



USER GUIDE

Nitrogen Gas Generator GEN₂ MINI

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nano

www.nano-purification.com

About Us

Experience.

Our team is comprised of and supported by individuals spanning all disciplines from research & development, engineering & manufacturing, marketing & sales and service & support. Our backgrounds are in air and gas purification and our experience in this field spans a wide range of industries. We combine this knowledge and experience to ensure our products and services are designed and provided to meet the objectives and expectations of you - our Customer

Customer.

We recognise that our Customers are not only our valuable distribution partners who sell and support our products or the machine builders who depend on them as protection for their equipment. They are the contractors who install them, the manufacturers who use them in their processes and the service people who maintain them. At nano we have developed our products, packaging and support materials to ensure they exceed all of our Customers' expectations.

Service.

At nano we recognise that world-class customer service is the most important component to any successful business. Your business needs to exceed your customers' expectations to stand out from your competitors and our service must positively impact your business so you can be successful in doing so. Our commitment is simple... we will stand behind our products and ensure that our customer service is unrivaled in the industry.



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1. General Information

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ANNOTATIONS



CAUTIONS: indicate any situation or operation that may result in potential damage to the product, injury to the user, or render the product unsafe.



NOTES: highlight important sections of information where particular care and attention should be paid.



WARNING: This product can expose you to chemicals including lead, which is known to the State of California to cause cancer and/or birth defects or other reproductive harm. For more information, go to www.P65Warning.ca.gov.

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1.2 Document Introduction

This manual provides factory prescribed installation and maintenance procedures for the PSA nitrogen gas generator. The procedures illustrated in this document are only to be performed by authorized personnel. For further information regarding the procedures outlined in this document contact the manufacturer before proceeding. Be sure to read this document carefully before attempting to install or operate the nitrogen generator. This document should be permanently available at the nitrogen generator installation site.

1.3 Warranty Guidelines

All products are supplied with a 2 year manufacturer's warranty from the date of purchase when installed and maintained in accordance with the manufacturers guidelines. Only genuine service parts should be used and no modifications made.

1.4 Packaging

All products are securely packaged in a specifically designed wooden packing box. All models are held in a horizontal position by wooden struts. The box top cover can be removed by removing the fixing screws and lifting off in one piece.

Check immediately to establish whether damage has occurred to the external packaging and if the damage extends to the product inside. If there is damage to a product, contact the relevant supplier immediately.



Under no circumstances must a damaged product be used in operation. Using damaged products can lead to irreparable functional faults or cause serious physical harm.

1.5 General Safety

No modifications must be made to the product. Any modifications may reduce the operational safety of the product and invalidate the manufacturer's warranty. This could potentially result in damage to the product and serious personal injury.



For your own safety, when carrying out work on this product, all relevant national safety regulations must be complied with relating to pressurized and electrical systems.

1.6 Intended use of the Product

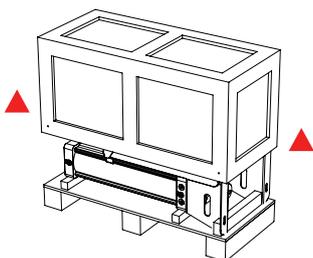
The nitrogen generator is exclusively intended for the production of nitrogen gas from compressed air, which is free from bulk water, oil and solid matter constituents and contaminants.

The product should be located within a building and protected from extreme conditions and weather. The nitrogen generator must be operated only in accordance with the data on the rating plate. Any operations that do not comply with those stated on the product rating label will render the warranty void.

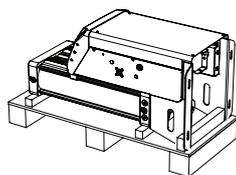


This product is designed to operate at operating pressures of between 6 to 10 barg. It is not suitable for pressures in excess of 10 barg although a higher pressure system is available upon request.

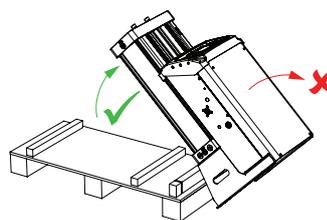
1.7 Unpacking the Product



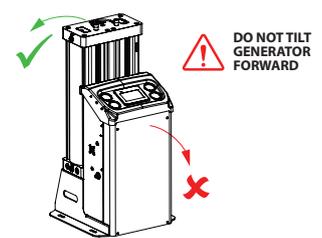
Box lid can be entirely removed
(Remove 4x screws)



Generator remains
on crate base



Carefully lift
generator from base



Generator can now be
moved to required position



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1.8 Safe Handling

Please ensure the relevant safe engineering practices and handling procedures are employed when handling, installing and operating this product. Ensure that the equipment is depressurized and electrically isolated prior to carrying out any of the scheduled maintenance instructions specified within this user guide.



A suitable lifting aid must be used to minimize the risk of physical injury or damage to the product.

1.9 Technical Description

The nitrogen generator operates on the Pressure Swing Adsorption (PSA) principle to produce a continuous stream of nitrogen gas from clean dry compressed air.

A dual chamber extruded aluminum column, filled with Carbon Molecular Sieve (CMS), is joined via an upper and lower manifold to produce a two bed system. Compressed air enters the bottom of the 'online' bed and flows up through the CMS. Oxygen is preferentially adsorbed by the CMS, allowing nitrogen to pass through.

After a pre-set time the control system automatically switches the bed to regenerative mode and oxygen is vented from the CMS. A small portion of the outlet nitrogen gas is expanded into the bed to accelerate the regeneration. At the same instant the second bed comes on-line and takes over the separation process.

The CMS beds alternate between online and regeneration modes to ensure continuous and uninterrupted nitrogen production.

The oxygen concentration in the nitrogen stream is monitored continuously on models fitted with an oxygen analyzer. If the outlet concentration exceeds the required production level, the nitrogen outlet is closed and the gas is vented to atmosphere. Normal operation will resume when the purity recovers. Various options are available for the nitrogen generator, please contact your supplier for more information.

1.10 Site Location and Installation

When selecting an installation site for the generator, ensure the following conditions are met:

- The site should be located indoors on a flat surface protected from weather and other harmful conditions.
- The ambient temperature must not drop below 5°C (41°F) or exceed 50°C (122°F).
- The installation site should be level and able to support the weight of the product.
- Ensure sufficient space around the product, we recommend at least 1m around the generator to allow access for operation and maintenance.
- Take into account the noise generated when in use when considering the final location.



Due to the nature of operation there is a possibility of oxygen enrichment surrounding the generator. Ensure the area surrounding the generator is adequately ventilated.

Once the generator has been located into position, install ball valves and the pipework ready for connection to the buffer vessel and compressed air supply. The diameter of the pipes must be sufficient to allow unrestricted inlet air supply to the generator and nitrogen supply to the applications. Ensure that all piping materials are suitable for the application, clean and debris free. All outlet piping must be solid and non-porous to minimize the ingress of oxygen. When routing the pipes ensure that they are adequately supported to prevent unnecessary strain which can lead to damage and leaks in the system. The nitrogen buffer vessel must be rated to at least the maximum operating pressure of the system and must be fitted with a suitable drain valve, pressure gauge and pressure relief valve.

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2. Specification

Specifications	Standard
Recommended Inlet Air Quality	ISO Class 1.2.1
Min. Inlet Air Quality	ISO Class 1:4:1
Min. Operating Pressure	6 barg (87 psig)
Max. Operating Pressure	10 barg (145 psig)
Recommended Operating Temp Range	20-25°C (68-77°F)
Min./Max. Operating Temperature Range	5-50°C (41-122°F)
Supply Voltage	100 - 240V AC
Fuse Rating	3A 'T'
Frequency	50...60Hz
Max. Power Consumption	72W
IP Rating	IP53 (NEMA 2)

Model	Connections			
	(BSP/NPT)		BSP	
	Compressed Air Inlet	To Buffer Vessel	From Buffer Vessel	Nitrogen Outlet
GEN ₂ Mini - 060				
GEN ₂ Mini - 080				
GEN ₂ Mini - 100				
GEN ₂ Mini - 110	1/2"	1/2"	1/4" NPT Adaptors (Factory Fitted)	1/2" NPT Adaptors (Factory Fitted)
GEN ₂ Mini - 120				
GEN ₂ Mini - 130				

Symbol	Description	Symbol	Description
	Always take caution while Using the Equipment		Ear Protection Recommended
	Beware, Pressurised Component(S)		The Generator can be controlled remotely and may start without warning
	Risk of Electric Shock		Use a Fork Lift to move the Nitrogen Generator
	Always Read the User Manual Before Operating the Equipment		



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2.1 Sizing

GENERATOR MODEL	RATED OUTLET FLOW ⁽¹⁾	NITROGEN PURITY OUTLET (MAXIMUM OXYGEN CONTENT)										
		10 PPM	50 PPM	100 PPM	500 PPM	1000 PPM	0.5%	1%	2%	3%	4%	5%
GEN ₂ MINI i4.0 060	Nm ³ /h	-	-	-	0.6	0.8	1.7	2.1	2.8	3.4	3.9	4.3
GEN ₂ MINI i4.0 080	Nm ³ /h	0.3	0.8	1.0	1.3	1.7	2.8	3.7	4.7	5.5	6.3	6.9
GEN ₂ MINI i4.0 100	Nm ³ /h	0.5	1.3	1.5	2.2	2.5	4.2	5.3	6.8	7.8	8.7	9.6
GEN ₂ MINI i4.0 110	Nm ³ /h	0.8	1.4	1.7	2.7	3.2	5.2	6.4	7.8	8.8	10.1	11.1
GEN ₂ MINI i4.0 120	Nm ³ /h	1.6	2.2	2.5	3.7	4.3	6.2	8.0	10.1	11.7	13.0	14.3
GEN ₂ MINI i4.0 130	Nm ³ /h	1.8	3.0	3.4	4.7	5.5	7.9	9.9	12.2	14.1	17.2	18.8

TEMPERATURE CORRECTION FACTORS ⁽²⁾											
Inlet air temperature (°C)	5	10	15	20	25	30	35	40	45	50	
Correction factor	0.80	0.90	0.94	1.00	1.00	0.98	0.95	0.90	0.85	0.72	

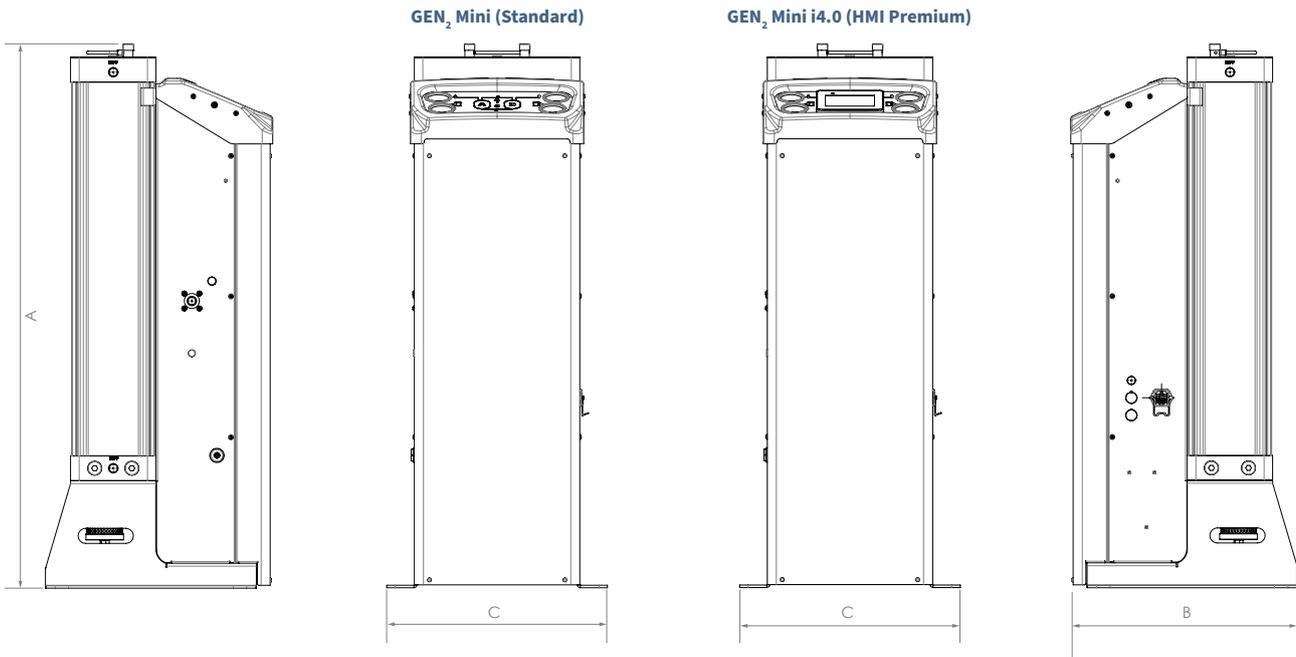
PRESSURE CORRECTION FACTORS ⁽²⁾											
Inlet air pressure (barg)				6	7	8	9	10			
Correction factor				0.88	1.00	1.10	1.20	1.30			

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2.2 Product Dimensions



GEN₂ Mini - Standard / HMI Premium Controller

MODEL	HEIGHT		DEPTH		WIDTH		WEIGHT	
	A	B	C	STANDARD	HMI PREMIUM			
GEN ₂ MINI 060	738mm [29IN]	452.5mm [17.8IN]	440mm [17.3IN]	54KG [119LBS]	57KG [126LBS]			
GEN ₂ MINI 080	918mm [36.1IN]	452.5mm [17.8IN]	440mm [17.3IN]	63KG [139LBS]	66KG [146LBS]			
GEN ₂ MINI 100	1093mm [43IN]	452.5mm [17.8IN]	440mm [17.3IN]	76KG [168LBS]	80KG [177LBS]			
GEN ₂ MINI 110	1243mm [48.9IN]	452.5mm [17.8IN]	440mm [17.3IN]	83KG [183LBS]	88KG [194LBS]			
GEN ₂ MINI 120	1493mm [58.8IN]	452.5mm [17.8IN]	440mm [17.3IN]	96KG [212LBS]	100KG [220LBS]			
GEN ₂ MINI 130	1843mm [72.6IN]	452.5mm [17.8IN]	440mm [17.3IN]	113KG [249LBS]	117KG [258LBS]			

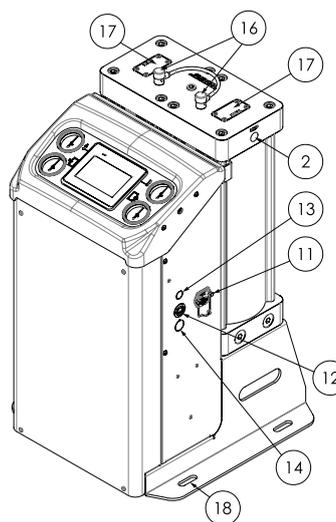
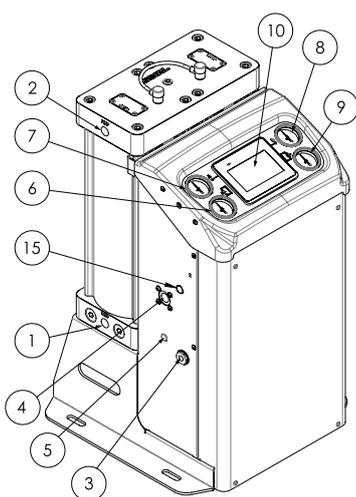


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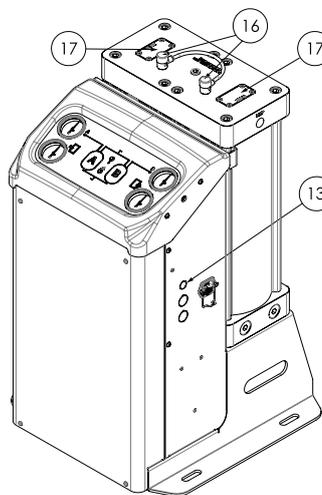
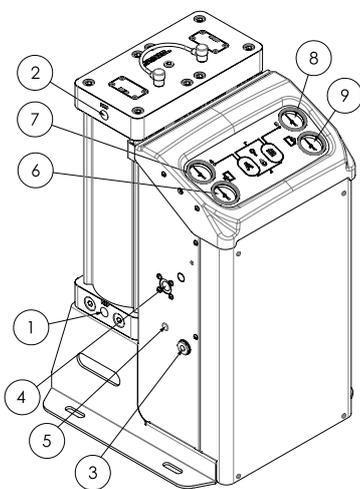
GEN₂ MINI

2.3 Product Overview

GEN₂ Mini i4.0 (HMI Premium)



GEN₂ Mini (Standard)



Number	Description	Number	Description
1	Compressed Air Inlet	10	HMI Generator Interface/Display*
2	Nitrogen To Buffer/Mixing Vessel	11	IEC Mains Power Socket
3	Nitrogen From Buffer/Mixing Vessel	12	RJ45 (Modbus Tcp) *
4	Nitrogen Outlet to Process	13	Remote Stop/Start - Customer Fit Option (M16 Cable-Gland Knock-Out)
5	Mass Flow Controller (If Fitted) Adjustment Access	14	USB Type A - Customer Fit Option (Knock-Out Provided)*
6	Compressed Air Inlet Pressure Gauge	15	External Flow Meter Connection (M16 Cable-Gland Knock-Out)*
7	Column 'A' Pressure Gauge	16	Purge Control Valves
8	Column 'B' Pressure Gauge	17	NRV Access Plates
9	Nitrogen Outlet To Process Pressure Gauge	18	Mount Slots (X4)

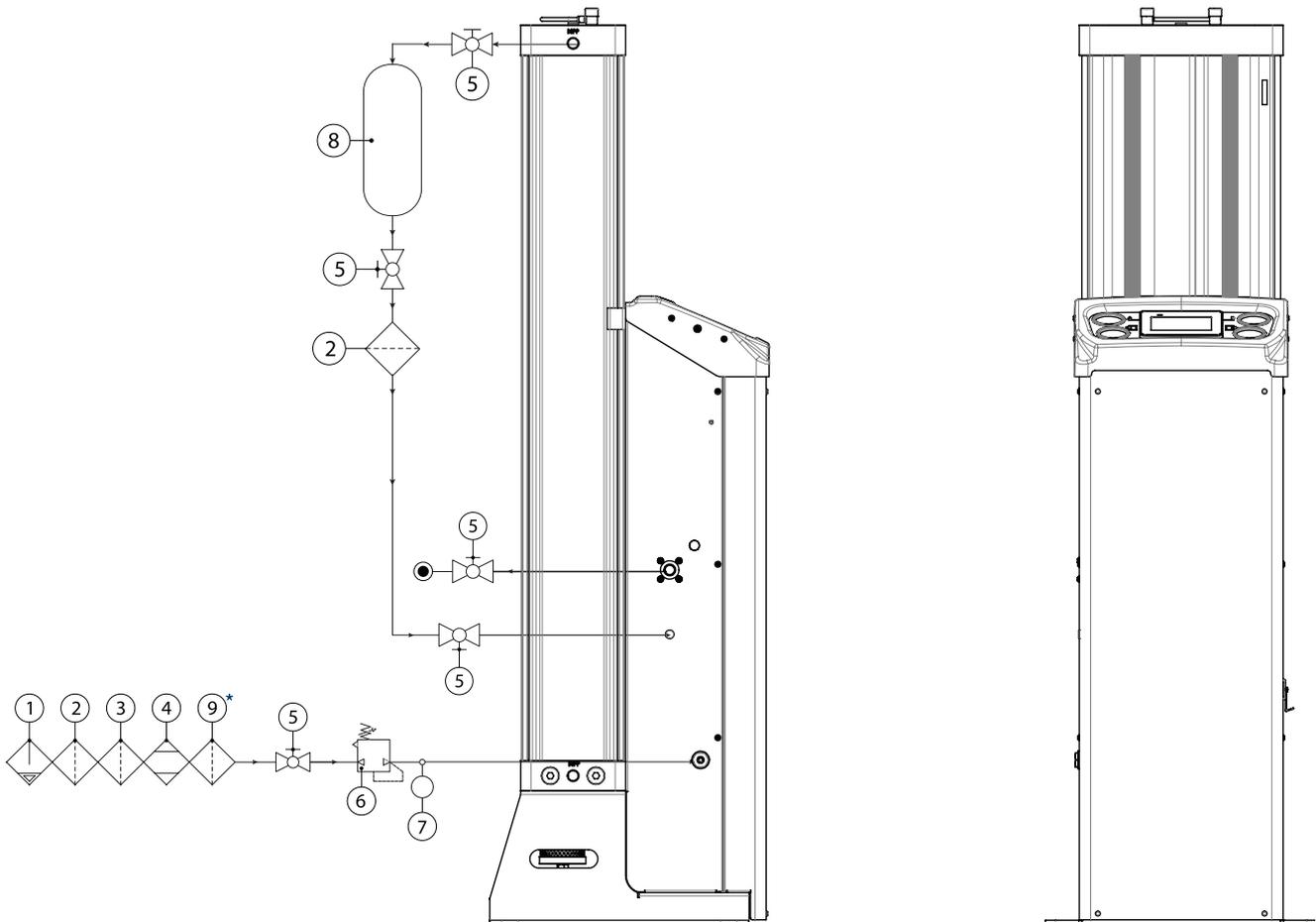
* only available on HMI Premium product

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2.4 Typical System Layout



Number	Description	Number	Description
1	Water Separator	6	Pressure Regulator (Optional)
2	1 µm Filter	7	Pressure Gauge (Optional)
3	0.1 µm Filter	8	Nitrogen Buffer/Mixing Vessel
4	Desiccant Air Dryer	9	1 µm Filter (Optional)*
5	Manual Ball Valve		



Only personnel trained, qualified and approved by the supplier should perform installation, commissioning, service and repair procedures.



It is essential that the system into which the product is installed is fitted with a pressure limiting/relief device. This device should be between the compressor and the generator. The device must be set to prevent the maximum working pressure of 10 barg (145 psig) from being exceeded.



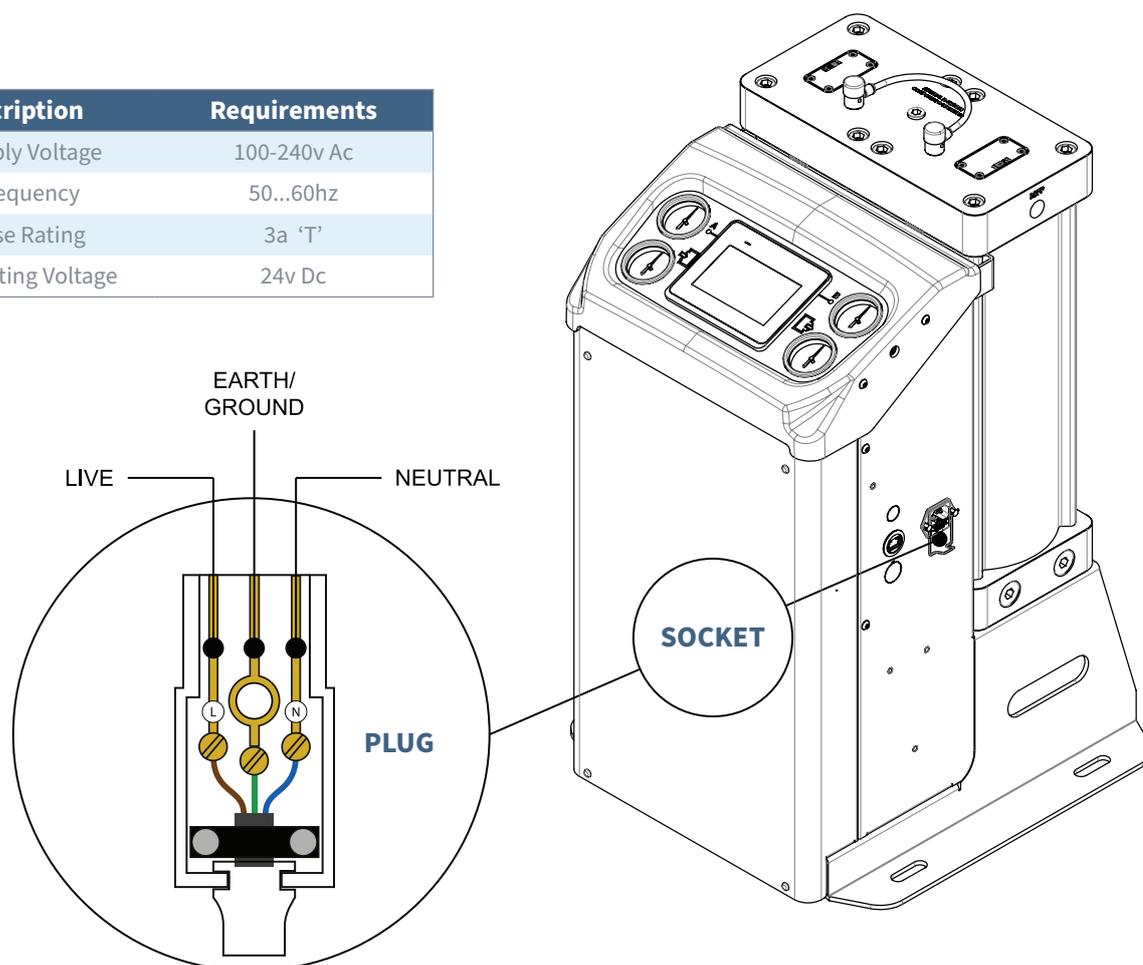
NITROGEN GAS GENERATOR

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2.5 Electrical Installation

Once in position, locate and remove the IEC plug from the side of the generator enclosure or bag containing user guide. Remove the back of the IEC plug and wire in your desired cable using the diagram below, we recommend using at least 0.75mm² (20AWG) gauge cable although this will vary depending on the cable run length. Each IEC plug is rated to 10A / 250V AC and can accommodate a cable size of up to 1.00mm² (18AWG).

Description	Requirements
Supply Voltage	100-240v Ac
Frequency	50...60hz
Fuse Rating	3a 'T'
Operating Voltage	24v Dc



IMPORTANT: This product must be grounded. In the event of an electrical short circuit, grounding reduces the risk of electric shock by providing an escape wire for the electric current. The plug must be plugged into an outlet that is properly installed and grounded in accordance with all local codes and ordinances. Check with a qualified electrician or service representative when the grounding instructions are not completely understood, or when in doubt as to whether the product is properly grounded. Do not modify the plug provided; if it does not fit the outlet, have the proper outlet installed by a qualified electrician.

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GEN₂ MINI i4.0 - HMI Premium Controller

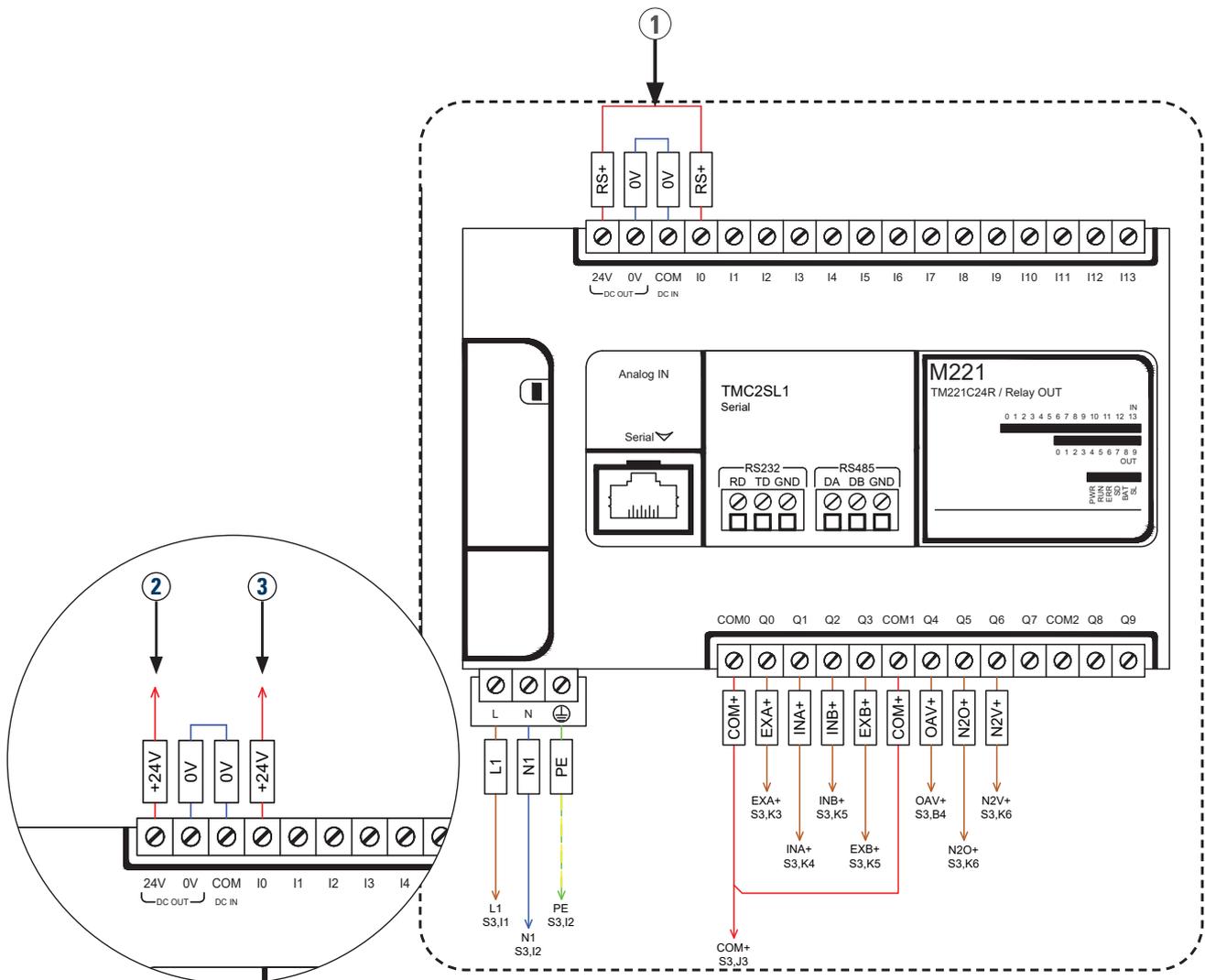


3. Remote Start/Stop

To use the remote start/stop feature, open the enclosure and locate the wire link marked as 'RS+' on the PLC (see item No.1 for reference). Remove the wire link from terminal i0.

In order to control the generator remotely via the start/stop feature you are required to install an additional two connections. First, an additional wire connection is required into the terminal '24V DC output' (see item No.2 for reference) this must be wired externally to the input of a switch or relay. Once this connection has been made you will need to add an additional connection on the output of the switch or relay, this should then be wired back to the PLC into terminal i0 (see item No.3 for reference).

When the connection is made and the circuit is complete you can then start the generator using the HMI power ON button. If for any reason this wired connection is broken, i.e. the generator has been remotely switched off, the generator will automatically commence a shut down procedure, stop cycling and go into standby mode until the connection is reestablished.





NITROGEN GAS GENERATOR

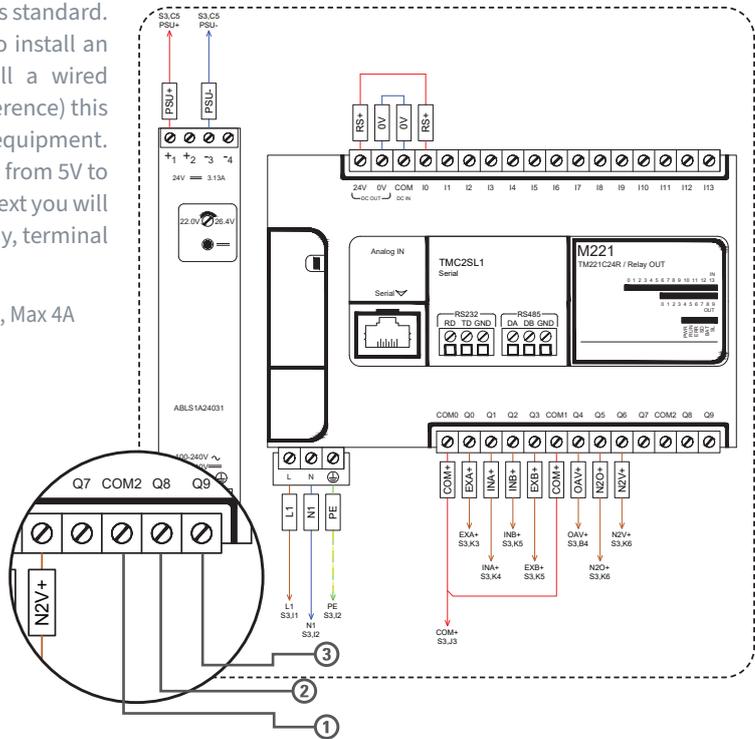
GEN₂ MINI i4.0 – HMI Premium Controller

3.1 Remote Alarms and Dryer

Every nitrogen generator comes with a general alarm as standard. In order to use the general alarm, you are required to install an additional wired connection. First, you must install a wired connection into terminal 'COM2' (see item No.1 for reference) this will be the voltage that is then relayed back to your equipment. The relay outputs are capable of switching any voltage from 5V to 277V AC / 125V DC and a maximum current of 4Amps. Next you will need to add an additional two connection on each relay, terminal Q9. (see item No.2, 3 for reference).

- **(1)** Terminal COM2 - 5...277V AC / 125V DC, 50/60Hz, Max 4A
- **(2)** Terminal Q8 - General alarm output
- **(3)** Terminal Q9 - Dryer Contact

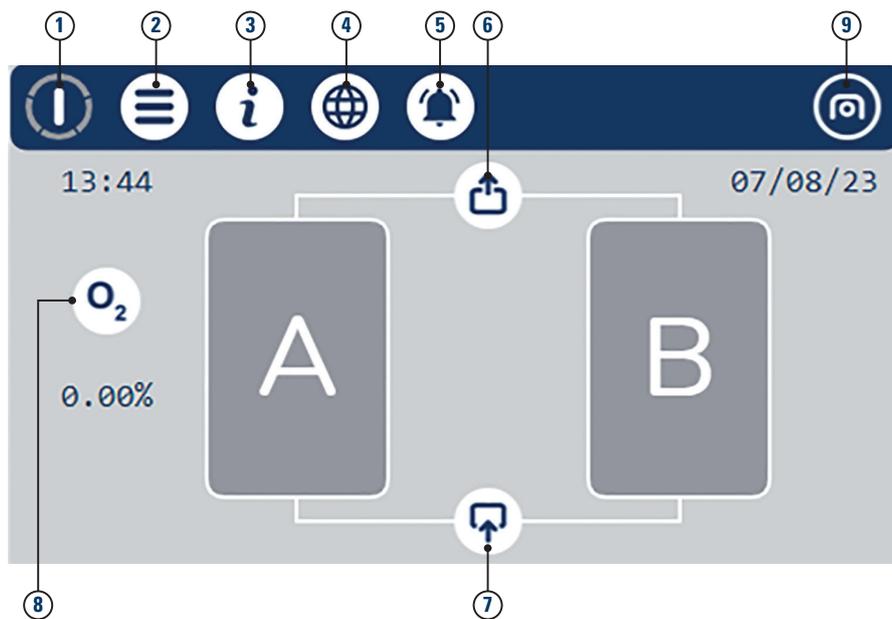
When making wired connections to and from the generator, there is an extra M16 cable gland knockouts located alongside the mains input socket. Using a blunt object, knock out the metal discs and insert M16 cable gland(s), these can then be numbered or marked up accordingly.



3.2 User Interface Quick Reference



If you require further details of the user interface, contact your service provider for the additional operators manual.



After 10 minutes of inactivity, the generators HMI will enter an energy saving mode where the HMI screen will go black. A green LED will remain blinking to indicate the HMI is still fully functional. If at any point the HMI detects human interaction the energy saving mode will deactivate and the screen will revert back to the mains display seen above.

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GEN₂ MINI i4.0 – HMI Premium Controller



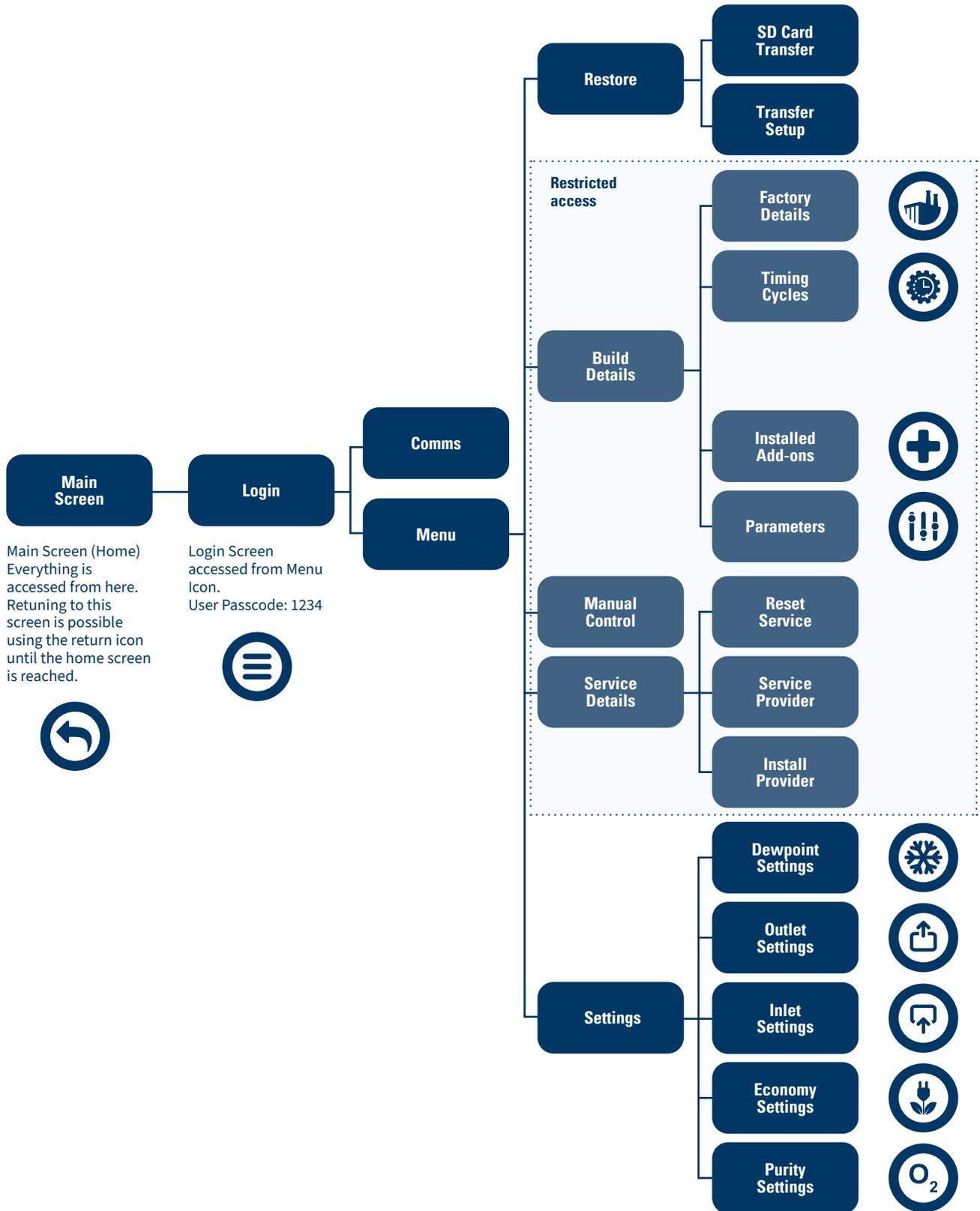
No.	Symbol	Description
1		Start/Stop Starts/Stops The Generator with a hold Of > 2s. Displays Cycle Information, rotating white : cycle running, rotating green economy stage 1, flashing green : economy shutdown, solid green : generator in economy, rotating amber : start-up mode, flashing white : generator controlled shutdown, solid grey : generator idle.
2		Menu/Return Navigates to menu via login page.
		Returns to previous page. Hold > 2s to return directly to home screen.
3		Information Displays Information Content.
4		Language Selection Navigates to language selection. Tapping the countries flag swaps to that language for all text strings.
5		Alarm Log Displays the Alarm Log.
		Displays the alarm log. Symbol flashing when alarm is active.
6		Outlet Icon Displays Outlet information, standard : pressure, options : dewpoint, flow.
		Displays Outlet information. Symbol flashes when outlet information is out of specification.
7		Inlet Icon Displays Inlet information, standard : pressure, options : dewpoint.
		Displays Inlet information. Symbol flashes when inlet information is out of specification.
8		Purity Displays Purity trend graph, generator idle.
		Displays Purity trend graph, generator in start-up mode, purity specification ignored.
		DisplaysPurity trend graph, purity within specification
		Displays purity trend graph, purity outside of specification.
9		Nano Logo Displays qr code that when scanned navigates user to company website.



NITROGEN GAS GENERATOR

GEN₂ MINI i4.0 - HMI Premium Controller

3.3 Interface Structure Overview



NITROGEN GAS GENERATOR

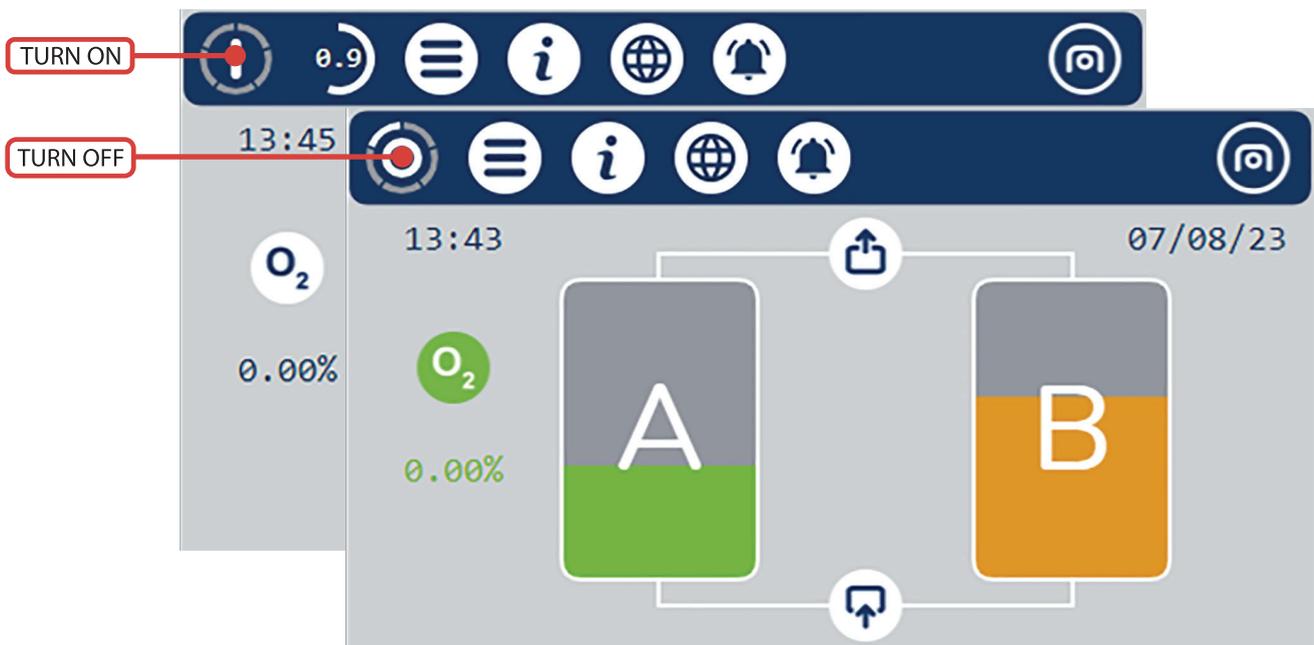
GEN₂ MINI i4.0 – HMI Premium Controller



3.4 Start-Up Procedure

A visual inspection of the installation should be carried out ensuring all connections to and from the nitrogen generator are secure and there is no visible damage to any components.

- Ensure that all isolation valves to and from the nitrogen generator are fully closed before operating.
- Switch on the power to the generator, the control system will carry out an initialization procedure.
- Slowly open the compressed air inlet isolation valve until fully open and check for leaks.
- Locate the 'START/STOP' button in the top left of the HMI screen and hold down for 3 seconds, the generator will begin its start-up procedure, button will rotate amber.
- Once the generator has completed its start-up procedure the compressed. START/STOP button will rotate white, at this point slowly open the inlet isolation valve of the buffer vessel.
- Once the buffer vessel is within 0.5 barg (7.2 psig) of the compressed air inlet pressure, slowly open the outlet isolation valve of the buffer vessel until fully open. Check all connections to and from the buffer vessel for any leaks as this could affect nitrogen purity.
- Slowly open the nitrogen outlet isolation valve until fully open.
- If the generator is working correctly, the O₂ symbol will turn green to show the purity is within specification and the generator is producing gas. If the generator develops a fault it will raise an alarm and indicate what has caused the alarm by turning the relevant symbol red.



3.5 Shutdown Procedure

- Fully close the nitrogen outlet isolation valve.
- Locate the 'STOP' button in the top left of the HMI screen and hold down for 3 seconds, the generator will begin its shutdown procedure. At this point the generator will complete its half cycle and then exhaust both columns until fully de-pressurized. START/STOP button will blink white. Generator will remain running until this stops blinking.
- The generator will remain in standby until manually re-started.



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3.6 Economy Mode

When under normal cycling conditions (i.e., not shutting down or in start-up mode) the generator will monitor the outlet pressure. If the outlet pressure rises above the “Economy High Pressure” Setpoint The generator will start a delay defined by “Economy Delay” Setpoint. “5 minutes as standard). If the pressure remains above the setpoint for the durations of the delay the Generator will close the outlet valve and stop supplying gas. Economy stage 1 is now active and is defined by the cycle start/stop button rotating green rather than white. The delay will start again and if the outlet pressure continues to remain above the setpoint the generator will perform a controlled shutdown the same as shutting down the generator manually. The cycle start/stop button will now be flashing green to signify a controlled economy shutdown. (See start-up/shutdown procedure). Once the generator has completed the shutdown procedure the cycle start/stop button will no longer flash and remain static green.

When The outlet pressure falls below the “Economy Low Pressure” Setpoint the Generator will start-up in start-up mode and begin cycling again to make sure that the CMS is primed before operation.

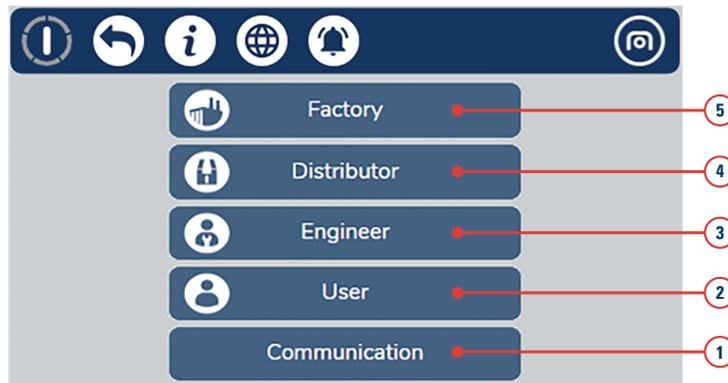


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3.7 Users & Login



1. Communication

When this option is selected the user will be taken to a communications menu that allows the user to reset the O₂ Analyser communications. (If Fitted) and also change the Ethernet settings of the HMI port.

2. User Login (Passcode: 1 2 3 4)

The user login allows access to settings, this will allow you to adjust;

- Purity settings (if option is fitted)
- Economy settings
- Inlet settings
- Outlet settings
- Dewpoint settings (if option is fitted)

3. Engineer Login (Passcode: contact supplier)

The engineer login allows access to the settings (as described above) as well as service detail, manual control function, build details as well as the ability to restore to factory settings. The service detail menu allows the engineer to perform a service reset. The manual control function can be used as a fault-finding tool in the event of a breakdown, this feature will not work while the generator is online. To use the manual control function, the nitrogen generator must be shut down and in standby.

4. Distributor Login

The distributor login grants the user access to the settings, service details, manual control function as well as build details. The build details menu will allow the user to adjust parameters and configuration of the nitrogen generator. In the configuration menu the user can activate additional extras such as dewpoint (providing the correct equipment has been fitted to the machine).



There is a password protected page called 'timing cycles' that will allow the user to adjust certain settings, should you need this password you will have to contact the manufacturer.

5. Factory Login

The factory login is reserved for use of the manufacturer only. Any attempt to gain access to this login is recorded within the machine and may result in loss of warranty.



Consecutive multiple attempts to login without the correct passcode can result in the machine interface becoming locked. In the event of this happening the user will have to contact the manufacturer in order to regain access.



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3.8 Login Process



Step 1

When in the login screen, touch the login required. A login box should appear with an empty field.

If you login in with no password or an incorrect one the field will flash Red.



Step 2

Enter the correct password and press enter.

If an incorrect digit is entered the Bs key can be used to delete the previous digit.



Step 3

Press the login button. If the password is correct the interface will advance to the next menu. If incorrect the login box will display red.



Step 3

Upon completion of the required task press the back button until the home screen is reached.

Note: if there is no activity detected for 10 minutes the interface will automatically log out and return to the home screen.

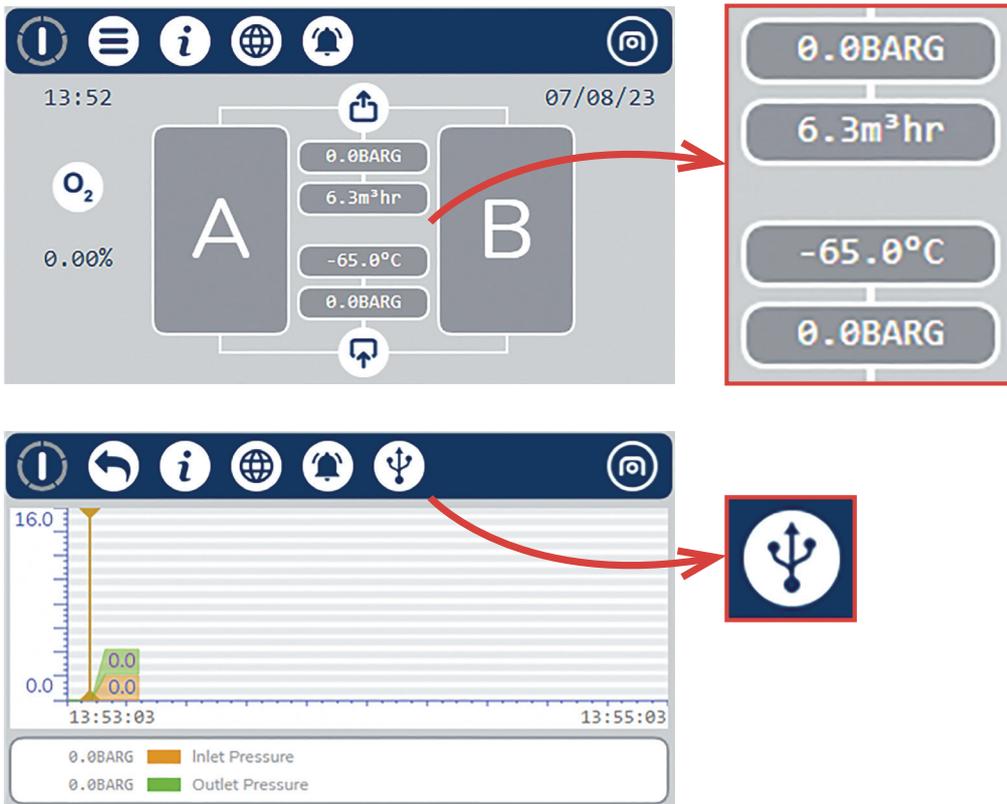
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3.9 Accessing Trend Charts

Accessing trend charts can be done by touching a value such as inlet pressure or purity (if O₂ Analyser fitted). This will then navigate to a trend chart where the data can also be exported to a USB Device. (See next section). The displays can be hidden or revealed by pressing the inlet or outlet icon respectively.





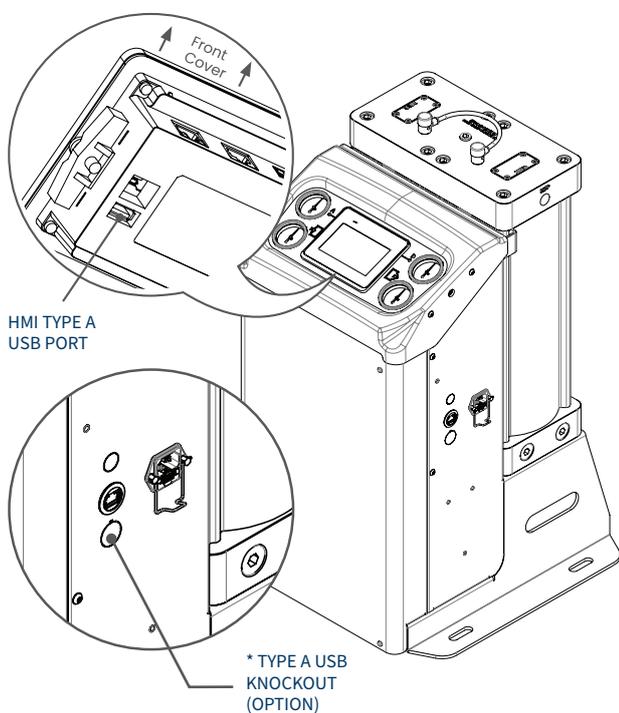
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3.10 Download Data to USB Storage Device

Step 1

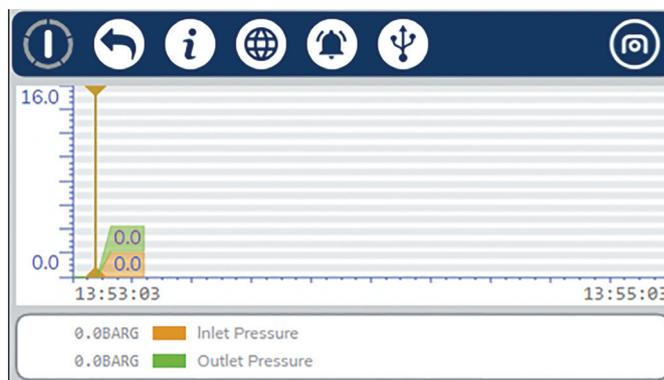
If using the USB infrequently insert a USB device into the type A port on the back of the HMI (to access, detach the front cover).



* If using the USB function frequently request the cable & socket kit from Nano to fit between the HMI and the panel knockout as indicated.

Step 2

Press and hold the USB export button for >2s to export the data from the graph



Step 3

If successful, the pop-up window should say Data exported ok. If not, the window will give detail to why the export was unsuccessful.



3.11 Network Settings

Changing the IP Address can be done to integrate the generator into a LAN to use the Modbus TCP re-transmission of data or the Web viewer function.



Step 1

Navigate to the Communication Menu by pressing the Menu Icon then pressing "Communication"

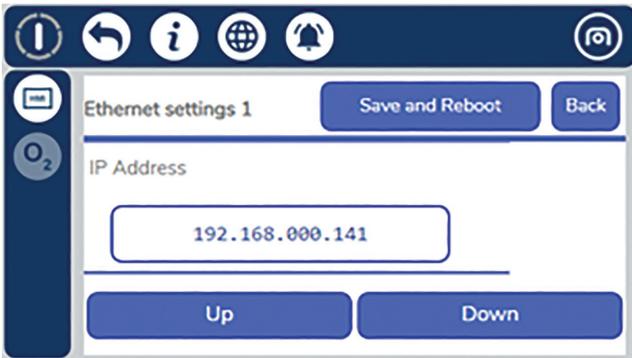
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Step 2

Using the Up/Down Keys Scroll down to “Ethernet 1”. Then press the button with “...”



Step 3

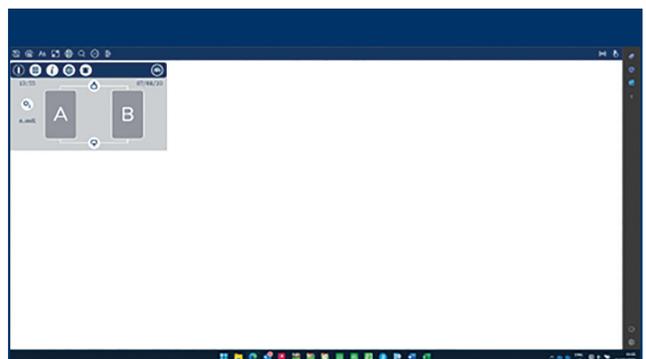
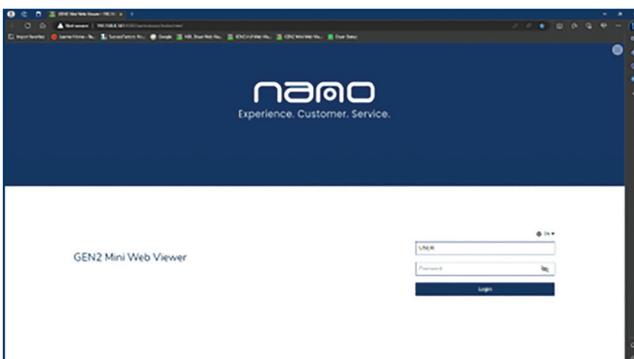
Change the IP Address, Subnet mask and default gateway to suite the LAN requirements. Then Press “Save and Reboot”. The process is now complete, and the new settings have been implemented.

3.12 Web Viewer Monitoring and Control

When the IP address has been changed to suit the LAN open a new instance of Edge, Firefox or Chrome and type in the following URL. <http://192.168.10.150:8082/webviewer/index.html>

The port number will always be 8082 and the IP address can be substituted for the relevant IP address. Upon completing this the browser should open the Login screen.

Enter the Username: USER and the password: 1234. And click Login. The Web viewer is now logged in and will show a real time view of the screen. This will function exactly as the HMI does.

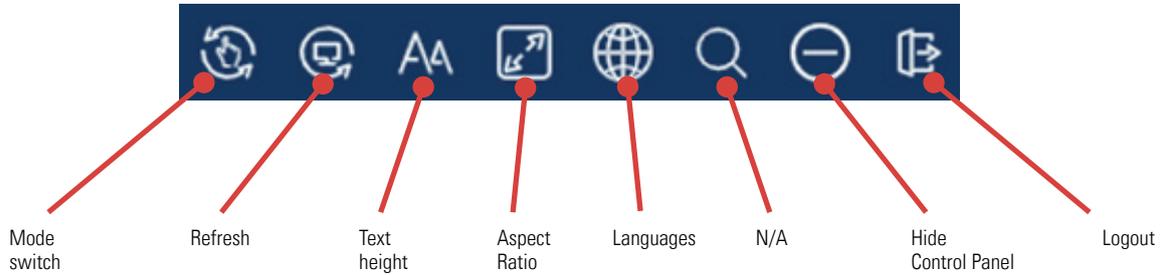




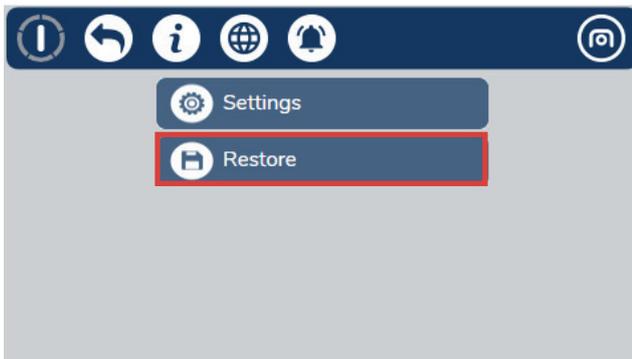
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The control panel at the top of the screen has various functions.

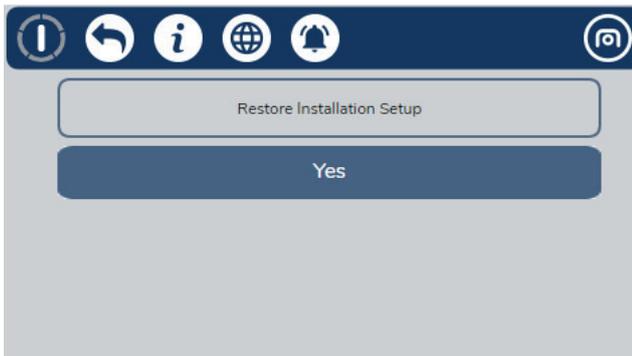


3.13 Restoring Settings



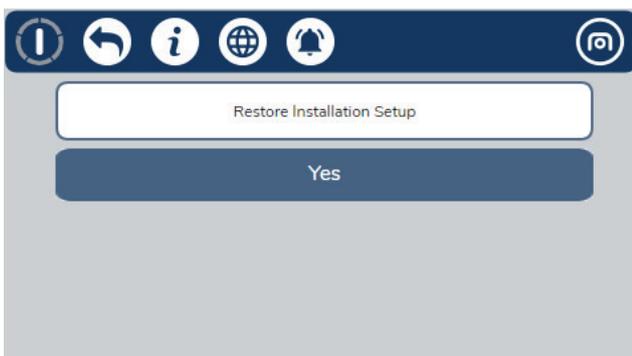
Step 1

Login as USER and navigate to the Restore page.



Step 2

Select Restore Installation Setup. The object should be highlighted.



Step 3

Hold the “Confirm” button until the previously highlighted field returns to its previous state. The settings should now have reverted to saved installation settings.

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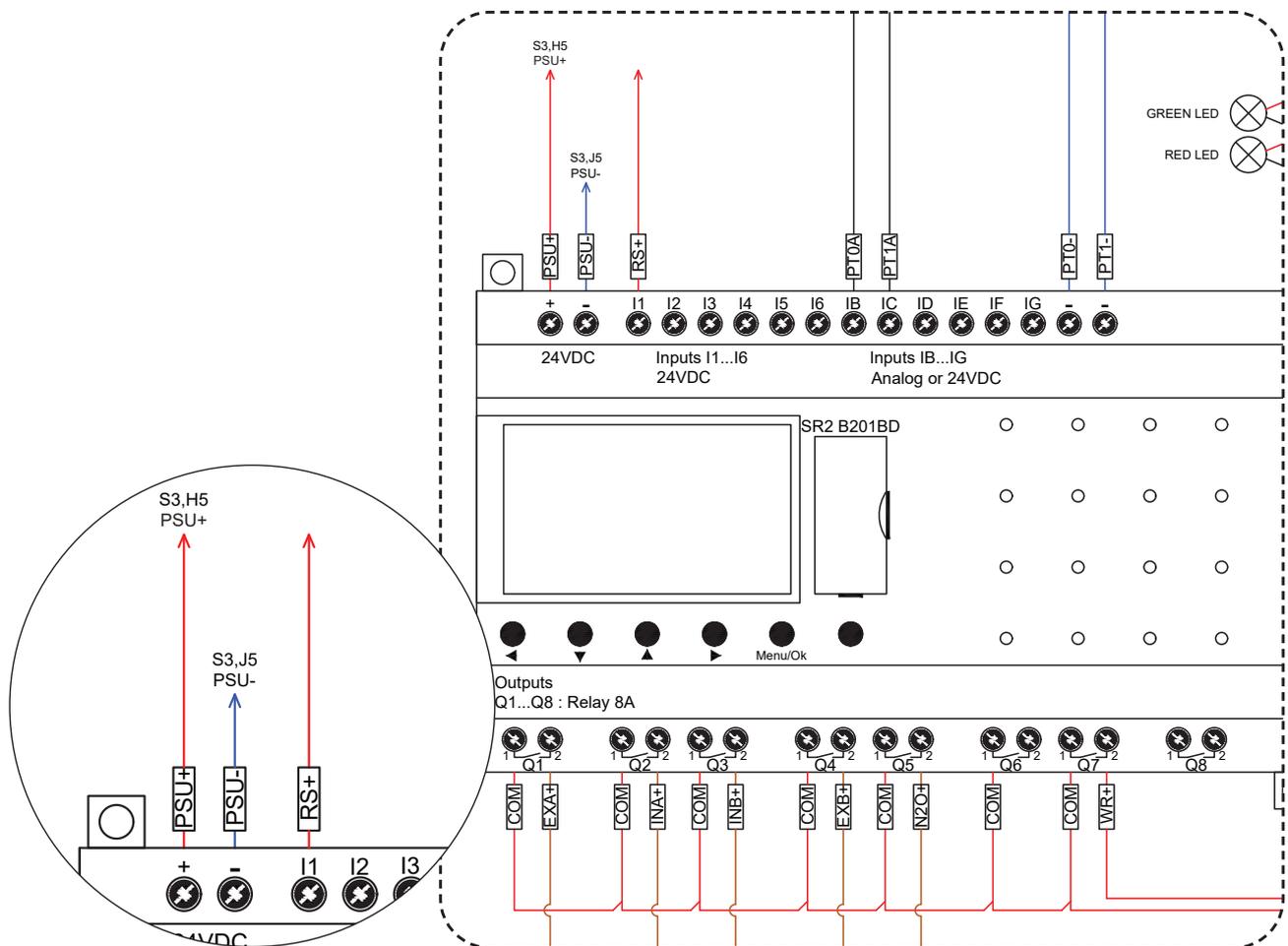


4. Remote Start/Stop

To use the remote start/stop feature, open the enclosure and locate the wire link across the '+' terminal and 'I1' on the PLC (see item No.1 for reference). Remove the wire link from terminal 'I1'.

To control the generator remotely via the start/stop feature you are required to install an additional connection. An external 24VDC signal is required on terminal 'I1' that can either be switch from an external relay or PLC output.

If for any reason this wired connection is broken, i.e., the generator has been remotely switched off, the generator will automatically commence a shutdown procedure, stop cycling and go into standby mode until the connection is re-established.



4.1 Remote Alarms

To use the alarm output, you are required to install an additional wired connection. First, you must install a wired connection into terminal 'Q8 (1)' (see item No.1 for reference) this will be the voltage that is then relayed back to your equipment. The relay outputs can switch any voltage from 12V to 240V AC / 12...24VDC and a maximum current of 4Amps. Next you will need to add an additional connection on terminal Q8 (2) for the alarm signal back to the external equipment.

- **(1)** Terminal Q8 - 12...240V AC 50/60Hz, 12...24VDC Max 4A
- **(2)** Terminal Q8 - Low inlet pressure/ Service alarm output



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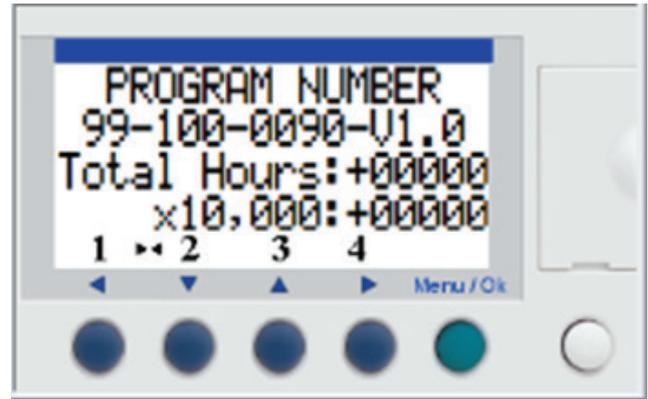
GEN₂ MINI – Standard Controller

4.2 User Interface Quick Reference

1. Power-Up Display (Only Visible on Power Start-Up for 10 seconds)

During power-up the screen will display:

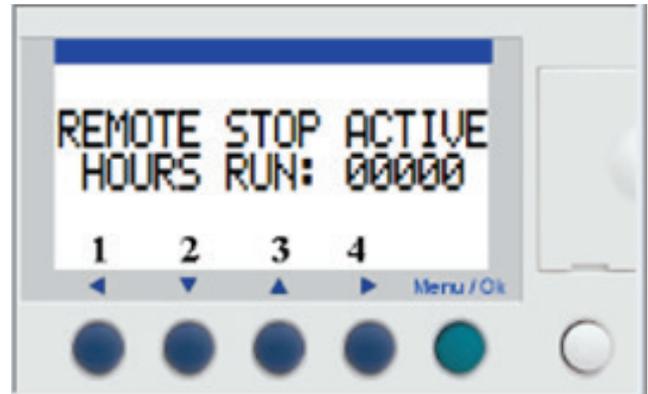
- Program number followed by the revision.
- Total hours dryer has operated.



2. Power-up display continued

During power-up the screen will display:

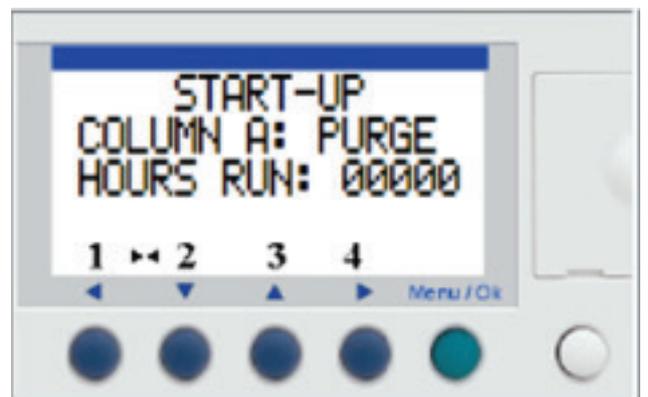
- Remote stop active will only appear if the remote start connection has been broken or the external relay/switch is not active
- Low inlet pressure will only appear if the inlet pressure is below the desired set-point
- Hours the generator has run between services
- Hours the generator has run in economy mode



3. Start-up sequence

During the start-up sequence the screen will display:

- Start-up will be displayed until the half cycle count has met the desired set point
- Column 'a' status and column 'b' status, this will be shown as online or purge
- Hours the generator has run between services
- Hours the generator has run in economy mode



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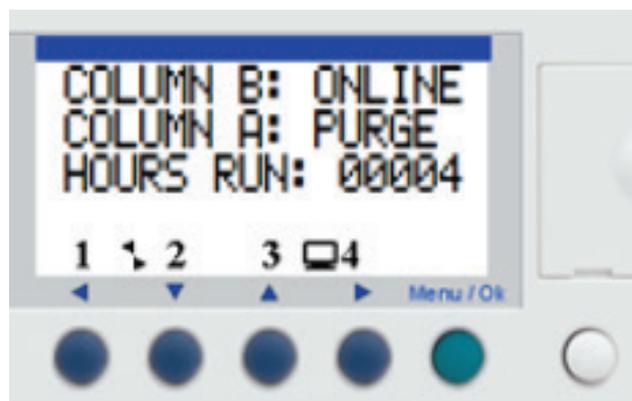


4. Normal operation display

During normal operation, if the generator enters economy mode the screen will display:

- Economy mode indicator to let you know it has shutdown, this will only occur when the desired outlet pressure reaches the set-point
- Hours the generator has run between services
- Hours the generator has run in economy mode

Speak to the manufacturer about your requirements.





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5. Maintenance



Maintenance operations should only be conducted once the system has been shut down and is fully depressurized. All operations should be carried out by authorized and suitably trained personnel.

- Isolate the generator from the compressed air and electrical supply ensuring the system is in a safe condition for maintenance to be carried out.
- All connections must be removed with care, paying particular attention to the areas that become pressurized.
- All seals removed during maintenance operations must be replaced with new seals.
- Only certified and approved replacement parts should be used.
- Do not modify or adjust the control settings.
- Check all connections and sealing faces for cleanliness and secure seating prior to assembly.
- Ensure all components are re-fitted to the product before operation.
- Check all connection and sealing faces for any leakage, if any found resolve and check again.
- Ensure the generator is left operating in a safe working condition after completion of maintenance.

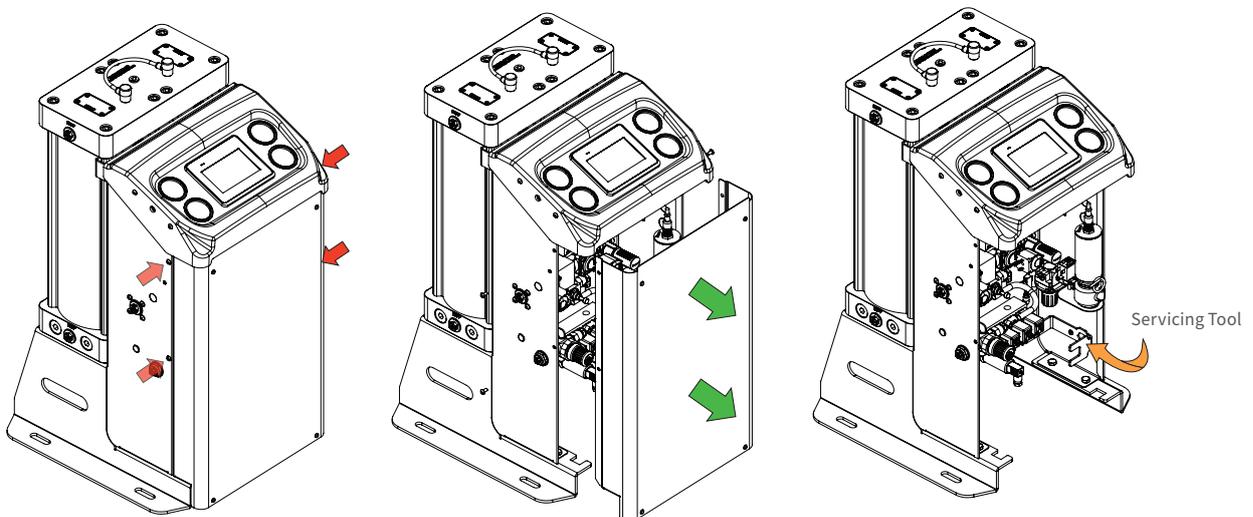
5.1 Cleaning

Clean the equipment with a damp cloth only and avoid excessive moisture around any electrical connections. If required a mild detergent can be used. Do not use abrasives/solvents as these may cause damage.

5.2 Daily Checks

- Check the generator for any signs of external damage.
- If the red service indicator is active, the generator must be serviced to ensure continued operation.
- Remove any loose dust or dirt from the generator, clean all surfaces that appear to have attracted unwanted contaminants.
- Ensure the generator is operating within the purity specification.
- Always check all connections for any leaks.
- Ensure all loose parts are removed or secured to the generator before operation.

5.3 Access for Maintenance



To remove the front cover for maintenance access - unfasten only these screws shown.

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5.4 Service Schedule – Generator with % O₂ Analyser



When contacting your service provider be sure to provide the product part number and serial number.

Ref.	Kit No.	Time Period (Months)									
		12	24	36	48	60	72	84	96	108	120
A	31-100-5001	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
B	31-100-0168		✓		✓		✓		✓		
C	31-100-1540 31-100-1541				✓				✓		
D	31-100-1530					✓					✓
E*	Calibration	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

5.5 Service Schedule – Generator with PPM O₂ Analyser

Ref.	Kit No.	Time Period (Months)									
		12	24	36	48	60	72	84	96	108	120
A	31-100-5001	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
B	31-100-0168		✓		✓		✓		✓		
C	31-100-1540 31-100-1541				✓				✓		
D	31-100-1531					✓					✓
E*	Calibration	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

5.6 Service Schedule – Generator without Analyser

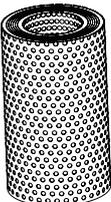
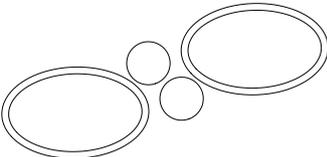
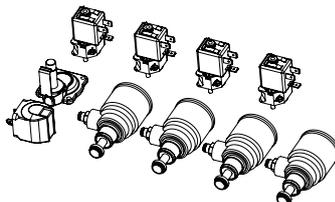
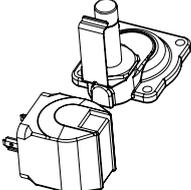
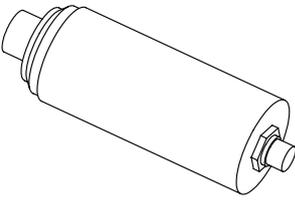
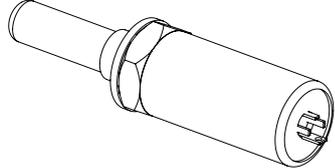
Ref.	Kit No.	Time Period (Months)									
		12	24	36	48	60	72	84	96	108	120
A	31-100-5001	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
B	31-100-0168		✓		✓		✓		✓		
C	31-100-1540				✓				✓		
E*	Calibration	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓



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5.7 Service Kits

Ref.	Kit Number	Kit Contents	Image
A	31-100-5001	Exhaust Silencer/Muffler (x1)	
B	31-100-0168	Non Return Valves	
C	31-100-1540	N ² Outlet Valve (x1) Control Valve Pistons (x4) Control Valve Pilots (x4)	
C	31-100-1541 (if analyser is fitted)	N ² Vent Valve (x1)	
D	31-100-1530 (if analyser is fitted)	% Purity Oxygen Sensor (x1)	
	31-100-1531 (if analyser is fitted)	PPM Purity Oxygen Sensor (x1)	
E*		Dewpoint Sensor (Range -50/+50°C)	
		Dewpoint Sensor (Range -100/+20°C)	

*E - Recommended for calibration every 12 Months

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5.8 Service Record

Part Number	Serial Number
-------------	---------------

Installed By	Installation Date
--------------	-------------------

Interval	Hours Run	Date	Serviced By		Comments / Observations
			Print	Sign	
12 Months					
24 Months					
36 Months					
48 Months					
60 Months					
72 Months					
84 Months					
96 Months					
108 Months					
120 Months					



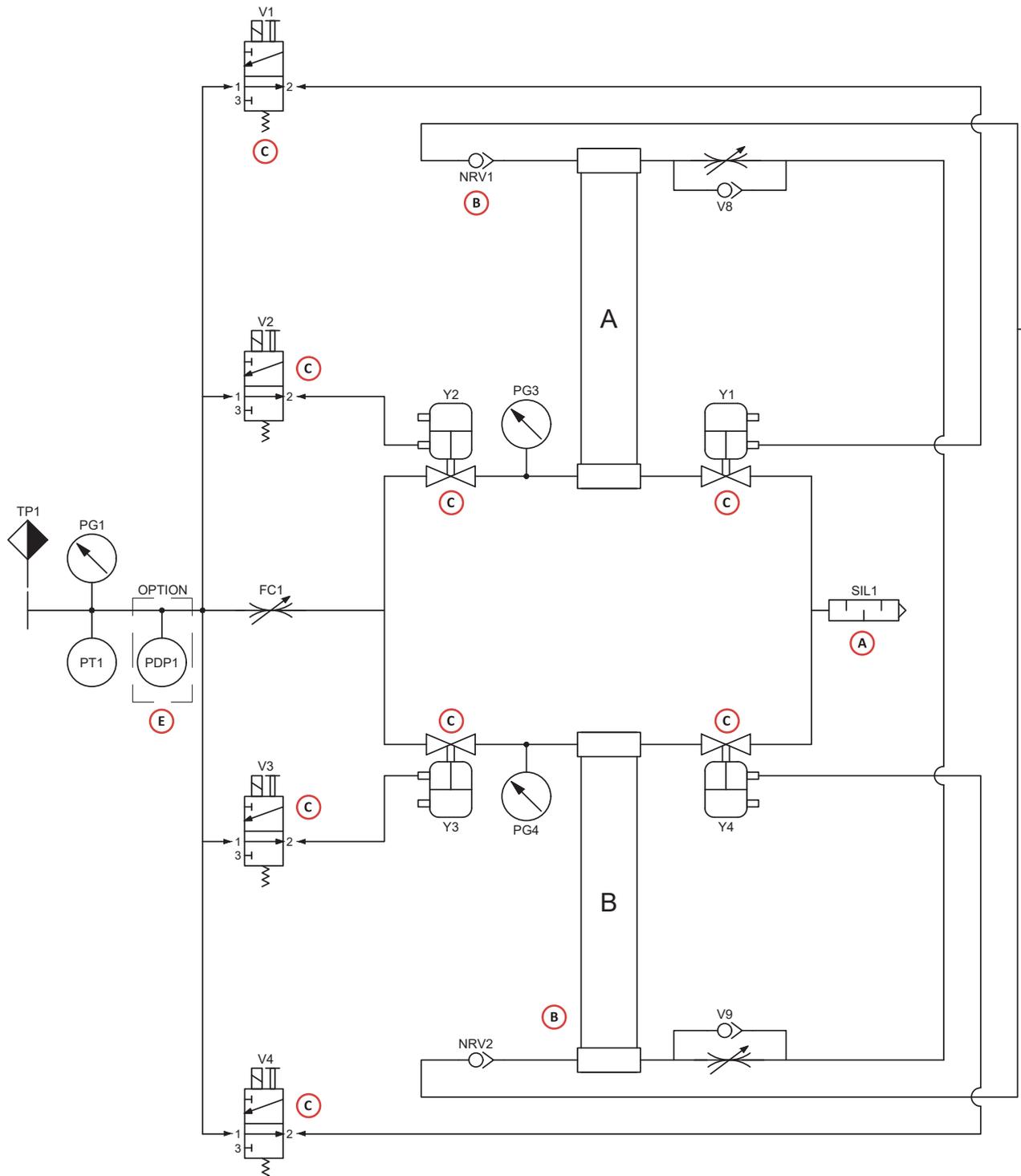
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5.9 Process and Instrumentation Diagram

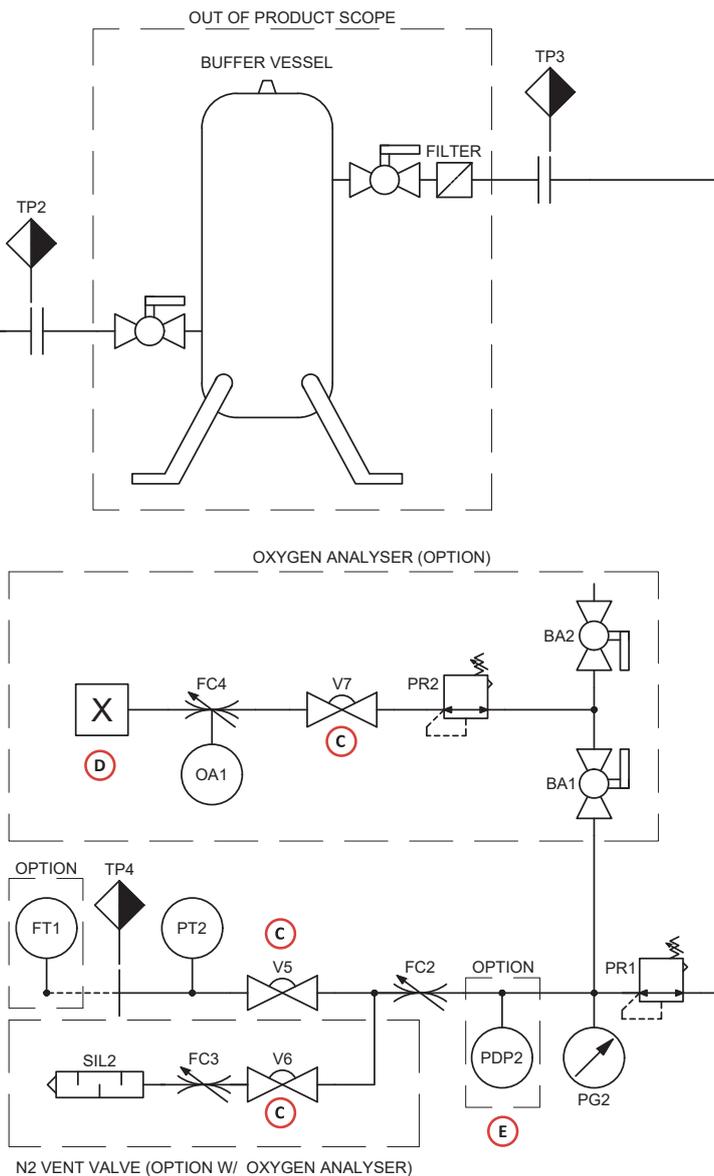


NOTE: For a more comprehensive diagram, please contact your supplier. Electrical schematics are also available on request.



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Note:

Letters surrounded by a red ring are reference to the required service kit for that component.

- Service **A** : Replace exhaust silencer
- Service **B** : Replace NRV balls & seals
- Service **C** : Replace all pilot valves, diaphragm valves, piston valves and solenoid coils
- Service **D** : Replace oxygen analyzer(s)
- Service **E** : Calibration

For more information about service kits see pages 29 and 30. For more information about service schedules and prices please contact your service provider.

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Notes

A series of horizontal dotted lines for taking notes.



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