

Instruction Manual

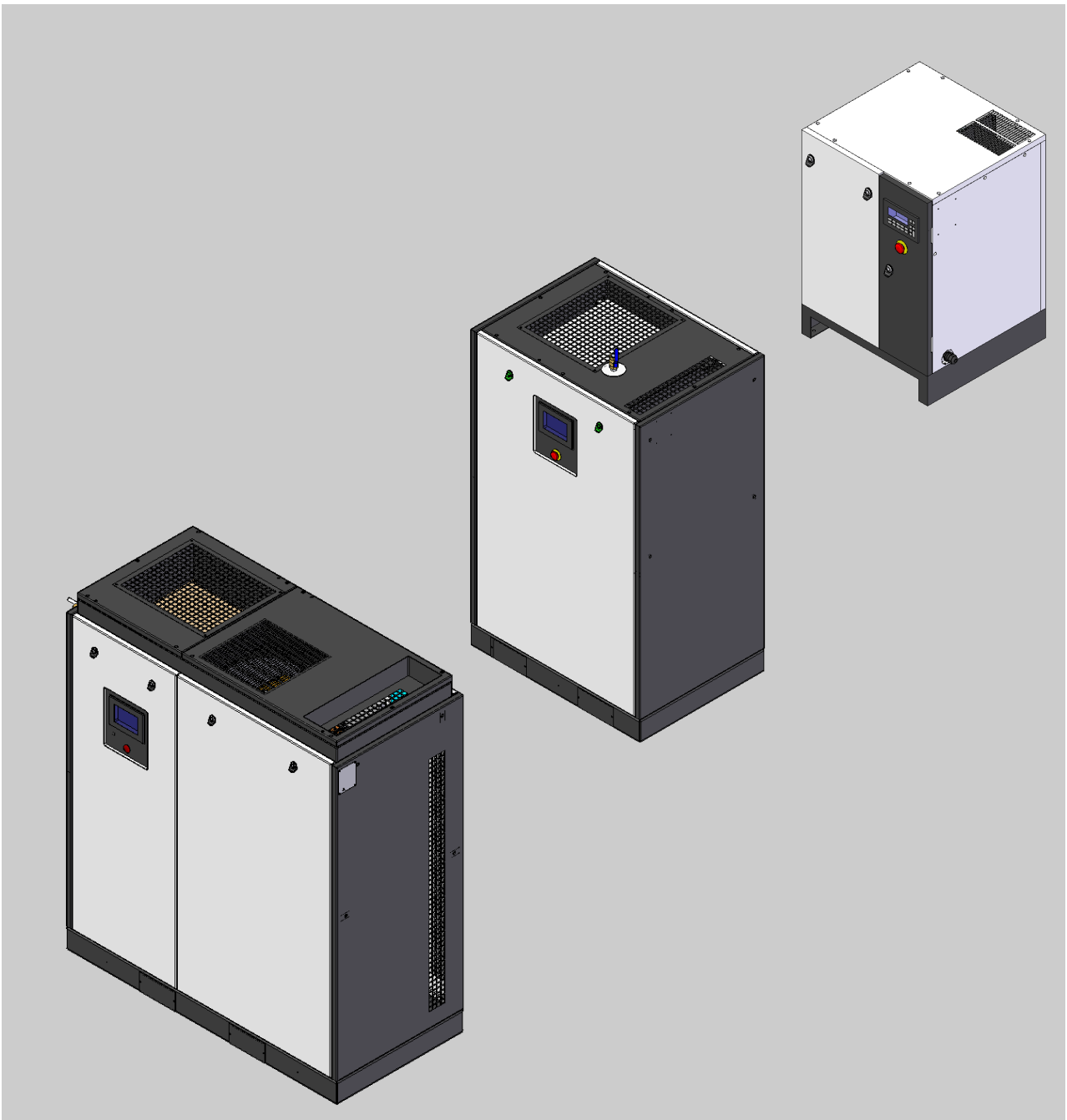


ECO Scroll Series

Oil-Free Compressors 3.7 kW ~ 15 kW

Date: 2022.11.18

Rev. B



Information about these operating instructions

These instructions enable you to use the machine safely and efficiently. The instructions are a component part of the machine and must be kept in the direct vicinity of the device and be accessible for staff at all times.

Staff must have carefully read and understood these instructions before starting all work. The basic prerequisite for safe working is compliance with all the safety instructions and instruction for actions included in these operating instructions.

The local occupational health and safety regulations and general safety rules for operational area of the machine also apply.

The instructions for the machine do not cover operation of the controller. Therefore, the instructions and content of the instructions for the controller in question must also be taken into account.

Furthermore, the instructions for the installed components found in the appendices also apply.

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Any infringement shall be subject to compensation for damages. We reserve the right to assert further claims.

Limitation of liability

All information and instructions in this manual have been compiled taking account of the applicable standards and regulations, state-of-the-art technology and our years of knowledge and experience.

The manufacturer assumes no liability for damages caused by:

- failure to adhere to these instructions
- improper use
- use of unqualified staff
- unauthorized conversions
- technical modifications
- use of non-approved spare parts

The actual scope of supply may differ from the descriptions and illustrations in these instructions in the case of special designs, the inclusion of additional ordering options or as a result of the latest technical modifications.

The obligations agreed in the contract of supply, the manufacturer's general terms and conditions of business and delivery and the legal regulations valid at the time of completion of the contract apply.

Customer service

Our Customer Service department is available to provide technical information and product support.

In addition, our employees are always interested in receiving new information and hearing of your experiences from usage which could be valuable for the improvement of our products.

1	Overview.....	1
1.1	Design	1
1.2	Brief description	7
1.3	Assembly description	7
1.3.1	Controller.....	7
1.3.2	Enclosure	7
1.3.3	Drive Unit	7
1.3.4	Air filter	8
1.3.5	Air-end.....	8
1.3.6	Safety valve.....	8
1.3.7	Non-return valve	9
1.3.8	Cooler.....	9
1.3.9	Cooling-air fan.....	9
1.4	Interface	10
2	Safety.....	11
2.1	Symbols in these instructions.....	11
2.2	Proper use.....	12
2.3	General safety	13
2.4	Safety devices	13
2.4.1	Position of the safety devices	14
2.4.2	Description of the installed safety devices.....	14
2.5	Environmental protection	15
2.5.1	Instructions on the machine	15
3	Technical data.....	16
3.1.1	Name plate.....	16
3.2	Emissions	16
3.3	General specifications.....	17
3.3.1	Operating environment conditions	17
3.3.2	Discharge port.....	17
3.4	Plant data	17
3.5	Electrical connection values.....	18
3.6	V-belt tension values.....	18
3.7	Air receiver volumes.....	18
4	Transport, packaging and storage	19
4.1	Safety instructions for transport	19
4.2	Transport inspection.....	19
4.3	Packaging.....	19
4.4	Symbols on the packaging	20
4.5	Transport.....	20

4.6	Storage.....	20
5	Installation and commissioning.....	21
5.1	Safety instructions for installation and initial commissioning	21
5.2	Requirements at the installation site	22
5.3	Installation	23
5.3.1	Ventilation	23
5.3.2	Connection to the compressed air network	24
5.3.3	Connecting to the power supply.....	25
5.4	Switching on after installation.....	25
5.5	Work after the initial commissioning	26
5.6	Setting parameters.....	26
6	Operation.....	27
6.1	Safety instructions for operation	27
6.2	Controller.....	27
6.3	Shutdown in an emergency.....	27
7	Maintenance.....	28
7.1	Safety instructions for maintenance	28
7.2	Spare parts.....	29
7.3	Maintenance schedule	29
7.4	Maintenance work	31
7.4.1	Checking for leaks	31
7.4.2	Checking the electrical connections	31
7.4.3	Checking the compressor temperature.....	31
7.4.4	Checking soiling of the cooler	32
7.4.5	Checking main motor	32
7.4.6	Add lubricating grease for main motor bearing.....	32
7.4.7	Replacing the air filter	33
7.4.8	Checking or replacing V-belt.....	34
7.4.9	Air-end maintenance.....	35
7.5	Measures after maintenance has been performed	35
8	Faults	36
8.1	Safety instructions for fault clearance	36
8.2	Fault displays	37
8.3	Fault troubleshooting.....	38
8.4	Trial run after troubleshooting	39
9	Dismantling and disposal.....	40
9.1	Safety instructions for dismantling and disposal	40
9.2	Disassembly.....	40
9.3	Disposal.....	40

Appendixes	41
A Training log.....	41
B Service log.....	42
C Maintenance schedules.....	45
D Installation space drawings	49
E Dimension drawings	52
F Electrical schematics	55
G Process and instrumentation diagrams (P&IDs)	59
H Parts lists	63

1 Overview

1.1 Design

Oil-free scroll compressor

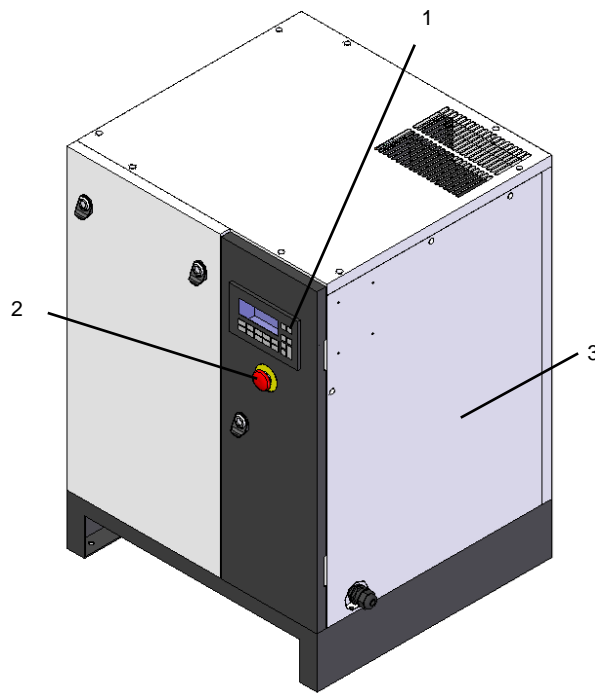


Fig. 1: Oil-free scroll compressor 3.7 kW

1 Controller

2 Emergency stop button

3 Enclosure

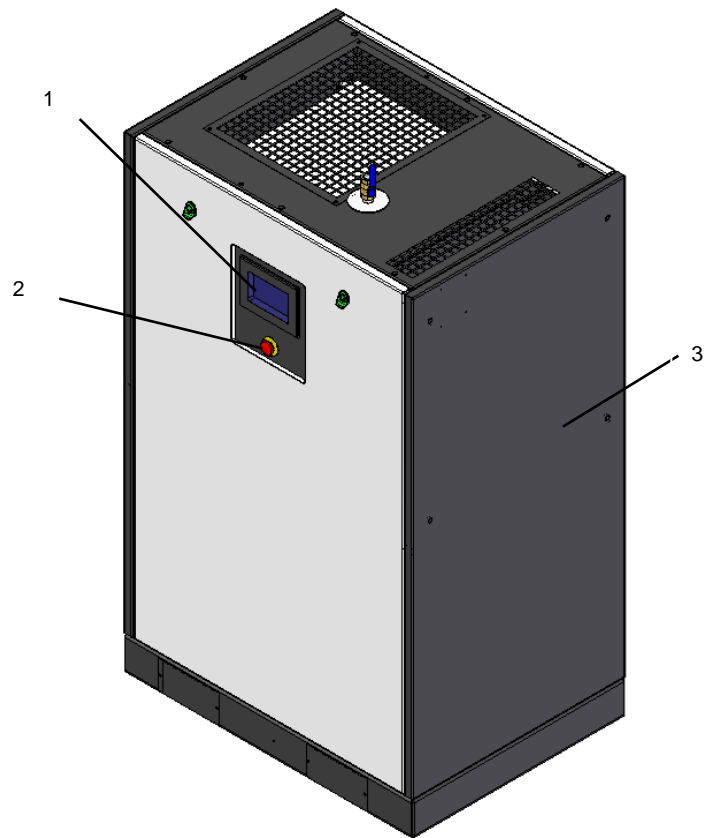


Fig. 2: Oil-free scroll compressor 7.5 kW

1 Controller

2 Emergency stop button

3 Enclosure

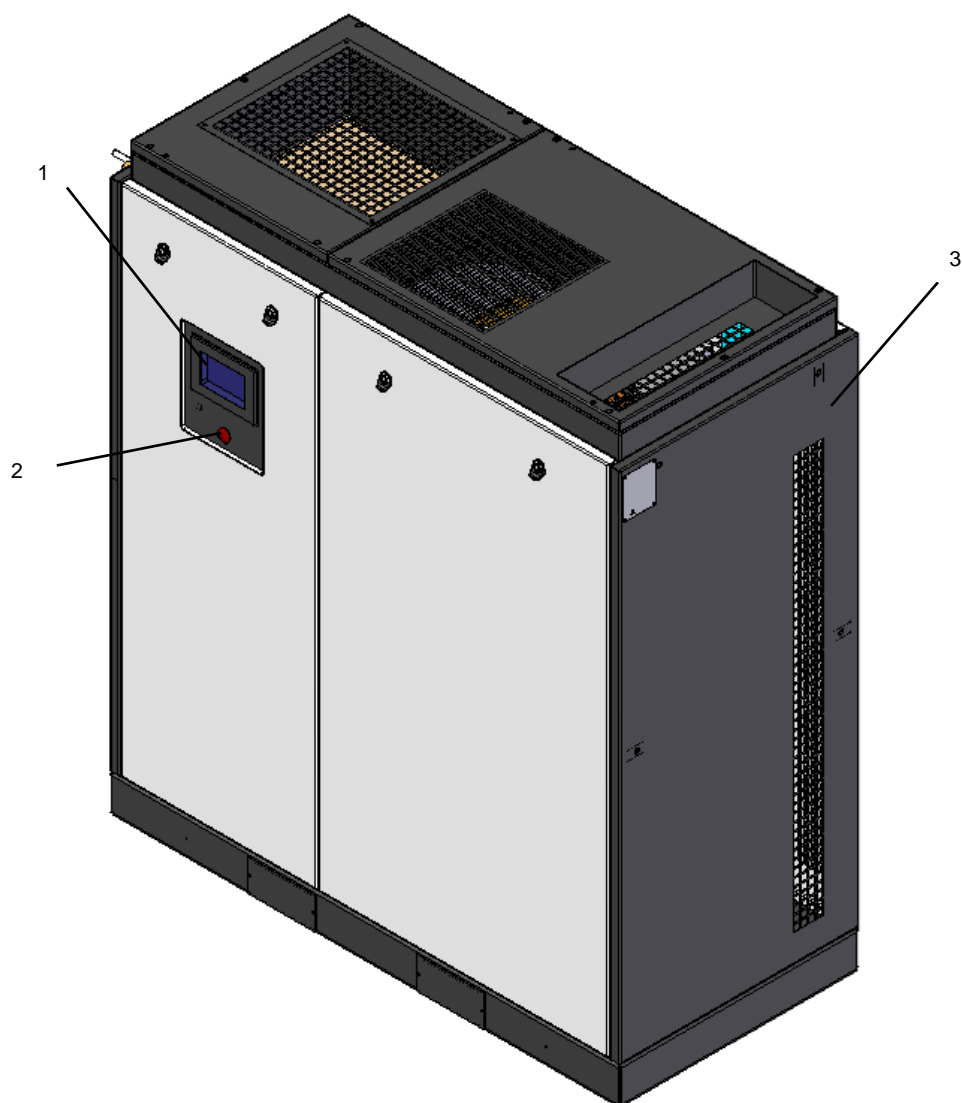


Fig. 3: Oil-free scroll compressor 11~15 kW

1 Controller

2 Emergency stop button

3 Enclosure

Assemblies

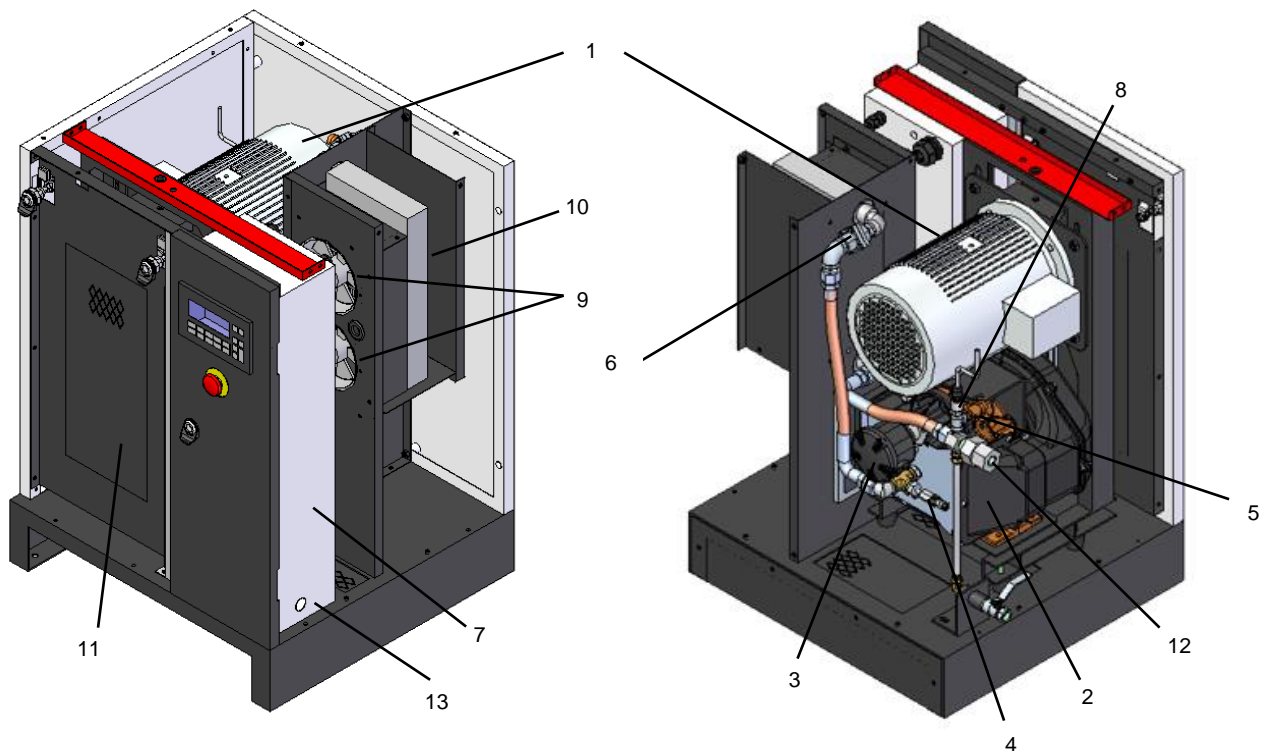


Fig. 4: Overview of the assemblies: Oil-free scroll compressor 3.7 kW

- | | | | |
|---|--------------------------|----|-----------------------|
| 1 | Motor | 8 | Pressure Sensor |
| 2 | Compressor air-end | 9 | Cooling-air fan |
| 3 | Air filter | 10 | After cooler |
| 4 | Temperature sensor | 11 | V-belt cover |
| 5 | Safety valve | 12 | Compressed air outlet |
| 6 | Non-return (check) valve | 13 | Cable port |
| 7 | Electrical cabinet | | |

Assemblies

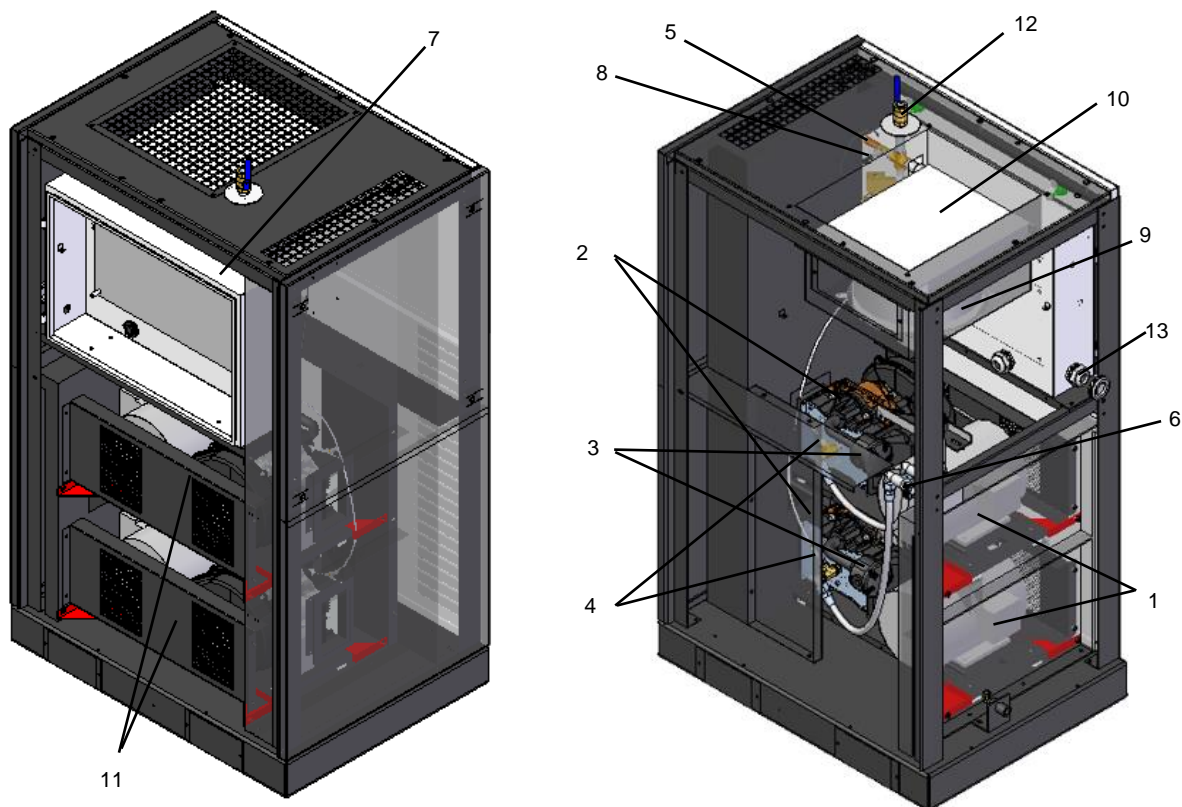


Fig. 5: Overview of the assemblies: Oil-free scroll compressor 7.5 kW

- | | |
|----------------------|--------------------------|
| 1 Motor | 8 Pressure sensor |
| 2 Compressor air-end | 9 Cooling-air fan |
| 3 Air filter | 10 After cooler |
| 4 Temperature sensor | 11 V-belt cover |
| 5 Safety valve | 12 Compressed air outlet |
| 6 Non-return valve | 13 Cable port |
| 7 Electrical cabinet | |

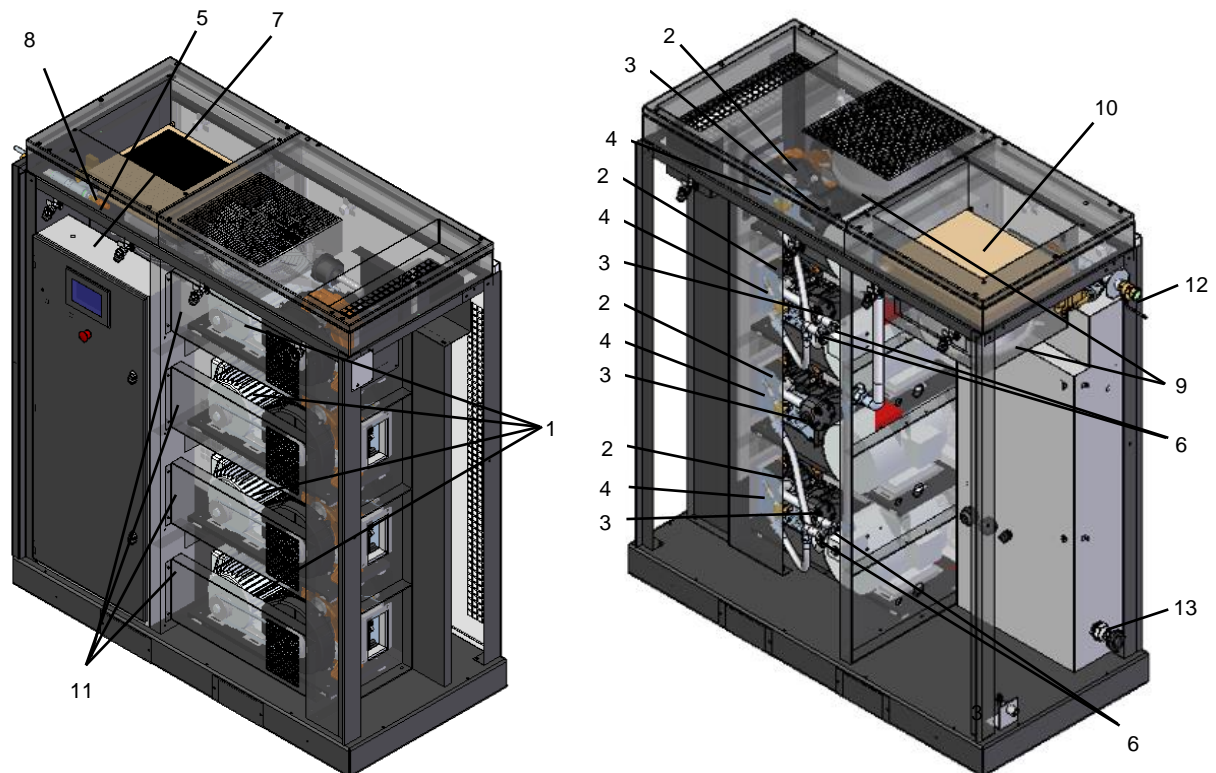
Assemblies

Fig. 6: Overview of the assemblies: Oil-free scroll compressor 11~15 kW

- | | | | |
|---|--------------------|----|-----------------------|
| 1 | Motor | 8 | Pressure sensor |
| 2 | Compressor air-end | 9 | Cooling-air fan |
| 3 | Air filter | 10 | After cooler |
| 4 | Temperature sensor | 11 | V-belt cover |
| 5 | Safety valve | 12 | Compressed air outlet |
| 6 | Non-return valve | 13 | Cable port |
| 7 | Electrical cabinet | | |

1.2 Brief description

Fresh air flows through the underside or side(s) of the enclosure, is cleaned by the air filter and enters into the air-end for compression process. The compressed air is released via outlet of air-end and enters into the aftercooler for cooling.

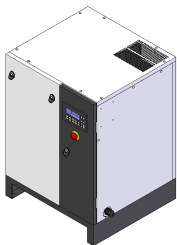
1.3 Assembly description

1.3.1 Controller



For detailed information about the controller installed, consult the separate Controller documentation.

1.3.2 Enclosure



ES04



ES08

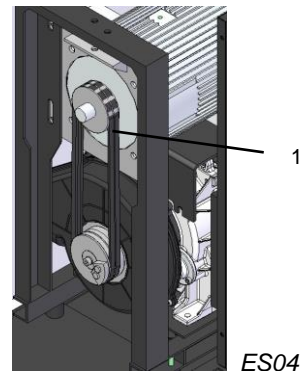


ES11~15

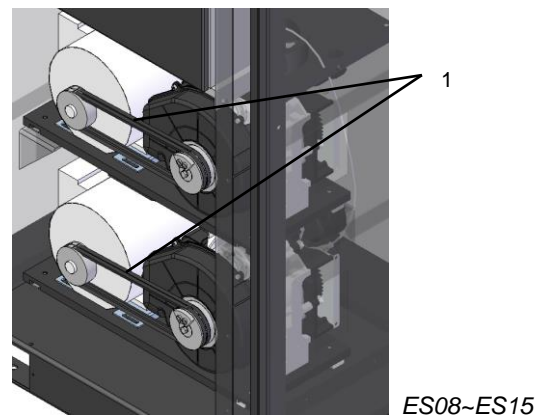
Fig. 7: Compressor enclosures

Allen key wrench is used to disassemble the enclosure.

1.3.3 Drive Unit



ES04



ES08~ES15

Fig. 8: V-belt and V-belt pulley

The air-end of compressor is driven by main motor via V-belt pulley (Fig 8). The rotating speed of air-end of compressor is constant. There is no variable speed inverter type.

Note: There is a different V-belt pulley of motor side between 50 and 60 Hz models.

1.3.4 Air filter

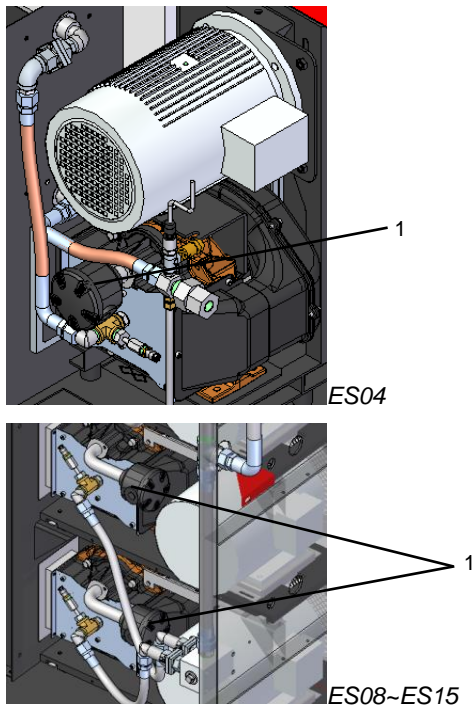


Fig. 9: Air filter

Air filter of scroll compressor (*Fig 9*) is located at the inlet of the air-end. The drawn-in air flows directly into the air-end for the purposes of compression.

1.3.5 Air-end

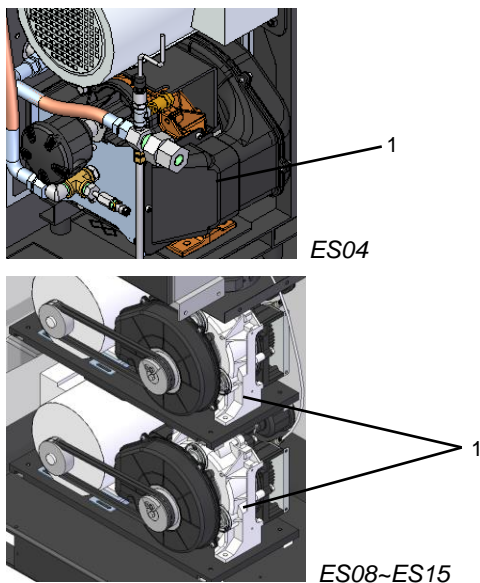


Fig. 10: Air-end

The air-end inhales air and then discharges it from the rear outlet after the air is compressed. Both inlet and outlet are at the back of the air-end.

1.3.6 Safety valve

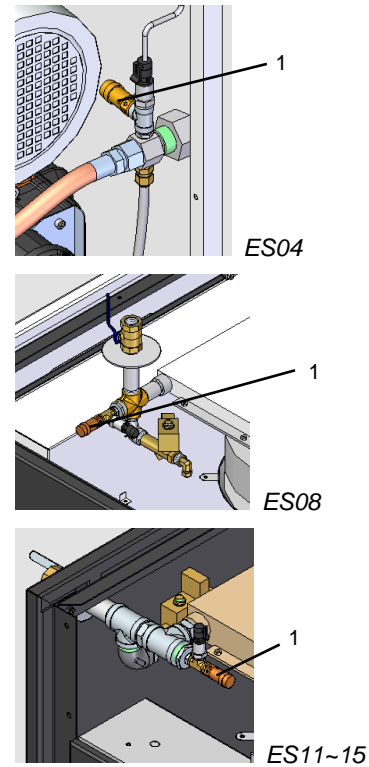


Fig. 11: Safety valve

The main purpose of the safety valve installed on cooling piping is protecting the system from excessive pressure.

1.3.7 Non-return valve

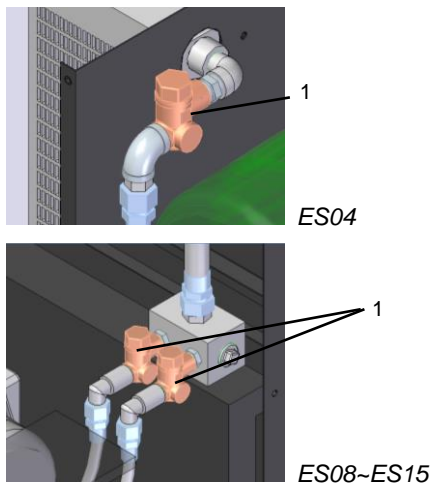


Fig. 12: Non-return valve

The non-return or check valve prevents a return flow of pressure from the network to the compressor air-end in the event of machine stoppage, which could otherwise cause reverse operation or leaks.

1.3.8 Cooler

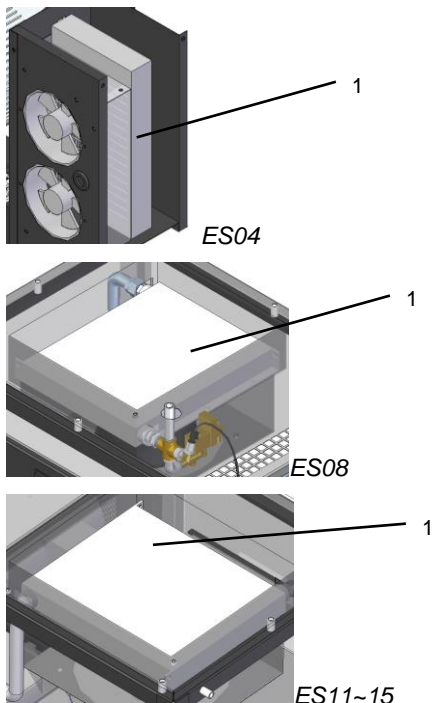


Fig. 13: Cooler

After the cooling process performed by the cooler, the compressed air enters the customer's network via the compressed air outlet.

1.3.9 Cooling-air fan

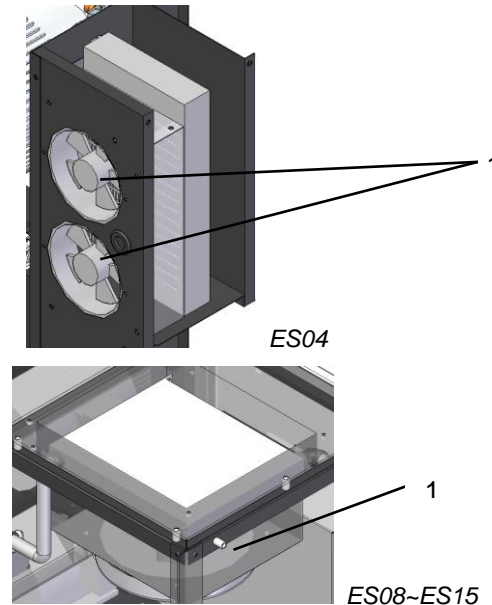


Fig. 14: Cooling-air fan

The compressed air that flows through the cooler is cooled by the cooling-air fan. The inner air of enclosure is sucked out by the cooling-air fan to keep the inner air temperature constant.

You can find information on cooling air volumes in the "Technical Data" chapter.



Ventilation in the air compressor room shall consider providing sufficient space for discharging compressed air and hot air. The discharged hot air can be used for heat recovery system.

1.4 Interface

Airflow

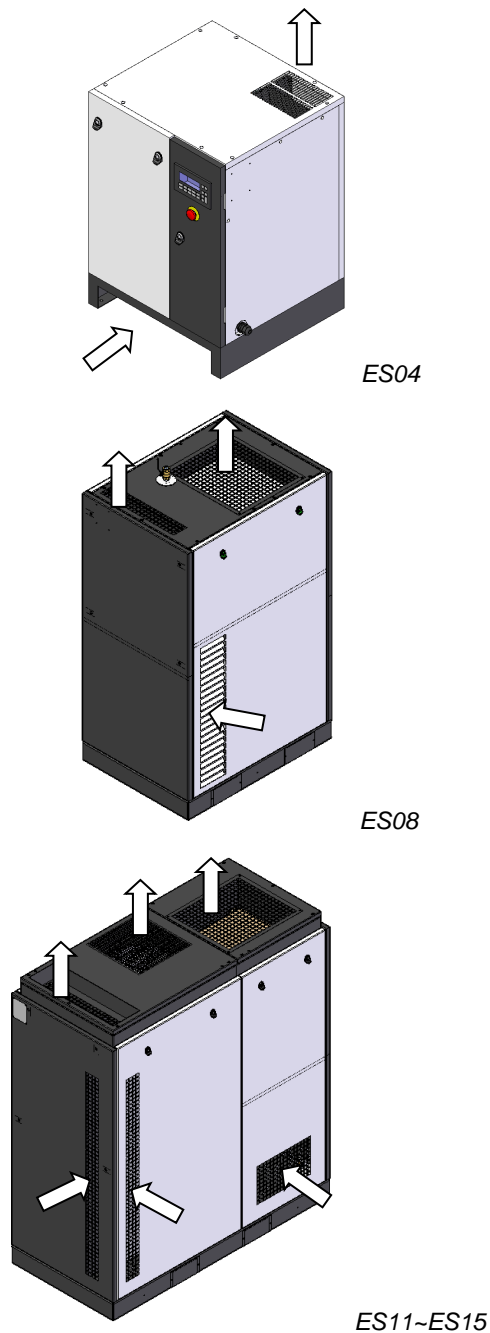


Fig. 15: Path of airflows

The cooling-air fan sucks air through the enclosure. A portion is sucked through the air filter and compressed by the air-end. The remaining air flows through the enclosure and cooler to take away heat from the compressed air and motor.

Compressed air outlet

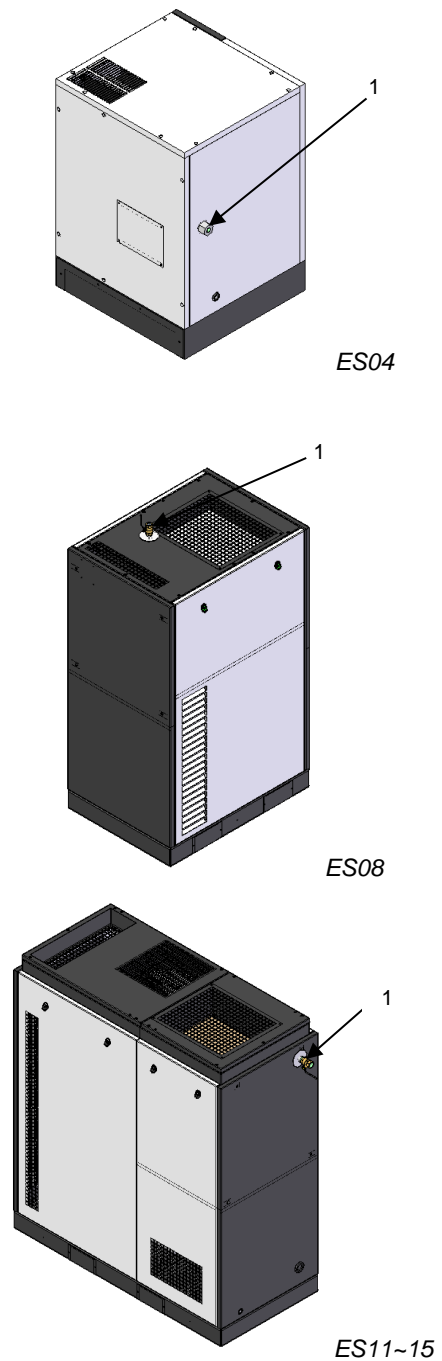


Fig. 16: Compressed air outlet

After cooling, the compressed air is released into the compressed air network via the compressed air outlet (Fig. 16).

2 Safety

This section is a summary of all the important safety aspects to ensure optimum protection of personnel and safe and trouble-free operation.

The owner, lessor or operator of this compressor is hereby notified and forewarned that failure to observe these safety precautions may result in injury or property damage.

FS-Curtis does not mean to imply that the following safety precautions are all-inclusive or that the observance of these precautions will prevent all injury or property damage.

FS-Curtis expressly disclaims responsibility or liability for any injury or property damage caused by failure to follow these specified precautions or by failure to exercise ordinary caution and due care required in operating or handling this equipment even though not expressly specified.

2.1 Symbols in these instructions

Safety instructions

The safety instructions and information in these instructions are illustrated using symbols. The safety instructions are prefaced by signal words which express the extent of the risk.



DANGER!

This combination of symbol and signal word indicates an immediate, hazardous situation which will lead to serious or even fatal injuries if not avoided.



WARNING!

This combination of symbol and signal word indicates a potentially hazardous situation which may lead to serious or even fatal injuries if not avoided.



CAUTION!

This combination of symbol and signal word indicates a potentially hazardous situation which may cause minor or slight injuries if not avoided.



NOTICE!

This combination of symbol and signal word indicates a potentially hazardous situation which may cause material or environmental damage if not avoided.

Safety instructions contained in operating instructions

Safety instructions may relate to certain individual instructions. These safety instructions are embedded in the operating instructions so that they do not interrupt the flow of reading when performing the relevant action. The signal words described above are used.

Example:

1. Unfasten the screw.

2.



CAUTION!




Risk of entrapment on the cover!

Close the cover carefully.

3. Tighten the screw.

Special safety instructions

The following symbols are used in conjunction with the safety instructions in order to draw attention to particular hazards:

	Warning of electrical voltage.
	Warning of potentially explosive materials.
	General warning sign.





Tips and recommendations



This symbol indicates tips, recommendations and information for efficient and trouble-free operation.

Further markings

The following markings are used in these instructions for emphasising operating instructions, results, lists, references and other elements:

Marking	Explanation
	Step-by-step operating instructions.
	Results of operating steps.
	References to sections of these instructions and other applicable documents.
	Lists without a set order.
[Button]	Operating controls (e.g. buttons, switches), display elements (e.g. indicator lamps).
"Display"	Screen elements (e.g. buttons, assignment of function keys).

2.2 Proper use

The machine is designed and constructed exclusively for the proper use described here.

The scroll compressor is only intended to generate compressed air in a non-explosive environment and must be supplied with cool, dry and dust-free cooling air.

Do not operate the compressor in excess of its rated pressures and speeds indicated on the compressor nameplate.

The proper use also includes compliance with all details in this manual.

Any use above and beyond the proper use, or any other type of use, is considered misuse.



WARNING! **Danger due to misuse!**

- The compressed air may not be used for respiration purposes without prior after-treatment.
- The compressed air may not be used directly for pharmaceutical or health treatment purposes, or for direct treatment of food without appropriate after-treatment.
- The scroll compressor may not be operated outdoors.
- The scroll compressor or its individual components may not be converted, modified or retooled.
- The scroll compressor may not be used in a potentially explosive atmosphere.
- The intake of any media other than cool, dry and dust-free air is forbidden.

No claims of any kind can be asserted for damage resulting from misuse.

2.3 General safety

1. Read and understand all the instructions found in this manual before operating your compressor.
2. Disconnect the main power source before working on or performing any maintenance procedures on this unit. Use a lock out and tag out process.
3. Do not attempt to remove any parts, break any connection, loosen oil fill plug or drain plug until the unit has been shut down and air pressure has been relieved.
4. Do not operate the compressor in excess of its rated pressure and speed indicated on the compressor nameplate.
5. Do not remove guards, shields, or screens while the compressor is in operation. If removed for maintenance, replace before resuming operation.
6. Observe the delivery pressure gauge daily to be sure the automatic control system is operating within proper limits.
7. Periodically check all safety and relief devices for proper operation.
8. Use compressed air properly. Pressurized air can cause serious injury to personnel.
9. Be sure that no tools, rags or loose parts are left in or on the compressor or drive parts.
10. Do not use flammable solvents for cleaning parts.
11. Exercise cleanliness during maintenance and when making repairs. Keep dirt away from parts and exposed openings by covering with clean cloth or kraft paper.
12. Do not install a shut-off valve in the discharge line without installing a pressure relief valve between the shut-off and the compressor package.
13. Do not operate the compressor in areas where there is a possibility of flammable or toxic substances entering the system.
14. Never disconnect (or bypass) the air discharge temperature switch or any other safety device and attempt to operate the compressor.
15. Know what mode of operation the

compressor is in before working around the unit. The power may be on, but the machine not running if it is in the auto restart, auto timer, remote control or sequential control modes. Adhere to note #2 above.

2.4 Safety devices



WARNING!

Risk of fatal injury from non-functional safety devices!

Risk of serious or fatal injury from non-functional or deactivated safety devices.

- Before starting any work, check whether all the safety devices are fully functional and correctly installed
- Never disable or bypass safety devices.
- Ensure that all safety devices are accessible at all times.

2.4.1 Position of the safety devices

The following illustrations show the position of the safety devices.

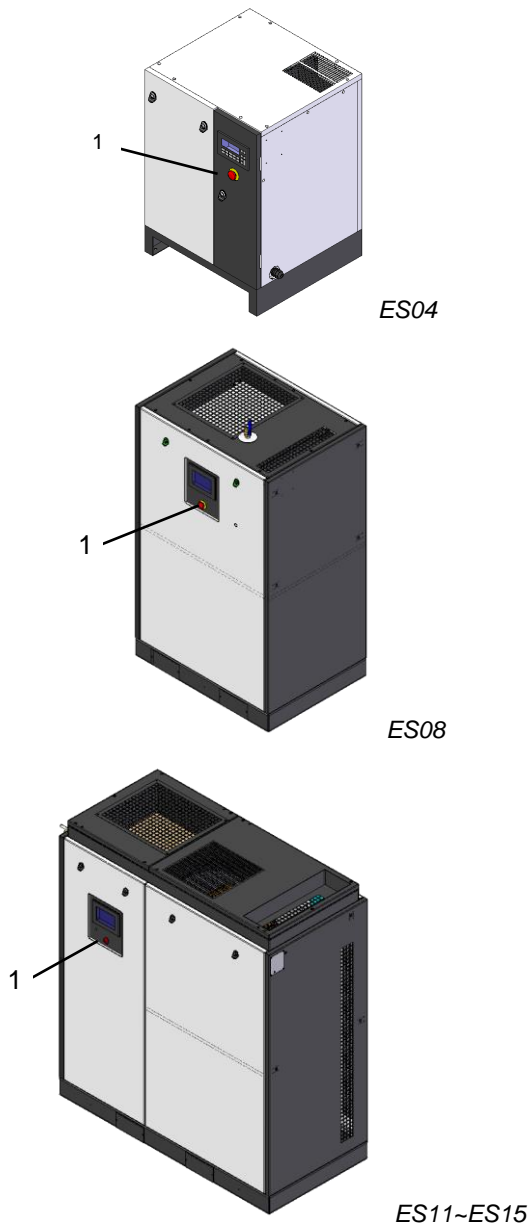


Fig. 17: Emergency stop button (1) on the oil-free scroll compressor

2.4.2 Description of the installed safety devices

Emergency stop button

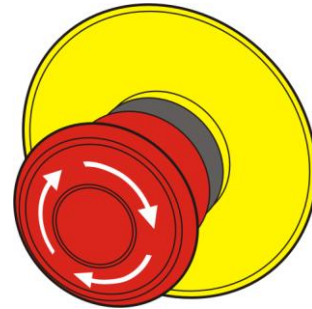


Fig. 18: Emergency stop button

Pressing the emergency stop button stops the machine by switching off the power supply with an immediate effect. After the emergency stop button has been pressed, it must be turned clockwise and unlocked to allow a restart.



WARNING!

Risk of fatal injury due to unauthorized restart!

Restarting the machine in an uncontrolled manner can cause serious or fatal injuries.

- Before restarting, ensure that the reason for the emergency stop has been rectified and that all safety devices are installed and in perfect working order.
- Do not unlock the EMERGENCY STOP button until there is no more danger.

Safety relief valves

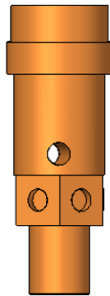


Fig. 19: Safety relief valve

Safety relief valves are relief devices for pressurized areas such as boilers, pressure tanks and pressure lines. In the event of unacceptably high pressure, relief valves discharge gases, vapours or liquids into the atmosphere.

Do not change the pressure setting of the pressure relief valve, restrict the function of the relief valve or replace the relief valve with a plug.

2.5 Environmental protection



NOTICE!
Danger to the environment from incorrect handling of environmentally hazardous substances!

Incorrect handling of environmentally hazardous substances, particularly incorrect waste disposal, may cause serious damage to the environment.

- Always observe the instructions below regarding handling and disposal of environmentally hazardous substances.
- If environmentally hazardous substances are accidentally released into the environment, take suitable measures immediately. If in doubt, inform the responsible local authorities about the damage and enquire about suitable measures.

The following environmentally hazardous substances are used:

Lubricants

Lubricants such as grease and oil contain toxic substances. They must not be released into the environment. Disposal must be carried out by a specialist disposal company.

2.5.1 Instructions on the machine

Direction of rotation



There is a direction of rotation sticker on the drive unit and on the cooling-air fan. This sticker shows the respective direction of rotation.

Electric voltage



Only qualified electricians may work in a room marked with this sign. Unauthorized persons may not enter workplaces marked with this sign nor open a cabinet marked with this sign.

Automatic start-up



Keep a sufficient distance from all parts that can move as they pose a risk of crushing or entanglement.

3 Technical data

3.1.1 Name plate


AIR COMPRESSOR	
MODEL	<input type="text"/>
ELECTRIC MOTOR	<input type="text"/> kW/ <input type="text"/> HP <input type="text"/> V <input type="text"/> Hz
AIR DELIVERY	<input type="text"/> m ³ /min <input type="text"/> CFM
RATED DISC. P	<input type="text"/>
AIR END SERIAL No.	<input type="text"/>
SERIAL NO.	<input type="text"/>
NET WEIGHT	<input type="text"/>
MFG. DATE	<input type="text"/>
	

Fig. 20: Name plate

The name plate is located on the lower frame on the maintenance side and on the rear side of enclosure. It includes the following details:

- Model
- Electric motor
- Free air delivery
- Maximum (rated) discharge pressure
- Air-end serial no.
- Machine serial no.
- Net weight
- Manufacturing date

3.2 Emissions

Noise emissions

Oil-free scroll compressors emit low noise. For noise of each machine type, please see the following table. The actual measured noise at end users' premises will be different because of environment or other reflectors. Data in the following table are measured in the standard anechoic chamber provided by third party testing unit and based on ISO-2151.

Type	Noise level (ISO-2151)
	dB(A)
ES04	57
ES08	59
ES11	61
ES15	63

3.3 General specifications

3.3.1 Operating environment conditions

Data	Value	Unit
Temperature, minimum ~ maximum	+2 ~ +40 (+35.6 ~ +104)	°C (°F)
Relative humidity, maximum	80	%
Maximum installation altitude above sea level	1,000 (3,281)	m (ft)

3.3.2 Discharge port

Type	Discharge Port
	(inch)
ES04	G 1/2
ES08	G 3/4
ES11	G 1
ES15	G 1

3.4 Plant data

Type	Main motor power	Oil-free scroll compressor		
	(kW)	L x W x H (mm)	Weight (kg)	Cooling air flowrate (m³/h)
ES04	3.7	640 x 604 x 895	170	690
ES08	3.7 x 2	1,020 x 750 x 1,645	440	1,875
ES11	3.7 x 3	1,600 x 750 x 1,830	685	3,750
ES15	3.7 x 4	1,600 x 750 x 1,830	770	3,750

3.5 Electrical connection values

Type	400 V / 50 Hz / 3-Phase Current	
	I _N (A)	I _{fuse protection} (A)
ES04	8.3	16
ES08	16.6	25
ES11	24.9	40
ES15	33.2	50

I_N = Nominal current I_{fuse protection} = Tripping current

Type D circuit breakers are recommended because the compressor motor is direct-on-line (DOL) starting.

3.6 V-belt tension values

Type	V-belt tension (N)
ES04	140 ~ 180
ES08	140 ~ 180
ES11	140 ~ 180
ES15	140 ~ 180

3.7 Air receiver volumes

Type	Air receiver volume – Minimum / Optimum (Litres)
ES04	110 / 110
ES08	110 / 210
ES11	110 / 320
ES15	110 / 430

The recommended air receiver sizes are based on a standard 2-bar pressure differential between the compressor's start and stop settings and no more than 30 air-end drive motor starts per hour (to avoid motor protection shutdown). Contact the manufacturer for application specific advice in special cases.

4 Transport, packaging and storage

4.1 Safety instructions for transport

Improper transport



NOTICE!
Material damage due to improper transport!

Improper transport poses the risk of falling or toppling transport units. This could cause considerable material damage.

- Proceed with caution when unloading packages upon delivery and when transporting them on the premises, and observe the symbols and instructions on the packaging.
- Only use the handling, tie down and lifting points provided.
- Do not remove packaging until shortly before installation.

4.2 Transport inspection

Upon receipt of the delivery, check for completeness and transport damage immediately.

In the event of visible external transport damage, proceed as follows:

- Do not accept the delivery, or only conditionally.
- Note the extent of the damage in the transport document or in the delivery note of the freight carrier.
- Initiate a complaints procedure.



Once detected, register complaints for defects and damage immediately. Claims for damages are only recognized within the applicable claim periods.

4.3 Packaging

About the packaging

The scroll compressors are packaged in cartons or sometimes on wooden frames in accordance with the anticipated transport conditions. Only environmentally friendly materials are used for the packaging.

The packaging is designed to protect the individual components from transport damage, corrosion and other damage until they are installed. Therefore, do not destroy the packaging and only remove it shortly before installation.

Handling packaging materials

Packaging materials comply with the applicable legal requirements and local regulations.



NOTICE!
Risk of environmental damage from improper disposal!

Packaging materials are valuable raw materials that, in many cases, can be re-used or properly processed and recycled. Environmental risks from improper disposal of packaging materials.

- Dispose of packaging materials in accordance with the applicable environmental regulations.
- Comply with the regulations for waste disposal that apply at the location. If necessary, have specialist company dispose of waste.

4.4 Symbols on the packaging

The following symbols are affixed to the packaging. Always observe these symbols during transport.

Top



The tips of the arrows indicate the top of the packaging. They must always point upwards; otherwise there is a risk of damage to the contents.

Fragile



This symbol indicates packages with fragile or delicate contents.

Handle the package carefully so that it cannot fall or be subjected to impacts.

Protect against moisture



Protect package from moisture and keep it dry.

4.5 Transport

Transport with a forklift vehicle

Packages can be transported with a forklift under the following conditions:

- The forklift must be designed for the weight of the packages.
- Existing guide rails on the frame must be used.
- The length of the forks must be at least 1,000 mm.

Transporting

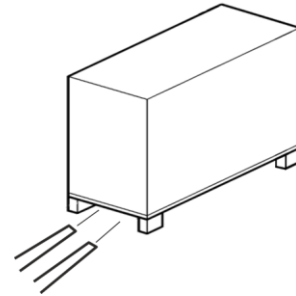


Fig. 21: Transport with a forklift vehicle

1. Move the forklift so that its forks are inserted, as shown in Fig. 21.
2. Insert the forks so that they protrude on the other side.
3. Ensure that the package cannot topple if the centre of gravity is off-centre.
4. Lift the package and begin transport.

4.6 Storage

Storage of packages

Store the packages in the following conditions:

- Do not store outdoors.
- Store in a dry and dust-free environment.
- Do not expose to any aggressive media.
- Protect from exposure to sunlight.
- Avoid mechanical jolts.
- Storage temperature: +2 ~ +40°C.
- Relative humidity: max. 80 %.
- In the event of storage for more than 3 months, check the general condition of all parts and the packaging regularly. If necessary, refresh or replace the rustproofing.



In some cases, there may be notes about storage on the packages which extend beyond the requirements specified here. Adhere to these accordingly.

5 Installation and commissioning

5.1 Safety instructions for installation and initial commissioning

Electrical system

**DANGER!****Risk of fatal injury due to electric current!**

Risk of fatal injury in the event of contact with live components. There is a risk of electrical components moving uncontrollably and causing serious or fatal injuries after they have been switched on.

- Before beginning work, switch off the power supply and ensure that it cannot be switched on again. Cordon off this area in accordance with the applicable instructions and label it accordingly.

Improper initial commissioning

**WARNING!****Risk of injury due to improperly performed initial commissioning!**

In the event of improperly performed initial commissioning there is a risk of serious injury and material damage.

- Before initial commissioning, ensure that all installation work has been performed and completed according to the information and notes in these instructions and the locally applicable regulations.

Securing to prevent restart

**WARNING!****Risk of fatal injury due to unauthorized restart!**

In the event of an unauthorized restart of the power supply during installation, there is a risk of serious or fatal injury in the hazard zone.

- Before beginning work, switch off the power supply and secure it against restarting.

Improper installation and initial commissioning

**WARNING!****Risk of injury due to improperly performed initial commissioning!**

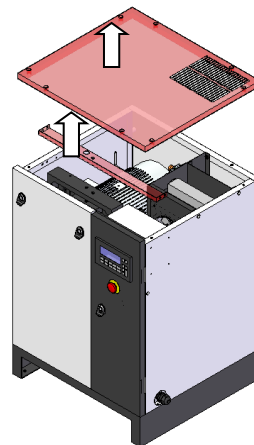
Improperly performed initial commissioning may result in serious injuries and considerable material damage.

- Before starting to work, ensure there is sufficient clearance for installation.
- Use caution when handling exposed sharp-edged components.
- Keep the machine's surroundings tidy and clean! Loosely stocked components, or components and tools lying around, are a potential source of accidents.
- Assemble all components properly. Tighten all screws with the specified torque.
- Ensure components cannot be dropped and cannot fall over.
- Prior to commissioning, observe the following:
 - Ensure that all installation work has been performed and completed according to instructions and information included in these instructions.
 - Ensure that there is nobody in the hazard zone.

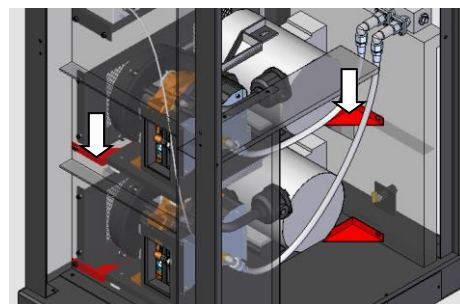
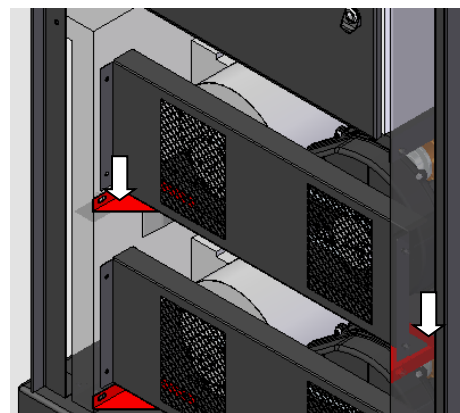
5.2 Requirements at the installation site

Set up the scroll compressor so that the following conditions are fulfilled:

- The installation site is level.
- The machine is easily accessible and can be accessed from all sides.
- There is sufficient lighting.
- There is sufficient ventilation.
- There is a power supply available.
- Escape paths and rescue equipment are freely accessible.
- The machine is not exposed to a potentially explosive atmosphere.
- The machine is not exposed to a corrosive atmosphere.
- The machine is not exposed to direct sunlight or precipitation.
- There is no external heat from surrounding heat sources
- There is no accumulation of dust.
- Fire protection measures have been taken.
- The machine is not exposed to vibrations.
- The floor surface is resistant to solvents, impermeable to liquids, anti-static and easy to clean.
- There are no machines in the vicinity which could cause electrical or electromagnetic interference.
- Before removing the transport securing devices, remove the upper cover first.



ES04



ES08~15



Spatial requirements at the installation site.

See Appendix D ↗ [Installation space drawings].

5.3 Installation

5.3.1 Ventilation



DANGER!

Risk of fatal injury from the use of explosive gas mixtures, vapours, dust or aggressive hazardous substances!

The use of explosive gas mixtures, vapours, dust or aggressive hazardous substances to ventilate the scroll compressor can cause serious or even fatal injuries as well as significant material damage.

- Never use explosive gas mixtures, vapours, dust or aggressive hazardous substances to ventilate the scroll compressor.
- Ensure that no potentially explosive gas mixtures, vapours, dust or aggressive hazardous substances enter into the ventilation for the scroll compressor.

1. Provide the required rate of cooling air according to the technical data for the scroll compressor (↪ *Chapter 3 'Technical data'*).
2. Extract the exhaust air according to the technical data for the scroll compressor (↪ *Chapter 3 'Technical data'*).
 - ⇒ This can prevent overheating of the air compressor room and oil-free scroll air compressor.

The air supplied via the intake openings is used for compression purposes and for cooling the unit.

Personnel: ■ Qualified personnel

Protective

equipment: ■ Safety shoes

■ Protective work clothing



NOTICE!

Risk of material damage due to condensation!

Cooling air that is too humid can create condensation.

- Only supply cool, dry and dust-free cooling air.
- For the intake of outside air, use a recirculating air flap.

5.3.2 Connection to the compressed air network

Personnel:	■ Qualified personnel
Protective equipment:	■ Protective work clothing
	■ Safety shoes
Materials:	■ Flexible compressed air hose



WARNING!

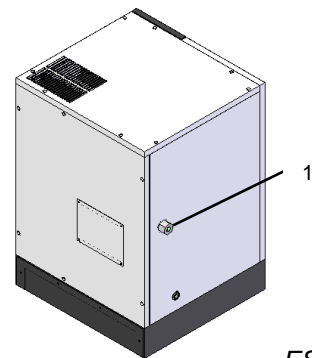
Risk of injury due to unpredictable movement of the compressed air hose!

Load changes in the compressed air network may cause the compressed air hose to move suddenly and with high force.

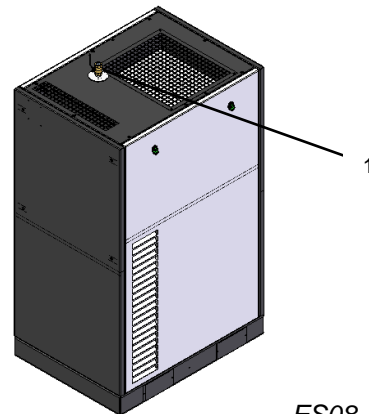
- Fasten the compressed air hose sufficiently.



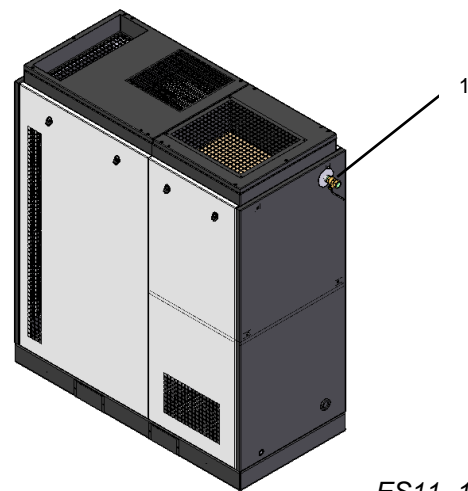
A carefully planned, installed and serviced compressed air network and an additional stop valve installed at the input to the compressed air network are prerequisites for correct installation. Relief valves must be positioned in front of potential blockage points (e.g. shut-off valves, heat exchangers and outlet silencers). Always guide air released by the relief valve away from areas in which people are located.



ES04



ES08



ES11~15

Fig. 22: Compressed air outlet

1. Connect the compressed air according to the technical data (🔗 Chapter 3 'Technical data').
2. Ensure that the compressed air hose does not present a tripping hazard.
3. Fasten the flexible compressed air hose properly.

5.3.3 Connecting to the power supply

- Personnel: ■ Qualified electrician
- Protective equipment: ■ Protective work clothing
■ Safety shoes



NOTICE!

Risk of material damage to the compressor stage due to incorrect connection of the power supply!

In case of incorrect connection of the power supply, the compressor stage could be damaged irreparably due to an incorrectly rotating drive.

- Connect the power according to the wiring diagram and check the rotating field before starting the scroll compressor.



Properly dimensioned safety devices (for personal/system protection) in the mains supply line and a suitable master switch (for switching the power supply on/off) are prerequisites for correct installation.

1. Using the data in the circuit diagram (in the switch cabinet), check whether the existing mains network is suitable. Voltage deviations of more than 5% are not permitted.
2. Connect the power according to the provided circuit diagram (in the switch cabinet) and the technical data (↪ *Chapter 3 'Technical data'*).
3. Check that the 3-phase electrical power supply is connected with clockwise red → white → blue phase sequence rotation BEFORE starting the compressor by using a rotating field test device.
4. Ensure that the power cable does not represent a tripping hazard.
5. Select the correct wire diameter according to the rated power of the air compressor. Do not use wire diameter that is too small because it can easily overheat and cause danger.
6. Air compressor should have an independent power supply, especially not connected with

other different power consumption systems. Because it is possible to trip the overload protection device due to large voltage reduction or imbalance of three-phase current. This is especially important for air compressors with large power.

7. Install adequate circuit breaker according to the power of the air compressor for the safety of power system and maintenance.
8. It is necessary to confirm the correct voltage while performing power distribution of air compressor.
9. The grounding wire of motor or system must be reliably installed and grounding wire cannot be connected to air delivery pipe or cooling water pipe, to prevent danger from electrocution.
10. Before performing any electrical maintenance work, be sure to switch off the power supply.

5.4 Switching on after installation

- Personnel: ■ Qualified personnel
- Protective equipment: ■ Protective work clothing
■ Safety shoes

1. Check all connections for proper installation and firm seating of screw.
2. Ensure that there are no tools or loose objects lying in or on the machine.
3. Install the enclosure doors and ensure that they are sealed.
4. Carefully open the shut-off valve downstream of the outlet port between the scroll compressor and the compressed air network.
 - ⇒ The scroll compressor is now connected to the compressed air network.
5. Switch on the main switch.
6. Start the scroll compressor ↪ *controller documentation*.
 - ⇒ The compressor is ready and may start up automatically at any time.

5.5 Work after the initial commissioning

Personnel:	■ Qualified personnel
Protective equipment:	■ Safety shoes
	■ Protective work clothing
	■ Protective gloves
	■ Light respiratory protection
	■ Safety goggles



WARNING!

Danger of injury due to hot surfaces!

Surfaces of components can heat up a lot during operation. Skin contact with hot surfaces can cause severe skin burns.

- When performing any work near hot surfaces, heat-resistant protective clothing and protective gloves must be worn.
- Before any work, ensure that all surfaces have cooled to the ambient temperature; wait at least 30 minutes.

1. Switch off the oil-free scroll compressor and secure it against restarting.

2. Open and remove the enclosure panels with the special spanner.
3. Wait until the components have cooled.
4. Check all compressed air and condensate drain lines for leaks.
5. Check the connectors of the components and tighten the screws.
6. Reinstall the enclosure panels and ensure that they are sealed.



NOTICE!

Risk of material damage due to the compressor temperature that is too low or too high!

If the compressor temperature is too low or too high, the scroll compressor may become damaged.

- For more detailed information, contact the manufacturer.

7. Check the compressor operating temperature.

5.6 Setting parameters



Refer to the  controller documentation.

6 Operation

6.1 Safety instructions for operation

Improper operation

**WARNING!****Danger of injury due to improper operation!**

Improper operation can cause serious injury and significant material damage.

- Perform all operating steps in accordance with the information and notices in this manual.
- Before starting work, observe the following points:
 - Ensure that all covers and safety devices are installed and functioning properly.
 - Ensure that there is nobody in the hazard area.
- Never bypass safety devices during operation.


2. If there is no danger to your own health, get people out of the hazard area.
3. Initiate first-aid measures as necessary.
4. Alert the fire department or rescue service.
5. Inform the responsible parties at the implementation site.
6. Switch the machine off and secure to prevent a restart.
7. Keep access routes free for emergency vehicles.
8. Give directions to rescue vehicles.

After the rescue measures

9. Depending on the seriousness of the emergency situation, inform the local authorities.
10. Assign specialized personnel to resolve the malfunction.

6.2 Controller

**Controller documentation**

Refer to the  controller documentation for information on how the scroll compressor is controlled.

**WARNING!****Risk of fatal injury if the machine is restarted without authorization or in an uncontrolled manner!**

An uncontrolled or unauthorized restart of the power supply can cause serious or fatal injuries.

- Before restarting, ensure that all safety devices are mounted and functional, and that there is no danger for personnel.

6.3 Shutdown in an emergency

In dangerous situations, the movements of component must be stopped as quickly as possible and the power supply must be switched off.

Shutdown in emergency situations

In emergency situation, proceed as follows:

1. Immediately trigger an emergency stop by pressing the emergency stop button.

11. Before restarting the machine, ensure that all safety devices are installed and functional.

7 Maintenance

7.1 Safety instructions for maintenance

Electrical system

**DANGER!****Risk of fatal injury due to electric power!**

Risk of fatal injury in the event of contact with live components. There is a risk of electrical components moving uncontrollably and causing serious injuries after they have been switched on.

- Before starting work, switch off the main power supply and make sure that it cannot be switched on again. Use a lock out and tag out process.

In the event of an unauthorized restart of the power supply during maintenance, there is a risk of serious injuries or death for persons in the danger zone.

- Before beginning work, switch off the power supply and ensure that it cannot be switched on again.

Moving parts

**WARNING!****Danger of injury from moving parts!**

Rotating parts or parts that make linear movements can cause serious injuries.

- Before beginning any maintenance work on moving parts, shut down the machine and take preventive measures to prevent restarting. Wait until all parts have stopped moving.
- Wear close-fitting protective work clothing with low tensile strength in the danger zone.

Hot surfaces

**WARNING!****Danger of injury from hot surfaces!**

The surfaces of components could heat up a lot during operation. Skin contact with hot surfaces can cause severe skin burns.

- During all work near hot surfaces, wear heat-resistant protective clothing and protective gloves.
- Before all work, make sure that all surfaces have cooled off to the ambient temperature, wait at least 30 minutes.

Improperly performed maintenance work

**WARNING!****Danger of injury due to improperly performed maintenance work!**

Improperly performed maintenance work may lead to serious injuries and significant material damage.

- Before beginning work, there is sufficient clearance assembly.
- Keep the machine's surroundings tidy and clean. Loosely stacked components, or components and tools left lying around, are a potential source of accidents. Protect components and exposed openings from dirt by covering

Securing to prevent restart

**WARNING!****Risk of fatal injury due to unauthorized restart!**

them with a clean cloth or kraft paper.

- Do not use flammable solvents for cleaning parts
- For reinstallation, ensure all components are installed properly and, in doing so, ensure that all fastening elements are re-installed and all screws are tightened using the correct torque.
- Before re-commissioning of the machine:
 - Ensure that all maintenance work has been performed and completed according to the instructions and information included in this manual.
 - Ensure that nobody is in the hazard area.
 - Ensure that all covers and safety devices are installed and functional.
 - Ensure that no tools, rags or loose parts are left in or on the compressor or drive parts.

- Have faulty components that are under pressure during operation replaced by appropriate specialist personnel immediately.
- Before all work, make sure that the compressor is not under pressure; wait at least 5 minutes.

7.2 Spare parts



WARNING!

Risk of injury due to using wrong spare parts!

Using incorrect or faulty spare parts brings dangers to the personnel and can cause damage, malfunctions or complete failure.

- Only use genuine spare parts supplied by the manufacturer or manufacturer-approved spare parts.
- If in doubt, always contact the manufacturer.

Compressed air



WARNING!

Danger of injury from compressed air!

Compressed air can escape from compressed air hoses or components under pressure in case of improper handling or in the event of a fault. This can result in eye injuries, dust being raised, or hoses making uncontrolled movements.

Pressurised components can move in an uncontrolled manner and can cause injuries if handled incorrectly.

- Before removing hoses or components under pressure, make sure the pressure is relieved.



Loss of warranty

The use of non-approved spare or replacement parts will invalidate the warranty.

Procure replacement parts from authorized dealers or directly from the manufacturer.

Please refer to the Parts list for accurate part number information.

7.3 Maintenance schedule

The next section describes the maintenance work that is required for optimal and fault-free operation of the machine.

Insofar as increased wear can be detected during regular checks, the required maintenance intervals must be shortened according to the actual signs of wear. For questions about maintenance work or intervals contact the manufacturer.

Interval	Maintenance Work	Personnel
Daily	Check discharge pressure and temperature(s), alarms, warnings, noise, vibration, condensate drainage and air leak(s)	Trained staff
After initial 500 hours or 3 months	Check and tighten all electrical connections and components	Electrician
	Check V-belt tension	Manufacturer
2,500 hours or 1 year	Replace air filter	Manufacturer
	Inspect V-belt, check tension and replace if necessary	Manufacturer
	Inspect safety valve and replace if necessary	Manufacturer
	Clean cooling fan and aftercooler, and replace if necessary	Manufacturer
	Check, clean and tighten all electrical connections and components	Electrician
5,000 hours or 2 years	Replace check valve	Manufacturer
	Inspect air-end inlet O-ring and replace if necessary	Manufacturer
	Inspect high pressure hoses and replace if necessary	Manufacturer
10,000 hours or 4 years	Replace air-end tip seal, silicone tube and inlet O-ring	Manufacturer
	Replace air-end bearing grease	Manufacturer
	Replace high pressure hoses	Manufacturer
	Inspect motor pulley and replace if necessary	Manufacturer
	Replace V-belt	Manufacturer
	Inspect pressure and temperature sensors, and replace if necessary	Manufacturer
20,000 hours or 8 years	Replace air-end	Manufacturer
	Inspect motor and replace if necessary	Electrician

- The schedule is based on intervals of 2,500 operating hours per year or every 12-month period. Maintenance should be conducted according to whichever term occurs first.
- The schedule is based on a clean operating environment with an ambient temperature of +2 ~ +30°C and a maximum humidity of 80%. If the operating location is warmer or the environmental conditions are adverse, the prescribed maintenance should be performed at shorter intervals. If warmer, shorten the maintenance intervals to 70% of those specified for every 5°C above 30°C.

7.4 Maintenance work



Necessary maintenance work

Necessary maintenance work appears on the display of the controller as a warning ⓘ Controller documentation.

7.4.1 Checking for leaks

- Personnel: ■ Qualified personnel
- Protective equipment: ■ Safety boots
■ Protective work clothing
■ Light respiratory protection
■ Safety goggles
■ Protective gloves
1. Switch the oil-free scroll compressor off and secure to prevent restarting.
 2. Close compressed air network-side gate valve and secure against re-opening.
 3. Open and remove the sound insulation covers with the special spanner.
 4. Check all lines and the base for leaks.
 5. Check the connectors of the components and tighten the screws.

7.4.2 Checking the electrical connections

- Personnel: ■ Qualified electrician
- Protective equipment: ■ Safety boots
■ Protective work clothing
■ Light respiratory protection
■ Safety goggles
■ Protective gloves



DANGER!

Danger to life from stored charges!

Electric charges may be stored in electrical components; these charges may be maintained even after the system has been switched off and disconnected from the power supply. Contact with these components may result in serious or fatal injury.

- Before working on the specified components, ensure that they have been completely disconnected from the power supply. Allow 10 minutes to elapse in order to ensure that the internal capacitors have been fully discharged.

1. Switch the compressor off and secure to prevent restarting.
2. Open and remove the sound insulation covers and the electrical cabinet cover with the special spanner.
3. Check the connections of the electrical components and tighten the screws.

7.4.3 Checking the compressor temperature

- Personnel: ■ Qualified personnel
- Protective equipment: ■ Safety boots
■ Protective work clothing



NOTICE!

Property damage due to compressor temperature that is too low or too high!

A compressor discharge temperature that is too low or too high can cause damage to the scroll compressor.

- For detailed information, contact the manufacturer.



- Standard compressor air-end discharge temperature is ambient temperature + 180°C.
- The discharge temperature should never be higher than 235°C. If more than this temperature, the operating panel will display an alarm message and the air compressor will shut down.

1. Check compressor discharge temperature via the controller.

7.4.4 Checking soiling of the cooler

- | | |
|-----------------------|--------------------------------|
| Personnel: | ■ Qualified personnel |
| Protective equipment: | ■ Safety boots |
| | ■ Protective work clothing |
| | ■ Light respiratory protection |
| | ■ Safety goggles |
| | ■ Protective gloves |

1. Switch the oil-free scroll compressor off and secure to prevent restarting.
2. Open and remove the upper covers of sound insulation with the special spanner.
3. Check compressed air cooler from inside and outside for soiling.
4. Remove soiling.



Soiling can be removed by blowing it out, e.g. While doing this, make sure that the soiling from the device is blown out of rather than into the machine. In case of severe soiling, consult the manufacturer.

7.4.5 Checking main motor

- | | |
|-----------------------|-----------------------|
| Personnel: | ■ Qualified personnel |
| Protective equipment: | ■ Safety boots |

- Protective work clothing
- Light respiratory protection
- Safety goggles
- Protective gloves

1. Switch the oil-free scroll compressor off and secure to prevent restarting.
 2. Open and remove the sound insulation covers with the special spanner.
 3. Visually check the main motor.
- ⇒ In case of visible defects, contact the manufacturer.

7.4.6 Add lubricating grease for main motor bearing

- | | |
|-----------------------|--------------------------------|
| Personnel: | ■ Qualified personnel |
| Protective equipment: | ■ Safety boots |
| | ■ Protective work clothing |
| | ■ Light respiratory protection |
| | ■ Safety goggles |
| | ■ Protective gloves |
| Materials: | ■ Lubricating grease |



If there is no lubricating grease inlet in the main motor, the main motor is filled with permanent lubricating grease.

1. Switch the oil-free scroll compressor off.
2. Open and remove the sound insulation covers with the special spanner.
3. For quantity and type of lubricating grease required for motor bearing, please see information on the motor label.



Lubricating grease inlets all located at rear sides of main motor.



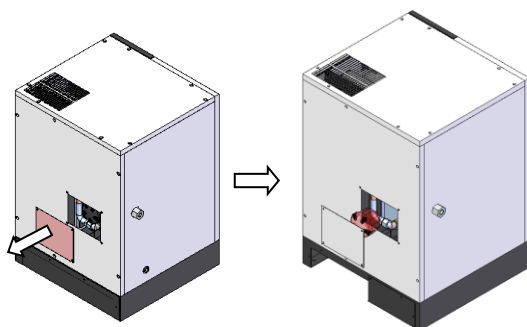
Fig. 23: Lubricating grease inlet

4. Open lubricating grease inlet (Fig. 23) and add lubricating grease to main motor bearing.

7.4.7 Replacing the air filter

Personnel:	■ Qualified personnel
Protective equipment:	■ Safety boots
	■ Protective work clothing
	■ Light respiratory protection
	■ Safety goggles
	■ Protective gloves

1. Switch the oil-free scroll compressor off and secure to prevent restarting.
2. Close the shut-off valve on the pressure network side and secure it to prevent it from being opened again.
3. Use cross screwdriver to open air filter maintenance cover.

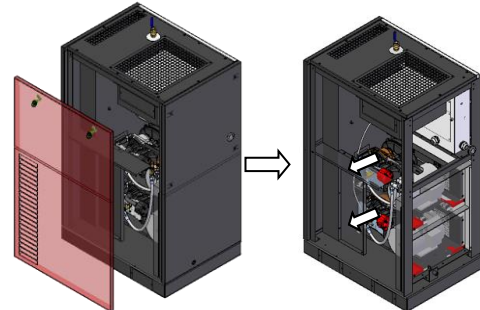


ES04

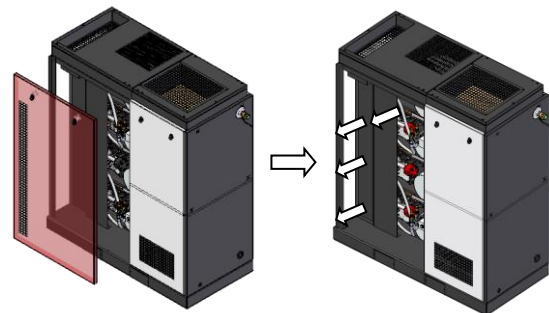
Fig. 24: Remove the intake air filter

4. Unfasten and remove the intake filter.
5. Remove the old filter element.

6. Replace the new filter element.
7. Reinstall air filter and screw tight.



ES08



ES11~ES15

1. Switch the oil-free scroll compressor off and secure to prevent restarting.
2. Close the shut-off valve on the pressure network side and secure it to prevent it from being opened again.
3. Use keys to open shutter and remove the sound insulation covers with the special spanner.
4. Unfasten and remove the intake filter.
5. Remove the old filter element
6. Replace the new filter element.
7. Reinstall air filter and screw tight.

7.4.8 Checking or replacing V-belt

Personnel:	■ Qualified personnel
Protective equipment:	■ Safety boots
	■ Protective work clothing
	■ Light respiratory protection
	■ Safety goggles
	■ Protective gloves

1. Switch the oil-free scroll compressor off and secure to prevent restarting.
2. Close the shut-off valve on the pressure network side and secure it to prevent it from being opened again.
3. Open front shutter.
4. Disassemble V-belt protecting cover with hexagon wrench.

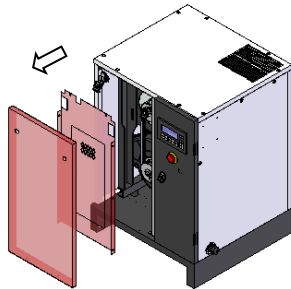


Fig. 25: Open front shutter and V-belt protecting cover ES04

5. Check V-belt tightness. If the value of V-belt tightness is within the allowable range, re-assemble front shutter and V-belt protecting cover. If the value of V-belt tightness needs to be adjusted, do so as follows.

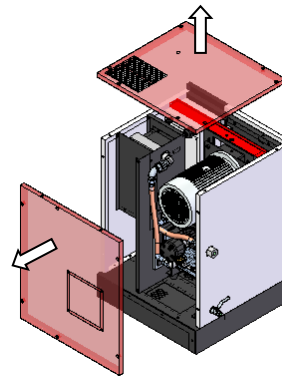


Fig. 26: Disassemble upper cover and rear cover ES04

6. Use Allen wrench to disassemble upper cover.
7. Use Allen wrench to disassemble rear cover.

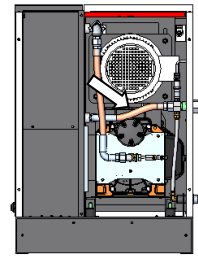


Fig. 27: Loosen supporting frame ES04

8. Loosen screws on the motor support frame.
9. Loosen screws on the motor flange plate.
10. Use screw at motor flange rotating plate to adjust the location of motor upward or downward, and adjust the tightness of V-belt and change V-belt.

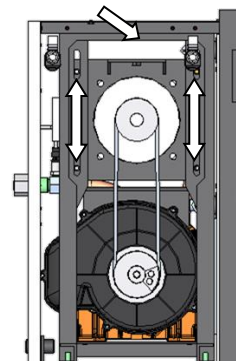
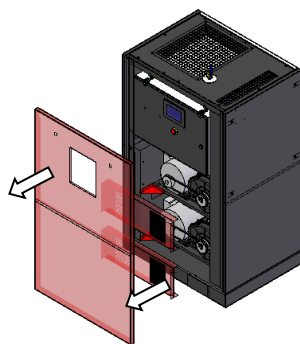
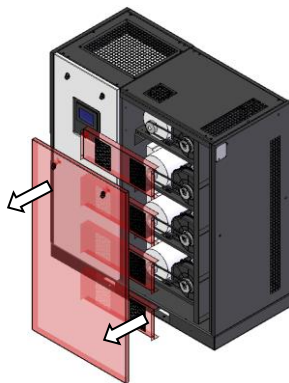


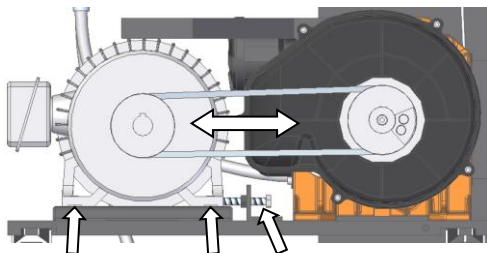
Fig. 28: Adjusting the tightness of V-belt ES04



ES08



ES11~ES15



**Fig. 29: Adjusting the tightness of V-belt
ES08 and ES11~ES15**

7.5 Measures after maintenance has been performed

After completion of the maintenance work and before switching the machine on, carry out the following steps:

1. Check whether all previously removed protective equipment and covers have been replaced properly.
2. Ensure that all tools, materials and other equipment used have been removed from the work area.
3. Clean the work area and remove any substances such as liquids, processing material or similar that may have escaped.
4. Ensure that all safety equipment on the machine functions perfectly.
5. Carefully open the compressed air network-side shut-off valve.
6. Document work on the machine in the maintenance log (please see Appendix B ↗ 'Service log').

7.4.9 Air-end maintenance



Air-end maintenance

Note: Refer to the ↗ Technical guide for scroll compressor air-end maintenance.

8 Faults

The following section describes possible causes of faults and the work to remedy them.

In case of faults that occur more than once, shorten the maintenance intervals according to the actual utilization.

In case of faults that cannot be remedied using the following instructions, contact the manufacturer.

8.1 Safety instructions for fault clearance

Electrical system



DANGER!
Danger to life from electric power!

Contact with live parts may prove fatal. When switched on, electric components may be subject to uncontrolled movements and may cause grave injury.

- Switch off the power supply before starting work and make sure that it cannot be switched on again.

Securing to prevent restart



WARNING!
Danger to life from an unauthorized restart!

In the event of an unauthorized restart of the power supply while tracking down and rectifying a fault, there is a danger of serious injuries or death for persons in the danger zone.

- Switch off all power supplies before starting work and make sure they cannot be switched on again.

Improperly executed troubleshooting work



WARNING!
Danger of injury from improper troubleshooting!

Improperly executed troubleshooting work may result in serious injury and significant damage to property.

- Ensure sufficient assembly space before starting work.
- Pay attention to orderliness and cleanliness in the assembly location! Loosely stacked or scattered components and tools could cause accidents.
- If components have been removed, pay attention to correct assembly, refit all fixing elements and comply with bolt tightening torques.
- Before the restart, ensure that
 - all troubleshooting work has been carried out and completed in accordance with the information and instructions in this manual.
 - no persons are in the danger zone.
 - all covers and safety devices are installed and functioning properly.

Hot surfaces



WARNING!
Danger of injury from hot surfaces!

Surfaces of components can heat up a lot during operation. Skin contact with hot surfaces can cause severe skin burns.

- During all work near hot surfaces, wear heat-resistant protective clothing and protective gloves.
- Before all work, make sure that all surfaces have cooled off to the

ambient temperature, wait at least 30 minutes.

Compressed air



WARNING!

Danger of injury from compressed air!

Compressed air can escape from compressed air hoses or components under pressure in case of improper handling or in case of a fault. It can injure eyes, whip up dust or cause uncontrolled movements of hoses.

Components under pressure can move in uncontrolled fashion with improper handling and cause injuries.


- Before removing hoses or components under pressure, make sure the pressure is relieved.
- Have faulty components that are under pressure during operation replaced by appropriate specialist personnel immediately.
- Before all work, make sure that the compressor is not under pressure; wait at least 5 minutes.

Response in the event of faults

The following applies in principle:

1. Immediately initiate an emergency stop in the event of faults posing an immediate danger to people or property.
2. Ascertain the cause of the fault.
3. If fault rectification requires work in the danger zone, shut down the machine and secure to prevent restarting.
Immediately notify those responsible at the place of use about the fault.
4. Depending on the nature of the fault, have it rectified by authorized specialized personnel or rectify it yourself.

8.2 Fault displays

Refer to the  *controller documentation* for information on fault displays.



8.3 Fault troubleshooting

Fault description	Possible Cause	Remedy	Personnel
No image on controller display panel	No electricity supply	Check electricity supply is switched on	Trained staff
	Low supply voltage, phase fault or incorrect phase rotation	Check supply voltage on all three phases at the compressor and check direction of phase rotation	Electrician
	Compressor electrical fault, overload or controller failure	Check or replace electrical connections, components or controller	Electrician
No response after pressing start button	System air pressure above start pressure	[Normal operation, no fault]	Trained staff
	Incorrect operation of controller	Check controller manual for operating instructions	Trained staff
	Alarm shutdown active	Check or remedy alarm shutdown condition	Trained staff
	Low supply voltage or phase fault	Check voltages at the compressor electrical cabinet and motor	Electrician
	Compressor electrical fault, overload or controller fault	Check or replace electrical connections, components or controller	Electrician
	Motor fault	Check or change motor	Electrician
Excessively high discharge air temperature	Too high ambient temp. or insufficient cooling air	Check or improve ambient temperature or cooling air supply	Trained staff
	Air cooler dirty or cooling airflow blocked	Check or clean air cooler and cooling air circuit	Manufacturer
	Electric cooling fan fault	Check or change electric cooling fan	Electrician
	Temperature sensor fault	Check or change temperature sensor	Manufacturer
	Controller fault	Check or change controller	Manufacturer
	Air-end fault	Check or change air-end	Manufacturer
Motor overload	V-belt or pulleys fault	Check or change V-belt and pulleys	Manufacturer
	Low supply voltage or phase fault	Check voltages at the compressor electrical cabinet and motor	Electrician
	Compressor electrical fault	Check or replace electrical connections or components	Electrician
	Motor fault	Check or change motor	Electrician
	Air-end fault	Check or change air-end	Manufacturer
Safety valve open	Incorrect pressure setting(s)	Check or correct pressure settings as per the controller manual	Trained staff
	Check valve fault	Check or change check valve	Manufacturer

Fault description	Possible Cause	Remedy	Personnel
	Pressure sensor fault	Check or change pressure sensor	Manufacturer
	Safety valve fault	Check or change safety valve	Manufacturer
Unable to build-up compressed air system pressure	Incorrect pressure setting(s)	Check or correct pressure settings as per the controller manual	Trained staff
	Blocked discharge pipeline or valve(s)	Check or repair pipeline and valve(s)	Trained staff
	Excessive air consumption	Check or reduce air consumption and leaks	Trained staff
	Blocked air filter	Check or change air filter element	Manufacturer
	V-belt or pulleys fault	Check or change V-belt or pulleys	Manufacturer
	Check valve fault	Check or change check valve	Manufacturer
	Air-end fault	Check or change air-end	Manufacturer
Excessive water condensate in discharge air	Incorrect condensate drain valve setting(s)	Check or correct drain valve settings as per the controller manual	Trained staff
	Blocked or faulty condensate drain piping or valve	Check, clean or replace drain piping or valve	Manufacturer
Unusual noise emission	Air-end rotating backwards	Check or change direction of motor rotation	Electrician
	V-belt or pulleys fault	Check or change V-belt or pulleys	Manufacturer
	Motor fault	Check or change motor	Electrician
	Electric cooling fan fault	Check or change electric cooling fan	Electrician
	Air-end fault	Check or change air-end	Manufacturer

8.4 Trial run after troubleshooting

Please do as follows to carry out trial run after troubleshooting:

1. Reset emergency button.
2. Confirm malfunction record,  *Controller Instruction Manual*.
3. All staff are evacuated from the danger area.
4. Startup the oil-free scroll compressor  *Controller Instruction Manual*.

9 Dismantling and disposal

Following the end of its useful life, the machine should be dismantled and disposed of in accordance with the environmental regulations.

9.1 Safety instructions for dismantling and disposal

Electrical system

**DANGER!****Danger to life from electric power!**

Contact with live parts may prove fatal. When switched on, electric components may be subject to uncontrolled movements and may cause grave injury.

- Before starting the dismantling, switch off the electric power supply and disconnect completely.

Improper dismantling

**WARNING!****Danger of injury due to improper dismantling!**

Stored residual energy, angular components, points and edges on or in the machine or on the tools needed can cause injuries.

- Ensure sufficient space before starting work.
- Handle exposed, sharp-edged components with care.
- Pay attention to orderliness and cleanliness in the workplace! Loosely stacked or scattered components and tools could cause accidents.
- Dismantle the components properly. Note that some components may have a high intrinsic weight. Use hoists if necessary.
- Secure components so that they cannot fall down or topple over.

- Consult the manufacturer if in doubt.

9.2 Disassembly

Before starting disassembly:

- Shut down the machine and secure to prevent restarting.
- Physically disconnect the power supply from the machine; discharge stored residual energy.
- Remove consumables, auxiliary materials and other processing materials and dispose of in accordance with the environmental regulations.

Then disassemble and clean assemblies and parts properly and dispose of them in compliance with applicable local occupational safety and environmental protection regulations.

9.3 Disposal

If no return or disposal agreement has been made, send the dismantled components for recycling.

- Scrap metals.
- Send plastic elements for recycling.
- Sort and dispose of other components in accordance with their material composition.

**NOTICE!****Danger to the environment due to incorrect disposal!**

Improper waste disposal will damage the environment

- Electrical scrap, electronic components, lubricants and other auxiliary materials must be disposed of by authorized specialist companies.
- If there is any question, please contact local competent authority or professional waste disposal company for waste disposal data.

Appendixes

A Training log


B Service log

Compressor type:	
Plant serial number: Please specify for all enquiries, orders and correspondence.	
Motor serial number:	
Air-end serial number:	
Date of commissioning:	
Customer service department:	

Page 43

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C Maintenance schedules



ES04

Maintenance Schedule

2022.01.26 Rev. A


Part Number	Name	Quantity	500 hours Initial	2,500 hours or 1 year	5,000 hours or 2 years	10,000 hours or 4 years	20,000 hours or 8 years
2620000042	GW4 Air-end	1					●
2620020281	Tip Seal	1 set				●	
2620020290	Silicone Tube	1				●	
2100050348	Bearing Grease	1				●	
2111010114	O-ring (Air-end Inlet)	1			○	●	
2106024779	Motor (3.7kW, 400V, 50Hz, 3φ)	1					○
2116040161	Air Filter Element (FS-Curtis Logo)	1		●			
2106130862	Fan (220V)	2		⊙			
2117010286	Cooler	1		⊙			
2113020356	Pulley (50Hz)	1				○	
2113010441	V-Belt (50Hz)	2	△	○		●	
2620330030	Check Valve	1			●		
2104110381	Safety Valve (9 bar, CE)	1		○			
2105040258	Temperature Sensor	1				○	
2105040259	Pressure Sensor	1				○	
2620460080	High Pressure Hose (Air-end Discharge)	1			○	●	
2620460260	High Pressure Hose (Aftercooler Discharge)	1			○	●	

Notes:

(1) ● Replace ○ Inspect and replace if necessary △ Adjust ⊙ Clean and replace if necessary

(2) The schedule is based on intervals of 2,500 operating hours per year or every 12-month period. Maintenance should be conducted according to whichever term occurs first.

(3) The schedule is based on a clean operating environment with an ambient temperature of +2 ~ +30°C and a maximum humidity of 80%. If the operating location is warmer or the environmental conditions are adverse, the prescribed maintenance should be performed at shorter intervals. If warmer, shorten the maintenance intervals to 70% of those specified for every 5°C above 30°C.



ES08

Maintenance Schedule

2022.01.26

Rev. A

Part Number	Name	Quantity	500 hours Initial	2,500 hours or 1 year	5,000 hours or 2 years	10,000 hours or 4 years	20,000 hours or 8 years
2620000042	GW4 Air-end	2					●
2620020281	Tip Seal	2 sets				●	
2620020290	Silicone Tube	2				●	
2100050348	Bearing Grease	1				●	
2111010114	O-ring (Air-end Inlet)	2			○	●	
2106024780	Motor (3.7kW, 400V, 50Hz, 3p)	2					○
2116040161	Air Filter Element (FS-Curtis Logo)	2		●			
2106130893	Fan (220V)	1		⊙			
2620510080	Cooler	1		⊙			
2113020356	Pulley (50Hz)	2				○	
2113010441	V-Belt (50Hz)	4	△	○		●	
2620330030	Check Valve	2			●		
2104110381	Safety Valve (9 bar, CE)	1		○			
2105040258	Temperature Sensor	2				○	
2105040259	Pressure Sensor	1				○	
2620460120	High Pressure Hose (Air-End Disch. - Upper)	1			○	●	
2620460130	High Pressure Hose (Air-End Disch. - Lower)	1			○	●	
2620460140	High Pressure Hose (Aftercooler Inlet)	1			○	●	

Notes:


1) ● Replace ○ Inspect and replace if necessary △ Adjust ⊙ Clean and replace if necessary

2) The schedule is based on intervals of 2,500 operating hours per year or every 12-month period. Maintenance should be conducted according to whichever term occurs first.

3) The schedule is based on a clean operating environment with an ambient temperature of +2 ~ +30°C and a maximum humidity of 80%. If the operating location is warmer or the environmental conditions are adverse, the prescribed maintenance should be performed at shorter intervals. If warmer, shorten the maintenance intervals to 70% of those specified for every 5°C above 30°C.

Notes:

- 1) ● Replace ○ Inspect and replace if necessary △ Adjust ⊙ Clean and replace if necessary
- 2) The schedule is based on intervals of 2,500 operating hours per year or every 12-month period. Maintenance should be conducted according to whichever term occurs first.
- 3) The schedule is based on a clean operating environment with an ambient temperature of +2 ~ +30°C and a maximum humidity of 80%. If the operating location is warmer or the environmental conditions are adverse, the prescribed maintenance should be performed at shorter intervals. If warmer, shorten the maintenance intervals to 70% of those specified for every 5°C above 30°C.



ES11

Maintenance Schedule

2022.01.26

Rev. A

Part Number	Name	Quantity	500 hours Initial	2,500 hours or 1 year	5,000 hours or 2 years	10,000 hours or 4 years	20,000 hours or 8 years
2620000042	GW4 Air-end	3					●
2620020281	Tip Seal	3 sets				●	
2620020290	Silicone Tube	3				●	
2100050348	Bearing Grease	1				●	
2111010114	O-ring (Air-end Inlet)	3			○	●	
2106024780	Motor (3.7kW, 400V, 50Hz, 3p)	3					○
2116040161	Air Filter Element (FS-Curtis Logo)	3		●			
2106130893	Fan (220V)	2		⊙			
2620510070	Cooler	1		⊙			
2113020356	Pulley (50Hz)	3				○	
2113010441	V-Belt (50Hz)	6	△	○		●	
2620330030	Check Valve	3			●		
2104110381	Safety Valve (9 bar, CE)	1		○			
2105040258	Temperature Sensor	3				○	
2105040271	Pressure Sensor	1				○	
2620460160	High Pressure Hose (Air-end Discharge)	3			○	●	
2620460170	High Pressure Hose (Manifold Connection)	1			○	●	
2620460180	High Pressure Hose (Aftercooler Inlet)	1			○	●	

Notes:

1)

● Replace

○ Inspect and replace if necessary

△ Adjust

⊙ Clean and replace if necessary

2)


The schedule is based on intervals of 2,500 operating hours per year or every 12-month period. Maintenance should be conducted according to whichever term occurs first.

3)

The schedule is based on a clean operating environment with an ambient temperature of +2 ~ +30°C and a maximum humidity of 80%. If the operating location is warmer or the environmental conditions are adverse, the prescribed maintenance should be performed at shorter intervals. If warmer, shorten the maintenance intervals to 70% of those specified for every 5°C above 30°C.

Notes:

- 1) ● Replace ○ Inspect and replace if necessary Δ Adjust ⊙ Clean and replace if necessary
- 2) The schedule is based on intervals of 2,500 operating hours per year or every 12-month period. Maintenance should be conducted according to whichever term occurs first.
- 3) The schedule is based on a clean operating environment with an ambient temperature of +2 ~ +30°C and a maximum humidity of 80%. If the operating location is warmer or the environmental conditions are adverse, the prescribed maintenance should be performed at shorter intervals. If warmer, shorten the maintenance intervals to 70% of those specified for every 5°C above 30°C.



ES15

Maintenance Schedule

2022.01.26

Rev. A

Part Number	Name	Quantity	500 hours Initial	2,500 hours or 1 year	5,000 hours or 2 years	10,000 hours or 4 years	20,000 hours or 8 years
2620000042	GW4 Air-end	4					●
2620020281	Tip Seal	4 sets				●	
2620020290	Silicone Tube	4				●	
2100050348	Bearing Grease	1				●	
2111010114	O-ring (Air-end Inlet)	4			○	●	
2106024780	Motor (3.7kW, 400V, 50Hz, 3φ)	4					○
2116040161	Air Filter Element (FS-Curtis Logo)	4		●			
2106130893	Fan (220V)	2		⊙			
2620510070	Cooler	1		⊙			
2113020356	Pulley (50Hz)	4				○	
2113010441	V-Belt (50Hz)	8	△	○		●	
2620330030	Check Valve	4			●		
2104110381	Safety Valve (9 bar, CE)	1		○			
2105040258	Temperature Sensor	4				○	
2105040271	Pressure Sensor	1				○	
2620460160	High Pressure Hose (Air-end Discharge)	4			○	●	
2620460170	High Pressure Hose (Manifold Connection)	1			○	●	
2620460180	High Pressure Hose (Aftercooler Inlet)	1			○	●	

Notes:

1) ● Replace ○ Inspect and replace if necessary △ Adjust ⊙ Clean and replace if necessary

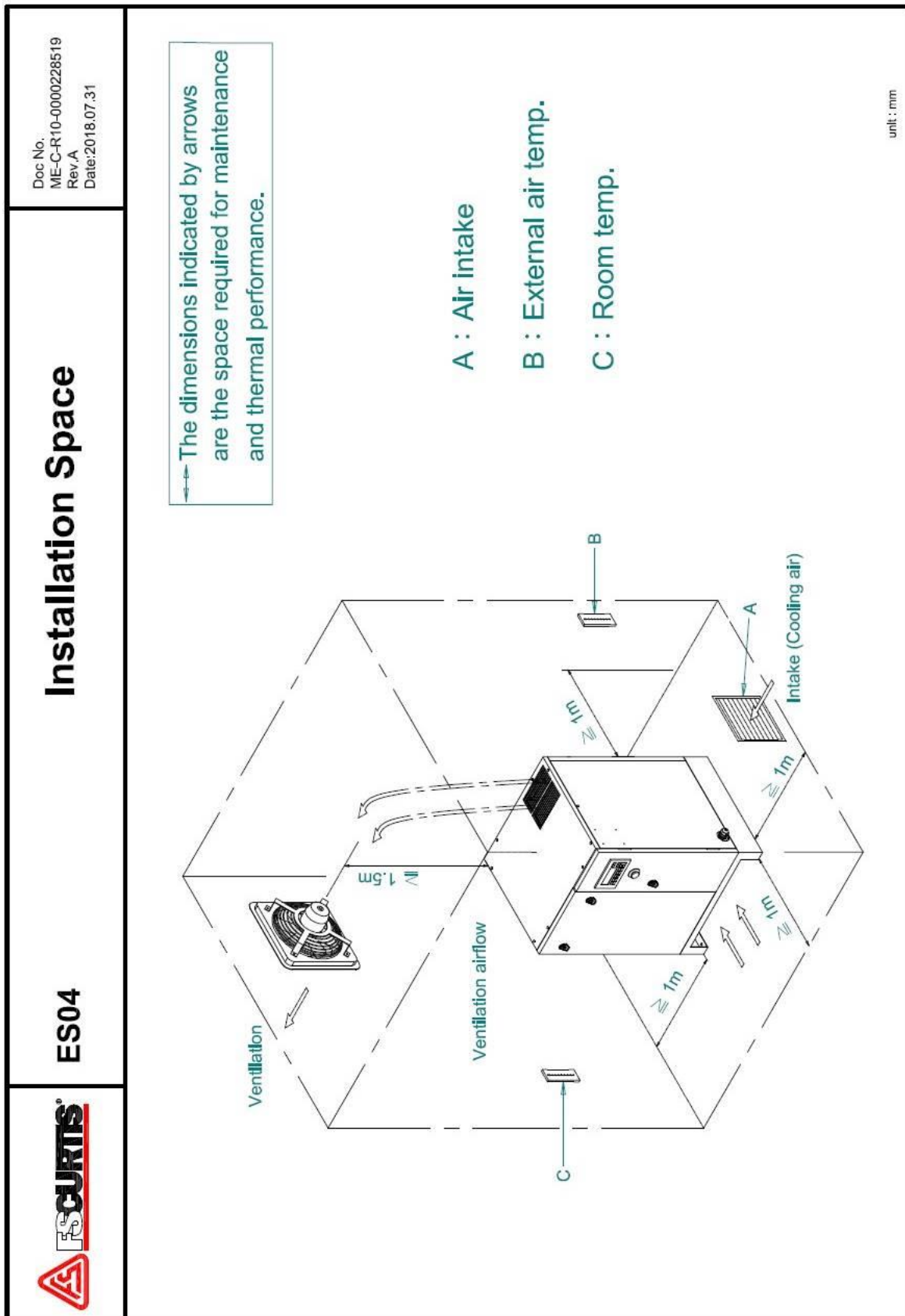
2) The schedule is based on intervals of 2,500 operating hours per year or every 12-month period. Maintenance should be conducted according to whichever term occurs first.

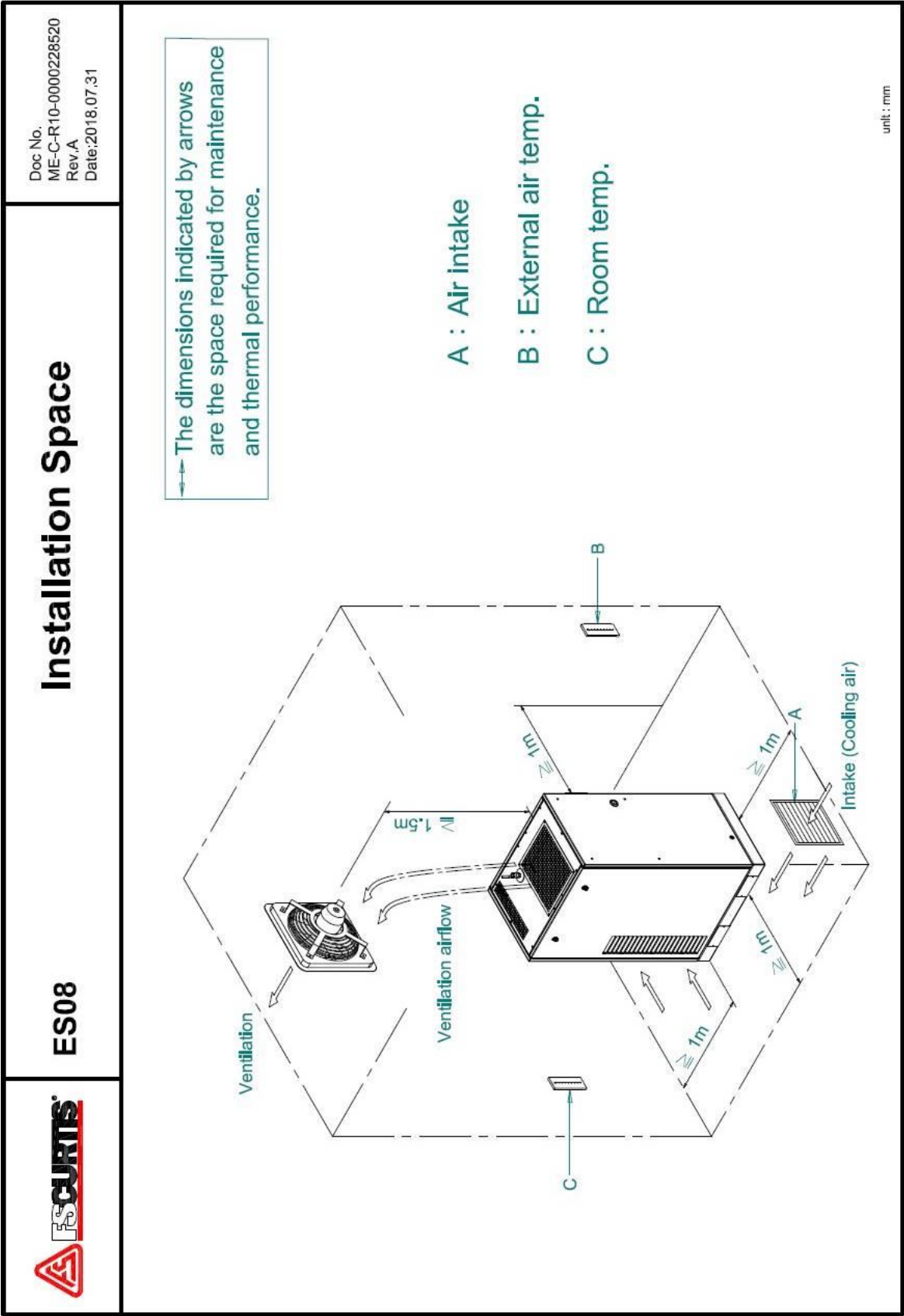
3) The schedule is based on a clean operating environment with an ambient temperature of +2 ~ +30°C and a maximum humidity of 80%. If the operating location is warmer or the environmental conditions are adverse, the prescribed maintenance should be performed at shorter intervals. If warmer, shorten the maintenance intervals to 70% of those specified for every 5°C above 30°C.

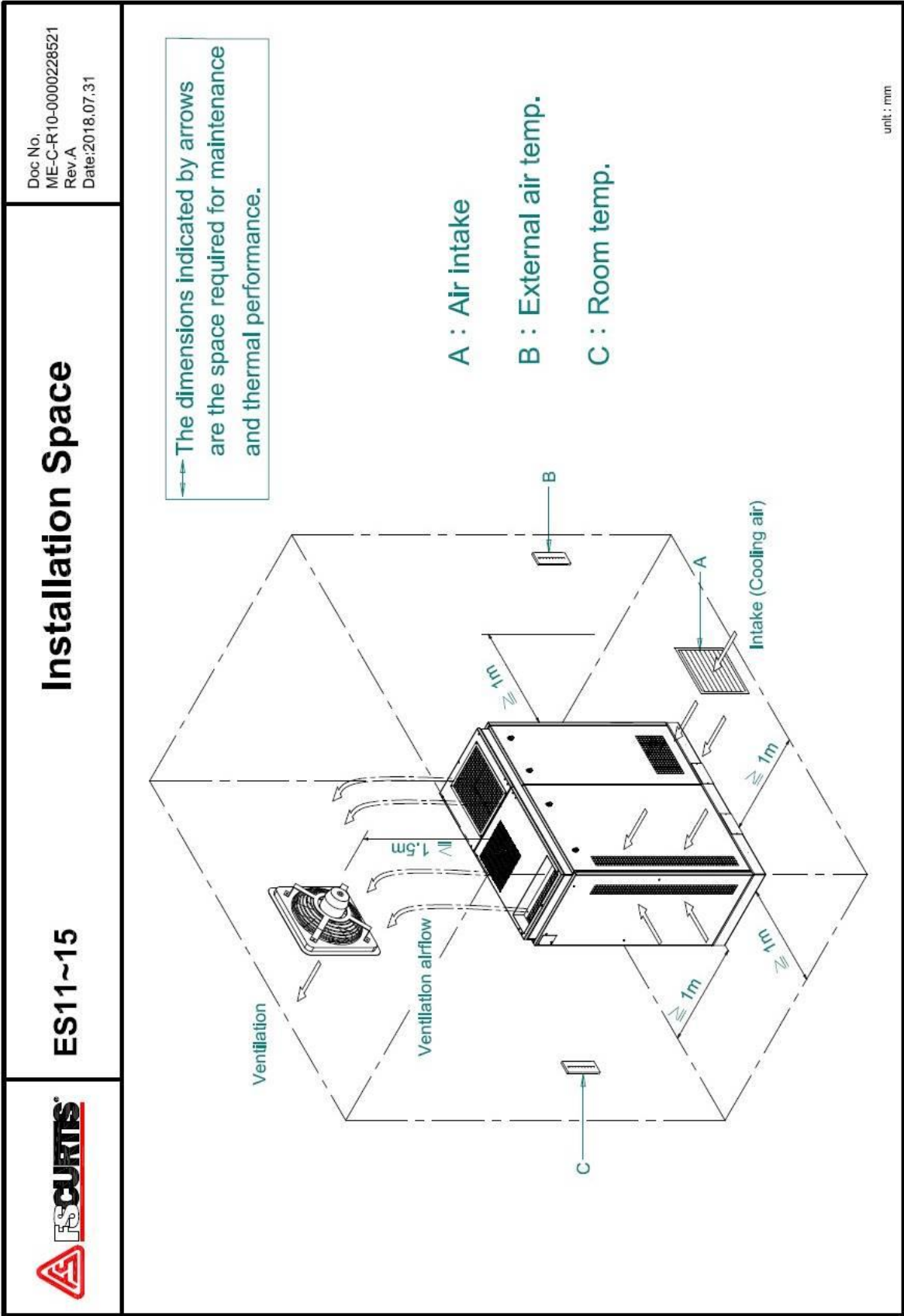
Notes:

- 1) ● Replace ○ Inspect and replace if necessary △ Adjust ⊙ Clean and replace if necessary
- 2) The schedule is based on intervals of 2,500 operating hours per year or every 12-month period. Maintenance should be conducted according to whichever term occurs first.
- 3) The schedule is based on a clean operating environment with an ambient temperature of +2 ~ +30°C and a maximum humidity of 80%. If the operating location is warmer or the environmental conditions are adverse, the prescribed maintenance should be performed at shorter intervals. If warmer, shorten the maintenance intervals to 70% of those specified for every 5°C above 30°C.

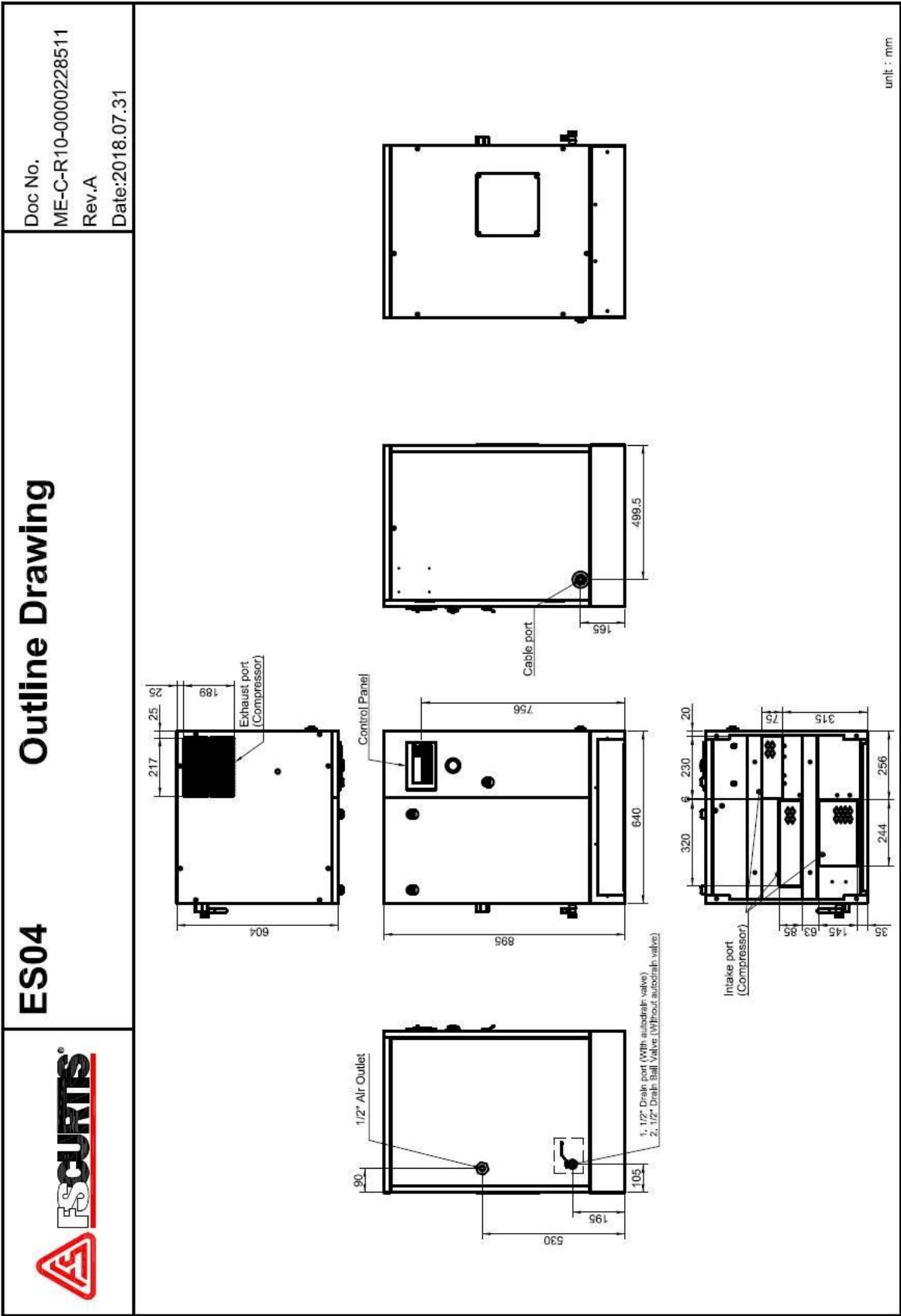
D Installation space drawings

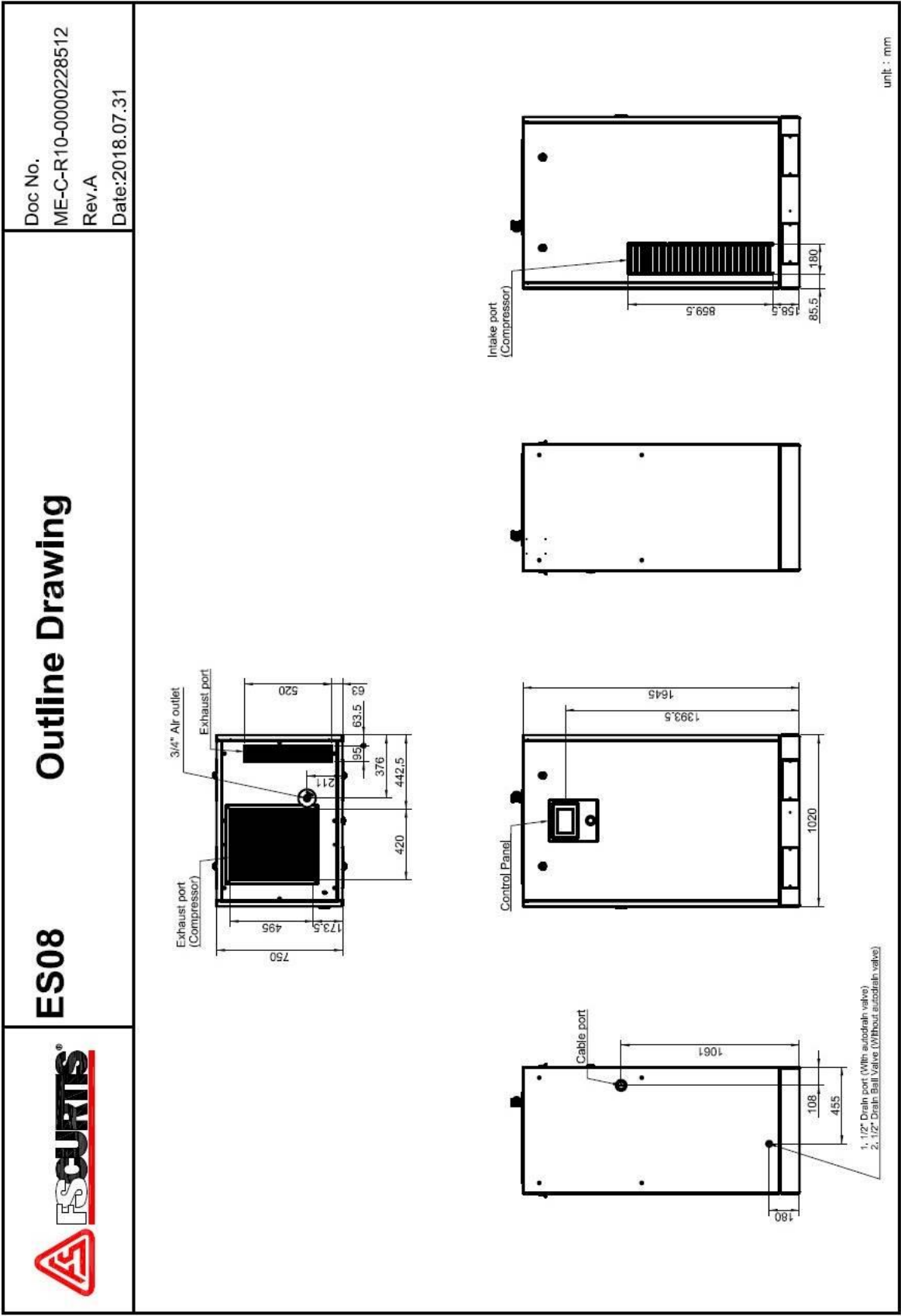


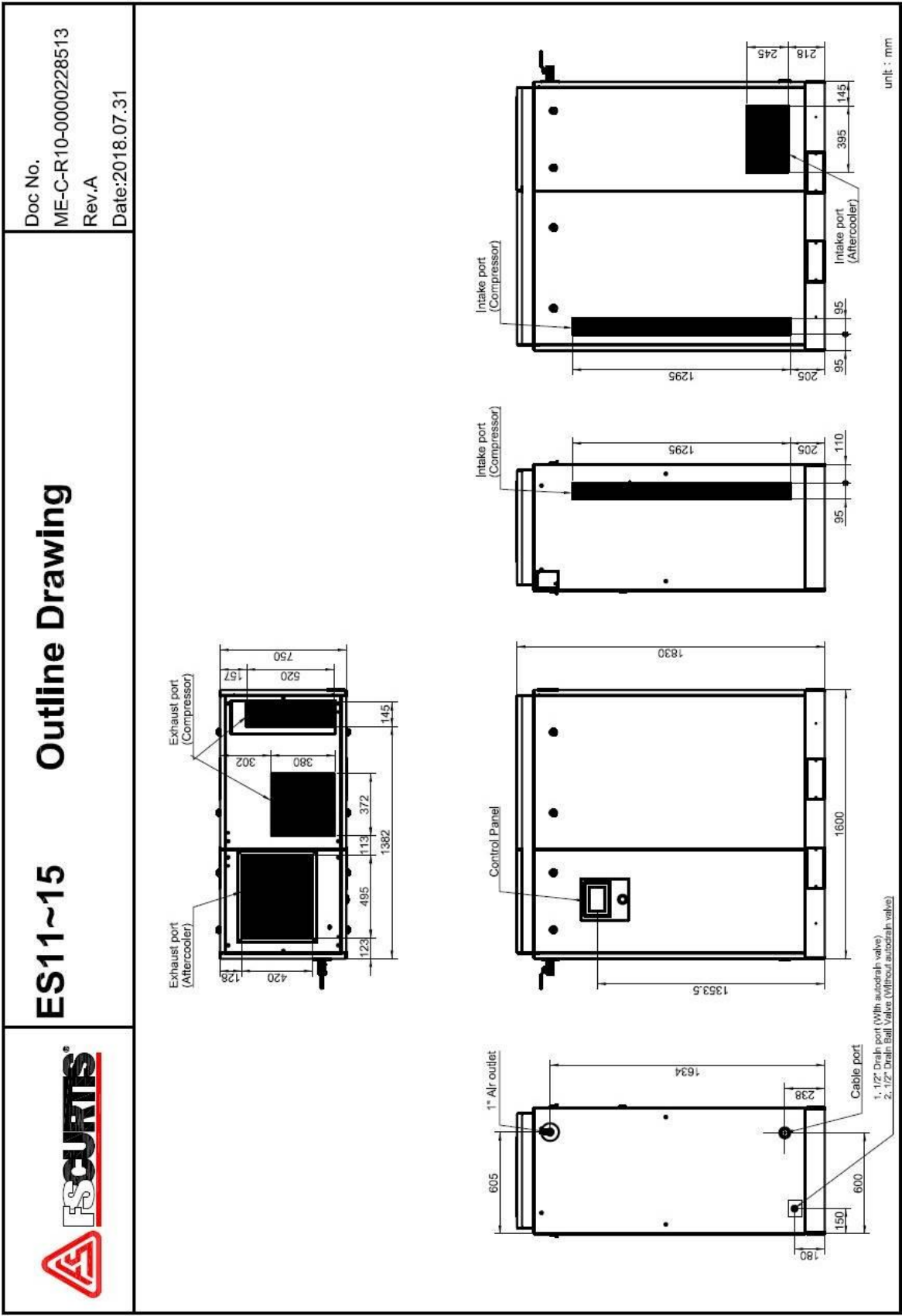




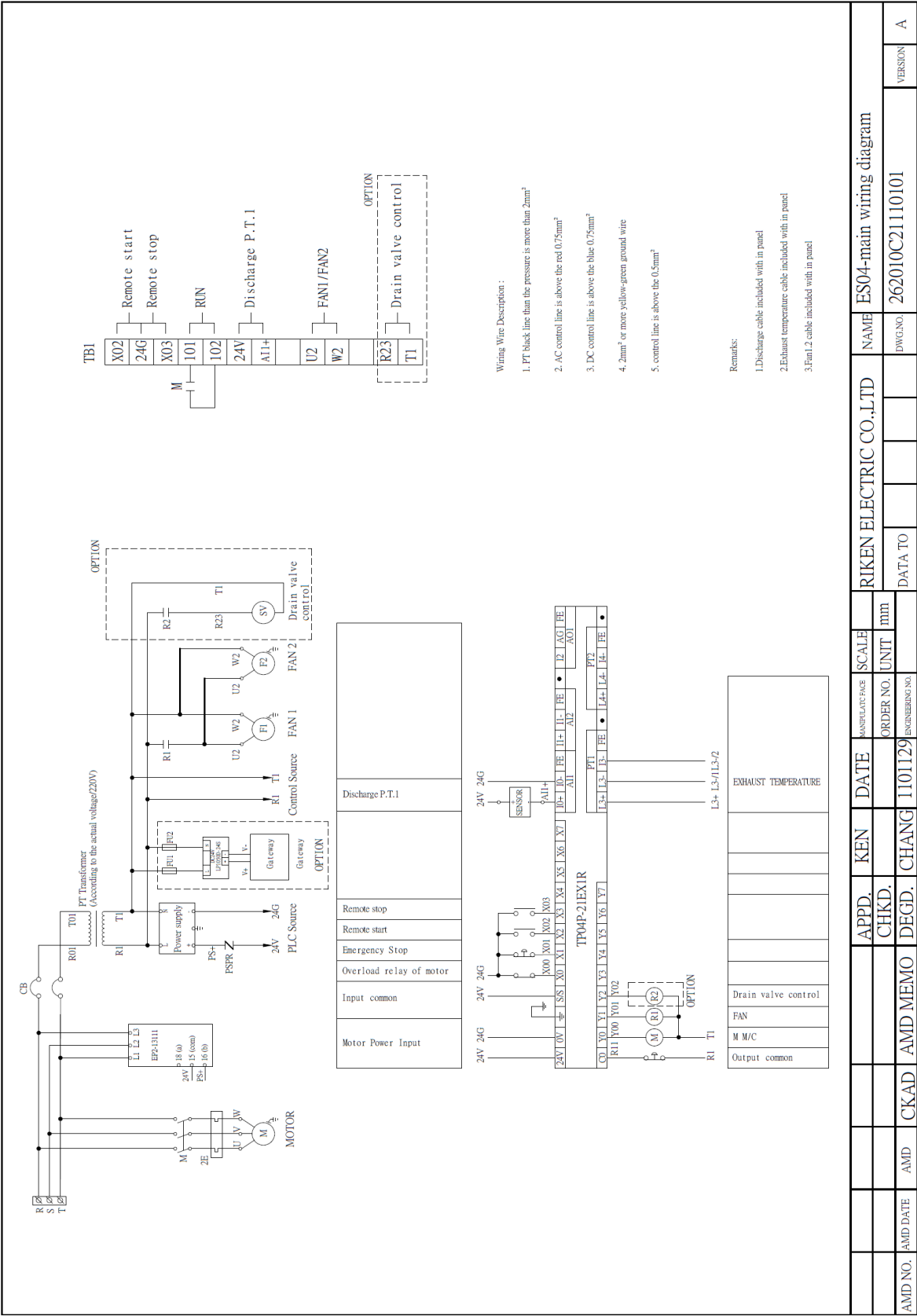
E Dimension drawings

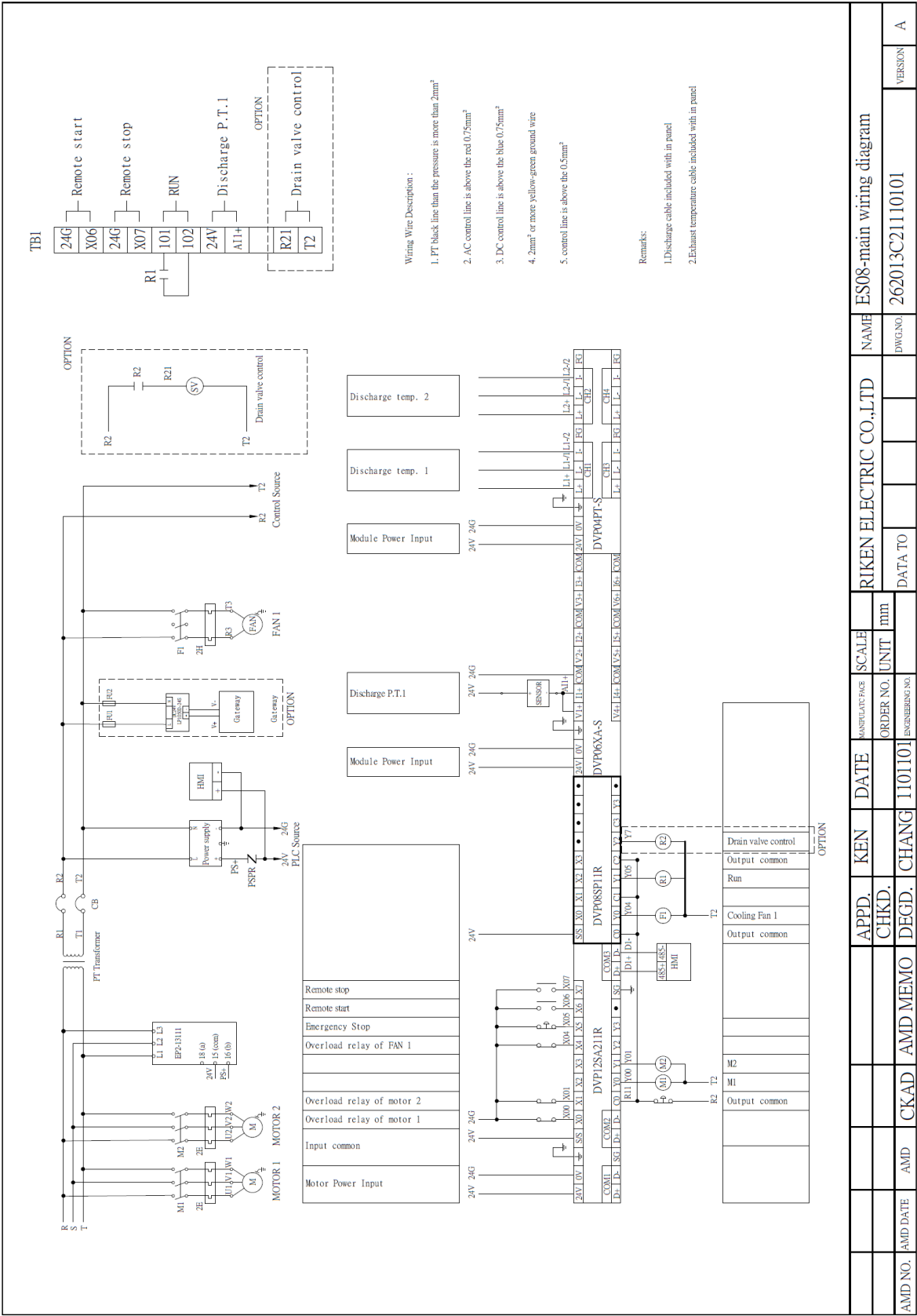


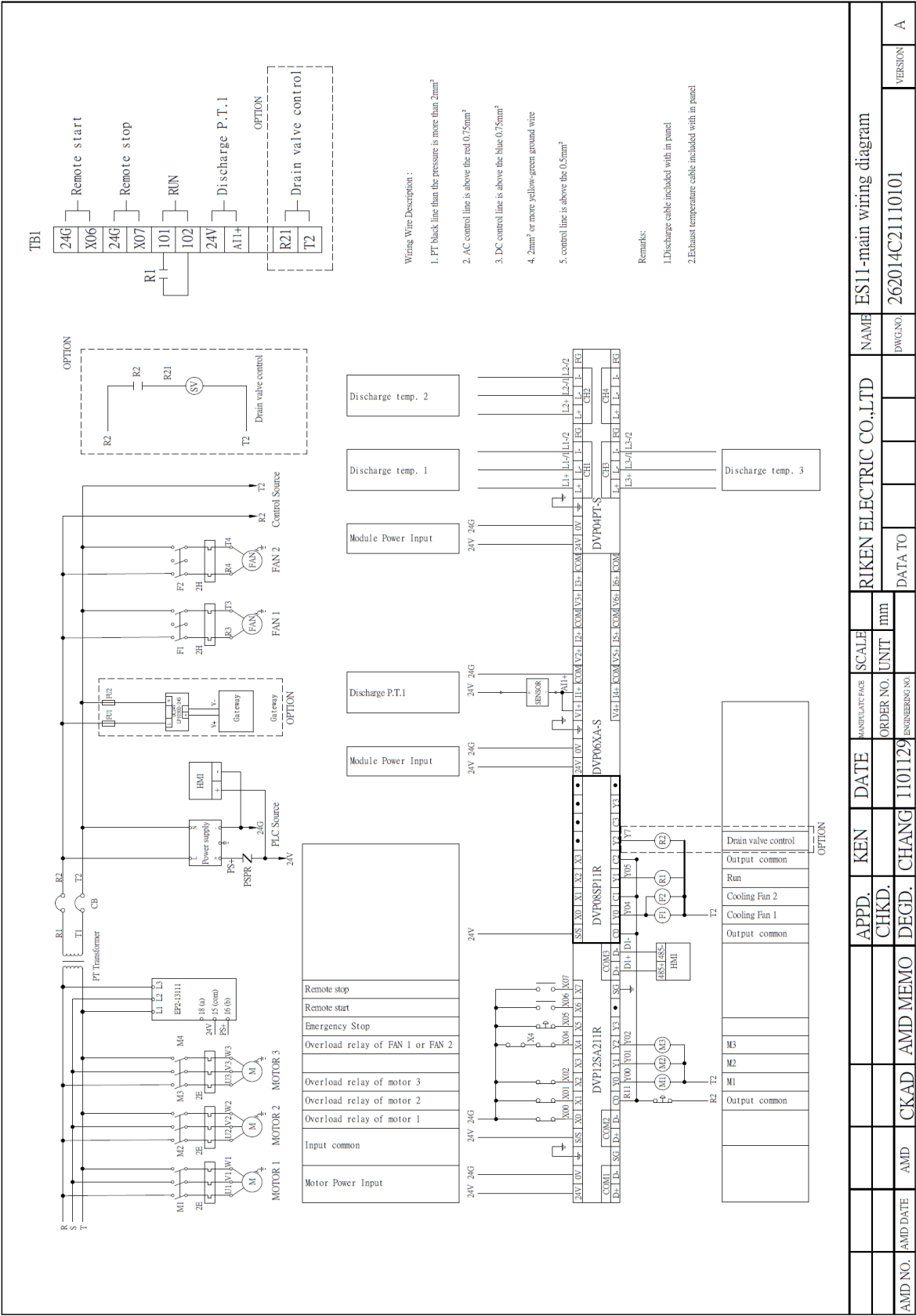


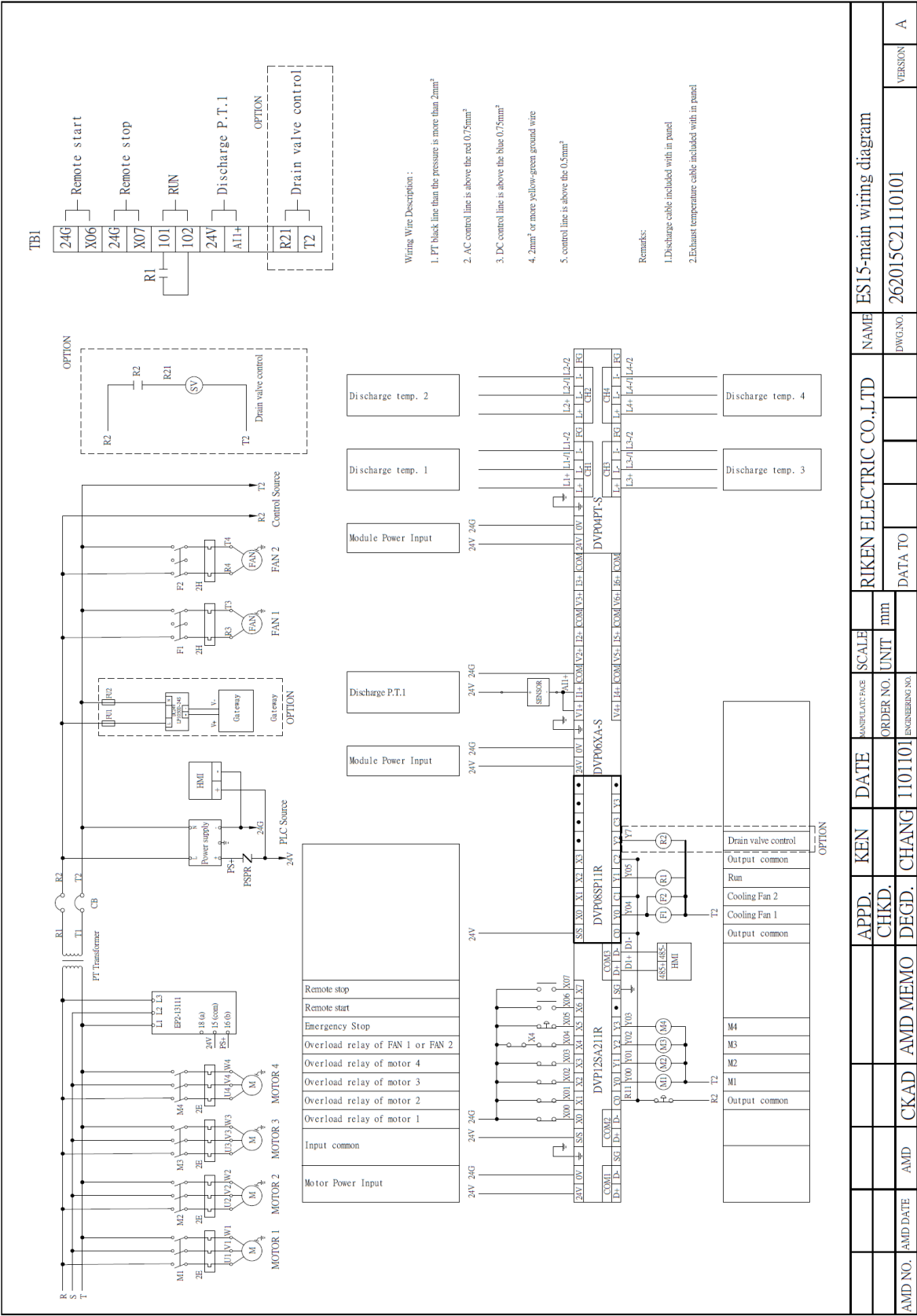


F Electrical schematics

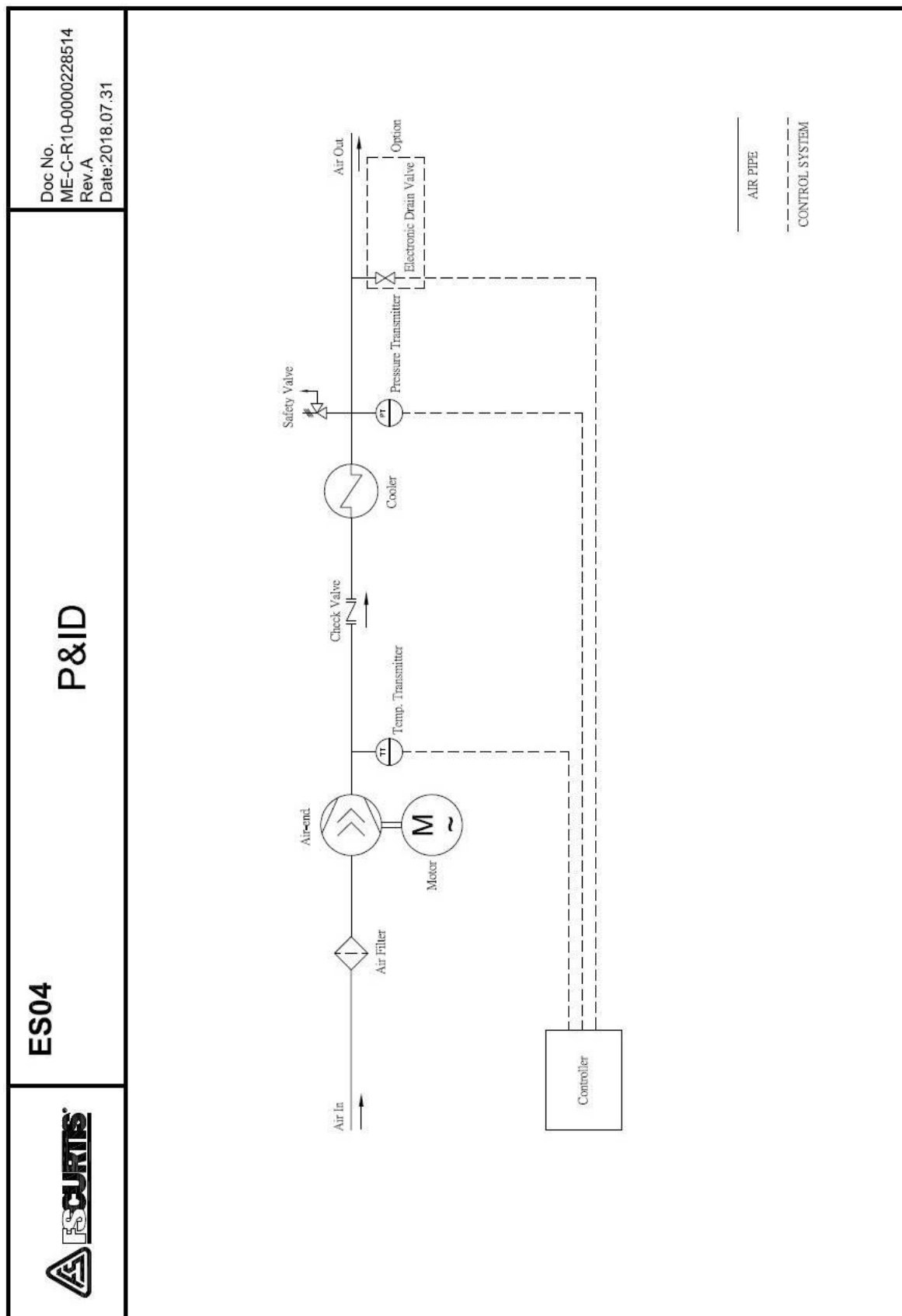


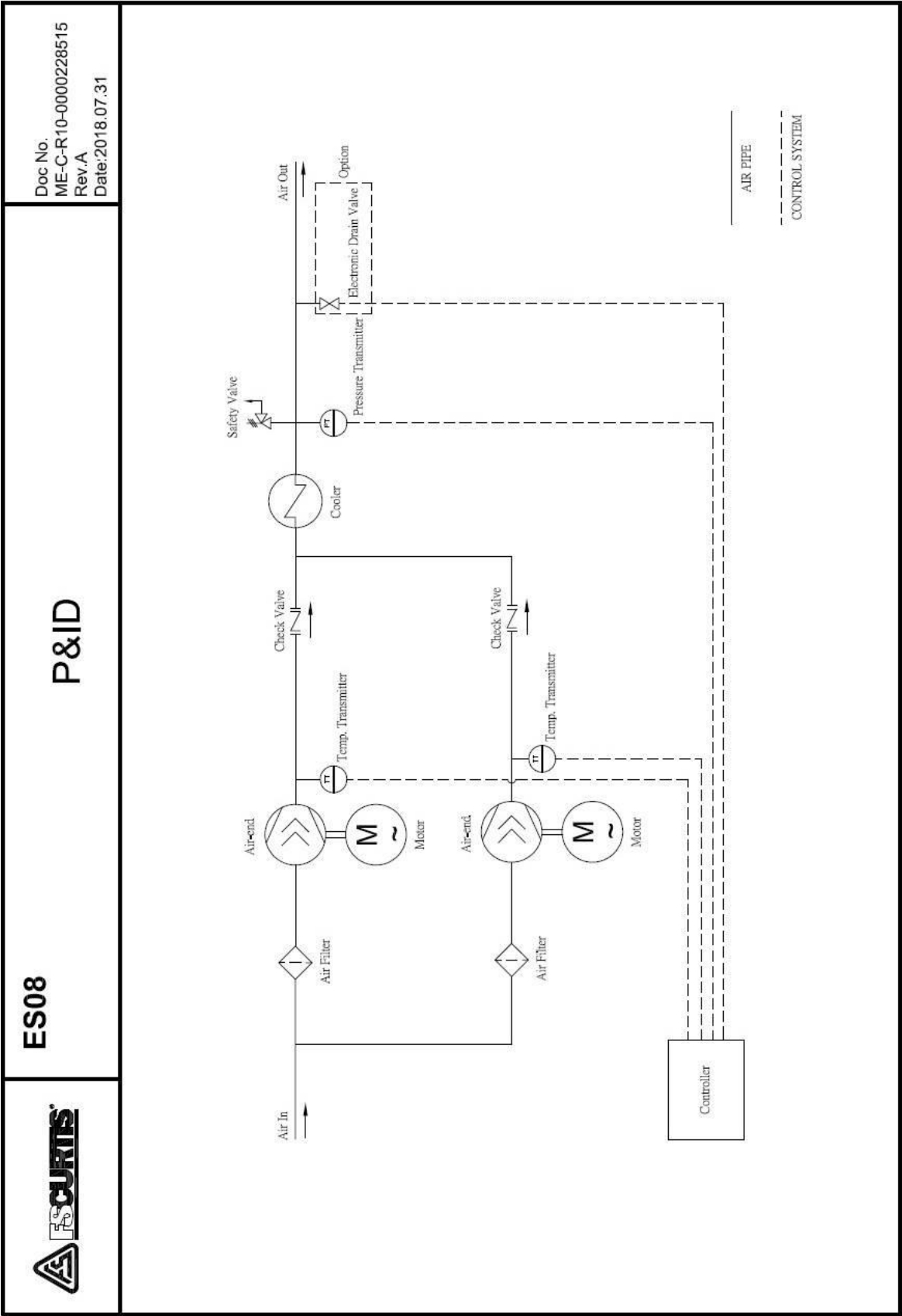


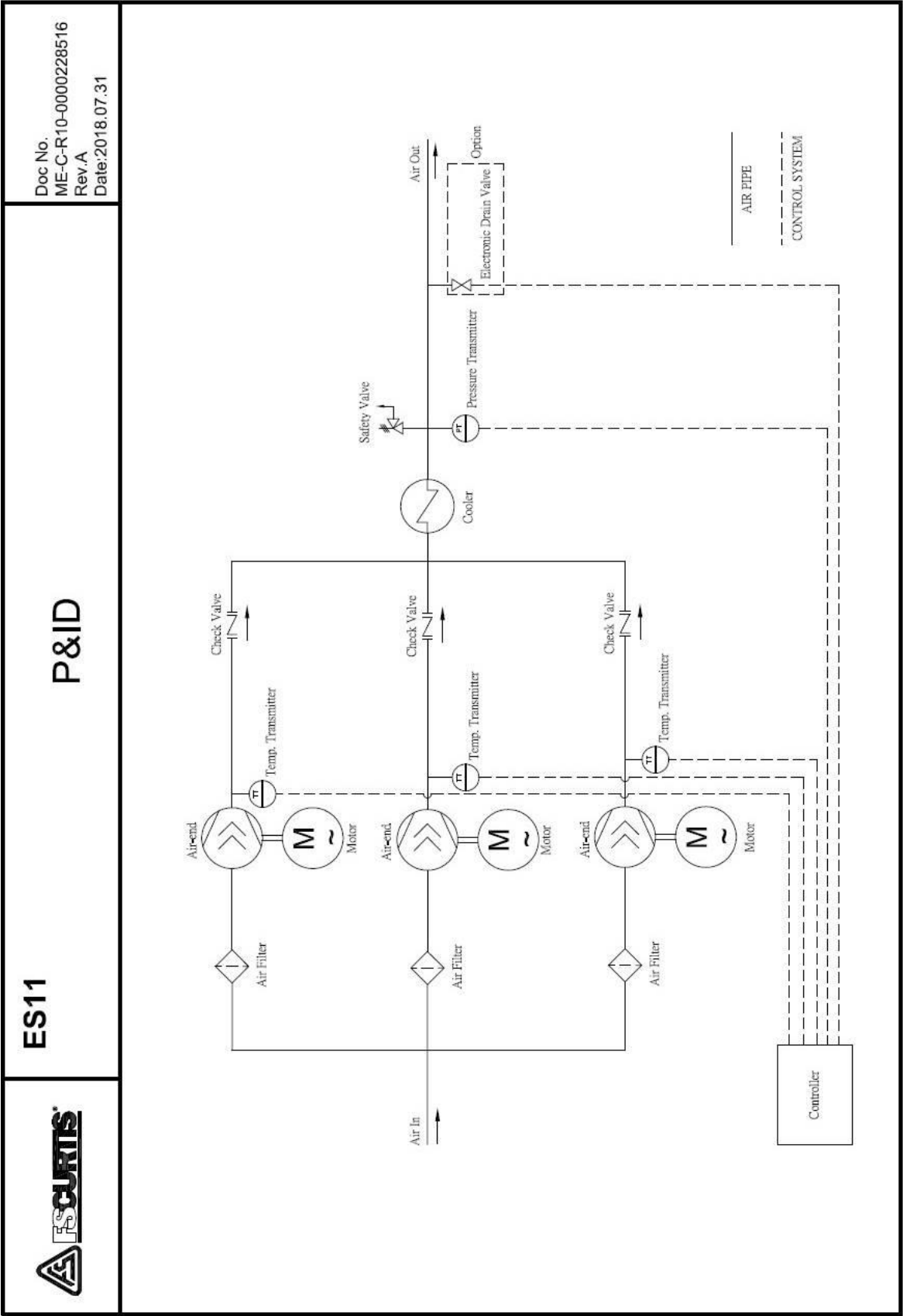


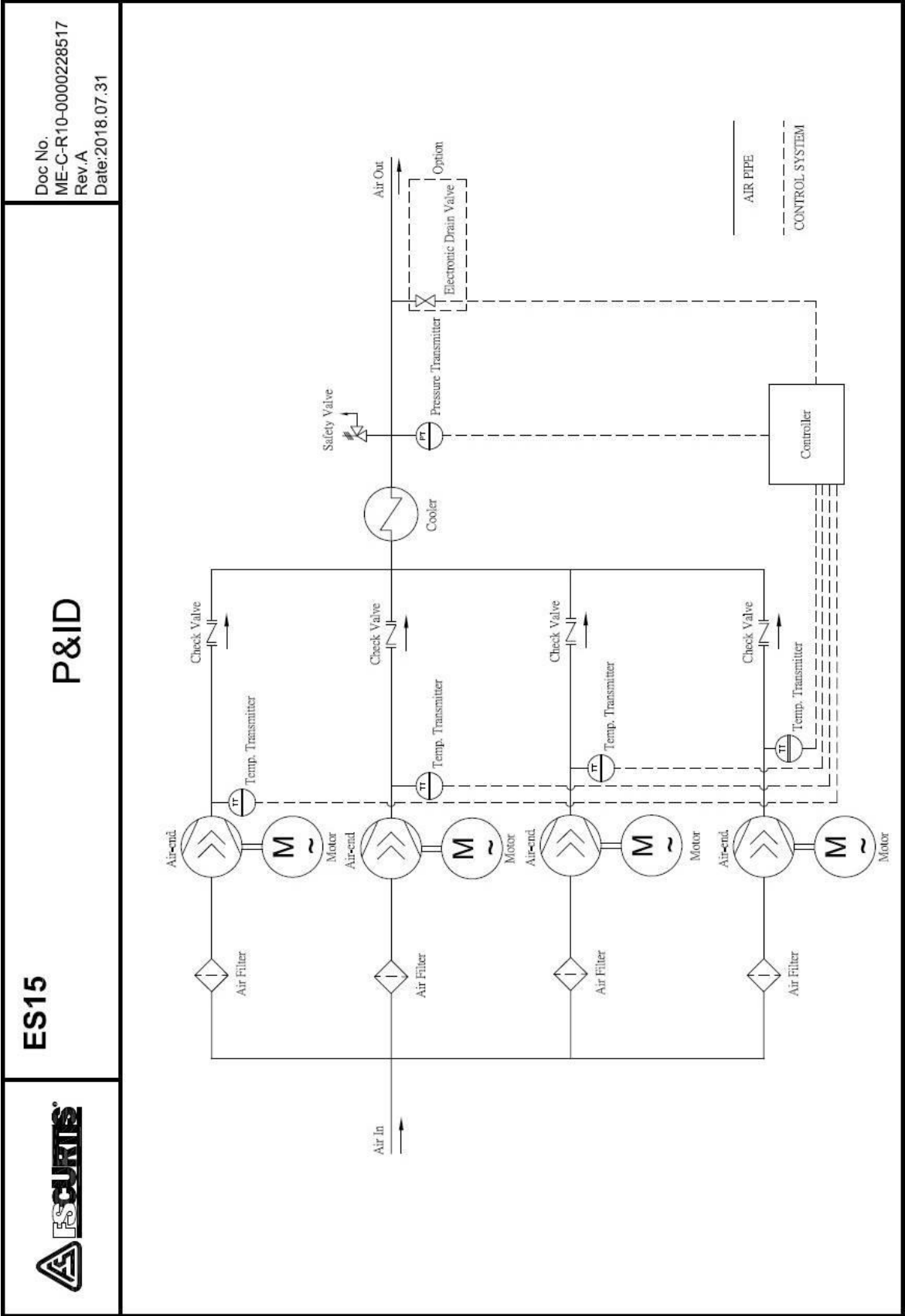


G Process and instrumentation diagrams (P&IDs)





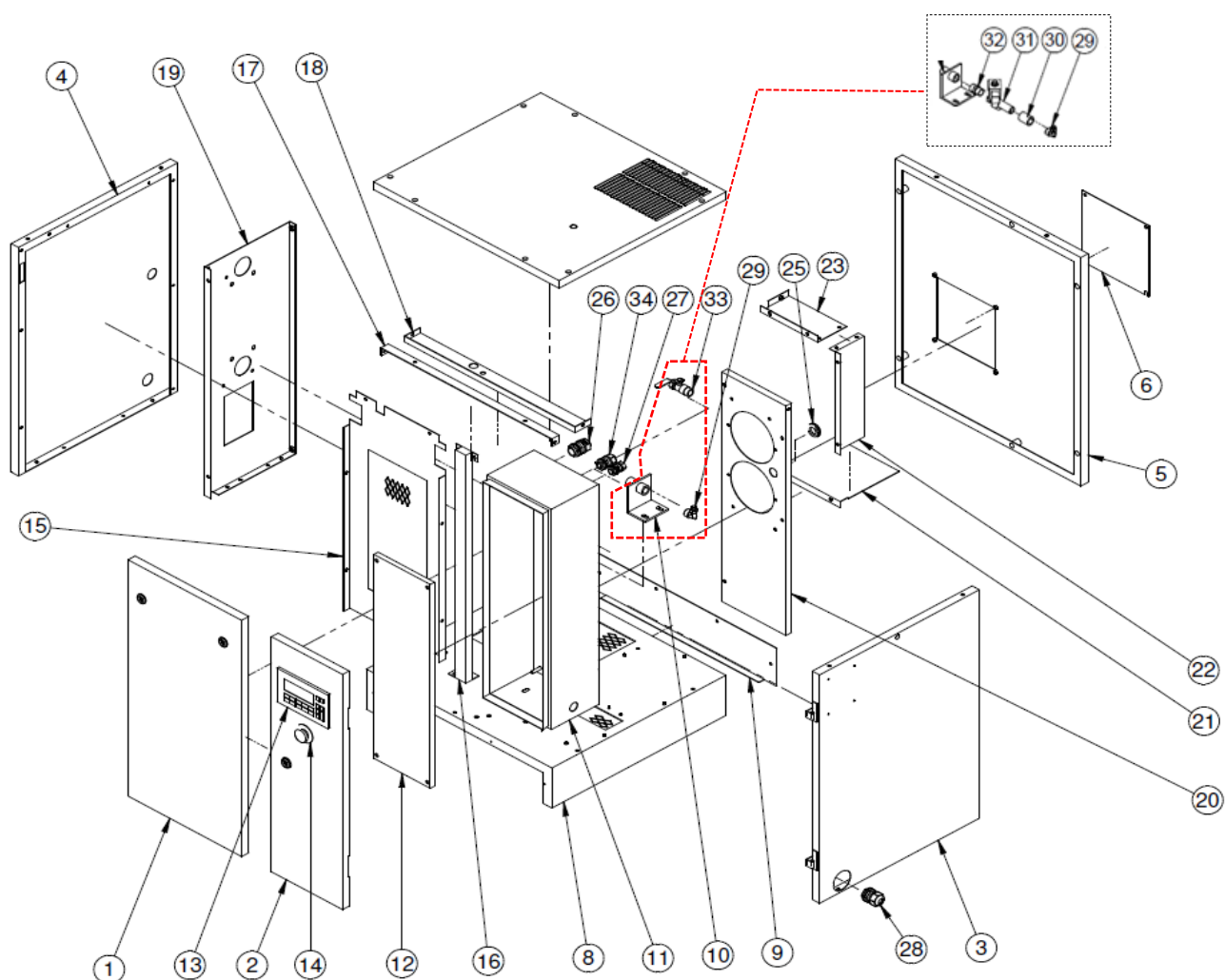




H Parts lists

1. ES04 Oil Free Scroll Air Compressor

1.1 ES04 Canopy Assembly

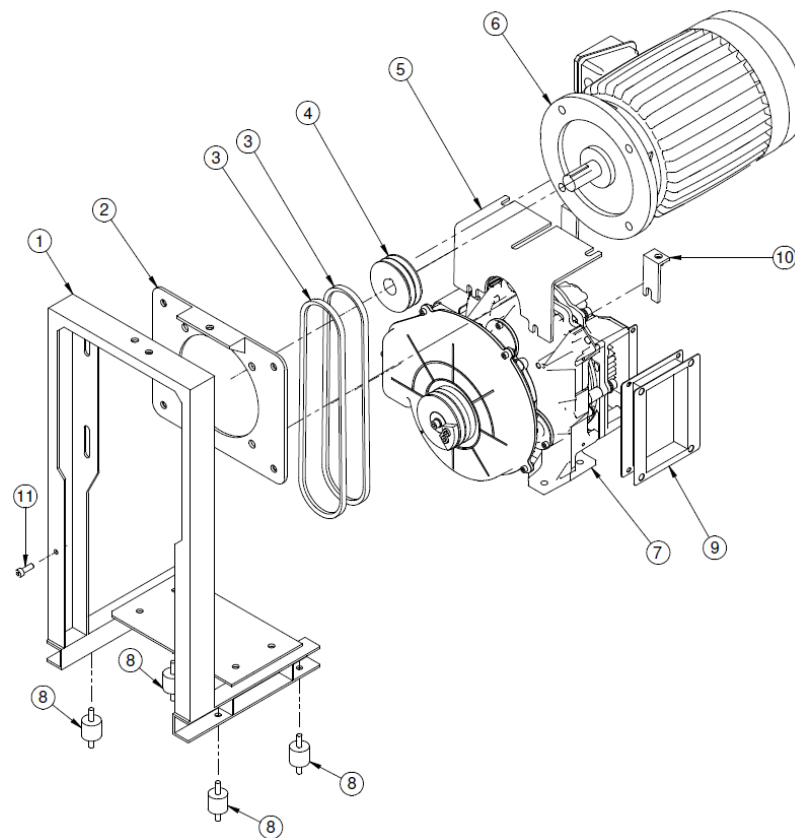


1.2 ES04 Canopy Assembly Parts List

Item	Part No.	Part Name	QTY	Remark
1	2620102740	Front Door	1	
2	2620102570	Control Box Cover	1	
3	2620102760	Right Door	1	
4	2620100760	Left Door	1	
5	2620102770	Back Door	1	
6	2620100630	Back Door Cover	1	
7	2620102750	Top Cover	1	
8	2620100690	Base Frame	1	
9	2620100720	Base Frame Front Cover	1	
10	2620102511	Drain Support	1	
11	2620100700	Control Box	1	
12	2107170006	Starter	1	50/60Hz,380V, 3Phase
	2107170099	Starter	1	50/60Hz,415V, 3Phase
13	2108100477	HMI + PLC	1	●
14	2108020031	Emergency Stop	1	●
15	2620100740	V-belt Cover	1	
16	2620102430	Pillar	1	
17	2620102420	Beam	1	
18	2620101360	Top Fixed Plate	1	
19	2620100600	Plate	1	
20	2620100680	Plate	1	
21	2620100660	Plate	1	
22	2620101350	Plate	1	
23	2620101340	Plate	1	
25	2108070159	Grommet	1	
26	2101410060	M25 Cable Gland	1	
27	2101410057	M16 Cable Gland	1	
28	2101410023	3/4" Cable Gland	1	
29	2101200031	Nylon Fitting	1	
30	2101070070	Socket	1	Option
31	2104070079	Electronic Drain Valve	1	Option, 220-240V, Normal
32	2101060224	Nipple	1	Option
33	2104010204	1/2"90°Ball Valve	1	Option
34	2101410068	M20 Cable Gland	1	

Remark: Parts with ● mark are in the Control Box.

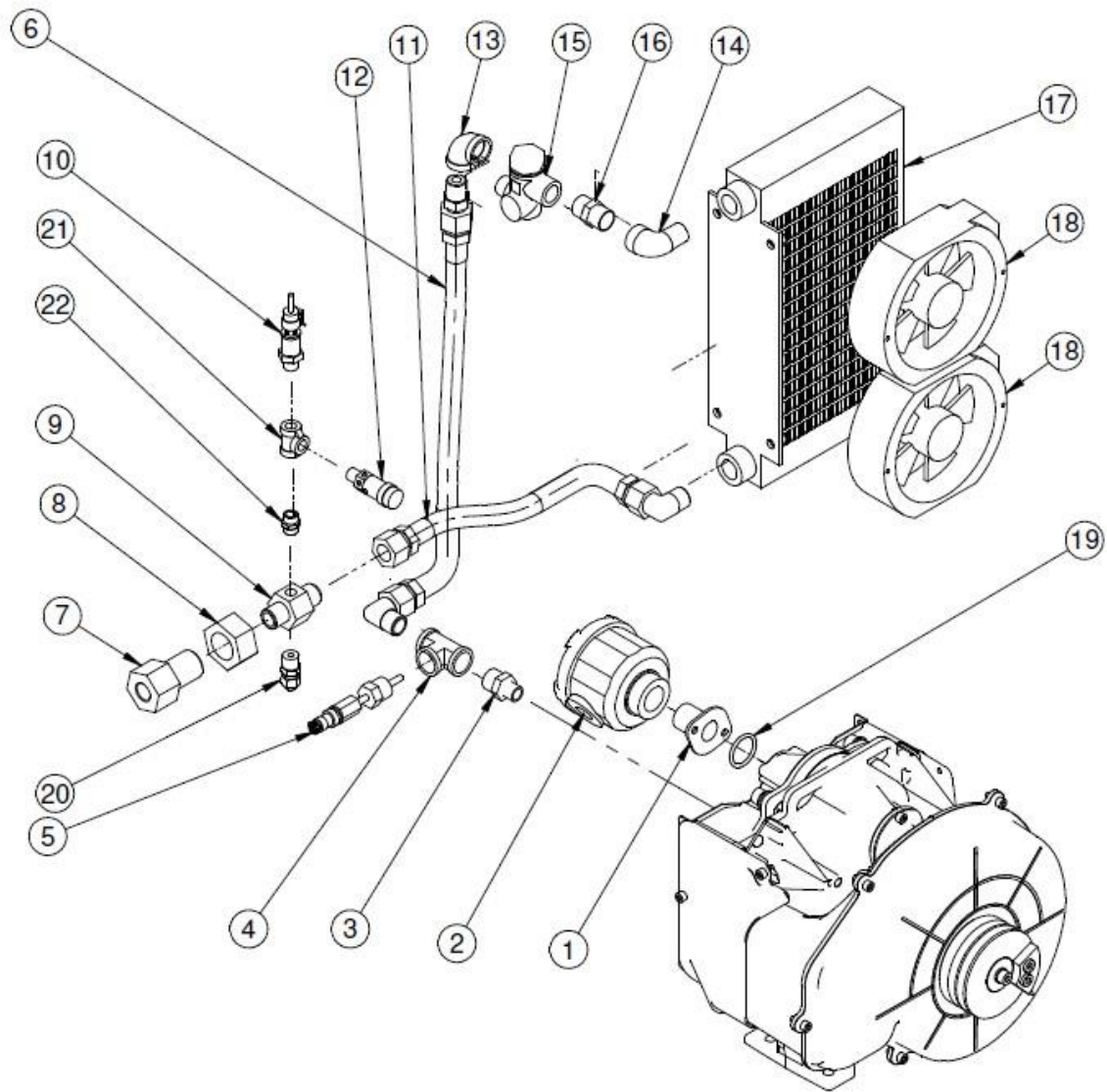
1.3 ES04 Motor and Air-end Assembly



1.4 ES04 Motor and Air-end Assembly Parts List

Item	Part No.	Part Name	QTY	Remark
1	2620100750	Main Frame	1	
2	2620100770	Motor Flange	1	
3	2113010441	V-belt	2	50Hz
4	2113020356	Pulley	1	50Hz
5	2620101260	Motor Frame	1	
6	2106024779	Motor	1	3.7kW, 400V, 50Hz, 3-Phase
7	2620000042	GW4 Air-end	1	WORKING PRESSURE: 8bar
8	2119010105	Isolation Pad	4	
9	2620102520	Radiating claspboard	1	
10	2620103000	Motor Sup support	1	
11	2620020700	Grease Injection Screw	1	

1.5 ES04 Air Pipe Assembly

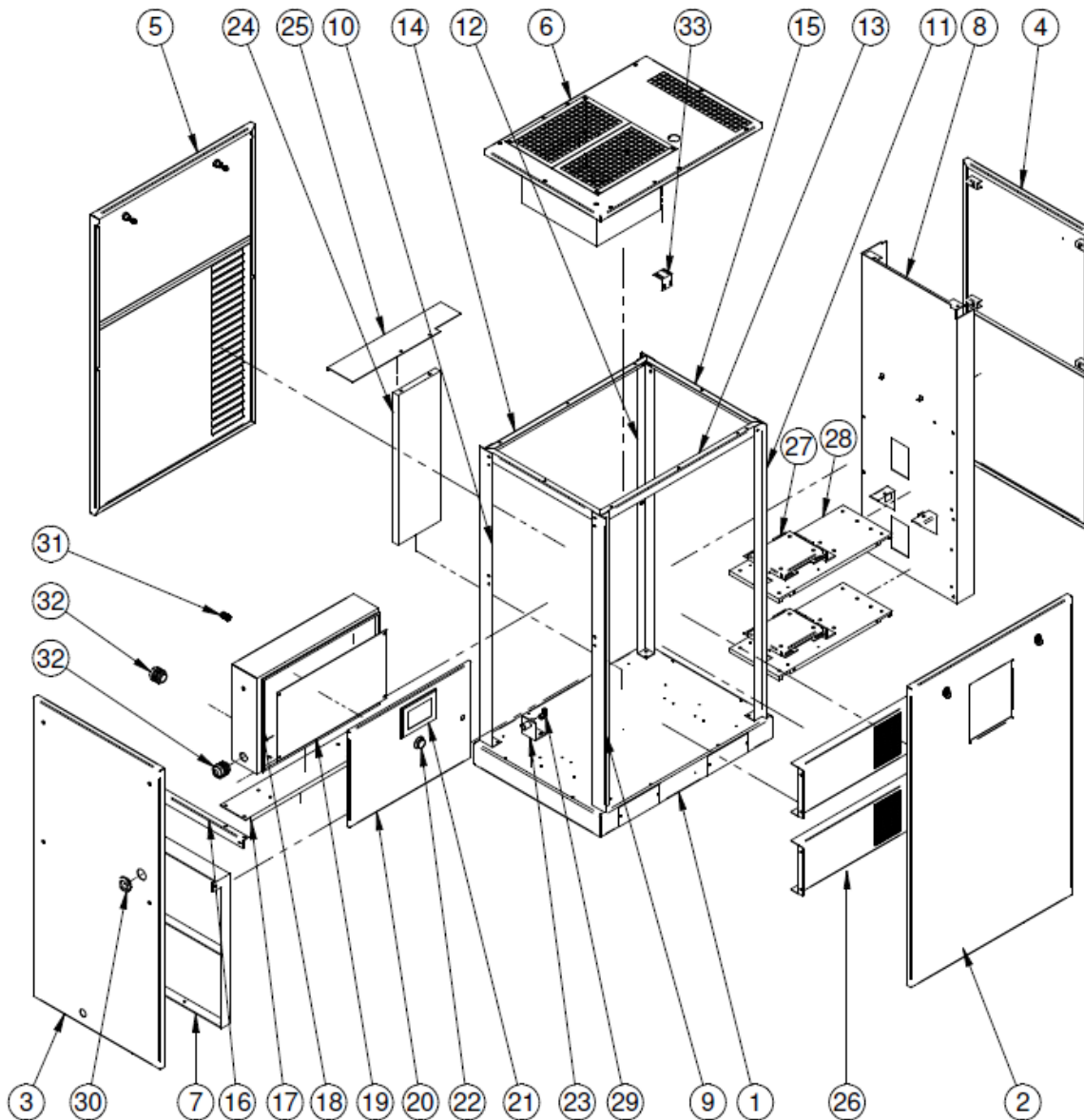


1.6 ES04 Air Pipe Assembly Parts List

Item	Part No.	Part Name	QTY	Remark
1	2620100590	Intake Pipe	1	
2	2116040250	Air Filter	1	(Curtis logo)
	2116040161	Filter Element	1	(Curtis logo)
3	2101060383	Reducing Nipple	1	
4	2101020051	Tee	1	
5	2105040258	Temp. Transmitter	1	
6	2620460080	High Pressure Hose	1	
7	2620360040	Union	1	
8	2102030372	Nuts	1	
9	2620410020	Union	1	
10	2105040259	Pressure Transmitter	1	
11	2620460260	High Pressure Hose	1	
12	2104110381	Safety Valve	1	1/4"PT,9barg (CE Version)
13	2101010207	Elbow	1	
14	2101010148	Elbow	1	
15	2620330030	Check Valve	1	
16	2101060224	Nipple	1	
17	2117010286	Cooler	1	
18	2106130862	Fan	2	220V,50/60Hz, Normal
19	2111010114	O-Ring	1	
20	2101200024	Nylon Fitting	1	
21	2101020114	Tee	1	
22	2101060394	1/4" Nipple	1	

2. ES08 Oil Free Scroll Air Compressor

2.1 ES08 Canopy Assembly



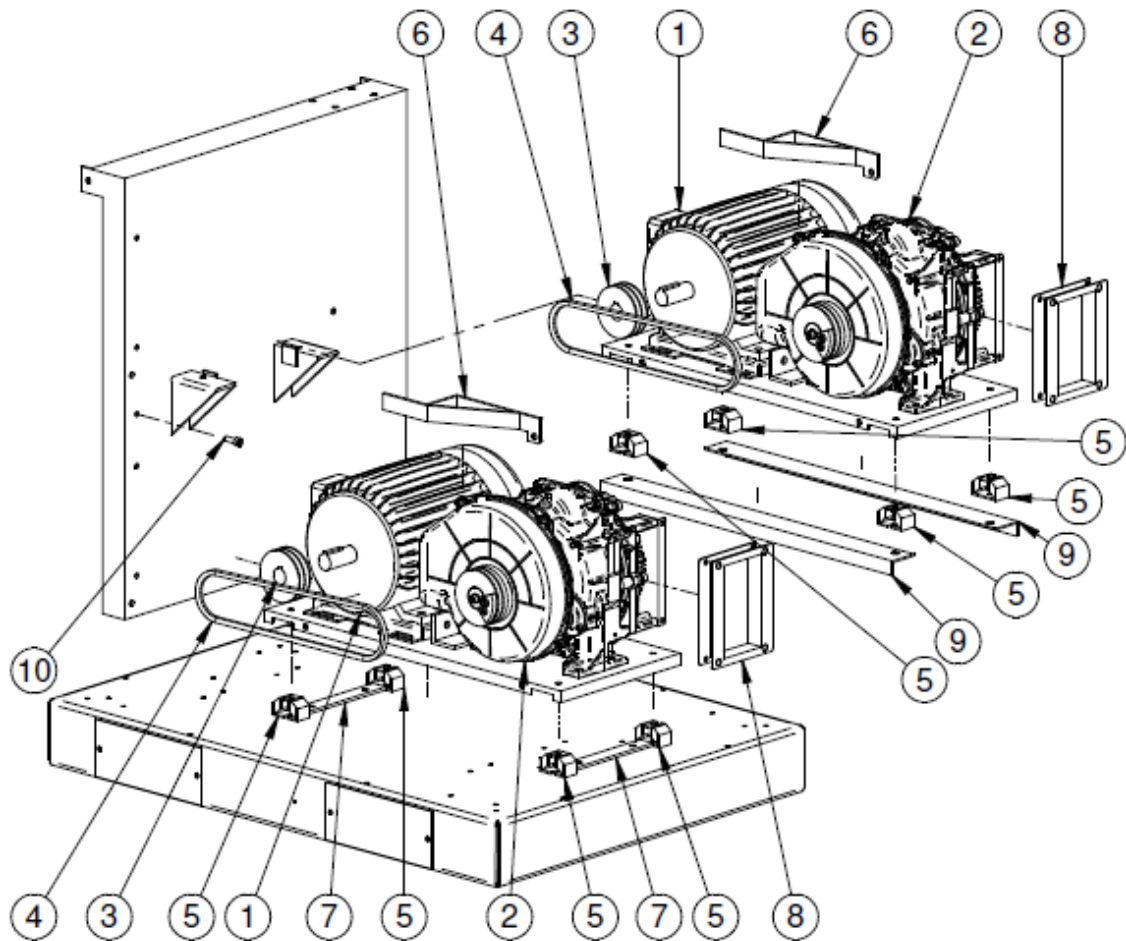
2.2 ES08 Canopy Assembly Parts List

Item	Part No.	Part Name	QTY	Remark
1	2620102160	Base Frame	1	
2	2620102600	Front Door	1	
3	2620102800	Left Door	1	
4	2620102790	Right Door	1	
5	2620102780	Back Door	1	
6	2620102310	Top Cover	1	

Item	Part No.	Part Name	QTY	Remark
7	2620102270	Plate	1	
8	2620102280	Plate	1	
9	2620102190	Left Front Pillar	1	
10	2620102200	Left Back Pillar	1	
11	2620102210	Right Front Pillar	1	
12	2620102220	Right Back Pillar	1	
13	2620102230	Front Beam	1	
14	2620102240	Back Beam	1	
15	2620102250	Side Beam	2	
16	2620102260	Left down Beam	1	
17	2620102340	Control Box Support	1	
18	2620102320	Control Box	1	
19	2107170009	Starter	1	50/60Hz,380V, 3Phase
	2107170100	Starter	1	50/60Hz,415V, 3Phase
20	2620102590	Control Box Door	1	
21	2108100539	HMI	1	●
22	2108020031	Emergency Stop	1	●
23	2620102510	Drain Support	1	
24	2620102360	Intake Cover	1	
25	2620102350	Plate	1	
26	2620102090	V-belt Cover	2	
27	2620102130	Motor Support	2	
28	2620102120	Bottom Plate	2	
29	2101200031	Nylon Fitting	1	
30	2108070164	Grommet	1	
31	2101410057	M16 Cable Gland	1	
32	2101410056	M40 Cable Gland	2	
33	2620102970	pipng bracket	1	

Remark: Parts with ● mark are in the Control Box.

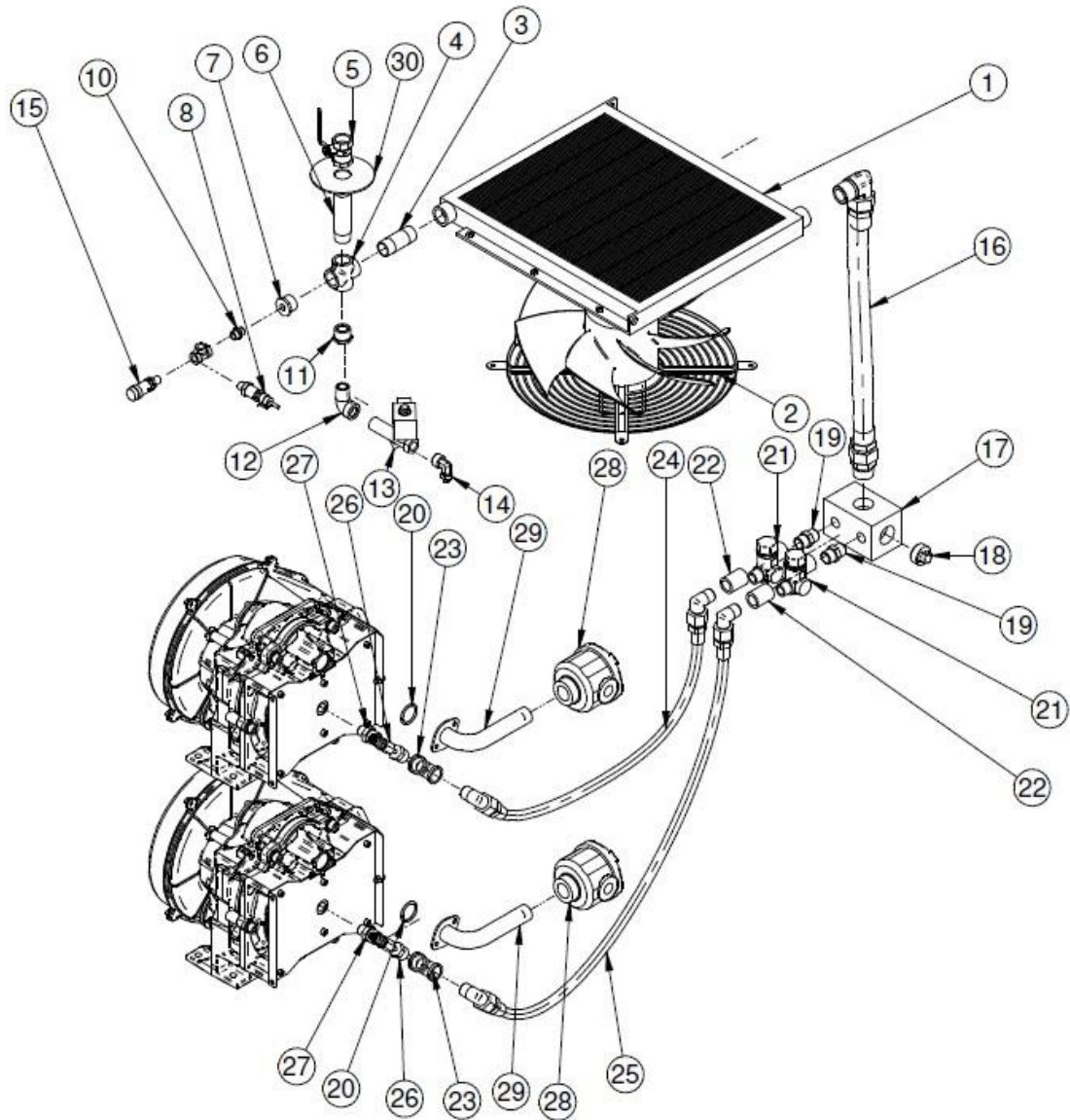
2.3 ES08 Motor and Air-end Assembly



2.4 ES08 Motor and Air-end Assembly Parts List

Item	Part No.	Part Name	QTY	Remark
1	2106024780	Motor	2	3.7kW, 400V, 50Hz, 3-Phase
2	2620000042	GW4 Air-end	2	WORKING PRESSURE: 8bar
3	2113020356	Pulley	2	50Hz
4	2113010441	V-belt	4	50Hz
5	2119010110	Isolation Pad	8	
6	2620102380	Fix Plate	2	
7	2620102110	Isolation Pad Fix Plate	2	
8	2620102520	Radiating clapboard	2	
9	2620103010	Sub baseplate	2	
10	2620020700	Grease Injection Screw	1	

2.5 ES08 Air Pipe Assembly

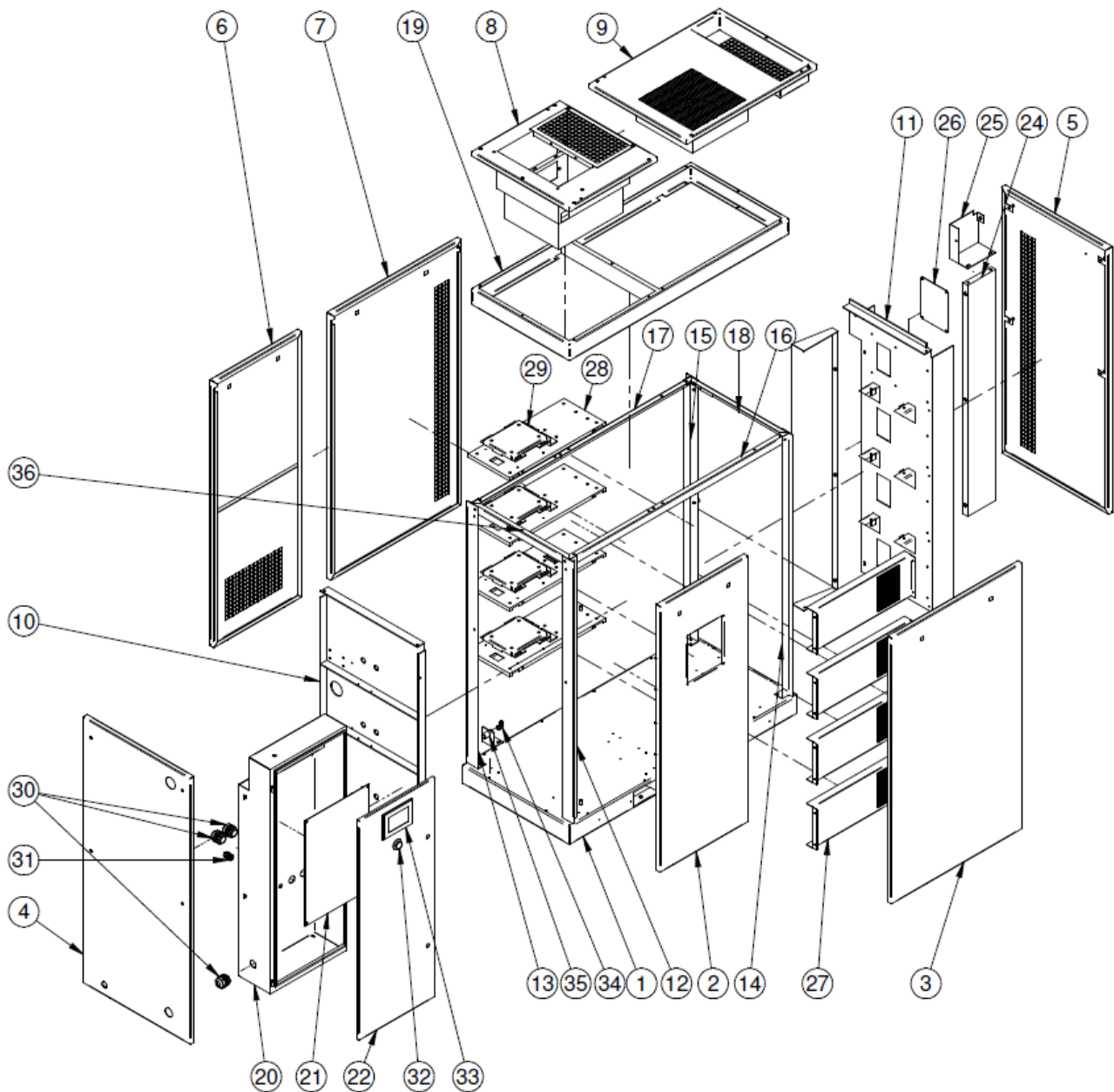


2.6 ES08 Air Pipe Assembly Parts List

Item	Part No.	Part Name	QTY	Remark
1	2620510080	Cooler	1	
2	2106130893	Fan	1	220V,60Hz, Normal
3	2620102670	Nipple	1	
4	2101030010	Cross	1	
5	2104010177	Ball Valve	1	
6	2101060390	Barrel Nipple	1	
7	2101050183	Bushing	1	
8	2105040259	Pressure Transmitter	1	
9	2101020114	Tee	1	
10	2101060394	Nipple	1	
11	2101050087	Bushing	1	
12	2101010148	Elbow	1	
13	2104070079	Electronic Drain Valve	1	220-240V, Normal
14	2101200031	Nylon Fitting	1	
15	2104110381	Safety Valve	1	1/4"PT,9barg (CE Version)
16	2620460140	High Pressure Hose	1	
17	2620490050	Interface	1	
18	2102020048	Plug	1	
19	2101060224	Nipple	2	
20	2111010114	O-Ring	2	
21	2620330030	Check Valve	2	
22	2101070070	Socket	2	
23	2101020051	Tee	2	
24	2620460120	High Pressure Hose	1	
25	2620460130	High Pressure Hose	1	
26	2105040258	Temp. Transmitter	2	
27	2101060383	Reducing Nipple	2	
28	2116040250	Air Filter	2	(Curtis logo)
	2116040161	Filter Element	2	(Curtis logo)
29	2620102530	Intake Port	2	
30	2605410930	Packing	1	

3 ES11~15 Oil Free Scroll Air Compressor

3.1 ES11~15 Canopy Assembly

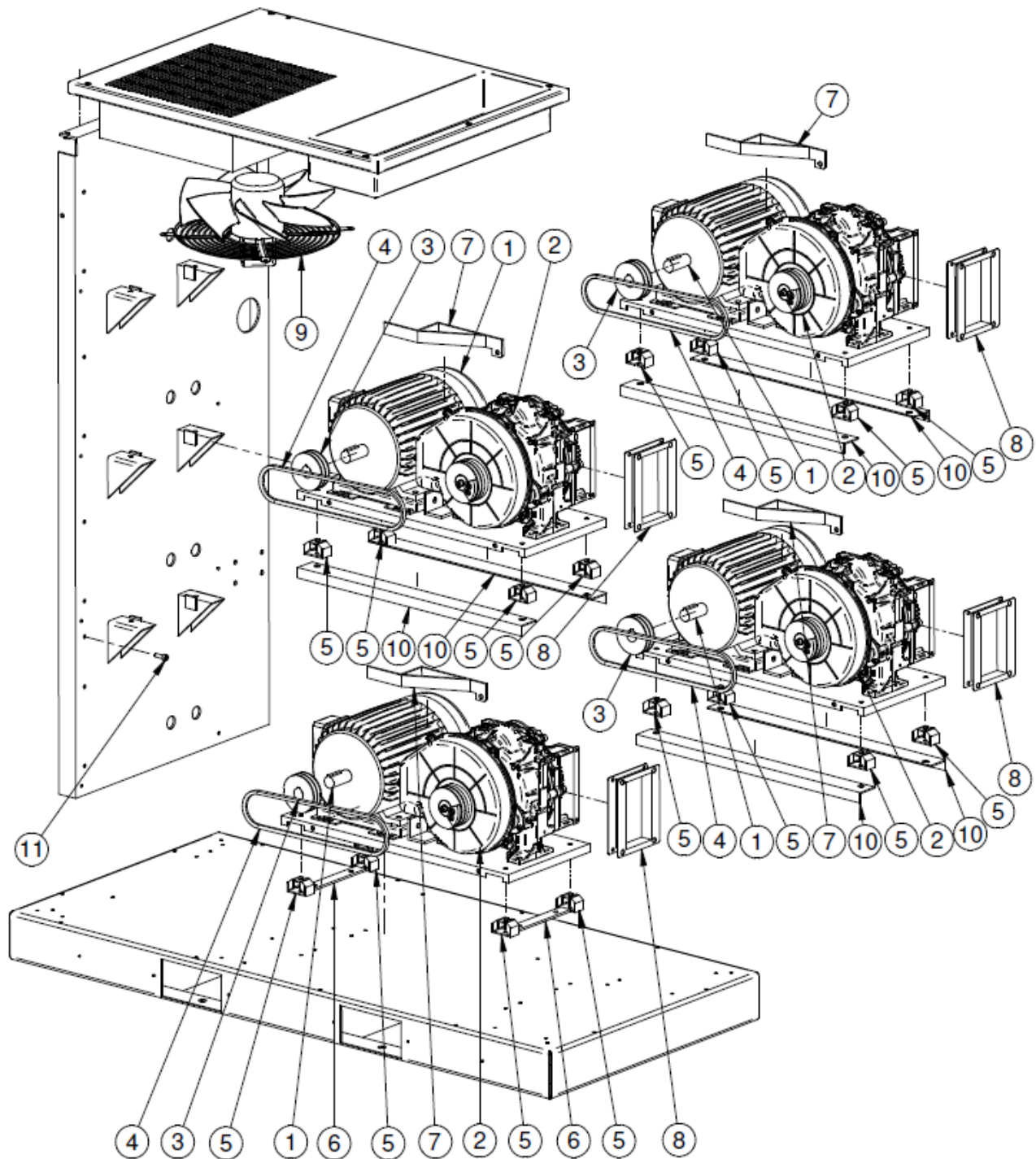


3.2 ES11~15 Canopy Assembly Parts List

Item	Part No.	Part Name	QTY		Remark
			ES11	ES15	
1	2620101850	Base Frame	1		
2	2620102630	Left Front Door	1		
3	2620102810	Right Front Door	1		
4	2620102920	Left Door	1		
5	2620102930	Right Door	1		
6	2620102820	Left Back Door	1		
7	2620102830	Right Back Door	1		
8	2620101920	Left Top Cover	1		
9	2620101930	Right Top Cover	1		
10	2620102840	Left Bulkhead	1		
11	2620101950	Right Bulkhead	1		
12	2620102680	Left Front Pillar	1		
13	2620101970	Left Back Pillar	1		
14	2620101980	Right Front Pillar	1		
15	2620101990	Right Back Pillar	1		
16	2620102000	Front Beam	1		
17	2620102010	Back Beam	1		
18	2620102020	Side Beam	1		
19	2620102540	Upper air director	1		
20	2620102040	Control Box	1		
21	2107170011	Starter	1	-	50/60Hz,380V, 3Phase
	2107170101	Starter	1		50/60Hz,415V, 3Phase
	2107170013	Starter	-	1	50/60Hz,380V, 3Phase
	2107170102	Starter		1	50/60Hz,415V, 3Phase
22	2620102650	Control Box Cover	1		
23	2620102060	Intake Cover	1		
24	2620102070	Bulkhead	1		
25	2620102080	Bulkhead	1		
26	2620102100	Cover	1	-	
27	2620102090	V-belt Cover	3	4	
28	2620102120	Frame	3	4	
29	2620102130	Motor Support	3	4	
30	2101410056	M40 Cable Gland	3		
31	2101410010	M20 Cable Gland	1		
32	2108020031	Emergency Stop	1		●
33	2108100539	HMI	1		●
34	2101200031	Nylon Fitting	1		
35	2620102510	Drain Support	1		
36	2620102990	Left Side Beam	1		

Remark: Parts with ● mark are in the Control Box.

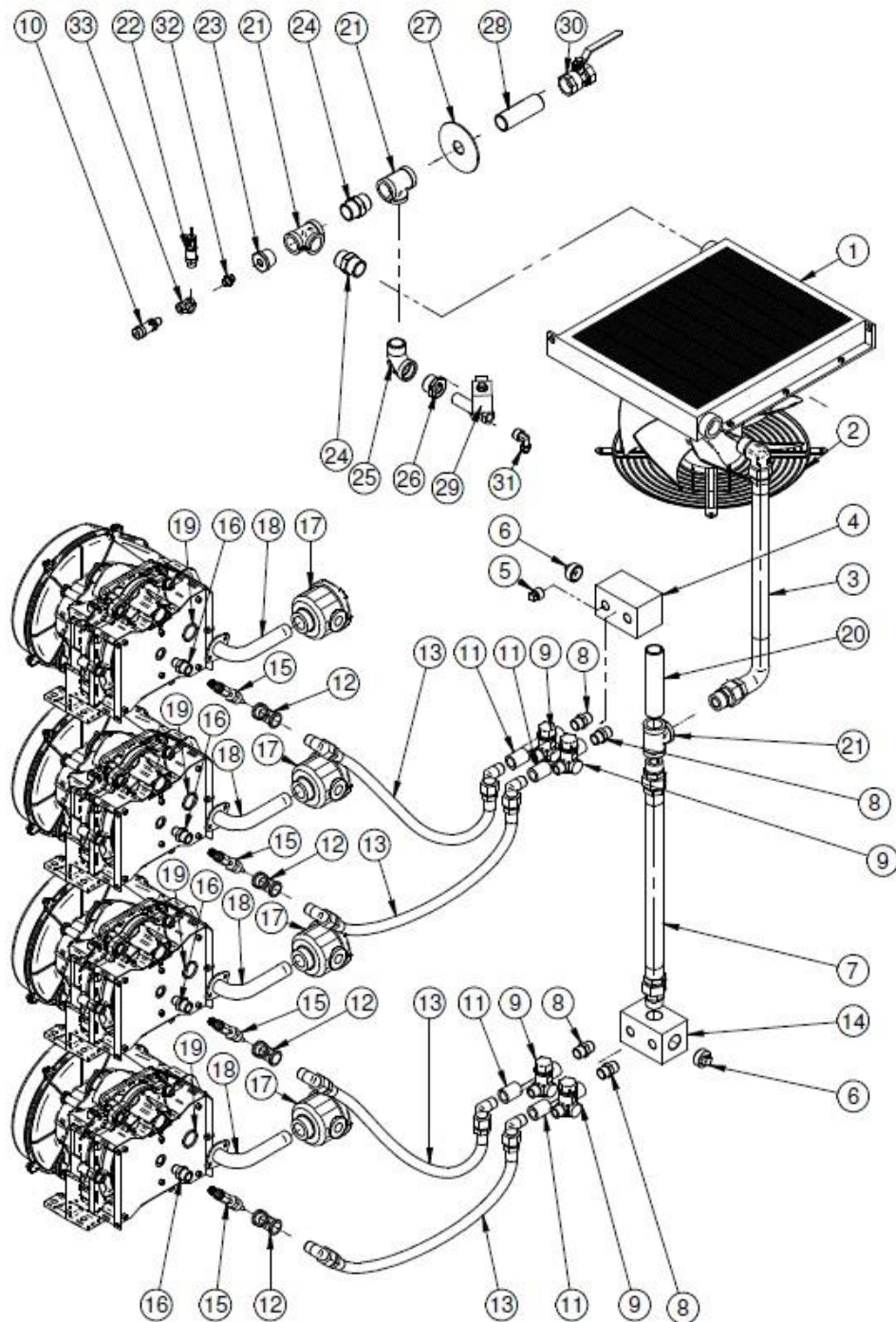
3.3 ES11~15 Motor and Air-end Assembly



3.4 ES11~15 Motor and Air-end Assembly Parts List

Item	Part No.	Part Name	QTY		Remark
			ES11	ES15	
1	2106024780	Motor	3	4	3.7kW, 400V, 50Hz, 3-Phase
2	2620000042	GW4 Air-end	3	4	WORKING PRESSURE: 8bar
3	2113020356	Pulley	3	4	50Hz
4	2113010441	V-belt	6	8	50Hz
5	2119010110	Isolation Pad	12	16	
6	2620102110	Isolation Pad Fix Plate	2		
7	2620102380	Fix Plate	3	4	
8	2620102520	Radiating clapboard	3	4	
9	2106130893	Fan	1		220V,60Hz, Normal
10	2620103010	Sub baseplate	6	6	
11	2620020700	Grease Injection Screw	1	1	

3.5 ES11~15 Air Pipe Assembly Parts List



3.6 ES11~15 Air Pipe Assembly Parts List

Item	Part No.	Part Name	QTY		Remark
			ES11	ES15	
1	2620510070	Cooler	1		
2	2106130893	Fan	1		220V,60Hz, Normal
3	2620460180	High Pressure Hose	1		
4	2620490060	Interface	1		
5	2102020047	Plug	1	-	
6	2102020048	Plug	2		
7	2620460170	High Pressure Hose	1		
8	2101060224	Nipple	3	4	
9	2620330030	Check Valve	3	4	
10	2104110381	Safety Valve	1		1/4"PT,9barg (CE Version)
11	2101070070	Socket	3	4	
12	2101020051	Tee	3	4	
13	2620460160	High Pressure Hose	3	4	
14	2620490060	Interface	1		
15	2105040258	Temp. Transmitter	3	4	
16	2101060383	Reducing Nipple	3	4	
17	2116040250	Air Filter	3	4	(Curtis logo)
	2116040161	Filter Element	3	4	(Curtis logo)
18	2620102530	Intake Pipe	3	4	
19	2111010114	O-Ring	3	4	
20	2101060392	Nipple	1		
21	2101020055	Tee	3		
22	2105040271	Pressure Transmitter	1		
23	2101050188	Threaded Fitting	1		
24	2101060226	Nipple	2		
25	2101010150	Elbow	1		
26	2101050088	Threaded Fitting	1		
27	2605410930	Packing	1		
28	2101060391	Nipple	1		
29	2104070079	Electronic Drain Valve	1		220-240V, Normal
30	2104010178	Ball Valve	1		
31	2101200031	Nylon Fitting	1		
32	2101060394	Nipple	1		
33	2101020114	Tee	1		



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