.
If the compressor is start stopping, press the stop button to make it stop properly.
Attention: when compressor is in stand-by, it may stop and may start up at random. Do not take it for granted that the compressor has been stopped when the motor is not in motion. Check if the stand-by light is on to confirm.

Tip: emergency shut-down button is only to be pressed in case of an emergency.

TYPE: MAM-KY02S（B）-（Ⅷ）

Attention

Please read this manual carefully before operation.

Only Authorized technicians are may install MAM.

Please take into consideration the installation environment during the installation to ensure good ventilation and to minimize electromagnetic interference.

During the wiring procedure, please separate the high current and light current lines to reduce electromagnetic interference.

A surging protector must be installed to the inductive load systems such as AC contactors of the relay outputs

Check carefully when wiring the input/output before applying power.

Correct grounding of the ground terminals of the unit (Third grounding) can improve the anti-noise capability of the unit.

The pre-setting of the rating current of the motor is set to the rated current on the name plate X Motor overload factor/1.2.

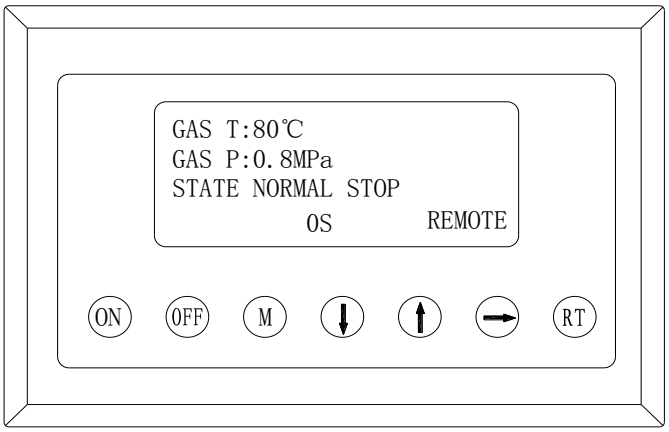
Features:

- LCD display
- Full protection function for the motor against short circuit, ceased rotor, phase drop, overload or unbalance.
- Start/Stop and operating control of the motor.

5. **Control Panel (for 18.5-250kw)**

- Rotation protection of the air compressor.
- Measuring, protecting and controlling temperature vital systems.
- Automatic adjustment of load rating to balance pressure.
- High Integrity, stable reliability and excellent performance.
- Optional remote / machine side control.
- Optional interactive/ independent operation.
- RS-485 communication interface function.

5.1 Basic Operation



Button Description Figure 1

ON——Start Button: Press this button to start the motor.

OFF——Stop Button: Press this button to stop the motor.

M——Set Button: Press this button to confirm the input data to be saved after modification of data.

↑——Up button: Press this button to move upward during modification of data. Press this button to select menu during the menu selection.

↓——Down Button: Press this button to move downward during modification of data. Press this button to select menu during the menu selection.

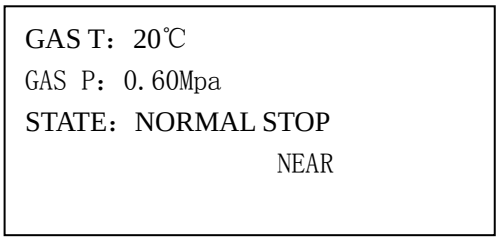
→——Cursor / Confirm Button: This button can be used as cursor during data modification and as a confirm button during menu selection.

RT——Return/reset Button: Press this button to return to upper-level menu during the menu operation. Press this button to reset the machine when the unit has stopped in failure.

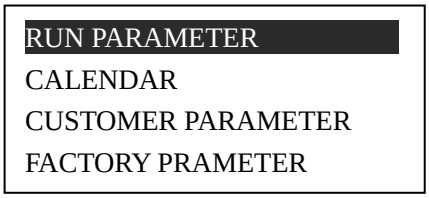
Status Display and Operation

The display interface is as following when POWERED ON:

The main display after 5 seconds will be the following:

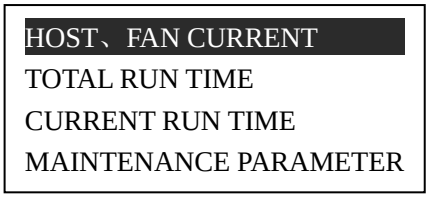


Press "↓" Enter the following Menu Selection Interface:

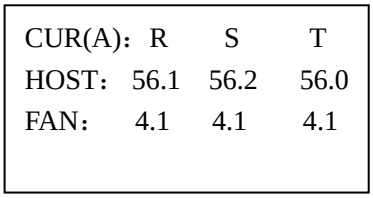


Run the Parameter Review

Press '↓'or '↑' to move the black cursor over the menu 'RUN PARAMETER'and then press '→' into the submenu:



Press '→' to into the next menu:



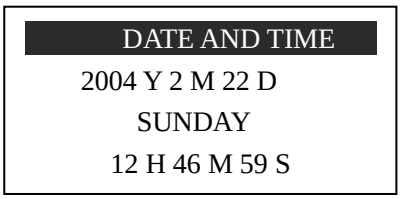
If the display menu is the last menu level, the black cursor will disappear, press the RETURN button '**RT'** and return to the upper menu or the main interface. If the operation is stopped in a certain interface, it will automatically return to the main interface after several seconds.

Using the moving buttons '↓' '↑', confirm button '→' return button ' **RT'** to view the RUN PARAMETERS such as: **CURRENT, RUN TIME, MAINTENANCE PARAMETER, HISTORIC FAILURE,**

PRODUCTION DATE and **CURRENT FAILURES** and then return to the upper menu with the similar method of the above.

Calendar and Time

Press '↓' or '↑' to move the black cursor to the menu 'CALENDAR' and then press '→' , the following menu will pop up:



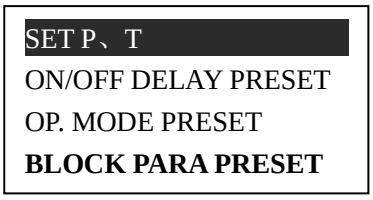
At the stop status of the unit, the date and time can be adjusted by the following steps: Press '↓' or '↑' to move the black cursor to the parameters you want to modify and then press '→' to reach the blinking position. Now the button '↓' and '↑' change to 'Page-up' and 'Page-down' button. **Press 'M' button to confirm and save the data after finishing the modification.** The buttons '↓' or '↑' return to black cursor move button and the button '→' changes back to its Return function.

CUSTOMER PARAMETERS

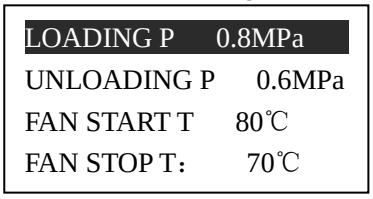
Tips: The Customer Parameters and the Factory Parameters cannot be modified during operation

The Customer Parameters could be read and modified by the same method of running the Parameter Review mentioned above. For example, to modify the parameter BLOCK UNLOAD PRESSURE, the steps will be as follows:

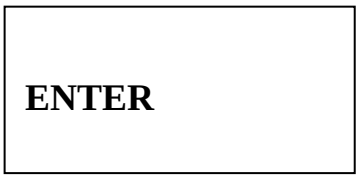
Press '↓' or '↑' to move the black cursor to 'CUSTOMER PARAMETER' menu and then press the CONFIRM button '→' to pop up the menu:



Press the CONFIRM button '→' again to reach the following menu:

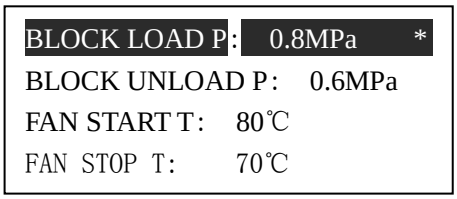


The CUSTOMER PARAMETERS can be read now when the CONFIRM button '→' is not pressed now. Press the CONFIRM button '→' again to pop up the following interface where the password input is required:



Note: The Customer Password can be modified in the CUSTOMER PARAMETER, the FACTORY PASSWORD is only available from your Detroit Authorized agent.

The Blinking Position will appear after this interface is displayed. The button '↓' and '↑' have been changed to PgUp and PgDown button that can be used to change the current value. The button '→' is changed to a move button to move to the position where the modification is needed, Press 'M' to confirm and the following interface will be displayed:



When there is a '*' displayed at the top right corner, it means it is at the CUSTOMER PARAMETER set status.

The '↓' or '↑' button returns to black cursor function and the button '→' returns to be the CONFIRM button function. Press the CONFIRM button '→' when the cursor is over the menu ' BLOCK UNLOAD PRESSURE', now blinking, appears and the button '↓' and '↑' have been changed to PgUp and PgDwn button function than can be used to change the current value. The button '→' is changed to move button function, move to the position where the modification is needed, Press 'M' to confirm and the blinking position will disappear. The '↓' or '↑' return to black cursor function, the move button and the button '→' change back to the CONFIRM function to continue to modify the other CUSTOMER PARAMETERS. If there are no other parameters needed to be modified, press the button '**RT'** to return to the upper menu or the main menu. The other CUSTOMER PARAMETERS could be modified with the same method above.

CUSTOMER PARAMETERS

First Submenu	Second submenu	Preset Value	Functions
	UNLOAD P.	*.**Mpa	Unload pressure value
	LOAD P.	*.**MPa	Load pressure value
SET P. T.	FAN START T.	***℃	Control fan starting. This value will be set to '120℃' if there is no fan present or the fan is not required.
	FAN STOP T.	***℃	Control the stopping temperature of the fan
	HOST START TIME	0008s	When using the controller to protect the motor, it is required that the time here defined will not meet the impulse starting current of the motor, the value here must be longer than the STAR DELAY TIME plus LOAD DELAY TIME
	FAN START TIME	0006s	When using the controller to protect the motor, it is required that the time here defined will not meet the impulse starting current of the motor.
	STAR DELAY TIME	0006S	Star contactor release starting delay time.
ON/OFF DELAY TIME PRESET	LOAD DELAY TIME	0002S	The loading delay time after the star contactor released.
	EMPTY DELAY	0020M	The machine will automatically stop after this time of being unloaded.
	STOP DELAY TIME	0010S	The machine will not stop until this time elapses on shut-down.
	START DELAY TIME	0100S	Machine can not be restarted before this set time after stopped or over time operation at a load free state.
	STANDBY DELAY TIME	0000S	Additional function.
	DRAIN OPEN TIME	0002S	The continuous draining time during the automatic drain function.
	DRAIN CLOSE TIME	0010M	The duration the automatic drain will stay shut between opening.
OPERATION MODE PRESET	ON/OFF MODE	Machine side	When the remote mode is set, both the buttons at machine side and the remote control button can turn the machine on and off.
	LOAD MODE	Auto	When the manual mode is set, the Load/Unload function can only be executed by pressing buttons.
	COM MODE	Prohibited	When this is set to 'PROHIBIT' the communication function is not available.

	COM CODE	0255	Communication address.
BLOCKING PARAMETERS PRESET	BLOCKING MODE	HOST	Act as Host or Secondary Machine when there are more than one machines running in blocking mode. The HOST controls the SECONDARY.
	BLOCKING ON/OFF	Sequence	
	SWITCHING TIME	9999 Hours	
	BLOCK NUMBER	0016	
	BLOCK LOAD P	*.**MPa	
	BLOCK UNLOAD P	*.**MPa	
	BLOCK DELAY TIME	0000S	
MAINTENANCE PARAMETER PRESET	OIL FILTER RESET	0000 HOURS	Reset time for the duration of oil filter changes.
	O/A RESET	0000Hours	Reset time for O/G Separator changes.
	AIR FILTER RESET	0000Hours	Reset time for air filter changes.
	LUB OIL RESET	0000Hours	Reset time for Oil Changes.
	LUB GREASE RESET	0000Hours	Reset time for Greasing bearings.
MAX LIFE TIME PRESET	OIL FILTER	9999Hours	Setting this value to ‘0’ will make the oil filter alarm null.
	O/G SEPARATOR	9999Hours	Set this value to ‘0’ to disable the O/G separator alarm function.
	GAS FILTER	9999Hours	Set this value to ‘0’ to disable the alarm for the air filter.
	LUB. OIL	9999Hours	Set this value to ‘0’ to disable the alarm for lubricant change.
	LUB GREASE	9999Hours	Set this value to ‘0’ to disable the time alarm of lubricating grease .
LANGUAGE SELECT		English	Set to ‘ENGLISH’ will change the interface to English.
NEW USER PASSWORD		****	Customer can modify the user password.

FACTORY PARAMETERS

The difference of the FACTORY PARAMETERS to the CUSTOMER PARAMETERS is that the FACTORY PARAMETERS cannot be modified unless you have the initial password from the factory. The modification method of the FACTORY PARAMETER is the same as that of the CUSTOMER PARAMETER. The main functions of the parameters are as follows:

PARAMETER	Initial Value	Functions
HOST RATED CURR.	Maximum overload value of the motor /1.2	After the start- delay time, if the motor current is greater than 1.2 times of the set value or less than 4 times the set value, the unit will activate the overload feature.
FAN RATED CURR.	Maximum overload value of the fan motor /1.2	Same as above
PRE-ALARM T	105℃	Alarm sounds when the temperature reaches this set value.
STOP T.	110℃	Alarm sounds when the air exhaust temperature reaches this set value.
STOP P.	1.00MPa	Alarm and stop when the air supply pressure reaches this set value.
UNLOAD LIM P	0.80MPa	The Unload Limit Pressure in the Customer Parameter must be set lower than this value.
MODI LOAD TIME	****Hours	The factory can modify the load running time.
MODI TOTAL TIME	****Hours	The factory can modify the total running time.
HISTORY FAULT RESET	****	Input the history failure password to clear all the history failures.
UNBALANCE SCOPE	0006	When (the max. phase current/min. phase current) is greater than (1+set value), the unbalance protection will stop the machine. If the set value is greater than 15, the unbalance protection will be disabled.
LACK PHASE STOP	0005	Set the LACK PHASE TIME ≥20S, the Lack phase protection will be disabled.
	0000 M	
PROD. DATE	****Y**M**D	The factory inputs the product date of the unit.
PROD. NO.	******	The factory inputs the product No. of the unit

5.2. PLC Functions and Technical Parameters

- Switching value: 8 ways of switching the value input. 10 ways of relay switching the value input.
- Analog quantity：2 Pt100 temperature input; 2 ways of 4～20mA transferred input; 2 groups of 3 phase current input (Match with CT)
- Input voltage of phase sequence: 3 phase 460V/230V.
- Working power of controller: 100V-220V, 50Hz/60Hz, 20VA.
- Display measuring Range:

Oil Temperature: —20～150℃; Accuracy: ±1℃.

Air Temperature: —20～150℃ Accuracy: ±1℃.

Running time: 0～999999 hours.

Current Display Measuring Range: 0～999.9A.

Pressure: 0～1.60Mpa, Accuracy: 0.01Mpa.

- Phase sequence Protection: When the protector detects the wrong phase sequence, it activates for ≤2s.
- Motor Protection: This control unit has the following 5 basic protection functions.

-Rotor Lock protection: After the starting of the motor, if the working current reaches 4 or 8 times the set value, the protection activates. The activation time is less than 0.2s.

-Short-Circuit Protection: if the detected current reaches 8 times or more above the set value, the protection activates in less than 0.2s.

-Drop phase protection: Any of the phases drop the protection activates as per the set time.

-Unbalance Protection: Current difference between any of the two phases reaches the percentage of the setting value, the protection activates in less than 5s.

-Overload anti-time limitation protection (time unit: s): See the following table. The multiple=I Actual value ／ I Set Value.

When the running current of the motor is in 1.2 ~3.0 times of the set value, the overload multiple and action delay time will be accordance with the following table.

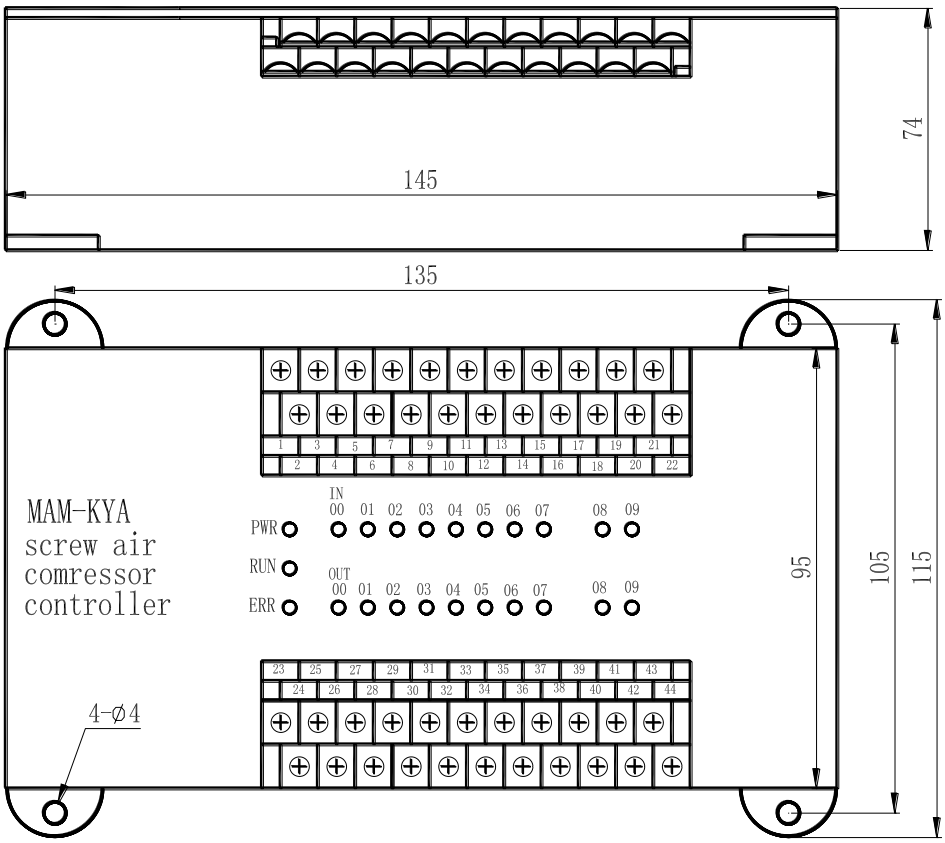
Iact/I set / Time Para	≥1.2	≥1.3	≥1.5	≥1.6	≥2.0	≥3.0
Action time	60	48	24	8	5	1

-Temperature Protection: When the actual detected temperature is higher than the set temperature, the protection activates, the activation time ≤2s.

-The output relay contactor capacity: 250V 5A. The life time of the contactors: 500000 contacts.

-The current display tolerance <1.0%.

-RS—485 communications.



Unit Structure Size

3. Power LCD： PWR
4. Running LCD: RUN LCD
5. FAILURE LCD: ERR LCD

Controller installation

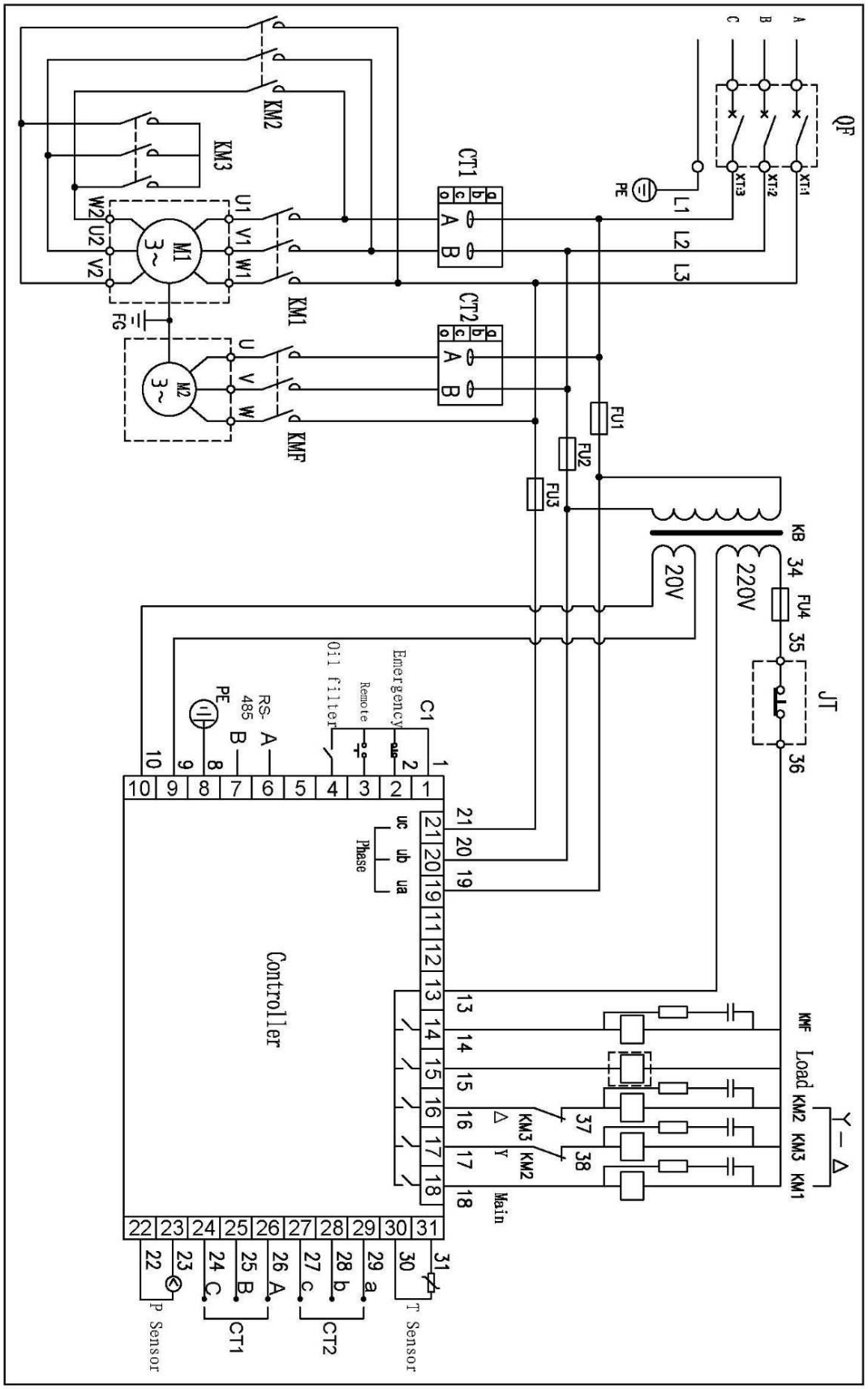
The Controller will be installed in the control cabinet. There must be enough space around the controller for accessibility when wiring. The recommended sizes are as below:

1. Input LCD（IN）: 00, 01, 02, 03, 04, 05, 06 and 07 relatively correspond to the input switching value terminals of 20, 19, 18, 17, 16, 15, 14 and 13.
2. Output LCD（OUT）

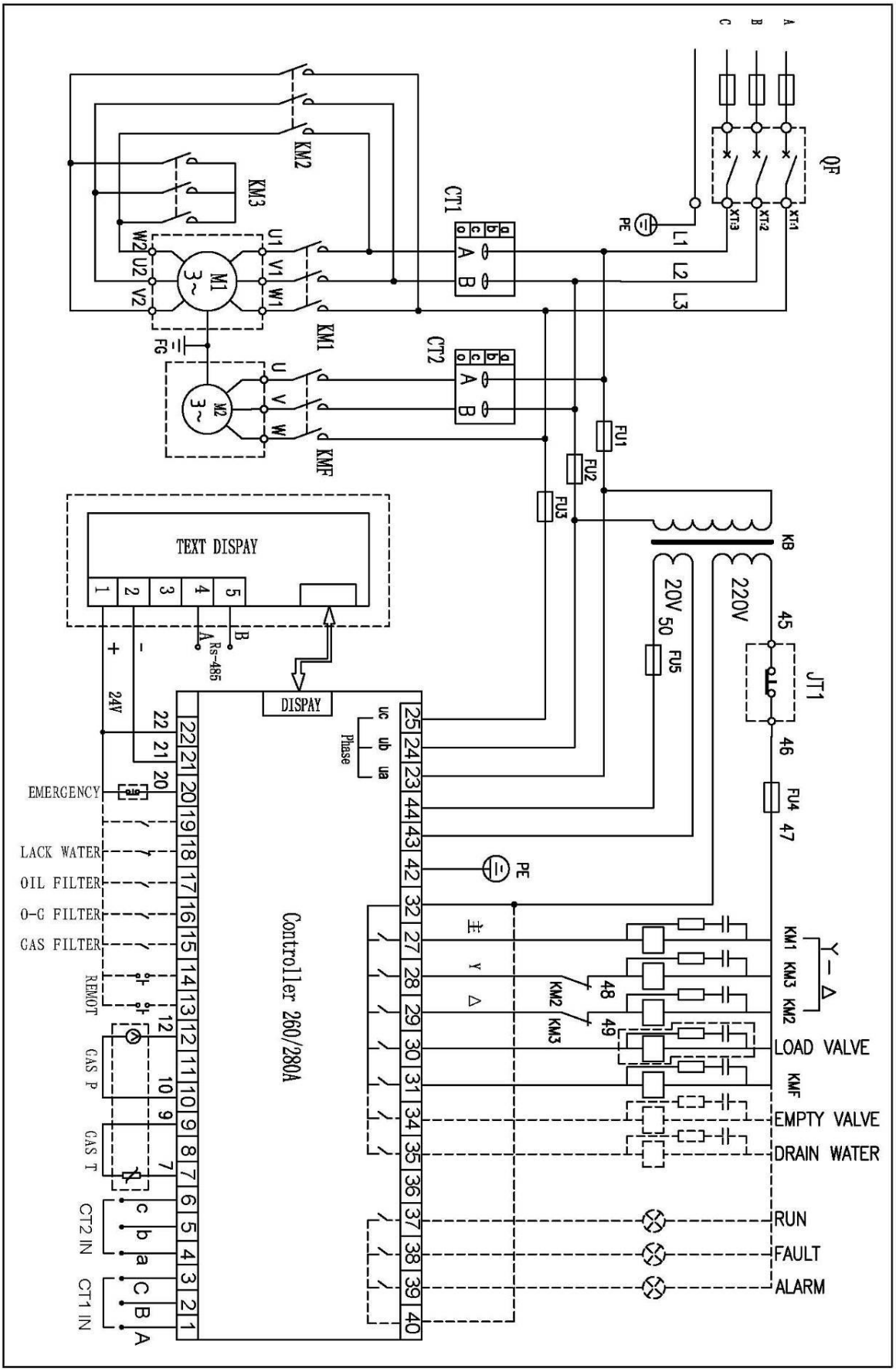
00, 01, 02, 03, 04, 05, 06, 07, 08 and 09 relatively corresponded to the output switching value terminals of 27, 28, 29, 30, 31, 35, 36, 37, 38 and 39.

Diagram 6: Main Control

5.2.1 Basic wiring diagram of the split type electronic Installation.



5.2.2 Basic wiring diagram of the integrated type electronic Installation.



Text Display connector terminals:

There are five connection terminals and one D type display cable connector which are used for the display connector, Rs—485 communication interface and 24V Power input

Controller Connection Terminals:

The display panel is connected to the controller using communication cables. 23, 24 and 25, are the phase sequence input terminals; 7 and 9 are the Air Exhaust Temperature Input terminals; CT1 is the host motor contactor; CT2 is the fan motor contactor. 32 is the common port COM1 of the relay output; 27 controls the main contactor; 28 controls the star contactor; 29 controls the angel contactor; 30 is the loading solenoid valve; 31 controls the Fan; 34 controls the Load release valve: 37 is the running indicator; 38 is the Failure indicator; 39 is the Alarm indicator; 40 is COM2; 42 is the simulated ground (Earth); 43 and 44 are the 220V power source.

Attention: the transformer must be connected to a surge protector when wiring

5.3 Control Principle

Individual Control

-Local Automatic control (ON/OFF mode: User operated; Loading method: Automatic)

- Press 'I' to start: (Y—△ Starting)

When the controller is powered on, it will perform a 3S self-check. Press the 'I' button, the machine will not start until self-checking is completed. The starting process of the host will be as follows: KM3 is powered on, KM2 is Powered on → Y type Starting Status → Time Delay finish（Y—△ converting time）, KM3 loses power (KM1 and KM3 interlocked) ，KM1 is powered on → Motor runs in △ type and starting is completed. The load solenoid valves are without power during the whole starting process to ensure load free starting.

- **Automatic Run Control:**

When the motor is started in △ state and loads, the solenoid valves will be activated. The air compressor will load and compress air until the pressure in the discharge reaches the pre-set unload pressure value. The compressor will then unload as the solenoid valve loses power, the loading head valve closes. Should the compressor be unloaded for extended periods the control system will shut the motor off until such time as the pressure in the system drops below the LOAD PRESSURE VALUE. At this time the control system will restart the machine.

- Manual Load/unload in automatic status function

At the automatic status function, the unit will stay in the unload state, press the button '↓↑' to load, if the pressure is higher than the unload pressure, the loading solenoid valve will close once and then return to the unloaded status; if the pressure is lower than the unload pressure, the loading solenoid valve will be activated. The unit will not unload until the air supply pressure becomes higher than the unload pressure. When the unit is in the load state, press the button '↓↑' to unload. If the pressure is higher than the load pressure, the loading solenoid valve will lose power and return to the unload state until the air discharge pressure becomes lower than the load pressure. If the pressure is lower than the load pressure, unloading is disabled.

- Normal Stopping:

Press the button 'O', the loading solenoid will lose power and the unloading solenoid activate, after

the stop-delay procedure the machines electrical systems will shut down and stop running.

- Frequency starting prevents control

The motor cannot be started immediately after shutdown. Should the system be started up again a time delay countdown will begin. The system will restart once the timer reaches “0”.

-Remote Automatic Control (ON/OFF mode: Remote; Load mode: Automatic)

The remote automatic control is almost the same as the local automatic control, the only difference is that the start and stop of the unit is controlled by remote control.

-Local Manual Control (On/Off mode: User operated; Load mode: Manual)

This starting and stopping control is the same as the automatic control, the only difference is that when the starting procedure completes in this mode, the machine is at the load free state and will be loaded by pressing the button ‘↓↑’. When the air supply pressure is higher than the unload pressure, the unit will load automatically, if the button ‘↓↑’ is not pressed to load, the unit will be running at the load free state until the load free stop is activated by the PLC. During the unloaded stage, press the button ‘↓↑’ to load and during the loaded stage, press the button ‘↓↑’ to unload.

-Remote Manual Control (On/Off Mode: Remote; Load mode: Manual)

The remote automatic control is almost the same as the local manual control, the only difference is that the start and stop of the unit is controlled by remote control.

-Network control

When the control network is set to ‘COMPUTER’, it can be controlled by a computer network.

Set the controller communication to ‘BLOCKING’ to enable network control between the machines.

The master control machine to which all other compressors are linked must be #1 controller.

-Fan Temperature control

When the air exhaust temperature is higher than the fan starting temperature, the fan motor will run; when the air exhaust temperature is lower than the fan stop temperature, the fan motor will stop running. If there is no fan or the fan is not necessary, set the starting temperature of the fan to ‘120℃’ and the stop temperature to ‘70℃’.

Failure stop and Emergency stop

When there is any electronic failure or high temperature alarm during the running process, the controller will stop the motor immediately. The motor can only be restarted after the failures are cleared. Should any emergency situation occur, please press the emergency stop button to cut off the power supply to the controller and motor contactors.

5.4 Alarm and Notices

Text Display tips

Air-filter Alarm tips:

- Check the alarm using the switch signal

  The controller can display the message on the LCD display to show the operator ‘ the air filter is blocked’ by checking the air pressure state.

- Set the running time alarm of the air filter

  The LCD displays ‘Air filter life end’ when the usage time of the air filter expires.

Oil Filter alarm tips:

- Check the alarm using the switch signal

  The controller can display a message on the LCD display to show the operator that 'the oil filter is blocked' by checking the oil pressure state.
- Set the running time alarm of the oil filter

The LCD displays 'Oil filter life end' when the usage time of the oil filter expires.

Oil separator alarm tips:

- Check the alarm using the switch signal

  The controller can display the message on the LCD display to show the operator that 'the oil separator is blocked' by checking the pressure state.
- Set the running time alarm of the oil separator

  The LCD displays 'Oil separator life end' when the usage of the oil separator expires.

Lubricant oil alarm tips:

- The LCD displays 'Lubricant Oil life end' when the usage time of the lubricant oil expires.

Lubricant grease alarm tips:

- The LCD displays 'Lubricant grease life end' when the usage time of the grease expires.

Main Controller Tips

Item	Meaning and Functions	Lights Status
POWER	Controller Power on	PWR Light
RUN	Controller run	RUN Light
Failure	Detect failure and stop	ERR Blinking
Input Switching Value	Terminal 20～12 Input switching value activated	IN00~08 lights, but if there is no function at the input point, no light illumination
Output Switching Value	Terminals 27,28,29,30,31,35,36,37,38 and 39 output switching value activated	OUT00~09 lights
Data Save	Set data and save time	PWR blinking once

5.5 SYSTEM SAFETY PROTECTION

Motor Protection

• MAM air compressor controller can perform short-circuit protection, rotor-lock protection, overload protection, phase-drop protection and unbalanced voltage protection for the motor.

Electronic failure	Failure Display	Possible Causes
Short-Circuit	Local Failure display 'Host or Fan short-circuited'	Short-circuited or the rated current is incorrectly set
Rotor lock	Local Failure display 'Host or Fan Rotor Locked'	Overloaded, bearing wear or other mechanic failures
OVERLOAD	Local Failure display 'Host or Fan Overloaded'	Overloaded, bearing wear or other mechanic failures
Phase Lack	Local Failure display ' Host or Fan Phase Lacking'	Phase drop occurred to power or the contactors
Unbalance	Local Failure display 'Host or Fan current unbalance'.	Contactors are not contacting correctly or the motor core is damaged.

Air Exhaust overheat protection

• When the air exhaust temperature is higher than the set limited unload temperature, the controller will alarm and stop the machine. LCD displays 'Air Exhaust High Temperature'.

• Reverse rotation running protection

Attention: When the phase sequence of the power connected to the air compressor is not conforming to the input of the controller, the LCD displays 'Wrong phase sequence' and as a result the controller will not start the motor. Check and alternate any two of the phase inputs and check rotation direction.

Over Pressure protection

When the pressure of the air exhaust is higher than the set stop pressure of the controller, the controller will alarm and stop the machine, the LCD displays 'Pressure too high'.

Sensor Failure Protection

When the cable of the pressure or the temperature sensor is broken, the controller will alarm and stop the machine. LCD displays '** sensor failure'.

5.6 History failure record

The failures caused by the peripheral equipments of the controller can be investigated by querying the failure record or the history failure records to find the failure causes and solve the problem.

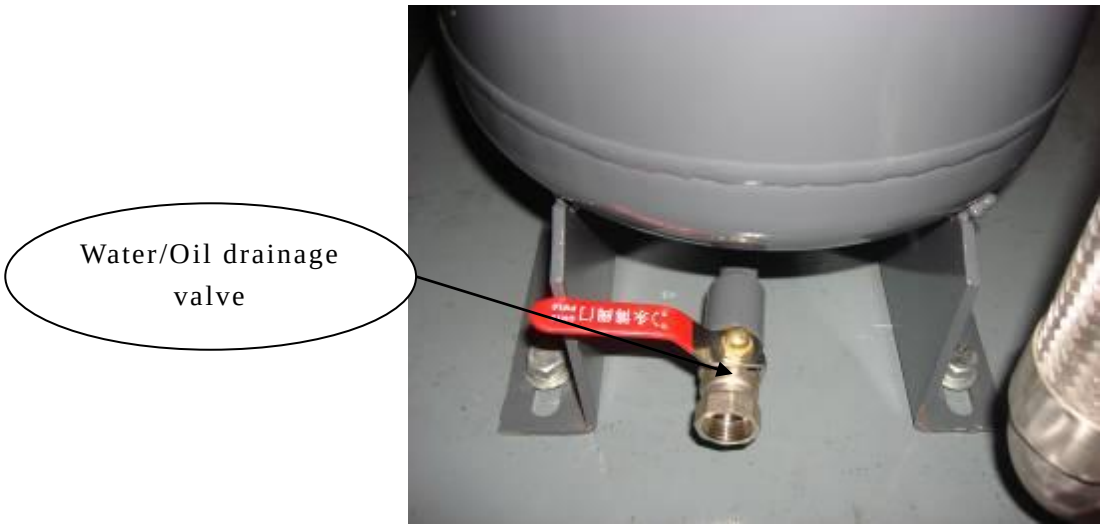
6. Maintenance

6.1 Maintenance items and maintenance intervals

Without proper maintenance the service life of the machine will be greatly reduced. Any high performance equipment requires regular maintenance to ensure perfect operation.

Daily maintenance

Before start-up: drain out water in the bottom of oil tank until some oil flows out, check the oil level is correct.



Attention: Don't open the oil-discharging ball valve for five minutes after shutdown.

After start-up: Watch the pressure on the control panel. Check temperature and the general condition inside the compressor. Check if there is leakage on the outer surface of the cooler.

Maintenance plan

DAILY

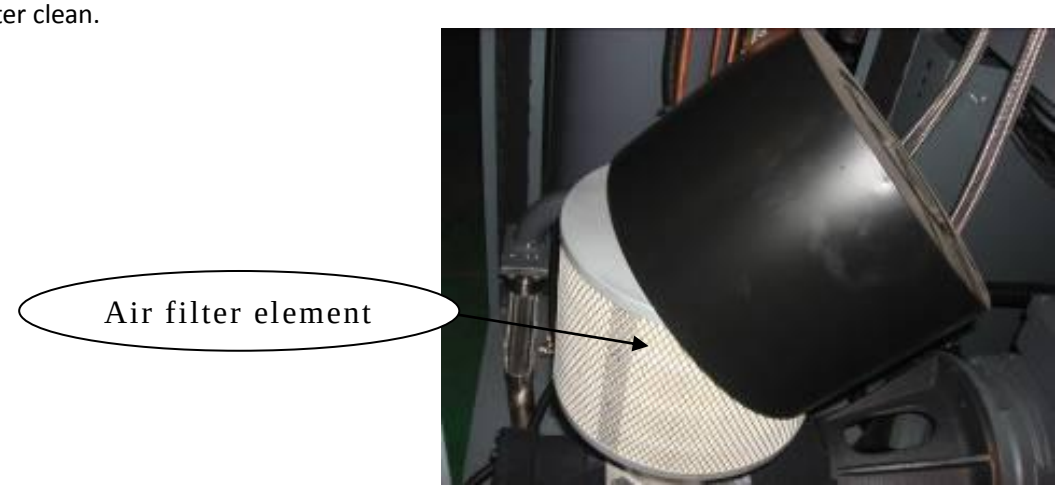
Check the running temperature and working pressure.

Write down the current, voltage, temperature and pressure.

WEEKLY

Clean compressor after shut-down.

Blow the air filter clean.



MONTHLY

Check oil level.

Check the bolts on the belt pulley / shaft coupling.

Blow the cooler clean.

Maintenance - 500 hours

Check the quality of oil. If it is clean, it can be re-used after being re-filtered. Otherwise, replace it.

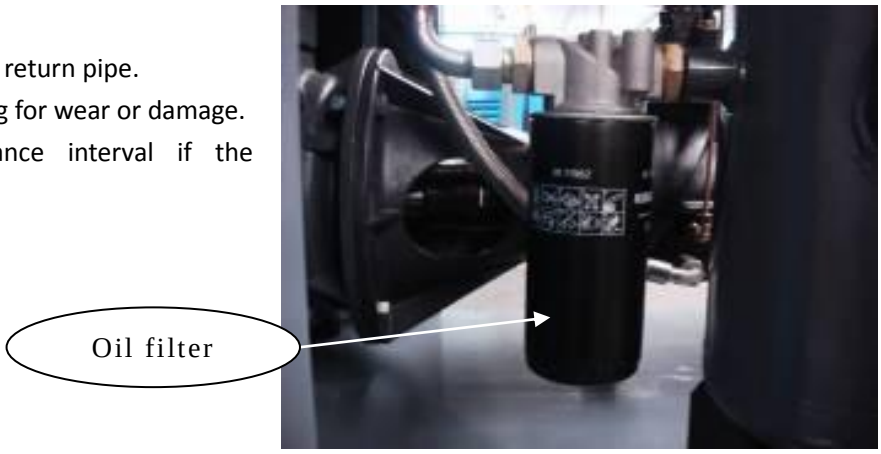
Replace the oil filter.

Replace the intake filter.

Replace the filter net of the oil return pipe.

Check the belts / shaft coupling for wear or damage.

Attention: Reduce maintenance interval if the environment is harsh.



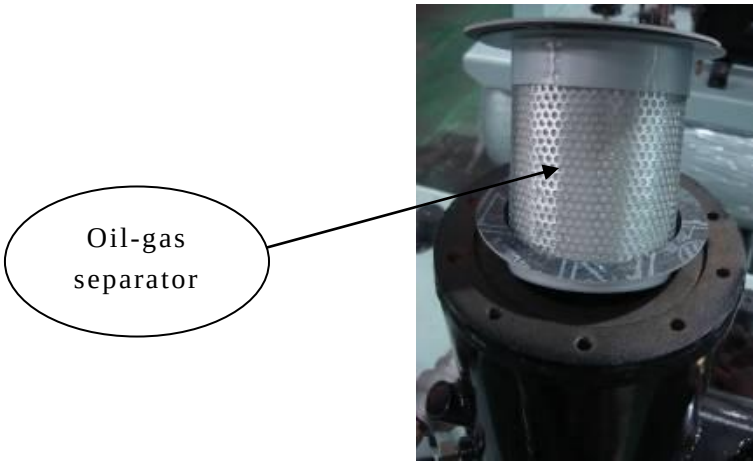
Every 2000 hours

Replace the intake filter.

Replace the separator.

Replace lubricant.

Check intake-control valve.



Every 4000 hours

Replace the minimum-pressure control valve.

Check thermostatic valve.

Check the electronic connections are secure.

Check if main bolts, main nuts and connectors are tight.

Check the security apparatus.

CAUTION

Don't repair / maintain the machine if the compressor is in motion or there is pressure in the system. Always shut the machine down and ensure no pressure remains in the system.

On completion of repairs or maintenance work, check compressor is properly assembled before restarting.

6.2 Maintenance of air intake filter

1. Open the end cover.
2. Take out the filter core.
3. Check the condition of intake filter (if it is not good, replace it).
4. Clean out the dust accumulation on the bottom cover.
5. Replace it with a new filter core if needed.
6. Replace the end cover.

6.3 Maintenance of oil filter

1. Unscrew the old filter with filter removal pliers.
2. Clean the contact surface.
3. Lay a thin film of oil on the seal ring of the new filter.
4. Tighten the filter by hand until it is tight and the contact surfaces are sealed.
5. Check if there is leakage after starting up.

6.4 Maintenance of oil separator

The method for the external type is the same as the oil filter.

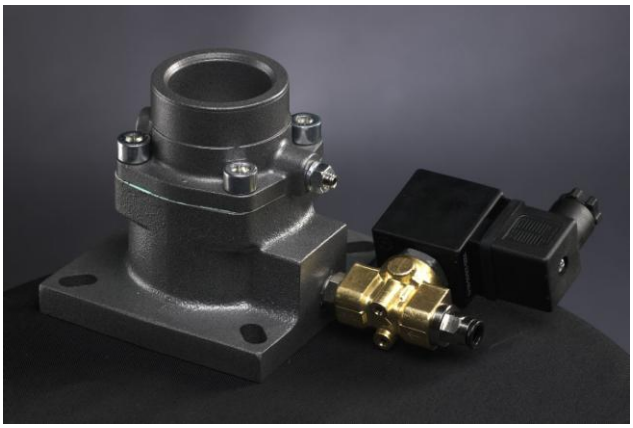
The method for the built-in type is as follow:

1. Open the service door.
2. Loosen the connector between pipe and minimum-pressure valve
3. Loosen the pipeline on the cover of oil separator. Make sure it can be reinstalled.
4. Loosen the fixing bolts on the oil separator.
5. Lift up the cover board slightly, and then clean the oil return pipe.
6. Take out the oil separator cartridge.
7. Replace the oil separator cartridge.
8. Install the new separator in reverse procedure. Check the length of oil return pipe (Refer to the maintenance method for the oil return pipe)
9. Tighten bolts with a torque wrench to ensure uniform tightening.

10. Restart the compressor and let it reach operating temperature, shut down the machine. Re-tighten the bolts of the cover plate of the oil separation cartridge.

The intake valve, solenoid valve and maintenance thereof

The Intake-control valve is comprised of a valve body, valve gate, piston, cylinder, spring and seal ring. A solenoid valve is mounted on the side of the unit. The system performs the functions of unloading the system, noise elimination, depressurizing the system etc… A small amount of air is output through an outlet in the intake-control valve. This keeps pressure in the separation element in the range of 0.2-0.3 Mpa and allows for normal cycling of the oil system. The pressure sensor and the solenoid valve automatically adjust and control the system loading and unloading as required by air demand. To increase the service life of the loading system and its components it is recommended that a pressure vessel be used for storage. This will reduce the loading and unloading frequency. Periodic maintenance is required to ensure smooth operation of the intake system. When maintenance is done, parts should be dismantled and checked for wear on friction surfaces. Special attention should be given to the surface of the intake seal ring located on the piston in the intake tube. If there is damage it must be replaced. Lubricate all friction surfaces to prolong service life.



6.5 Maintenance of minimum-pressure valve and temperature control valve

1. Unscrew the lid, pay attention to the spring force of the valve.
2. Remove the lid.
3. Check if there is abrasion on the O-ring of the piston. If so replace the ring.
4. Check if there is abrasion on the seal ring. If so replace it.
5. Lubricate with high temperature grease. Reinstall.

Replacing lubricant

1. Stop compressor. Power off.
2. Connect up the oil-discharging pipe, open the ball valve and then drain the oil into an oil-recycling can.
3. Close the oil-discharging ball valve, then open the oil filling cap and refill with new oil. Ensure the oil level is in the center of oil gauge.
4. Close the oil filling cap and then check the O-ring is in the correct position.
5. Start up the compressor. Check the oil level after running for a while. If oil level is low properly fill it to the correct level.

Attention: If the environment is dusty or hot replace oil more frequently.

Oil level:

Maximum oil level: oil level is in the center of the oil gauge after the compressor has stopped for 30 minutes.

Minimum oil level: oil level is in the lower part of oil gauge when the compressor is running.

Adjusting belt tension

1. Stop the machine, power off.
2. Open service door.
3. Loosen the bolt under the motor base. Three-quarter turn tightness is correct once under tension.
4. Rotate the adjusting bolt adjust the tightness of the belt until getting the correct tension.
5. Re-torque the bolt on the base.

Method for replacing belts

Follow the same method as tension adjusting.

After installing the new belts run the machine for 5 minutes then shut down and re-tension the belt. Repeat this process 3 times. The belts are now tensioned correctly.

Tip: Replace all belts, never run old belts with new ones.

Adjustment of belt pulley

It is essential that the motor pulley and the air-end pulley stay perfectly aligned. After moving any of these parts relocate the motor and air-end and ensure the pulleys run on the same plane. This will ensure that belt abrasion does not occur. Properly set belts run quieter, cooler and last much longer.

Centering of flexible shaft coupling on direct drive systems

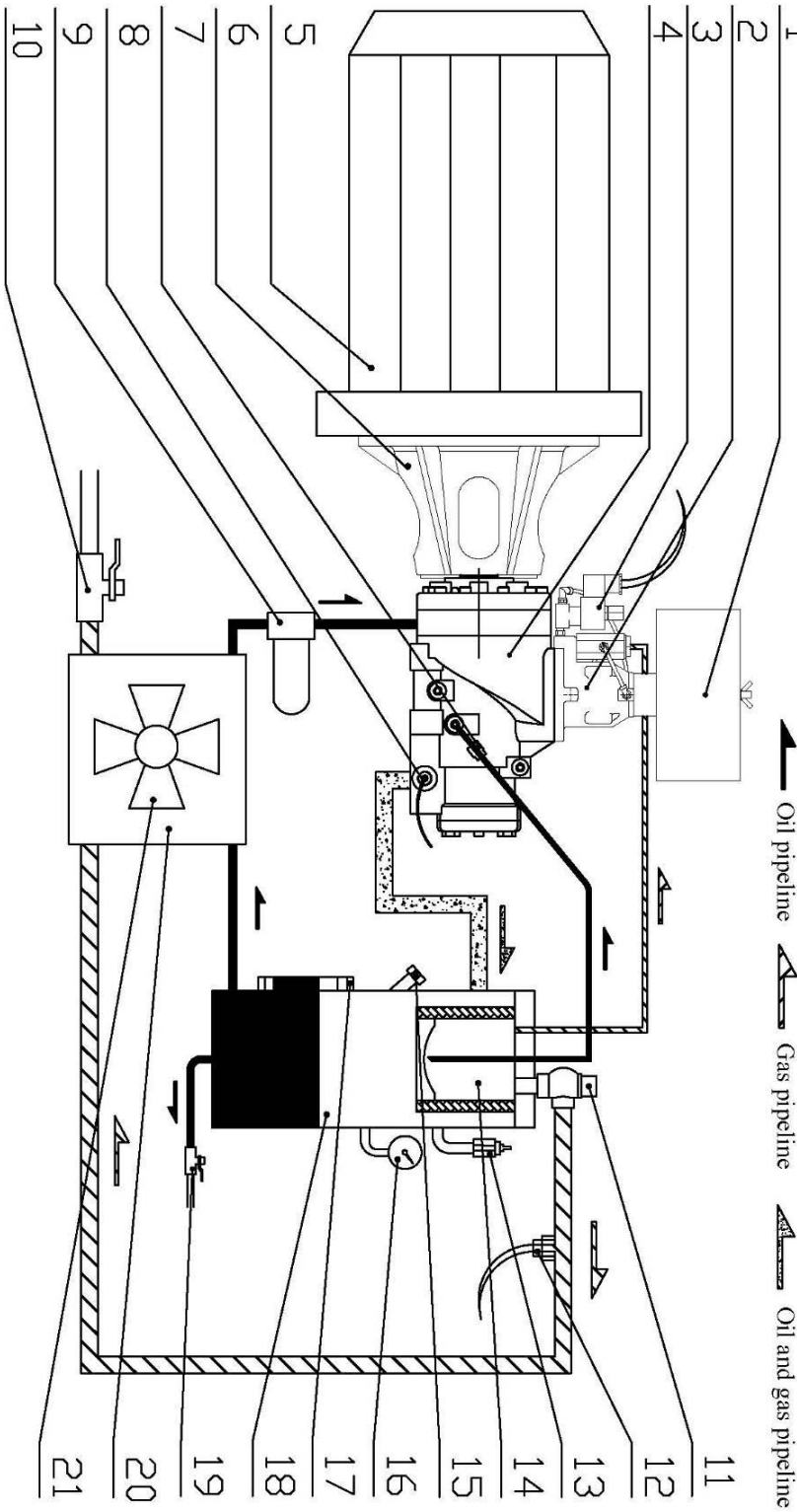
The flexible shaft coupling must be centered when the motor or gear end is moved or reinstalled. Both shafts must be completely axial with a tolerance of 0-0.05mm.

Maintenance for the electric motor

A high quality lubricant should be applied on the motor bearings every 1500 hours. (Use shell Alvania RL3, if not specified.) Run the motor in a unload state after removing the pulley and belts. Continue to pump lubricant while the motor is running until all original old grease has been purged from the bearing cavity. Do not add grease while the motor is shut down, bearing damage may occur. Wipe away the excess grease. Excess grease causes damage to the bearings.

7. Flow diagram

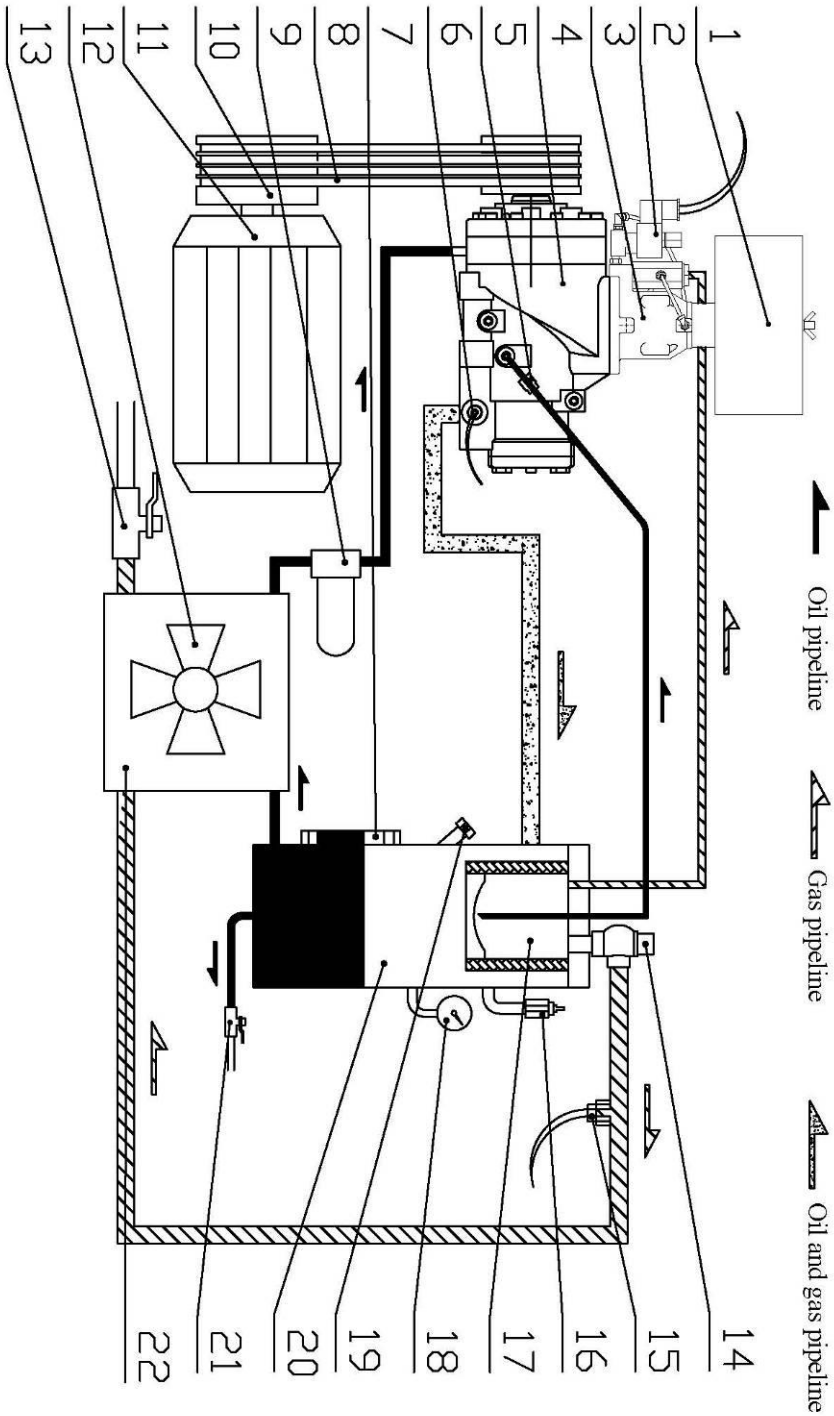
DT- SERIES (18.5-250KW direct drive)



1	Air filter	7	One-way valne	13	Safety valve	19	Oil and water outlet valve
2	Air inlet group valve	8	Temperature sensor	14	Gas-oil separator	20	Cooler
3	Unloading and valve	9	Oil filter	15	Pouring orifice	21	Cooling fan
4	Screw host machine	10	Ball valve	16	Pressure gauge		
5	Drive motor	11	Pressure maintain valve	17	Oil sight glass		
6	Centric coupling holder	12	Pressure sensor	18	Oil and gas barrel		

Flow diagram

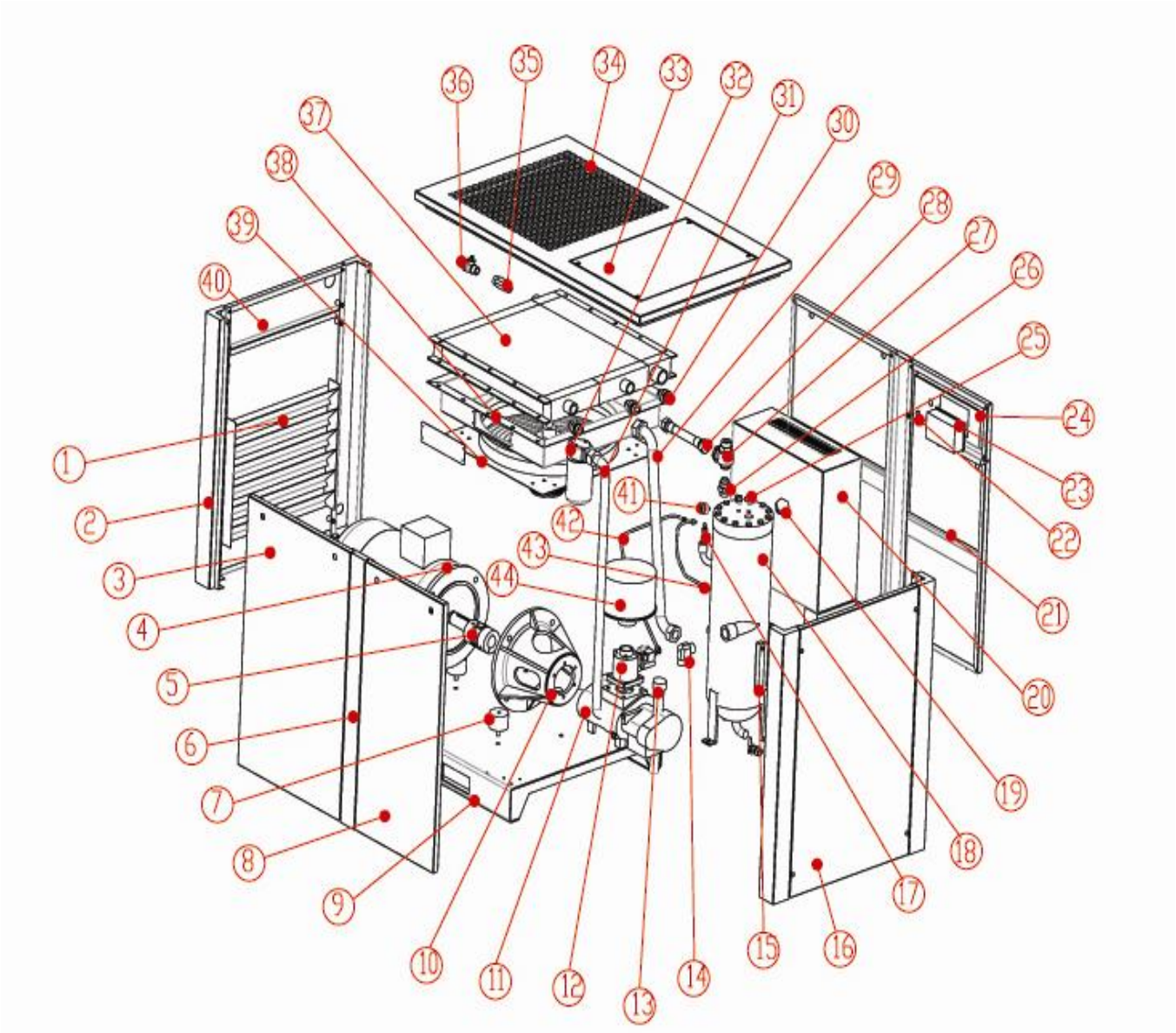
DT- SERIES (18.5-250KW belt drive)



1	Air filter	7	Oil sight glass	13	Ball valve	19	Pouring orifice
2	Unloading and valve	8	Pelt	14	Pressure maintain valve	20	Oil and water outlet valve
3	Air inlet group valve	9	Oil filter	15	Pressure sensor	21	Ball valve
4	Screw host machine	10	Pulley	16	Safety valve	22	Cooler
5	Oil non-return valve	11	Drive motor	17	Gas-oil separator		
6	Temperature sensor	12	Cooling fan	18	Pressure gauge		

Parts list

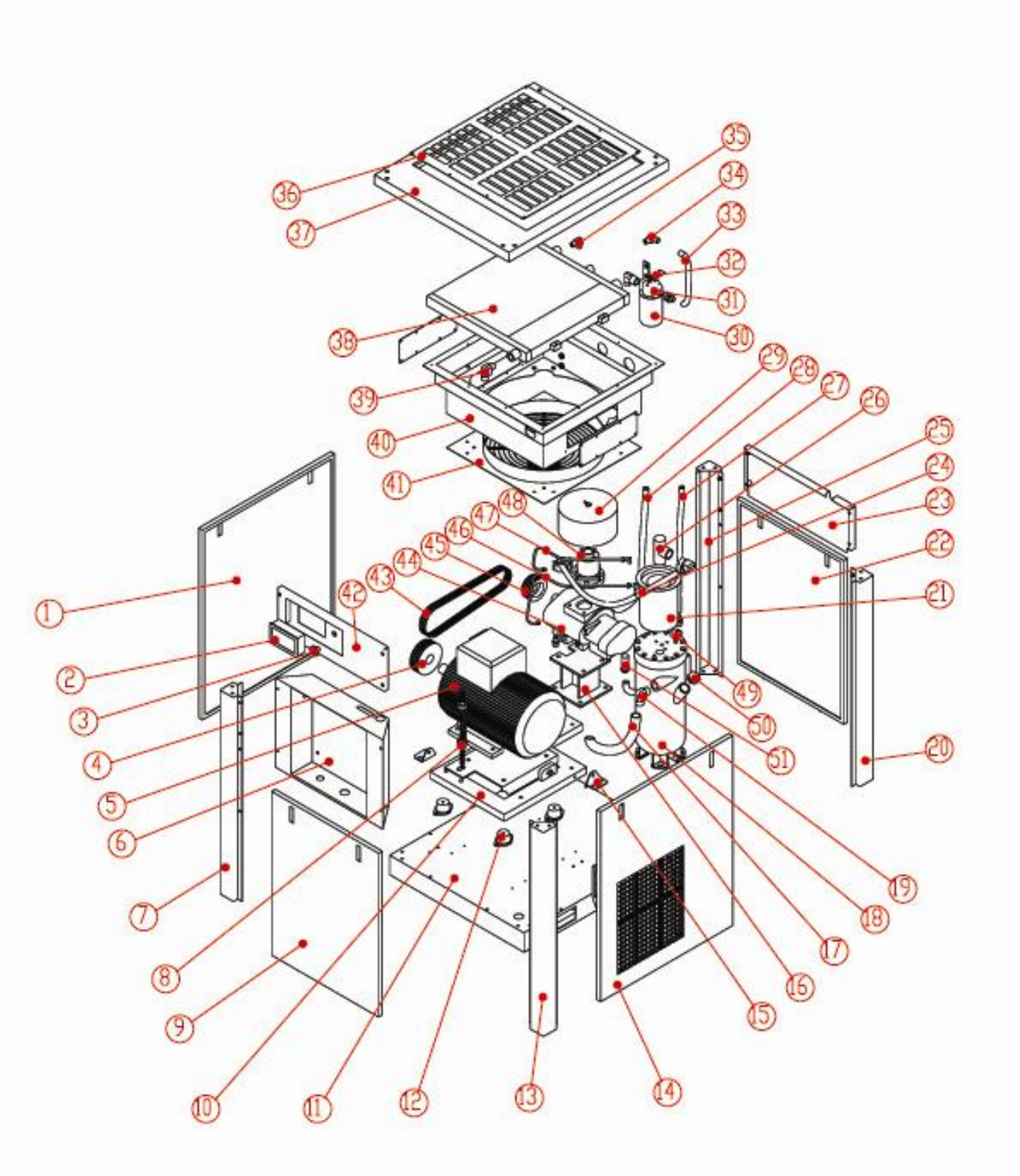
DT- SERIES (90-250KW direct drive)



S.N.	Name	Quantity	S.N.	Name	Quantity
1	Right panel	1	24	Control shutter	1
2	Cabinet frame leg	1	25	Bend	1
3	Front and back right shutters	1	26	Adjustable pipe joint	1
4	Motor	1	27	Minimum pressure valve	1
5	Coupling	1	28	Air outlet pipe	1
6	Back-central gatepost	1	29	Head oil inlet	1
7	Anti-vibration pad	1	30	Cooler oil inlet joint	1
8	Back-left gatepost	1	31	Oil filter assembly	1
9	Main baseplate	1	32	Oil filter joint	1
10	Center bracket	1	33	Removable service panel	1
11	Screw air end	1	34	After-cooler cover	1
12	Air inlet valve	1	35	Air outlet	1
13	Air end exhaust	1	36	Ball valve	1
14	Bend	1	37	After-cooler	1
15	Oil level indicator	1	38	Fan cowl	1
16	Left shutter	1	39	Fan	1
17	Relief valve	1	40	Removable side panel	1
18	Oil-gas separator tank	1	41	Separator tank pressure gauge	1
19	Refill cap of the oil-gas tank	1	42	Oil return pipe	1
20	Electrical control panel	1	43	Unloading pipe	1
21	Front-left shutter	1	44	Air filter assembly	1
22	Emergency "stop" button	1			
23	Controller	1			

Parts list

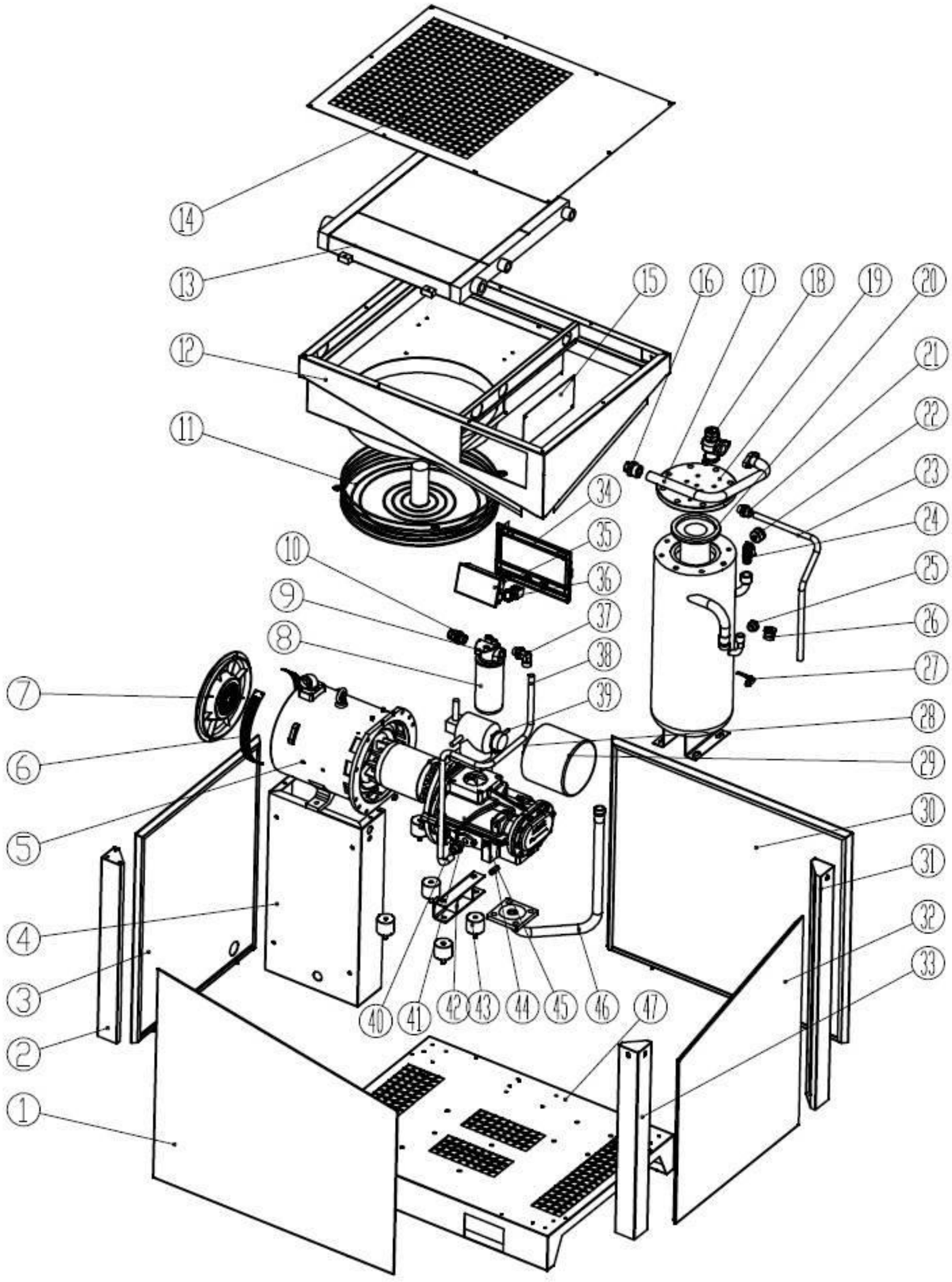
DT- SERIES (18.5-250KW belt drive)



S.N.	Name	Quantity	S.N.	Name	Quantity
1	Left shutter	1	27	Oil return pipe from separator	1
2	Digital display panel	1	28	Main return pipe for air end	1
3	Emergency "stop" button	1	29	Air filter assembly	1
4	Motor pulley	1	30	Oil filter	1
5	Motor	1	31	Oil filter joint	1
6	Electrical control panel	1	32	Oil filter housing	1
7	Cabinet frame leg	1	33	Oil filter exhausting pipe	1
8	Automatic belt tension spring	1	34	Oil inlet bend	1
9	Front shutter	1	35	Oil return bend	1
10	Anti-vibration platform	1	36	After-cooler cover	1
11	Main base-plate	1	37	After-cooler cover panel	1
12	Anti-vibration pad	4	38	After-cooler	1
13	Cabinet frame leg	1	39	Exhaust bend	1
14	Shutter on the right side	1	40	Cooling fan cage	1
15	Transportation fixing bolt	1	41	Cooling fan	1
16	Air end mounting frame	1	42	Control panel	1
17	Exhaust header pipe for air end	1	43	Belt	3
18	Oil-gas separator tank	1	44	Air end	1
19	Bend	1	45	Air end pulley	1
20	Cabinet frame leg	1	46	Oil Return pipe	1
21	Separator cartridge	1	47	Unloading pipe	1
22	Back shutter panel	1	48	Air intake valve	1
23	Removable panel	1	49	Oil-gas separator tank pressure gauge	1
24	Separator tank exhaust	1	50	Oil refill cap of separator	1
25	Cabinet frame leg	1	51	Air intake pipe joint	1
26	Minimum pressure valve	1			

Parts list

DT- SERIES (7.5-75KW direct drive)



S.N.	Name	Quantity	S.N.	Name	Quantity
1	Front side panel	1	25	Oil level indicator	1
2	Cabinet frame leg	1	26	Separator tank oil filler cap	1
3	Left side panel	1	27	Ball valve	1
4	Electrical control panel	1	28	Air filter element	1
5	Motor frame	1	29	Air filter cover	1
6	Motor vent grid	1	30	Back side panel	1
7	Motor end-plate	1	31	Cabinet frame leg	1
8	Oil filter	1	32	Right side panel	1
9	Oil filter mount	1	33	Cabinet frame leg	1
10	Adjustable connector	1	34	Plastic panel mount	1
11	Cooling fan	1	35	LCD control panel	1
12	Cooling fan cage	1	36	Emergency stop switch	1
13	After cooler	1	37	90° adjustable connector	1
14	After-cooler cover	1	38	Main air end return pipe	1
15	Fan cover plate	1	39	Air inlet valve	1
16	Discharge pipe connector	1	40	Air end	1
17	Oil-gas separator discharge pipe	1	41	Oil inlet connector	1
18	Minimum pressure valve	1	42	Air end support	1
19	Separator lid	1	43	Anti-vibration pad	1
20	Separator cartridge	1	44	Oil return valve	1
21	Oil return pipe connector	1	45	Temperature sensor	1
22	Pressure gauge	1	46	Air end discharge pipe	1
23	Separator tank oil return pipe	1	47	Main base plate	1
24	Safety valve	1			

8. Troubleshooting

FAULT	POSSIBLE REASON	SOLUTION
Compressor does not start	No electric power to compressor. Emergency stop is activated.	Check electrical connection
	Sequence of phases is not correct or phase lacking	Check or interchange two phases (L1,L2 or L3) in the power cable
	Overload protection relay does not reset	Reset it by hand
	Fuses or electrical contactors are defective	Check , replace if necessary
Compressor fails to start and stop automatically due to high current	Under- voltage or phase voltage unbalanced	Ensure constant voltage in accordance with IEC Standard
	Electrical connection is loose	Check and tighten connection
	Compressor cannot vent pressure	Check intake valve and replace if necessary
	Compressor oil is very viscous due to low ambient temperature	Heat up the compressor before startup
	Minimum pressure valve fails to close	Check the valve spring and replace if necessary
Compressor stops automatically due to over load	Exhaust pressure exceeds rated value	Check and adjust unloading pressure value
	Set value of overload protection is incorrect	Check and adjust setting current value of main
	Oil/air separator is blocked	motor or fan motor
	Pressure control or sensor faulty	Check it, replace if necessary Check pressure sensor or replace
	Air end or main rotor jammed	Rotate by with hand, repair or replace if necessary
Compressor stops automatically due to overheating	Insufficient or incorrect type oil	Fill oil and ensure oil level is not below the “minimum level” mark
	Cooling unit soiled or internal blockage	Clean cooling unit
	Ambient temperature too high (≥40℃）	
	Insufficient cooling air intake	Improve ventilation of compressor room
	Oil filter or thermostatic valve jam	Clean and keep air inlet vents open
	Cooling fan faulty	Clean it , replace if necessary
	Temperature sensor PT100 defective or wire broken	Check and replace if necessary
	Oil pipe leakage	Check and replace if necessary Fasten and seal oil pipe couplings

Excessive oil consumption	Separator element Is defective	Check and replace if necessary
	Excessive oil level	Drain some oil, ensure oil level is not higher than "maximum level" mark
	Oil-return line blockage	Check and replace one-way valve if necessary
	Working pressure is too low for extended periods（≤0.6MPA）	User should reduce compressed air consumption to let pressure build-up
	Incorrect oil, more foam and low viscosity	Use original manufacture oil only
	Excess water in internal system due to high humidity climate	Drain condensate water from oil tank frequently
No compressed air exhaust, no pressure build up	Intake valve does not open	Intake controller or solenoid valve is defective, or air pipe connected to controller is leaking, check and replace if necessary
	Discharge solenoid valve defective	Check electric supply and clean valve , replace if need
	Minimum pressure valve does not open	Check minimum pressure valve spring , replace if necessary
	Components in compressor are leaking	Check oil and air lines in compressor, tighten and reseal coupling connections.
	V-belts are torn or slip	Check and replace if necessary
System pressure does not decrease when reaching rated pressure value	Intake valve does not close	Intake controller or solenoid valve is defective, or air pipe connected to controller is leaking, check and replace if necessary
	Discharge solenoid valve is defective	Check electric supply and clean valve, replace if necessary
	System pressure control fault	Check pressure sensor, pressure switch or computer controller, replace if necessary
Oil or oil smoking in intake filter when stopping	Intake valve is leaking. Pressing Emergency Stop when compressor is in load can cause this	Check and replace if necessary Switch off compressor using OFF Button, only use the Emergency Stop Button in emergencies
	Minimum pressure non-return valve is leaking	Check and replace if necessary
	Excessive oil in air	See the reasons of excessive oil consumption
Exhaust volume decreases	Air vent, intake filter or oil/air separator blockage	Clean and replace if necessary
	Intake valve does not function correctly	Check and replace if necessary
	Components in compressor are leaking	Check air lines in compressor, tighten and reseal screw coupling connections if necessary
Compressor loads/ unloads very frequently	Pressure differential incorrectly set	Adjust pressure differential, not smaller than 0.15MPA usually
	Air consumptions is not steady	Use a bigger volume receiver tank
	External units of the compressed air treatment block	Clean external air pipeline ,air dryer or air filter , replace if necessary
	Ball valve at compressor outlet closed	Open ball valve

Abnormal noise and vibration of the compressor	Fixing bolts on the base are loose	Tighten
	V-belts are slipping	Adjust v-belt tension, replace if necessary
	Friction with fan vane and edge	Adjust fan vane
	Compressor installed improperly	Mounted compressor on flat ground
	Screw air end or motor is defective	Check air end or main motor and fan motor, repair if necessary
Safety valve blows	Operating pressure has been misadjusted	Set operating pressure to the maximum permissible pressure range of compressor (see value in nameplate)
	Safety valve is defective	
	System internal pressure has exceeded pressure of safety valve	Replace safety valve Check and replace air/oil separator if necessary

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