# Controller Manual

## Neuron III

Version 3.6
July 2020

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## 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 |
| VFD | Variable frequency drive |
| AO | Analog output |
| UL | Unload |
| En | Enable |
| Dis | Disable |
| L | Load |
| St | Stop |
| F | Fault |
| R | Run |
| Sby | Standby |
| STC | Start count |
| LDC | Load count |
| DD | Date |
| MM | Month |
| YY | Year |
| Ph Fail | Phase failure |
| Pr | Pressure |
| Tr | Temperature |
| DCS | Distributed control system |
| PR | Pressure |
| MMOL | Main motor overload |
| OL | Overload |
| NC | Not connected |
| PS | Pressure schedule |
| RST | Restart time |
| DTR | Delta to run |
| RTS | Run to stop |
| I/O | Input / Output |
| REM | Remote |
| RTU | Remote terminal unit |

# 7.1 Technical specification

| | | |
|---|---|---|
| Definition | : | Pre-programmed logic controller |
| Function | : | Compressor control system & I/O monitoring |
| Part number | : | 018362618 |
| Software | : | Embedded C |
| Rated voltage | : | 24VAC + 15% -20% |
| Power consumption | : | 10W (Max) |
| Ride through | : | 30ms |
| Graphic display | : | 2.9" Mono chrome graphics display |
| Display contrast | : | Adjustable using software |
| Protections | : | Low voltage |
| 3 Phase detection | : | Phase loss / reverse at the time of pressing START key |
| Keypad | : | 11 key (Usage: up, down, right, left, enter, TAB, INFO, Esc, start, stop & reset) 11 LED (status, warnings and fault indication) |
| Language | : | English, French, Portuguese, Italian, Spanish |
| Enclosure material | : | ABS PC - Plastic |
| Dimensions | : | 280 X 190 X 90 mm |
| Mounting | : | Locking knob for panel tightening |
| Protection class | : | IP55 from front panel only |
| Operating temp | : | - 10°C ~ 50°C (14°F ~ 122°F) |
| Storage temp | : | -10 to 70°C (14°F ~ 158°F) |
| Relative humidity | : | <95% @ 50°C (122°F) without condensation |
| Certification | : | CE, UL |

For Technical support/assistance contact ELGI Customer Care
E-mail: ccs@elgi.com

### Digital inputs:

| | | |
|---|---|---|
| Number of channel | : | 8 Ports |
| Rated voltage | : | 24VDC |
| Usage | : | Emergency stop, motor overload, cooler over load, motor reverse rotation, DPOF, |

### Digital outputs:

| | | |
|---|---|---|
| Number of channel | : | 8 Ports |
| Rated voltage | : | 24VDC / 250VAC |
| Rated load | : | 10A @ 250VAC |

| | | |
|---|---|---|
| Coil rated current | : | 21mA |
| Coil voltage | : | 24VDC |
| Contact resistance | : | max 100milliohms |
| Insulation resistance | : | min 1000Megohms @ 500VDC |
| Usage | : | 6 Pre-programmed (Main, star, delta, load/unload, ADV, fan motor), 2 by default programmed for trip and warn. programmable for warn, load, service, standby, trip, remote, ready and dryer if enabled. |
| **Analog inputs:** | | |
| Number of channel | : | 4 |
| **2 x 4-20mA inputs:** | | |
| Range | : | 0 to16 bar (0 to 232 psi) |
| Resolution | : | 0.1bar (1 psi) |
| Accuracy | : | ± 0.1bar (1 psi) |
| Usage | : | Discharge pressure and sump pressure |
| **2 x PT1000:** | | |
| Range | : | -10 to150° C (14 to 302°F)for 1st channel<br>-10 to 200° C (14 to 392°F)for 2nd channel |
| Resolution | : | 1°C (2°F) |
| Accuracy | : | ±1°C (2°F) |
| Usage | : | Discharge temperature, dew point /motor winding temperature software selectable |
| **Analog outputs:** | | |
| Number of channel | : | 2 |
| Range | : | 1 to 5V DC |
| Resolution | : | 1 mV |
| Accuracy | : | ±25 mV |
| Usage | : | Discharge pressure and discharge temperature |
| Communication ports: | | |
| Port 1 | : | RS485, MODBUS RTU (for DCS interface) |
| Port 2 | : | RS485, MODBUS RTU (for VFD parameter reading, analog input module) |

### 7.2.1. Equipment safety

The device, before delivery, was checked according to the prescribed tests of the inspection scheme. In order to maintain this status through shipment and secure a safe operation, consider the notes and warning notes this instruction manual covers. The device should be operated by only trained personnel. Maintenance and repair should be performed only by trained, technical personnel, familiar with the associated dangers. The device can be operated without compromising 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 has to correspond to the class of protection. The ambient temperature in the installation position may not exceed the admissible temperature for the nominal use, specified in the data sheet. Not to use in wet condition.

The devices should be installed only outside of explosion hazardous areas!

#### 7.2.1.3. Electrical connection

External connections are to be performed according to the respective national rules. Switch off the device before doing any wiring work. Do not connect or disconnect any wire when the device is powered on and operating.

#### 7.2.1.4. Power supply

It is to be ensured that supply voltage corresponds with the specification on the type sign. If the device is switched on with other devices and/or mechanisms, then the effects have to be considered before switching and appropriate precautions taken. Do not connect welding or such high noise sources to the same line of controller supply.

### 7.2.2. General instruction

The following procedures and instructions should be followed 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 with feed and storage to rule out damage from inappropriate handling. If the device indicates damage, so that safe operation is not possible, then the device may be removed from operation.

Carefully unpack the system. Open the doors and inspect the cabinet, door, printed circuit board, and other components for the possibility of shipping damage. It is recommended that the cabinet be stored in a clean dry area until mounting takes place.

The signal cables and power cable should be separately routed.

The protective earth connection in the panel must be connected to field earth only.

**Protection from direct sunlight**

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

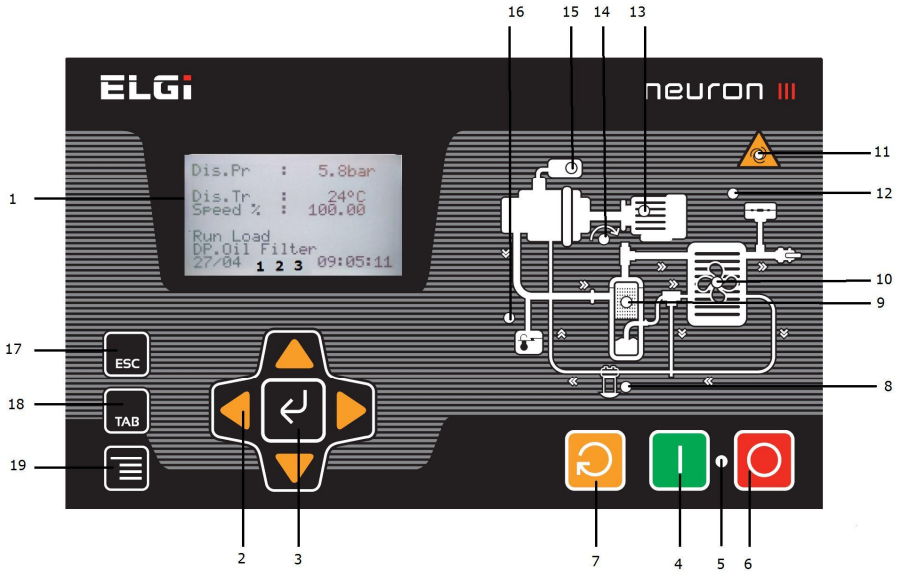
**Protection from rain**

Partial tightening of screws or doors allows water to enter the enclosure and cause irreparable damage to the circuitry. Provide canopy to avoid such damages.

**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
8 Oil filter change indication LED
9 Air oil separator change indication LED
10 Cooler fault LED
11 Auto mode enabled indication LED
12 High pressure fault LED
13 Main motor fault LED
14 Reverse rotation fault LED
15 Air filter change indication LED
16 High discharge temperature fault LED
17 Escape key
18 Tab key
19 Info key

### 7.3.1. Terminal connection

X01 - Power supply

X02 - Digital input (8 Channel)

X03 - Analog input (4 Channel) / output (2 Channel)

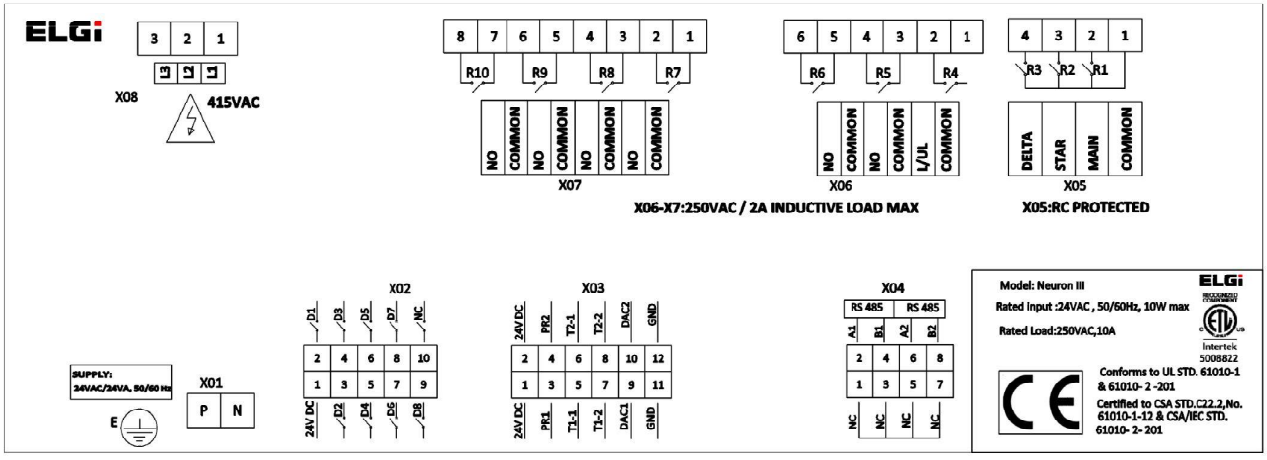
X04 - Communication ports (2 Ports)

X05 - Relay outputs (main, star, delta)

X06 - Relay outputs (3 Nos)

X07 - Relay outputs (2 Nos)

X08 - Phase monitoring



# 7.4 Neuron-III 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 -> day report and fault report)

- 30 day reports (load hours, unload hours, run hours, stop hours, fault hours, standby hours, start count, load count)
- 99 fault reports
- Faults with date and time stamp, 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. Lead and Lag - Pressure schedule (Operator -> schedule)

- 32 pressure program **(one schedule should be in Sunday (first day of the week) 00:00 Hrs)**
- Setting hours considered as 24hr format irrespective of time format setting.
- Important parameters to customize - Day, On Time, OFF Time, Load Pr, Unload Pr

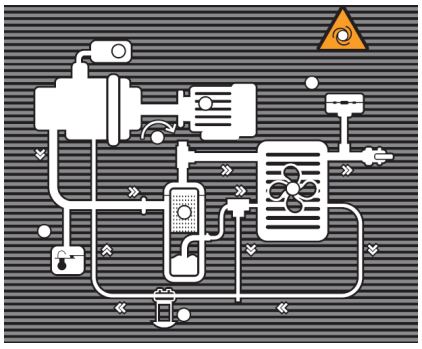
### 7.4.5. Other interfaces and communication

- VFD interface through MODBUS
- PC interface through MODBUS - To download reports and setting parameters
- 70 + Modbus parameters for DCS controls
- Dryer integration
- High, Low dew point warnings

### 7.4.6. Safeguard

- The 'Smart Logic' of NEURON III automatically decides the start delay required to ensure minimum wait time between successive starts of the compressor and dryer thereby increasing their lifetime.
- Start Inhibit till sump pressure is within safe limits to enhance the life of the compressor
- Low voltage & Short time Power interrupts detection to enhance the life of the contactors
- Low temperature start inhibit to avoid start-up overloads

### 7.4.7. Mimic LED for fault indications



| LED | Description |
|---|---|
| Auto | Continuous glow - to indicate the machine in auto power recovery mode.<br>LED blink - when the machine is going to start irrespective of any start mode. |
| Air oil separator | Glows when<br>1. Air oil separator service is due - based on service hours<br>2. Pressure drop in separator is more than set value (if sensor is fixed). |
| Main motor overload | Glows when the main motor overload digital input is open. |
| Reverse rotation | Glows when the reverse rotation digital input is closed. |
| Cooler O/L | Glows when the cooler digital input is open |
| Pressure | Glows when<br>1. Analog pressure input is open (probe failure)<br>2. Discharge pressure is higher than set HSP<br>3. Sump. pressure is higher than set HSP (If sump pressure sensor is fixed) |
| Temperature | Glows when the<br>1. Analog Temperature Input is Open (Probe Failure)<br>2. Dis. Temperature is higher than set Trip temp. |
| Differential Pressure oil Filter (DPOF) | Glows when the<br>1. DPOF Digital input is open & DPOF is enabled<br>2. Oil filter service is due - based on service hours |
| Differential pressure air filter (DPAF) | Glows when the<br>1. DPAF digital input is open & DPAF is enabled<br>2. Air filter Service is due - based on service hours |
| Start & Stop | 1. Glows in red when machine is stopped / idle<br>2. Glows in green when machine is running |

# 7.5 Input output description

### 7.5.1 X01: Power supply

| Pin | Function | Id | Active state |
|---|---|---|---|
| 1 | 24V AC Phase | 24 VAC P | - |
| 2 | 24V AC Neutral | 24 VAC N | - |
| 3 | 24V Earth | Earth | - |

### 7.5.2 X02: Digital inputs

| Pin | Function | Id | Active state |
|---|---|---|---|
| 1 | Digital Inputs common - 24VDC | 24VDC | - |
| 2 | Emergency stop | Emergency | Fault if open |
| 3 | Differential pressure oil filter | DPOF | Warn if open |
| 4 | Reverse rotation | Rev. Rot | Fault if closed |
| 5 | DPAF/REM load and unload | DPAF/REM L/UL | Warn or unload if open |
| 6 | Remote start stop control | Remote Start /Stop | Stop if open |
| 7 | Dryer warn/trip | Dryer Warn/Trip | Warn/Fault if open |
| 8 | Cooler motor overload | Cooler OL | Fault if open |
| 9 | Main motor overload | MMOL | Fault if open |

### 7.5.3 X03: Analog input/output

| Pin | Function | Id | Type | Range |
|---|---|---|---|---|
| 1 & 3 | 24V DC discharge pressure | 24V DC PR1 | 4 - 20mA | 0 to 16 bar (0 to 232 psi) |
| 2 & 4 | 24V DC sump pressure | 24V DC PR2 | 4 - 20mA | 0 to 16 bar (0 to 232 psi) |
| 5 & 7 | Discharge temperature | T1-1 T1-2 | PT1000 | -10 to 150°C (14 to 302°F) |
| 6 & 8 | ** Dew point temperature / Ambient temperature/winding temperature | T2-1 T2-2 | PT1000 | -10 to 200°C (14 to 392°F) |
| 9 & 11 | Dis. pressure output (0 to 16 bar/0 to 232 psi) common ground | DAC1 GND | Voltage | 1~5V |
| 10 & 12 | Dis. Temperature (-10 to 150°C / 14 to 302°F) common ground | DAC2 GND | Voltage | 1~5V |

### 7.5.4 X04 : RS 485 Communication

| Pin | Function | | Id | Active state |
|---|---|---|---|---|
| 2 | DCS interface | A1 | RS485 A | Modbus RTU protocol |
| 4 | DCS interface | B1 | RS485 B | |
| 6 | * VFD interface /AI module | A2 | RS485 A | Modbus RTU protocol |
| 8 | * VFD interface /AI module | B2 | RS485 B | |
| 1 | NC | | | |
| 3 | NC | | | |
| 5 | NC | | | |
| 7 | NC | | | |

*If Dryer and VFD is enabled, AI module add-on will be used for dryer dew point

** If Dew point sensor and Winding temperature are used, Winding temperature shall be connected here

### 7.5.5 X05: Main motor relays

| Pin | Function | Id | Active state |
|---|---|---|---|
| 1 | Common for main, star and delta contactors | Common | - |
| 2 | Main contactor | Main | Energized |
| 3 | Star contactor | Star | Energized |
| 4 | Delta contactor | Delta | Energized |

### 7.5.6 X06 : Relays

| Pin | Function | Id | Active state |
|---|---|---|---|
| 1 | Common - load relay | Common | Load when energized |
| 2 | Load relay | L/UL | |
| 3 | Common - fan relay | Common | FAN ON when energized |
| 4 | Fan relay | NO | |
| 5 | Common - auto drain valve relay | Common | ADV ON when energized |
| 6 | Auto drain valve relay | NO | |

### 7.5.7 X07 : Relays

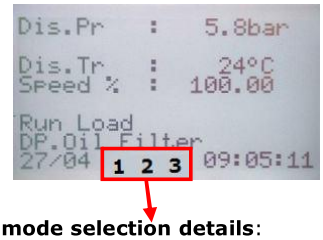
| Pin | Function | Id | Active state |
|---|---|---|---|
| 1 | Common - Programmable relay | Common | Energized |
| 2 | Programmable relay | NO | |
| 3 | Common - Programmable relay | Common | Energized |
| 4 | Programmable relay | NO | |

### 7.5.8 X08: 3 Phase input

| Pin | Function | Id | Type | Range |
|---|---|---|---|---|
| 1 | R Phase | L1 | AC Voltage | 150 to 550 V AC |
| 2 | Y Phase | L2 | | |
| 3 | B Phase | L3 | | |

# 7.6 Home screen

The home screen will show discharge pressure , discharge oil temperature ,VFD speed % (if VFD enabled), compressor status, warn messages, compressor mode selection details and date & time




**Compressor mode selection details**:

1. PS - Pressure schedule enabled ,
   UL - unload mode enabled,
   PS & 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.

**Shortcut key usage**

When the controller is in home screen, you can access below listed parameters using the shortcut keys.

"**RIGHT" - Live analog values**

- Live differential pressure (displays only if sump pressure enabled)
- Live sump pressure (displays only if sump pressure enabled)
- Live Pt1000 temperature (displays only if DRYER ON enabled)

**"UP" - Set analog values**

- Set load pressure
- Set unload pressure
- Set start sump pressure (displays only if sump Pressure enabled)
- Max differential pressure (displays only if sump Pressure enabled)

**"DOWN" - Today report**

- Load and stop hours
- Unload and fault hours
- Run and standby hours
- Start count and load count

**TAB Key** - For changing the language

**HELP Key** - For contrast adjustments

## 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 |
| Start inhibit xx.x | During the start, if the sump pressure is higher than the set start sump pressure value, you will see this message. XX.X denotes the live sump pressure value. The compressor starts only if the sump pressure value goes below the set value. |
| Temperature inhibit ±XX | During the start, 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. |
| Start inhibit "seconds" | If sump pressure is not used (disabled) then the controller will ensure minimum 60 seconds delay between the stop and the start. Count stops if "STOP" key is pressed |
| 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 |

## Message 2 - Compressor fault message

| Fault | Description |
|---|---|
| Pr. Probe failure | Discharge pressure sensor probe failure |
| Tr. Probe failure | Temperature sensor probe failure |
| Sump pr. probe failure | Sump pressure sensor probe failure, if sump pressure is enabled |
| HSP (AS) | Case 1: sump pressure is enabled |
| | If sump pressure exceeds the set high sump pressure value. |
| HSP (AD) | If discharge pressure exceeds the set high sump pressure value. |
| Cooler | If the cooler digital Input opens due to Cooler fault |
| Main motor overload/ VFD error | IF the MMOL digital input opens due to main motor over load. VFD error if VFD control is enabled. |
| Rev rot / Ph fail | If the rev rot input closes when motor running due to motor reverse rotation or Phase failure. |
| Trip temperature | If the discharge temperature exceeds the set trip temperature value. |
| Sump Pressure Not Developing | After the Start, The sump pressure should be at least 0.3 bar/4psi after star delay expires. If this is NOT achieved this Fault occurs , if sump pressure is enabled. |
| Power failure | If the mains supply is interrupted for more than 20 msec |
| Low voltage | If the mains supply voltage is less than the 75% of rated voltage.<br>Compressor is tripped & All controller operation is 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 this is NOT achieved this fault occurs |
| Dryer IP trip | If dryer is enabled with trip, if dryer trip occurs, this fault message will be shown |
| Dryer low DP trip | When dew point temperature is less than set value. |
| Temperature not developing | If the discharge temperature not raised above the inhibit temperature before the set inhibit temperature time. |
| Winding temp. high | If CV20 variant selected or winding temperature enabled, it will trip the compressor based on SET value of MOTOR WINDING temperature |
| Winding temp. fail | If CV20 variant selected or winding temperature enabled, it will trip the compressor if sensor open |

## Message 3 - Compressor warning message

| Warning | Description |
|---|---|
| DPAF | If DPAF Digital Input is Open and DPAF ON in factory setting |
| DPOF | If DPOF Digital Input is Open and DPOF ON in factory |
| Dryer Probe Failure | When Ch-4 analog sensor input fails |
| Dryer Off - Low DP warn | When Ch-4 Dew point temp. is less than Set value |
| High Dew Point | When Ch-4 Dew point temp. is greater than Set Value |
| High Differential Pressure | When the difference between Sump. Pressure and Discharge Pressure exceeds the Set Pressure. ( Only in Sump Pr. Enabled condition) |
| Warn Temperature | When Discharge temp. exceeds the set warntemperature (Default is 105Deg C/Deg F) |
| Change Oil Filter | When service remaining Hr. reaches 0000 Hrs |
| Change Air Filter | When service remaining Hr. reaches 0000 Hrs |
| Change Oil | When service remaining Hr. reaches 0000 Hrs |
| Change Grease | When service remaining Hr. reaches 0000 Hrs |
| Change Separator | When service remaining Hr. reaches 0000 Hrs |
| Change Valve kit | When service remaining Hr. reaches 0000 Hrs |
| Dryer Off - IP Warn | If Dryer Digital Input is Open and dryer warn is selected in the input |
| Calibration error | When there is error in sensor calibration |
| Winding temp Exceeded | If CV20 variant selected or winding temperature enabled and if the temperature exceeds [SET value-10] of MOTOR WINDING temperature |

### 7.6.1 Important user machine settings

**1. Control mode**

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

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

**DCS** - Users can start and stop the compressor by using RS485 modbus communication port ( refer connector - X07 ).

**NOTE**

*In remote and DCS mode, the start/stop button in the controller is inactive. In case of emergency, stop the compressor using the "emergency stop push" button available in the front panel. This is applicable across all types of control mode.*

**2. Unload mode**

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

**3. Auto restart**

If this is enabled, the compressor operates automatically after a power outage and resumes based on the previous condition. The default delay is 30* sec. Warn RST delay delays the compressor start if power resumes and Auto Restart Mode is ON.

*If compressor recover from standby, restart delay is 10 sec.

**4. Load / Unload pressure**

The compressor operates between load pressure and unload pressure based on compressed air utilization. You can set load/unload pressure based on the requirement within the operating pressure band zone.

**5. Star delay**

Star to delta change over delay time. Default 6 sec delay given in the factory.

**6. DTR delay**

From delta change over to load delay time. Default 3 sec delay given in the factory.

**7. RTS delay**

The normal stop of the compressor will unload and wait for this delay time to stop the compressor. The default delay is 5 sec.

**8. Standby time**

The compressor will switch to standby if unloading exceeds the specified time. The default delay is 5 mins.

**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.

**NOTE**

*If the compressor is started more than the specified number of cycles per hour through the Standby sequence, then the system does not enter into the Standby stop sequence until the existing hour is completed. Next, the Standby override will appear on the screen.*

**9. Start/Stop per hour**

The system will warn if the compressor is started more than the specified number of cycles per hour. The default timeframe is 5 per hours.

**10. Auto drain valve**

The auto drain valve is a special feature to prevent water from entering into compressed air delivery. This function resets the drain valve to ON and OFF based on the time specified in the menu. The default setting is 5 Sec ON in 4-min intervals. You can adjust the ON and OFF time based on the requirement.

**11. Low dew point**

The system will warn/trip if the dew point temperature is less than the set value (if the dryer is enabled).

**12. High dew Point**

The system will warn if the dew point temperature is higher than the set value (if the dryer is enabled).

**13. Load/Unload Source**

**Local:** Load/Unload pressure is based on load/unload settings in the controller.

**Remote:** Selection from digital input– remote load/unload can be operated from remote through a wired switch.

**DCS:** Load/Unload can be operated from DCS (load/unload command should be given continuously in the interval ≤ 3 sec) Ensure master control bit in enabled condition.

**NOTE**

*The compressor starts working in local load and unload mode if communication is lost in DCS mode.*

**14. VFD Function**

VFD speed percentage will appear in the HOME screen once VFD mode is enabled in the factory setting.

You can also view the below VFD parameters by accessing the view->VFD menu:

- Voltage in V
- Current in A
- Frequency in Hz
- Power in KW
- RPM
- Status of the VFD

**VFD Mechanism**

- The machine operates at the set minimum speed till it reaches the RUN LOAD condition at start-up.
- The machine will run at the set unload speed when it is in unload, which may be remote or DCS unload or when discharge pressure is > unload pressure.
- The machine will run at optimum speed when optimum is ON. This works only under the load condition. Under the unload condition, it follows the unload speed.
- The machine will run at calculated speed between minimum and maximum speed based on machine usage and when the machine is under load with optimum OFF.

# 7.7 Menu structure

Press any one of the following keys ▲▼◀ 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 |
| | Admin |

#### 7.7.1.1 View

In the view menu, you can view the set parameters, but you cannot edit any of them - no password required.

| | |
|---|---|
| View | Operator |
| | Fault report |
| | Day report |
| | Service time |
| | Cumulative time |
| | VFD |
| | Rental hours |

#### 7.7.1.2 Operator

| 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 |
| | | | Pr. schedule | ON/ OFF |
| | | **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 / Odd |
| | | | 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 | |

### 7.7.1.3 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 |
| | | Date : DD/MM/YY |
| | | Time : HH:MM:SS |
| | | Dis.Pr : X X .X |
| | | Dis.Tr : X X X |
| | | Status : RDY/ACK/STAR etc., |

### 7.7.1.4 Day Report

The day report explains the usage pattern of the compressor day wise for last 30 days. Use Δ and ∇ to select the record number (1 to 30). The latest report will be displayed in record 1.

| LEVEL 1 | LEVEL 2 | LEVEL 3 |
|---|---|---|
| View | Day report | Date: DD/MM/YY |
| | | L:X X Hours St: X X Hours |
| | | UL:X X Hours F:X X Hours |
| | | R:X X Hours Sby: X X Hours |
| | | STC:X X X LDC:X X X X X |

L- Load, St - Stop, UL - Unload, F- Fault, R- Run, Sby- Standby, STC - Start Count, LDC - Load Count

### 7.7.1.5 View Service Time

For consumable parts, the remaining life will appear in the view menu. Every run hour, the count will decrements by one hour. Once it reaches zero, an alarm message will pop up and the counter will show negative hours.

| 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 |

### 7.7.1.6 View Cumulative Time

From the compressor commissioning to till date , the run hours and utilization pattern will be displayed in the menu.

| 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 % |

### 7.7.1.7 VFD

If VFD is enabled in the controller and VFD communication port is connected, you can view the following VFD parameters in Neuron III.

- Voltage in V
- Current in A
- Frequency in Hz
- Power in KW
- RPM
- Status of the VFD
- Run hours based on VFD speed %

| | |
|---|---|
| < 40% speed | XXXX hours |
| 40~50% speed | XXXX hours |
| 51~60% speed | XXXX hours |
| 61-70% speed | XXXX hours |
| 71-80% speed | XXXX hours |
| 81~90% speed | XXXX hours |
| 91~100% speed | XXXX hours |

### 7.7.1.8 Rental hours

If you select rental hours in the operator menu, you can view the run hours and the utilization pattern of the compressor in the view menu.

To reset the rental hours, you have to choose "rental off" and then "rental on" in operator menu.

| | |
|---|---|
| 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 |

### 7.7.2 Operator

This option requires a password to adjust operator settings within the set limits.

| | |
|---|---|
| Operator | Machine<br>Scheduler<br>Maintenance<br>Language<br>Change password<br>VFD control<br>Rented hrs setting<br>Last serviced |

### 7.7.2.1 Machine

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 / far | cen | - |
| **Pressure** | | | | | | |
| 5 | Unload pressure | ≥ load pressure | ≤ max unload pressure | - | Based on compressor pressure rating | bar/psi |
| 6 | Load pressure | 4.0bar(58psi) | ≤ unload pressure - | - | | bar/psi |
| **Set Delay** | | | | | | |
| 7 | Warn RST | 30 | 250 | - | 30 | second |
| 8 | Star | 6 | 20 | - | 6 | second |
| 9 | DTR | 10 | 60 | - | 3 | second |
| 10 | RTS | 5 | 30 | - | 5 | second |
| 11 | Standby | 1(VFD),3(Non-VFD) | 99 | - | 3 | minute |
| **DCS Port** | | | | | | |
| 12 | Type | - | - | Modbus | - | |
| 13 | ID | 01 | 99 | - | 01 | - |
| 14 | Baud | - | - | 9600/19200 | 9600 | bps |

| # | Item | Min | Max | Option | Default | Unit |
|---|---|---|---|---|---|---|
| 14 | Baud | - | - | 9600/19200 | 9600 | bps |
| 15 | Parity | - | - | None/Even/ Odd | None | |
| 16 | Length | - | - | 8 / 7 | 8 | - |
| 17 | Stop bit | - | - | 2 / 1 | 1 | - |
| **Auto Drain Valve** | | | | | | |
| 18 | Off time | 1 | 180 | - | 4 | minute |
| 19 | On time | 1 | 15 | - | 5 | Second |
| **Load / Unload Source** | | | | | | |
| 20 | LD / UL Source | - | - | Loc / Rem/ DCS | Loc | - |
| **Set dew point** | | | | | | |
| 21 | Low dew point | -6°C(21°F) | 2°C(36°F) | | -2°C(28°F) | Cen |
| 22 | High dew point | 6°C(43°F) | 12°C(54°F) | | 8°C(46°F) | Cen |
| **Contrast adjust** | | | | | | |
| 24 | Contrast adjust | 10 | 100 | | 50 | % |

### 7.7.2.2 Operator - Scheduler

If you enable the pressure scheduler, then you can view and access the below table in edit mode. Use Δ and ∇ to select the pressure scheduler number (1 to 32). For details, refer to “Example - scheduler setting”.

| # | Item | Min | Max | Option | Default | Unit |
|---|---|---|---|---|---|---|
| 1 | Day | - | - | Sun to Sat / (--- means no schedule) | --- | - |
| 2 | Action | - | - | on / off | off | - |
| 3 | Time HH | 00 | 23 | - | 00 | Hour |
| 4 | Time MM | 00 | 59 | - | 00 | Minute |
| 5 | Unload Pressure | ≥ Load pressure + 0.5bar(7psi) | ≤Max unload pressure | - | 7.5bar (109psi) | bar/psi |
| 6 | Load pressure | 4.0 bar(58psi) | ≤Unload pressure - | - | 5.5bar | bar/psi |

(one schedule should be in Sunday (first day of the week) 00:00 Hrs) Then Press "Enter" to set the following

### 7.7.2.3 Operator - Maintenance

If you modify the settings for the below consumables, you can select the yes option to restart the service counter from the default

| # | 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 | - |

### 7.7.2.4 Language

Default is English. You can choose any one of the given languages.

| # | Item |
|---|---|
| 1 | English |
| 2 | Portuguese |
| 3 | Francais |
| 4 | Italiano |
| 5 | Spanish |

### 7.7.2.5 VFD Control

| Item | Min | Max | Default | Unit |
|---|---|---|---|---|
| Optimum Speed | on/off | on/off | off | |
| P-Gain | 1 | 50000 | 250 | |
| I-Gain | 1 | 5000 | 500 | |
| I-Time | 1 | 200 | 20 | |
| Max. Speed | Factory settings can be viewed here | | | RPM |
| Min. Speed | | | | RPM |
| Optimum Speed | | | | RPM |
| UL Speed | | | | RPM |
| High (5v) | | | | RPM |
| Low (1v) | | | | RPM |

### 7.7.2.6 VFD Speed Control

**Optimum speed:** The compressor runs at optimum speed under load with optimum ON (Operator menu).

**PI speed control:** In the "Run Load" condition, the compressor operates at calculated speed between Min and Max speed depending on air utilization/usage.

**Setting the P value**

**P-Gain - Range:** 1-50000. This gain occurs over a full range. The recommended setting is 20-1000.

A proportional–integral controller (PI controller) is a control loop feedback mechanism used in industrial control systems and a variety of other applications requiring continuously modulated control.

Proportional-Integral controller results from the combination of the proportional and the integral mode. This mode is also called as the proportional plus reset action controller

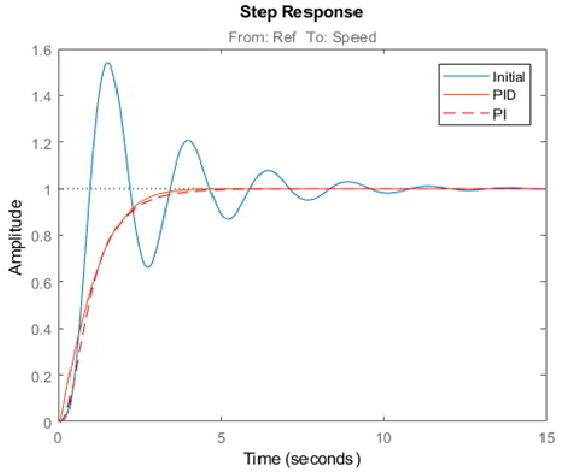
**Effect of Proportional Value**

The proportional term produces an output value that is proportional to the current error value. The proportional response can be adjusted by multiplying the error by a constant Kp, called the proportional gain constant.

A high proportional gain results in a large change in the output for a given change in the error. If the proportional gain is too high, the system can become unstable. In contrast, a small gain results in a small output response to a large input error, and a less responsive or less sensitive controller. If the proportional gain is too low, the control action may be too small when responding to system disturbances.

**Effect of Integral Value**

The contribution from the integral term is proportional to both the magnitude of the error and the duration of the error.The integral term accelerates the movement of the process towards set point and eliminates the residual steady-state error that occurs with a pure proportional controller. However, since the integral term responds to



| Parameter | Rise time | Overshoot | Settling time | Steady-state error | Stability |
|---|---|---|---|---|---|
| Kp | Decrease | Increase | Small change | Decrease | Degrade |
| **Ki** | Decrease | Increase | Increase | Eliminate | Degrade |

accumulated errors from the past, it can cause the present value to overshoot the set point value

Effect of change in Kp( Proportional value ) & Ki ( Integral value ) listed below.

**Example:**

**Sample 1:**

If P-Gain=20 and the difference between set pressure and actual pressure ≥ 5 bar (73 psi), then the PI loop activates.

**Sample 2:**

If P-Gain=1000 and the difference between set pressure actual pressure ≥ 0.1 bar (1 psi), then the PI loop activates.

Set a higher P-Gain value if receiver capacity is high and the reverse holds true.

**Setting the I-Gain value**

**I-Gain - Range:** 1-5000. This gain occurs over a full range. The recommended setting is 50- 1000.

The recommended value is 125 to 250 in our case. Anything less than 125 will be more stable.

A lower setting enables the system to be tolerant to the error. A value of 50 for I-Gain will enable the system to correct the error only if the pressure difference between set and actual pressure exceeds 0.020 bar / 0.3 psi.

The higher the setting, the more sensitive the system becomes to very small changes.

**E.g.** A value of 1000 for I-Gain makes the system sensitive to a 0.001 bar / 0.01 psi difference. A very high value and sensitive system (low receiver capacity) will drive the system into a completely unstable state. Always try to set lower values for I-Gain.

**Setting I-Time**

I-time - Range: 1-200. This indirectly counts the scan time. The recommended value is 15-20.

The higher the value, the more delay will be on the application of correction calculated based on I-Gain and the reverse is true.

**Min speed:** The compressor remains in min speed up to the start "Run Load" condition during start. If demand is very little, the compressor will run at minimum speed.

**Unload speed:** The compressor runs at set unload speed during unload. This is irrespective of all unload modes like Remote, DCS and local unload.

**Pre-checks that must be performed before starting the compressor under VFD control**

- VFD should be enabled in Factory -> VFD settings to read and write between VFD and Neuron III.
- View the VFD RPM range in the factory AO scaling menu to ensure MODBUS communication exists between VFD and Neuron III. Current VFD RPM appears here, if communication no longer exists.
- Ensure min reference of AO scaling > VFD Parameters 3 -02 and 4-11 and max reference of AO scaling < VFD parameters 3-03 and 4-13.

**NOTE**

*The VFD factory settings in the controller are synchronized with VFD. It is not recommended to adjust the settings in VFD.*

**Rental hrs settings**

Rental-ON: If selected, then a separate timer is recorded for rental hrs of load, unload, run, stop, fault, and standby/STC/LDC. It can be viewed in the view menu only when the rental hour is on.

To reset the rental hour, select "rental off" and then "rental on".

**Last serviced**

AMC service - If you select yes, the last AMC serviced updates with the current date. You can then view it in the customer care menu.

Spares replaced - If you select yes, the last spares replaced updates with the current date. You can then view it in the customer care menu.

Regular service - If you select yes, the Regular service updates with the current date. You can then view it in the customer care menu.

## 7.7.3 Service

Password required.

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

| | |
|---|---|
| Service | Sensor Offset |
| | Relay |
| | Temperature |
| | Maintenance |
| | Clock |
| | Self-Test |
| | Password |
| | Digital Input |
| | Dryer Input |
| | Unload Mode |
| | Lat /Lon |
| | VFD_model |

### 7.7.3.1 Calibration (offset)

If any deviation occurs in the pressure and temperature between that displayed in the controller and that in the master gauge, approach the ELGi service engineer.

### 7.7.3.2 Programmable relay

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

| # | Item |
|---|---|
| 1 | Warn |
| 2 | Load |
| 3 | Service |
| 4 | Stand by |
| 5 | Trip |
| 6 | Remote |
| 7 | Ready |

**Default**

Relay 1 = Warn
Relay 2 = Trip

***NOTE***

*If Dryer is enabled, then programmable relay 2 is not user programmable. It is used for automatic dryer control.*

### 7.7.3.3 Temperature

**Fan Temperature -** Fan relay will energize if discharge temperature reaches the set value. It will de-energize when the temperature comes below 75°C from the set value. Alternatively, fan start/stop is allowed for 15 times/ per hour. Beyond 15 times, the fan will not switch off.

The above logic will work only if the fan input connected to relay output of the controller (Ref:7.5.6 X06: Relay in page No:7.11).

**Inhibit temperature –** If you enable this setting and Temperature inhibit is already enabled in factory settings, the compressor will start when the discharge temperature is higher than the set value.

**Temperature inhibit time -** The compressor will wait for this specified time to reach the inhibit temperature. If not, it trips as temperature is not building. .

| # | Item | Min | Max | Option | Default | Unit |
|---|---|---|---|---|---|---|
| 1 | Fan temp | On 95℃ | Off | - | - | C/F |
| 2 | Inhibit temp | -5℃ (23°F) | 5℃ (41°F) | - | 0℃ (32°F) | C/F |
| 3 | Tr_ intial time | 5 | 90 | - | 5 | min |

### 7.7.3.4 Maintenance

Here you can feed the filter lift time. This timeframe will vary depending on the model and filter. Contact Elgi for more information.

You used to register the filter replacement in operator-> Maintenance by choosing Yes/No option. Once you choose Yes in operator then filter life time will be updated.

| # | 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 |

### 7.7.3.5 Clock

Here the real time clock settings can be done. 24 hrs format will be applicable for all menus and features related to clock settings, Whereas 12 hrs time format is applicable for the home screen only.

| # | Item | Min | Max |
|---|---|---|---|
| 1 | Hour | 00 | 23 |
| 2 | Minute | 00 | 59 |
| 3 | Second | 00 | 59 |
| 4 | Date | 01 | 31 |
| 5 | Month | 01 | 12 |
| 6 | Year | 00 | 99 |
| 7 | Day | Sun/Mon/Tue/Wed/Thu/ Fri/Sat | |

**Daylight saving**

Daylight saving settings will add 1 or 2 hours from the current GMT time. If you choose daylight option as off, the clock will revert back to GMT time.

| # | Item | Min | Max |
|---|---|---|---|
| 1 | Date format | DD/MM/YY | MM/DD/YY |
| 2 | Time format | 12 hr | 24 hr |
| 3 | Day light savings | 0 | 2 |

### 7.7.3.6 Digital input

Configuration of DI-4 (DPAF or Remote Load/Unload) can be viewed from this menu. (if the load/unload source is selected as remote in operator -> machine settings). Then the digital Input will configure for remote Load/Unload.

### 7.7.3.7 Dryer input

Dryer digital input DI-6 can be configured for warn or trip. This input will be effective if the dryer is ON in factory -> dryer.

### 7.7.3.8 Latitude/Longitude

This option involves deg, min, and sec with NE, NW, SE, and SW format.

The Latitude/Longitude entry helps ElGi to determine the location of the compressor on which air alert is equipped.

### 7.7.3.9 VFD_model

A list of VFD models appears here for you to select a pressure-based speed, based on customer requirement.

### 7.7.4 Customer care

| | | |
|---|---|---|
| Dis. Pr | : | 6.0 bar/ 87psi |
| Dis. Tr | : | 32°C (90°F) |
| Status | : | S/W Version |
| URL | : | www.elgi.com |
| E-mail | : | ccs@elgi.com |

# 7.8 Data interface

Neuron III supports two types of data interface

- Analog output
- DCS Port

## 7.8.1 Analog output

Two channels are available as analog output.

**Channel -1** for discharge pressure values 0.0 to 16.0 bar / 0 to 232 psi converted into 1 to 5V.

**Channel -2** for discharge temperature values from -10 to 150°C / 14 to 302°F converted into 1 to 5V.

***NOTE***

*If analog input probe failure occurs, analog output becomes 0V by default.*

## 7.8.2 DCS port

The DCS port is a Modbus RTU type to interface to the generic DCS system.

You can set the device ID in the "Operator/ Machine/ DCS Port" menu. Also the baud rate, parity, data length, and stop bit are user settable.

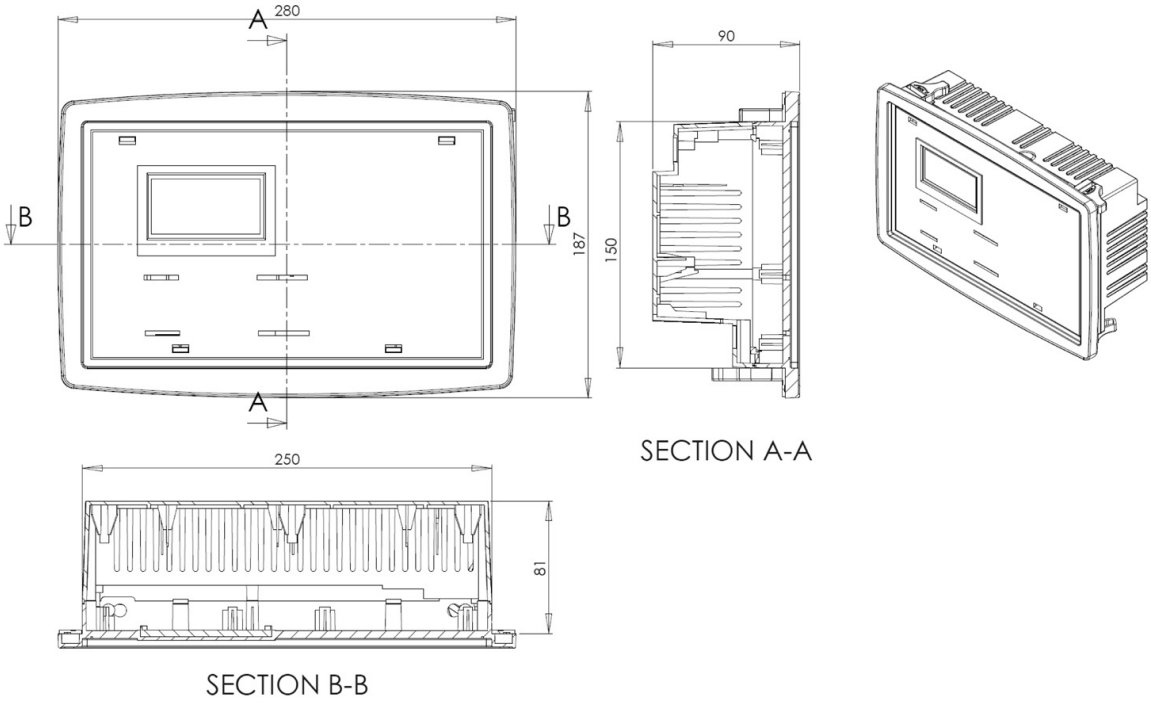
# 7.9 Troubleshooting

| S. NO | Failure symptoms | Possible causes | Remedies |
|---|---|---|---|
| 1 | No display in LCD Screen & Backlight was not glown | No input supply | Check incoming AC input |
| | | Transformer failure. | Please check the controller input voltage at connector X08. Voltage should be 24V ± 15% VAC. |
| | | Controller failure. | Change the controller. |
| 2 | Key not functioning<br>Note: Controller keys | 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 functioning, once input voltage recovered<br>to nominal or with in specification<br>( 415 V +10% - 15 %) |
| 4 | "Pr. probe failure" message in display | Loose connection in connector position (X03 - 1, 3) & (X03 - 2, 4) . | 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 (X03 - 3) & (X03-4) 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 (X03 - 5, 7) & (X03 - 6, 8) | 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 (X03 - 7) & (X03-8) with Gnd, voltage should be 3.3 VDC. If it is different change the controller. |
| 6 | "Emergency stop"<br>"MMOL"<br>"Cooler OL"<br>"Dryer trip"<br>"Rev rot/Ph fail"<br>message in display | Loose connection in connector position X02 - 1 to 9). | 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 X05, X06 & X07 connector,<br>Check the relay working by switching on the start key (X05 -1) with (X05- 2, 3 & 4) & (X06 -1) with (X06-2).<br>Note: Ckeck in the continuity mode. |
| 8 | "Phase loss/ Reverse" message in display | Loose connection in connector position X08 - 1, 2 & 3. | Check the loose connection at controller end. |
| | | Controller failure | Check for the X05 connection X08(1- R, 2-Y, 3 -B), Still the same error change the controller |

# 7.10 Construction

- Plastic enclosures
- IP55 polyethylene front keypad
- Inputs and Outputs through terminal block
- Enclosure dimensions 280 X 190 X 90 mm

### 7.10.1 Dimension drawing

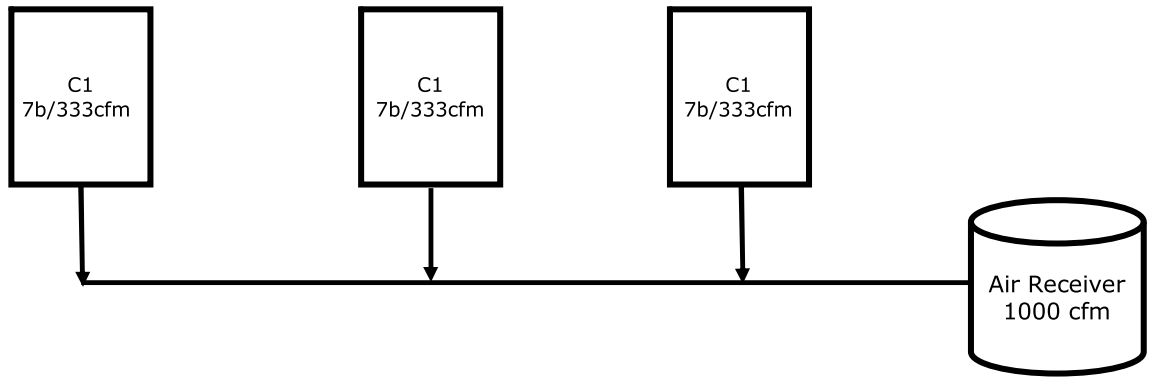


# 7.11 Example – scheduler setting

Scheduler settings are considered when:

1. End customer usage is 6 bar (87 psi)
2. Pressure variation in the air pipe is less than 0.1bar (1 psi)
3. All 3 compressors connect to a single/common header or a common receiver
4. All 3 compressors connect to a common header or a common receiver

| | Pressure schedule settings in Neuron III | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Comp-1 | | | | Comp-2 | | | | Comp-3 | | | |
| | ON | OFF | Load bar (psi) | U/L bar (psi) | ON | OFF | Load bar (psi) | U/L bar (psi) | ON | OFF | Load bar (psi) | U/L bar (psi) |
| **Monday** | **Lead** | | | | **Lag** | | | | **Lag** | | | |
| | 8:00 | 18:00 | 7 (102) | 7.5 (109) | 8:00 | 18:00 | 6.6 (96) | 7.2 (104) | 8:00 | 18:00 | 6 (87) | 6.8 (99) |
| **Tuesday** | **Lag** | | | | **Lead** | | | | **Lag** | | | |
| | 8:00 | 18:00 | 6 (87) | 6.8 (99) | 8:00 | 18:00 | 7 (102) | 7.5 (109) | 8:00 | 18:00 | 6.6 (96) | 7.2 (104) |
| **Wednesday** | **Lag** | | | | **Lag** | | | | **Lead** | | | |
| | 8:00 | 18:00 | 6.6 (96) | 7.2 (104) | 8:00 | 18:00 | 6 (87) | 6.8 (99) | 8:00 | 18:00 | 7 (102) | 7.5 (109) |
| **Thursday** | **Lead** | | | | **Lag** | | | | **Lag** | | | |
| | 8:00 | 18:00 | 7 (102) | 7.5 (109) | 8:00 | 18:00 | 6.6 (96) | 7.2 (104) | 8:00 | 18:00 | 6 (87) | 6.8 (99) |
| **Friday** | **Lag** | | | | Lead | | | | **Lag** | | | |
| | 8:00 | 18:00 | 6 (87) | 6.8 (99) | 8:00 | 18:00 | 7 (102) | 7.5 (109) | 8:00 | 18:00 | 6.6 (96) | 7.2 (104) |
| **Saturday** | **Lag** | | | | **Lag** | | | | **Lead** | | | |
| | 8:00 | 18:00 | 6.6 (96) | 7.2 (104) | 8:00 | 18:00 | 6 (87) | 6.8 (99) | 8:00 | 18:00 | 7 (102) | 7.5 (109) |
| **Sunday** | 00:00hrs As required ON/Off has to be set. This is mandatory setting. | | | | | | | | | | | |



**Example - scheduler setting**

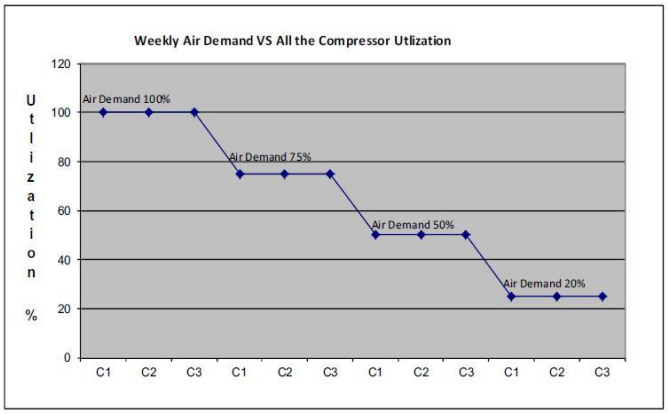
**Weekly utilization**

| | Air demand: 100% | | | Air demand: 75% | | | Air demand: 50% | | | Air demand:25% | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Comp -> | **C1** | **C2** | **C3** | **C1** | **C2** | **C3** | **C1** | **C2** | **C3** | **C1** | **C2** | **C3** |
| Day-1 | 100 | 100 | 100 | 100 | 100 | 25 | 100 | 50 | 0 | 75 | 0 | 0 |
| Day-2 | 100 | 100 | 100 | 25 | 100 | 100 | 0 | 100 | 50 | 0 | 75 | 0 |
| Day-3 | 100 | 100 | 100 | 100 | 25 | 100 | 50 | 0 | 100 | 0 | 0 | 75 |
| Day-4 | 100 | 100 | 100 | 100 | 100 | 25 | 100 | 50 | 0 | 75 | 0 | 0 |
| Day-5 | 100 | 100 | 100 | 25 | 100 | 100 | 0 | 100 | 50 | 0 | 75 | 0 |
| Day-6 | 100 | 100 | 100 | 100 | 25 | 100 | 50 | 0 | 100 | 0 | 0 | 75 |
| **Avg. Utl%** | **100** | **100** | **100** | **75** | **75** | **75** | **50** | **50** | **50** | **25** | **25** | **25** |

**Conclusion**

Equal utilization of all the 3 compressor based on pressure demand

The scheduler reduces power consumption since compressors are only utilized based on demand.




**Neuron III Pressure schedule setup**

Step-1 Go to operator menu

Step-2 Enter password "4545"

Step-3 operator -> schedule

Step-4 enable

Step-5 set ON TIME

Step-6 set OFF TIME

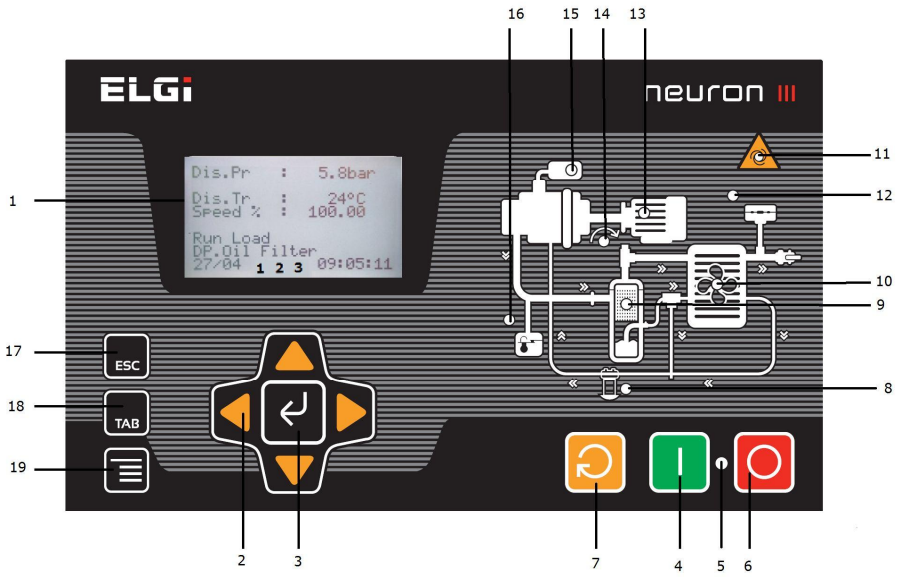
Step-7 set load Pr.

Step-8 set unload Pr.

# 7.12 Revision Details

| Version | Date | Changes |
|---|---|---|
| 1.0 | 25/02/15 | Release |
| 2.0 | 09/05/15 | Updated corrections |
| 3.0 | 30/06/17 | Software features & CE/UL updated |
| 3.1 | 01/03/18 | Software version 2.07 |
| 3.2 | 01/12/18 | Software version 2.08 |
| 3.3 | 11/03/19 | Software version 2.09 |
| 3.4 | 05/07/19 | Software version 2.09a |
| 3.5 | 10/02/20 | Software version 2.09b |
| 3.6 | 10/07/20 | Software version 2.09c |

# 7.13 Neuron III 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
8 Oil filter change indication LED
9 Air oil separator change indication LED
10 Cooler fault LED
11 Auto mode enabled indication LED
12 High pressure fault LED
13 Main motor fault LED
14 Reverse rotation fault LED
15 Air filter change indication LED
16 High discharge temperature fault LED
17 Escape key
18 Tab key
19 Info key

## MAIN SCREEN DISPLAY

- Package Discharge Pressure
- Discharge Temperature
- VFD Speed % on screen (if applicable)
- Machine Status like Run, Load, Unload, Standby etc.
- Warning Messages
- Date & Time
- Mode Information (see below)

**Mode Information – 1, 2, 3**

1. PS – Pressure Schedule Enabled / UL – Unload Mode Enabled
2. L – Local / R – Remote / D – DCS

**MAIN SCREEN SHORTCUTS**

**Pressing the navigation keys while on the main menu allows user to read common settings.**

**►"RIGHT" - Live Analog Values**

1. Live Differential Pressure (Displays only if Sump Pressure enabled)
2. Live Sump Pressure (Displays only if Sump Pressure enabled)
3. Live Pt1000 Temperature (Displays only if Dryer ON enabled)

**▲ "UP" – Set Analog Values**

1. Current Load Pressure
2. Current Unload Pressure
3. Current Start Sump Pressure (Displays only if Sump Pressure enabled)
4. Current Differential Pressure (Displays only if Sump Pressure enabled)

**▼ "DOWN" – Today Report**

1. Load and Stop Hours
2. Unload and Fault Hours
3. Run and Standby Hours

## 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 |
| Start inhibit xx.x | During the start, if the sump pressure is higher than the set start sump pressure value, you will see this message. XX.X denotes the live sump pressure value. The compressor starts only if the sump pressure value goes below the set value. |
| Temperature inhibit ±XX | During the start, 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. |
| Start inhibit "seconds" | If sump pressure is not used (disabled) then the controller will ensure minimum 60 seconds delay between the stop and the start. Count stops if "STOP" key is pressed |
| 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 |

## Compressor Warning messages

| Warning | Description |
|---|---|
| DPAF | If DPAF Digital Input is Open and DPAF ON in factory setting |
| DPOF | If DPOF Digital Input is Open and DPOF ON in factory |
| Dryer Probe Failure | When Ch-4 analog sensor input fails |
| Dryer Off - Low DP warn | When Ch-4 Dew point temp. is less than Set value |
| High Dew Point | When Ch-4 Dew point temp. is greater than Set Value |
| High Differential Pressure | When the difference between Sump. Pressure and Discharge Pressure exceeds the Set Pressure. ( Only in Sump Pr. Enabled condition) |
| Warn Temperature | When Discharge temp. exceeds the set warntemperature (Default is 105Deg C/Deg F) |
| Change Oil Filter | When service remaining Hr. reaches 0000 Hrs |
| Change Air Filter | When service remaining Hr. reaches 0000 Hrs |
| Change Oil | When service remaining Hr. reaches 0000 Hrs |
| Change Grease | When service remaining Hr. reaches 0000 Hrs |
| Change Separator | When service remaining Hr. reaches 0000 Hrs |
| Change Valve kit | When service remaining Hr. reaches 0000 Hrs |
| Dryer Off - IP Warn | If Dryer Digital Input is Open and dryer warn is selected in the input |
| Calibration error | When there is error in sensor calibration |

## Compressor Fault messages

| Fault | Description |
|---|---|
| Pr. Probe failure | Discharge pressure sensor probe failure |
| Tr. Probe failure | Temperature sensor probe failure |
| Sump pr. probe failure | Sump pressure sensor probe failure, if sump pressure is enabled |
| HSP (AS) | Case 1: sump pressure is enabled |
| | If sump pressure exceeds the set high sump pressure value. |
| HSP (AD) | If discharge pressure exceeds the set high sump pressure value. |
| Cooler | If the cooler digital Input opens due to Cooler fault |
| Main motor overload/<br>VFD error | IF the MMOL digital input opens due to main motor<br>over load. VFD error if VFD control is enabled. |
| Rev rot / Ph fail | If the rev rot input closes when motor running due to motor reverse rotation or Phase failure. |
| Trip temperature | If the discharge temperature exceeds the set trip temperature value. |
| Sump Pressure<br>Not Developing | After the Start, The sump pressure should be at least 0.3 bar/4psi after star delay expires. If this is NOT achieved this Fault occurs , if sump pressure is enabled. |
| Power failure | If the mains supply is interrupted for more than 20 msec |
| Low voltage | If the mains supply voltage is less than the 75% of rated voltage.<br>Compressor is tripped & All controller operation is halted until the mains supply Comes back to normal (at least 85% of the rated) |
| Dis. pressure<br>Not developing | After the Load, The discharge pressure should be at least 0.5 bar/7psi in 5mins. If this is NOT achieved this fault occurs |
| Dryer IP trip | If dryer is enabled with trip, if dryer trip occurs, this fault message will be shown |
| Dryer low DP trip | When dew point temperature is less than set value. |
| Temperature not developing | If the discharge temperature not raised above the inhibit temperature before the set inhibit temperature time. |
| Winding temp. high/fail | It will trip the compressor based on SET value of MOTOR WINDING temperature/ sensor open |

## Menu Structure