ELGi™
Always Better.

EQ Series
Screw Air Compressor

Operation, Maintenance and Parts Manual

EQ 18, Standard + VFD
460V, 3Ph, 60Hz

CIN:L29120TZ1960PLC000351

Product Manual

EQ Series
Electric Powered Screw Air Compressor

EQ 18 - 100 V

Air - Cooled, Standard + VFD
460V, 3Ph, 60Hz

ELGI EQUIPMENTS LIMITED

Coimbatore, TN - 641 005

Part / Document No. 019002637

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Machine Identification and Sale Record

Owner's name / Company name	:	.....
Phone number	:	.....
Contact person	:	.....
E-Mail address/ Phone number	:	.....
Model	:	.....
Fab. No.	:	.....
Year of manufacture	:	.....
Motor	:	..... kW (HP)
Capacity	:	..... m^3/min (cfm)
Rated pressure	:	..... bar.g (psi.g)
Date of delivery	:	.....
Date of commissioning	:	.....
Dealer name/address	:	.....
Dealer's signature	:	.....

NOTE *The warranty on the compressor is valid only if all the details above are filled in and the dealer stamps and signs this page. This report must reach the Regional Office/Head Office of ELGi within seven days of commissioning date.*

Table of Contents

1.0 About ELGi

ELGi, established in 1960, designs and manufactures a wide range of air compressors. The company has gained its reputation for design and manufacture of screw compressors through strategic partnerships and continuous research and development. Over the years, it has emerged as a multi-product, multi-market enterprise providing total compressed air solutions to all segments. ELGi's design capabilities translated into a wide range of products ranging from oil-lubricated and oil-free rotary screw compressors, reciprocating compressors and centrifugal compressors.

ELGi is one of the few companies in the world capable of manufacturing wide range of airends and compressor packages. ELGi has most modern manufacturing facilities with high precision grinding machines, turning centres, CNC horizontal and vertical machining centres and also the latest self measurement technology to maintain precise, aerospace manufacturing tolerances. ELGi's manufacturing plants are ISO and EOHS certified.

Over two million ELGi compressors are powering business in 70+ countries worldwide. The company offers a strong sales and service network with a well-knit distribution network of dealers and distribution, worldwide. ELGi has its own manufacturing operations in India, Italy and USA with subsidiary offices in Australia, Bangladesh, Brazil, China, Indonesia, Italy, Malaysia, Middle East, Sri Lanka and Thailand. The company is fast expanding its global footprint, attracting distributors and customers with its new generation products.

Need help...?

In India

You can contact ELGi customer care system (ECCS) to take care of customer complaints. The ELGi CCS works for six days a week from 08:30 to 21:30 IST (Monday to Saturday). The complaints can be logged by calling any of the following toll free numbers or by e–mail.

Toll free : 1800 425 3544

E-Mail : ccs@elgi.com

Website : www.elgi.com

Before making service request for your compressor, keep ready the details printed on the name plate of the compressor and machine identification and sale record of this manual. When ordering spare parts, refer to the lists provided in the parts manual and identify the part number. Specify the part number and quantity, in addition to the name plate details.

Refer "ELGi services" for more details about ECCS under chapter "Maintenance".

2.0 General functional description

Contents

2.1 Using the manual

This operation and maintenance manual has been specially designed keeping the customer in mind so that the person can get the most out of this EQ compressor. Before starting the compressor, it is requested that the manual should be read thoroughly. It contains vital information about installation, commissioning, operation and useful tips on maintenance to keep the compressor as good as new, year after year. The manual has been prepared with utmost care to help you understand the various systems of the compressor, along with descriptions, information and illustrations.

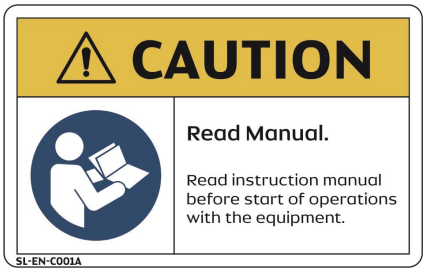
Following chapters are provided to help operate the compressor in its best way.

- **Safety -** safety precautions that must be followed while using the compressor.
- **Technical specifications -** technical details about the compressor.
- **Installation and commissioning -** all site requirements, procedures to be followed during installation, commissioning, preservation etc.
- **Functional description –** parts, their function and working.
- **Operating instructions –** to operate the compressor properly.
- **Maintenance –** how to do the maintenance for the compressor and their intervals.
- **Troubleshooting –** identification and solving the problems.
- **Decommissioning –** how to decommission the compressor, its disposal etc.
- **ELGi services –** services from ELGi: CCS, air audit, spare parts
- **Appendix –** conversion tables, torque values, service log book

Refer to the parts manual to identify the part number of the required spare. Mention the Fab number, model and part number while ordering.

This manual must be made available to the compressor operating and maintenance personnel at all times.

2.1.1 Definitions and symbols



This information is related to your safety and also to prevent any problems relevant to the equipments used. To help recognize this information better, the symbols are illustrated in section "**safety**".

All the information, illustrations and specifications in this manual are based on the latest product information at the time of preparation of the manual. Product improvement is a continuous process in ELGi. The details in this manual are likely to change without notice and ELGi reserves the right to incorporate such changes.

NOTE

Note clarifies procedures or conditions which may otherwise be misinterpreted or overlooked. Note may also be used to clarify apparently contradictory or confusing situations.

⚠ WARNING

Warning calls attention to dangerous or hazardous conditions inherent to the operation, cleaning and maintenance of the compressor which may result in fatal accident and personal injury of the operator or other staff

⚠ CAUTION

Caution is to draw attention to a procedure which, if not done correctly can lead to compressor damage.

2.2 Introduction

Welcome to ELGi customer family. ELGi compressors are the source of compressed air in various segments across the globe.

ELGi compressors are known for

- Greatest reliability
- Fewer maintenance interval
- Ease of use
- Highest safety

ELGi screw compressor is designed to give

- High energy efficiency
- Low maintenance cost
- High discharge air quality

All the above assures a low life-cycle cost.

The rotors incorporate a specially designed **eta-v profile** – ELGi patented profile-which emphasizes on improving reliability, performance and efficiency. Eta-v profile is the latest and the most energy efficient profile in the industry globally, assuring consistent performance during entire life of the compressor. ELGi screw air compressors have a compact design and compressor run with low noise or vibrations. The capacity control system ensures optimum air intake during start up, normal running and unloading stages, minimizing power consumption. The oil separation system ensures that maximum oil is separated from the compressed air, ensuring the best air quality with very little oil carry-over.

Uptime

At ELGi, we are changing the way you look at compressed air systems. It's no longer just about delivering air. It's about delivering uptime. Our uptime design ensures that the compressors would run cooler, cleaner and longer with longer service intervals. The uptime components are bests in quality keeps your compressor to run smoothly, efficiently and profitably. With uptime assurance we back our pledge, with industry-leading warranties, parts availability, loaner compressors and call centres staffed by experts. We thank you for purchasing ELGi compressor and assure you the best service during entire life of compressor.

EQ Series

Your EQ Series compressor belongs to a family of rotary screw compressors from ELGi. The compressor has only two moving parts: the two rotors. A thin film of oil separates the rotors to prevent wear. This also means that the reliability of the compressor is unsurpassed.

The screw compressor technology ensures that output capacity never diminishes even after many years of operation. It involves a continuous flow of air through helical cavities in the screw, ensuring pulsation-free compressed air delivery.

The design of the EQ Series gives you a compact and self-contained compressor. Because it contains no reciprocating parts, it runs quietly and free of vibrations. The discharge temperature of the coolant oil is low, less than 90°C (195°F), under normal conditions and therefore prevents carbonized oil from forming in the compressor.

Salient Features

- Three-stage air filtration
- Improved air filter life cycle
- Noise-free package suitable for in-house operations
- High volumetric efficiency
- Efficient air-oil separation by OSBIC (Oil Separation By Impact and Centrifugal action)
- Reliable fan that works even at high temperature
- Robust cooling system
- Industrial designed canopy
- Compact and hardly space-intensive
- Split type oil & after coolers for easy serviceability
- Flush type panels for easy handling
- Anti-vibration mounts for restricted vibration
- Increased life of consumables
- Integrated VFD (Variable Frequency Drive) and tank mounted dryer option*.
- Zero-leak flanged joints.
- Oil carry over < 3 ppm
- Advanced Neuron controller
- Globally certified product - CE / UL and other country specific approvals.

* For selected models.

The operator must follow the safe working practices, instructions, procedures that this manual describes for safe operation. The maintenance personnel must be adequately trained, and have read and thoroughly understood this 'Operation and maintenance manual'. Decals are affixed at specific locations of the compressor and they illustrate very important safety precautions.

2.3.1 Precautions during installation

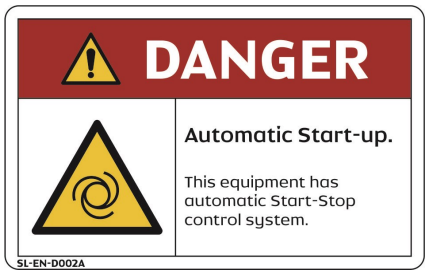
- Ensure that you fasten all loose parts before lifting. Select the appropriate lifting equipment by considering the local safety regulations, size and weight of the compressor. Operate the lifting equipment carefully within the safe operating limits. Ensure all necessary personal protective equipment's (PPEs) is close at hand during this operation.
- Maintain a cool and clean ambient for the compressor

and ensure that the air inlet is not obstructed. Make arrangements to reduce the moisture entry through the incoming air.

- Remove protection such as caps, plugs, desiccant bags before connecting the air line pipes.
- Remove the red colored protective clamps from the airend and motor while commissioning the compressor.
- Do not use frayed, damaged or worn hoses. Distribution pipes and connections must be of the correct size and

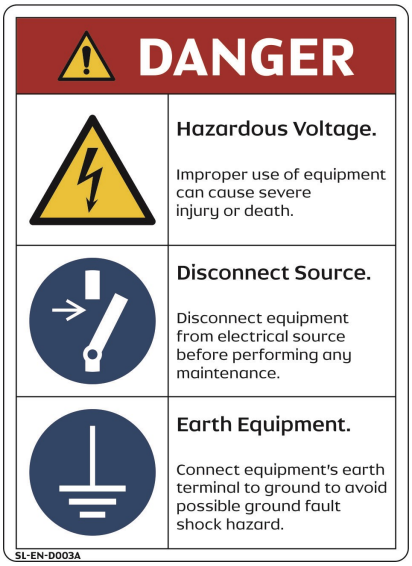
suitable for working pressure.

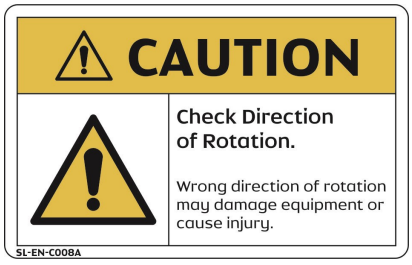
- Make sure that the aspirated air by the compressor is free of flammable fumes, vapors and particles, to prevent internal fire or explosion.
- For remotely controlled compressors and auto-start compressors, provide a clear caution stating: **"DANGER" – Remotely controlled machine and will start without notice**
- Ensure the operator is located far away from the intake of the compressor.



- Position the after-cooler discharge pipe in a way that it is free to expand under heat and is not in contact with or close to flammable materials.
- Do not exert external force on the air outlet valve and keep the connected pipe always free of strain.
- Make available adequate cooling air must be made available for the compressor particularly air cooled compressors. Make sure that exhausted air does not circulate back to the intake or cooling system.
- Make the electrical connections according to the legal standards and earth the compressor suitably. Provide a sufficient number of fuses and other protective devices to protect the compressor against short circuits. Good practice is to provide an isolating switch nearby the compressor.
- Install manual valves behind non-return valves (NRV) to isolate each compressor in multi-compressor systems. Do not rely on NRV for isolating pressure systems.
- Do not bypass, remove or adjust the safety devices or other attachments residing on the compressor. Every installed pressure vessel or auxiliary outside the compressor should have pressure relieving device or devices, as required.

- Danger! Be aware that compressed air used for breathing or food processing must meet O.S.H.A. 1910.134 or F.D.A. 21 C.F.R. 178.3570 regulations. Failure to do so may cause severe injury or death.





- Insulate or use protective guards to cover pipes or other parts that may exceed 80ºC (176ºF). High-temperature

pipes must have a clear marking as potentially dangerous.

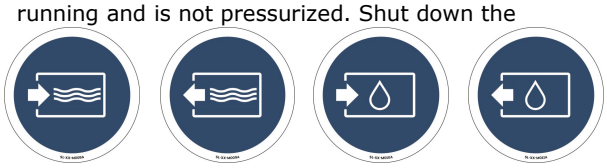
- Position the compressor on level surface. In case of inclined surface, contact ELGi.
- Do not allow compressed air to come in contact with food and related items unless they are compressed air-treated specifically.
- Be aware that this air compressor is intended for generating only industrial-use compressed air.

2.3.2 Precautions during operations

- When switching on remotely controlled compressors ensure that no one is checking or working on the compressor at that time.
- Before starting, ensure that no tools or any loose parts remain inside the compressor.
- Do not operate the compressor if a possibility exists that it could inhale flammable or toxic fumes, vapors or particles.
- Do not operate the compressor below or above its operating limits.
- Wear ear protectors if you work in an environment where the sound pressure level reaches or exceeds 90 dB (A).
- Keep all the compressor doors shut during operation. For carrying out routine checks, the doors should open only for short durations not more than 10 minutes. Wear ear protectors when opening a door.
- Keep hands, feet, floors, controls and walking surfaces clean and free of water or other liquid to minimize the possibility of slips and falls.

Pressure release

- Know that annual servicing of the safety valve is necessary. It should be checked at the prescribed pressure for operation.
- Use correct tools for maintenance and repair work. Do not allow the manufacturers' rated safe operating pressure to exceed for pipes, valves, filters and other fittings.
- It is hazardous to point the compressed air directly towards any personnel. Keep personnel out of the line of the discharge air when opening hoses or other points of compressed air discharge.
- Use only the correct type and size of hose end fittings and connections. When blowing through a hose or airline ensure that the open end stays securely. A free end will whip and may cause injury. Make sure to depressurize a hose fully before disconnecting it.
- Release all the pressure in the compressor system before servicing or performing any maintenance activity.
- Do not engage in horseplay with air hoses. Serious injury or death may result.
- Do not use air at a pressure greater than 2.5 bar.g (36 psi.g) for cleaning purpose.
- Open the oil fill cap only when the compressor is not running and is not pressurized. Shut down the



compressor and bleed the receiver tank to zero internal pressure before removing the cap.

Fire and explosion

- Clean up spills of lubricants or other combustible substances immediately.
- Shut down the compressor and allow it to cool down before checking or adding oil. Remove sparks, flames and other sources of ignition away from the compressor.
- Do not permit smoking in the vicinity of the compressor.
- Do not use flammable solvents for cleaning purposes.
- Keep electrical wiring and other terminals in good condition. Replace any wiring that has cracked, cut, abraded or otherwise degraded insulation. Keep all

terminals clean and tight.

- Keep grounded conductive objects such as tools away from exposed live electrical parts like terminals to avoid arcing, which might serve as a source.
- Keep oily rags, trash, dry leaves, litter or other combustibles out of and away from the compressor.
- Do not operate the compressor without a proper flow of cooling air or with an inadequate flow of lubricant or with a degraded lubricant.
- Do not attempt to operate the compressor in a hazardous environment of any classification unless the compressor has been specially designed and manufactured for explosive applications.

Moving Parts

- Rotating fan blades can cause serious injury. Disconnect power supply before attempting service.
- Keep compressor doors closed except when servicing or during maintenance. The sound damping material on the inner side of the compressor body should not be removed or tampered with.
- Wear snug-fitting clothing and tie long hair when working around the compressor, especially when hot or moving parts such as the cooler, the airend, the thermal valve, the main motor or the fan motor are exposed.
- Keep hands, arms and clothing away from couplings, fans/belts and other moving parts.
- Do not attempt to operate the compressor with the fan

guards, coupling guards/belt guards or other guards removed.

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

Hot surfaces

- Avoid bodily contact with hot oil and hot surfaces like cooler, pipes etc.
- Keep all parts of the body away from all points of air discharge.
- Keep a first aid kit handy. Seek medical assistance promptly in case of injury. Do not ignore small cuts and burns.

Toxic and irritating substances

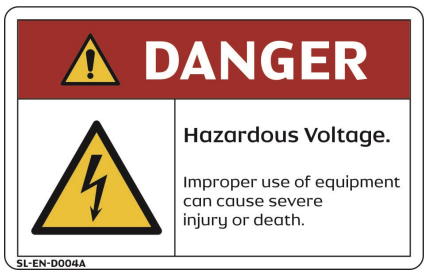
- Do not use air from the compressor for breathing.
- Always wear safety equipment while operating the compressor. Refer OSHA safety standards.

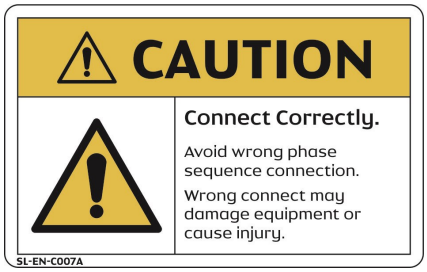
- Do not allow compressed air to come into contact with any edible items.
- In the event of ingestion of oils, coolants or lubricants used in the compressor, seek medical treatment promptly. In case you come in contact with such substances, wash with soap and water. Use MSDS for oil to know more on this.

- If warm cooling air from the compressor is being used in air heating systems, e.g. to warm up a work room, take precautions against air pollution and possible contamination of the breathing air.

Electric shock

- Keep all parts of the body and any handheld tools or other conductive objects away from exposed live parts of the electrical system.
- Stand on a dry or insulating surface and do not contact any other part of the compressor when making adjustments or repairs to exposed live parts of the electrical system.
- Before switching on the compressor ensure that proper earthing is done as per recommendation.
- Make all adjustments or repairs with one hand. This minimizes the risk of creating a current path through the heart.
- Conduct repairs only in a clean, dry, well-lit and ventilated area.
- Do not leave the compressor unattended with open electrical enclosures. If necessary to do so, disconnect the power to the compressor at the source and lock it out so that power is not in advertently restored.
- Disconnect, lock out, and tag the power source prior to attempting repairs or adjustments, turning the compressor manually or handling ungrounded conductors.
- All electrical installation must be in accordance with recognized electrical codes and any local health & safety codes.
- Recognize that only authorized and qualified trained personnel should carry out any electrical work on the compressor.





- Regularly check that all electrical connections are tight and in good condition.

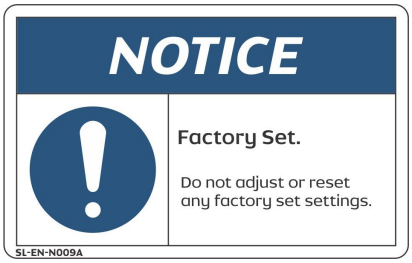
Periodically check whether

- All guards are in place and securely fastened.
- All hoses and pipes inside the compressor are in good condition, secure and not rubbing against each other.
- Any leaks exists.
- All fasteners are tight.
- All electrical leads are secure and in good order.
- Safety valves and other pressure relief devices are not obstructed by dirt or paint.
- Air outlet valve, i.e. pipes, couplings, manifolds, valves, hoses, etc. are in good repair, free of wear or abuse.
- The air-oil tank is properly grounded.

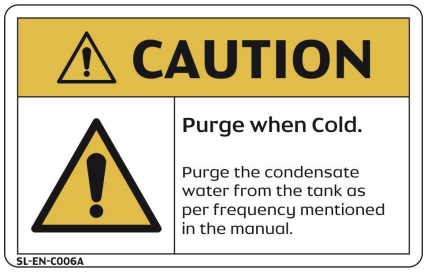
2.3.3 Precautions during maintenance

- Use safety glasses and incorporate safe working practices before maintenance work.
- Use appropriate tools for all maintenance works.

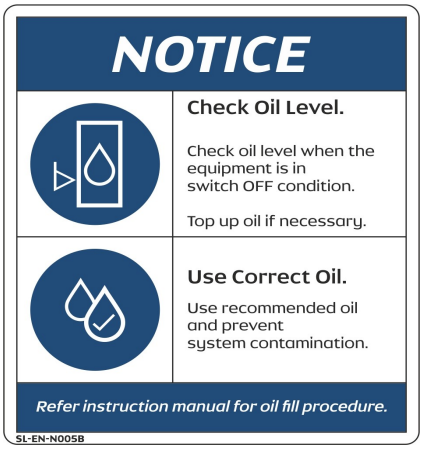
- Use only genuine spare parts. Refer the **section "Use genuine spare parts"** in **"Maintenance"** chapter.
- Ensure that the compressor is cooled down before maintenance is performed.
- Springs under tension or compression store energy. Uncontrolled release of this energy can cause serious injury or death. Be cautious while performing the maintenance of components loaded with springs (for example minimum pressure valve, safety valve etc.).
- Display a warning sign that says **"Maintenance under progress, don't switch on"** near the start switch.
- Isolate the compressor from the air line (discharge) and disconnect the power by opening and locking the isolating switch before maintenance.
- Prior to attempting repairs or adjustments, disconnect the power at the source and verify at the compressor that the circuits have de-energized. This minimizes the possibility of accidental start-up or operation, especially when the compressor is remotely controlled.
- Open the oil filler cap only when the compressor is not running and is not pressurized. Shut down the compressor and bleed the receiver tank to zero internal pressure before removing the cap.
- If you are going to switch on remotely controlled compressors must ensure that nobody is checking or working on the compressor at that time. A warning sign near the equipment's start button is mandatory.

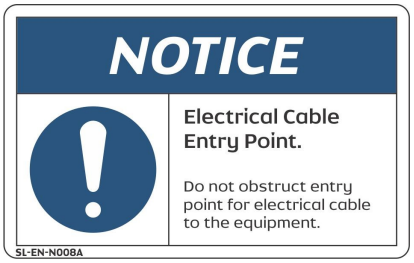


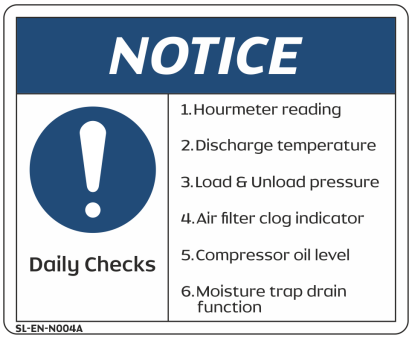
- Wait up to five minutes to ensure that the air in the air-oil separator tank is released to start routing maintenance.



- Vent all internal pressure prior to opening any line, fitting, valve, drain plug, connection or other components such as filters. Vent pressure by popping up the safety valve.
- Display a maintenance chart near the compressor to easily identify the maintenance intervals of regular service items.




NOTICE
Electrical Cable Entry Point.
Do not obstruct entry point for electrical cable to the equipment.
SL-EN-N008A


NOTICE
Daily Checks
1. Hourmeter reading
2. Discharge temperature
3. Load & Unload pressure
4. Air filter clog indicator
5. Compressor oil level
6. Moisture trap drain function
SL-EN-N004A

2.4 Functional description

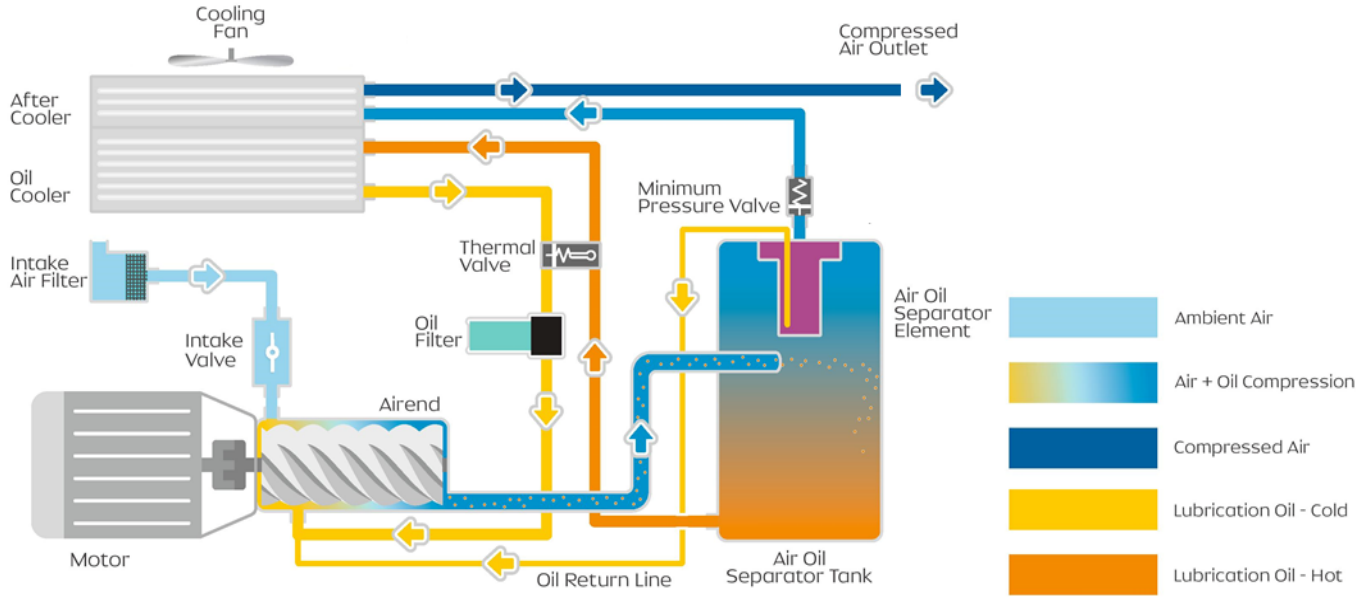


Figure 1. Screw compressor systems - Schematic diagram

2.4.1 Air circuit

The atmospheric air enters into the airend through the air intake system. The intake filters (pre filter and air filter) prevents the entry of foreign particles (such as dust) into the airend. The intake valve regulates the amount of air sucked into the airend. The opening and closing of the intake valve are controlled by the pneumatic pulse line actuated by an electrically controlled solenoid valve. The clog indicator fitted in the air filter turns red when the filter is clogged.

The filtered air enters into the airend where it mixes with the injected oil. The injected oil acts as a coolant to maintain optimum temperature. It also seals the leaks between the rotors and the housing and lubricates the bearings and gears. The airend consists of two counter-rotating intermeshed helical screws - the male and the female rotors - which are driven by electric motor. The air -oil mixture is trapped between the rotors of the airend and is progressively compressed.

After being compressed, the air-oil mixture enters with high velocity into the air-oil separator tank where it undergoes a unique 3 stage separation process which removes maximum oil content. This highly efficient 3 stage separation process uses the impact velocity of air-oil mixture along with centrifugal action, which makes the mixture very lean. The final stage of this separation consists of passing the lean mixture through the air-oil separator element which leaves the air with an oil content of < 3 ppm.

The oil separated and collected in this element is then returned to the airend through the oil return line. The air passes through a minimum pressure valve (MPV). It maintains a minimum differential pressure which is required for circulation of oil within the compressor unit. The compressed hot air is cooled in the after cooler and discharged to the external receiver, ready to be used.

2.4.2 Oil circuit

The oil in the air-oil separation tank after being separated is fed into the airend. The oil either gets diverted to the oil cooler or oil filter or both depending upon the temperature. The thermal valve governs and controls the oil flow path. The oil before being injected into the airend is filtered. An orifice is provided in oil flow path towards the airend to control the oil flow. The whole oil circulation circuit in the compressor is operated solely by the differential pressure maintained by the minimum pressure valve (MPV) and doesn't require any additional pump.

2.4.3 Drive system

The airend transmission is powered by an electric induction motor through a coupling. When the compressor is turned ON, the motor is started in star mode and takes 6 to 9 seconds to change over to delta mode. During this period the intake valve remains closed and thus the motor starts without load. In delta mode, the motor speed stabilizes, the solenoid valve energizes after 10 seconds of change-over to reduce load on the motor, the blow down valve is closes, intake valve opens and the compressor starts loading. For compressors with variable frequency drive (VFD), speed of the motor gradually increases within 30 seconds (ramp-up time) while the intake valve remains in the closed position. This ensures very little starting load. Next, the intake valve opens and the system starts building up pressure. An adaptor ring connects the airend and the motor. It also helps in maintaining the coupling alignment. The coupling element acts as a safety interlock and it is the first one to fail when coupling elements become over loaded. This architecture saves the whole drive system from failure. Malfunctioning of the coupling element will result in noise and vibration. Anti-vibration mountings reside below the air end and the motor. This configuration reduces the transmission of vibration from airend and motor to the structure, reducing noise and ensuring reliability of mounted parts on the structure.

2.4.4 Control system

Load - Unload

Depending on the demand for compressed air from the application at a particular time, the compressor needs to respond accordingly. The compressor, therefore operates in either loading or unloading mode to meet this requirement. The primary objective of these modes is to save energy and reduce wear and tear on the machine. The control system ensures a smooth start without overloading the motor. The compressor is started in star mode, during which most of the compressed air is vented to the atmosphere. This mechanism helps prevent overloading the motor. In delta mode the motor speed stabilizes, the solenoid valve energizes after 10 seconds of change-over to reduce load on the motor, the blow-down valve is closes, and the compressor starts loading.

When the receiver pressure reaches the maximum limit, a signal arrives the solenoid valve from the control system. Next, the inlet valve actuates and closes, and the compressor runs in unloading mode. If unloading mode continues for more than 5 minutes, i.e., compressed air is consumed and thus no decrease in pressure occurs, the system stops and switches to standby mode. If a drop in pressure occurs in the receiver, the compressor returns to loading mode automatically.

VFD modulation

VFD is an efficient way of controlling capacity as per demand. In a compressor with VFD the power of compressor varies proportionally with capacity reduction. The VFD tunes the frequency, thereby adjusting the speed based on the change in line pressure. The incoming flow will automatically reduce because of reduced speed of the motor. Conversely speed increases when line pressure goes down below working pressure.

2.4.5 For retro-fitment of Standalone VFD with Compressor (C) version in field

1. Change the bearings to insulated type for motors >=90kw at Non Drive End side of Motor

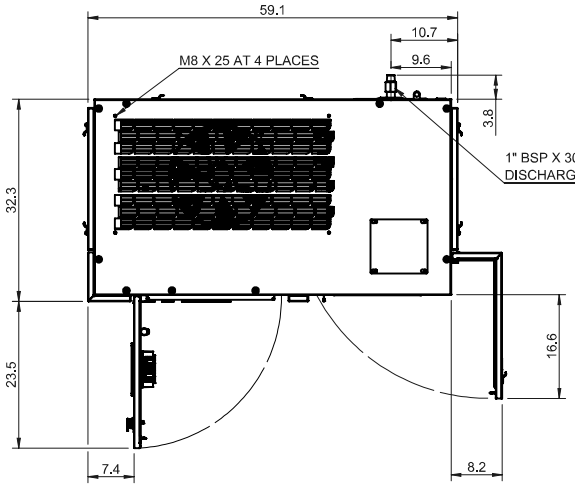
2. Turndown only upto 50% for conversion models (considering the motor speed) i.e. motor frequency range is 50 - 25 Hz for 50Hz variant and 60 - 30Hz for 60Hz variant. No pressure turndown is applicable

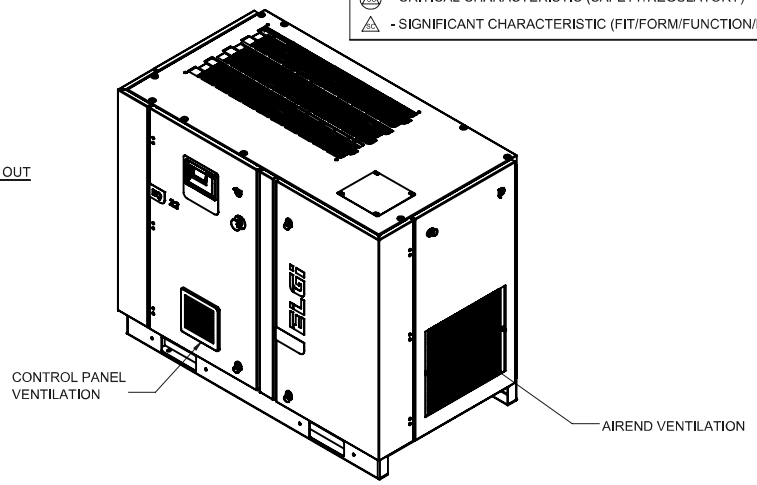
3. Run the compressor in the VFD operating range (50 to 25Hz) and skip the frequency in VFD controller (within +/- 1Hz) if abnormal noise / vibration is observed

4. Change the thermal element from 65°C to 75°C

S.NO	DESCRIPTION	QTY
14	CONTROLLER & CONTROL PANEL ASSY (BEHIND THE DOOR)	1
13	VARIABLE FREQUENCY DRIVE #	1
12	OIL FILTER	1
11	OIL AND AFTER COOLER	1
10	COOLING FAN (18-22 KW)	1
9	MINIMUM PRESSURE VALVE	1
8	SAFETY VALVE	1
7	SEPERATOR ELEMENT	1
6	AIR OIL SEPERATOR TANK	1
5	DRIVE COUPLING	1
4	INTAKE VALVE	1
3	AIR FILTER	1
2	AIR END	1
1	ELECTRIC MOTOR	1

CG DETAILS (approx.) +/- 0.39"		
X	Y	Z
29.2	18.8	13.9





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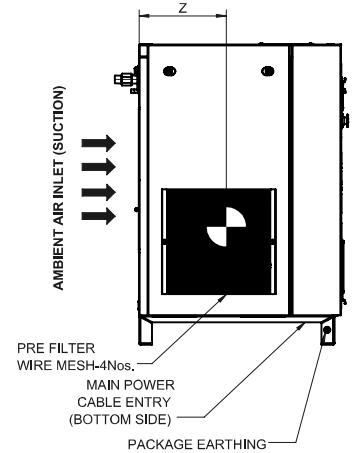
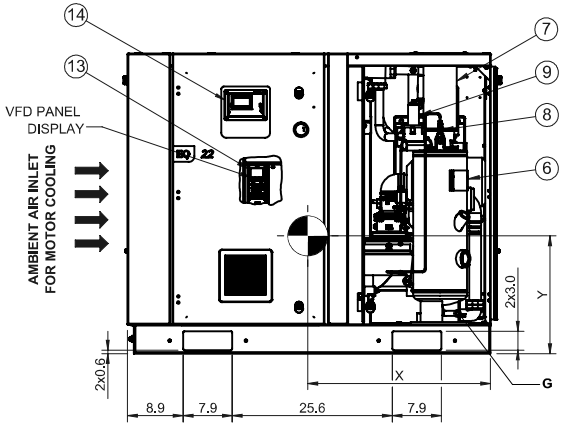
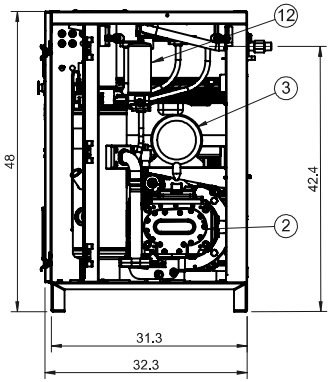
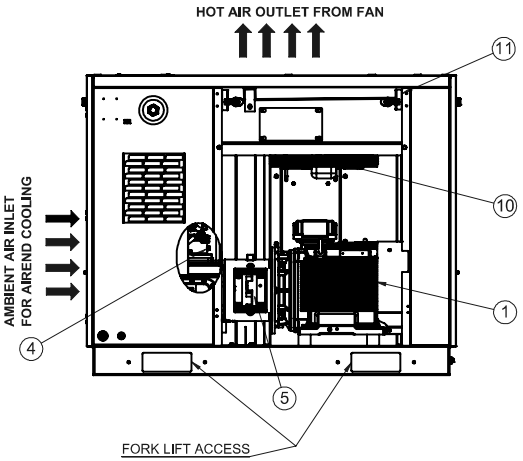
- SIGNIFICANT CHARACTERISTIC (FIT/FORM/FUNCTION/FINISH)









DETAIL G

PACKAGE WEIGHT (approx) ±55 lbs		
MODEL	C	CV
EQ 18	1477	1532
EQ 22	1488	1543

NOTES:
1.ALL DIMENSIONS AND WEIGHTS ARE FOR REFERENCE ONLY
2.REFER SPECSHEET FOR COOLING AIR FLOW RATE DATA
3.MINIMUM DISTANCE REQUIRED AROUND THE COMPRESSOR IS 3.3 ft ON ALL SIDES AND 6.6 ft ON TOP (INSTALLATION REQUIREMENT)
4.#-VFD AVAILABLE IN CV VERSION ONLY

SURFACE FINISH SYMBOLS												
ROUGHNESS SYMBOL	N1	N2	N3	N4	N5	N6	N7	N8	N9	N10	N11	N12
ROUGHNESS VALUE Ra µm	0.025	0.05	0.1	0.2	0.4	0.8	1.6	3.2	6.3	12.5	25	50

MACHINING DEVIATION FOR OPEN DIMNS.IS 2102(Medium)											
DIMN.	OVER	-	6	30	120	315	1000	2000	4000	>4000	
	UP TO & INCL	6	30	120	315	1000	2000	4000			
TOLERANCE		±0.1	±0.2	±0.3	±0.5	±0.8	±1.2	±2		±3	

ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE SPECIFIED.

For unspecified tolerances, Refer Drg. No. 012392230

REV. NO.	ECO.No.	DATE	DESCRIPTION	ALT. BY	CHKD. BY

Sl.No.	DESCRIPTION	Qty.	DRAWING No.	Rev.	REMARKS

MODEL. : EQ 18-22

MATERIAL : NOT APPLICABLE

WEIGHT : REFER TABLE

2023	NAME	DATE
CAD	PV	16.05.23
CHECKED	JAVA	
APPROVED	SD	

ELGI EQUIPMENTS LTD.,
COIMBATORE - INDIA.

GA DRAWING EQ 18-22/60HZ
(USA / BRAZIL)

REF.DRG.No.

NEXT ASSY.

SCALE NTS

DRG.No. 01 53 2677 6

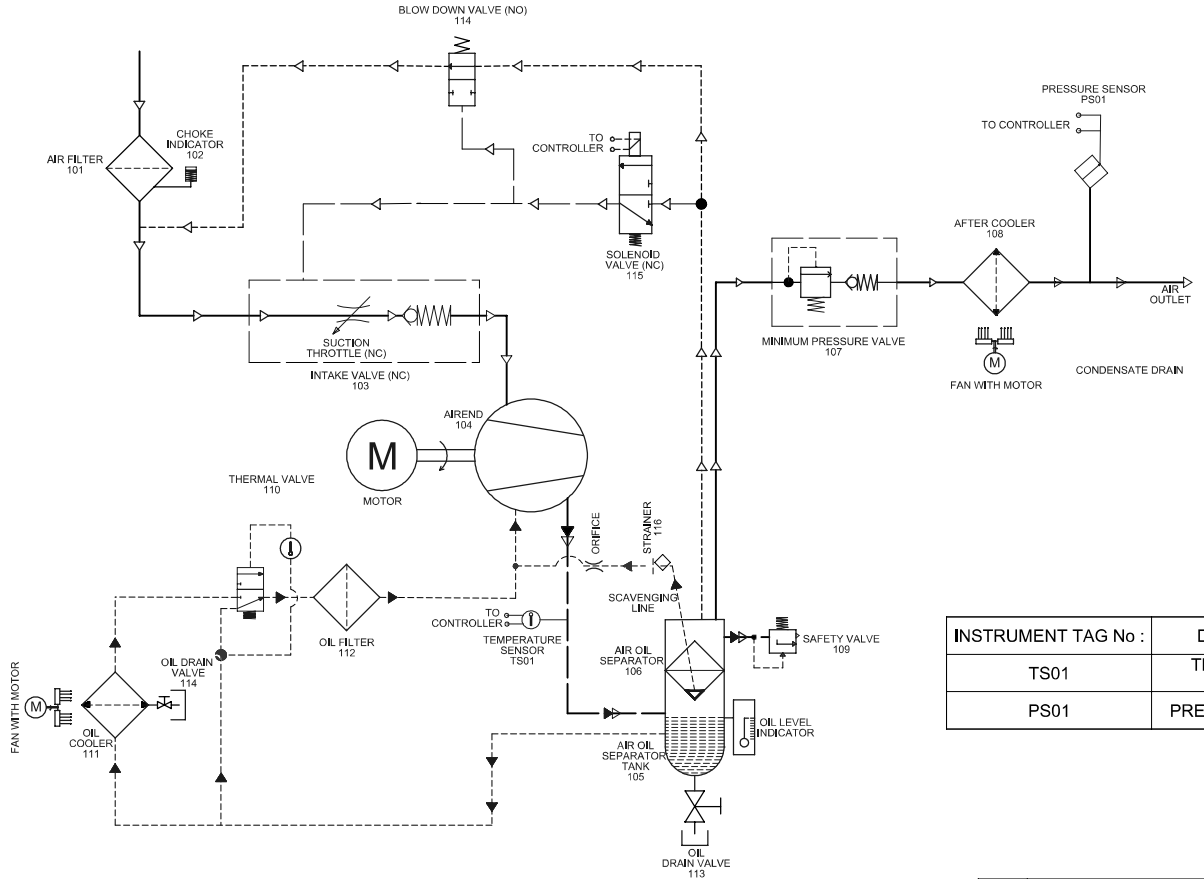
DRG.SHEET 1 OF 3

REVISION R 0 0

DO NOT SCALE THIS DRG. IF IN DOUBT, ASK ENGG. DEPT.

P & I DIAGRAM

- CRITICAL CHARACTERISTIC (SAFETY/REGULATORY)
- SIGNIFICANT CHARACTERISTIC (FIT/FORM/FUNCTION/FINISH)



INSTRUMENT TAG No :	DESCRIPTION
TS01	TEMPERATURE SENSOR
PS01	PRESSURE SENSOR

S.NO	SYMBOL	PART NAME
101		AIR FILTER
102		CHOKE INDICATOR
103		INTAKE VALVE (NC)
104		AIREND
105		AIR OIL SEPARATOR TANK
106		AIR OIL SEPARATOR
107		MINIMUM PRESSURE VALVE
108		AFTER COOLER
109		SAFETY VALVE
110		THERMAL VALVE
111		OIL COOLER
112		OIL FILTER
113		OIL DRAIN VALVE
114		BLOW DOWN VALVE (NO)
115		SOLENOID VALVE (NC)
116		STRAINER

LEGEND	CIRCUIT	PIPE SIZE
	ENVELOPE LINE	NOT APPLICABLE
	AIR LINE	1 INCH
	PULSE LINE	1/4 INCH
	OIL LINE	3/4 INCH
	AIR OIL LINE	1 1/2 INCH
	BLOW DOWN LINE	1/4 INCH OR 3/8 INCH

SURFACE FINISH SYMBOLS												
ROUGHNESS SYMBOL		N1	N2	N3	N4	N5	N6	N7	N8	N9	N10	N11	N12
ROUGHNESS VALUE Ra μm		0.025	0.05	0.1	0.2	0.4	0.8	1.6	3.2	6.3	12.5	25	50

MACHINING DEVIATION FOR OPEN DIMNS.IS 2102(Medium)											
DIMN.	OVER	-	6	30	120	315	1000	2000	4000	>4000	
	UP TO & INCL	6	30	120	315	1000	2000	4000			
TOLERANCE		±0.1	±0.2	±0.3	±0.5	±0.8	±1.2	±2		±3	

ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE SPECIFIED.

For unspecified tolerances, Refer **Drg. No. 012392230**

Sl.No.	DESCRIPTION	Qty.	DRAWING No.	Rev.	REMARKS

MODEL. : EQ 18-22

MATERIAL : NOT APPLICABLE

WEIGHT : REFER TABLE

ELGI EQUIPMENTS LTD.,
COIMBATORE - INDIA.

GA DRAWING EQ 18-22/60HZ
(USA / BRAZIL)

	NAME	DATE
2023		
CAD	PV	16.05.23
CHECKED	MVA	
APPROVED	SD	

REF.DRG.No.

NEXT ASSY.

SCALE NTS

DRG.No. 01 53 2677 6

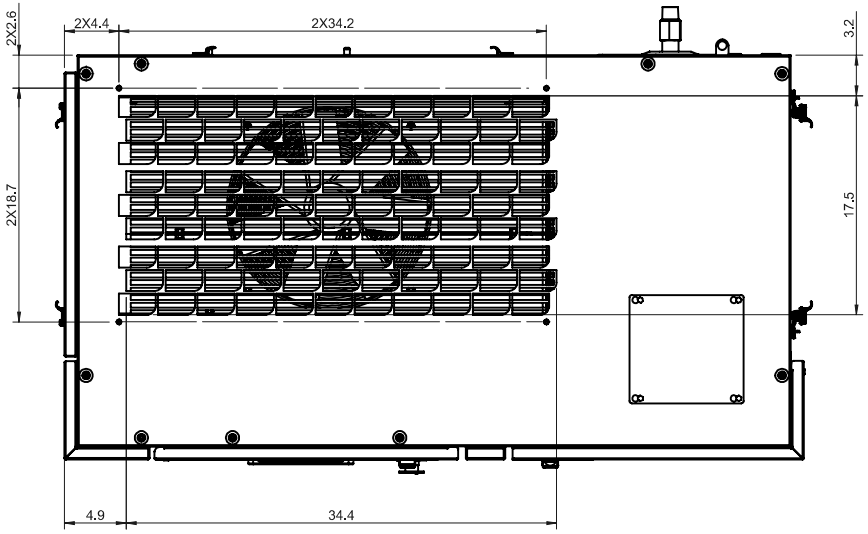
DRG.SHEET 2 OF 3

REVISION R00

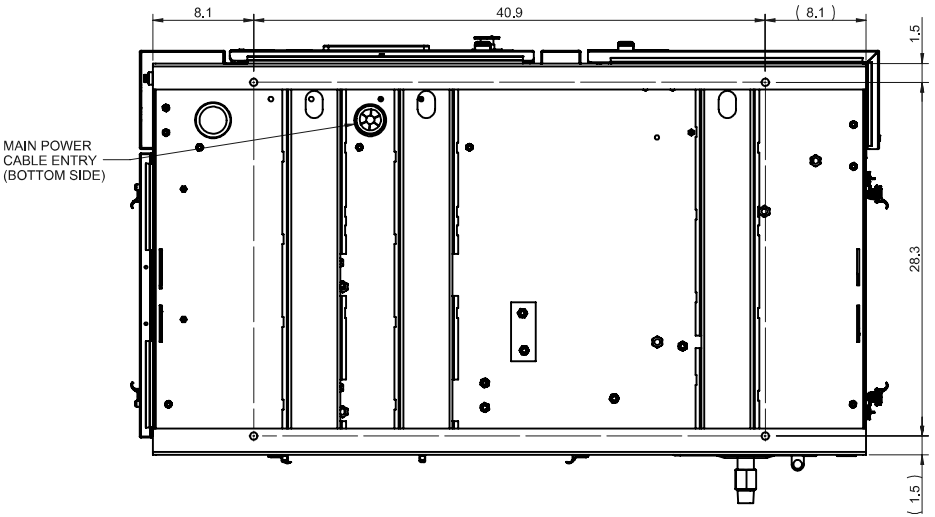
DO NOT SCALE THIS DRG. IF IN DOUBT, ASK ENGG. DEPT.

- CRITICAL CHARACTERISTIC (SAFETY/REGULATORY)
- SIGNIFICANT CHARACTERISTIC (FIT/FORM/FUNCTION/FINISH)

DUCT MOUNTING HOLES



PACKAGE MOUNTING HOLES



SURFACE FINISH SYMBOLS

ROUGHNESS SYMBOL	N1	N2	N3	N4	N5	N6	N7	N8	N9	N10	N11	N12
ROUGHNESS VALUE Ra µm	0.025	0.05	0.1	0.2	0.4	0.8	1.6	3.2	6.3	12.5	25	50

MACHINING DEVIATION FOR OPEN DIMNS.IS 2102(Medium)

DIMN. OVER	-	6	30	120	315	1000	2000	4000	>4000
UP TO & INCL	6	30	120	315	1000	2000	4000		
TOLERANCE	±0.1	±0.2	±0.3	±0.5	±0.8	±1.2	±2	±3	

ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE SPECIFIED.

For unspecified tolerances, Refer **Drg. No. 012392230**

REV. NO.	ECO.No.	DATE	DESCRIPTION	ALT. BY	CHKD. BY

Sl.No.	DESCRIPTION	Qty.	DRAWING No.	Rev.	REMARKS

MODEL. : EQ 18-22

MATERIAL : NOT APPLICABLE

WEIGHT : REFER TABLE

2023	NAME	DATE
CAD	PV	16.05.23
CHECKED	MVA	
APPROVED	SD	

ELGI EQUIPMENTS LTD.,
COIMBATORE - INDIA.

GA DRAWING EQ 18-22/60HZ
(USA / BRAZIL)

REF.DRG.No.

NEXT ASSY.

SCALE NTS

DRG.No. 01 53 2677 6

DRG.SHEET 3 OF 3

REVISION R00

DO NOT SCALE THIS DRG. IF IN DOUBT, ASK ENGG. DEPT.

4.0 Technical data

Standard, Standard + VFD

Model		-	EQ 11				EQ 15				EQ 18				EQ 22			
Working pressure		psi.g	100	125	150	175	100	125	150	175	100	125	150	175	100	125	150	175
FAD - Free air		cfm	68	58	52	46	89	81	73	62	111	100	87	78	134	118	109	91
Delivery		m^3/ min	1.93	1.64	1.47	1.30	2.51	2.29	2.07	1.75	3.14	2.83	2.46	2.21	3.79	3.34	3.09	2.58
Unloading pressure		psi.g	107	132	157	182	107	132	157	182	107	132	157	182	107	132	157	182
Nominal power supply conditions		-	208-230V / 460V (+/-10%), 60Hz(+/-5%),3phase															
Main motor rating		hp	15				20				25				30			
Type of motors (main drive & fan drive)		-	Squirrel Cage Induction-TEFC & Cooling Fan Integrated Motor															
Insulation and protection of main motor		-	Class F & IP55															
Frame size / mounting type		-	160M&L / B35				160M&L / B35				180M&L / B35				180M&L / B35			
Type of starter for main motor	STD	-	Automatic Star Delta															
	STD + VFD		Through Variable Frequency Drive															
Maximum fan motor rating per fan X no. of fans		hp	0.38 (208-230V) / 0.40 (460V) X 1 Fan															
Rated speed of fan motor		rpm	1560 (208V-230V) / 1630 (460V)															
Safety valve set pressure		psi.g	205															

5.0 Installation and operation

ELGi

Contents

Before the new EQseries compressor is operated for the first time, it needs to be installed at your site according to ELGi's installation guidelines

5.1.1 Unpacking

Unpack the compressor from the packing case by removing the nails. Unscrew the bolts, holding the compressor to the base of the crate

Once the packing material is removed, check the contents against the packing list. The compressor is shipped with the following

- Key for doors.
- Operation and maintenance manual
- Checklist of parts of the machine
- Electrical drawing

5.1.2 Disposal of packing material

The wood/cardboard used to make the shipping crates of the EQ series compressors are biodegradable.

The polyethylene covers wrapped around the compressor and the polystyrene packing provided around the electrical panels are not recyclable. They must be disposed off in accordance with prevailing local environmental laws.

5.1.3 Handling

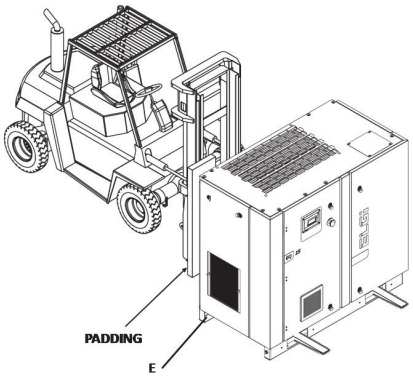


Figure 2. Lifting using forklift

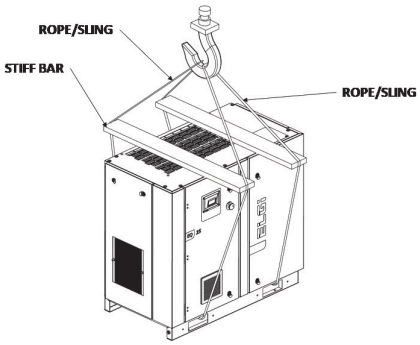


Figure 3. Lifting using crane

- Lifted compressors using either a forklift /pallet truck (Fig.2) or a crane (Fig.3).
- When using a forklift, ensure padding is used in between the compressor and forklift (as shown in Fig.2) to prevent damage to the compressor's canopy.
- When using a crane, please ensure stiff spreader bars are used (as shown in Fig.3) to prevent rope slings from damaging the compressor's canopy.
- Do not drop the compressor.
- Do not attempt to move the compressor by pushing or dragging it as this may cause jerky movements causing damage to the compressor.

NOTE

Removal of transit brackets:

Once you have placed the compressor in its final position, remove the red painted transit brackets and store for future use.

Locations:

- *Bracket in between the base and airend support*
- *Bracket in between the base and motor*
- *Bracket in between the shroud and control panel box*

5.1.4 Site requirements

- Install the air compressor in a clean, dry, cool and dust free room as extreme temperatures (hot or cold), moisture, and air borne contaminants can significantly affect compressor performance, durability and compressed air quality.
- Be aware the entrance to the compressor room should be high enough and wide enough to carry the compressor in and out.
- Leave a minimum of 1m (3.28ft) space around the compressor for safe and proper inspection, cleaning, and maintenance activities.
- Leave a minimum of 2m (6.56ft) space above the compressor for hot air to flow away from the compressor.
- Ensure the compressor is protected against direct sunlight and rain.
- Avoid exposing the compressor to excessive moisture (from rain, dryer vent etc.) as moisture can affect airend lubrication, promote rust formation on the compressor and lead to electrical problems of the motor.
- Neither install the machine in a location where flame is used or place any inflammable objects near the compressor.
- Ensure the room temperature is within 50ºC (122ºF) as high ambient temperatures can reduce oil life due to higher discharge oil temperature (DOT). It also results in high approach temperatures affecting cooling and condensation efficiency in the after- cooler and in air treatment equipment like air dryers.
- Ensure the hot and medium of other utility equipment like gensets/dryers/ boilers, etc., is not sucked by the

compressor inlet or in any way the room temperature does not rise to prevent high discharge oil temperature.

- Ensure the ambient temperature does not drop below 0ºC (32ºF). Provide air supply openings and adjustable louvers to ensure that the minimum temperature does not drop down below 0ºC (32ºF).
- Install the compressor on a smooth, solid, level surface capable of bearing the weight of the compressor Ensure unevenness of the surface is within 6mm (0.25") and taper is within 50 per meter.
- If the floor is splashed frequently with water while cleaning, then place your compressor on a raised concrete plinth 100 to 150 mm (4 to 6 inches) high.
- If installed on a metallic floor or frame, the frame should be electrically grounded separately.

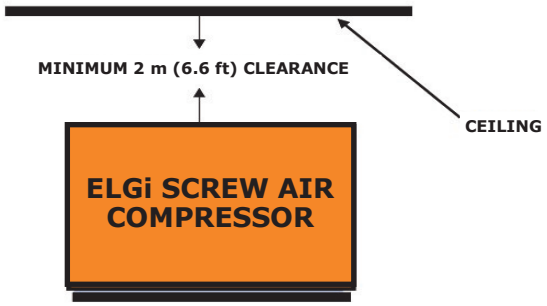


Figure 4. Vertical clearance around the compressor

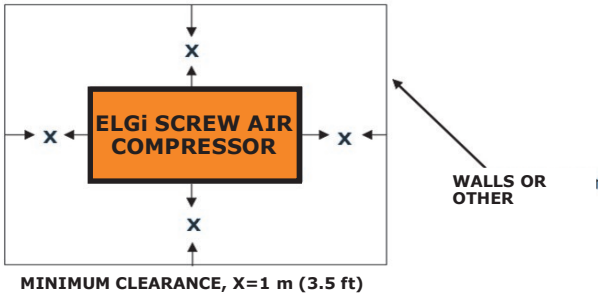


Figure 5. Horizontal clearance around the compressor

- Ensure the compressor base makes 100% contact directly with the floor.
- Know that an industrial floor with a level surface capable of supporting the weight if the compressor is sufficient for installing your compressor. No special foundation or anchoring is necessary for rotary screw compressors.
- Do not store toxic, volatile, or corrosive agents near the compressor.
- Isolate the compressor from corrosive agents like ammonia, chlorine, salt spray, and other chemicals as these may erode the internal components and also contaminate the oil and filters.
- Do not allow hot air from additional equipment to blow towards the compressor.
- If you operate in high dust applications like rice mills, cement, flour mills etc., clean and replace the filters more often.
- Good practice is to have overhead lifting in the compressor room to facilitate any major overhaul. If an overhead hoist is not available, you should be able to use a mobile crane or forklift truck in your compressor room at a minimum.

5.1.4.1 Ventilation

- A part of electric energy to your compressor motor is converted into heat and this heat must be removed from the compressor room by suitable ventilation.
- The ventilation requirements of the compressor are listed in Table 1.
- The ventilation requirements could be achieved by the following methods.
- Natural ventilation is sufficient if the temperature rise in the compressor room (measured by a thermometer near the air inlet pre-filter) is within 5ºC (9ºF) when compared with outside temperature.
- Forced ventilation with an exhaust fan is necessary if the temperature rise inside the room (measured by a thermometer near the air inlet pre-filter mesh) rises above 5ºC (9ºF) .
- Ventilation with ducts: Ensure hot air exhaust from the compressor is diverted through the ducts when installed in an enclosed area. (contact ELGi for ducting requirements)
- Provide openings on walls/partitions close to the air suction side of the compressor.
- Provide exhaust openings close to the ceiling for hot air exit.
- If more than four compressors are installed in a room, good practice is to ducting arrangements. This will avoid hot air recirculation.
- Be aware hot air recirculation in the enclosed area will affect the compressor performance.
- Ensure the air velocity in the supply and exhaust ducts does not exceed 4 m/s (13 ft/s).
- Know air velocity is ascertained during commissioning using an anemometer.

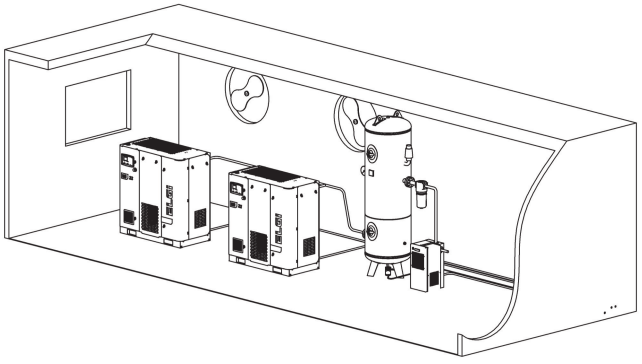


Figure 6. Forced ventilation with exhaust fan

- Do not connect cool air inlet ducts directly to the compressor inlet side.
- To eliminate transmission of vibrations, provide a soft bellows connector between the duct and the compressor.
- Contact ELGi in case you need to provide a duct

HZ	Model	Minimum ventilation requirement (ft^3/h)	Minimum ventilation requirement (m^3/h)
50	EQ 11 & EQ 15	105,944	3,000
	EQ 18 & EQ 22	91,818	2,600
60	EQ 11 & EQ 15	113,007	3,200
	EQ 18 & EQ 22	104,178	2,950

connection or filter fitment on the compressor.

Table 1. EQ series – Ventilation requirements

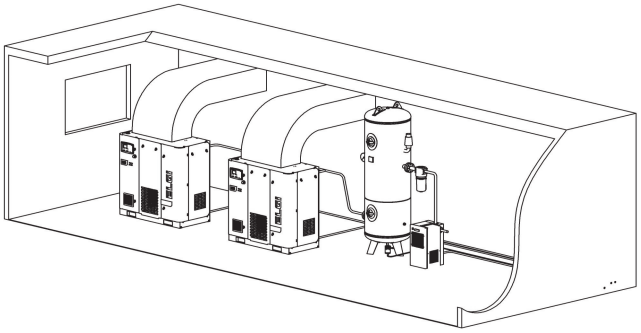


Figure 7. Ventilation with ducts

⚠ WARNING

Ensure that only authorized service technicians carry out the electrical work. Study the electrical circuit diagram before starting the work.

5.1.5 Electricals

1. Supply power to the compressor through a dedicated switch disconnected fuse (SDF) unit of suitable a rating mounted within 5 m (16.4ft) of the compressor. (This architecture lets you isolate the compressor).
2. Use an HRC (high rupturing current) fuse instead of an MCCB (moulded case circuit breaker) to avoid possible contactor and motor failure.
3. Refer to table 2 for fuse and cable specifications for 380/400/415 V, 50Hz,3-Ph power supplies.
4. Do not use an MCB (miniature circuit breaker) because the selection of contactors depends on Type-2 co-ordination.
5. Connect the earthling line to the point provided on the base frame at the side of the compressor and motor.

Compressor model	Incoming fuse rating	Incoming cable size (Armored) Copper	Incoming cable size (Armored) Aluminum	Power cable gland hole diameter
	A	Sq.mm	Sq.mm	mm (inches)
EQ 11	32	4C x 6	4C x 6	50 (1.97)
EQ 15	40	4C x 6	4C x 10	50 (1.97)
EQ 18	50	4C x 10	4C x 16	50 (1.97)
EQ 22	63	4C x 10	4C x 25	50 (1.97)

Table 2. EQ series – Electrical requirements

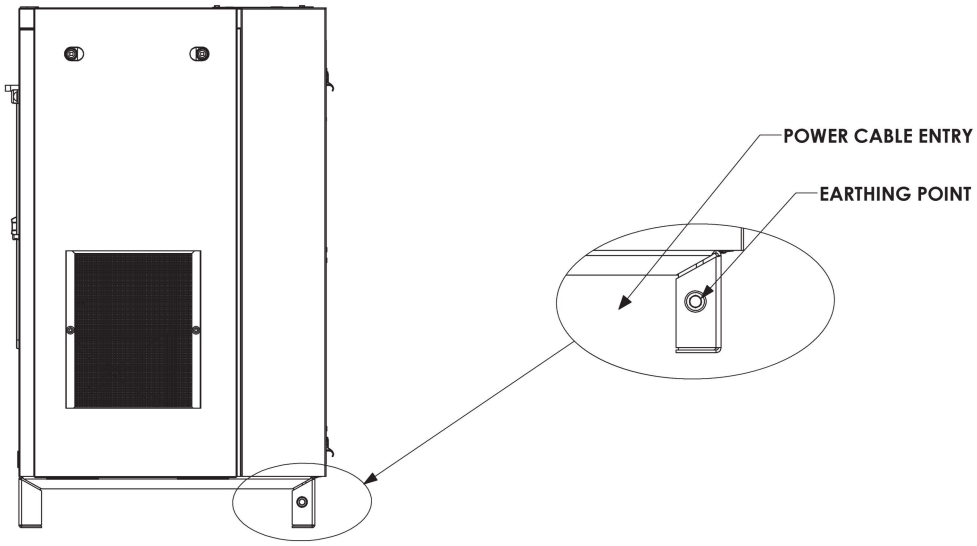


Figure 8. Earthing line of compressor

5.1.6 Air pipe dimensions

Volume Flow FAD		NPS Pipe size/ Inside diameter (mm)									
		1/2		3/4		1		1 1/4		1 1/2	
		15.80		20.93		26.65		35.05		40.89	
(m^3/min)	(cfm)	(bar)	(psi)	(bar)	(psi)	(bar)	(psi)	(bar)	(psi)	(bar)	(psi)
0.1	4	0.02	0.22								
0.2	7	0.06	0.80	0.01	0.20						
0.3	11	0.12	1.69	0.03	0.41	0.01	0.12				
0.4	14	0.20	2.88	0.05	0.71	0.01	0.21				
0.5	18	0.30	4.35	0.07	1.07	0.01	0.32	0.01	0.08		
0.6	21	0.43	6.09	0.10	1.49	0.03	0.45	0.01	0.11		
0.7	25	0.57	8.10	0.14	1.99	0.04	0.59	0.01	0.15		
0.8	28	0.73	10.38	0.18	2.54	0.05	0.76	0.01	0.19	0.01	0.09
0.9	32	0.90	12.90	0.22	3.16	0.07	0.95	0.02	0.24	0.01	0.11
1.0	35	1.10	15.68	0.27	3.84	0.08	1.15	0.02	0.29	0.01	0.13
1.2	42			0.38	5.38	0.11	1.61	0.03	0.41	0.01	0.19
1.4	49			0.50	7.16	0.15	2.14	0.04	0.54	0.02	0.25
1.6	56			0.64	9.16	0.19	2.74	0.05	0.70	0.02	0.32
1.8	64			0.80	11.40	0.24	3.41	0.06	0.87	0.03	0.40
2.0	71			0.97	13.85	0.29	4.14	0.07	1.05	0.03	0.49
2.2	78			1.16	16.52	0.35	4.94	0.09	1.25	0.04	0.58
2.4	85			1.36	19.40	0.41	5.80	0.10	1.47	0.05	0.68
2.6	92					0.47	6.73	0.12	1.71	0.06	0.79
2.8	99					0.54	7.72	0.14	1.96	0.06	0.91
3.0	106					0.61	8.77	0.16	2.23	0.07	1.03
3.5	124					0.82	11.66	0.21	2.96	0.10	1.37
4.0	141					1.05	14.93	0.27	3.79	0.12	1.75
4.5	159					1.30	18.57	0.33	4.71	0.15	2.18
5.0	177							0.40	5.73	0.19	2.65
5.5	194							0.48	6.83	0.22	3.16
6.0	212							0.56	8.02	0.26	3.71
6.5	229							0.65	9.30	0.30	4.30
7.0	247							0.75	10.67	0.35	4.94
7.5	265							0.85	12.12	0.39	5.61
8.0	282							0.96	13.66	0.44	6.32
8.5	300							1.07	15.28	0.50	7.07
9.0	318							1.19	16.99	0.55	7.86
9.5	335							1.32	18.477	0.61	8.69
10.0	353							1.45	20.64	0.67	9.55
15.0	530									1.42	20.22

Volume Flow FAD		NPS Pipe size/ Inside diameter (mm)									
		1 1/2		2		2 1/2		3		4	
		40.89		52.50		62.71		77.93		102.26	
(m^3/ min)	(cfm)	(bar)	(psi)	(bar)	(psi)	(bar)	(psi)	(bar)	(psi)	(bar)	(psi)
0.8	28	0.01	0.09								
0.9	32	0.01	0.11								
1.0	35	0.01	0.13								
1.2	42	0.01	0.19								
1.4	49	0.02	0.25	0.01	0.07						
1.6	56	0.02	0.32	0.01	0.09						
1.8	64	0.03	0.40	0.01	0.11						
2.0	71	0.03	0.49	0.01	0.14						
2.2	78	0.04	0.58	0.01	0.17						
2.4	85	0.05	0.68	0.01	0.20	0.01	0.08				
2.6	92	0.06	0.79	0.02	0.23	0.01	0.09				
2.8	99	0.06	0.91	0.02	0.26	0.01	0.11				
3.0	106	0.07	1.03	0.02	0.30	0.01	0.12				
3.5	124	0.10	1.37	0.03	0.39	0.01	0.16				
4.0	141	0.12	1.75	0.04	0.50	0.01	0.21				
4.5	159	0.15	2.18	0.04	0.63	0.02	0.26	0.01	0.09		
5.0	177	0.19	2.65	0.05	0.76	0.02	0.31	0.01	0.11		
5.5	194	0.22	3.16	0.06	0.91	0.03	0.37	0.01	0.13		
6.0	212	0.26	3.71	0.07	1.06	0.03	0.44	0.01	0.15		
6.5	229	0.30	4.30	0.09	1.23	0.04	0.51	0.01	0.17		
7.0	247	0.35	4.94	0.10	1.42	0.04	0.58	0.01	0.20		
7.5	265	0.39	5.61	0.11	1.61	0.05	0.66	0.02	0.22		
8.0	282	0.44	6.32	0.13	1.81	0.05	0.75	0.02	0.25		
8.5	300	0.50	7.07	0.14	2.03	0.06	0.83	0.02	0.28	0.01	0.07
9.0	318	0.55	7.86	0.16	2.25	0.06	0.93	0.02	0.31	0.01	0.08
9.5	335	0.61	8.69	0.17	2.49	0.07	1.02	0.02	0.35	0.01	0.09
10.0	353	0.67	9.55	0.19	2.74	0.08	1.13	0.03	0.38	0.01	0.10
15.0	530	1.42	20.22	0.41	5.80	0.17	2.38	0.06	0.80	0.01	0.21
20.0	706			0.69	9.87	0.28	4.06	0.10	1.37	0.02	0.35
25.0	883			1.05	14.92	0.43	6.13	0.15	2.07	0.04	0.53
30.0	1059			1.46	20.90	0.60	8.59	0.20	2.90	0.05	0.75
35.0	1236					0.80	11.43	0.27	3.86	0.07	0.99
40.0	1412					1.03	14.63	0.35	4.94	0.09	1.27
45.0	1589					1.28	18.20	0.43	6.14	0.11	1.58
50.0	1765							0.52	7.46	0.13	1.92
55.0	1942							0.62	8.90	0.16	2.29
60.0	2118							0.73	10.46	0.19	2.69
65.0	2295							0.85	12.13	0.22	3.12
70.0	2471							0.97	13.91	0.25	3.57
75.0	2648							1.11	15.80	0.28	4.06
80.0	2824							1.25	17.81	0.32	4.58
85.0	3001							1.40	19.92	0.36	5.12
90.0	3177									0.40	5.69
95.0	3354									0.44	6.29
100.0	3530									0.48	6.92
150.0	5295									1.03	14.64

Table 3. EQ series – Air pipeline dimensions

NOTE

The above table shows the pressure drops in 100m length schedule 40 steel pipe at 7 bar (abs)

1. Use the pipe sizes (as in Table 3) for the delivery pipe that connects to the ball valve of the compressor.
2. In case the main delivery pipe is more than 100 m (300 feet) long, use a pipe diameter that is one size bigger than shown in the table.

5.1.7 Receivers for compressed air systems

Receiver applications		Compressed capacity			
Volume		On/Off control		Modulation control	
m^3	ft^3	m^3/min	cfm	m^3/min	cfm
0.3	10.59	Up to 1.13	Up to 40	Up to 1.7	Up to 60
0.5	17.66	1.14 - 2.4	41 - 85	1.7 - 3.4	61-120
1	35.32	2.4 - 4.0	86 - 140	3.4 - 6.7	121-235
1.5	52.97	4.0 - 6.4	141 - 225	6.7 - 10.0	236-355
2	70.63	6.4 - 8.8	226 - 310	10.0 - 13.0	356-470
3	106.0	8.8 - 12.6	311 - 445	13.0 - 20.1	471-710
4	141.3	12.6 - 16.1	446 - 570	20.1 - 26.7	711-945
5	176.6	16.1 - 19.8	571 - 700	26.7 - 33.4	946-1180
6	211.9	19.8 - 24.0	701 - 850	33.4 - 40.0	1181-1415
7	247.2	24.0 - 28.0	851 - 990	40.0 - 46.7	1416-1650
8	282.5	28.0 - 32.0	990 - 1130	46.7 - 53.3	1651-1885

Table 4. EQ series—Receivers specifications

5.1.8 Possible mistakes

1. The compressor is installed on the wooden pallet of the packing case.
2. The compressor base is not making 100% contact with the floor.
3. The compressor is mounted on anti-vibration mounts.
4. The isolator is more than 5m (16.40ft) away from the compressor.

5.1.9 Commissioning procedure

1. Please make preparations according to the installation section as given, before the compressor is commissioned.
2. Ensure that the location meets the requirements of accessibility, ventilation and safety.
3. Provide electrical power as recommended in the installation section.
4. Select air pipe lines and receivers for your system according to the tables provided in the installation section.

Checkpoints before commissioning

Replace the parts in compressor if it had been in storage for more than one year.

1. Air filter
2. Oil filter
3. Air oil separator (check and replace)
4. Oil

a. Check for any external / internal damages of the package.

b. Monger the main motor and fan motor should be mongered to find the winding insulation conditions if the compressor is not commissioned for more than 1 year

c. Re-grease the main motor to be carried out if the compressor is not commissioned for more than 1- ½ years (18 Months)

d. Replace the AVMs if you detected any abnormal squeezing or damage in the rubber part.

e. Check whether all the screws in the control panel are in place and tightened properly.

f. Check the oil cooler and after-cooler for any external fin blockage and clear the blockage if necessary.

d. Ensure that all the transit brackets are removed.

During commissioning

The Servicing technician performs a series of checks on the machine and on the systems to which it connects, to ensure that it is in a condition to function safely and as recommended. The Servicing technician will then explain how to operated and maintain the equipment. This procedure is referred to as the commissioning process.

The commissioning of the compressor ensures that it is installed safely.

The general operating conditions of the equipment including the cleanliness of the atmosphere, the temperature and the ventilation are checked. Technical details relating to your system such as particulars of your electrical installation are noted. The operator of the compressor is familiarized with all aspects of both its normal running and dealing with unusual situations.

Upon completion of the commissioning process, the technician will fill in the document known as the commissioning report and the warranty card provided in this manual.

During commissioning any modification suggested by the technician should be performed before the compressor is ready for regular use. Else, Warranty become void if not done. In case of change of operator other than the person trained, the new operator should be trained before he is dedicated for operating the compressor.

5.1.10 Oil fill procedure

Initial oil fill procedure

Check whether your compressor comes with the oil filled.

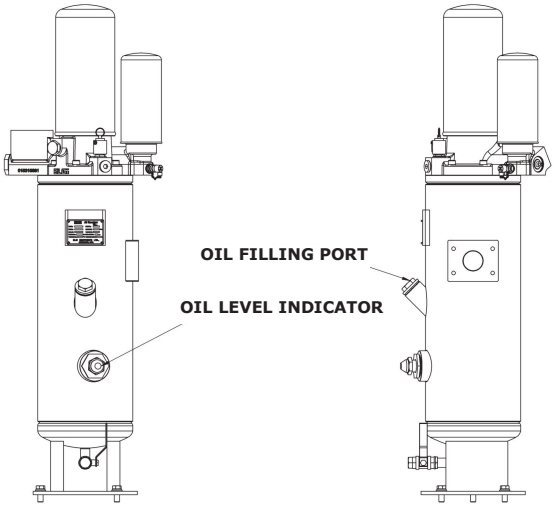


Figure 9. Oil filling and oil level indicator location on air oil seperator tank

This can be checked through the oil sight float gauge on the air oil separator tank. If not, follow the oil filling procedure given below.

How to read oil level?

- When level indication is in start of red zone as shown in figure start filling of oil (**Oil less alarm region**)

- Fill the oil up to this black line (black line in the green region) (**Oil Fill limit region**)

When to read oil level?

Following sequence to be followed before reading the oil level in separator tank

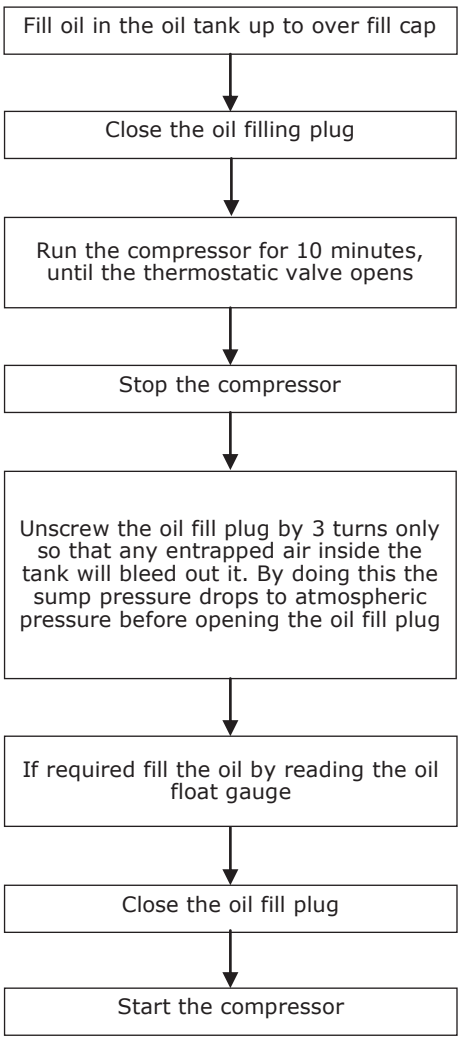
a) Switch off the machine in load condition

b) Wait for 3 mins to allow the oil drain back to separator tank

c) Read the oil level as mentioned above

Oil level check

- The float gauge indication should be shown as "green" after fumes settle down after shutdown.



Sl. No.	HZ	Model	Volume of oil required (litres)
1	50	EQ 11- 7, 8, 9.5 & 12.5 EQ 15- 9.5 & 12.5 EQ 18- 12.5	9
2		EQ 15- 7 & 8 EQ 18- 7,8 & 9.5 EQ 22 -7,8,9.5 & 12.5	10
3	60	EQ 11 -100,125,150 & 175 EQ 15 -100,125,150 & 175 EQ 18 -150 & 175 EQ 22 -175	9
4		EQ 18 -100 & 125 EQ 22 -100,125 & 150	10

NOTE

Refill oil in the tank if the level falls below the minimum level.

5.2 Preservation for long idle storage

If your compressor is going to remain unused for six months or longer, special measures must be undertaken to ensure the protection of the following components:

- Airend
- Motors
- Air–oil separator tank
- Rubber hoses

5.2.1 Airend

To prepare the airend for 6-month storage:

- Remove the airend discharge hose/pipe coupling.
- Rotate the drive coupling three times so that the oil present inside the airend comes out through the discharge port.
- Block the discharge port completely.
- Remove the inlet rubber duct connected to the intake valve of the air filter assembly.
- Turn the intake valve flap and pour rust preventive oil (use Castrol DWX 32 or an equivalent grade) into the airend through the intake valve.
- Rotate the coupling five times by hand so that the rust preventive oil spreads all over the bearings, seals and other parts of the airend.
- Drain the rust-preventive oil by opening the discharge port plug fully.
- Refit the hose/pipe coupling on the discharge port.
- Take care to ensure that all the openings are plugged always to avoid dust entry.
- Rotate the compressor shaft once in 7 days and ensure free rotation.
- This procedure protects the airend for up to six months storage. It must be repeated every six months during storage.
- For more details contact ELGi office or ELGi's distributer network.

5.2.2 Motor

- To prepare the motor for 1-year storage: Check the insulation of the motor winding.
- Remove any moisture in the motor.
- Check junction box terminals for tightness of wires.
- Apply grease on the motor bearings.
- This procedure will protect the motor for up to one year storage.

5.2.3 Air-oil separator tank

To prepare the airend for 2-year storage:

- Drain the oil from the separator tank.
- Remove the entire tank from the compressor after disconnecting it from all hoses, the tank top plate, the minimum pressure valve outlet line, and control pulse lines and control switches.
- Clean the tank using ELGi compressor clean flushing oil.
- Check the air-oil separator tank.
- Replace the oil filter element before you use the compressor.
- Replace the air filter element similarly.
- Flush the tank, airend with compressor oil and replace the separator element before using the compressor again.

5.2.4 Rubber hoses

Test recommendations for rubber hoses	
Age	**Recommendations**
Up to 3 years	Use without further testing.
3 to 5 years	Use after representative samples are subjected to proof-pressure test.
5 to 8 years	Use after representative samples are subjected to proof, impulse, and burst pressure tests, and cold bend and electrical tests.
Over 8 years	Scrap.

⚠ WARNING

Please adhere to the safety instructions provided at the section 2.3.2 : precautions during operations

5.3.1 Initial start-up checks

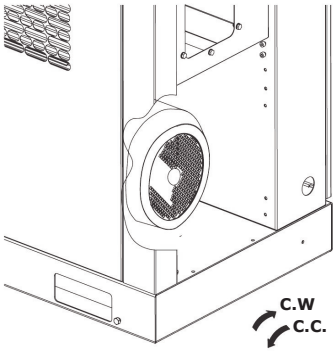
- Check whether the oil level in the tank is up to the specified level. If not, top up oil as per the oil fill procedure given in the maintenance section.
- Open all doors and visually check the compressor for abnormality. Make sure all connections are tight.
- Open the electrical panel door of the compressor and check that the three phases and earth cables are connected securely. (L1, L2, L3, and PE wires.)
- Check the necessary earthing line in the panel/ compressor base.
- Ensure that all condensate drains are connected properly.
- For water cooled compressors, ensure that the water inlet and outlet valves are opened. Also make sure that the inlet and outlet water drain valves are closed.

5.3.2 Initial start-up

Turn on power, open the air outlet ball valve and press the start button (Green). The direction of rotation of motor for gear driven airend is clockwise (C.W.) whereas in case of direct driven airend direction of rotation is counter clockwise (C.C.W.) from motor cowling side (non-driving side). The correct direction of rotation is also shown on the motor. Ensure correct direction of rotation. if not, stop the compressor by pressing the stop button (Red) on the control panel. Open the isolating switch and reverse the appropriate lines.

⚠ WARNING

Running the compressor in the wrong direction for more than 5 seconds will cause damage to compressor parts or even cause total damage.



Sl. No.	HZ	Model	Type of Drive
1	50	EQ 11- 7, 8, 9.5 & 12.5 EQ 15- 9.5 & 12.5 EQ 18- 12.5	Gear Driven
2		EQ 15- 7 & 8 EQ 18- 7,8 & 9.5 EQ 22 -7,8,9.5 & 12.5	Direct Driven
3	60	EQ 11 -100,125,150 & 175 EQ 15 -100,125,150 & 175 EQ 18 -150 & 175 EQ 22 -175	Gear Driven
4		EQ 18 -100 & 125 EQ 22 -100,125 & 150	Direct Driven

5.3.3 Daily start checks

Before using the compressor every day, you must prepare it by performing these tasks:

- Check whether the oil level in the tank is up to the specified level. If not, top up oil as per the oil fill procedure given in the maintenance section.
- Open all doors and visually check the compressor for abnormality. Make sure all connections are tight.
- Refer to section 6.1.1 for how to perform daily maintenance activities.

5.3.4 Starting

To prepare to start the system, perform these tasks:

- Turn on power.
- If all inputs from contact switches, pressure and temperature transducers are normal, the display will indicate "READY''.
- Open the air discharge valve.
- Press the ''START'' (green) button on the controller.
- Machines with an automatic star-delta starter will have 6 seconds changeover time from star to delta and another 10-seconds delta-to-run delay.

5.3.5 During running

- To ensure seamless running:
- Monitor the controller display and control panel indicators regularly when the compressor is running.
- Graphic warning display: This gives graphically the location of fault.
- Discharge temperature sensor & warning: It is fixed on the air-oil discharge pipe. It senses the temperature of the discharge air-oil mixture. The compressor will shutdown automatically and the warning light on the controller will glows when the discharge temperature exceeds the preset value of 110 ± 5ºC (230 ± 9ºF).
- Separator element warning: Indicates that the separator element needs to be replaced. The

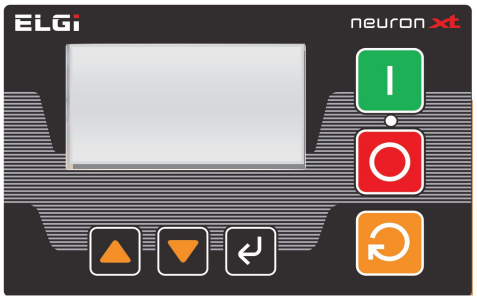


Figure 20 Human machine interface

compressor will not shutdown automatically in this situation.

- Oil filter warning: Indicates that the oil filter element needs to be replaced. The compressor will not shutdown automatically in this situation.
- High discharge temperature warning: The compressor will shutdown automatically and the warning light on the controller will glows when discharge temperature exceeds the preset value of 110 ± 5ºC (230 ± 9ºF).
- Main motor overload trip: The compressor will shutdown when the main motor is overloaded and the corresponding warning light will glow.
- Fan motor overload trip: The fan motor has internal thermal overload protection, which safeguards the fan motor. If the fan motor trips, discharge oil temperature will be high and the compressor will trip.
- Reset button: This button must be pressed before restarting the compressor after it has shutdown with a warning. The machine must be restarted only after taking necessary remedial measures.
- Pressure relief valve: This valve relieves the pressure in the air-oil separator tank when it exceeds 14.5 bar. g (210 psi.g)
- Reverse direction switch: If the motor rotates in the wrong direction, the reverse direction switch detects and, in turn, trips off the compressor.

Model	Type	Cutout pressure bar
EQ 11 - EQ 22	Standard, Standard +VFD	Working pressure + 0.5

- After reaching the maximum cutoff pressure the pressure sensor senses the pressure and cuts off the solenoid electrical supply.

5.3.6 Stopping

- Press the stop (Red) button in the controller. The compressor will come to a halt within 10 seconds.
- In case of emergency, to stop the compressor use the emergency stop switch. Correct the fault, rotate counter clockwise, and unlock the emergency switch. Then press the reset button before the next start.
- Do not use the emergency stop switch for normal stopping.
- Close the air discharge valve.

⚠ WARNING

- *Isolate the power supply before the discharge ball valve closes.*
- *Do not use the emergency stop switch for normal stopping.*

- For water cooled models, close the water inlet valve.
- If any possibility of freezing exists, drain the cooling system completely.

5.3.7 Changing the compressor settings

Change the compressor settings using the tactile keypad and LCD panel on the controller. (Refer to Neuron manual to learn ——— ◆ ◆ ◆ ———more about control panel and how interpret the message.)

Refer the VFD setting procedure manual for VFD operations.

6.0 Maintenance

Contents

6.1 Maintenance

6.1.1 Maintenance intervals

Frequency	Part	Remarks
Daily	Oil level	Check
	Warning / alarms	Check
	Condensate in AOS tank	Check
Weekly	Pre filter (air intake, cooler, control panel)	Clean *
	Air filter element	Clean *
1000 hours or 3 months #	Pre filter	Clean *
	Moisture drain	Clean
2000 hours or 6 months #	Oil & after coolers - air cooled (External)	Check & Clean *
	Oil	Sampling **
4000 hours or every year #	Oil filter	Replace
	Pre filter (air intake, cooler, control panel)	Replace *
	Air filter element	Replace *
	Oil – Air lube XD / Air lube FG	Replace
	Air-oil separator element – Air lube XD / Air lube FG	Replace
	Return line sight glass / orifice / NRV	Check & Clean
	Return line strainer	Check & Clean
8000 hours or every 2 years #	Oil – Air lube UT Synthetic plus	Replace
	Air-oil separator element – Air lube UT Synthetic plus	Replace
	Electrical connections	Check
	Drive coupling element	Replace
	Intake valve kit	Replace
	Actuator kit	Replace
	MPV kit	Replace
	BDV kit	Replace
	Solenoid valve	Replace
	Safety valve	Replace
	Thermal Valve Kit	Check & Replace
	Tubes and Fittings Kit	Replace
	Blow down adjustment kit	Check & Replace
	Oil & after coolers - water cooled (External)	Check & Clean
	Grease for 50 Hz & 60 Hz motor (4 pole)	Re-grease

- Whichever comes first * - More frequently in dusty atmosphere ** - For USA region only

Table 5. Maintenance intervals

NOTE

The above maintenance schedule is valid for standard reference conditions (Refer Table A) and standard working pressure (Refer technical data)
If the compressor is operating at low duty cycle, dusty environment, high humidity, high temperatures the maintenance interval will be shorter.
In the event of change in operating / environmental conditions, consult ELGi.

REFERENCE CONDITIONS

Air inlet pressure (absolute)	*bar(g) / psi(g)*	*1 / 14.5*
Air inlet temperature	*°C / °F*	*20 / 68*
Relative humidity	*%*	*0*

Table—A

NOTE

Depending on the ambient conditions and operating conditions of the compressors with variable frequency drive (i.e. with low ambient / low duty cycle), thermal valve element to be replaced with a higher rating if necessary.

Precautions

A. If the compressor is kept idle

- Close the main air outlet valve.
- Drain the water from the condensate system.
- Close the inlet and outlet water valve. (applicable only for water cooled compressors)

B. If the compressor is kept idle for more than 6 months

- Follow the above steps.
- Refer to the section "Preservation for long idle storage".

6.1.2 Oil change over procedure

FROM Present Oil in the compressor	**TO** Change Oil type in the Compressor			
	ELGi Airlube XD (Mineral)	ELGi Airlube UT Synthetic	ELGi Airlube UT Synthetic plus	ELGi Airlube FG (Food Grade)
ELGi Airlube XD (Mineral) 000998118– 5 Liters 000998119 - 20 Liters 000998121 - 210 Liters	NA	ELGI Air lube Cleaner Cleaner Oil 000998074 - 20 Liters	ELGI Air lube Cleaner Cleaner Oil 000998074 - 20 Liters	ELGI Airlube FG Cleaner* Cleaner Oil
ELGi Airlube UT Synthetic 000998092 - 5 Liters 000998090 - 20 Liters 000998093 - 208 Liters	NA	NA	No Cleaner required	ELGI Airlube FG Cleaner* Cleaner Oil
ELGi Airlube UT Synthetic plus 000998101 - 5 Liters 000998102 - 20 Liters 000998103 - 209 Liters	NA	NA	NA	ELGI Airlube FG Cleaner* Cleaner Oil
ELGi Airlube FG 000998079 - 5 Liters 000998078 - 20 Liters 000998077 - 210 Liters	NA	NA	NA	NA

Table 6. Oil change over procedure

*Yet to be approved by ELGi

Procedure for change over of oil

Step 1 : Drain the present oil in the compressor completely

Step 2 : Fill in cleaner oil (Ref. above table) to the recommended oil quantity in the compressor

Step 3: Run the compressor for 500 hours and drain out the cleaner oil completely

Step 4: Replace Oil filter and Air oil separator

Step 5: Fill the compressor with new required oil type.

Sl. No.	Part Description	Part Number
1	MOBILITH SHC 100 GREASE (CARTRIDGE)	105400563

Table 7. Electric motor grease

⚠ WARNING

Disconnect all the power at the source before you attempt to perform the maintenance or adjustment.

6.1.3 Maintenance of individual components and systems

Check all accessories independently to verify that they are functioning as required and replace their components as necessary.

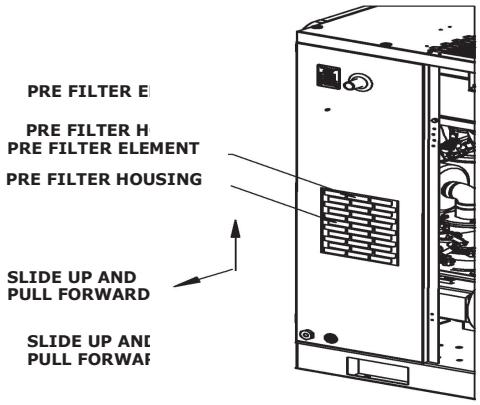


Fig 11. Pre filter

6.1.3.1 Pre filter

Pre work

- Switch off the compressor and disconnect power supply to the motor.
- Close the discharge end ball valve.
- Release the air oil tank pressure and allow the tank to cool for a few minutes.

Requirements

- Compressed air, new pre-filter element (if needed)

Maintenance

- Switch off the machine
- Refer to the pre-filter cartridge removal & insert procedure.
- Hold or fix the pre-filter assembly in the cleaning area.
- Clean the pre-filter with compressed air at less than 2.5 bar.g (36.3 psi.g) from the reverse or back side of the pre filter cartridge.
- In case of major dust/dirt accumulation in the pre-filter element, wash with clean water or light detergent.
- Do not use any acidic/alkaline chemicals for cleaning.
- Repeat this process based on dust conditions or at regular periodic intervals.

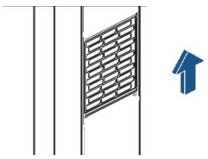
Suction pre-filter cartridge removal procedure

1. Slide Upward

Hold the pre-filter between the louvers and slide upwards slightly until the pre-filter bottom edge is visible

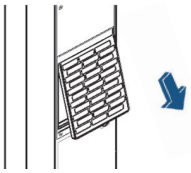
2. Slide Downward

When the pre-filter bottom edge is visible, slant the pre-filter forward and slide it downwards away from the compressor.



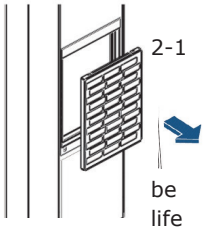
3. Pull Forward

When the top and bottom edges of the pre-filter are free from the main unit, move the pre-filter forward to remove completely.



Suction pre filter cartridge insert procedure.

For insert sequence procedure from 3-2-1



6.1.3.2 Air filter

If the air filter clog indicator shows a red colour (meaning the blocked condition), then the air filter needs to be cleaned or replaced (if the stipulated life has elapsed).

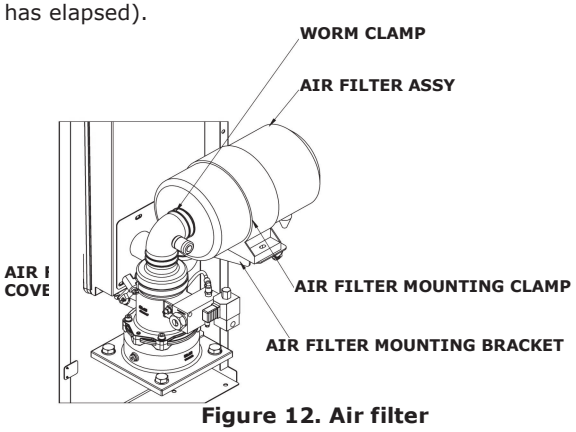


Figure 12. Air filter

Pre work

- Switch off the compressor and disconnect power supply to the motor.
- Close the discharge end ball valve.
- Release the air oil tank pressure and allow it to cool for few minutes.

Requirements

- Compressed air, new filter element (if needed).

Maintenance

- Unlock the mounting clips provided on the filter housing.
- Rotate and remove the filter element and remove it carefully.
- Clean from the filter using moisture free compressed air at less than 2.5 bar.g (36.3 psi.g).
- Clean from the inside to outside.
- Remove the dust ejector from the filter housing cap and

clean it carefully.

- Show bright light from inner side of the filter element to inspect for damage or holes that result in leaks.

- will emerge from the holes, indicating their locations. In case of damages replace the filter element.
- Inspect all rubber seals and their contact surfaces of the housing. Faulty rubber sealing must be replaced immediately.
- Return the filter element back in position, assemble the filter housing cap such that the dust ejector settles in bottom position, and lock the assembly using the mounting clips.
- Inspect and tighten all air inlet connections prior to resuming operation (if necessary).
- Reset the air filter clog indicator.
- If a clean element is to be stored for later use, it must be stored in a clean container.

6.1.3.3 Air oil separator

Pre work

- Switch off the compressor and disconnect power supply to the motor.
- Close the discharge end ball valve.
- Release the air oil tank pressure and allow it to cool for

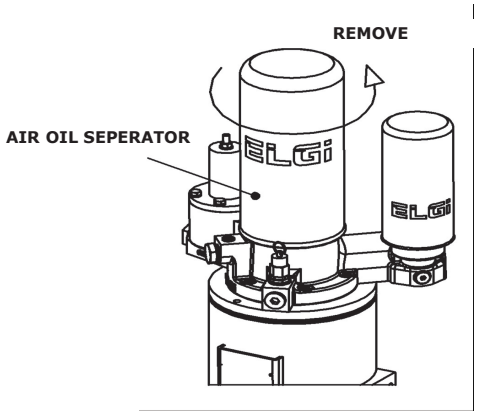


Figure 13. Air oil separator

few minutes.

Requirements

- Strap wrench, new separator element, clean cloth.

Maintenance

Disassembly of existing separator

- Hold the separator outer shell by the removed strap wrench and rotate it counter clockwise, until it completely unscrews
- Ensure the hex adapter stays in the separator head during disassembly
- Once the recommended life is over, replace it with a new element.

Assembly of new Separator

- Ensure O-ring of the separator is damaged free.
- Clean the O-ring-seating surface with a clean cloth
- Apply a thin film of compressor oil on the mating surface of the O-ring.
- Return the separator to its original position and rotate it by hand clockwise.
- Ensure no oil leaks from the mating surface. In case of leakage, check the O-ring.
- After tightening by hand, rotate it further for one and a half times

6.1.3.4 Oil top up & oil change over

Proper compressor maintenance and operation is crucial for the lubricant to function properly and last till its estimated rated oil hours. The oil product shelf life is of minimum 3 years and maximum 5 years. Products should be kept properly sealed in the original container. Once the seal is broken, the above stated life span of the product is no longer applicable. Products should be stored in proper storage warehouse that is away from direct sunlight and is not exposed to weather elements like rain, typhoon and snow storms. The products should also be stored away from any heat source, high humidity, and moisture areas. If drums are stacked on ground level, they should all be stacked horizontally with the bung openings arranged at

NOTE

The air-oil separator tank is tested according to standards. Regularly have inspections performed in conformity with local regulations.

the 3 and 9 o'clock position.

ELGi recommends that once the seal is broken, all products be used immediately. ELGi does not encourage reuse or recycling of any of these leftover fluids due to contamination hazard. ELGi will not warrant the quality of the product once the original seal is broken. Also ensure that the oils are not mixed up between brands and types.

Please refer Material Safety Data Sheet (MSDS) for oil spill handling and disposal procedures.

Pre work

- Switch off the compressor and disconnect the power supply to the motor.
- Close the discharge end ball valve.
- Release the air oil tank pressure and allow the tank cool for few minutes.

Requirements

- New oil, flushing fluid (if needed)

Maintenance

Step 1: Draining

a. Remove drain plug from the bottom of the separator tank and drain out all oil. Drain oil while the compressor is warm.

b. Remove the pipe and drain plug from bottom of oil cooler. Then drain completely .

c. Disconnect all oil pipe work to the prevent oil from being trapped. Then, drain completely.

d. Drain oil from the airend discharge pipe after dismantling it.

NOTE

- *The compressor is filled with a particular oil, if you want to change over to other types of oil, perform steps 1, 2 and 3.*
- *If you want to change the oil but continue with the same kind (same brand & type) perform steps 1 and 3 only.*
- *Ensure that you drain at least 90% of oil capacity of the compressor; if not the residual oil can contaminate new oil.*
- *Ensure no oil spills on anti-vibration mount during maintenance.*

e. Drain oil from the airend by hand rotation.

Step 2: Flushing (Only for oil change over)

For Oil change over procedure refer 6.1.2

a. After 300 hours, send a sample** to ELGi for analysis.

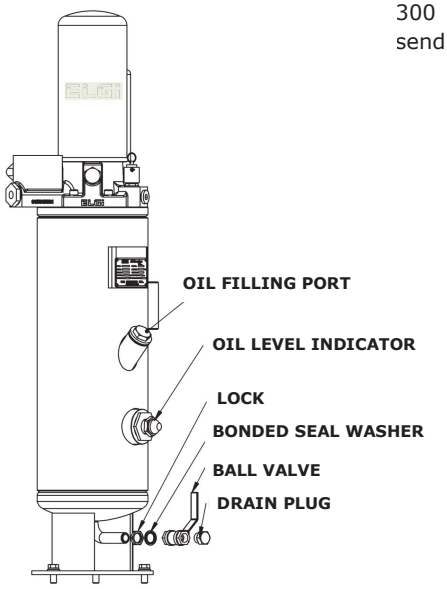


Figure 14. Air oil separator tank– oil drain

***: Applicable only for USA.*

NOTE

- *The cleaner is not recommended to run longer than 500 hours.*
- *Change the oil filter and oil separator after oil change over.*

Step 3:

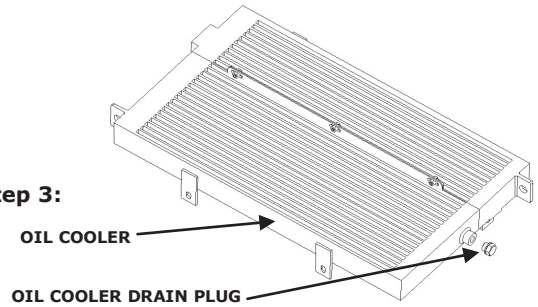


Figure 15. Cooler oil drain

Filling the oil

a. Add fresh oil; fill it up to the oil fill plug. (initial fill)

b. Close the oil fill plug

c. Pour oil into airend through the intake valve after removing the air filter hose. Then restart the compressor.

d. Allow it to run for about 10 minutes.

e. Stop the compressor.

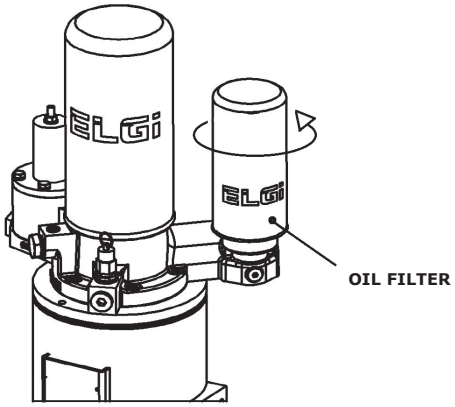


Figure 16. Oil filter

f. Unscrew the oil filling plug after 5 minutes so that residual pressure in the tank is vented out through the bleed hole in the oil fill plug.

g. Refill the tank up to the oil fill plug. (second fill)

h. Restart the compressor.

6.1.3.5 Oil filter

The oil filter is fitted between the oil cooler and the airend unit. The components of the oil filter assembly are shown

in the figure 15. This is a full flow filter with a pleated element. To service this filter, order the consumables kit (available with ELGi service personnel) The procedure for complete servicing of this filter is as follows.

Pre work

- Switch off the compressor and disconnect power supply to the motor.
- Close the discharge end ball valve.
- Release the air oil tank pressure and allow it to cool for a few minutes.

Requirements

- Strap wrench, new oil filter, and clean cloth, O-ring.

Maintenance

Disassembly of the existing oil filter :

- Isolate the machine from the service line, vent separator tank pressure, and allow the tank to cool for few minutes.
- Hold the filter shell and rotate it counter clockwise using the strap wrench.

Assembly of new oil filter :

- Ensure the O-ring of the filter is damage free.
- Clean the seating surface with clean cotton
- Apply a thin film of compressor oil on the mating surface of the O-ring
- Return the filter to its original position and rotate it clockwise manually. After tightening, rotate it further by hand for one a half rotation
- Ensure no oil leaks from the mating surface.

6.1.3.6 Intake valve

NOTE

Suspended particulate matter should be less than 150spm to achieve the specified consumable life. Guarantee become void compressor is operated above its intended pressure.

⚠ WARNING

Valves should not be opened without releasing the pressure is applied.

NOTE

The maintenance of following parts (valves) demands highly skilled authorized personnel. So, it is recommended that an ELGi service engineer does the maintenance.

NOTE

Below mentioned numbering procedure is documented for EIV 102. Ignore numberings that are unavailable in part list of EIV 102 .

Pre work:

- Switch off the compressor and disconnect the power supply to compressor.
- Close the discharge end ball valve.
- Release the air pressure in separator tank and allow the tank to cool for 10 mins.

Requirements :

- Pressure gauge, Soft cloth, Grease, Liquid cleaner.
- Refer periodic maintenance kit
    - **EIV 102:**Intake valve kit EIV 102, BDV Assembly kit EIV 102, Tamper Cap kit EIV 102 , Actuator Kit EIV 102,Hoses and Fittings Kit.

Disassembly procedure:

- Remove the connections of intake valve
    - Pulse line & blow down line connection
    - Power supply to solenoid
    - Duct from air filter
- Remove the intake valve from Air end.
- Remove the Solenoid valve (26) & Hex nipple (37).
- Remove quick fittings (19),(49),(52) & hoses (36) (51A),(51 B).
- Remove the Silencer (50).
- Remove the BDV assembly from Top Housing(03).
- Remove O rings (27) & (45).
- Remove the Actuator block(34) from Bottom housing (01).
- Remove the Throttle plate (09) from Throttle shaft (08) by disassembling screw(11) and spring washer(10)
- Remove the Bush(8) and Sleeve (42) from top housing (03).
- Remove the Top Housing(03) from Bottom housing(01).
- Remove the Plunger(05) and Spring(04) from Bottom housing(01).

Maintenance

- Clean Bottom housing(01) bore dia, Plunger(5) sliding area with liquid cleaner.

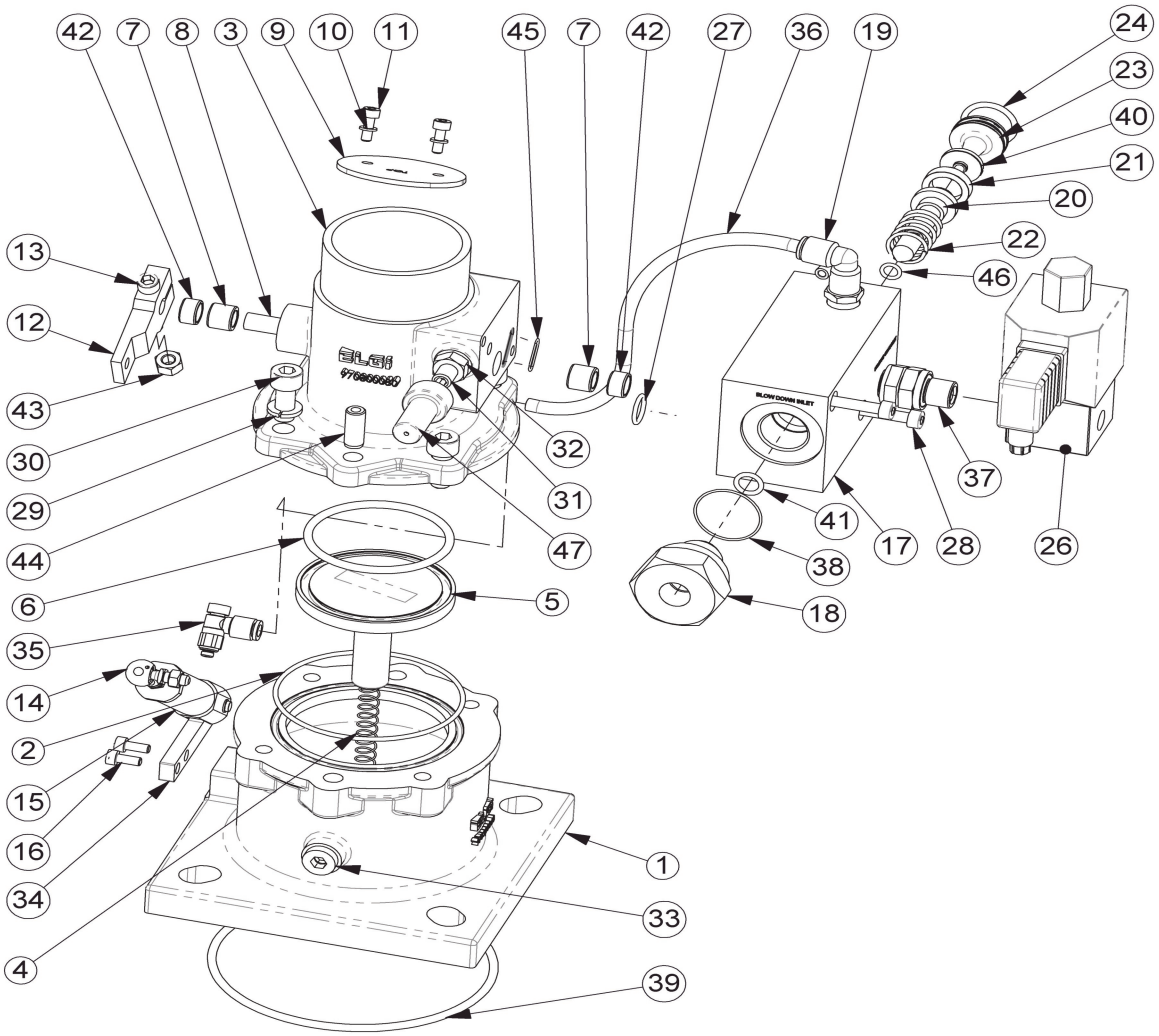


Figure 17. EIV 102 - A970008

Sl. no	Description	Part number	Qty
2	O-RING ID74.0 X 2.0	991401220	1
4	SPRING CHECK VALVE IV102	970400050	1
5	PLUNGER IV102	970300100	1
6	O RING 54.02 X 3.53	970400220	1
7	BUSH THROTTLE SHAFT	970400030	2
13	SCR SOC HD CAP M6x35	000983067	1
14	BALL JOINT MACHINED M5X0.8	B004900520003	1
15	ACTUATOR PNEU.	B011406760001	1
16	SCR SOC HD CAP M5x16 12.9	000983044	2
17	BLOWDOWN BLOCK	970300170	1
19	QF ELBOW 1/4BSP-DIA 6	000920624	1
26	SOL VALVE NC,24V50/60HZ	B007300990017	1

Sl. no	Description	Part number	Qty
27	O-RING ID11.6 X 1.8	990402410	1
28	SCR SOC HD CAP M5x40	000983050	2
31	SCREW GRUB M8X40	970400370	1
32	NUT;HEX;M8; ZYP	000948008	1
34	SUPPORT ACTUATOR IV102	970400070	1
35	FLOW CONTROL VALVE	B013406760001	1
36	TUBINGS 6MM	000920620	0.3
39	O-RING ID110.7 X 3.5	415400814	1
42	SLEEVE 102	970400280	2
43	NUT NYLOC M6	000948307	1
45	O RING ID 12.5X1	970400400	1
47	TAMPER CAP EIV	970300680	1

Table 8. EIV 102 - A970008

- Clean the pivot hole of Top housing (03) in which throttle shaft rotates.

NOTE

Refer GA drawing (EIV 102 - 970300390) for required torque values.

- After cleaning replace all parts as per the kit drawing.

Assemble the intake valve in the following sequence:

- Insert the Spring(04) and Plunger(05) in the Bottom housing(01).
- Assemble the Top Housing(03) and Bottom housing (01).
- Insert the Bush(8) and Sleeve (42) in top housing (03).
- Assemble the Throttle plate (09) and Throttle shaft (08) with screw(11) and spring washer(10). Ensure the engraving "TOP" in throttle plate is facing the top side.
- Fasten the Actuator block(34) and corresponding actuator kit parts to Bottom housing(01) .
- Connect throttle shaft (08) and ball joint(14) with the help of shaft connector(12). Press the throttle plate against the housing (03) and fasten shaft connector(12) with bolt (13).
- Assemble O rings (27) & (45).
- Assemble the BDV assembly kit to Top Housing(03) with screw(28).
- Assemble quick fittings (19),(49),(52) & hoses (36) (51A),(51 B).

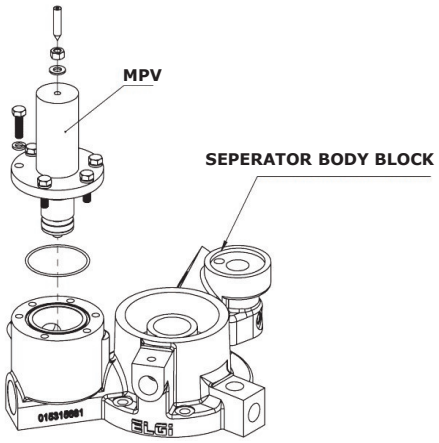


Figure 19. Minimum pressure valve

⚠ CAUTION

No Load sump pressure adjustment should be carried out by skilled ELGi service person only.

- Assemble the hex nipple(37) & Solenoid valve (26) .
- Assemble the intake valve on Air end.
- Connect the below mentioned parts to intake valve
    - Pulse line & BDV tube connection
    - Power supply to solenoid
    - Duct from air filter

No Load sump pressure adjustment:

- Assemble the pressure gauge to the air oil separator tank by removing the plug.
- Start the compressor , run in unload mode and check no load sump pressure is in the range of 1.2 to 1.6 bar.g / 17.4 - 23.2 psi.g.

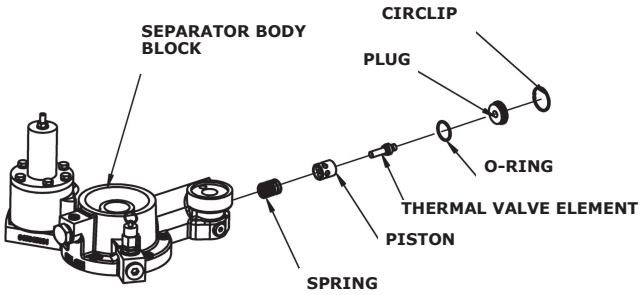


Figure 20. Thermal valve

After completion of intake valve assembly in package, ensure to verify the performance as per the product

- If no load sump pressure is out of specification, follow the below steps to adjust the no load sump pressure.

Adjustment procedures as follows,

- Break & Remove the Tamper cap (47).
- Loosen Nut (32) .
- Adjust Blow down adjustment screw (31) to achieve no load sump pressure.
    - Turn the screw clockwise to increase the no load sump pressure
    - Turn the screw anticlockwise to decrease the no load sump pressure
- Fasten the Nut (32), after attainment of desired no load sump pressure
- Apply Loctite & Assemble the new tamper cap(47).

6.1.3.7 Minimum pressure valve

Pre work

- Switch off the compressor and disconnect power supply to the motor.
- Close the discharge end ball valve.
- Release air oil tank pressure and allow the system to

⚠ WARNING

- *Extreme caution should be taken while removing the cap or cover from the body because of the spring.*
- *Over and under setting of the MPV can upset machine performance*

cool for a few minutes.

- Release the receiver tank and downstream pressure.

Requirements

- New MPV kit, allen key, grease.

Maintenance

MPV Replacement

- Unscrew the four screws
- Remove and replace the old MPV kit with a new one.
- Grease the O-ring groove in the new MPV kit
- Assemble the MPV kit and reinstall the spring and cap.
- Tighten the bolts
- Adjust stud protrusion (6mm/0.236 inch) to achieve a minimum pressure of 4.5 bar.g (65 psi.g)

6.1.3.8 Thermal valve

Pre work

- Switch off the compressor and disconnect power supply to the motor.
- Close the discharge end ball valve.
- Release air oil tank pressure and allow the tank to cool for few minutes.

Requirements

- Pliers, screw driver, new thermal valve element, new O-ring.

Procedure

Replacing thermal Valve

- Remove the circlip using a plier
- Remove

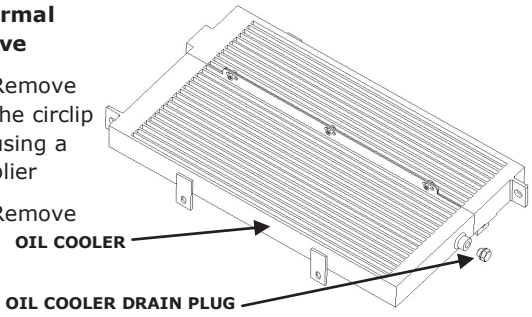


Figure 15. Cooler oil drain

the thermal valve from the separator body

- Inspect and clean seating area in the housing
- Fix a new thermal valve
- Assemble the valve in its place and lock it by circlips.
- Remove the plug using an M6 screw.
-

6.1.3.9 Electric motor greasing

Pre work

- Switch off the compressor and disconnect power supply to the motor.
- Close the discharge end ball valve.
- Release air oil tank pressure and allow the system to cool for a few minutes.

Requirements

- Recommended grease (refer table 7), cleaning cloth, grease gun.

Procedure

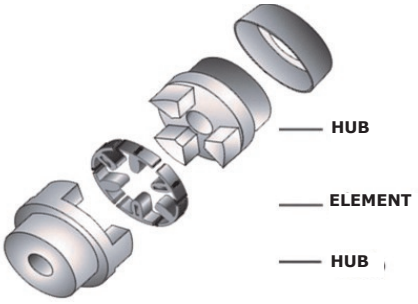


Figure 23. Drive coupling

- Thoroughly clean the grease inlet fitting or plug. If the motor has a plug, remove the plug and clean the inlet.
- Remove the drain plug and wipe out any hardened grease.
- Slowly pump the grease into the grease inlet until the new grease comes out of the drain plug.
- Start the motor and let it run for a minimum of one hour to expel any excess grease from the drain opening before re-installing the drain plug.
- Stop the motor and lock out the switch.
- Re-install the drain plug.
- Put the motor back in operation.

6.1.3.10 After and oil coolers

Pre work

- Switch off the compressor and disconnect power supply to the motor.
- Close the discharge end ball valve.
- Release the air oil tank pressure and allow the system to cool for a few minutes.

Requirements

- Pliers, allen keys.

Maintenance

External surfaces

- Open both the LH panel and cooler inspection cover.

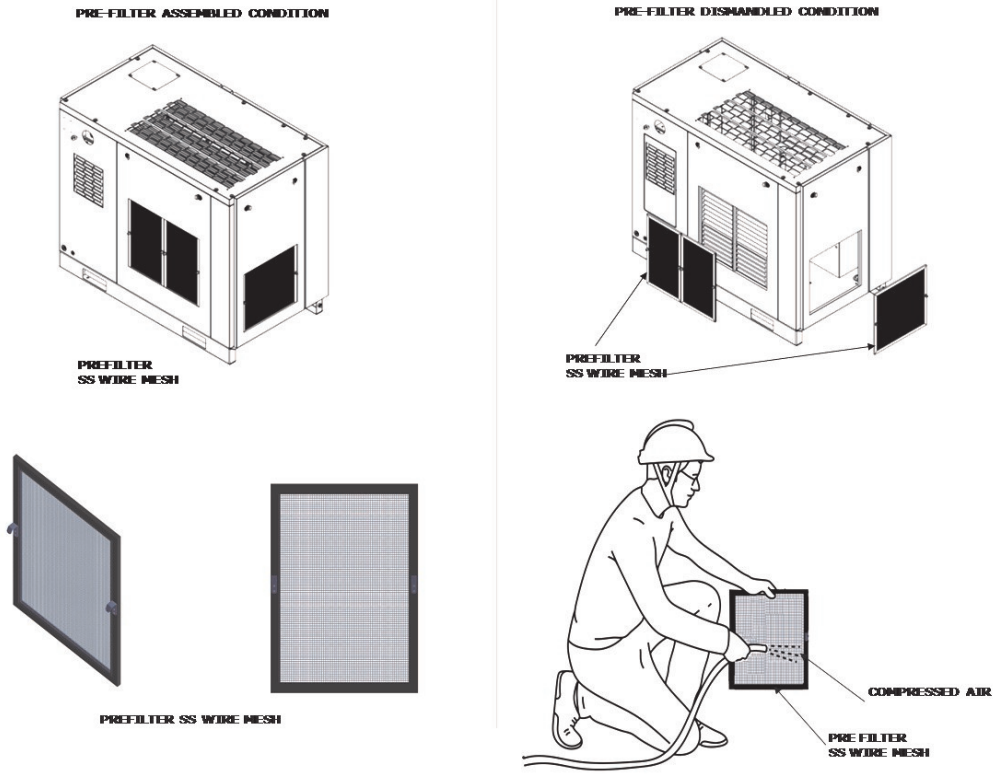


Figure 22. Pre filter –SS Wire-mesh

- Use compressed air below 2.5 bar.g(36.3 psi.g) to clean the outer surface of the cooler.
- Supply a jet of air in direction opposite to the cooling airflow direction
- After cleaning the outer surface of the cooler, properly close the cooler with a cleaning plate and an LH panel.

6.1.3.11 Drive coupling

Malfunctioning of the coupling element results in abnormal sound and excessive vibration.

Pre work

- Switch off the compressor and disconnect power supply to the motor.
- Close the discharge end ball valve.
- Release the air oil tank pressure and allow the system to cool for few minutes

Requirements

- Spanners, new coupling element.

6.1.3.12 Cooler and motor suction prefilter

prefilter cleaning & maintenance instructions

- Lift upward & take out the cooler pre-filter assembly from the compressor.
- Hold the pre-filter assembly in the cleaning area.
- Clean the pre-filter with compressed air at less than 2.5 bar.g(36.3 psi.g) from the reverse / back side of the prefilter.
- In case of major dust / dirt accumulation in the pre-filter mesh, wash with clean water.
- Do not use any acidic / alkaline chemicals for cleaning.
- Repeat the process based on dust conditions or at regular periodic intervals.

Maintenance

Replacing the Coupling Element

- Open the cooler side panel covers
- Open the coupling guard from the adapter ring
- Remove the three coupling screws and slid the coupling element on the shaft spline to free the coupling element
- Replace the old coupling element with a new coupling
- Tighten the coupling screws to the specified torque
- Assemble the coupling guard and cooler side panel cover
- Inspect every three month to ensure screw stay tight.

6.1.3.13 Oil Strainer

Pre work

- Close the discharge end ball valve.
- Switch off the machine and disconnect the power supply to the motor.
- Release the air oil tank pressure and allow it to cool for few minutes.

Effect	Spurious part	Remarks
Higher power consumption	Air oil separator	Due to dense filtration media, it creates in additional pressure drop and so causes additional power consumption. Every1 bar (14.5 psi) of pressure drop results in ~7% additional power consumption.
	Lubricant	Spurious oil loses its properties soon and may get solidified causing the rotor to malfunction.
Reduced performance	Air oil separator	This imposes 10% additional resistance for air flow and creates more pressure drop and thus additional load on motor. Inadequate separation deteriorates air quality, reduce the performance, and damages downstream components. It also results in huge oil loss (1L / 200hr).
	Oil filter	Contaminants are not filtered properly and the contaminated oil affects the critical parts of airend. Thus it reduces performance and life (33% reduction) of the air end, air oil separator etc. Contaminated oil also cause clogging and reduces the cooler performance.
	Air filter	Dust carries over to the system and causes the same problems as caused by the spurious oil filter
Safety hazard	Air oil separator	Inadequate earthing can cause a separator to collapse (25% risk). Inadequate earthing can also cause fire and destroy the entire machine.
Cost		Higher power consumption means a higher operating cost. Reduced performance leads to extra functioning and operating cost. Spurious parts will damage the other components and accelerate maintenance frequency and cost. Higher consumption of consumables like oil (due to the use of spurious parts) will result in, increased cost.

element

6.2 Troubleshooting

This guide lists the most likely indications with possible causes. For any problem, follow the diagnosis in sequential order as mentioned in the following charts. Before doing any work in the compressor, be sure that electrical supply has been cut off and the entire compressor is depressurized.

Problem	Cause	Solution (go sequentially)
Compressor not starting	Power supply not available	Restore incoming power supply
	Incoming voltage is below limit	(1) Correct the incoming voltage.
		(2) Ensure isolator is within 5m (16 ft) from the compressor.
		(3) Ensure sufficient power back up
		(4) Select and use the correct cable size.
	Emergency stop switch in pushed condition	Rotate counterclockwise direction and release
	Emergency stop switch malfunction	Clean or replace the emergency switch.
		Tighten the wires at terminals
	Isolator fuse blown.	(1) Select correct fuse rating from selection chart.
		(2) Check and correct the short circuit within the control panel.
		(3) Dedicated isolator to be provided to the compressor.
		(4) Check and correct the motor winding/ body short after megger test.
	Incoming phase-to-phase voltage imbalance of more than 5V	Correct incoming voltage.
		Adjust main incoming transformer tapping.
		Correct the power factor to less than unity.
	Incoming phase to earth voltage imbalance of more than 5V	Correct the incoming voltage.
	Control MCB malfunction	Replace MCB
	Control fuses inside compressor control panel blown	Check for any short circuit or loose connection.
		Replace the solenoid valve / control transformer if defective.
		Replace the glass fuse as per the drawing (for Neuron, for the control circuit).
	Control transformer fuse blown	Replace the control transformer if defective.
		Replace glass fuse as per the drawing (for Neuron, for the control circuit).
	No power supply to Neuron controller.	(1) Replace control transformer fuses.
		(2) Ensure tight connection of the 24V power supply connector to Neuron
		(3) Replace control transformer.
	No display in Neuron controller	(1) Replace the control transformer.
		(2) Replace the control fuse.
		(3) If 24V power supply to Neuron is okay then replace with anew Neuron micro controller.

Problem	Cause	Solution (go sequentially)
High discharge oil temperature	Oil level is low	(1) Check and refill oil to correct the level. (in stopped condition)
		(2) Refer diagnosis procedure for high oil carry over.
		(3) Arrest oil leaks
		(4) Ensure the correct grade of oil is used.
	Room temperature is higher than outside ambient temperature by 30°C (86°F)	Improve ventilation in compressor room
	Oil cooler clogged externally	Clean the cooler assembly / cooler pre filter mesh (if available) externally by first using a fibre brush and then blowing compressed air at 2.5 bar.g(36.3 psi.g).
		For sticky dust, remove the cooler, close all the cooler ports with dummy plugs and do a water-wash with soap oil.
		Install the cooler prefilter mesh.
	Cooling fan rotating in wrong direction.	Check and correct the wiring connection to the cooling fan.
		Replace with correct fan type.
	Check fan motor fuse	Replace the fuse if blown.
		Replace with the 2A fuse.
	Cooling fan not working.	Check and ensure the neutral connection is connected.
	Temperature sensor malfunction	Replace the sensor.
		Tighten/recrimp the connection with adaptor.
	Oil filter clogged	Replace oil filter.
		If required replace the oil (based on the condition of oil) and run the compressor.
	Thermal valve malfunctioning	Replace the thermal valve element.
	Oil injection orifice chocked or improper size	Clean the oil injection orifice.
		Replace with correct size.
	Air filter clogged	Clean or replace the air filter
	Separator element clogged	Check pressure drop is less than 1bar (14.5 psi).
		Replace oil.
		Replace separator element.
	Poor quality of oil	Replace oil.
	Oil cooler clogged internally	Check for pressure drop across the oil cooler if less than 1.5 bar (22 psi).
		Check and clean the cooler internally with 20L of isopropyl alcohol + toluene mixture in the 1:1 ratio and circulate for 4 hours with external 1 HP pump.
		Refit the cleaned cooler and, if required, replace oil (based on condition of the oil) and run the compressor.

Problem	Cause	Solution (go sequentially)
High oil carry over	High oil level	Drain excess oil and maintain the recommended oil level.
	Oil is milky	Replace oil and maintain the recommended level.
	Scavenge return line non return valve (NRV)/ orifice clogged	1) Remove the return line NRV/orifice and clean it thoroughly.
		2) Change/clean the air filter.
	Scavenge return line tube clogged	Remove and clean the clogged scavenge return line tube.
	Scavenge return line tube gap not maintained (not applicable below 22kW units)	Remove the return line tube from the separator and correct it.
	The spin-on separator internal pipe thread damaged (applicable to EN series)	Replace the internal pipe.
	High discharge oil temperature (DOT)	Refer to the diagnosis procedure for high DOT.
	Improper grade of oil	Use ELGi recommended Air lube oil.
	Separator punctured/collapsed (not applicable below 22kW units)	Replace with new separator.
	Separator element bonding ruptured (not applicable below 22kW units)	Replace with new separator.
	Compressor runs at lower pressure than normal pressure.	1) Use suitable higher capacity compressor or match demand to compressor capacity.
		2) Arrest all line leakages.
	Minimum pressure valve (MPV) opening earlier than at the specified opening pressure* 4.5 bar.g (65.26psi.g). * 3.5 bar.g (50.8 psi.g) for compressors with working pressure 4.5 bar.g	Replace MPV kit/assembly.
High tank pressure	Neuron microcontroller pressure settings: 1) Unload pressure set value is above specification. 2) High tank pressure set value is below specification.	Check and correct the unload pressure and high tank pressure values in Neuron micro-controller
	Intake valve malfunction	1) Check and replace intake valve kit if required.
		2) Check the solenoid valve and clean or replace if required.
		3) Check and replace the actuator kit if required.
	BDV malfunction	Check/replace
	Compressor started with air outlet ball valve closed	Open the outlet ball valve.
	Solenoid valve malfunction	Check the solenoid valve and clean or replace if required.
	Neuron microcontroller malfunction	Replace the Neuron microcontroller
	Pressure transmitter malfunction	Replace the pressure transmitter
	MPV stuck up (check with pressure gauge in AOS tank)	Replace the MPV kit.
	Separator element choked	Replace the separator element

Problem	Cause	Solution (go sequentially)
Loading/unloading Problem	No control air supply to solenoid valve	Replace / connect
	Solenoid valve malfunctioning	1. Replace the solenoid valve assembly
		2. Clean the orifice
	No electrical supply for energising the solenoid valve	Replace the Neuron microcontroller
	Intake valve malfunctioning	Check and replace the intake valve kit.
	Blow-down valve malfunctioning	1. Clean or change BDV assembly.
		2. Clean the orifice.
	MPV malfunctioning	1. Check and change the MPV kit.
		2. Check and change the MPV assembly
	Actuator failure	Check and change the actuator / kit / assy.
	1. Air requirement is more than compressor capacity	1. Replace the compressor 2. Arrest all pipeline leakages.
	2. Working pressure is lower than required application pressure.	
	3. Excess pressure drop in pipe line.	
	Pressure transmitter malfunction	1. Tighten the lap cable
		2. Replace the lap cable
		3. Replace the pressure transmitter
		4. Replace the Neuron microcontroller
	Malfunction of R04 relay (loading/ unloading relay) in Neuron microcontroller	Replace the Neuron microcontroller
	Unload mode enabled in Neuron microcontroller	Disable 'unload mode' in operator settings of the Neuron microcontroller

Problem	Cause	Solution (go sequentially)
Pressure not built up	Inlet air pre-filter mat clogged	Clean/change pre-filter mat by following these steps: Switch off the machine. Squeeze and pull out the pre-filter mat from the canopy. Clean pre-filter with compressed air at less than 2.5 bar /36.3 psi Refit the filter after cleaning.
	Clogged air filter element	Clean/change air filter element.
	1. Air requirement is more than compressor capacity	1. Replace compressor 2. Arrest all pipeline leakages.
	2. Working pressure is lower than required application pressure.	
	3. Excess pressure drop in pipe line.	
	No control air supply to solenoid valve.	Replace / connect the control line tubes.
	Solenoid valve malfunctioning	1. Replace the solenoid valve assembly
		2. Clean the orifice
	No electrical control supply to solenoid valve	Replace the microcontroller
	Intake valve malfunctioning	Check and replace intake valve kit.
	Blow down valve malfunctioning	1. Check and change the BDV assembly.
		2. Clean the orifice.
	MPV malfunctioning	1. Check and change the MPV kit.
		2. Check and change the MPV assembly
	Actuator failure	Check/change actuator / kit / assembly.
	Separator element choked (increase in pressure drop across separator)	Replace separator element. If required, replace the oil (based on condition of the oil) and run the compressor.

6.3 Decommissioning, dismantling and putting out of service

If you do not intend to use the compressor or any of its parts, you must dismantle and putting out of service. These tasks must be carried out in compliance with the standards in force of that particular country.

6.3.1 Waste disposal

- Use of compressor generates waste. The residues from agricultural, industrial, crafts, commercial and service activities must be treated as waste, which needs to be disposed off properly. Deteriorated or obsolete machines are also classified as waste.
- Special attention must be given to active carbon filters as they cannot be included in urban waste. Observe the waste disposal laws in force where the compressor is used.
- It is mandatory to record loading or unloading of exhausted oils, obsolete machines and toxic harmful wastes that derive from heavy or light industry processes.
- It is especially important that exhausted oils be disposed off in compliance with the laws in the countries of use.

6.3.2 Dismantling the compressor

- Dismantle the compressor in accordance with all the precautions imposed by the laws in force in the country of use.
- Before dismantling, request an inspection by the relevant authorities. Disconnect the compressor from the electrical system.
- Eliminate any interfaces the compressor may have with other machines, making sure that interfaces between remaining machines are unaffected.
- Empty the air oil tank containing the lubricating oil and store in compliance with the laws in force.
- Proceed with the disassembly of the individual compressor components and group them together according to the materials they are made of: Steel, Stainless Steel, Aluminium and plastic parts.
- Then scrap the machine in compliance with the laws in force of the country of use.

6.3.3 Decommissioning the compressor

- Remove the foundation for the compressor.
- Unplug the power cable entry to the compressor.
- Drain the oil from the cooler and air oil tank. Dispose of it properly.
- Make sure all the compressed air is vented out through ball valves and safety devices residing in the compressor.
- Ensure that all the external supply lines have been properly disconnected from the compressor before decommissioning.

6.3.4 Disposal of consumables and replaced parts

- The moisture condensate separated from the compressed air contains oil particles. Disposal of condensate and filter element is to be done in accordance with the pollution control norms prevailing at the time of compressor installation or use.
- Parts of the compressor that are replaced have metal and rubber components. These may be recycled and disposed of according to pollution control regulations, respectively.
- Rubber items such as AVMs, coupling elements, and O-rings should be disposed and replaced before running again.

NOTE

ELGi is not responsible for the disposal of old oil or condensate. It is the responsibility of customer to dispose of the foregoing in accordance with local environmental statutory laws.

⚠ WARNING

The compressor does not give any warnings during short operating times. If it is operated below the dew point and moisture condensate may mix with oil. This will reduce the lubricating quality of the oil and lead to damage of compressor.

6.4.1 ELGi customer care system (ELGi CCS)

ELGi provides dedicated customer care and after-sales support through the ELGi customer care system (CCS), a computerized system developed in-house. The CCS aims to minimize the time taken to resolve customer complaints.

Service requests/complaints

The CCS toll-free telephone number 1800-425-3544 (accessible within India through BSNL and MTNL lines) patches the customer's call to our centralized customer care center in Coimbatore. Customers can register their service requirements or complaints here.

A unique tracking number is generated for each call logged by the CCS. The customer receives an automatic e-mail acknowledgement with the tracking number and details of the call for reference.

A service engineer is assigned to the call, and the date and time of the engineer's visit are communicated to the customer by e-mail. Every requirement or complaint must be resolved and closed in the CCS within a specified time limit, failing which the complaint is automatically brought to the notice of the manager. If the issue remains unresolved, it will get escalated to the managing director. The CCS ensures that not only the customer complaints are logged but they are also attended to on time, every time.

Enquiries

A number of calls received by the CCS relate to customer queries regarding products and spare parts. The details are noted, and basic information on product specifications and usage is provided. The caller is then referred to a salesperson at the head office or the appropriate branch for follow-up.

The CCS database

The CCS also creates a database of customers, adding details of every new customer who calls, thereby building a large pool of installation details. These details are used to provide value-added services to improve customer satisfaction with ELGi products.

CCS-working hours

The ELGi CCS works for six days a week from 08:30 to 21:30 IST (Monday to Saturday).

Multi-lingual capability

The coordinators at the CCS are multi-lingual. They can handle calls in English and all the major regional languages of India.

Coverage: The CCS toll-free number 1800-425-3544 is accessible from the following areas:

- **Southern Region:** Tamil Nadu, Karnataka, Kerala, Puducherry, Andhra Pradesh, Telangana, Andaman & Nicobar Islands.
- **Western Region:** Maharashtra, Gujarat, Madhya Pradesh, Goa, Lakshadweep Islands.
- **Eastern Region:** Orissa, Chhattisgarh, Jharkhand, West Bengal, Bihar and the North-Eastern states.
- **Northern Region:** Rajasthan, Uttar Pradesh, Delhi, Haryana, Punjab, Uttaranchal, Himachal and Jammu & Kashmir.

Contact Numbers: You can contact CCS also with the following numbers:

Telephone: 0422-2589206 / 241 / 242 / 243/ 244 / 245 / 97900 21100

Fax: 0422-2589240

Please send the following details to the mail, thus enable us to take immediate action.

1. Name of the customer
2. Compressor model
3. Fab. number
4. Contact person name
5. Phone number
6. Nature of complaint
7. Hour meter reading

You may use the CCS by sending e-mail to: **ccs@elgi.com**

Customer satisfaction survey

If you have used the CCS, you may be contacted for your feedback on our after-sales support. Your response helps ELGi to improve.

International customers:

Refer contact information at the end of this manual book.

6.4.2 ELGi genuine spare parts

When ordering spare parts, refer to the lists provided in the parts manual and identify the part number. Specify the part number and quantity, in addition to the name plate details. Global support center of ELGi ensures the supply of the quality spares on time. Ensure that you are using the genuine spare parts so that your Compressor will be working efficiently and effectively. Refer to section 6.1.3 for details on need of using genuine spares.

Please contact our After sales team for any compressor accessory requirements like VFD, Air-Dryer, etc.

6.4.3 Air audit

We extend our proven capabilities in energy efficiency initiatives by carrying out air audits for our customers.

ELGi conducts audits and trains end users in key energy oriented functional areas. The audit reports prepared by ELGi experts' team include recommendations on short, medium and long term measures for energy conservation, along with financial estimates and analysis for implementation.

This air audit objective is to provide the customer with :

- The framework for systematic collection of data relevant to the efficient operation of compressed air systems.
- A thorough analysis about the performance of the compressed air system, identifying potential electricity savings and to provide sound recommendations for implementation of energy efficiency initiatives.

Data analysis will be comprised of the information about different areas such as air leakages, inappropriate use of compressed air, compressed air system network,

compressed air system supply including compressor internal maintenance conditions and even more.

The final report issued to the customer end will serve the purpose of assisting concise, consistent and complete presentation of the analysis, findings and recommendations arising from a compressed air system audit.

Depending on the measurement, reporting and cost requirements from the customer end, the intensity in level of audit (base level or investment level) will be decided. Also post implementation monitoring after air audit will be provided if requested from the customer end.

For further information on air audit contact ELGi.

E-Mail: ccs@elgi.com

6.5 Appendix

6.5.1 Conversion tables

Description	From	To	Multiply by
Length (L)	Inches	Millimetres	25.4
	Metres	Inches	39.37
	Feet	Millimetres	304.8
	Metres	Feet	3.281
	Inches	Thou	1000
	Millimetres	Micrometres	1000
Area (A)	Square metres	Square feet	10.765
	Square feet	Square inches	144
	Square inches	Square millimetres	645.16
Volume (V)	Cubic metres	Cubic feet	35.315
	Cubic feet	Cubic inches	1728
	Cubic metres	Litres	1000
	Cubic feet	Litres	28.32
	US gallons (liq)	Litres	3.785
	Imperial gallons (liq)	Litres	4.546
Volumetric flow (Q)	Cubic feet per minute (cfm)	Cubic metres per hour (m^3/h)	1.6988
	Cubic feet per minute (cfm)	lpm	28.32
	Cubic metres per hour (m^3/h)	lpm	16.667
	Cubic metres per minute (m^3/min)	lps	16.667
Mass (M)	Kilograms	Pounds	2.205
	Kilograms	Grams	1000
	Kilograms	Ounces	35.27
Pressure (P)	kg f/cm^2 g	psi g	14.223
	psi g	Pascal	6895
	bar g	kg f/cm^2 g	1.0197
	bar g	psi g	14.503
	psi g	kg f/cm^2 g	0.0703
Temperature (T)	Degree Celsius (°C)	Degree Fahrenheit (°F)	°F = 9(°C)/5 +32
	Degree Celsius (°C)	Kelvin (K)	K = °C + 273.15
	Degree Fahrenheit (°F)	Degree Rankine (°R)	°R = °F + 460
Heat (q), Work (W), Energy (E)	ft-lb f	Joules	1.35582
	ft-lb f	Btu	0.001285
	Joules	Calories	0.2388
	Btu/h	Calories/h	252
	Kilowatts	Btu/h	3411
Power (P)	Metric horsepower	Kilowatts	0.7355
	Imperial horsepower	Kilowatts	0.7457

Table 8: Conversion table

6.5.2 Torque values

The tightening torque values for bolts and screws used in ELGi Compressors are provided in this section for reference. The tolerance for the torque values is (-) 10% from the given value.

Thread size*	Tightening torque (N-m)	Tightening torque (lb-ft)
M4	2.9	2.13
M5	5.7	4.20
M6	9.8	7.22
M8	24	17.7
M10	47	34.66
M12	81	59.73
M16	197	145.28
M20	385	283.93

Table 9: Metric hexagonal head bolts and screws

Thread size (inches)	Tightening torque (N-m)	Tightening torque (lb-ft)
¼"	45	33.19
½"	85	62.69
¾"	170	125.38
1"	330	243.39
1¼"	430	317.15
1½"	510	376.15

Table 10: BSP threads

Thread size (inches)	Tightening torque (N-m)	Tightening torque (lb-ft)
9/16"	149	109.8875
7/8"	579	427.0125

Table 11: UNF threads

* Property class of 8.8 only

6.5.3 Service log book – record of maintenance

Date	From	Till	Total operated hours / day	Line pressure	System pressure	Discharge temperature	Oil level in AOS tank	Moisture removal from AOS tank	Pre Filter Cleaning	Cooler cleaning	Trip record descrip-tion	Comments	Operator sign
	Start/Stop Time						Low/ normal/ high/ change	Before starting					

6.6 Disclaimers

Please read this document and the warranty terms accompanying the product carefully before using our product.
By purchasing our product, you agree that you will assume total responsibility and risk for your use of the product.
The warranty terms of the product have been provided separately.

1. ELGi is not liable for failure of the compressor (hereinafter "compressor" or "product") to perform its obligations if such failure is as a result of Acts of God (including but not limited to fire, flood, earthquake, storm, hurricane or other natural disaster), war, invasion, act of foreign enemies, hostilities (regardless of whether war is declared), civil war, rebellion, revolution, insurrection, military or usurped power or confiscation, terrorist activities, nationalization, government sanction, blockage, embargo, labour dispute, strike, lockout or interruption or failure of electricity or telephone service and any other reasons beyond ELGi's control.
2. ELGi does not take responsibility for any damage or injury resulting from neglecting the safety instructions, warnings, cautions, precautions, or non-observance of the normal caution and care required for installation, operation, maintenance and repair of the product, even if not expressly stated, and such instances are specifically disclaimed by ELGi.
3. The entire literature including product description or any other information in this manual exclusively belongs to ELGi and is subject to copyright. No person has any right to copy, modify, distribute, transmit, display, perform, reproduce, publish, license, create derivative works, transfer or sell any information, or deal with the same in any other manner, without the knowledge and written concurrence of ELGi, violation of which would amount to infringement of rights of ELGi and would necessitate legal action.
4. The information published in this manual may include inaccuracies, or typographical errors. Changes may be periodically added to the information herein. Any changes/improvements may also be made to the products stated in this manual and ELGi is not liable if the readers are not updated with information.
5. Likewise ELGi is responsible only till the point of first sale to the ultimate customer and not thereafter and only if the product is purchased from authorized dealers of ELGi. ELGi disowns liability on account of purchase of any second hand product or purchase otherwise from unauthorized dealers. ELGi shall not be liable for any indirect, incidental, punitive, special or consequential losses or damages including any loss of profit, loss of production, loss of income or contract, loss of goodwill, expected savings or business relationships, arising out of or in any way connected with the usage of the product or information in this manual.
6. In no event ELGi shall be liable for any claims or loss having a value higher than the original purchase price of the product sold by ELGi or its network of authorised dealers.
7. These Disclaimers and the contents of this manual shall be subject to the laws of India and any disputes pertaining to this manual or anything stated therein or any product stated therein is subject to the exclusive jurisdiction of the courts in Coimbatore, Tamil Nadu, India.
8. No liability in connection with the product will accrue to ELGi,

- If any welding or related operation involving heat is carried out in the compressor. Never weld or modify any parts including pressure vessels.
- If any damages to the product directly or indirectly arise due to long storage (6 months) of product and subsequent corrosion of internal parts and which leads to fire or malfunctioning of the product.
- If the compressor package and its accessories are installed in such a way to allow moisture, rain, freezing temperature or sun damage to affect the safe operation of the unit.
- If the person who operates / maintains the compressor does not adhere to all work related safety practices and regulatory requirements.
- If unauthorized personnel other than ELGi authorized or trained personnel carries out commissioning, installation, operation, maintenance and any repair work on the compressor.
- If the compressor and the compressed air are used for unintended use or are misused.
- If the compressor is operated below or in excess of its pressure and temperature limits.
- If the compressor "ON/ OFF" switch is operated through remote control situated away from the compressor location without giving any adequate notice / alarm before starting the product .

Controller Manual

Neuron XT

Version 3.6
Dec 2021

Contents

Contents

Abbreviations Used

Dis. Pressure	Discharge pressure
Dis. Temperature	Discharge temperature
HSP	High sump pressure
Temp	Temperature
DPAF	Differential pressure air filter
DPOF	Differential pressure oil filter
AF	Air filter
OF	Oil filter
Min	Minimum
Max	Maximum
UL	Unload
En	Enable
Dis	Disable
L	Load
St	Stop
F	Fault
R	Run
Sby	Standby
STC	Start count
LDC	Load count
Ph Fail	Phase failure
Pr	Pressure
Tr	Temperature
DCS	Distributed control system
PR	Pressure
MMOL	Main motor overload
OL	Overload
NC	Not connected
RST	Restart time
DTR	Delta to run
RTS	Run to stop
REM	Remote
RTU	Remote terminal unit

7.1 Technical specification

The following are the specifications that you must be familiar with for Neuron XT

Definition	:	Pre programmed logic controller
Function	:	Compressor control system
Part number	:	018362887
Working voltage	:	19 to 28.8 VAC
Power consumption	:	10W (Max)
Display	:	Monochrome graphics LCD (128 x 64)
Protections	:	Power interruption & low voltage cutoff
Detection	:	Zero crossing detection
Keypad	:	6keys

Terminal connections

X01 - Power supply 24VAC, OV (Earth will be connected via socket)

X02 - Digital input (5), analog inputs (2), RS485 (MODBUS communication)

X03 - relay output (Main, Star, Delta)

X04 - Relay output (load/unload, programmable relay 2 no's)

X05 - Phase reverse / Phase loss detection

Relay outputs	:	6 Ports
Rated voltage	:	24VDC / 230VAC
Rated load	:	10A @ 230VAC
Contact resistance	:	max 100milli ohms
Insulation resistance	:	min 1000Meg ohms @ 500VDC
Usage	:	4 pre-programmed (main, star, delta, load / unload solenoid) 5Th & 6Th relay - programmable for warn / ready / remote / trip / service / standby / load / FAN /ADV
Digital inputs	:	5 Ports
Rated voltage	:	24VDC
Usage	:	Emergency stop, motor overload, cooler overload, remote load_ unload/spp, remote start/stop
Analog inputs	:	2 Ports

1 x 4-20mA inputs for pressure

Range	:	0~16 bar (0 to 232 psi)
Resolution	:	0.1bar (1 psi)
Accuracy	:	±0.1bar (1 psi)

1 x Resistance input for temperature (PT1000)

Range	:	-10~150°C (14 to 302°F)
Resolution	:	1°C (2°F)
Accuracy	:	±1°C (2°F)

3Phase detection

Phase loss /phase reverse detection before starting the compressor

Communication ports

Protocol	:	MODBUS RTU protocol
Mounting	:	128 x 99 mm - Panel
Mounting overall dimensions :	:	172 x 123x 80 mm
Regulatory	:	CE, UL
Operating temp	:	-10 ~ 55°C (14°F ~ 122°F)
Storage temp	:	-10 ~+70°C (14°F ~ 158°F)
IP protection	:	IP55 on the front panel side
RH	:	<95% @ 40°C (104 °F) without condensation

7.2 Installation instruction

7.2.1. Equipment's safety

ELGi conduct thorough checks of the device before delivery according to the prescribed tests of the inspection scheme. In order to maintain this status through shipment and secure a safe operation, the user must consider the notes and warning notes provided as safety tips and in the instruction manual.

Important points to observe

The device must be operated by only trained persons. Maintenance and repair must be executed only by trained, technical staff, who are familiar with the associated dangers. The device can be operated without impairment of its security within the certified environment condition.

7.2.1.1. Static discharge warning

This equipment is sensitive to electrostatic discharge, which can cause internal damage and affect normal operation. Follow these guidelines when you handle this equipment

Touch a grounded object to discharge potential static.

Wear an approved grounding wrist-strap.

Do not touch connectors or pins on component boards.

Do not touch circuit components inside the equipment.

Store the equipment in appropriate static-safe packaging when not in use.

7.2.1.2. Assembly

The place of assembly must correspond to the class of protection. The ambient temperature at the place of installation should not exceed the recommended temperature for the nominal use, as specified in the data sheet. It is not to be used in wet conditions.

The devices may must be installed only outside of explosion hazardous areas.

7.2.1.3. Electrical connection

External connections must be carried out according to rules in the respective country where the compressor is being used.

Switch off the device before carrying out any wiring work.

Do not connect or disconnect any wire when the device is operating.

7.2.1.4. Power supply

Ensure that the supply voltage corresponds with the specification on the type sign.

Consider the load on the electrical circuit/phase before you switch on the device along with other devices and/or mechanisms. Do not connect welding or such high electrical noise sources to the same line as the controller supply.

7.2.2. General instruction

Observe the following procedures and instructions closely to avoid damage to the control panel and its associated equipment. Reliability of the system depends upon proper installation and maintenance.

The device is to be examined for damages resulting from inappropriate feed and storage. If the device indicates damage that could impede safe operation, stop operating.

Carefully unpack the system. Open the door and inspect the cabinet, door, printed circuit board and other components for shipping-related damage.

Good practice is to store the cabinet in a clean, dry area until you mount it.

Return the signal cables and power cable separately.

Connect the protective earth in the panel to field earth only.

Protection from direct sunlight

Since the electronic circuits must not be subjected to uncontrolled temperatures, place the cabinet in the shade, away from direct sunlight.

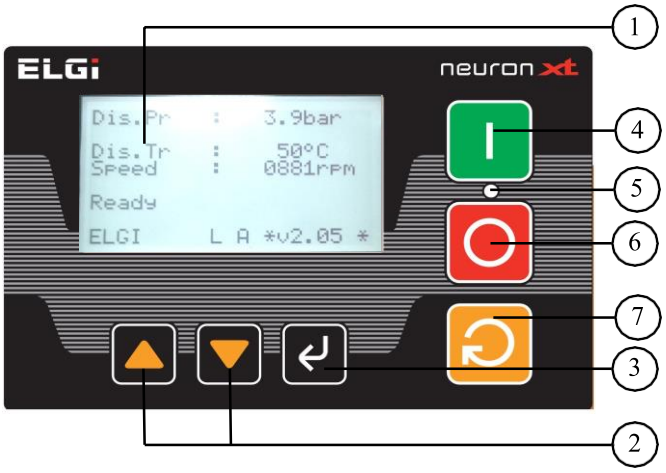
Protection from rain

Partial tightening of the screws or doors would allow water to enter the enclosure and cause irreparable damage to the circuitry. Provide a canopy over the unit to prevent rainwater from entering the machine.

Do not install equipment on structures subject to continuous vibration

partially tightened wires or components in the cabinet disconnect during vibrations and cause irreparable damage to circuitry.

7.3 Display & terminal details



1 128x64 Graphical display
2 Navigation keys
3 Enter key
4 Start key
5 LED (Green - Start , Red - Stop/Fault)
6 Stop key
7 Reset key

7.3.1. Terminal connection

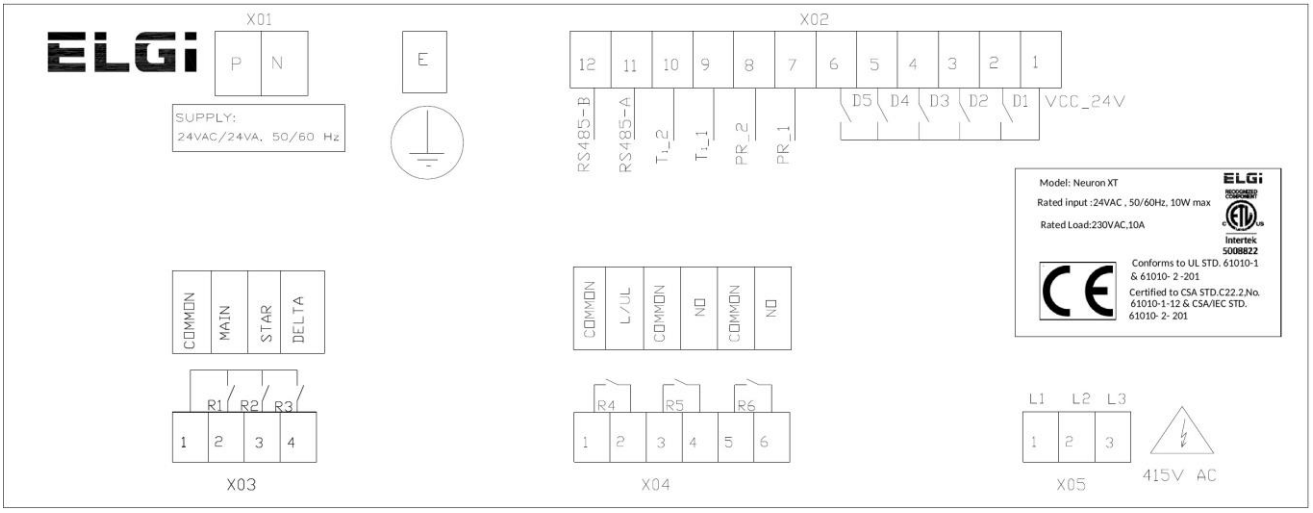
X01 - Power supply 24VAC, OV (Earth will be connected via socket)

X02 - Digital input (5), Analog inputs (2), RS485 (MODBUS communication)

X03 - Relay output (main, star, delta)

X04 - Load/unload & Programming relay output (2)

X05 - Phase reverse / Phase loss detection



7.4 Neuron-XT salient features

7.4.1. Home screen display

- Easy User interface 8-line graphical display and intuitive menu navigation keys

7.4.2. Records (view -> fault report)

- 99 fault reports
- Faults with run hour and status of the machine at the time of fault etc.

7.4.3. Remote function (both from MODBUS as well as digital input)

- Remote loading and unloading
- Remote start and stop

7.4.4. Other interfaces and communication

- 70 + Modbus parameters for DCS controls

7.4.5. Safeguard

- Low voltage and short time power interrupts detection to enhance the life of the contactors
- Low temperature start inhibit to avoid start-up overloads

7.5 Input output description

7.5.1 X01: Power supply

Pin	Function	Id	Active state
1	24V AC Phase	P	-
2	24V AC Neutral	N	-

7.5.2 X02: Digital / Analog inputs & Communication

Pin	Function	Id	Active state
1	Digital inputs common	24VDC	-
2	Emergency stop	Emergency	Fault if open
3	Main motor Overload	MMOL	Fault if open
4	Cooler Motor overload	Cooler OL	Fault if open
5	Remote load and unload / spp	Remote L / UL / spp	Unload if open/ Trip if open
6	Remote start / stop	Remote Start /Stop	Stop if open

Pin	Function	Id	Type	Range
7	Discharge pressure—15~24V DC	Pr-1	4-20 mA	0 to 16 bar (0 to 232 psi)
8	Discharge pressure	Pr-2		

Pin	Function	Id	Type	Range
9	Discharge temperature	T1-1	PT1000	-10 to 150°C (14 to 302°F)
10	Discharge temperature	T1-2		
Pin	**Function**	**Id**	**Type**	**Protocol/Range**
11	DCS interface	RS485 -A	RS485	Modbus RTU protocol
12	DCS interface	RS485 -B	RS485	

7.5.3 X03: Relay output

Pin	Function	Id	Active state
1	Common for Main, Star and Delta	Common	-
2	Main Contactor	Main	Energise
3	Star Contactor	Star	De-Energise
4	Delta Contactor	Delta	Energise

7.5.4 X04 : Relay output

Pin	Function	Id	Active state
1	Common - Load relay	Common	Load when energised
2	Load relay	L/UL	
3	Common - programmable relay 1	Common	Energised
4	Programmable relay 1	No	
5	Common - programmable relay 1	Common	Energised
6	Programmable relay 2	No	

7.5.5 X05: Single phase detector

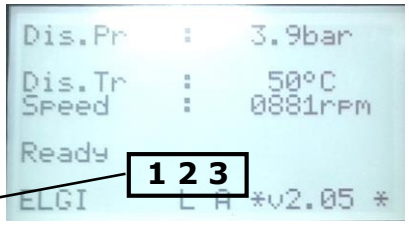
Pin	Function	Active state
1	R- Phase	R - 120 Deg Phase Diff
2	Y - Phase	Y - 120 Deg Phase Diff
3	B - Phase	B - 120 Deg Phase Diff

7.6 Main screen

- Discharge pressure at 0.1bar / 1psi resolution
- Oil temperature at 1°C / 2°F resolution
- VFD speed (if VFD enabled)
- Trip or machine status like Run, Load, Unload, Standby etc.,
- Warning messages
- Version with mode information

Compressor mode selection details:

1. UL - unload mode enabled, UL disabled the space will be shown as empty
2. L or R or D - compressor start from - Local or remote or DCS,
3. A or M - Auto restart enabled or auto restart disabled. For more details refer machine settings in operator menu.



7.6.1 Important machine settings for

NOTE

The version (eg. v2.04) displayed in main screen refers to software version (changes for every software update)

Message 1 - Compressor status message

Status	Description
Ready	Ready for start
Star	Motor running in star
Run	Motor running in delta
Run load	Compressor in load
Run unload	Compressor in unload
Stop busy	Stop sequence in progress
Emergency stop	Emergency stop push switch is on
Temperature inhibit ±XX	While starting, if the discharge temperature is lower than the set inhibit temperature value, you will see this message. ±XX denotes the live discharge temperature value. The compressor starts only if the discharge temperature value goes above the set value.
Auto restart "seconds"	If compressor is in auto mode, The controller will ensure minimum delay (user set, e.g. 60 sec) between stop and start. count stops if "STOP" key is pressed
Start ack wait…	This message is displayed after a fault is cleared and waiting for user acknowledgement. By pressing "RESET" key user can acknowledge.
Standby	Compressor in standby mode.

Message 2 - Compressor fault message

Fault	Description
Pr. Probe failure	Discharge pressure sensor probe failure
Tr. Probe failure	Temperature sensor probe failure
HSP	If discharge pressure exceeds the set high sump pressure value.
Cooler	If the cooler digital input opens due to cooler fault.
Main motor overload	If the MMOL digital input opens due to main motor
Phase loss/reverse	If input phase is lost or reversed before start of the main motor.
Trip temperature	If the discharge temperature exceeds the set trip temperature value.
Power interruption	If the mains supply is interrupted for more than 20 msec.
Low voltage	If the mains supply voltage is less than 75% of the rated voltage, the compressor will be tripped and all controller operations have halted until the mains supply comes back to normal (at least 85% of the rated).
Dis. pressure not developing	After the load, the discharge pressure should be at least 0.5 bar/7psi in 5mins. If it has not reached this level, this fault occurs.
Temperature not developing	If the discharge temperature not raised above the inhibit temperature before the set inhibit temperature time.

Message 3 - Compressor warning message

Warning	Description
Warn temperature	When discharge temp. exceeds the set warn temperature (Default is 105°C)
Change oil filter	When service remaining Hr. reaches 0000
Change air filter	When service remaining Hr. reaches 0000
Change oil	When service remaining Hr. reaches 0000
Change grease	When service remaining Hr. reaches 0000
Change separator	When service remaining Hr. reaches 0000
Change valve kit	When service remaining Hr. reaches 0000

users

1. Control mode

Local - User can start and stop the compressor by using local start/stop key

Remote - User can start and stop the compressor by using potential free digital input. (refer digital input connector - X04).

DCS - User can start and stop the compressor by using RS485 MODBUS communication port (refer connector - X02).

2. Unload mode

NOTE

In the case of an emergency, good practice is to stop the compressor regardless of the control mode that the compressor is in. Use the "Emergency Stop Push Button" available on the front panel to stop the compressor.

- If this is enabled, compressor operates only in unload mode and never in load mode. (This mode is used for service and maintenance purpose).

3. Auto restart

- If you enable this option, compressor will runs automatically after power failure and it resumes based on the previous condition. The default delay setting is 30 sec*.

4. Warn RST delay

- Enable this option to delay the compressor start after power resumes. This option works if Auto Restart Mode is ON. (Default :30 sec)

5. Load / Unload pressure

- The compressor runs between load and unload pressure based on compressed air utilization. You can set your own load/unload pressure within the operating pressure band zone.

6. Star delay

- For Star to Delta change over delay time, the default delay setting is 6 sec.

7. DTR delay

- For Delta change over to load delay time, the default delay setting is 3 sec.

8. RTS delay

- During normal stoppage, the compressor will unload to before it stopped and wait for this set delay time. A default delay setting of 5 sec has been provided.

9. Standby time

- The compressor will shift to standby mode if unloading exceeds the specified time. A default delay setting of 5 mins has been provided.
- **Standby resume** - If the actual pressure is less than the load pressure, then the compressor will restart automatically after 10 sec delay. If demand from the standby stop comes after 10 sec, the compressor will start immediately. This feature helps save the energy if very little compressed air is used.

10. Start/Stop per hour

- The system sends a warning if you exceed the configured number of cycles per hour that you start the compressor per hour. The default factory setting is five per hour.

11. Load/Unload source

- **Local:** Load/ unload pressure is based on local settings.
- **Remote selection from the digital input**– Load/ unload is possible.

NOTE

In case the compressor exceeds the specified number of cycles per hour when in the standby sequence, then the system will not enter into standby stop sequence until the existing hours are completed. In the mean time standby override will display on the screen.

- **DCS:** Load/ unload can be operated from the DCS (The load/unload command should be used continuously with the interval ≤3 Sec)

12. VFD Function

- VFD speed will appear in the home screen once VFD mode is enabled in factory settings.

NOTE

- **VFD mechanism -** Load and unload pressure which set in

The compressor resumes in local load and unload mode if communication is lost in DCS mode.

operator will write into VFD's respective address through Modbus protocol

NOTE

Modbus communication should be established between VFD and Neuron –XT controller. If VFD is enabled other slave device should not be connected, such as DCS.

7.7 Menu structure

Press any one of the following keys Δ and ∇ to enter main menu

7.7.1 Main Menu

Dis. Pr	: 0.0 bar / 0 psi
Dis. Tr	: 25°C / 77°F
Status	:
	View
	Operator
	Service
	Factory
	Customer care

LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	
View	Operator	Mode	Control mode	Local / Remote / DCS
			Auto restart	On/ Off
			Pressure unit	Bar/psi
			Temperature unit	Fahren / Centi
		Pressure	Unload pressure	X X . X b or p (bar or psi)
			Load pressure	X X . X b or p
		Delay	Warn RST delay	X X X s (second)
			Star delay	X X s
			DTR delay	X X s
			RTS delay	X X s
			Standby time	X X m (minute)
			St/Sp PH	X X
		DCS port	Type	Modbus
			ID	X X
			Baud	9600/19200
			Parity	None / Even / Add
			Length	8 / 7
			Stop bit	2 / 1
		Temperature	Trip temperature	X X X C or F
			Warn temp	X X X C or F
			Fan temp	X X X C or F
		Rating	XXXXXXXXXX	
		Fab No.	XXXXXXXXXX	

7.7.1.2 Fault Report

Use Δ and ∇ to select the fault record number (1 to 99). The latest fault will be displayed in the first position. For fault message details refer the "Fault Message" table.

LEVEL 1	LEVEL 2	LEVEL 3
View	Fault report	Fault Message
		Run Hour : XXXXXX
		Dis.Pr : X X .X
		Dis.Tr : X X X
		Status : RDY/ACK/STAR etc.,

7.7.1.1 Operator

7.7.1.3 View Service Time

LEVEL 1	LEVEL 2	LEVEL 3
View	Service time	Remaining AFCT: X X X X X hours
		Remaining OFCT: X X X X X hours
		Remaining OSCT: X X X X X hours
		Remaining OCT: X X X X X hours
		Remaining RGT: X X X X X hours
		Remaining Valve kit: X X X X X hours

7.7.1.4 View Cumulative Time

LEVEL 1	LEVEL 2	LEVEL 3	
View	Cumulative time	Load	X X X X X X hrs: X X Min
		Unload	X X X X X X hrs: X X Min
		Run	X X X X X X hrs: X X Min
		Stop	X X X X X X hrs: X X Min
		Fault	X X X X X X hrs: X X Min
		Standby	X X X X X X hrs: X X Min
		Start Count	X X X X X X
		Load Count	X X X X X X X X
		Utilisation	X X %

7.7.2 Operator

Password required to adjust the operator settings within the set limits.

7.7.2.1 Operator Machine

Operator	Machine
	Maintenance
	Language
	Change Password

The machine settings available are listed in the below table.

#	Item	Min	Max	Option	Default	Unit
Mode						
1	Control mode	-	-	loc/rem/dcs	loc	-
2	Auto restart	-	-	on / off	off	-
3	Pr unit	-	-	bar / psi	bar/psi	-
4	Tr unit	-	-	cen / for	cen	-
Pressure						
5	Unload pressure	≥ load pressure +0.5bar(7psi)	≤ max unload pressure	-	7.5 bar (109 psi)	bar/psi
6	Load pressure	4.0bar(58psi)	≤ unload pressure - 0.5bar(7psi)	-	5.5 bar (80 psi)	bar/psi

#	Item	Min	Max	Option	Default	Unit
			Set Delay			
8	Warn RST	30	250	-	30	second
9	Star	6	20	-	6	second
10	DTR	3	60	-	3	second
11	RTS	5	30	-	5	second
12	Standby	3	99	-	5	minute
			DCS Port			
13	Type	-	-	Modbus	-	
14	ID	1	99	-	1	-
15	Baud	-	-	9600/19200	9600	bps
16	Parity	-	-	None/Even/Odd	None	
17	Length	-	-	7 / 8	8	-
18	Stop bit	-	-	1 / 2	1	-
			***Auto Drain Valve (ADV)**			
19	Off time	1	180	-	4	minute
20	On time	1	15	-	5	Second
			Load / Unload Source			
21	LD / UL Source	-	-	Loc / Rem/ DCS	Loc	-
			Contrast adjust			
22	Contrast adjust	10	100	10 / 100	50	%

* If ADV enabled in service menu

7.7.2.2 Operator - Maintenance

If you change the below consumables, then select Yes to restart the service counter from the default set value.

#	Item	Min	Max	Option	Default	Unit
1	AF changed	-	-	No/Yes	No	-
2	OF changed	-	-	No/Yes	No	-
3	OS changed	-	-	No/Yes	No	-
4	Oil changed	-	-	No/Yes	No	-
5	Re-grease	-	-	No/Yes	No	-
6	Valve kit	-	-	No/Yes	No	-

7.7.2.3 Language

Default is english. Customer can choose any one of the given languages.

#	Item
1	English
2	Francais
3	Italiano
4	Spanish

7.7.3 Service

Password required.

NOTE

Any setting changes should be made by an ELGi authorized service engineer only. Any attempt to change service settings by unauthorized people may lead to compressor malfunction and the warranty becoming void.

Service	Calibration (Offset)
	Relay
	Temperature
	Maintenance
	Self-Test
	Change Password
	Unload Mode
	DI-5

7.7.3.1 Calibration (offset)

If any deviation occurs in the pressure and temperature displayed between the controller and the master gauge, ask ELGi service engineer to offset the valve. Factory fitted sensor/controller are pre-calibrated.

7.7.3.2 Programmable relay

Select the programmable relay 1 or 2 using the Δ and ∇ keys. Then press Enter to assign any one of the following functionalities for the relay.

Default

#	Item
1	Warn
2	Load
3	Service
4	Standby
5	Trip
6	Remote
7	Ready
8	Fan*
9	ADV* *

Relay 1 = Warn
Relay 2 = Trip

7.7.3.3 Temperature

1. **Fan temperature*** - (If a fan is equipped with machine) This option causes the fan relay to energize always on.
2. **Inhibit temperature** - This option causes the compressor to start when the discharge temperature is higher than the set value (if Temperature inhibit is enabled in factory settings).
3. **Temperature Inhibit time** - - This option causes the compressor to wait for this specified time to reach the Inhibit temperature.

If not, it trips because temperature is not building.

7.7.3.4 Auto drain valve**

The auto drain valve is a special feature that helps prevent water from entering into compressed air delivery. This function enables the drain valve to switch on and off based on a specified time in the menu. The default setting is 5 sec ON with a 4 min interval. It is programmed in the relay menu available in service.

#	Item	Min	Max	Option	Default	Unit
1	Fan Temp	60°C (140°F)	90°C (194° F)	-	85°C (140°F)	C/F
2	Inhibit Temp	- 5°C (23°F)	5°C (41°F)	-	0°C (32°F)	C/F
3	Tr. Inhibit Time	5	90	-	5	min

7.7.3.5 Maintenance

Here you can feed the filter life time. The time limit will vary depending on the model and filter. Contact your authorized dealer to learn more.

Good practice is to record the details in the operator/ maintenance menu once the filter is replaced.

7.7.3.6 Self test

Perform a self test to verify the controller display, mimic LEDs, keys, analog and digital inputs/outputs. Follow the instructions that appear in the screen.

7.7.3.7 Unload mode

#	Item	Min	Max	Option	Default	Unit
1	Set AFCT	0000	30000	-	2000H	Hour
2	Set OFCT	0000	30000	-	2000H	Hour
3	Set OSCT	0000	30000	-	4000H	Hour
4	Set OCT	0000	30000	-	2000H	Hour
5	Set RGT	0000	30000	-	2000H	Hour
6	Set Valve Kit	0000	30000	-	2000H	Hour

If you enable this option, the compressor will run only in the unload mode. The option disables compressor load mode. (This mode is used for service and maintenance purpose).

⚠ WARNING

Conduct self test only after you totally disconnect compressor wiring from the controller. Else, the compressor will sustain severe damage. A self–test must be done only by an authorized service person.

7.7.3.8 Digital Input

This input can be configured as either the Remote Load/ Unload or spp function. Default: Remote Load/Unload

7.7.4 Customer care

If customer enter into the customer care menu, this message will appear

* Version may vary based on the software update.

7.8 Data interface

DCS port is Modbus RTU type. It enables you to interface with the generic DCS.

You can set the device ID in menu "Operator/ Machine/ DCS Port.".

You can also configure the baud rate, parity, data length,

Version: XXXX*
URL: www.elgi.com
E-mail: ccs@elgi.com

and the stop bit to suit your requirements. The Modbus table will be provided on request.

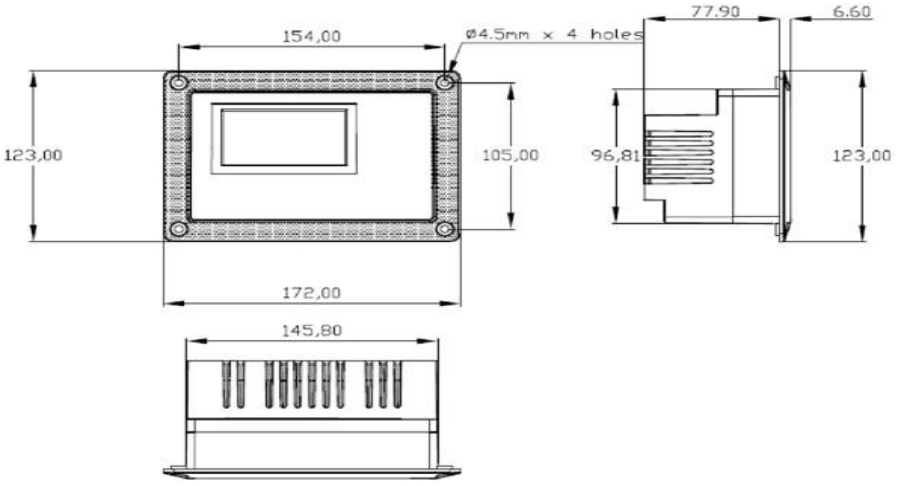
7.9 Troubleshooting

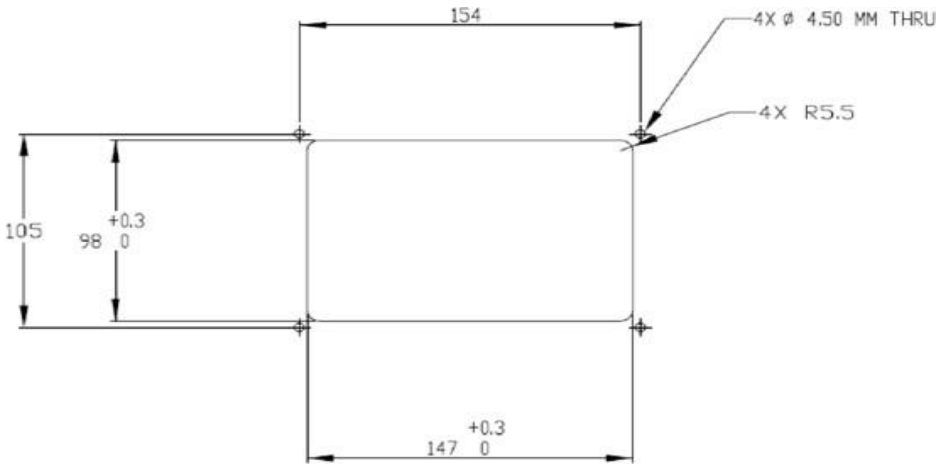
S. NO	Failure symptoms	Possible causes	Remedies
1	No display in LCD Screen & Backlight was not glown	No input supply	Check incoming supply to compressor
		Transformer failure	Please check the controller input voltage at connector X01. Voltage should be 24V ± 15% VAC.
		Controller failure.	Change the controller.
2	Keypad in Controller not responding	Key not responding	Check any key stuck / Flat. If any change Controller
		Key struck / Flat	Change the controller.
3	"Low voltage" message in display.	Controller Input voltage less than 18VAC	Until will start functioninig, once input voltage recovered to nominal or with in specification (415 V +10% - 15 %)
4	"Pr. probe failure" message in display	Loose connection in connector position (X02 - 7 & 8).	Check the loose connection at both end - Controller and pressure sensor side.
		Pressure sensor failure.	Change the Pressure sensor.
		Controller failure	Check the voltage across (X02 - 8) with Gnd, voltage should be b/w 0.4 to 2VDC. If it is different change the controller.
5	"Tr. probe failure" message in display	Loose connection in connector position X02 - 9 & 10.	Check the loose connection at both end - Controller and Temp sensor side.
		Temperature sensor failure.	Change the Temperature sensor.
		Controller failure	Check the voltage across X02 - 9 with Gnd, voltage should be 3.3 VDC. If it is different change the controller.
6	"Emergency stop" "MMOL" "Cooler OL" message in display	Loose connection in connector position (X02 - 1, 2 ,3 & 4).	Check the loose connection at controller end.
		Switch got struck	Check either the external switches got sturck / Fault not cleared
		Controller Failure	Change the controller.
7	Motor not driving	Controller failure	Disconnect the X03 & X04 connector, Check the relay working by switching on the start key (X03 -1) with (X03- 2, 3 & 4) & (X04 -1) with (X04- 2). Note: Ckeck in the continuity mode.
8	"Phase loss/ Reverse" message in display	Loose connection in connector position (X05 - 1, 2 & 3).	Check the loose connection at controller end.
		Controller failure	Check for the X05 connection X05(1- R, 2-Y, 3 -B), Still the same error change the controller

7.10 Construction

- Plastic enclosures
- IP65 polyethylene front keypad
- Inputs and outputs through terminal block
- Front plate cutout dimensions 154 x 105 mm
- Enclosure dim

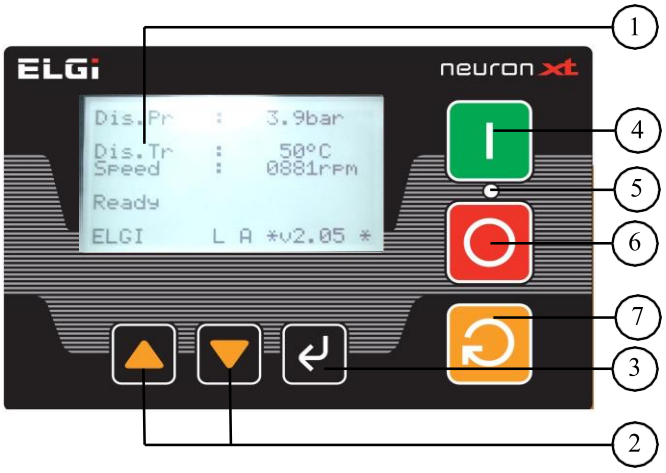
7.10.1 Dimension drawing





PANEL CUTOUT DIMENSION

7.11 Neuron XT quick reference



1 128x64 Graphical display
2 Navigation keys
3 Enter key
4 Start key
5 LED (Green - Start , Red - Stop/Fault)
6 Stop key
7 Reset key

MAIN SCREEN DISPLAY

- Package Discharge Pressure
- Discharge Temperature
- Machine Status like Run, Load, Unload, Standby etc.
- Warning Messages
- Mode Information (see below)

Mode Information

1. PS – Pressure Schedule Enabled / UL – Unload Mode Enabled
2. L – Local / R – Remote / D – DCS
3. A / M – Auto Restart ON / Manual Mode

Compressor Status messages

Status	Description
Ready	Ready for start
Star	Motor running in star
Run	Motor running in delta
Run load	Compressor in load
Run unload	Compressor in unload
Stop busy	Stop sequence in progress
Emergency stop	Emergency stop push switch is on
Temperature inhibit ±XX	While starting, if the discharge temperature is lower than the set inhibit temperature value, you will see this message. ±XX denotes the live discharge temperature value. The compressor starts only if the discharge temperature value goes above the set value.
Auto restart “seconds”	If compressor is in auto mode, The controller will ensure minimum delay (user set, e.g. 60 sec) between stop and start. count stops if "STOP" key is pressed
Start ack wait…	This message is displayed after a fault is cleared and waiting for user acknowledgement. By pressing “RESET” key user can acknowledge.
Standby	Compressor in standby mode.

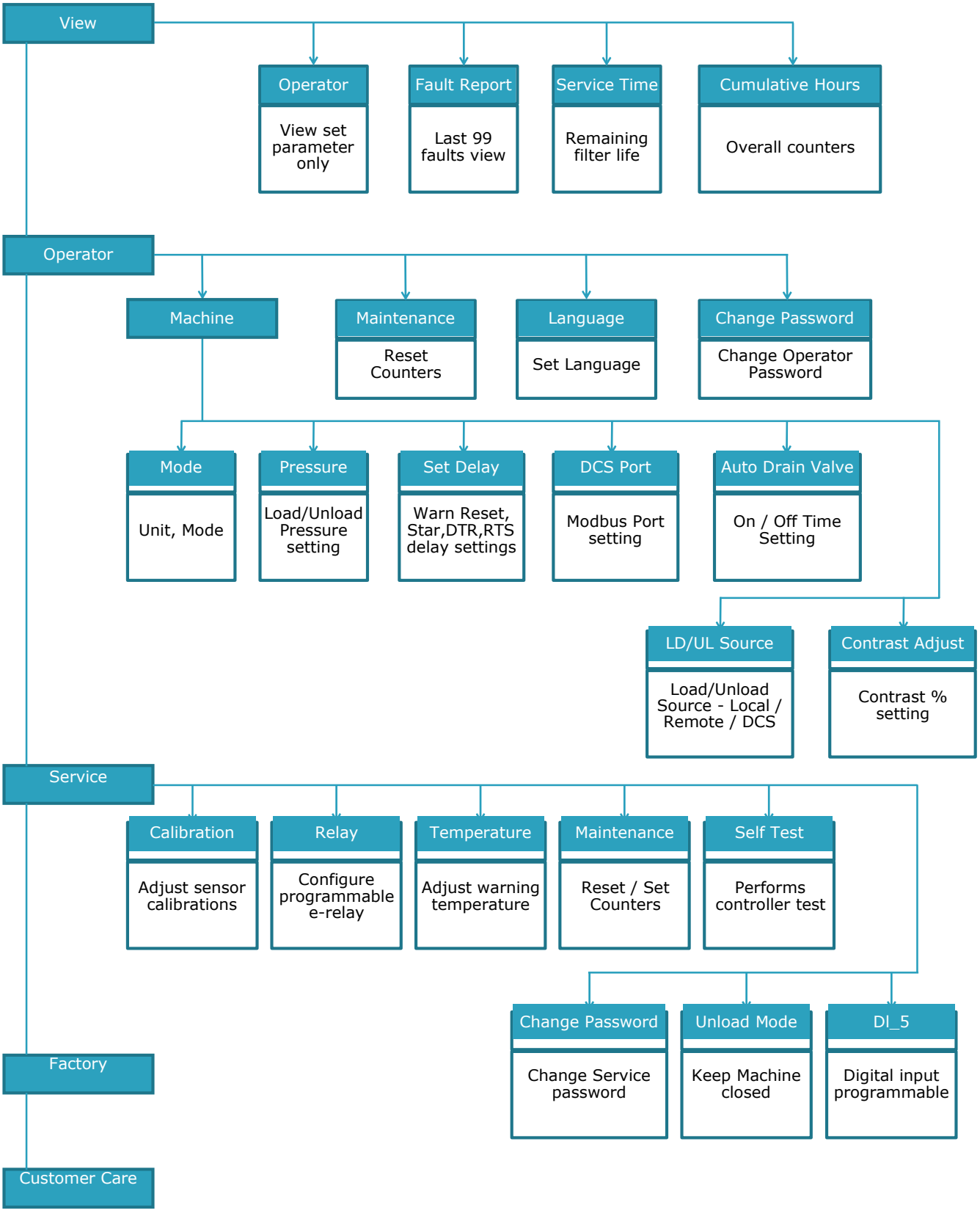
Compressor Warning messages

Warning	Description
Warn temperature	When discharge temp. exceeds the set warn temperature (Default is 105°C)
Change oil filter	When service remaining Hr. reaches 0000
Change air filter	When service remaining Hr. reaches 0000
Change oil	When service remaining Hr. reaches 0000
Change grease	When service remaining Hr. reaches 0000
Change separator	When service remaining Hr. reaches 0000
Change valve kit	When service remaining Hr. reaches 0000

Compressor fault messages

Fault	Description
Pr. Probe failure	Discharge pressure sensor probe failure
Tr. Probe failure	Temperature sensor probe failure
HSP	If discharge pressure exceeds the set high sump pressure value.
Cooler	If the cooler digital input opens due to cooler fault.
Main motor overload	If the MMOL digital input opens due to main motor
Phase loss/reverse	If input phase is lost or reversed before start of the main motor.
Trip temperature	If the discharge temperature exceeds the set trip temperature value.
Power interruption	If the mains supply is interrupted for more than 20 msec.
Low voltage	If the mains supply voltage is less than 67% of the rated voltage, the compressor will be tripped and all controller operations have halted until the mains supply comes back to normal (at least 75% of the rated).
Dis. pressure not developing	After the load, the discharge pressure should be at least 0.5 bar/7psi in 5mins. If it has not reached this level, this fault occurs.

Menu Structure



7.12. Revision Details:

Version	Date	Changes
1.0	02/03/2015	Initial Draft
2.0	31/08/2017	Updated corrections
3.0	02/01/2018	Feature addition/deletion
3.1	01/08/2018	Software version 1.8
3.2	01/12/2018	Software version 2.04
3.3	28/03/2019	Software version 2.05
3.4	08/08/2019	Software version 2.06
3.5	22/10/2020	Software version 2.07a
3.6	20/12/2021	Correction on Pin numbering & Software version 2.07b

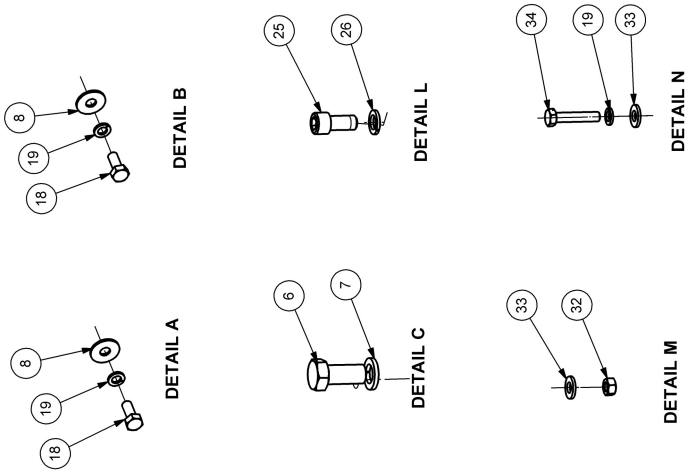
PARTS MANUAL

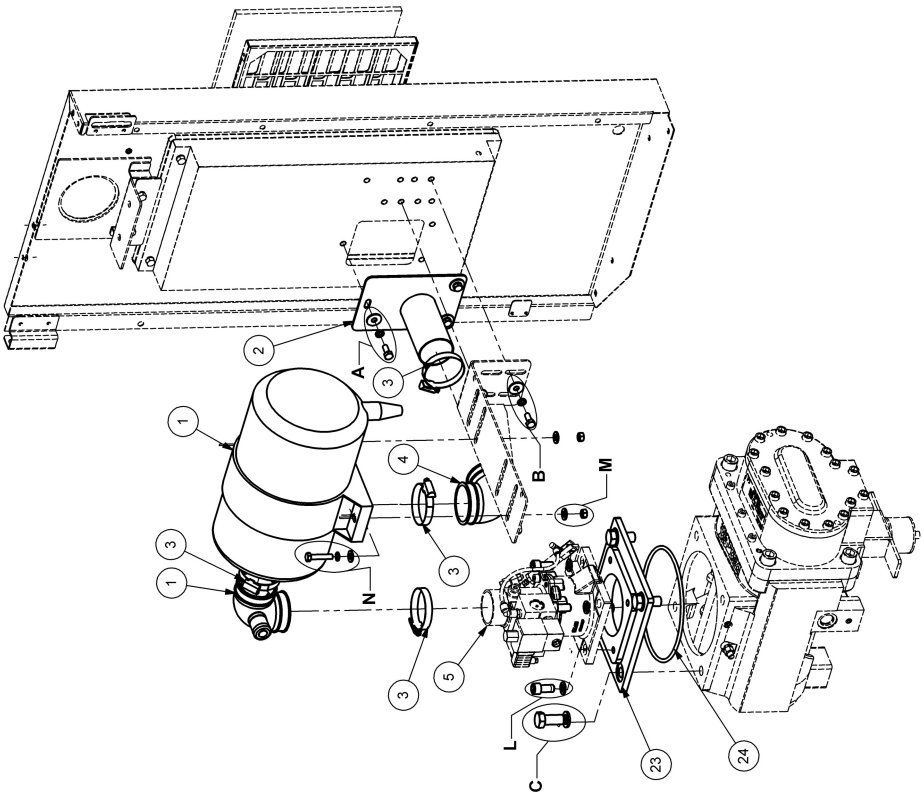
EQ SERIES

ELECTRIC POWERED SCREW AIR COMPRESSOR
EQ 18 TO EQ 22

8.0 Air inlet and control system

[Ref : 015325507 - X0110074]





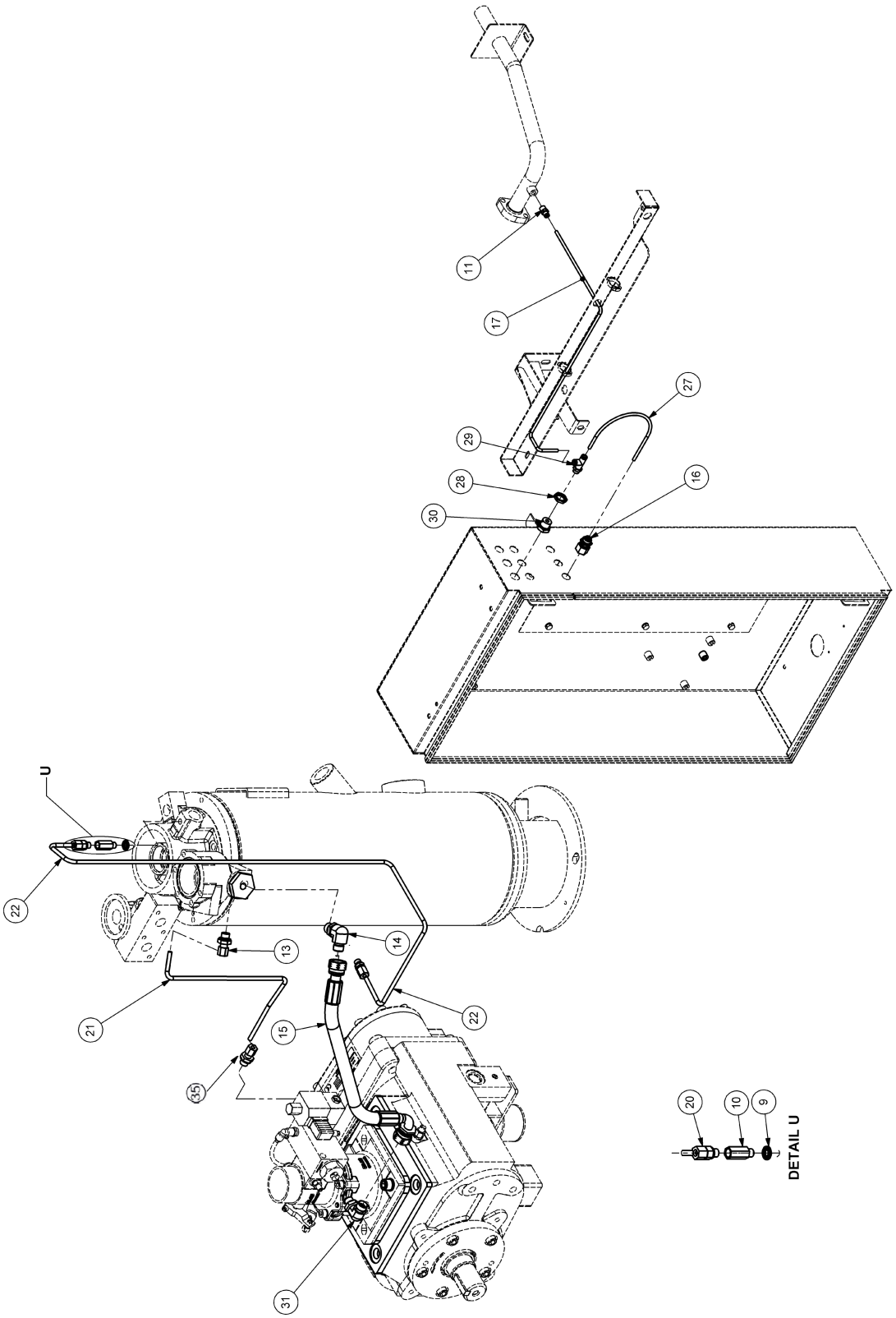
8.0 Air inlet and control system

[Ref : 015325507 - X0110074]

Sl. No.	Description	Qty.	Part Number
1	AIR FILTER ASSY E18-E22	1	B004700770002
2	DUCT, INTAKE VALVE -EQ 22	1	015326090
3	SS WORM CLAMP JW6C13-54-70	4	B005000530003
4	RUBBER DUCT EG-22	1	015404122
5	EIV 102_W/O MODULATION	1	970300390
6	BOLT HEX M16X35 8.8 ZYP 5-8M	4	000906213
7	WASHER SPRING REC SEC M16	4	000996116
8	WASHER PLAIN M8 ZYP	3	000996008
9	RUBBER WASHER	1	015405117
10	NON RETURN VALVE 1/8 INCH MXF	1	B004100170002
11	QUICK FITTINGS CONN 1/4BSP-6	1	000920504
12	PMS CPLNG ORI. 1MM 1/4X1/8BSP	1	B009606780021
13	PMS COUPLING 1/4BSP X 6MM	1	B009606780026
14	ADJ ELBOW HOSE CONN M-M G3/8	1	B010506720013
15	HOSE BLOW DOWN EG-22	1	015404123
16	BULK HEAD CONNECTOR	1	B010500170002
17	PLASTIC TUBING DIA.6x1	0.8	000919226
18	BOLT HEX M8X20 8.8 ZYP 5-8M	3	000906115
19	WASHER SPRING M8 RECT ZYP	7	000996108
20	ST FITTING 1/8 TO 6mm OD	1	000959913
21	PULSE LINE TUBE -159 EQ 22	1	015325500
22	SCAVENGING TUBE -159 EQ 22	1	015325499
23	ADAPTOR PLATE	1	015321548
24	O-RING ID190.0 X 5.3	1	015403257
25	SCR SOC HD M12X25 10.9 ZYP5-8u	4	000983142
26	WASHER SPRING REC SEC M12	4	000996112
27	PLASTIC TUBING DIA.6x1	0.2	000919226
28	LOCK NUT 1/2 BSP	1	020496120
29	MALE BRANCH TEE 1/4"X6MM BSPP	1	B009605390008
30	RED. ADAPTER 1/2 X 1/4 BSP	1	B010506130010
31	ADJ ELBOW 1/4"MX3/8"HOSE-SS	1	B010505390027
32	NUT HEX M8 8 ZYP	2	000948008
33	WASHER;PLATE M8 ZYP	4	000996058
34	BOLT HEX M8X40 8.8 ZYP 5-8M	2	000906119
35	STUD COUPLING G 1/8 MALE	1	B009606780004

8.0 Air inlet and control system

[Ref : 015325507 - X0110074]



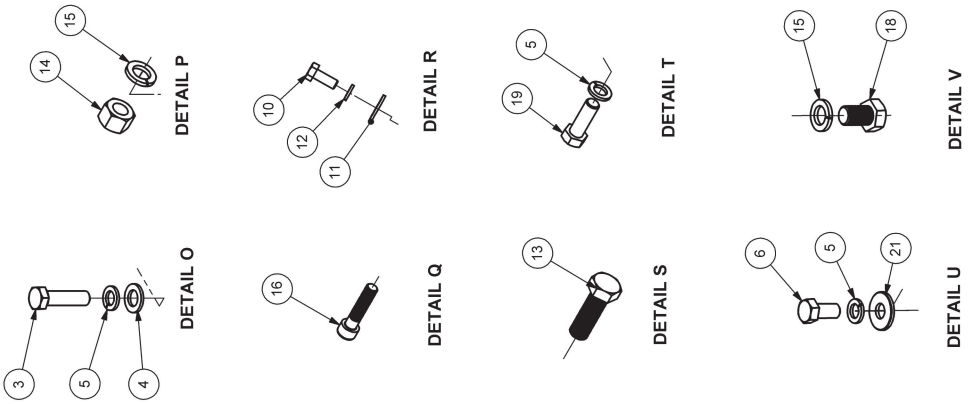
8.0 Air inlet and control system

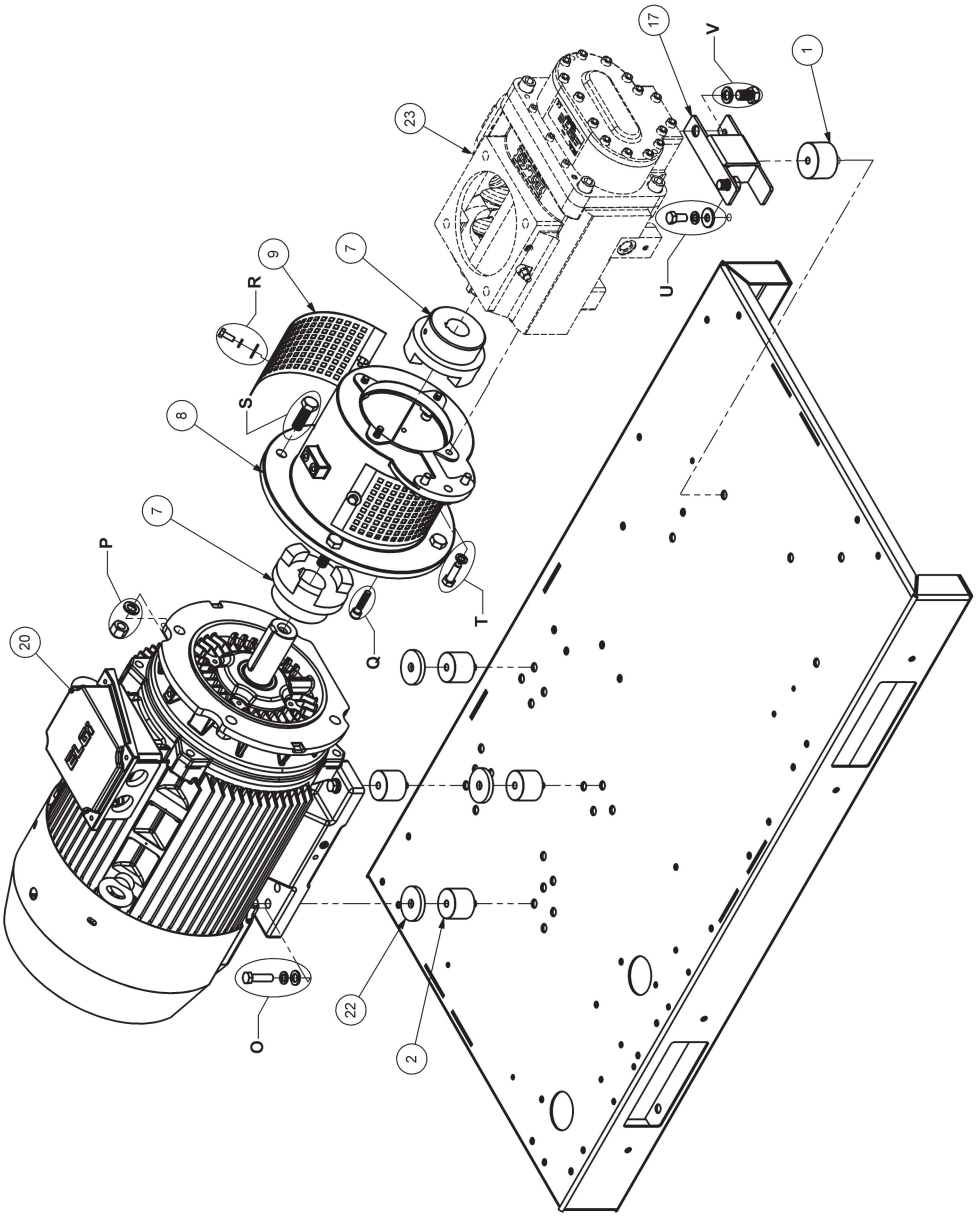
[Ref : 015325507 - X0110074]

Sl. No.	Description	Qty.	Part Number
1	AIR FILTER ASSY E18-E22	1	B004700770002
2	DUCT, INTAKE VALVE -EQ 22	1	015326090
3	SS WORM CLAMP JW6C13-54-70	4	B005000530003
4	RUBBER DUCT EG-22	1	015404122
5	EIV 102_W/O MODULATION	1	970300390
6	BOLT HEX M16X35 8.8 ZYP 5-8M	4	000906213
7	WASHER SPRING REC SEC M16	4	000996116
8	WASHER PLAIN M8 ZYP	3	000996008
9	RUBBER WASHER	1	015405117
10	NON RETURN VALVE 1/8 INCH MXF	1	B004100170002
11	QUICK FITTINGS CONN 1/4BSP-6	1	000920504
12	PMS CPLNG ORI. 1MM 1/4X1/8BSP	1	B009606780021
13	PMS COUPLING 1/4BSP X 6MM	1	B009606780026
14	ADJ ELBOW HOSE CONN M-M G3/8	1	B010506720013
15	HOSE BLOW DOWN EG-22	1	015404123
16	BULK HEAD CONNECTOR	1	B010500170002
17	PLASTIC TUBING DIA.6x1	0.8	000919226
18	BOLT HEX M8X20 8.8 ZYP 5-8M	3	000906115
19	WASHER SPRING M8 RECT ZYP	7	000996108
20	ST FITTING 1/8 TO 6mm OD	1	000959913
21	PULSE LINE TUBE -159 EQ 22	1	015325500
22	SCAVENGING TUBE -159 EQ 22	1	015325499
23	ADAPTOR PLATE	1	015321548
24	O-RING ID190.0 X 5.3	1	015403257
25	SCR SOC HD M12X25 10.9 ZYP5-8u	4	000983142
26	WASHER SPRING REC SEC M12	4	000996112
27	PLASTIC TUBING DIA.6x1	0.2	000919226
28	LOCK NUT 1/2 BSP	1	020496120
29	MALE BRANCH TEE 1/4"X6MM BSPP	1	B009605390008
30	RED. ADAPTER 1/2 X 1/4 BSP	1	B010506130010
31	ADJ ELBOW 1/4"MX3/8"HOSE-SS	1	B010505390027
32	NUT HEX M8 8 ZYP	2	000948008
33	WASHER;PLATE M8 ZYP	4	000996058
34	BOLT HEX M8X40 8.8 ZYP 5-8M	2	000906119
35	STUD COUPLING G 1/8 MALE	1	B009606780004

9.0 Drive system

[Ref : 015326071- X0110180]





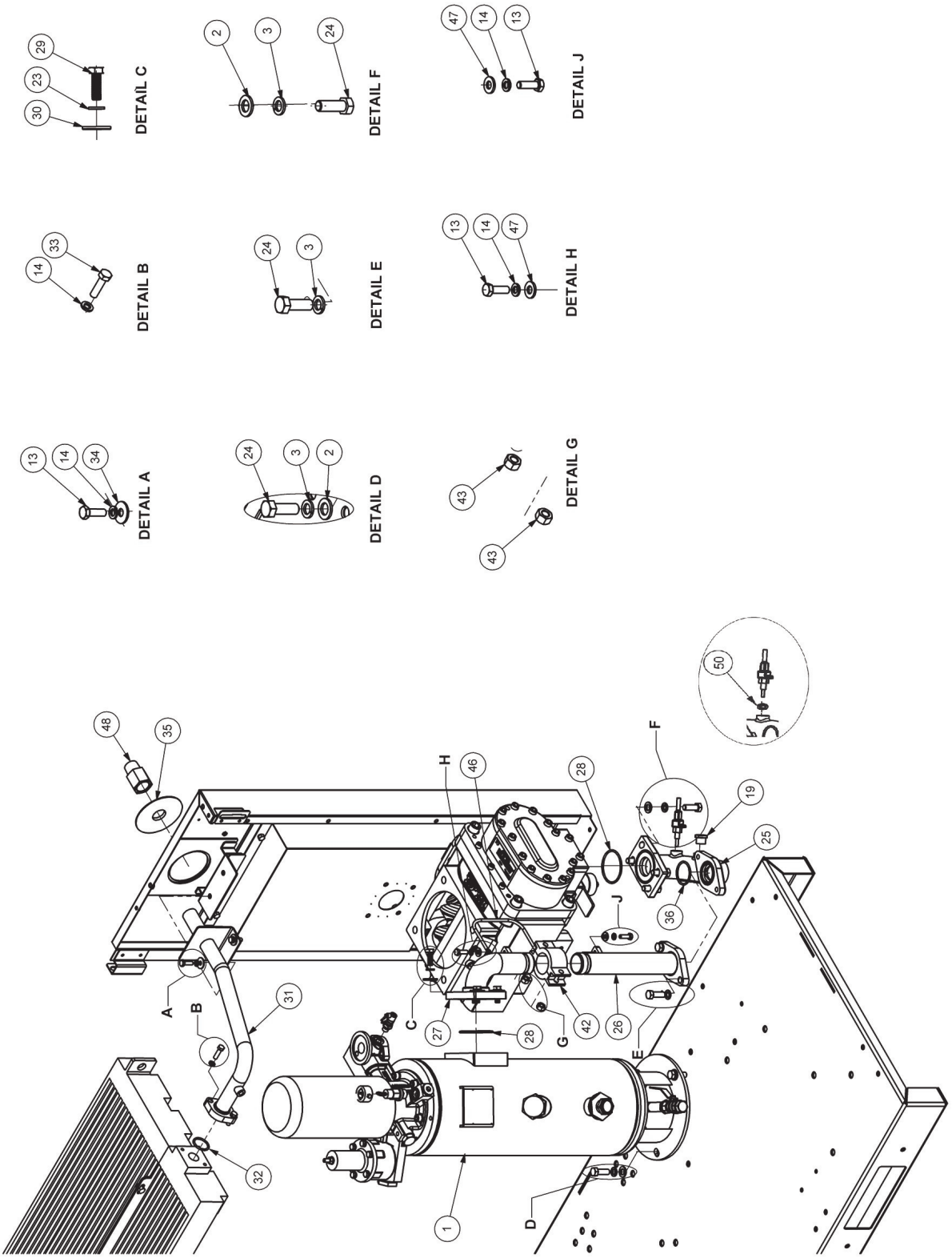
9.0 Drive system

[Ref : 015326071- X0110180]

Sl. No.	Description	Qty.	Part Number
1	ANTI VIBRATION MOUNT MF	1	B001401300003
2	AVM	4	B001401300022
3	BOLT HEX M12X45 8.8 ZYP 5-8M	4	000906186
4	WASHER;PLATE;M12 ZYP	4	000996060
5	WASHER SPRING REC SEC M12	8	000996112
6	BOLT HEX M12X25 8.8 ZYP 5-8M	1	000906182
7	DRIVE COUPLING 48/40 F2 SH98	1	B005401170070
8	ADAPTOR RING	1	015324418
9	COUPLING GUARD - F2	1	990303610
10	BOLT HEX M8X20 8.8 ZYP 5-8M	2	000906115
11	WASHER PLAIN M8 ZYP	2	000996008
12	WASHER SPRING M8 RECT ZYP	2	000996108
13	BOLT;HEX;M16 X 50	4	000906216
14	NUT;HEX; M16;ZYP	4	000948016
15	WASHER SPRING REC SEC M16	7	000996116
16	SCR SOC HD M10X45 10.9 ZYP5-8u	4	000983118
17	AIR END SUPPORT	1	015313389
18	BOLT HEX M16X25 8.8 ZYP 5-8M	2	000906211
19	BOLT HEX M12X35 8.8 ZYP 5-8M	3	000906184
20	MOTOR-18.5 KW IE3-CLASS F	1	X100154
21	WASHER OD32 X ID13 X 3T ZNBLUE	1	015404366
22	SPACER AVM	4	015404340
23	AIREND - EQ 18-100	1	X990673
	AIREND - EQ 18-125	1	X990684

10.0 Discharge system

[Ref : 015326072- X0110181]



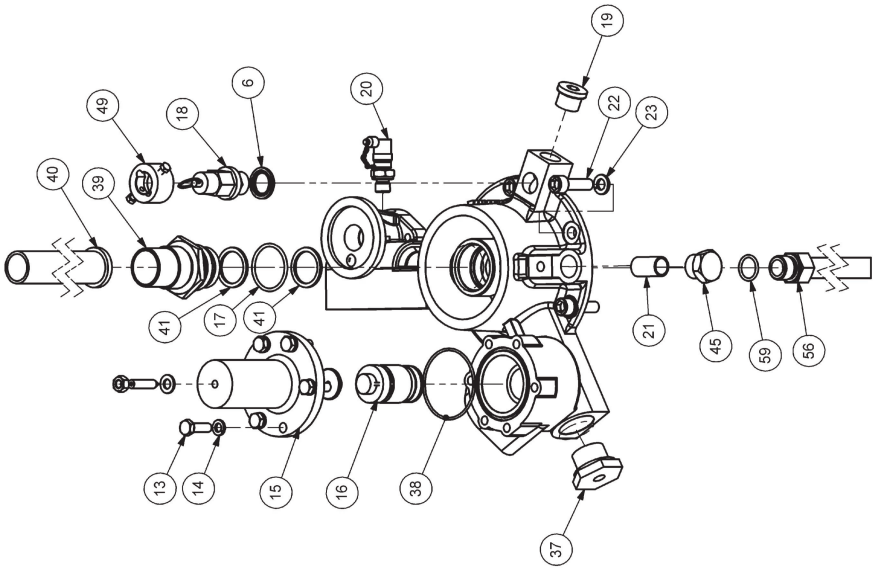
10.0 Discharge system

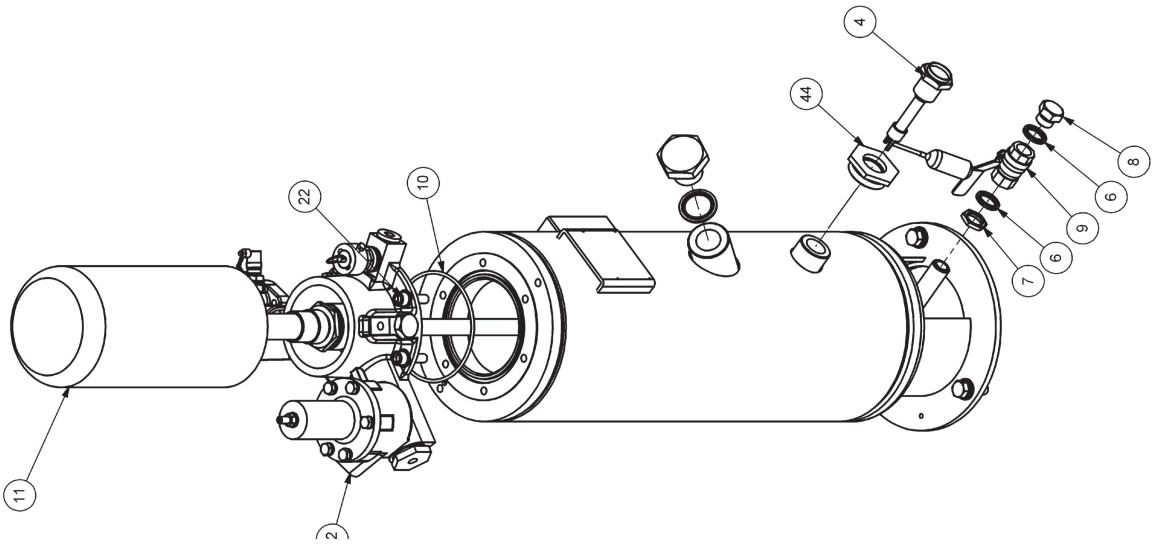
[Ref : 015326072- X0110181]

Sl. No.	Description	Qty.	Part Number	Sl. No.	Description	Qty.	Part Number
1	AOS TANK EG22 - U STAMP	1	015317035	40	SEPERATOR PIPE EG22	1	015322217
2	WASHER;PLATE;M12 ZYP	7	000996060	41	O RING	2	015404365
3	WASHER SPRING REC SEC M12	7	000996112	42	PIPE COUPLING 1-1/2 STY12(ACM	1	B56XX07
4	GAUGE FLOAT OIL LEVEL 7483S00020	1	B010706790001	43	NUT HEX M10 8 ZYP	2	000948010
6	1/2 BSP BONDED SEAL WASHER	3	000959387	44	REDUCER 1.5"BSP(M)X3/4"BSP	1	B010506780024
7	LOCK NUT 1/2 BSP	1	020496120	45	STRAINER PLUG, M22 X 1.5	1	B009605390009
8	PLUG HEX 1/2"BSP ZYP ENGC	1	340401400	46	COPPER CONNECTING LINK	1	038360255
9	VALVE ASSY BALL 1/2"BSP	1	011410000	47	WASHER;PLATE M8 ZYP	2	000996058
10	O-RING ID122.0 X 3.6	1	415400655	48	1 INCH CONNECTOR	1	015317270
11	AIR OIL SEPERATOR SPINON	1	B006700770010	49	SAFETY VALVE GUARD F2A	1	015405003
12	SEPERATOR BLOCK BODY	1	015324891	50	RUBBER RING	1	990405530
13	BOLT HEX M8X25 8.8 ZYP 5-8M	10	000906116				
14	WASHER SPRING M8 RECT ZYP	12	000996108				
15	MPV HOUSING,EN 102	1	990402630				
16	MPV sub assy, EN 102	1	990402950				
17	O-RING_M42 ISO	1	990404850				
18	SAFETY VALVE-F2@205PSI	1	B012805340024				
19	CLOSURE PLUG G1/2	2	B010506360004				
20	OIL SAMPLING VALVE 1/4IN BSP	1	B013206660001				
21	STRAINER MESH EG22	1	B008806100003				
22	SCR SOC HD M10X25 10.9 ZYP5-8u	6	000983114				
23	WASHER SPRING REC SEC M10	10	000996110				
24	BOLT HEX M12X35 8.8 ZYP 5-8M	9	000906184				
25	BOTTOM PIPE 159	1	015320511				
26	DISCHARGE PIPE CONNECTOR 102	1	015324521				
27	DISCHARGE PIPE TANK SIDE	1	015324131				
28	O-RING ID69.4 X 3.5	2	010453920				
29	BOLT HEX M10X30 8.8 ZYP 5-8M	4	000906145				
30	WASHER OD32 X ID10 X 3T ZNBLUE	4	015404399				
31	AIR OUTLET PIPE	1	015324073				
32	O-RING ID32.9 X 3.5	1	015402685				
33	BOLT HEX M8X30 8.8 ZYP 5-8M	2	000906117				
34	WASHER PLAIN M8 ZYP	2	000996008				
35	AIR OUTLET RUBBER COVER	1	015404940				
36	O-RING ID47.2 X 3.5	1	015400891				
37	ADAPTOR 1BSP M - 3-8BSP F	1	B010506720008				
38	O-RING ID62.0 X 2.0	1	990402960				
39	DOUBLE FITTING EG22	1	015322216				

10.0 Discharge system

[Ref : 015326072- X0110181]





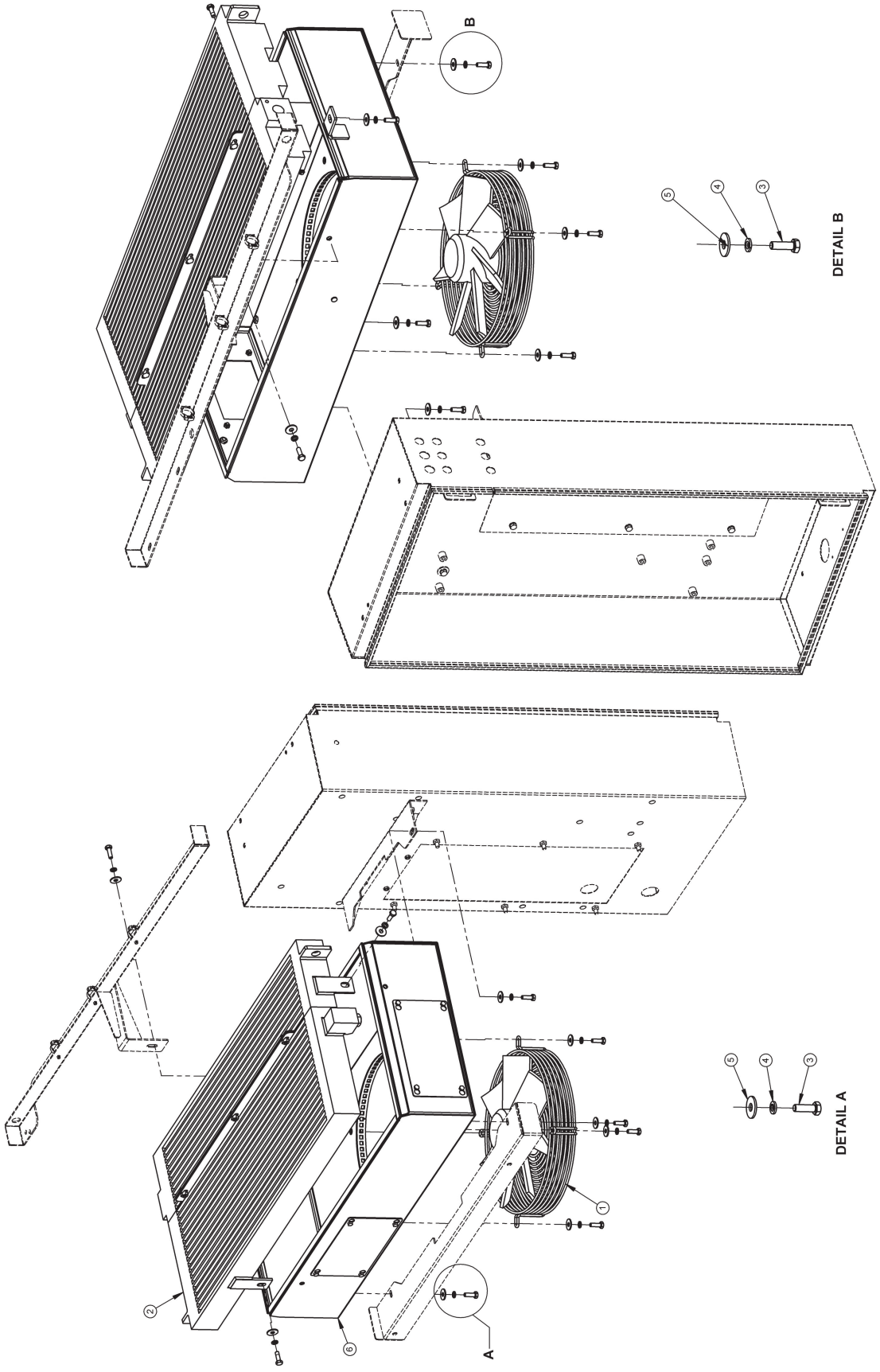
10.0 Discharge system

[Ref : 015326072- X0110181]

Sl. No.	Description	Qty.	Part Number	Sl. No.	Description	Qty.	Part Number
1	AOS TANK EG22 - U STAMP	1	015317035	40	SEPERATOR PIPE EG22	1	015322217
2	WASHER;PLATE;M12 ZYP	7	000996060	41	O RING	2	015404365
3	WASHER SPRING REC SEC M12	7	000996112	42	PIPE COUPLING 1-1/2 STY12(ACM	1	B56XX07
4	GAUGE FLOAT OIL LEVEL 7483S00020	1	B010706790001	43	NUT HEX M10 8 ZYP	2	000948010
6	1/2 BSP BONDED SEAL WASHER	3	000959387	44	REDUCER 1.5"BSP(M)X3/4"BSP	1	B010506780024
7	LOCK NUT 1/2 BSP	1	020496120	45	STRAINER PLUG, M22 X 1.5	1	B009605390009
8	PLUG HEX 1/2"BSP ZYP ENGC	1	340401400	46	COPPER CONNECTING LINK	1	038360255
9	VALVE ASSY BALL 1/2"BSP	1	011410000	47	WASHER;PLATE M8 ZYP	2	000996058
10	O-RING ID122.0 X 3.6	1	415400655	48	1 INCH CONNECTOR	1	015317270
11	AIR OIL SEPERATOR SPINON	1	B006700770010	49	SAFETY VALVE GUARD F2A	1	015405003
12	SEPERATOR BLOCK BODY	1	015324891	50	RUBBER RING	1	990405530
13	BOLT HEX M8X25 8.8 ZYP 5-8M	10	000906116				
14	WASHER SPRING M8 RECT ZYP	12	000996108				
15	MPV HOUSING,EN 102	1	990402630				
16	MPV sub assy, EN 102	1	990402950				
17	O-RING_M42 ISO	1	990404850				
18	SAFETY VALVE-F2@205PSI	1	B012805340024				
19	CLOSURE PLUG G1/2	2	B010506360004				
20	OIL SAMPLING VALVE 1/4IN BSP	1	B013206660001				
21	STRAINER MESH EG22	1	B008806100003				
22	SCR SOC HD M10X25 10.9 ZYP5-8u	6	000983114				
23	WASHER SPRING REC SEC M10	10	000996110				
24	BOLT HEX M12X35 8.8 ZYP 5-8M	9	000906184				
25	BOTTOM PIPE 159	1	015320511				
26	DISCHARGE PIPE CONNECTOR 102	1	015324521				
27	DISCHARGE PIPE TANK SIDE	1	015324131				
28	O-RING ID69.4 X 3.5	2	010453920				
29	BOLT HEX M10X30 8.8 ZYP 5-8M	4	000906145				
30	WASHER OD32 X ID10 X 3T ZNBLUE	4	015404399				
31	AIR OUTLET PIPE	1	015324073				
32	O-RING ID32.9 X 3.5	1	015402685				
33	BOLT HEX M8X30 8.8 ZYP 5-8M	2	000906117				
34	WASHER PLAIN M8 ZYP	2	000996008				
35	AIR OUTLET RUBBER COVER	1	015404940				
36	O-RING ID47.2 X 3.5	1	015400891				
37	ADAPTOR 1BSP M - 3-8BSP F	1	B010506720008				
38	O-RING ID62.0 X 2.0	1	990402960				
39	DOUBLE FITTING EG22	1	015322216				

11.0 Cooling system

[Ref : 015326073 - X0110182]



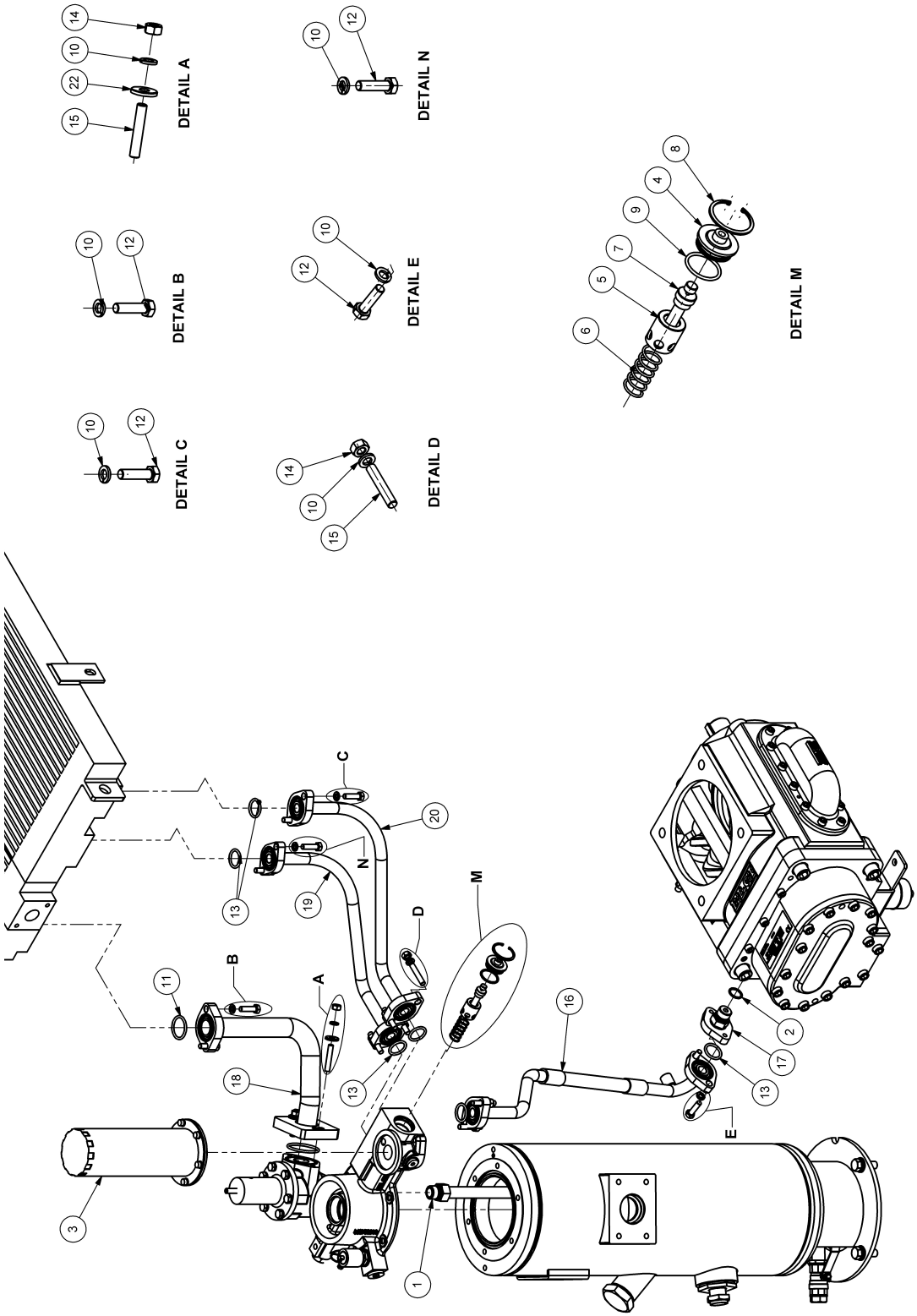
11.0 Cooling system

[Ref : 015326073 - X0110182]

Sl. No.	Description	Qty.	Part Number
1	PUSHER AXIAL FAN 350DIA,60HZ-FN035-4DW.OF.A7P2	1	B008106910003
2	OIL AND AFTER COOLER EG-22	1	015315678
3	BOLT HEX M8X25 8.8 ZYP 5-8M	11	000906116
4	WASHER SPRING M8 RECT ZYP	11	000996108
5	WASHER PLAIN M8 ZYP	12	000996008
6	SHROUD 60HZ SINGLE FAN 18-22 KW	1	015325727

12.0 LUBRICATION SYSTEM EQ-22

[Ref : 015325511 - X0110078]



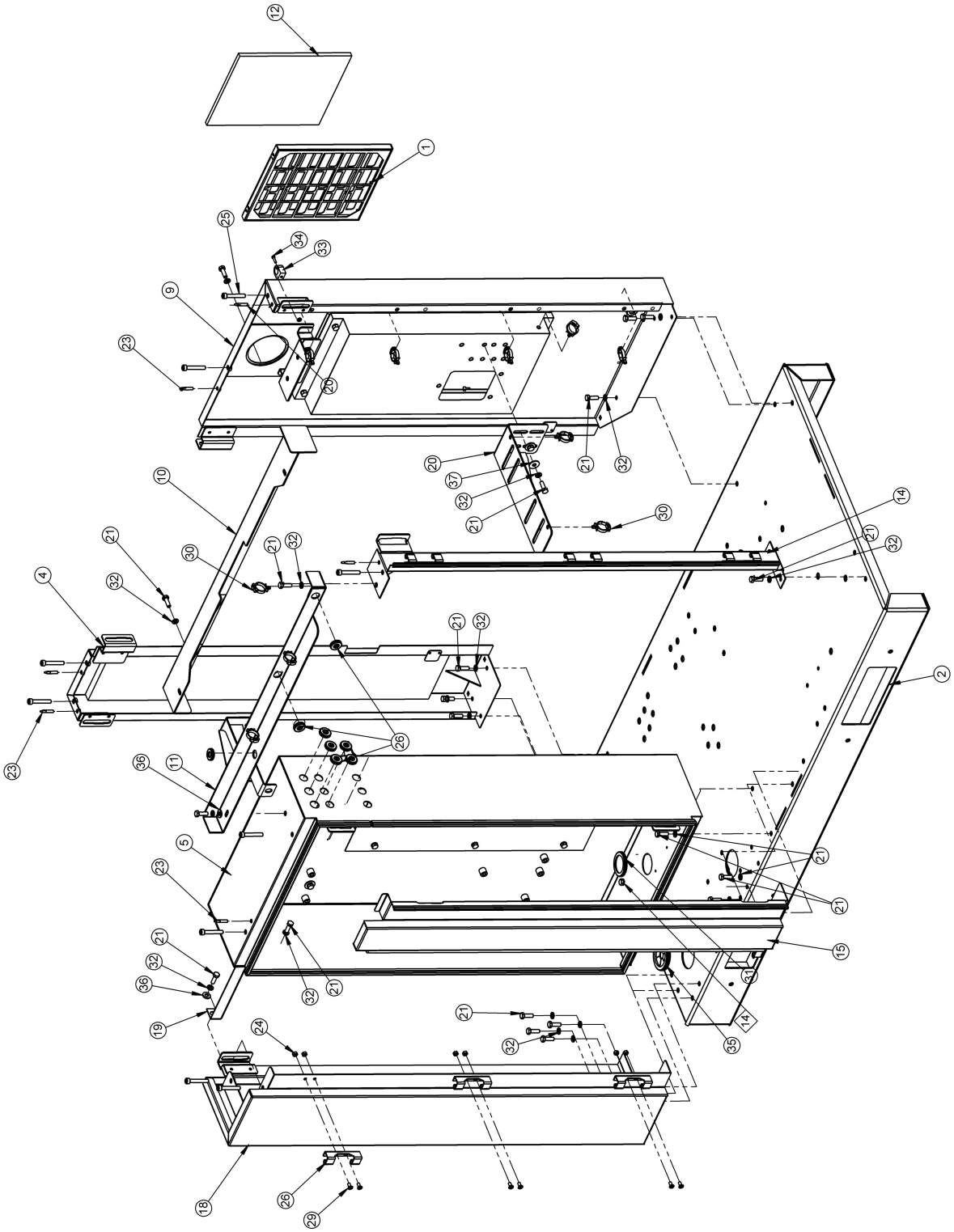
12.0 LUBRICATION SYSTEM EQ-22

[Ref : 015325511 - X0110078]

FN. No.	Description	Qty.	Part Number
1	PIPE OIL SUCTION EG-22	1	015315690
2	O-RING ID19.2 X 2.5	2	015402046
3	OIL FILTER ASSY	1	X017485
4	THERMOSTATIC VALVE PLUG	1	015400874
5	PISTON TVB EG22	1	015404024
6	SPRING THERMAL	1	015401073
7	THERMAL ELEMENT 75 DEG CELCIU	1	B008706030008
8	CIRCLIP INTERNAL B37	1	000917237
9	O-RING ID27.6 X 2.4	1	015400890
10	WASHER SPRING M8 RECT ZYP	16	000996108
11	O-RING ID32.9 X 3.5	1	015402685
12	BOLT HEX M8X30 8.8 ZYP 5-8M	8	000906117
13	O-RING ID25.0 X 3.5	6	015403001
14	NUT HEX M8 8 ZYP	8	000948008
15	STUD M8	8	015404066
16	HOSE-OIL INJECTION EV-22	1	015321716
17	OIL INJECTION ORIFICE DIA 7	1	015324964
18	PIPE ASSY-MPV TO COOLER -EQ 2	1	015325498
19	HOSE ASSY-TO COOLER EQ22 P2	1	015325503
20	HOSE ASSY-FROM COOLER EQ22 P2	1	015325504
21	O-RING ID47.2 X 3.5	1	015400891
22	WASHER OD22XID8.5X3T ZN BLUE	2	015404994

13.0 Base & canopy system

[Ref : 015323975 - X019573]



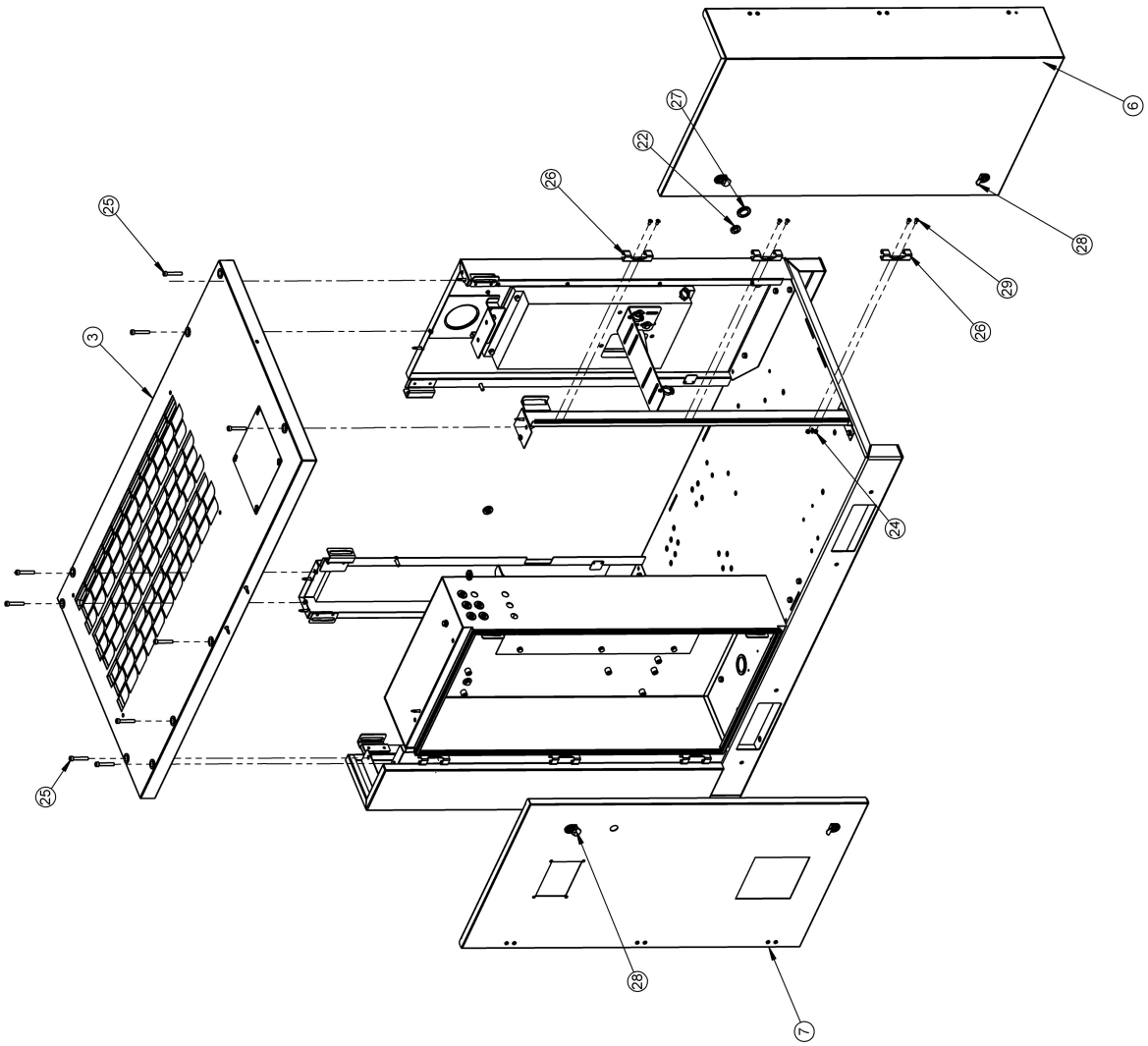
13.0 Base & canopy system

[Ref : 015323975 - X019573]

Sl. No.	Description	Qty.	Part Number
1	CATRIDGE PRE FILTER	1	015326435
2	BASE ASSEMBLY 18-22 KW / 50 HZ	1	015323903
3	TOP PROOF PANEL ASSEMBLY	1	015325380
4	MOTOR SIDE PILLAR ASSY	1	015323876
5	CONTROL PANEL BOX ASSY	1	015325381
6	SERVICE DOOR ASSEMBLY	1	015325388
7	CONTROL PANEL DOOR ASSY	1	015325387
8	PANEL ASSY RH	1	015324474
9	DISCHARGE SIDE PILLAR ASSY	1	015326082
10	COOLER SUPPORT MEMBER EQ-22	1	015321507
11	CROSS-MEMBER FRONT	1	015325383
12	PRE FILTER	1	015400889
13	PANEL-REAR EQ-22	1	015324862
14	TANK SIDE PILLAR	1	015323886
15	FRONT PILLAR - EQ 22	1	015325382
16	PRE-FILTER COOLER SIDE	1	015322092
17	PRE-FILTER F2 RM	1	015324493
18	CONTROL PANEL PILLAR - EQ 22	1	015325386
19	C. P BOX SUPPORT BRACKET	1	015325726
20	AIR FILTER BRACKET-EQ	1	015321539
21	M8 X 25 HEX BOLT	26	000906116
22	GROMMET ID -20 MM	9	01531068B
23	GUIDE PIN (M6)	6	-
24	HEX NUT M6	12	-
25	M8X50 SOCKET HEAD SCREW	9	-
26	HINGE DHIM 120	6	B011604790005
27	GROMMET ID -31 MM	1	01531068D
28	LOCK	10	B15204790005
29	COUNTER SUNK SCREW M6X16	12	-
30	WIRE GUIDE	8	008985060
31	GROMMET ID -51 MM	1	01531068F
32	M8 SPRING WASHER	26	-
33	KEY HOLDER	1	015403237
34	SLOTTED CHEESE SCREW - M4 X 16	1	-
35	GROMMET ID -63 MM	1	01531068H
36	M8 PUNCHED WASHER	2	-
37	WASHER PLAIN M8 ZYP	2	-

13.0 Base & canopy system

[Ref : 015323975 - X019573]



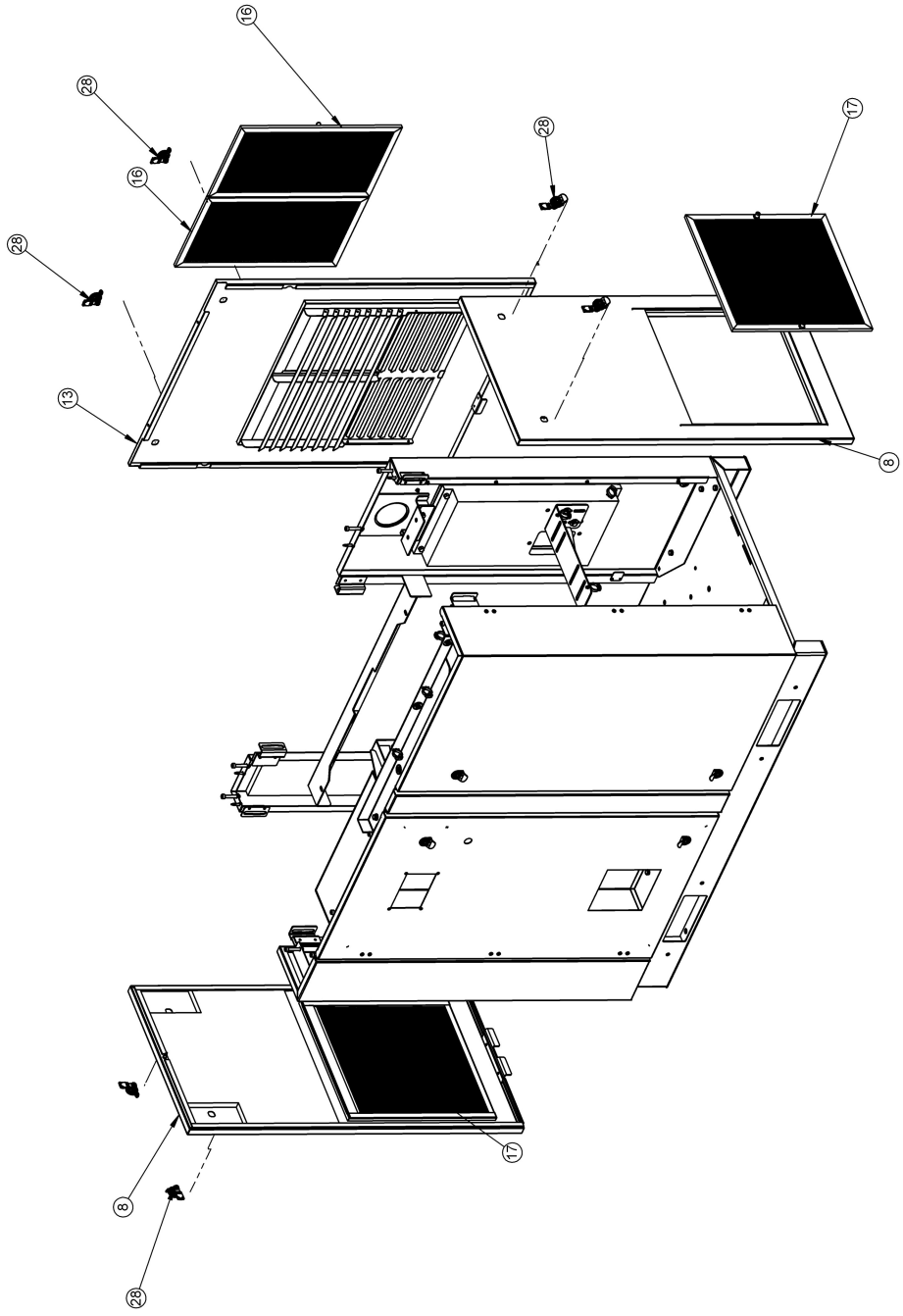
13.0 Base & canopy system

[Ref : 015323975 - X019573]

Sl. No.	Description	Qty.	Part Number
1	CATRIDGE PRE FILTER	1	015326435
2	BASE ASSEMBLY 18-22 KW / 50 HZ	1	015323903
3	TOP PROOF PANEL ASSEMBLY	1	015325380
4	MOTOR SIDE PILLAR ASSY	1	015323876
5	CONTROL PANEL BOX ASSY	1	015325381
6	SERVICE DOOR ASSEMBLY	1	015325388
7	CONTROL PANEL DOOR ASSY	1	015325387
8	PANEL ASSY RH	1	015324474
9	DISCHARGE SIDE PILLAR ASSY	1	015326082
10	COOLER SUPPORT MEMBER EQ-22	1	015321507
11	CROSS-MEMBER FRONT	1	015325383
12	PRE FILTER	1	015400889
13	PANEL-REAR EQ-22	1	015324862
14	TANK SIDE PILLAR	1	015323886
15	FRONT PILLAR - EQ 22	1	015325382
16	PRE-FILTER COOLER SIDE	1	015322092
17	PRE-FILTER F2 RM	1	015324493
18	CONTROL PANEL PILLAR - EQ 22	1	015325386
19	C. P BOX SUPPORT BRACKET	1	015325726
20	AIR FILTER BRACKET-EQ	1	015321539
21	M8 X 25 HEX BOLT	26	000906116
22	GROMMET ID -20 MM	9	01531068B
23	GUIDE PIN (M6)	6	-
24	HEX NUT M6	12	-
25	M8X50 SOCKET HEAD SCREW	9	-
26	HINGE DHIM 120	6	B011604790005
27	GROMMET ID -31 MM	1	01531068D
28	LOCK	10	B15204790005
29	COUNTER SUNK SCREW M6X16	12	-
30	WIRE GUIDE	8	008985060
31	GROMMET ID -51 MM	1	01531068F
32	M8 SPRING WASHER	26	-
33	KEY HOLDER	1	015403237
34	SLOTTED CHEESE SCREW - M4 X 16	1	-
35	GROMMET ID -63 MM	1	01531068H
36	M8 PUNCHED WASHER	2	-
37	WASHER PLAIN M8 ZYP	2	-

13.0 Base & canopy system

[Ref : 015323975 - X019573]



13.0 Base & canopy system

[Ref : 015323975 - X019573]

Sl. No.	Description	Qty.	Part Number
1	CATRIDGE PRE FILTER	1	015326435
2	BASE ASSEMBLY 18-22 KW / 50 HZ	1	015323903
3	TOP PROOF PANEL ASSEMBLY	1	015325380
4	MOTOR SIDE PILLAR ASSY	1	015323876
5	CONTROL PANEL BOX ASSY	1	015325381
6	SERVICE DOOR ASSEMBLY	1	015325388
7	CONTROL PANEL DOOR ASSY	1	015325387
8	PANEL ASSY RH	1	015324474
9	DISCHARGE SIDE PILLAR ASSY	1	015326082
10	COOLER SUPPORT MEMBER EQ-22	1	015321507
11	CROSS-MEMBER FRONT	1	015325383
12	PRE FILTER	1	015400889
13	PANEL-REAR EQ-22	1	015324862
14	TANK SIDE PILLAR	1	015323886
15	FRONT PILLAR - EQ 22	1	015325382
16	PRE-FILTER COOLER SIDE	1	015322092
17	PRE-FILTER F2 RM	1	015324493
18	CONTROL PANEL PILLAR - EQ 22	1	015325386
19	C. P BOX SUPPORT BRACKET	1	015325726
20	AIR FILTER BRACKET-EQ	1	015321539
21	M8 X 25 HEX BOLT	26	000906116
22	GROMMET ID -20 MM	9	01531068B
23	GUIDE PIN (M6)	6	-
24	HEX NUT M6	12	-
25	M8X50 SOCKET HEAD SCREW	9	-
26	HINGE DHIM 120	6	B011604790005
27	GROMMET ID -31 MM	1	01531068D
28	LOCK	10	B15204790005
29	COUNTER SUNK SCREW M6X16	12	-
30	WIRE GUIDE	8	008985060
31	GROMMET ID -51 MM	1	01531068F
32	M8 SPRING WASHER	26	-
33	KEY HOLDER	1	015403237
34	SLOTTED CHEESE SCREW - M4 X 16	1	-
35	GROMMET ID -63 MM	1	01531068H
36	M8 PUNCHED WASHER	2	-
37	WASHER PLAIN M8 ZYP	2	-

RECOMMENDED SPARES

A) PERIODIC MAINTENANCE KITS

1) SERVICE KIT AT 2000 HOURS - 012490679

S. No	Description	Part Number	Qty.
1	OIL SAMPLING KIT	B024700070001	1

2) SERVICE KIT AT 4000 HRS (FG OIL) - 012490939

S. No	Description	Part Number	Qty.
1	AIRFILTER ELEMENT E18TO22	B005700770005	1
2	FILTER [184X184] UNIT	018400062	1
3	PRE FILTER	015400889	1
4	AIR OIL SEPERATOR SPINON	B006700770010	1
5	OIL FILTER ASSY	X017485	1
6	ELGI AIRLUBE FG-1.3 GAL	000998079	2
7	OIL SAMPLING KIT	B024700070001	1

3) SERVICE KIT AT 8000 HRS (FG OIL) - 012490959

S. No	Description	Part Number	Qty.
1	AIRFILTER ELEMENT E18TO22	B005700770005	1
2	DRIVE COUP ELEMENT 18&22KWSH9	B011201170006	1
3	FILTER [184X184] UNIT	018400062	1
4	PRE FILTER	015400889	1
5	AIR OIL SEPERATOR SPINON	B006700770010	1
6	OIL FILTER ASSY	X017485	1
7	MOBILITH SHC 100 GREASE (CARTRIDGE)	105400563	1
8	ELGI AIRLUBE FG-1.3 GAL	000998079	2
9	OIL SAMPLING KIT	B024700070001	1

4) ANNUAL SERVICE KIT UPTO 8000 HRS (FG OIL) - 012490979

S. No	Description	Part Number	Qty.
1	AIRFILTER ELEMENT E18TO22	B005700770005	2
2	DRIVE COUP ELEMENT 18&22KWSH9	B011201170006	1
3	FILTER [184X184] UNIT	018400062	2
4	PRE FILTER	015400889	2
5	AIR OIL SEPERATOR SPINON	B006700770010	2
6	OIL FILTER ASSY	X017485	2
7	MOBILITH SHC 100 GREASE (CARTRIDGE)	105400563	1
8	ELGI AIRLUBE FG-5.3 GAL	000998078	1
9	OIL SAMPLING KIT	B024700070001	4

5) SERVICE KIT AT 4000 HRS (UT SYNTH PLUS OIL) - 012490999

S. No	Description	Part Number	Qty.
1	AIRFILTER ELEMENT E18TO22	B005700770005	1
2	FILTER [184X184] UNIT	018400062	1
3	PRE FILTER	015400889	1
4	OIL FILTER ASSY	X017485	1
5	OIL SAMPLING KIT	B024700070001	1

6) SERVICE KIT AT 8000 HRS (UT SYNTH PLUS OIL) - 012491019

S. No	Description	Part Number	Qty.
1	AIRFILTER ELEMENT E18TO22	B005700770005	1
2	DRIVE COUP ELEMENT 18&22KWSH9	B011201170006	1
3	FILTER [184X184] UNIT	018400062	1
4	PRE FILTER	015400889	1
5	AIR OIL SEPERATOR SPINON	B006700770010	1
6	OIL FILTER ASSY	X017485	1
7	MOBILITH SHC 100 GREASE (CARTRIDGE)	105400563	1
8	ELGI AIRLUBE UT SYN PLUS 5L(1.3G)	000998101	2
9	OIL SAMPLING KIT	B024700070001	1

7) ANNUAL SERVICE KIT UPTO 8000 HRS (UT SYNTH PLUS OIL) - 012491039

S. No	Description	Part Number	Qty.
1	AIRFILTER ELEMENT E18TO22	B005700770005	2
2	DRIVE COUP ELEMENT 18&22KWSH9	B011201170006	1
3	FILTER [184X184] UNIT	018400062	2
4	PRE FILTER	015400889	2
5	AIR OIL SEPERATOR SPINON	B006700770010	1
6	OIL FILTER ASSY	X017485	2
7	MOBILITH SHC 100 GREASE (CARTRIDGE)	105400563	1
8	ELGI AIRLUBE UT SYN PLUS 5L(1.3G)	000998101	2
9	OIL SAMPLING KIT	B024700070001	4

8) VALVE KIT - 012489299

S. No	Description	Part Number	Qty.
1	INTAKE VALVE KIT EIV 102	972300040	1
2	BDV ASSEMBLY KIT EIV 102	972300080	1
3	SOLENOID VALVE NC,24V50/60HZ	B007300990017	1
4	MPV KIT,EN 102	A990293	1
5	ACTUATOR KIT EIV 102	972300060	1

9) TUBE AND FITTING KIT - 012489219

S. No	Description	Part Number	Qty.
1	QUICK FITTINGS CONN 1/4BSP-6	000920504	1
2	QF ELBOW 1/4BSP-DIA 6	000920624	1
3	TUBINGS 6MM	000920620	1.5
4	BULK HEAD CONNECTOR	B010500170002	1

10) THERMAL VALVE KIT 65 DEG C - 012485140

S. No	Description	Part Number	Qty.
1	CIRCLIP INTERNAL B37	000917237	1
2	O-RING ID27.6 X 2.4	015400890	1
3	SPRING THERMAL	015401073	1
4	PISTON-ELEMENT ASSY, F2, 65DEG.	A010601	1

11) THERMAL VALVE KIT 75 DEG C - 012485141

S. No	Description	Part Number	Qty.
1	CIRCLIP INTERNAL B37	000917237	1
2	O-RING ID27.6 X 2.4	015400890	1
3	SPRING THERMAL	015401073	1
4	PISTON-ELEMENT ASSY, F2, 75DEG.	A010602	1

12) O-RING KIT - 012489229

S. No	Description	Part Number	Qty.
1	O-RING ID19.2 X 2.5	015402046	2
2	O-RING ID27.6 X 2.4	015400890	1
3	O RING	015404365	2
4	O-RING ID32.9 X 3.5	015402685	2
5	O-RING_M42 ISO	990404850	1
6	O-RING ID47.2 X 3.5	015400891	2
7	O-RING ID62.0 X 2.0	990402960	1
8	O-RING ID69.4 X 3.5	010453920	2
9	O-RING ID122.0 X 3.6	415400655	1
10	O-RING ID190.0 X 5.3	015403257	1
11	O-RING ID25.0 X 3.5	015403001	6
12	1/8 BSP BONDED SEAL WASHER	000959381	1
13	1/2 BSP BONDED SEAL WASHER	000959387	3
14	1 BSP BONDED SEAL WASHER VITON	000959439	1
15	1 1/2 BSP BONDED SEAL WASHER	000959391	1
16	O-RING ID110.7 X 3.5	415400814	1

13) SS TUBE AND FITTING - 012489239

S. No	Description	Part Number	Qty.
1	ST FITTING 1/8 TO 6MM OD	000959913	1
2	PMS COUPLING 1/4BSP X 6MM	B009606780026	2
3	SCAVENGING TUBE -159 EQ 22	015325499	1
4	PULSE LINE TUBE -159 EQ 22	015325500	1
5	PMS CPLNG ORI. 1MM 1/4X1/8BSP	B009606780021	1

14) MPV TO COOLER PIPE KIT - 012489249

S. No	Description	Part Number	Qty.
1	O-RING ID32.9 X 3.5	015402685	1
2	O-RING ID47.2 X 3.5	015400891	1
3	PIPE ASSY-MPV TO COOLER -EQ 22	015325498	1

15) HOSE OIL INJECTION KIT - 012488489

S. No	Description	Part Number	Qty.
1	O-RING ID25.0 X 3.5	015403001	2
2	HOSE-OIL INJECTION EV-22	015321716	1

16) HOSE TANK TO COOLER KIT - 012489259

S. No	Description	Part Number	Qty.
1	HOSE ASSY-TO COOLER EQ22 P2	015325503	1
2	O-RING ID25.0 X 3.5	015403001	2

17) HOSE COOLER TO TANK KIT - 012489269

S. No	Description	Part Number	Qty.
1	O-RING ID25.0 X 3.5	015403001	2
2	HOSE ASSY-FROM COOLER EQ22 P2	015325504	1

18) ATER COOLER REPLACEMENT KIT - 012490809

S. No	Description	Part Number	Qty.
1	CLIP ON GASKET - 6.5MM	015311825	0.5
2	SEALING TAPE	41041X223	2.1
3	O-RING ID32.9 X 3.5	015402685	2

19) OIL COOLER REPLACEMENT KIT - 012490819

S. No	Description	Part Number	Qty.
1	O-RING ID25.0 X 3.5	015403001	2
2	CLIP ON GASKET - 6.5MM	015311825	0.5
3	SEALING TAPE	41041X223	2.1

20) SEAL GROUP AXIS-102GD(METRIC) - A019272

S. No	Description	Part Number	Qty.
1	SEAL HOUSING (AXIS-102 GD)	013336409	1
2	INNER RING IR 40X45X20 (102)	013436088	1
3	SEAL SHAFT45X60X12 AXIS-102 CW	013436408	1
4	SPACER-102	013436087	1
5	SCR SOC HD M8X16 10.9 ZYP 5-8U	000983081	5
6	SCREW GRUB M5X12	000987725	3

21) INSURANCE KIT C - 012491059

S. No	Description	Part Number	Qty.
1	SAFETY VALVE-F2@205PSI	B012805340024	1
2	THERMAL VALVE KIT 65 DEG C	012485140	1
3	SOLENOID VALVE NC,24V50/60HZ	B007300990017	1
4	INTAKE VALVE KIT EIV 102	972300040	1
5	NON RETURN VALVE 1/8 INCH MXF	B004100170002	1
6	ACTUATOR KIT EIV 102	972300060	1
7	BDV ASSEMBLY KIT EIV 102	972300080	1
8	MPV KIT,EN 102	A990293	1
9	DRIVE COUP ELEMENT 18&22KWSH9	B011201170006	1
10	O-RING KIT	012489229	1
11	TUBE AND FITTING KIT	012489219	1
12	GAUGE FLOAT OIL LEVEL 7483S00020	B010706790001	1
13	SEAL GROUP AXIS-102GD(METRIC)	A019272	1
14	MVP TO COOLER PIPE KIT	012489249	1
15	HOSE COOLER TO TANK KIT	012489269	1
16	HOSE TANK TO COOLER KIT	012489259	1
17	PT1000 TS 4.2M CABLE	018400076	1
18	PRESSURE TRANSMITTER(0-16BAR)MBS1900	00897902N	1

22) INSURANCE KIT CV - 012491069

S. No	Description	Part Number	Qty.
1	SAFETY VALVE-F2@205PSI	B012805340024	1
2	THERMAL VALVE KIT 75 DEG C	012485141	1
3	SOLENOID VALVE NC,24V50/60HZ	B007300990017	1
4	INTAKE VALVE KIT EIV 102	972300040	1
5	NON RETURN VALVE 1/8 INCH MXF	B004100170002	1
6	ACTUATOR KIT EIV 102	972300060	1
7	BDV ASSEMBLY KIT EIV 102	972300080	1
8	MPV KIT,EN 102	A990293	1
9	DRIVE COUP ELEMENT 18&22KWSH9	B011201170006	1
10	O-RING KIT	012489229	1
11	TUBE AND FITTING KIT	012489219	1
12	GAUGE FLOAT OIL LEVEL 7483S00020	B010706790001	1
13	SEAL GROUP AXIS-102GD(METRIC)	A019272	1
14	MVP TO COOLER PIPE KIT	012489249	1
15	HOSE COOLER TO TANK KIT	012489269	1
16	HOSE TANK TO COOLER KIT	012489259	1
17	PT1000 TS 4.2M CABLE	018400076	1
18	PRESSURE TRANSMITTER(0-16BAR)MBS1900	00897902N	1

B) OTHER MAINTENANCE ITEMS

S. No	Description	Part Number	Qty.
1	ELGI AIRLUBE UT SYN PLUS 5L(1.3G)	000998101	1
2	ELGI AIRLUBE UT SYN PLUS 20L(5.3G)	000998102	1
3	ELGI AIRLUBE UT SYN PLUS 209L	000998103	1
4	ELGI AIRLUBE FG-1.3 GAL	000998079	1
5	ELGI AIRLUBE FG-5.3 GAL	000998078	1
6	ELGI AIRLUBE FG-55 GAL	000998077	1
7	MOBILITH SHC 100 GREASE (CARTRIDGE)	105400563	1
8	PIPE COUPLING 1-1/2 STY12(ACM	B56XX07	1
9	DRIVE COUP ELEMENT 18&22KWSH9	B011201170006	1
10	SAFETY VALVE-F2@205PSI	B012805340024	1
11	AVM	B001401300022	4
12	ANTI VIBRATION MOUNT MF	B001401300003	1
13	OIL COOLER EG-22	015315701	1
14	AFTER COOLER EG-22	015315702	1
15	PRE-FILTER F2 RM	015324493	2
16	PRE-FILTER COOLER SIDE	015322092	2
17	O-RING ID110.7 X 3.5	415400814	1
18	O-RING ID190.0 X 5.3	015403257	1
19	SAFETY ELEMENT 97 CFM	B005704620008	1

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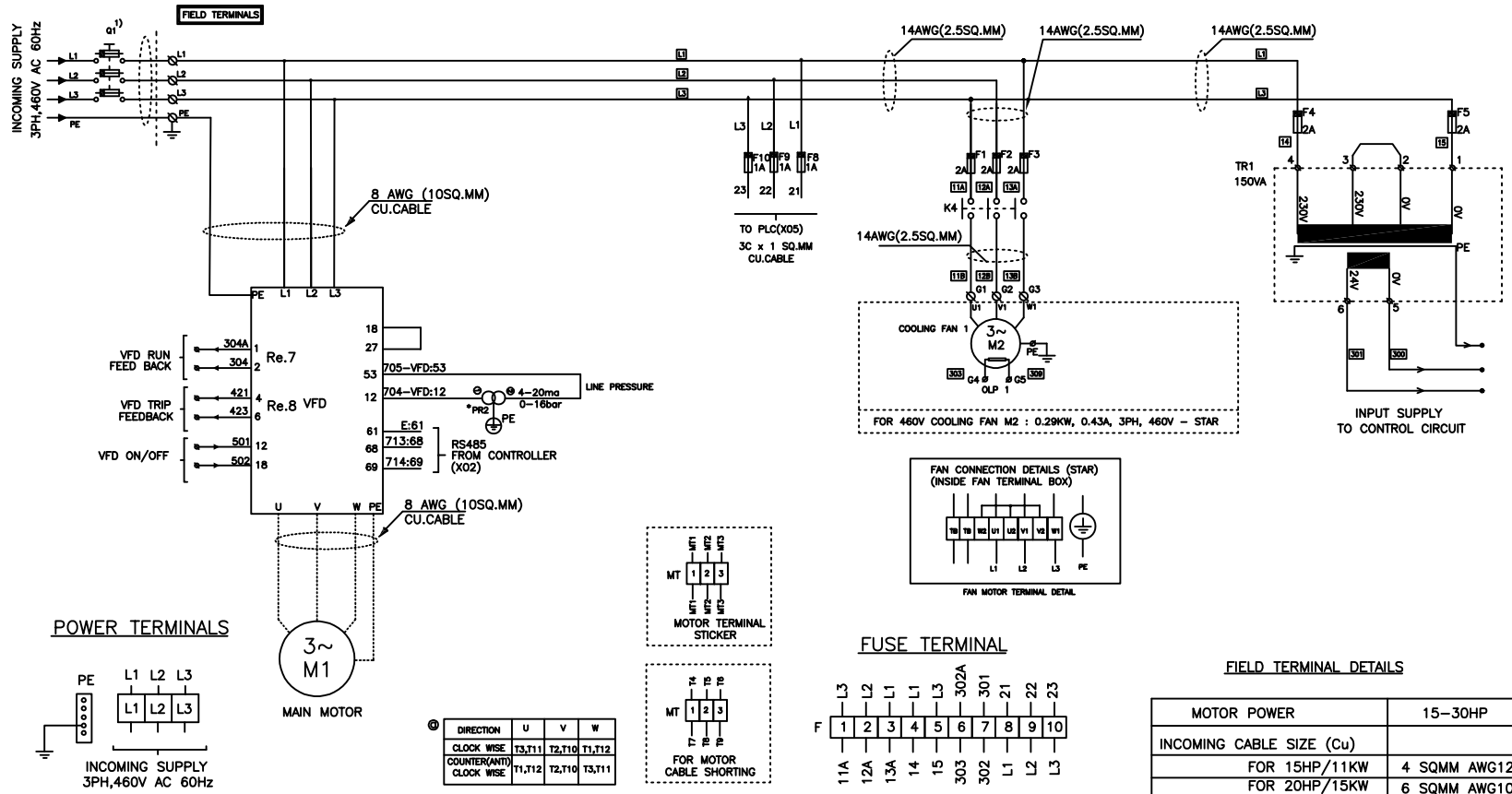


POWER TERMINALS

DIRECTION	U	V	W
CLOCK WISE	T3,T11	T2,T10	T1,T12
COUNTER(ANTI) CLOCK WISE	T1,T12	T2,T10	T3,T11

FUSE TERMINAL

FIELD TERMINAL DETAILS

MOTOR POWER	15–30HP
INCOMING CABLE SIZE (Cu)	
FOR 15HP/11KW	4 SQMM AWG12
FOR 20HP/15KW	6 SQMM AWG10
FOR 25HP/18.5KW	10 SQMM AWG8
FOR 30HP/22KW	25 SQMM AWG4
INCOMING TERMINAL	RSC6–F
TIGHTENING TORQUE (Nm)	3.2Nm

GENERAL INSTRUCTION :
1. DIRECTION OF ROTATION OF MOTOR TO BE AS PER PRESSURE SETTING & GEAR/DIRECT DRIVEN MODEL.
2. ABOVE CONNECTIONS ARE FOR CLOCKWISE DIRECTION FROM DRIVE END (DIRECT DRIVEN MODEL)
3. SWITCHES AND CONTACTS ARE SHOWN IN PRESSURE FREE AND DE–ENERGISED CONDITION.
4. OLP– OVER LOAD PROTECTION FOR FAN
5. FOR CABLE COLOR CODING FOLLOW THE LATEST REVISION OF WORK INSTRUCTION
6. 3X1SQ.MM CABLE (BLACK x BLACK x BLACK) TO BE BROUGHT SEPARATELY FROM FUSE TERMINAL TO NEURON XT X05 CONNECTOR
7. X05 PIN CONNECTOR CONNECTION TO BE ENSURED ACCORDING TO MOTOR CONNECTION.
8. DEPENDING UPON THE INCOMING CABLE SIZE, RING SOCKET PROVIDED AS SPARE

NOTE:
1) SFU (Q1)TO BE PROVIDED BY CUSTOMER

ITEM NO.	DESCRIPTION	QTY	DRAWING No.	REV.	REMARKS

MODEL. CONTROL PANEL EQ11-22V,460V,60HZ,NXT

MAT'L.

ELGI EQUIPMENTS LTD., COIMBATORE - INDIA.

	NAME	DATE
DESIGNED	VMR	07.10.21
CAD	VISHNU	07.10.21
CHECKED		
APPD.		

CONTROL PANEL EQ11-22V,460V,60HZ,NXT
CONTROL CIRCUIT

RPF.DRG.No. | NEXT ASSY.

SCALE NTS

DRG.No. 01 83 6525 2

DRG.SHEET 1 OF 4 | REVISION R05

REV. NO.	ECO.No.	DATE	DESCRIPTION	ALT.BY.	CHD.BY.

DO NOT SCALE THIS DRG. IF IN DOUBT, ASK ENGG. DEPT.

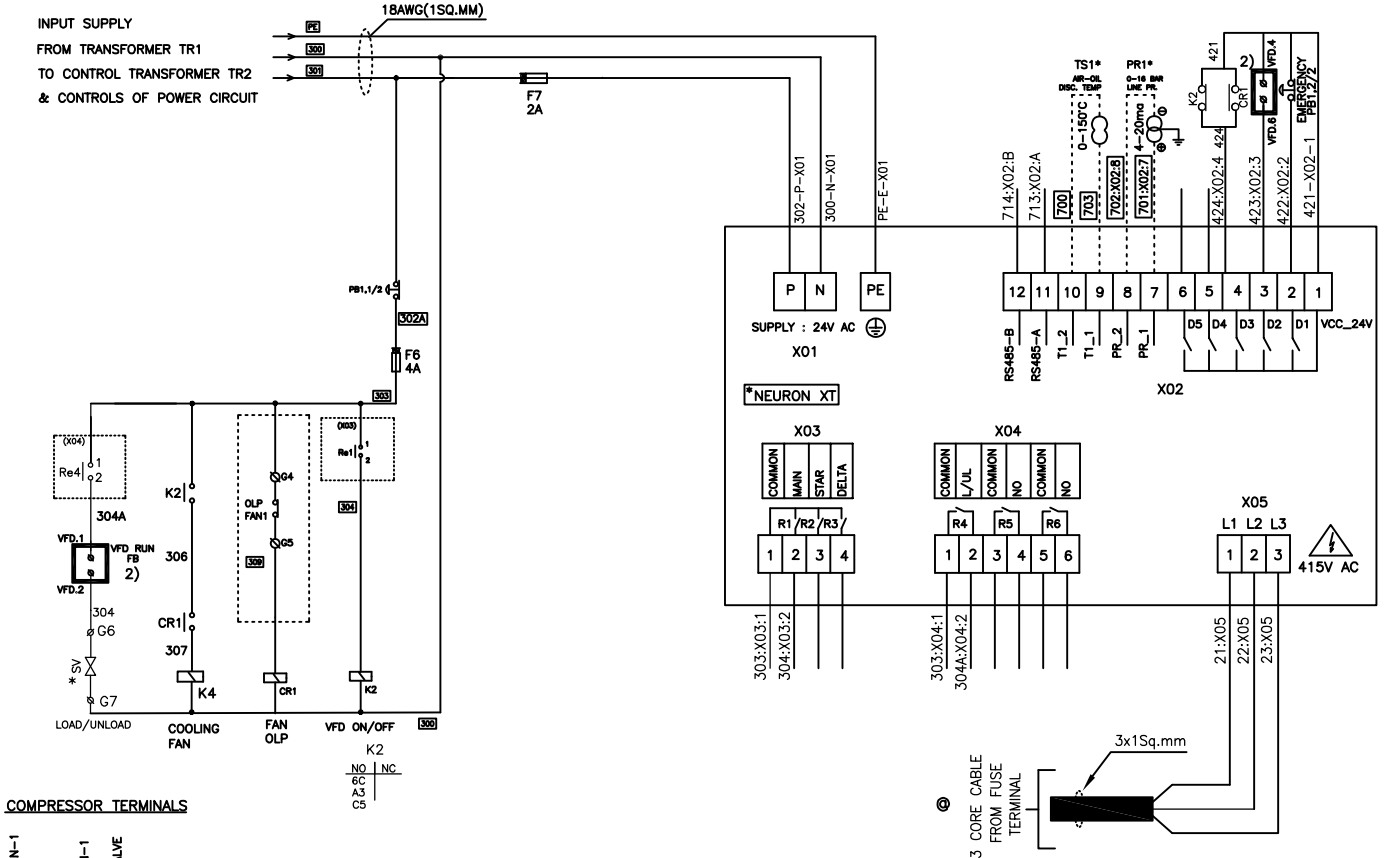
SURFACE FINISH SYMBOLS

ROUGHNESS SYMBOL	N1	N2	N3	N4	N5	N6	N7	N8	N9	N10	N11	N12
ROUGHNESS VALUE Ra µm	0.025	0.05	0.1	0.2	0.4	0.8	1.6	3.2	6.3	12.5	25	50

MACHINING DEVIATION FOR OPEN DIMNS.IS 2102(Medium)

DIMN.	OVER	UP TO & INCL.	TOLERANCE
	–	6	±0.1
	6	30	±0.2
	30	120	±0.3
	120	315	±0.5
	315	1000	±0.8
	1000	2000	±1.2
	2000	4000	±2
	>4000		±3

CAD FILE NAME : 018365252



LEGENDS:

- * SV – SOLENOID VALVE
- * PR1 – DISCHARGE LINE PRESSURE SENSOR
- * TS1 – DISCHARGE TEMPERATURE SENSOR
- * NEURON XT – CONTROLLER

ITEM NO.	DESCRIPTION	QTY	DRAWING No.	REV.	REMARKS
MODEL.	CONTROL PANEL EQ11-22V,460V,60HZ,NXT				
MAT'L.					

ELGI EQUIPMENTS LTD.,
COIMBATORE - INDIA.

	NAME	DATE
DESIGNED	VMR	07.10.21
CAD	VISHNU	07.10.21
CHECKED		
APPD.		

CONTROL PANEL EQ11-22V,460V,60HZ,NXT
CONTROLLER CIRCUIT

RPF.DRG.No. | NEXT ASSY.

SCALE NTS

DRG.No. 01 83 6525 2

DRG.SHEET 2 OF 4 | REVISION R05

REV. NO.	ECO.No.	DATE	DESCRIPTION	ALT.BY.	CHD.BY.

DO NOT SCALE THIS DRG. IF IN DOUBT, ASK ENGG. DEPT.

SURFACE FINISH SYMBOLS

	N1	N2	N3	N4	N5	N6	N7	N8	N9	N10	N11	N12
ROUGHNESS SYMBOL												
ROUGHNESS VALUE Ra μm	0.025	0.05	0.1	0.2	0.4	0.8	1.6	3.2	6.3	12.5	25	50

MACHINING DEVIATION FOR OPEN DIMNS.IS 2102(Medium)

DIMN.	OVER	–	6	30	120	315	1000	2000	4000	>4000
	UP TO & INCL.	6	30	120	315	1000	2000	4000		
TOLERANCE		±0.1	±0.2	±0.3	±0.5	±0.8	±1.2	±2		±3

CAD FILE NAME : 018365252

BILL OF MATERIAL

SL.NO	CODE	DESCRIPTION	MAKE	RATING	ELGI PART NO	QTY
1	VFD	DRIVE	DANFOSS	11KW–22KW	REF.TABLE	1
2	K2	CONTROL CONTACTOR	SIEMENS	3RH21 31–1AB00,10A+3RT2916–1CB00	018362749+018400196	1
3	K4	POWER CONTACTOR FOR COOLING FAN	SIEMENS	9A,3RT20 23–1AC20+3RT29 26–1CB00	008900170+018400197	1
4	CR1	CONTROL RELAY	WAGO	788–512, 24V	018900037	1
5	TR1	TRANSFORMER	SALZER	150VA, 0–0–230V–230V/0–24V	00893703A	1
6	CONNECTOR	PLC CONNECTOR SET	WAGO/ DEGSON	PIN : 2,12,4,6,3	00897903T / –	1 SET
7	F1–F10	FUSE TERMINALS WITH GLASS FUSE	WAGO	281–611	018362735	10
8	L1,L2,L3	INCOMING TERMINALS WITH PROTECTIVE COVER	ELMEX	SPT35(G)	008946234	AS REQ.
9	G	CONTROL TERMINAL BLOCKS	WAGO	281–101	018362734	7
10	PE	EARTH TERMINAL BLOCK	WAGO	281–107	018362733	1
11	PB1	EMERGENCY STOP(FULL DIAL PLATE)	TEKNIC	2AML4 + 2 S2 CONTACT	008940030	1
12	–	PVC CHANNEL	–	WIDE SLOT, NON–SLIP–45 x 45/45 x 25	–	
13	PE	EARTH STRIP FOR COMPONENT EARTH WITH 5mm SCREW WITH FLAT & SPRING WASHER	–	COPPER WITH TIN COATING	–	1
14	NXT	NEURON CONTROLLER	ELGI	–	018362887	1
15	TS1	TEMPERATURE SENSOR	DANFOSS	0–150°C	018400076	1
16	PR1	PRESSURE TRANSMITTER	DANFOSS	0–16 BAR	00897902N	1
17	MT	MOTOR CONNECTION TERMINALS	CONNECTWELL	CTS16U	008946320	AS REQ.
18	F1–F5	CERAMIC FUSE–20 X 5	LITTLE/BEL	TIME LAG, 2A	018900029	AS REQ.
19	F7	GLASS FUSE 20 x 5	PROTECTRON	SLOW BLOW 2A	00894642A	AS REQ.
20	F6	GLASS FUSE 20 x 5	PROTECTRON	SLOW BLOW 4A	00894644A	AS REQ.
21	F8–F10	CERAMIC FUSE–20 X 5	LITTLE/BEL	TIME LAG, 1A	018900028	AS REQ.

MODEL	VFD PART No.
EG11	B012000510023
EG15	B012000510024
EG18	B012000510025
EG22	B012000510019

FEMALE CONNECTOR SET FOR NEURON–XT ENCAP (00897903T)

SL.No	DESCRIPTION	NO. OF PINS	CONNECTOR	MAKE	FEMALE PART NO.
1	POWER SUPPLY INPUT	2	X01	WAGO	231–102/026–000
2	INPUT / OUTPUT	12	X02	WAGO	231–312/026–000
3	RELAY OUT – MAIN/STAR/DELTA	4	X03	WAGO	231–204/026–000
4	RELAY OUT	6	X04	WAGO	231–206/026–000
5	3Φ SUPPLY – SPP	3	X05	WAGO	231–203/026–000

NOTE:

3) SELECTED BASED ON SUPPLIER MIGRATION ON 3RT1 TO 3RT2 CONTACTORS
SIMULTANIOUSLY ADDON CONTACTS QUANTITY WILL DIFFER BASED ON CONTACTOR MIGRATION

GENERAL INSTRUCTION :

CONTACTOR ORDERING TO BE DONE BASED ON PANEL REQUIREMENT

REV. NO.	ECO.No.	DATE	DESCRIPTION	ALT.BY.	CHD.BY.

ITEM NO.	DESCRIPTION	QTY	DRAWING No.	REV.	REMARKS
MODEL.	CONTROL PANEL EQ11-22V,460V,60HZ,NXT				
MAT'L.					

ELGI EQUIPMENTS LTD.,
COIMBATORE - INDIA.

	NAME	DATE
DESIGNED	VMR	07.10.21
CAD	VISHNU	07.10.21
CHECKED		
APPD.		

CONTROL PANEL EQ11-22V,460V,60HZ,NXT
BILL OF MATERIALS

RPF.DRG.No. | NEXT ASSY.

SCALE NTS

DRG.No. 01 83 6525 2

DRG.SHEET 3 OF 4 | REVISION R05

DO NOT SCALE THIS DRG. IF IN DOUBT, ASK ENGG. DEPT.

SURFACE FINISH SYMBOLS

ROUGHNESS SYMBOL	N1	N2	N3	N4	N5	N6	N7	N8	N9	N10	N11	N12
ROUGHNESS VALUE Ra μm	0.025	0.05	0.1	0.2	0.4	0.8	1.6	3.2	6.3	12.5	25	50

MACHINING DEVIATION FOR OPEN DIMNS.IS 2102(Medium)

DIMN.	OVER	UP TO & INCL.	TOLERANCE
	–	6	±0.1
	6	30	±0.2
	30	120	±0.3
	120	315	±0.5
	315	1000	±0.8
	1000	2000	±1.2
	2000	4000	±2
	>4000		±3

ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE SPECIFIED.

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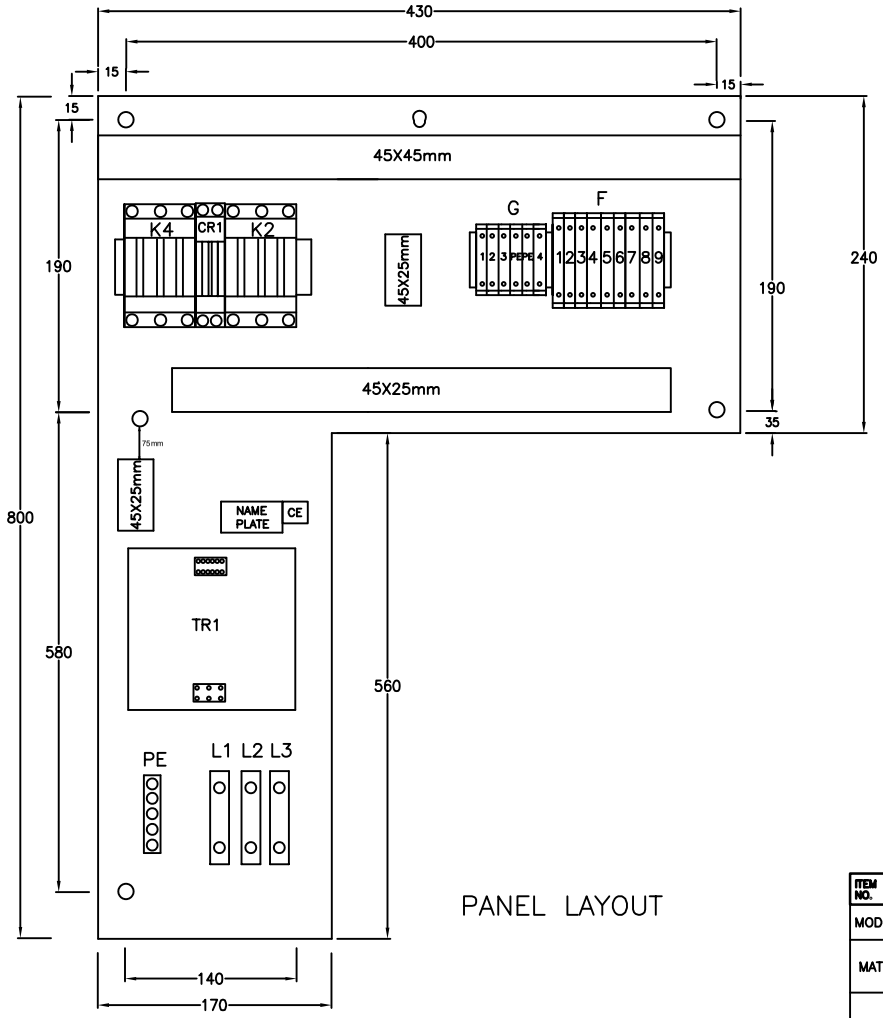


PANEL LAYOUT

CODE	DESCRIPTION
K2,K4	CONTROL CONTACTOR
TR1	TRANSFORMER
F1–F9	FUSE TERMINALS WITH GLASS FUSE
G	CONTROL TERMINAL BLOCKS
L1–L3	INCOMING TERMINALS WITH PROTECTIVE COVER
PE	EARTH TERMINAL

ITEM NO.	DESCRIPTION	QTY	DRAWING No.	REV.	REMARKS

MODEL. CONTROL PANEL EQ11-22V,460V,60HZ,NXT

MAT'L.

ELGI EQUIPMENTS LTD.,
COIMBATORE - INDIA.

	NAME	DATE
DESIGNED	VMR	07.10.21
CAD	VISHNU	07.10.21
CHECKED		
APPD.		

CONTROL PANEL EQ11-22V,460V,60HZ,NXT
PANEL LAYOUT

RPF.DRG.No. | NEXT ASSY.

SCALE NTS

DRG.No. 01 83 6525 2

DRG.SHEET 4 OF 4 | REVISION R05

DO NOT SCALE THIS DRG. IF IN DOUBT, ASK ENGG. DEPT.

REV. NO.	ECO.No.	DATE	DESCRIPTION	ALT.BY.	CHD.BY.

SURFACE FINISH SYMBOLS

ROUGHNESS SYMBOL	N1	N2	N3	N4	N5	N6	N7	N8	N9	N10	N11	N12
ROUGHNESS VALUE Ra µm	0.025	0.05	0.1	0.2	0.4	0.8	1.6	3.2	6.3	12.5	25	50

MACHINING DEVIATION FOR OPEN DIMNS.IS 2102(Medium)

DIMN. OVER	–	6	30	120	315	1000	2000	4000
UP TO & INCL.	6	30	120	315	1000	2000	4000	>4000
TOLERANCE	±0.1	±0.2	±0.3	±0.5	±0.8	±1.2	±2	±3

ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE SPECIFIED.

16.0 VFD setting procedure

Brief introduction to VFD in the global series compressor

In VFD model compressors, the Variable Frequency Drive (VFD) is integrated with the compressor. Simply put, the main motor is controlled through VFD instead of the star delta starter.

Hardware (wiring) details

The figure illustrates the wiring integrations with the VFD and control panel/controller. The following section describes the purpose of each connection in this architecture.

1. 3 Phase connection to VFD

The input side phase sequence is critical for the fan direction of rotation. During installation, the fan direction needs to be checked and, if required, change the phase sequence. However, the motor phase sequence is controlled by VFD.

2. Motor connection

It is wired for the required phase sequence with respect to your compressor requirements. Do not change the configuration.

3. Start command to VFD

The Start/Stop command that flows to the VFD from the controller rotates/stops the main motor.

4. Run feedback signal

After reaching 40% of speed, VFD sends a run feedback signal to the controller to switch on the solenoid valve to the start loading process.

5. Trip command from VFD

During any abnormalities in the VFD drive, a trip signal flows to the controller to stop the compressor. (To troubleshoot, refer to the VFD manual.)

6. Pressure feedback signal

The delivery pressure feedback signal propagates from the controller (analogue output CH1) to VFD to control motor speed. The feedback is an analogue voltage signal with a range 1-5 V.

7. RS485 communication

An RS485 communication medium occurs between the VFD and controller to read/write parameters such as voltage, current, power, frequency, and the analog scale setting.

All the above connections are factory wired and you only need to connect the incoming supply to the compressor with the right wire size and incoming protection fuse (as per the compressor manual).

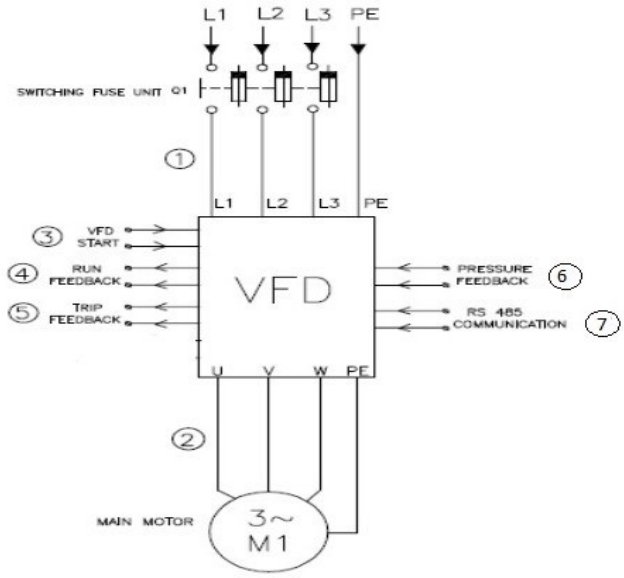
NOTE

Ensure the dip switch in VFD (right behind the display) is set in voltage mode.

Software details (programming details)

Based on the compressor rating, VFD parameters are pre-programmed in the Setup 1 location and in the compressor controller. The setting details are available in Annexure 1.

During installation and commissioning, you can tune the PI at your own site to ensure smooth speed control according to your requirements. Except for PI settings in the controller, no other setting is required to change. Similarly



in VFD, all settings are pre–programmed, so you need not change any of the settings. During operation, you can change the load pressure set point according to your requirements. .

The following parameters are important for the correct drive operation

- Right analog output feedback from the controller to VFD. (1V corresponds to AO scaling low reference and 5V corresponds to AO scaling high reference.)
- The AO high and low reference scaling settings are configured in the factory setting menu in the Neuron II controller. You can view these parameters in the NII controller. The corresponding low ref and high ref settings must be verified in drive parameters 614 and 615, respectively.
- Ensure the dip switch in VFD (right behind the display) is set in voltage mode.
- Enter motor nameplate details in VSD settings (such as voltage, current (I max value-SF current), power, frequency, and RPM).
- You need to adjust PI parameters at your site for effective tuning to ensure smooth speed control to meet your exact requirements.
- You can edit the parameters 614 and 615 in the VFD through the controller. Ensure this value matches the

AO scaling in the controller. Good practice is to not attempt to change these settings on your own. Instead contact ELGi .

For more details about VFD parameters and troubleshooting, refer to the VFD manual that shipped along with the compressor.

Operation

The Start command enables the compressor motor to start and rotate in the required direction. It is issued from the controller to VFD.

After receiving the Start command, VFD accelerates the compressor motor to 40% speed (minimum speed setting in the controller). After ensuring the run feedback signal from VFD and reaching 40% speed, the controller actuates the solenoid valve to start the loading process. Only then does VFD increase motor speed from 40% to 100% (max speed setting in the controller).

Until the Target pressure is reached, the VFD delivers 100% speed. Once the Target pressure is reached and the demand becomes low, the speed reduces and stabilizes to maintain the set pressure. The speed limit varies from 40% to 100% speed based on the demand and pressure range.

Even when speed reaches 40% of the rating and the demand is still low, pressure increases and reaches load pressure of +7 psi. At this point, the compressor switches to unload mode and starts running at unload speed.

If pressure reduces and reaches the load point of the controller, then the compressor starts loading and the speed increases from 40% to maintain the set pressure.

- If the machine runs in unload for more than the stand by time set in the controller, the compressor stops and goes to standby mode. It waits till pressure reaches the set load point in the controller and then starts as per the start sequence.

If the drive does not respond to quick pressure changes (drop in set pressure) or responds very fast to pressure changes (continuous increase and decrease in speed to maintain set pressure), then adjust P and I settings in the NII controller**.

** One-time fine tuning is recommended during installation by an expert.

If you do not opt for speed change with respect to pressure, and instead opt to operate in fixed speed, then choose the optimum speed enable option in the operator setting. The compressor then operates at optimum speed during load and at unload speed during unload.

NOTE

Max speed, min speed, optimum speed, and unload speed are all factory settings. Do not attempt to change these settings. You can view set speed details in the operator menu

Trouble shooting

	Fault Description	Details to be checked
1	The motor runs at full speed or low speed (no speed change with respect to pressure)	The PI settings in the controller to be reduced to have the speed respond to pressure variation. The compressor does not develop the required pressure (under-rating of the compressor) and always runs at max speed of the motor. Check the controller A/O scaling value (viewed in the operator menu) with respect to the VFD parameter 614,615. Ensure unload is enabled in the controller. Ensure optimum speed setting is enabled.
2	The motor speed changes frequently and makes noise (acceleration and deceleration)	The PI setting is too short. It continuously gives feedback to change motor speed and produces very high response to pressure variation. In this case, PI values must be increased to have smooth speed changeover.
3	The motor runs at low speed continuously (30Hz)	The compressor runs in unload mode. Air demand is less and the standby time set is more than 3 minutes.
4	The compressor minimum and maximum speed is not as per minimum and maximum speed limits set in the controller	Check AO scaling values in the controller (operator menu view). Ensure VFD parameters 614 and 615 are the same.
5	Motor not starting	Ensure VFD processes the start command and VFD display shows Ramping or Running. Check for any Trip Message in the VFD. Verify that the ON status LED in the VFD glows. If not, press the Auto on button in the VFD and ensure the ON LED glows. Check the pressure is more than load pressure and the compressor is in standby mode.

	Fault Description	Details to be checked
6	Compressor does not switch to load mode	Check the run feedback signal from VFD. Verify that the controller issues the load command. Ensure that the solenoid valve receives supply and energizes.
7	Compressor trips from VFD and the controller displays VFD fault	Verify if the motor consumes more power than the nameplate value. Ensure that the VFD parameter is correct. Check the VFD trip history/details of the trip and make the required corrections as per VFD troubleshooting guidelines.

FAQ

What is target pressure?

It is a set load pressure that VFD needs to maintain by varying compressor motor speed. If demand is low, speed reduces and pressure remains constant. If demand continues to be low, pressure increases and reaches load pressure

- Of 7 psi. When this occurs, the compressor switches to unload mode and starts operating at unload speed.

What is the significance of P&I settings in the controller?

The change in pressure with respect to time is not linear in all the cases, but the rate of change in pressure depends on receiver and pipeline capacity of a particular customer. The higher the storage capacity, the greater is the time available for speed correction and for producing a response to pressure requirement, and the reverse is also true. In such a case, the P & I setting must be adjusted at the site for smooth speed change-over. One-time fine tuning is required at the site and the settings can be adjusted through the controller.

Why must be the direction of rotation verified in VFD output?

VFD output always causes clockwise rotation irrespective of the input connection to the VFD. In case the compressor needs to operate counterclockwise, the motor connection from VFD output must be reversed. (Refer to the circuit right direction of rotation.)

What is the meaning of main motor overload trip in the controller?

The VFD trip is connected to the controller for main motor trip display in the controller. Refer to VFD trip information, verify the type of trip, and make corrections as per the manual.

What is the significance of the AO scale setting in the controller?

AO scaling with respect to 1V corresponds to min speed and 5V corresponds to max speed. Based on this scaling range and analogue input reference, VFD calculates the required speed/frequency at which the compressor motor must operate. AO scaling values in the controller settings and in the drive parameters 614 and 615 need to be the same.

What is the significance of max and min speed settings in the controller?

This imposes limitation on Max/Min speed for selected compressor models. This limitation will change between compressor models. This setting must not exceed the AO scaling range.

What is the significance of the optimum speed setting in the controller?

If the compressor needs to operate in fixed speed, then optimum speed must be enabled in the operator setting, If optimum speed is enabled, the compressor will operate at optimum speed during load and at unload speed during unload. This feature affords flexibility to customers if the compressed air circuit has more than one VFD machine and one machine for speed control. Typically, one machine is enough.

The optimum speed setting lies between the range of min and max speed settings.

What is the significance of the unload speed setting in the controller?

Unload speed is nothing but the speed at which the compressor must operate during unload. This setting must be in the range of min speed and max speed and less than optimum speed.

Annexure 1

ID	Name	Setup 1
1	Language	English
2	Motor Speed Unit	RPM
10	Active Set-up	Set-up 1
20	Display Line 1.1 Small	Motor Voltage
21	Display Line 1.2 Small	Motor current
22	Display Line 1.3 Small	Speed [RPM]
23	Display Line 2 Large	Analog Input 53
24	Display Line 3 Large	Frequency
40	[Hand on] Key on LCP	Disabled
41	[Off] Key on LCP	Disabled
42	[Auto on] Key on LCP	Enabled
43	[Reset] Key on LCP	Enabled
100	Configuration Mode	Speed open loop
101	Motor Control Principle	VVC+
104	Overload Mode	Normal torque
106	Clockwise Direction	Normal
120	Motor Power [kW]	**Motor name plate**
122	Motor Voltage	**Motor name plate**
123	Motor Frequency	**Motor name plate**
124	Motor Current	**Motor name plate * SF**
125	Motor Nominal Speed	**Motor name plate**
139	Motor Poles	**Motor name plate**
190	Motor Thermal Protection	ETR Trip1
191	Motor External Fan	Yes
300	Reference Range	Min - Max
301	Reference/Feedback Unit	RPM
302	Minimum Reference	750
303	Maximum Reference	1800
304	Reference Function	Sum
310-[0]	Preset Reference	0
313	Reference Site	Remote
315	Reference Resource 1	Analog Input 53
316	Reference Resource 2	No Function
317	Reference Resource 3	No Function
340	Ramp 1 Type	Linear
341	Ramp 1 Ramp Up Time	
342	Ramp 1 Ramp Down Time	

ID	Name	Setup 1
410	Motor Speed Direction	Clockwise
411	Motor Speed Low Limit [RPM]	750
413	Motor Speed High Limit [RPM]	1800
419	Max Output Frequency	80
512	Terminal 27 Digital Input	Coast inverse
540	Relay->Option relay 7-> Function relay	Running
540	Relay->Option relay 8-> Function relay	Alarm
610	Terminal 53 Low Voltage	1
611	Terminal 53 High Voltage	5
614	Terminal 53 Low Ref./Feedb. Value	*** (Edit from NII Controller)
615	Terminal 53 High Ref./Feedb. Value	*** (Edit from NII Controller)
830	Protocol	Modbus RTU
832	FC Port Baud rate	9600
833	Parity/Stop bits	No Parity,1 Stop bit
843-[0]	PCD read Configuration	(1603) – Status word
844-[1]	PCD read Configuration	(1605) – Main Actual Value ...
845-[2]	PCD read Configuration	(1612) – Motor Voltage
846-[3]	PCD read Configuration	(1613) – Frequency
847-[4]	PCD read Configuration	(1614) – Motor Current
848-[5]	PCD read Configuration	(1614) – Motor Current
849-[6]	PCD read Configuration	(1610) – Power KW
850-[7]	PCD read Configuration	(1610) – Power KW
851-[8]	PCD read Configuration	(1502) – Kwh Counter
852-[9]	PCD read Configuration	(1502) – Kwh Counter
853-[10]	PCD read Configuration	(1501) – Running Hours
854-[11]	PCD read Configuration	(1501) – Running Hours
855-[12]	PCD read Configuration	(1601) – Reference [Unit]
856-[13]	PCD read Configuration	(1601) – Reference [Unit]
857-[14]	PCD read Configuration	(1617) – Speed [RPM]
858-[15]	PCD read Configuration	(1617) – Speed [RPM]
859-[16]	PCD read Configuration	(1615) – Frequency [%]

NOTE

#Make ramp-up time (341) and ramp-down time (342) settings as follows:

Motor kW	Ramp up time	Ramp down time
11 KW to 45 KW	25sec	15 sec
55 KW and 75 KW	30 sec	20 sec
160 KW	30 sec	30 sec

Compressor controller setting in Operator menu VFD settings.

Item	Min	Max	Default	Unit
Optimum speed	on/off	on/off	off	-
P-Gain	0	50000	100	-
I-Gain	0	5000	100	-
I-Time	0	200	10	-
Max. speed	Factory setting can be viewed			RPM
Min. speed				RPM
Optimum speed				RPM
UL speed				RPM
High (5V)				RPM
Low (1V)				RPM

This information is for reference only. The settings are all made at the factory. You need not perform these settings at your site. However, P, I, and integral time settings need to be configured during installation.

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