

NITROSource Plus

NSP-020 to 120

High Efficiency PSA

Nitrogen Gas Generators



IOMI - Installation, Operation and Maintenance Instructions

(EN)

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SAFETY & INSPECTION

SAFETY INFORMATION

Do not operate this equipment until the safety information and instructions in this user guide have been read and understood by all personnel concerned.

USER RESPONSIBILITY

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

This document and other information from Parker Hannifin Corporation, its subsidiaries and authorised distributors provide product or system options for further investigation by users having technical expertise.

The user, through its own analysis and testing, is solely responsible for making the final selection of the system and components and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyse all aspects of the application, follow applicable industry standards, and follow the information concerning the product in the current product catalogue and in any other materials provided from Parker or its subsidiaries or authorised distributors.

To the extent that Parker or its subsidiaries or authorised distributors provide component or system options based upon data or specifications provided by the user, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the components or systems.

The pressure envelope of the equipment must not be breached under any circumstances. Failure to comply may result in an unplanned release of pressure, and may cause serious personal injury or death. All maintenance procedures that require the pressure envelope to be breached must only be performed by competent personnel trained, qualified, and approved by Parker.

Use of the equipment in a manner not specified within this user guide may result in an unplanned release of pressure, which may cause serious personal injury or damage.

When handling, installing or operating this equipment, personnel must employ safe engineering practices and observe all related regulations, health & safety procedures, and legal requirements for safety.

Ensure that the equipment is depressurised and electrically isolated, prior to carrying out any of the scheduled maintenance instructions specified within this user guide.

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

Parker can not anticipate every possible circumstance which may represent a potential hazard. The warnings in this manual cover the most known potential hazards, but by definition can not be all-inclusive. If the user employs an operating procedure, item of equipment or a method of working which is not specifically recommended by Parker the user must ensure that the equipment will not be damaged or become hazardous to persons or property.

Most accidents that occur during the operation and maintenance of machinery are the result of failure to observe basic safety rules and procedures. Accidents can be avoided by recognising that any machinery is potentially hazardous.

Details of your nearest Parker sales office can be found at www.parker.com/gsfe

Retain this user guide for future reference.

MARKINGS AND SYMBOLS

The following markings and international symbols are used on the equipment or within this user guide:

	Caution, Read the User Guide.		Wear ear protection.
	Risk of electric shock.		Pressurised components on the system.
	Highlights actions or procedures which, if not performed correctly, may lead to personal injury or death.		Remote control. Dryer may start automatically without warning.
	Highlights actions or procedures which, if not performed correctly, may lead to damage to this product.		Conformité Européenne
	Highlights actions or procedures which, if not performed correctly, could lead to electric shock.		Waste electrical and electronic equipment should not be disposed of with municipal waste.
	Read the User Guide.		Safety gloves to be worn
	NITROGEN (N2) NITROX DO NOT BREATHE Asphyxiant in high concentrations. No odour. Slightly lighter than air. Ensure adequate ventilation. Breathing 100% nitrogen will produce immediate unconsciousness and death due to lack of oxygen. NON-FLAMMABLE COMPRESSED GAS		Use a forklift truck to move the product

IDENTIFICATION

The NITROSource Plus Modular PSA Nitrogen gas generator range consists of 11 models which can operating at various purities, pressures and temperatures. All the critical operating parameters including operating specification can be identified via the products rating plate.



PART NUMBER CONFIGURATION

Example		N	S	P	-				-						-	0	0	A
Model	Prefix																	
NSP-020	0 2 0																	
NSP-030	0 3 0																	
NSP-040	0 4 0																	
NSP-050	0 5 0																	
NSP-060	0 6 0																	
NSP-070	0 7 0																	
NSP-080	0 8 0																	
NSP-090	0 9 0																	
NSP-100	1 0 0																	
NSP-110	1 1 0																	
NSP-120	1 2 0																	
Purity	Prefix																	
5ppm / 10ppm / 50ppm	U																	
100ppm / 250ppm / 500ppm / 0.1%	H																	
0.5% / 1.0% / 2.0% / 3.0%	L																	
Oxygen Analyser Technology	Prefix																	
Electrochemical	E																	
Zirconia	Z																	
Energy Saving Technology ⁽¹⁾	Prefix																	
Not Fitted	N																	
Fitted	Y																	
Nitrogen Outlet Flow Range ⁽²⁾	Prefix																	
High Flow	H																	
Low Flow	L																	
Dew point Monitoring	Prefix																	
Not Fitted	N																	
Inlet PDP Protection	I																	
Outlet PDP Monitoring	O																	
Both Inlet & Outlet Monitoring	B																	

⁽¹⁾ Energy Saving Technology not available on 50ppm, 10ppm or 5ppm generators.

⁽²⁾ See 'Mass Flow Controller Flow Breaks' chart for sizing information.

Mass Flow Controller Flow Breaks										
Outlet Pressure	bar(g)	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0
	psi(g)	72.5	87.0	101.5	116.0	130.5	145.0	159.5	174.0	188.5
High Flow	m ³ /hr	190.0	205.0	219.0	232.0	245.0	257.0	268.0	279.0	290.0
	scfh	111.8	120.6	128.8	136.5	144.2	151.2	157.7	164.2	170.6
Low Flow	m ³ /hr	61.0	66.0	70.0	74.0	78.0	82.0	86.0	89.0	93.0
	scfh	35.9	38.8	41.2	43.5	45.9	48.2	50.6	52.3	54.7

RECEIVING AND INSPECTING THE EQUIPMENT

The NITROSource Plus Nitrogen gas generator is supplied in a sturdy wooden crate designed to be moved using a forklift or pallet truck. On delivery of the equipment check the crate and its contents for damage. If there are any signs of damage to the crate, or there are any parts missing please inform the delivery company immediately and contact your equipment supplier or local Parker sales company.

Contents

Every NITROSource Plus model includes an OIL-X dry particulate filter and a variety of balls valves and fittings to aid in the correct installation of the generator.

NSP-020, 030, 040, 050, 060, 070, 080 & 090			NSP-100, 110 & 120		
Ref	Description	Qty	Ref	Description	Qty
1	NITROSource Plus Unit	1	1	NITROSource Plus Unit	1
2	OIL-X A0 Grade Dry Particulate Filter	1	2	OIL-X A0 Grade Dry Particulate Filter	1
3	G1" Ball Valve and Fittings	4	3	G1" Ball Valve and Fittings	2
4	G1" 3 way ball valve	1	4	G1½" Ball Valve and Fittings	2
			5	G1" 3 way ball valve	1

Storage

The equipment should be stored, within the packing crate, in a clean dry environment. If the crate is stored in an area where the environmental conditions fall outside of those specified in the technical specification, it should be moved to it's final location (installation site) and left to climatise prior to unpacking. Failure to do this could cause condensing humidity and potential failure of the equipment.

Unpacking

Remove the lid and all four sides of the packing crate. Lift the generator on to its feet using suitable slings and an overhead crane. Carefully move the generator to its final location, using a forklift or pallet truck.



An additional support is fitted to the NSP-020 stand to ensure complete stability of the product. This in conjunction with the location of the products stands mean that it is impossible to move the product with the use of a pallet truck. In this instance the product should be moved with use of appropriate slings and a overhead crane or forklift truck.



UNPACKING THE PRODUCT

A



B



C



D



COMPONENT IDENTIFICATION



Ref	Description	Ref	Description
1	Compressed Air Inlet	8	Modbus TCP/IP Connection
2	To Buffer Vessel	9	Webserver Connection
3	From Buffer Vessel	10	Digital/Analogue Inputs & Outputs
4	Nitrogen Outlet	11	Column 1 Pressure Gauge
5	Mains Supply Input	12	Column 2 Pressure Gauge
6	Electrical Supply Isolator/Emergency Shut Off	13	Compressed Air Inlet Pressure Gauge
7	Touchscreen Interface	14	Nitrogen Outlet Pressure Gauge

RANGE OVERVIEW

MODULAR CONSTRUCTION

The NITROSource Plus Nitrogen gas generator range are designed as a modular aluminium construction, utilising high tensile aluminium extrusions for inlet distribution manifolds, columns, outlet distribution manifolds and associated valve assemblies. All distribution manifolds and columns have an internal diameter of 150 mm (6") or less.

Large modular aluminium constructions such as those used on NITROSource Plus models use multiple extruded columns of equal length which are snow-storm filled with carbon molecular sieve (CMS). For compactness, each single column extrusion consists of two separate chambers. When compressed air is flowed through these chambers in parallel, there is sufficient CMS to provide the required Nitrogen gas flow rate of the system the generator was sized for.

A typical modular aluminium construction consists of:

- A lower inlet distribution manifold
- Multiple columns of equal length
- An upper outlet distribution manifold

To ensure the generator has enough CMS to deliver the desired Nitrogen gas flow rates and achieve the selected outlet purity, the NITROSource Plus range has eleven models with various capacities.

Range	Model	No. of Columns	No. of Chambers
NITROSource Plus	NSP-020	2	4
	NSP-030	3	6
	NSP-040	4	8
	NSP-050	5	10
	NSP-060	6	12
	NSP-070	7	14
	NSP-080	8	16
	NSP-090	9	18
	NSP-100	10	20
	NSP-110	11	22
	NSP-120	12	24

As inlet flow capacity increases, the number of columns required to generate the gas also increases, up to the maximum length of the manifolds. NSP-120 has 12 columns, this is the maximum number of columns available for Nitrogen gas generation applications.

Referencing Columns During Operation

Although modular aluminium construction generators have multiple columns and chambers, the multiple columns are in fact, flowed in parallel to increase capacity. Additionally, the distribution manifolds separate the air flow longitudinally, effectively creating two large separate chambers, with 50% of the CMS being used for generation of the Nitrogen gas, whilst the other 50% is being regenerated or kept in stand-by.

Therefore, during operation the two large (parallel flow) chambers simply are referred to as Column 1 and Column 2 or Side 1 and Side 2.



Example: NSP-120...1 Generator Bank



PRINCIPLE OF OPERATION

What are PSA Nitrogen gas generators and how do they work?

A Pressure Swing Adsorption (PSA) nitrogen gas generator is a system used to produce high-purity nitrogen gas from atmospheric air. It operates based on the principles of adsorption, where certain gases adhere to the surface of a solid material, and pressure manipulation to selectively adsorb and desorb gases. Here's a step-by-step breakdown of how a PSA nitrogen gas generator works:

Air Compression and Pre-Treatment

Atmospheric air is drawn into the system and compressed using an air compressor. The compressed air is then passed through pre-treatment filters to remove oil, moisture, and other impurities. This ensures that the air entering the PSA unit is clean and dry.

Adsorption

The clean, dry air is directed into one of the adsorption towers (typically there are two or more towers working in cycles). Each tower contains an adsorbent material, usually Carbon Molecular Sieves (CMS), that selectively adsorbs oxygen, carbon dioxide, and water vapor, while allowing nitrogen to pass through. The air is introduced into the tower at high pressure (typically 5-10 bar). At this pressure, oxygen, carbon dioxide, and water vapor molecules adhere to the surface of the adsorbent, while nitrogen molecules pass through and are collected as the product gas.

Desorption (Regeneration)

Once the adsorbent material in the tower becomes saturated with oxygen and other adsorbed gases, the tower is depressurized. This is called the desorption phase. The reduction in pressure causes the adsorbed gases to desorb (detach) from the adsorbent material and be vented out of the system. The adsorbent material is regenerated and ready for another cycle of adsorption.

Switching Between Towers

The PSA system typically uses two or more adsorption towers that operate in alternating cycles. While one tower is in the adsorption phase, the other is in the desorption (regeneration) phase. An automatic control system manages the switching between towers, ensuring a continuous flow of nitrogen gas.

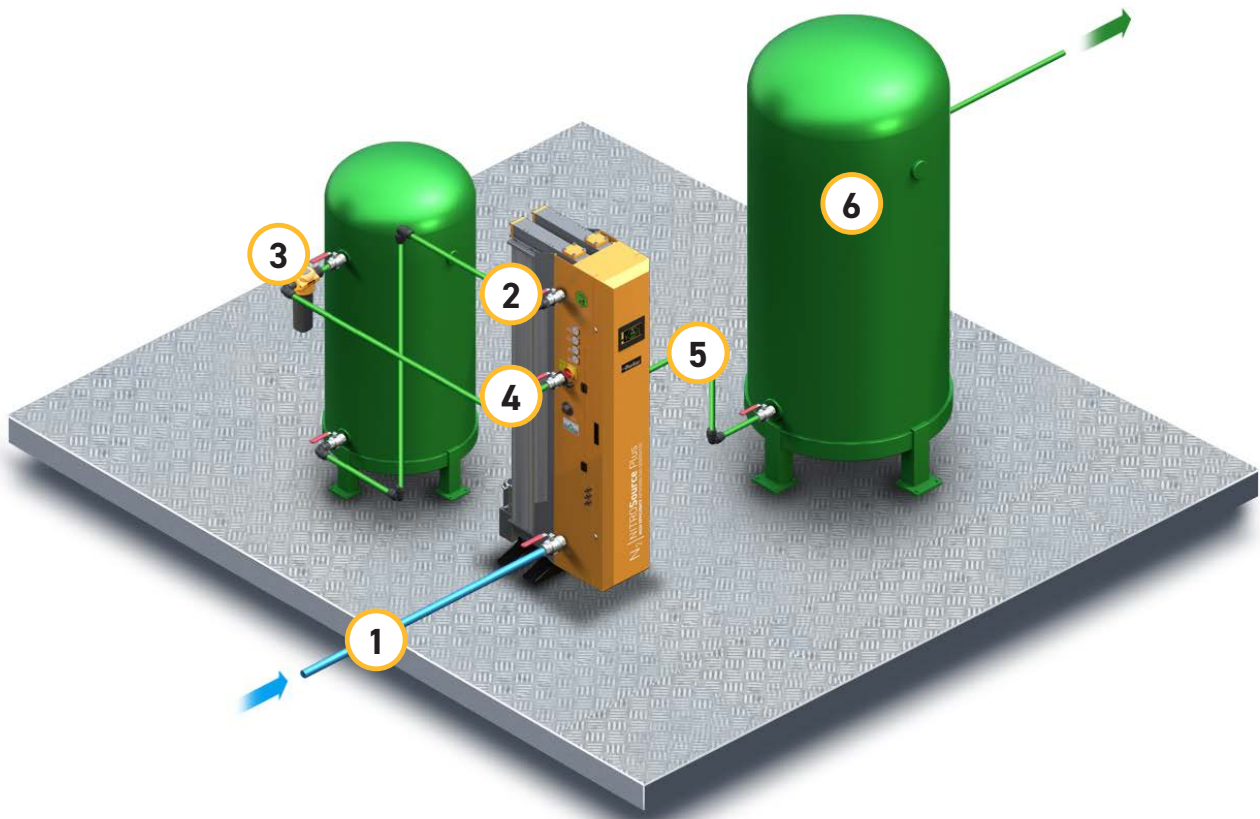
Nitrogen Collection and Delivery

The purified nitrogen gas is collected in a buffer tank to ensure a steady supply and consistent pressure. The nitrogen gas can then be delivered to the point of use, such as for industrial applications, food packaging, or other processes requiring high-purity nitrogen.

Overall, a PSA nitrogen gas generator is an efficient and reliable method for producing high-purity nitrogen gas from compressed air, using the principles of pressure swing adsorption to separate nitrogen from other components in the air.

SYSTEM OVERVIEW

Parker NITROSource Plus Nitrogen gas generators operate using the Pressure Swing Adsorption (PSA) principle to produce a reliable and continuous flow of Nitrogen gas at various purities, pressures and flow rates depending on the specification of the application the generator is sized for. The nitrogen generation process is a



1 Compressed Air Inlet ISO 8573-1:2010 Class 2.4.1	2 Connection To Buffer Vessel	3 Buffer Vessel Dry Particulate Filter
4 Connection From Buffer Vessel	5 Nitrogen Outlet Connection	6 Nitrogen Storage Vessel

* Important Note

Every NITROSource Plus model has a recommended buffer vessel size, this buffer vessel should be sized correctly based on manufacturers recommendations. Use of a smaller vessel may result in reduction in outlet pressure or deviations in outlet gas purity.

MODEL NUMBERS



NSP-020



NSP-030



NSP-040



NSP-050



NSP-060



NSP-070



NSP-080



NSP-090



NSP-100



NSP-110



NSP-120

TECHNICAL SPECIFICATIONS

TECHNICAL SPECIFICATION

Operating Parameters

Minimum Inlet Air Quality	ISO 8573-1: 2010 Class 2.4.1	
Minimum Operating Pressure	5.0 bar(g)	72.5 psi(g)
Maximum Operating Pressure	13.0 bar(g)	188.5 psi(g)
Design Pressure	15.0 bar(g)	217.5 psi(g)
Minimum Operating Temperature	5.0°C	41.0°F
Maximum Operating Temperature	50.0°C	122.0°F

Electrical Parameters

Supply Voltage	100-240V AC (±10%) 50/60Hz	
Power Consumption	100W	
Overvoltage Category	II	

Environmental Parameters

Humidity	50% @ 40°C (80% @ Max ≤31°C)	
Pollution Degree *	2	
Altitude	< 2000 m	< 6562 ft
IP Rating	IP32	NEMA 2
Peak Noise Level (@7.0bar(g))	~105 dB (C)	
Average Noise Level (@7.0bar(g))	~80 dB (A)	

* Pollution Degree 2 indicates that in order for this equipment to operate safely, only non-conductive pollution (i.e. solids, liquids or ionised gases) or temporary condensation may be present within the environment.

Purity Ranges

Ultra High Purity	5ppm, 10ppm & 50ppm	
High Purity	100ppm, 250ppm, 500ppm & 1000ppm (0.1%)	
Low Purity	0.5%, 1.0%, 2.0% & 3.0%	

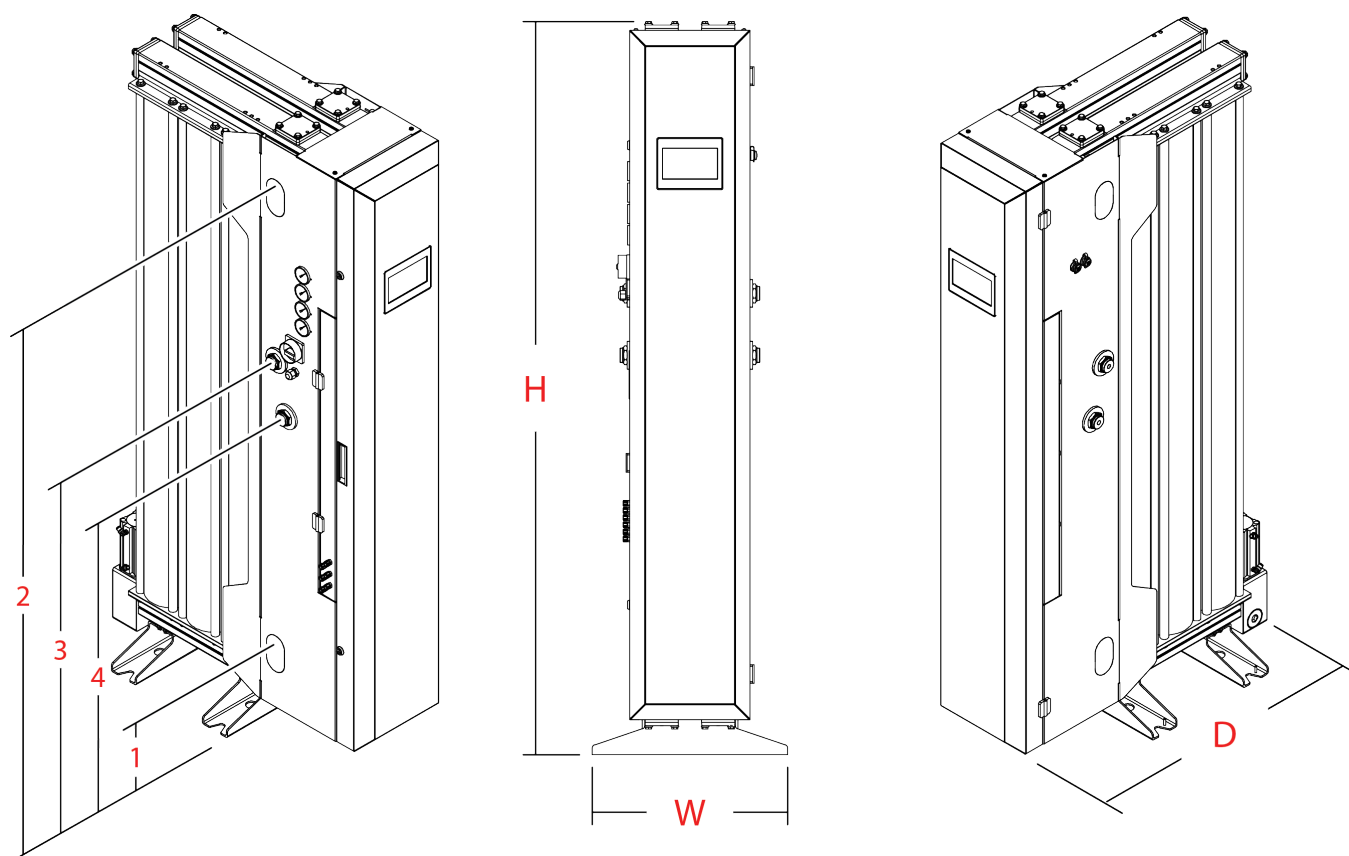
Recommended Buffer Bessel Sizes

NSP-020	270 Litres	71 Gallon
NSP-030	500 Litres	132 Gallon
NSP-040	500 Litres	132 Gallon
NSP-050	1000 Litres	264 Gallon
NSP-060	1000 Litres	264 Gallon
NSP-070	1000 Litres	264 Gallon
NSP-080	1500 Litres	396 Gallon
NSP-090	1500 Litres	396 Gallon
NSP-100	1500 Litres	396 Gallon
NSP-110	1500 Litres	396 Gallon
NSP-120	2000 Litres	528 Gallon

Filtration Performance

Filter Included	AOPX030GGMX	
Filtration Type	Dry Particulate	
Particle Reduction	Down to 1 micron	
Filtration Efficiency	99.925%	

WEIGHTS AND DIMENSIONS



Model	Height (H)		Width (W)		Depth (D)		Air Inlet (1)		To Buffer (2)		From Buffer (3)		N ₂ Outlet (4)		Weight	
	mm	ins	mm	ins	mm	ins	mm	ins	mm	ins	mm	ins	mm	ins	kg	lbs
NSP-020	2063	81.2	550	21.6	883	34.7	256	10.1	1878	73.9	1298	51.1	1124	44.3	335	738
NSP-030	2063	81.2	550	21.6	1052	41.4	256	10.1	1878	73.9	1298	51.1	1124	44.3	429	945
NSP-040	2063	81.2	550	21.6	1221	48.1	256	10.1	1878	73.9	1298	51.1	1124	44.3	522	1150
NSP-050	2063	81.2	550	21.6	1390	54.7	256	10.1	1878	73.9	1298	51.1	1124	44.3	615	1355
NSP-060	2063	81.2	550	21.6	1559	61.3	256	10.1	1878	73.9	1298	51.1	1124	44.3	710	1565
NSP-070	2063	81.2	550	21.6	1728	68.0	256	10.1	1878	73.9	1298	51.1	1124	44.3	805	1774
NSP-080	2063	81.2	550	21.6	1897	74.6	256	10.1	1878	73.9	1298	51.1	1124	44.3	897	1977
NSP-090	2063	81.2	550	21.6	2028	79.8	256	10.1	1878	73.9	1298	51.1	1124	44.3	988	2178
NSP-100	2063	81.2	550	21.6	2194	86.3	307	12.1	1827	71.9	1298	51.1	1124	44.3	1104	2433
NSP-110	2063	81.2	550	21.6	2360	92.9	307	12.1	1827	71.9	1298	51.1	1124	44.3	1197	2638
NSP-120	2063	81.2	550	21.6	2526	99.4	307	12.1	1827	71.9	1298	51.1	1124	44.3	1292	2848

PERFORMANCE FIGURES @ 5.0 BAR(G) INLET

Nitrogen Outlet Flow Rates												
Model	Unit	Purity (Remaining Oxygen Content) vs Nitrogen Outlet Flow Rate (m³/hr)										
		5ppm	10ppm	50ppm	100ppm	250ppm	500ppm	0.1%	0.5%	1.0%	2.0%	3.0%
NSP-020	m³/hr	4.1	4.7	6.6	7.4	8.7	9.8	11.1	15.5	18.3	22.0	27.0
	scfm	2.4	2.8	3.9	4.4	5.1	5.8	6.5	9.1	10.8	12.9	15.9
NSP-030	m³/hr	5.5	6.4	9.5	10.8	12.8	15.0	16.8	23.3	27.4	32.6	39.6
	scfm	3.3	3.7	5.6	6.4	7.5	8.8	9.9	13.7	16.1	19.2	23.3
NSP-040	m³/hr	7.4	8.5	12.6	14.4	17.0	20.0	22.3	31.0	36.6	43.5	52.9
	scfm	4.3	5.0	7.4	8.5	10.0	11.8	13.1	18.3	21.5	25.6	31.1
NSP-050	m³/hr	9.2	10.6	15.8	18.0	21.3	25.0	27.9	38.8	45.7	54.3	66.1
	scfm	5.4	6.2	9.3	10.6	12.5	14.7	16.4	22.8	26.9	32.0	38.9
NSP-060	m³/hr	11.1	12.7	18.6	21.2	25.3	28.8	32.5	45.6	53.7	63.9	79.3
	scfm	6.5	7.5	10.9	12.4	14.9	16.9	19.1	26.9	31.6	37.6	46.7
NSP-070	m³/hr	12.9	14.8	21.7	24.7	29.5	33.6	37.9	53.2	62.7	74.6	92.5
	scfm	7.6	8.7	12.7	14.5	17.4	19.8	22.3	31.3	36.9	43.9	54.5
NSP-080	m³/hr	14.8	16.9	24.8	28.2	33.8	38.4	43.3	60.8	71.6	85.2	105.7
	scfm	8.7	10.0	14.6	16.6	19.9	22.6	25.5	35.8	42.2	50.2	62.2
NSP-090	m³/hr	16.6	19.1	27.8	31.7	38.0	43.2	48.7	68.4	80.6	95.9	118.9
	scfm	9.8	11.2	16.4	18.7	22.3	25.4	28.7	40.3	47.4	56.4	70.0
NSP-100	m³/hr	20.2	23.0	33.8	36.9	42.9	48.2	54.5	76.9	90.2	110.2	128.7
	scfm	11.9	13.6	19.9	21.7	25.3	28.4	32.1	45.3	53.1	64.9	75.7
NSP-110	m³/hr	22.3	25.3	37.2	40.6	47.2	53.0	59.9	84.6	99.3	121.2	141.3
	scfm	13.1	14.9	21.9	23.9	27.8	31.2	35.3	49.8	58.4	71.3	83.2
NSP-120	m³/hr	24.3	27.7	40.5	44.3	51.5	57.8	65.4	92.3	108.3	132.2	-
	scfm	14.3	16.3	23.9	26.1	30.3	34.0	38.5	54.3	63.7	77.8	-

Maximum Outlet Pressure												
Pressure	5ppm	10ppm	50ppm	100ppm	250ppm	500ppm	0.1%	0.5%	1.0%	2.0%	3.0%	
bar(g)	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.1	4.0	3.9	3.8	
psi(g)	60.9	60.9	60.9	60.9	60.9	60.9	60.9	59.5	58.0	56.6	55.1	

MANUFACTURERS RECOMMENDATION

It is recommended for any nitrogen generator operating at 5ppm, 10ppm or 50ppm that an Electrochemical Oxygen Analyser is selected/installed to ensure highest level of purity measurement accuracy. If a Zirconia Oxygen Analyser is selected/installed then it is recommended to install a independent oxygen analyser to measure the purity at point of use to protect critical applications/processes.

If the generator is operating in high ambient temperature conditions >40°C, it is recommended the generator be selected/fitted with the Zirconia Oxygen Analyser.

PERFORMANCE FIGURES @ 6.0 BAR(G) INLET

Nitrogen Outlet Flow Rates												
Model	Unit	Purity (Remaining Oxygen Content) vs Nitrogen Outlet Flow Rate (m³/hr)										
		5ppm	10ppm	50ppm	100ppm	250ppm	500ppm	0.1%	0.5%	1.0%	2.0%	3.0%
NSP-020	m³/hr	5.5	6.3	8.4	9.5	11.1	12.5	14.1	19.2	22.6	27.2	32.2
	scfm	3.2	3.7	4.9	5.6	6.5	7.4	8.3	11.3	13.3	16.0	19.0
NSP-030	m³/hr	7.4	8.5	12.1	13.8	16.3	19.2	21.4	28.8	34.0	40.4	47.4
	scfm	4.4	5.0	7.1	8.1	9.6	11.3	12.6	17.0	20.0	23.8	27.9
NSP-040	m³/hr	9.9	11.3	16.1	18.4	21.8	25.5	28.5	38.4	45.3	53.9	63.1
	scfm	5.8	6.7	9.5	10.8	12.8	15.0	16.8	22.6	26.7	31.7	37.2
NSP-050	m³/hr	12.4	14.2	20.2	23.0	27.2	31.9	35.6	48.1	56.6	67.3	78.9
	scfm	7.3	8.3	11.9	13.5	16.0	18.8	21.0	28.3	33.3	39.6	46.5
NSP-060	m³/hr	14.8	17.0	23.7	27.0	32.3	36.8	41.5	56.5	66.6	79.2	94.7
	scfm	8.7	10.0	14.0	15.9	19.0	21.6	24.4	33.3	39.2	46.6	55.7
NSP-070	m³/hr	17.3	19.9	27.7	31.5	37.7	42.9	48.4	65.9	77.7	92.4	110.5
	scfm	10.2	11.7	16.3	18.5	22.2	25.2	28.5	38.8	45.7	54.4	65.0
NSP-080	m³/hr	19.8	22.7	31.6	36.0	43.1	49.0	55.3	75.4	88.8	105.6	126.3
	scfm	11.6	13.4	18.6	21.2	25.4	28.9	32.6	44.4	52.2	62.1	74.3
NSP-090	m³/hr	22.2	25.5	35.6	40.5	48.5	55.2	62.2	84.8	99.9	118.7	142.1
	scfm	13.1	15.0	20.9	23.8	28.5	32.5	36.6	49.9	58.8	69.9	83.6
NSP-100	m³/hr	27.1	30.9	43.1	47.2	54.8	61.5	69.5	95.3	111.8	136.5	153.7
	scfm	16.0	18.2	25.4	27.8	32.3	36.2	40.9	56.1	65.8	80.3	90.5
NSP-110	m³/hr	29.8	33.9	47.5	51.9	60.3	67.7	76.5	104.9	123.0	150.1	168.8
	scfm	17.6	20.0	27.9	30.5	35.5	39.8	45.0	61.7	72.4	88.4	99.3
NSP-120	m³/hr	32.5	37.0	51.8	56.6	65.8	73.8	83.5	114.4	134.1	163.8	-
	scfm	19.1	21.8	30.5	33.3	38.7	43.4	49.1	67.3	79.0	96.4	-

Maximum Outlet Pressure												
Pressure	5ppm	10ppm	50ppm	100ppm	250ppm	500ppm	0.1%	0.5%	1.0%	2.0%	3.0%	
bar(g)	5.1	5.1	5.1	5.1	5.1	5.0	5.0	5.0	4.9	4.8	4.7	
psi(g)	74.0	74.0	74.0	74.0	74.0	72.5	72.5	72.5	71.1	69.6	68.2	

MANUFACTURERS RECOMMENDATION

It is recommended for any nitrogen generator operating at 5ppm, 10ppm or 50ppm that an Electrochemical Oxygen Analyser is selected/installed to ensure highest level of purity measurement accuracy. If a Zirconia Oxygen Analyser is selected/installed then it is recommended to install a independent oxygen analyser to measure the purity at point of use to protect critical applications/processes.

If the generator is operating in high ambient temperature conditions >40°C, it is recommended the generator be selected/fitted with the Zirconia Oxygen Analyser.

PERFORMANCE FIGURES @ 7.0 BAR(G) INLET

Nitrogen Outlet Flow Rates												
Model	Unit	Purity (Remaining Oxygen Content) vs Nitrogen Outlet Flow Rate (m³/hr)										
		5ppm	10ppm	50ppm	100ppm	250ppm	500ppm	0.1%	0.5%	1.0%	2.0%	3.0%
NSP-020	m³/hr	7.0	8.0	10.1	11.4	13.4	15.1	17.0	23.2	27.3	32.8	37.5
	scfm	4.1	4.7	6.0	6.7	7.9	8.9	10.0	13.6	16.1	19.3	22.0
NSP-030	m³/hr	9.4	10.8	14.6	16.6	19.7	23.1	25.8	34.7	40.9	48.7	55.1
	scfm	5.5	6.3	8.6	9.8	11.6	13.6	15.2	20.4	24.1	28.6	32.4
NSP-040	m³/hr	12.5	14.4	19.4	22.1	26.2	30.8	34.4	46.3	54.6	64.9	73.4
	scfm	7.4	8.5	11.4	13.0	15.4	18.1	20.2	27.3	32.1	38.2	43.2
NSP-050	m³/hr	15.6	18.0	24.3	27.7	32.8	38.5	43.0	57.9	68.2	81.1	91.8
	scfm	9.2	10.6	14.3	16.3	19.3	22.6	25.3	34.1	40.1	47.7	54.0
NSP-060	m³/hr	18.8	21.5	28.6	32.5	38.9	44.3	50.0	68.1	80.2	95.4	110.1
	scfm	11.0	12.7	16.8	19.2	22.9	26.1	29.4	40.1	47.2	56.1	64.8
NSP-070	m³/hr	21.9	25.1	33.3	38.0	45.4	51.7	58.3	79.4	93.6	111.3	128.5
	scfm	12.9	14.8	19.6	22.3	26.7	30.4	34.3	46.8	55.1	65.5	75.6
NSP-080	m³/hr	25.0	28.7	38.1	43.4	51.9	59.1	66.7	90.8	106.9	127.2	146.8
	scfm	14.7	16.9	22.4	25.5	30.6	34.8	39.2	53.4	62.9	74.9	86.4
NSP-090	m³/hr	28.1	32.3	42.8	48.8	58.4	66.4	75.0	102.1	120.3	143.1	165.2
	scfm	16.6	19.0	25.2	28.7	34.4	39.1	44.1	60.1	70.8	84.2	97.2
NSP-100	m³/hr	34.3	39.1	52.0	56.8	66.1	74.1	83.8	114.8	134.7	164.5	178.7
	scfm	20.2	23.0	30.6	33.4	38.9	43.6	49.3	67.6	79.3	96.8	105.2
NSP-110	m³/hr	37.7	43.0	57.2	62.5	72.7	81.5	92.2	126.3	148.2	180.9	196.2
	scfm	22.2	25.3	33.7	36.8	42.8	48.0	54.2	74.4	87.2	106.5	115.5
NSP-120	m³/hr	41.2	46.9	62.4	68.2	79.3	88.9	100.6	137.8	161.6	197.3	-
	scfm	24.2	27.6	36.7	40.1	46.7	52.3	59.2	81.1	95.1	116.1	-

Maximum Outlet Pressure												
Pressure	5ppm	10ppm	50ppm	100ppm	250ppm	500ppm	0.1%	0.5%	1.0%	2.0%	3.0%	
bar(g)	6.0	6.0	6.0	6.0	5.9	5.9	5.8	5.7	5.7	5.6	5.5	
psi(g)	87.0	87.0	87.0	87.0	85.6	85.6	84.1	82.7	82.7	81.2	79.8	

MANUFACTURERS RECOMMENDATION

It is recommended for any nitrogen generator operating at 5ppm, 10ppm or 50ppm that an Electrochemical Oxygen Analyser is selected/installed to ensure highest level of purity measurement accuracy. If a Zirconia Oxygen Analyser is selected/installed then it is recommended to install a independent oxygen analyser to measure the purity at point of use to protect critical applications/processes.

If the generator is operating in high ambient temperature conditions >40°C, it is recommended the generator be selected/fitted with the Zirconia Oxygen Analyser.

PERFORMANCE FIGURES @ 8.0 BAR(G) INLET

Nitrogen Outlet Flow Rates												
Model	Unit	Purity (Remaining Oxygen Content) vs Nitrogen Outlet Flow Rate (m³/hr)										
		5ppm	10ppm	50ppm	100ppm	250ppm	500ppm	0.1%	0.5%	1.0%	2.0%	3.0%
NSP-020	m³/hr	8.0	9.2	11.3	12.8	15.0	16.9	19.1	25.7	29.7	35.7	40.8
	scfm	4.7	5.4	6.7	7.5	8.8	9.9	11.2	15.1	17.5	21.0	24.0
NSP-030	m³/hr	10.8	12.4	16.3	18.6	22.0	25.8	28.9	38.6	44.6	53.0	60.0
	scfm	6.4	7.3	9.6	10.9	13.0	15.2	17.0	22.7	26.3	31.2	35.3
NSP-040	m³/hr	14.4	16.5	21.8	24.8	29.4	34.5	38.5	51.4	59.5	70.7	80.0
	scfm	8.5	9.7	12.8	14.6	17.3	20.3	22.7	30.3	35.0	41.6	47.1
NSP-050	m³/hr	18.0	20.6	27.2	31.0	36.7	43.1	48.1	64.3	74.3	88.4	100.0
	scfm	10.6	12.2	16.0	18.2	21.6	25.3	28.3	37.8	43.8	52.0	58.9
NSP-060	m³/hr	21.6	24.8	32.0	36.4	43.6	49.6	56.0	75.6	87.4	104.0	120.0
	scfm	12.7	14.6	18.8	21.4	25.7	29.2	33.0	44.5	51.5	61.2	70.7
NSP-070	m³/hr	25.2	28.9	37.3	42.5	50.9	57.9	65.3	88.2	102.0	121.3	140.1
	scfm	14.8	17.0	22.0	25.0	30.0	34.1	38.4	51.9	60.0	71.4	82.4
NSP-080	m³/hr	28.8	33.0	42.7	48.6	58.2	66.2	74.7	100.8	116.6	138.6	160.1
	scfm	16.9	19.4	25.1	28.6	34.2	38.9	43.9	59.3	68.6	81.6	94.2
NSP-090	m³/hr	32.4	37.2	48.0	54.7	65.4	74.4	84.0	113.4	131.1	155.9	180.1
	scfm	19.1	21.9	28.2	32.2	38.5	43.8	49.4	66.7	77.2	91.8	106.0
NSP-100	m³/hr	39.5	44.9	58.2	63.6	74.0	83.0	93.8	127.5	146.8	179.3	194.8
	scfm	23.2	26.4	34.3	37.4	43.5	48.9	55.2	75.0	86.4	105.5	114.6
NSP-110	m³/hr	43.4	49.4	64.0	70.0	81.4	91.3	103.2	140.2	161.5	197.2	213.9
	scfm	25.6	29.1	37.7	41.2	47.9	53.7	60.8	82.5	95.0	116.1	125.9
NSP-120	m³/hr	47.4	53.9	69.9	76.4	88.8	99.6	112.6	153.0	176.2	215.1	-
	scfm	27.9	31.7	41.1	44.9	52.2	58.6	66.3	90.0	103.7	126.6	-

Maximum Outlet Pressure											
Pressure	5ppm	10ppm	50ppm	100ppm	250ppm	500ppm	0.1%	0.5%	1.0%	2.0%	3.0%
bar(g)	6.9	6.9	6.9	6.8	6.8	6.7	6.7	6.6	6.5	6.4	6.3
psi(g)	100.1	100.1	100.1	98.6	98.6	97.2	97.2	95.7	94.3	92.8	91.4

MANUFACTURERS RECOMMENDATION

It is recommended for any nitrogen generator operating at 5ppm, 10ppm or 50ppm that an Electrochemical Oxygen Analyser is selected/installed to ensure highest level of purity measurement accuracy. If a Zirconia Oxygen Analyser is selected/installed then it is recommended to install a independent oxygen analyser to measure the purity at point of use to protect critical applications/processes.

If the generator is operating in high ambient temperature conditions >40°C, it is recommended the generator be selected/fitted with the Zirconia Oxygen Analyser.

PERFORMANCE FIGURES @ 9.0 BAR(G) INLET

Nitrogen Outlet Flow Rates												
Model	Unit	Purity (Remaining Oxygen Content) vs Nitrogen Outlet Flow Rate (m³/hr)										
		5ppm	10ppm	50ppm	100ppm	250ppm	500ppm	0.1%	0.5%	1.0%	2.0%	3.0%
NSP-020	m³/hr	9.0	10.4	12.5	14.1	16.6	18.7	21.1	28.3	32.5	39.0	44.6
	scfm	5.3	6.1	7.4	8.3	9.8	11.0	12.4	16.6	19.1	23.0	26.2
NSP-030	m³/hr	12.2	14.0	18.1	20.6	24.4	28.6	32.0	42.4	48.7	57.9	65.5
	scfm	7.2	8.2	10.6	12.1	14.4	16.8	18.8	24.9	28.7	34.1	38.6
NSP-040	m³/hr	16.3	18.7	24.1	27.4	32.5	38.1	42.6	56.5	64.9	77.2	87.4
	scfm	9.6	11.0	14.2	16.2	19.1	22.5	25.1	33.3	38.2	45.4	51.4
NSP-050	m³/hr	20.3	23.3	30.1	34.3	40.6	47.7	53.3	70.6	81.2	96.5	109.2
	scfm	12.0	13.7	17.7	20.2	23.9	28.1	31.3	41.6	47.8	56.8	64.3
NSP-060	m³/hr	24.4	28.0	35.4	40.3	48.3	54.9	62.0	83.1	95.4	113.5	131.1
	scfm	14.4	16.5	20.8	23.7	28.4	32.3	36.5	48.9	56.2	66.8	77.1
NSP-070	m³/hr	28.5	32.7	41.3	47.1	56.3	64.1	72.3	96.9	111.3	132.4	152.9
	scfm	16.8	19.2	24.3	27.7	33.2	37.7	42.6	57.0	65.5	77.9	90.0
NSP-080	m³/hr	32.5	37.3	47.2	53.8	64.4	73.2	82.7	110.8	127.3	151.3	174.7
	scfm	19.1	22.0	27.8	31.7	37.9	43.1	48.7	65.2	74.9	89.1	102.9
NSP-090	m³/hr	36.6	42.0	53.1	60.5	72.4	82.4	93.0	124.6	143.2	170.3	196.6
	scfm	21.5	24.7	31.3	35.6	42.6	48.5	54.7	73.3	84.3	100.2	115.7
NSP-100	m³/hr	44.6	50.8	64.5	70.4	81.9	91.9	103.9	140.1	160.3	195.7	212.7
	scfm	26.3	29.9	37.9	41.5	48.2	54.1	61.2	82.5	94.3	115.2	125.2
NSP-110	m³/hr	49.1	55.9	70.9	77.5	90.1	101.1	114.3	154.1	176.3	215.3	-
	scfm	28.9	32.9	41.7	45.6	53.0	59.5	67.3	90.7	103.8	126.7	-
NSP-120	m³/hr	53.5	60.9	77.4	84.5	98.3	110.3	124.7	168.1	192.3	-	-
	scfm	31.5	35.9	45.5	49.8	57.8	64.9	73.4	99.0	113.2	-	-

Maximum Outlet Pressure												
Pressure	5ppm	10ppm	50ppm	100ppm	250ppm	500ppm	0.1%	0.5%	1.0%	2.0%	3.0%	
bar(g)	7.8	7.8	7.8	7.7	7.7	7.6	7.5	7.4	7.3	7.2	7.1	
psi(g)	113.1	113.1	113.1	111.7	111.7	110.2	108.8	107.3	105.9	104.4	103.0	

MANUFACTURERS RECOMMENDATION

It is recommended for any nitrogen generator operating at 5ppm, 10ppm or 50ppm that an Electrochemical Oxygen Analyser is selected/installed to ensure highest level of purity measurement accuracy. If a Zirconia Oxygen Analyser is selected/installed then it is recommended to install a independent oxygen analyser to measure the purity at point of use to protect critical applications/processes.

If the generator is operating in high ambient temperature conditions >40°C, it is recommended the generator be selected/fitted with the Zirconia Oxygen Analyser.

PERFORMANCE FIGURES @ 10.0 BAR(G) INLET

Nitrogen Outlet Flow Rates												
Model	Unit	Purity (Remaining Oxygen Content) vs Nitrogen Outlet Flow Rate (m³/hr)										
		5ppm	10ppm	50ppm	100ppm	250ppm	500ppm	0.1%	0.5%	1.0%	2.0%	3.0%
NSP-020	m³/hr	10.1	11.6	13.9	15.6	18.3	20.7	23.3	30.6	34.9	41.9	47.9
	scfm	5.9	6.8	8.2	9.2	10.8	12.2	13.7	18.0	20.6	24.7	28.2
NSP-030	m³/hr	13.6	15.6	20.0	22.7	26.9	31.6	35.3	45.9	52.4	62.3	70.5
	scfm	8.0	9.2	11.8	13.4	15.9	18.6	20.8	27.0	30.8	36.7	41.5
NSP-040	m³/hr	18.1	20.8	26.6	30.3	35.9	42.1	47.1	61.1	69.8	83.1	94.0
	scfm	10.7	12.3	15.7	17.8	21.1	24.8	27.7	36.0	41.1	48.9	55.3
NSP-050	m³/hr	22.7	26.0	33.3	37.9	44.9	52.7	58.8	76.4	87.3	103.8	117.5
	scfm	13.3	15.3	19.6	22.3	26.4	31.0	34.6	45.0	51.4	61.1	69.1
NSP-060	m³/hr	27.2	31.2	39.1	44.6	53.4	60.7	68.5	89.9	102.7	122.1	141.0
	scfm	16.0	18.4	23.0	26.2	31.4	35.7	40.3	52.9	60.4	71.9	83.0
NSP-070	m³/hr	31.7	36.4	45.7	52.0	62.2	70.8	79.9	104.9	119.8	142.4	164.5
	scfm	18.7	21.5	26.9	30.6	36.6	41.7	47.0	61.7	70.5	83.8	96.8
NSP-080	m³/hr	36.3	41.7	52.2	59.4	71.1	80.9	91.3	119.8	136.9	162.8	188.0
	scfm	21.4	24.5	30.7	35.0	41.9	47.6	53.8	70.5	80.6	95.8	110.6
NSP-090	m³/hr	40.8	46.9	58.7	66.9	80.0	91.0	102.7	134.8	154.0	183.1	211.5
	scfm	24.0	27.6	34.5	39.4	47.1	53.6	60.5	79.4	90.6	107.8	124.5
NSP-100	m³/hr	49.8	56.6	71.2	77.8	90.5	101.5	114.8	151.6	172.4	210.5	228.7
	scfm	29.3	33.3	41.9	45.8	53.3	59.8	67.6	89.2	101.5	123.9	134.6
NSP-110	m³/hr	54.7	62.3	78.3	85.6	99.5	111.7	126.3	166.8	189.6	231.5	-
	scfm	32.2	36.7	46.1	50.4	58.6	65.7	74.3	98.1	111.6	136.3	-
NSP-120	m³/hr	59.7	68.0	85.5	93.4	108.6	121.8	137.8	181.9	206.9	-	-
	scfm	35.1	40.0	50.3	55.0	63.9	71.7	81.1	107.1	121.8	-	-

Maximum Outlet Pressure											
Pressure	5ppm	10ppm	50ppm	100ppm	250ppm	500ppm	0.1%	0.5%	1.0%	2.0%	3.0%
bar(g)	8.7	8.7	8.7	8.6	8.5	8.5	8.4	8.2	8.0	7.9	7.8
psi(g)	126.2	126.2	126.2	124.7	123.3	123.3	121.8	118.9	116.0	114.6	113.1

MANUFACTURERS RECOMMENDATION

It is recommended for any nitrogen generator operating at 5ppm, 10ppm or 50ppm that an Electrochemical Oxygen Analyser is selected/installed to ensure highest level of purity measurement accuracy. If a Zirconia Oxygen Analyser is selected/installed then it is recommended to install a independent oxygen analyser to measure the purity at point of use to protect critical applications/processes.

If the generator is operating in high ambient temperature conditions >40°C, it is recommended the generator be selected/fitted with the Zirconia Oxygen Analyser.

PERFORMANCE FIGURES @ 11.0 BAR(G) INLET

Nitrogen Outlet Flow Rates												
Model	Unit	Purity (Remaining Oxygen Content) vs Nitrogen Outlet Flow Rate (m³/hr)										
		5ppm	10ppm	50ppm	100ppm	250ppm	500ppm	0.1%	0.5%	1.0%	2.0%	3.0%
NSP-020	m³/hr	10.7	12.3	14.4	16.2	19.0	21.4	24.2	32.0	36.3	43.6	49.8
	scfm	6.3	7.2	8.5	9.5	11.2	12.6	14.2	18.8	21.4	25.7	29.3
NSP-030	m³/hr	14.4	16.6	20.7	23.6	27.9	32.8	36.6	47.9	54.4	64.7	73.2
	scfm	8.5	9.8	12.2	13.9	16.4	19.3	21.5	28.2	32.0	38.1	43.1
NSP-040	m³/hr	19.3	22.1	27.6	31.4	37.2	43.7	48.8	63.9	72.6	86.3	97.7
	scfm	11.3	13.0	16.2	18.5	21.9	25.7	28.7	37.6	42.7	50.8	57.5
NSP-050	m³/hr	24.1	27.7	34.5	39.3	46.5	54.6	61.0	79.9	90.7	107.9	122.1
	scfm	14.2	16.3	20.3	23.1	27.4	32.1	35.9	47.0	53.4	63.5	71.8
NSP-060	m³/hr	28.9	33.2	40.6	46.2	55.3	62.9	71.0	94.0	106.7	126.9	146.5
	scfm	17.0	19.5	23.9	27.2	32.5	37.0	41.8	55.3	62.8	74.7	86.2
NSP-070	m³/hr	33.7	38.7	47.3	53.9	64.5	73.4	82.8	109.6	124.4	148.0	170.9
	scfm	19.8	22.8	27.9	31.7	38.0	43.2	48.7	64.5	73.2	87.1	100.6
NSP-080	m³/hr	38.5	44.2	54.1	61.6	73.7	83.9	94.7	125.3	142.2	169.1	195.3
	scfm	22.7	26.0	31.8	36.3	43.4	49.4	55.7	73.7	83.7	99.6	115.0
NSP-090	m³/hr	43.3	49.8	60.8	69.3	83.0	94.4	106.5	140.9	160.0	190.3	219.7
	scfm	25.5	29.3	35.8	40.8	48.8	55.5	62.7	83.0	94.2	112.0	129.3
NSP-100	m³/hr	52.8	60.1	73.8	80.7	93.8	105.2	119.0	158.5	179.1	218.7	237.7
	scfm	31.1	35.4	43.4	47.5	55.2	61.9	70.0	93.3	105.4	128.7	139.9
NSP-110	m³/hr	58.1	66.2	81.2	88.7	103.2	115.8	130.9	174.3	197.0	240.6	-
	scfm	34.2	38.9	47.8	52.2	60.7	68.1	77.0	102.6	116.0	141.6	-
NSP-120	m³/hr	63.4	72.2	88.6	96.8	112.5	126.3	142.8	190.2	215.0	-	-
	scfm	37.3	42.5	52.1	57.0	66.2	74.3	84.0	111.9	126.5	-	-

Maximum Outlet Pressure											
Pressure	5ppm	10ppm	50ppm	100ppm	250ppm	500ppm	0.1%	0.5%	1.0%	2.0%	3.0%
bar(g)	9.6	9.6	9.6	9.5	9.4	9.3	9.2	9.0	8.8	8.6	8.4
psi(g)	139.2	139.2	139.2	137.8	136.3	134.9	133.4	130.5	127.6	124.7	121.8

MANUFACTURERS RECOMMENDATION

It is recommended for any nitrogen generator operating at 5ppm, 10ppm or 50ppm that an Electrochemical Oxygen Analyser is selected/installed to ensure highest level of purity measurement accuracy. If a Zirconia Oxygen Analyser is selected/installed then it is recommended to install a independent oxygen analyser to measure the purity at point of use to protect critical applications/processes.

If the generator is operating in high ambient temperature conditions >40°C, it is recommended the generator be selected/fitted with the Zirconia Oxygen Analyser.

PERFORMANCE FIGURES @ 12.0 BAR(G) INLET

Nitrogen Outlet Flow Rates												
Model	Unit	Purity (Remaining Oxygen Content) vs Nitrogen Outlet Flow Rate (m³/hr)										
		5ppm	10ppm	50ppm	100ppm	250ppm	500ppm	0.1%	0.5%	1.0%	2.0%	3.0%
NSP-020	m³/hr	11.3	13.0	15.0	16.9	19.8	22.3	25.2	33.1	37.6	45.2	51.7
	scfm	6.7	7.7	8.8	9.9	11.7	13.1	14.8	19.5	22.2	26.6	30.4
NSP-030	m³/hr	15.3	17.6	21.6	24.6	29.1	34.1	38.1	49.7	56.5	67.2	76.0
	scfm	9.0	10.3	12.7	14.5	17.1	20.1	22.4	29.2	33.2	39.5	44.7
NSP-040	m³/hr	20.4	23.4	28.8	32.8	38.8	45.5	50.9	66.2	75.3	89.5	101.3
	scfm	12.0	13.8	16.9	19.3	22.8	26.8	29.9	39.0	44.3	52.7	59.6
NSP-050	m³/hr	25.5	29.3	35.9	41.0	48.5	56.9	63.6	82.8	94.1	111.9	126.7
	scfm	15.0	17.2	21.2	24.1	28.6	33.5	37.4	48.7	55.4	65.9	74.5
NSP-060	m³/hr	30.6	35.1	42.3	48.2	57.6	65.6	74.0	97.4	110.7	131.6	152.0
	scfm	18.0	20.7	24.9	28.3	33.9	38.6	43.5	57.3	65.1	77.5	89.5
NSP-070	m³/hr	35.7	41.0	49.3	56.2	67.2	76.5	86.3	113.6	129.1	153.6	177.3
	scfm	21.0	24.1	29.0	33.1	39.6	45.0	50.8	66.9	76.0	90.4	104.4
NSP-080	m³/hr	40.8	46.8	56.4	64.2	76.8	87.4	98.7	129.8	147.6	175.5	202.6
	scfm	24.0	27.6	33.2	37.8	45.2	51.5	58.1	76.4	86.9	103.3	119.3
NSP-090	m³/hr	45.9	52.7	63.4	72.2	86.5	98.3	111.0	146.1	166.0	197.4	228.0
	scfm	27.0	31.0	37.3	42.5	50.9	57.9	65.3	86.0	97.7	116.2	134.2
NSP-100	m³/hr	55.9	63.7	76.9	84.1	97.8	109.7	124.0	164.2	185.9	226.9	246.6
	scfm	32.9	37.5	45.3	49.5	57.5	64.6	73.0	96.7	109.4	133.6	145.1
NSP-110	m³/hr	61.5	70.0	84.6	92.5	107.5	120.6	136.4	180.6	204.4	248.6	-
	scfm	36.2	41.2	49.8	54.4	63.3	71.0	80.3	106.3	120.3	146.3	-
NSP-120	m³/hr	67.1	76.4	92.3	100.9	117.3	131.6	148.8	197.1	223.0	-	-
	scfm	39.5	45.0	54.3	59.4	69.0	77.5	87.6	116.0	131.3	-	-

Maximum Outlet Pressure												
Pressure	5ppm	10ppm	50ppm	100ppm	250ppm	500ppm	0.1%	0.5%	1.0%	2.0%	3.0%	
bar(g)	10.6	10.6	10.5	10.4	10.3	10.2	10.0	9.8	9.5	9.3	9.1	
psi(g)	153.7	153.7	152.3	150.8	149.4	147.9	145.0	142.1	137.8	134.9	132.0	

MANUFACTURERS RECOMMENDATION

It is recommended for any nitrogen generator operating at 5ppm, 10ppm or 50ppm that an Electrochemical Oxygen Analyser is selected/installed to ensure highest level of purity measurement accuracy. If a Zirconia Oxygen Analyser is selected/installed then it is recommended to install a independent oxygen analyser to measure the purity at point of use to protect critical applications/processes.

If the generator is operating in high ambient temperature conditions >40°C, it is recommended the generator be selected/fitted with the Zirconia Oxygen Analyser.

PERFORMANCE FIGURES @ 13.0 BAR(G) INLET

Nitrogen Outlet Flow Rates												
Model	Unit	Purity (Remaining Oxygen Content) vs Nitrogen Outlet Flow Rate (m³/hr)										
		5ppm	10ppm	50ppm	100ppm	250ppm	500ppm	0.1%	0.5%	1.0%	2.0%	3.0%
NSP-020	m³/hr	12.0	13.7	15.5	17.5	20.5	23.1	26.0	34.5	38.7	46.5	53.2
	scfm	7.0	8.1	9.1	10.3	12.0	13.6	15.3	20.3	22.8	27.4	31.3
NSP-030	m³/hr	16.1	18.5	22.3	25.4	30.1	35.3	39.4	51.8	58.1	69.1	78.2
	scfm	9.5	10.9	13.1	15.0	17.7	20.8	23.2	30.5	34.2	40.7	46.0
NSP-040	m³/hr	21.5	24.7	29.7	33.9	40.1	47.1	52.6	69.0	77.5	92.1	104.3
	scfm	12.7	14.5	17.5	19.9	23.6	27.7	30.9	40.6	45.6	54.2	61.4
NSP-050	m³/hr	26.9	30.9	37.2	42.3	50.2	58.8	65.7	86.3	96.8	115.2	130.3
	scfm	15.8	18.2	21.9	24.9	29.5	34.6	38.7	50.8	57.0	67.8	76.7
NSP-060	m³/hr	32.3	37.1	43.7	49.8	59.6	67.8	76.5	101.5	113.9	135.4	156.4
	scfm	19.0	21.8	25.7	29.3	35.1	39.9	45.0	59.7	67.0	79.7	92.0
NSP-070	m³/hr	37.7	43.2	51.0	58.1	69.5	79.1	89.2	118.4	132.9	158.0	182.5
	scfm	22.2	25.4	30.0	34.2	40.9	46.5	52.5	69.7	78.2	93.0	107.4
NSP-080	m³/hr	43.0	49.4	58.3	66.4	79.4	90.4	102.0	135.3	151.9	180.6	208.5
	scfm	25.3	29.1	34.3	39.1	46.8	53.2	60.0	79.6	89.4	106.3	122.7
NSP-090	m³/hr	48.4	55.6	65.6	74.7	89.4	101.7	114.7	152.2	170.8	203.2	234.6
	scfm	28.5	32.7	38.6	44.0	52.6	59.8	67.5	89.6	100.5	119.6	138.1
NSP-100	m³/hr	59.0	67.2	79.5	86.9	101.1	113.4	128.2	171.1	191.3	233.5	253.8
	scfm	34.7	39.5	46.8	51.2	59.5	66.7	75.5	100.7	112.6	137.4	149.4
NSP-110	m³/hr	64.9	73.9	87.5	95.6	111.2	124.7	141.0	188.2	210.4	256.9	-
	scfm	38.2	43.5	51.5	56.3	65.4	73.4	83.0	110.8	123.8	151.2	-
NSP-120	m³/hr	70.8	80.6	95.4	104.3	121.3	136.1	153.8	205.3	229.5	-	-
	scfm	41.7	47.4	56.2	61.4	71.4	80.1	90.5	120.9	135.1	-	-

Maximum Outlet Pressure											
Pressure	5ppm	10ppm	50ppm	100ppm	250ppm	500ppm	0.1%	0.5%	1.0%	2.0%	3.0%
bar(g)	11.5	11.5	11.4	11.3	11.2	11.0	10.9	10.6	10.3	10.0	9.7
psi(g)	166.8	166.8	165.3	163.9	162.4	159.5	158.1	153.7	149.4	145.0	140.7

MANUFACTURERS RECOMMENDATION

It is recommended for any nitrogen generator operating at 5ppm, 10ppm or 50ppm that an Electrochemical Oxygen Analyser is selected/installed to ensure highest level of purity measurement accuracy. If a Zirconia Oxygen Analyser is selected/installed then it is recommended to install a independent oxygen analyser to measure the purity at point of use to protect critical applications/processes.

If the generator is operating in high ambient temperature conditions >40°C, it is recommended the generator be selected/fitted with the Zirconia Oxygen Analyser.

AMBIENT TEMPERATURE CORRECTION FACTORS

Purity	5°C	10°C	15°C	20°C	25°C	30°C	35°C	40°C	45°C	50°C
	41°F	50°F	59°F	68°F	77°F	86°F	95°F	104°F	113°F	122°F
5 - 50ppm	0.80	0.90	0.94	1.00	0.98	0.96	0.88	0.76	0.66	0.56
100 - 500ppm							0.88	0.81	0.73	0.65
0.1 - 3.0%							0.91	0.85	0.80	0.74

MATERIALS OF CONSTRUCTION

Component(s)	Material(s)
Inlet / Outlet Manifolds	Aluminium Extrusion EN AW-6063 T6
Columns	Aluminium Extrusion EN AW-6063 T6
Inlet / Outlet Valve Blocks	Aluminium Extrusion EN AW-6063 T6
Manifold End Plates	Cast Machined EN AW-6082 T6
Inlet, Outlet and Exhaust Valve Block End Plates	Cast Machined EN AC-44100-F
Inlet and Exhaust Cylinders	Aluminium Alloy
Silencer Baffle and End Cap	Aluminium
Dryer Feet	8MM Steel Plate
Control Shroud & Door	16SWG Mild Steel
Fittings	Nickel Plated Brass and Nickle Plated Mild Steel
Pressure Gauges	ABS Plastic casing and dial and brass connector
Seal Materials	Nitrile, Viton, EPDM, PTFE (tape)
Paint	Dry Powder Epoxy Coating
Dry Particulate Filter Housing	Aluminium
Dry Particulate Filter Element	Glass Filled Nylon Endcaps / Stainless Steel Support Cylinders / Borosilicate Glass Nano fibre media / Polyester Needle felt drainage layer

INTERNAL VOLUMES

Unlike traditional welded steel pressure vessels, the pressure envelope of NITROSource Plus is made up of multiples of extruded aluminium columns, bolted to extruded aluminium inlet and outlet manifolds and sealed with o-ring's and/or gaskets. All pressure containing extrusions have an internal diameter equal to or less than 150mm (6"). The total internal volume of each model can be found on the product rating label. The total and individual column / manifold internal volumes can be found below.

Range	NITROSource Plus										
Model	NSP-020	NSP-030	NSP-040	NSP-050	NSP-060	NSP-070	NSP-080	NSP-090	NSP-100	NSP-110	NSP-120
Min. Operating Pressure	5.0 bar(g) 72.5 psi(g)										
Max. Operating Pressure	13.0 bar(g) 188.5 psi(g)										
Max. Design Pressure	15.0 bar(g) 217.5 psi(g)										
Burst Pressure	65.0 bar(g) 217.5 psi(g)										
Min. Operating Temp	5.0°C 41.0°F										
Max. Operating Temp	50.0°C 122.0°F										
Min. Design Temp	5.0°C 41.0°F										
Max. Design Temp	50.0°C 122.0°F										
Number of Cycles	2,400,000										
Designed to Standard	Generally in Accordance with ASME VIII Div 1										
No. of Columns	2	3	4	5	6	7	8	9	10	11	12
No. of Chambers	4	6	8	10	12	14	16	18	20	22	24
Total Column Volume	122L	183L	244L	305L	366L	428L	489L	550L	611L	672L	733L
Total Internal Volume	130L	193L	256L	320L	383L	447L	510L	573L	634L	700L	763L
PED Category	IV										
PED Module(s)	B										

Statement of design, manufacture and conformity assessment:

All Parker Hannifin Manufacturing Ltd, Gas Separation and Filtration Division, modular aluminium construction, compressed air adsorption filters, compressed air adsorption dryers, nitrogen gas generators and CO₂ purifiers have been designed, manufactured, and assessed as pressure vessels under the Pressure Equipment Directive, 2014/68/EU.

Recommendations for periodic inspection

The recommendation is that the following inspection periods are adopted when modular aluminium construction compressed air dryers and nitrogen gas generators are deemed to be pressure vessels under National Legislation.

Modular Aluminium Construction

Modular aluminium construction Nitrogen gas generators are manufactured from extruded aluminium alloy which is surface treated with Alochrom and coated externally with a dry powder epoxy coating. The design life of the modular aluminium construction compressed air dryer is 10 years. There should be no need for an internal inspection to be carried out during this period.

Using Products Beyond 10 Years

Lifetime of adsorbent desiccant material is typically 60 months. Lifetime of adsorbent activated carbon is typically 12 months. Should the working life of the modular aluminium construction be extended beyond 10 years, the adsorbent material may need replacing. It is recommended that an internal inspection be carried out at the same time.

Local legislation and codes should be followed in conjunction with a competent person.

PRODUCT APPROVALS COMPLIANCE AND EXEMPTIONS

Region / Country	Directive	Standards Used	Additional Information
United Kingdom & Europe	PED 2014/68/EU	Generally in accordance with ASME VIII Div 1 : 2010 + 2011a Addenda.	PED Modules Used Module B + D
			PED Certificate Number 50351
			PED Number: 0525 -PED-DE-50351/1-Mod-D-1 LRQA Deutschland GmbH, Curienstrabe 1, D-20095 Hamburg, Deutschland
	LVD 2014/35/EU	EN 61010-1 : 2010	
	EMC 2014/30/EU	EN IEC 61326-1:2021 & EN 61326-1:2013	
		EN 61000-3-2:2019 +A1:2021	
		EN 61000-3-3:2013 +A1:2019 +A2:2021	
Australia	RoHS 2011/65/EU		
	Australian Standard	AS1210:2010	
	RCM	EN 61326-1 accepted by AMCA as meeting EMC requirement	
Singapore	MOM	Generally in accordance with ASME VIII Div 1 : 2023.	
United States of America	ASME	Generally in accordance with ASME VIII Div 1 : 2023.	
	UL		
	FCC	CFR 47 Part 15B	

Safety and Electromagnetic Compatibility

This equipment has been tested and complies with the following Standards:

EN 61010_1:2010 + A1:2019

Safety requirements for electrical equipment for measurement, control and laboratory use.

APPROVALS, ACCREDITATIONS AND ASSOCIATIONS



MECHANICAL INSTALLATION

COMMISSIONING CHECK LIST



Warning

Only competent personnel trained, qualified, and approved by Parker Hannifin should perform installation, commissioning, service and repair procedures.

Task	Comments	Tick When Complete
Review Recommended System Layout and Installation		
Space Requirements Identified		
Mechanical Installation - General Requirements		
Securing the Generator		
Electrical Component Identification		
Electrical Install - Connecting the Incoming Power Supply		
Electrical Install - Remote Stop / Start		
Electrical Install - External Alarms		
Electrical Install - Analogue Outputs		
Electrical Install - External O2 Sensor		
Electrical Install - Purge Economy		
Electrical Install - Connection of Additional Sensors		
External Connectivity - Webserver		
External Connectivity - MODBUS TCP/IP		
Modbus Strings		
HMI Menus & Screens - User Level Access		
Operating & Monitoring Using the HMI Menus & Screens		
First Time Start Up		

MECHANICAL INSTALLATION

Environment

The Nitrogen generator must be installed indoors and protected from wind, low and high temperature, direct sunlight, moisture, and dust. As the Nitrogen generator regenerates, the exhaust silencer will discharge high concentrations of Oxygen (O₂) followed by concentrated Nitrogen (N₂). Changes in temperature, humidity, and airborne pollution will affect the environment in which the equipment is operating and may impair the safety and operation. It is the customers' responsibility to ensure that the environmental conditions specified for the equipment are maintained.

Space Requirements

The equipment should be mounted on a flat surface capable of supporting its own weight plus the weight of all ancillary parts. There must be adequate space around the equipment to allow airflow and access for maintenance purposes and lifting equipment. A minimum spacing of approximately 500mm (20 ins) is recommended around all sides of the generator and 750mm (29.5 ins) above.

Do Not position the equipment so that it is difficult to operate or disconnect from the electrical supply.

General Requirements

- It is important to ensure that all inlet and outlet piping materials are suitable for the application, clean and debris free.
- Parker transair piping is recommended for Nitrogen generator installations.
- Ensure all piping is adequately supported to prevent damage and leaks in the system.
- The internal diameter of all piping must be sufficient to allow an unrestricted air flow

Important Notes

- Performance may be degraded and warranty will be invalid if above requirements are not followed.



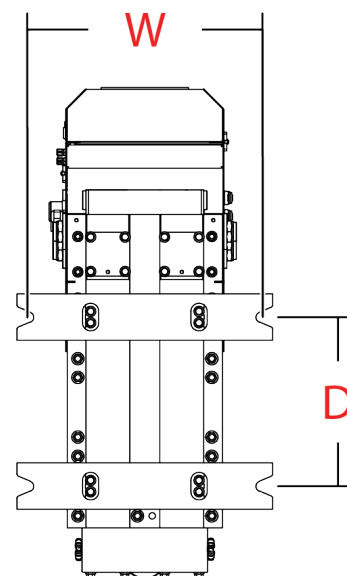
Warning

The system must be protected with a suitably rated thermal pressure relief valve.

Securing the Generator

It is recommended that as soon as the generator is unpacked, it is secured to prevent toppling until positioned and securely fastened to the floor. Mounting holes are provided in the feet of the generator. Once the generator has been positioned in its final location ensure that it is securely fixed to the floor using M20 fixing bolts.

Model	Width		Depth	
	mm	ins	mm	ins
NSP-020	500	19.7	194	7.6
NSP-030	500	19.7	363	14.3
NSP-040	500	19.7	507	20.0
NSP-050	500	19.7	676	26.6
NSP-060	500	19.7	845	33.3
NSP-070	500	19.7	1014	39.9
NSP-080	500	19.7	1183	46.6
NSP-090	500	19.7	1314	51.7
NSP-100	500	19.7	1480	58.3
NSP-110	500	19.7	1646	64.8
NSP-120	500	19.7	1812	71.3

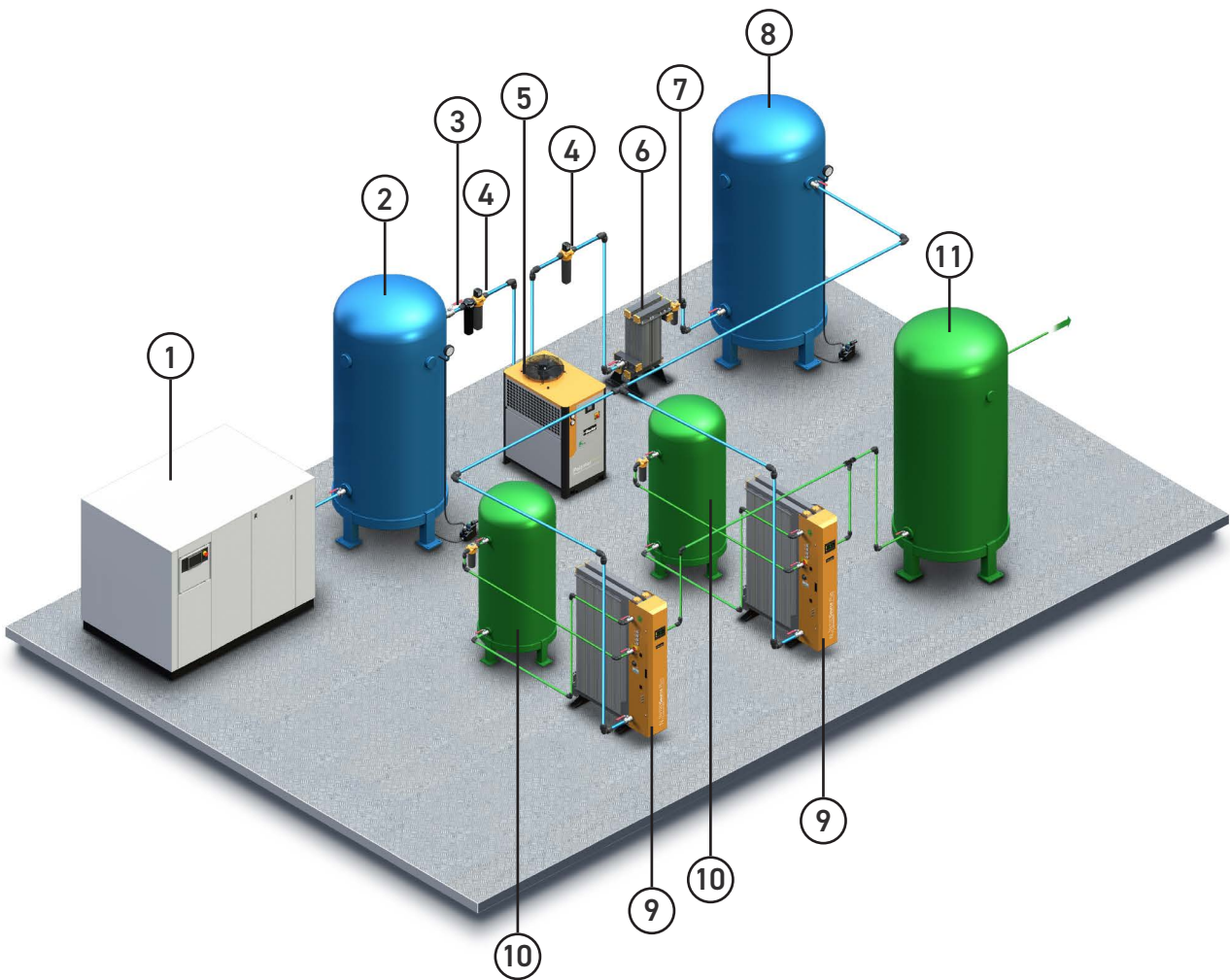
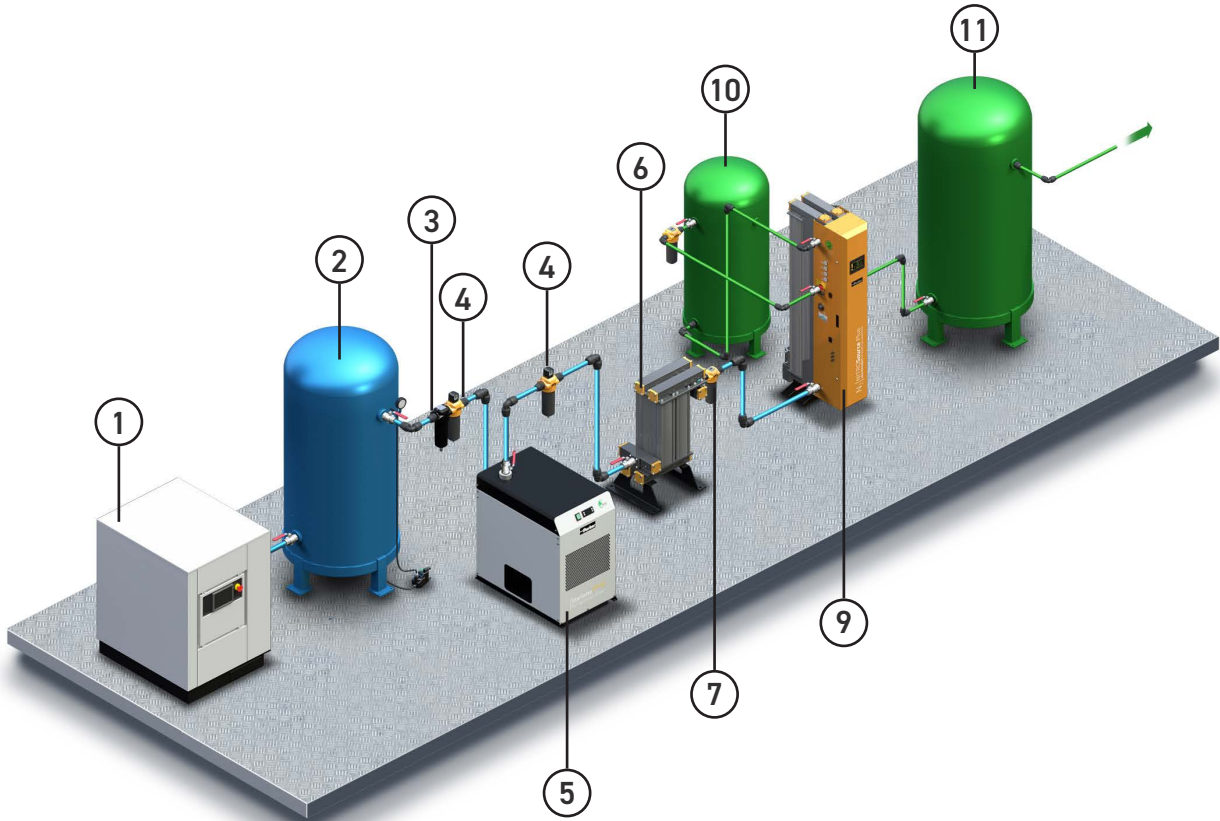


Remote Piping of the Exhaust

If the generator is to be located in a noise sensitive area or there is insufficient air circulation, the exhaust air can be remotely piped away. If the exhaust is to be piped away then a minimum pipe size of 50mm (2ins) should be used to clear the generator, expanding to larger diameter (>100mm id recommended for a single bank, larger for multi-bank installations) the longer the pipe run becomes. A minimum bend radius of four times the radius of the pipe should be employed.

Failure to pipe away correctly may result in back pressure (indicated by a minimal pressure on the off-line pressure gauge) which prevents full regeneration of the off-line bed and results in loss of purity.

RECOMMENDED SYSTEM LAYOUT (REFRIGERATION DRYER)



1. Oil-free Variable Speed Compressor

2. Wet Air Receiver/Storage Vessel

3. OIL-X Grade WS Liquid Separator (Optional)

Should the pre-treatment be installed directly after the air compressor (no wet air receiver) or the distance from the outlet of the wet air receiver is >3m, an optional OIL-X Grade WS liquid separator must be installed. Liquid separators are used to protect the coalescing filters from liquid contamination.

4. OIL-X Grade AO General Purpose Coalescing Filter and OIL-X Grade AA High Efficiency Coalescing Filters

Coalescing filters are probably the single most important items of purification equipment in a compressed air system. They are designed to treat aerosols (droplets) of oil and water using mechanical filtration techniques and solid particulate to very low levels (as small as 0.01micron in size). Installed in pairs, the first filter is a 'General Purpose Filter' which protects the second 'High Efficiency Filter' from bulk contamination. The dual filter installation ensures a continuous supply of high quality compressed air with the additional benefits of low operational costs and minimal maintenance.

5. Refrigeration Dryer

The NITROSource Plus nitrogen generators can be installed downstream of refrigeration dryer providing it is sized to match the site inlet conditions (minimum inlet pressure / maximum summer inlet temperature / maximum inlet flow rate / required outlet dewpoint). The refrigeration dryer can be sized as a point of use for a single NITROSource Plus generator or for multi-bank installations a centralised refrigeration dryer can be sized to supply multiple NITROSource Plus generators.

6. OVR (Oil Vapour Reduction) System

Parker OIL-X OVR provides 'technicaly Oil free compressed air' from either oil-free or oil lubricated compressors. OIL-X OVR filters are designed to reduce oil vapour and also overcome the issues of trational loose filled carbon towers.

7. OIL-X Grade AO Dry Particulate Filter

A single General Purpose Dry Particulate Filter is required for the reduction of particulates. Dry particulate filters provide identical particulate reduction performance to the equivalent coalescing filter and use the same mechanical filtration techniques to provide particle reduction.

8. Dry Air Reciever/Storage Vessel (Optional)

9. NITROSource Plus Nitrogen Gas Generator(s)

At the heart of the system is the NITROSource Plus nitrogen gas generator offering nitrogen purities ranging from 97% to 99.9995% catering to the specific requirements of your process providing a reliable, cost effective and conitnuous supply of nitrogen for various industrial applications.

10. Nitrogen Buffer Vessel

A key component in the gas generation process. The nitrogen buffer vessel or otherwise known as the mixing vessel, stabilizes pressure, stores nitrogen and improves the overall efficiency of the system. It absorbs fluctuations caused by the PSA generators cyclic operation ensuring a steady nitrogen supplu at a consistent pressure. Additionally it acts as a reserve to handle short term spikes in demand, allowing the generator to operate more efficiently.

11. Nitrogen Storage Vessel

The nitrogen storage vessel is recommended to maintain a steady supply of nitrogen, compensate for any fluctuations in demand, and ensure a consistent pressure at the outlet. It stores nitrogen produced during low demand periods and provides additional capacity during high demand periods, improving system efficiency and ensuring stable, reliable nitrogen flow and downstream pressure.



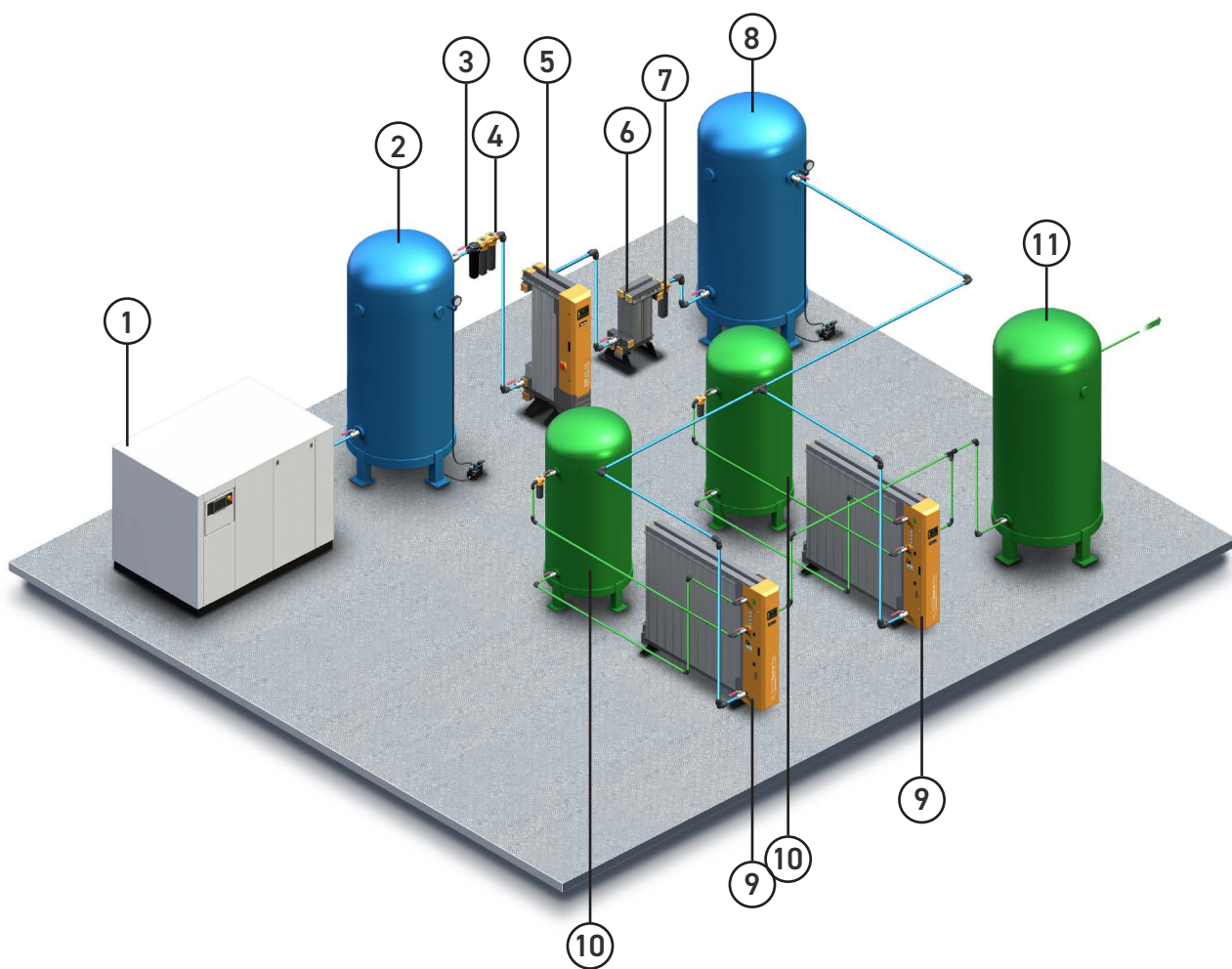
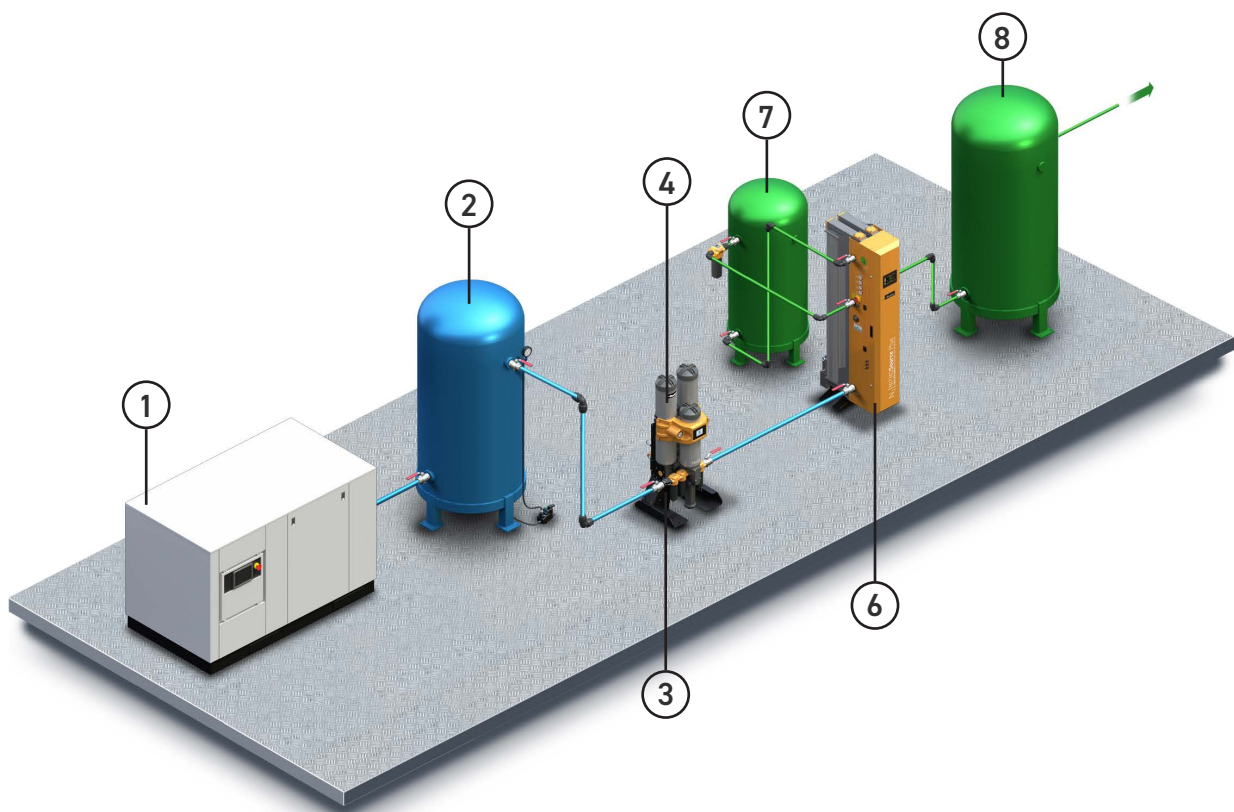
Warning

Consideration must be given to the environment in which the system is installed. As per the generator specification, the noise level upon exhaust can peak at 105 dB (C) or greater, this happens every 50 seconds under normal operation.



To achieve the maximum performance, reliability and service life, Parker strongly recommend the use of a Parker desiccant dryer based pretreatment package. A Parker Desiccant dryer pretreatment package provides a physical barrier to oil, ensures maximum generator efficiency by minimising Carbon Molecular Sieve (CMS) moisture loading. Some applications such as pharmaceutical and food require nitrogen moisture contents that are only achievable with a desiccant dryer based pre-treatment package.

RECOMMENDED SYSTEM LAYOUT (DESICCANT DRYER)



1. Compressor

2. Wet Air Receiver/Storage Vessel

3. OIL-X Grade WS Liquid Separator (Optional)

Should the pre-treatment be installed directly after the air compressor (no wet air receiver) or the distance from the outlet of the wet air receiver is >3m, an optional OIL-X Grade WS liquid separator must be installed. Liquid separators are used to protect the coalescing filters from liquid contamination.

4. CDAS, OFAS FBP HL/LE Desiccant Dryer System Including:

OIL-X Grade AO General Purpose Coalescing Filter and OIL-X Grade AA High Efficiency Coalescing Filters

Coalescing filters are probably the single most important items of purification equipment in a compressed air system. They are designed to treat aerosols (droplets) of oil and water using mechanical filtration techniques and solid particulate to very low levels (as small as 0.01micron in size). Installed in pairs, the first filter is a 'General Purpose Filter' which protects the second 'High Efficiency Filter' from bulk contamination. The dual filter installation ensures a continuous supply of high quality compressed air with the additional benefits of low operational costs and minimal maintenance.

Desiccant Dryer

NITROSource Plus can be installed downstream of either a Refrigeration dryer or Desiccant dryer. When sized to match the site inlet conditions (minimum inlet pressure / maximum summer inlet temperature / maximum inlet flow rate / required outlet dewpoint), this adsorption dryer can deliver a constant pressure dewpoint of -20°C, -40°C or -70°C (Dewpoint selection must be made prior to ordering the system).

OVR (Oil Vapour Removal) System

OIL-X Grade AO Dry Particulate Filter

A single General Purpose Dry Particulate Filter is required for the reduction of particulates. Dry particulate filters provide identical particulate reduction performance to the equivalent coalescing filter and use the same mechanical filtration techniques to provide particle reduction.

5. Dry Air Receiver/Storage Vessel (Optional)

6. NITROSource Plus Nitrogen Gas Generator(s)

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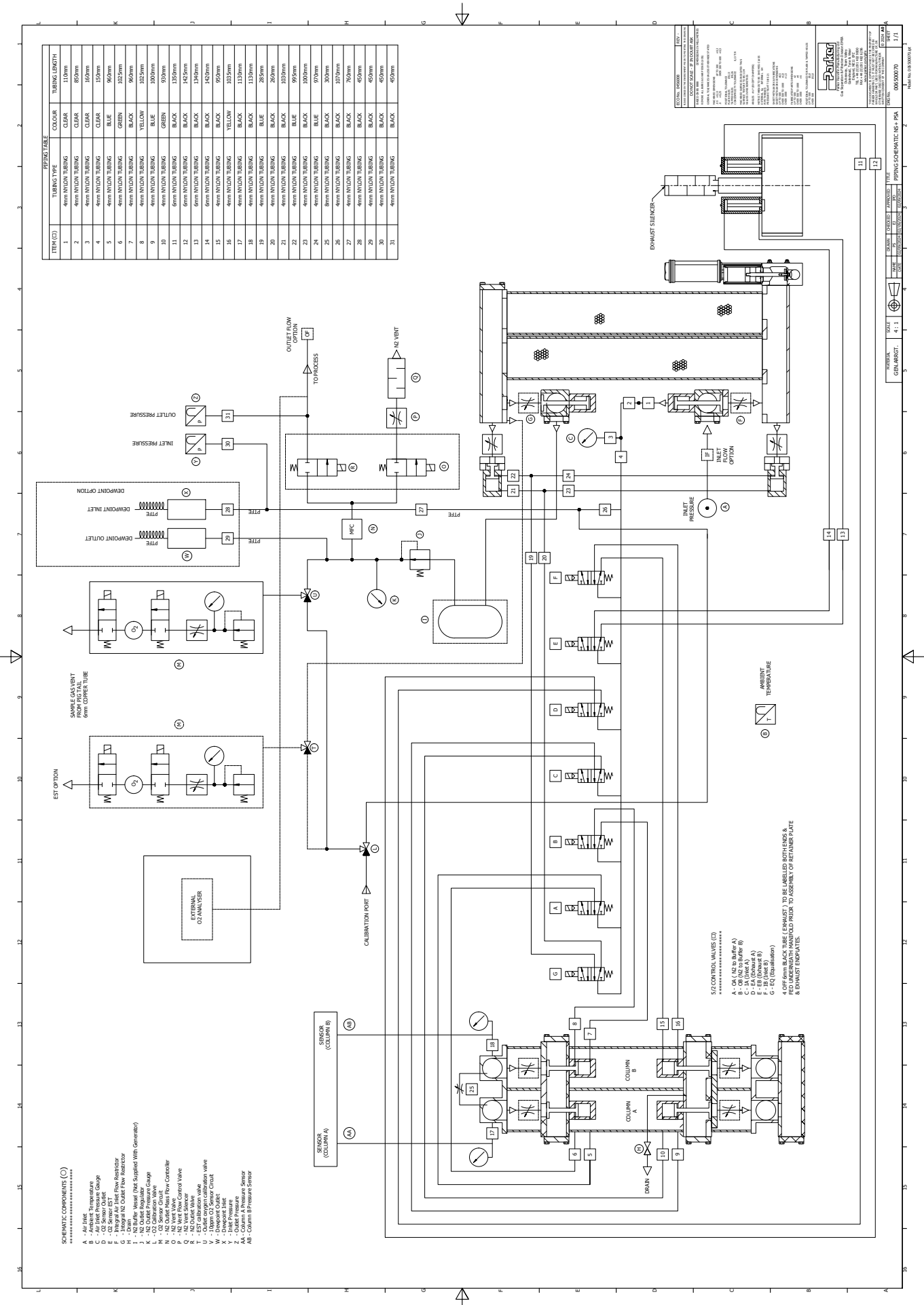


Warning

Consideration must be given to the environment in which the system is installed. As per the generator specification, the noise level upon exhaust can peak at 105 dB (C) or greater, this happens every 50 seconds under normal operation.



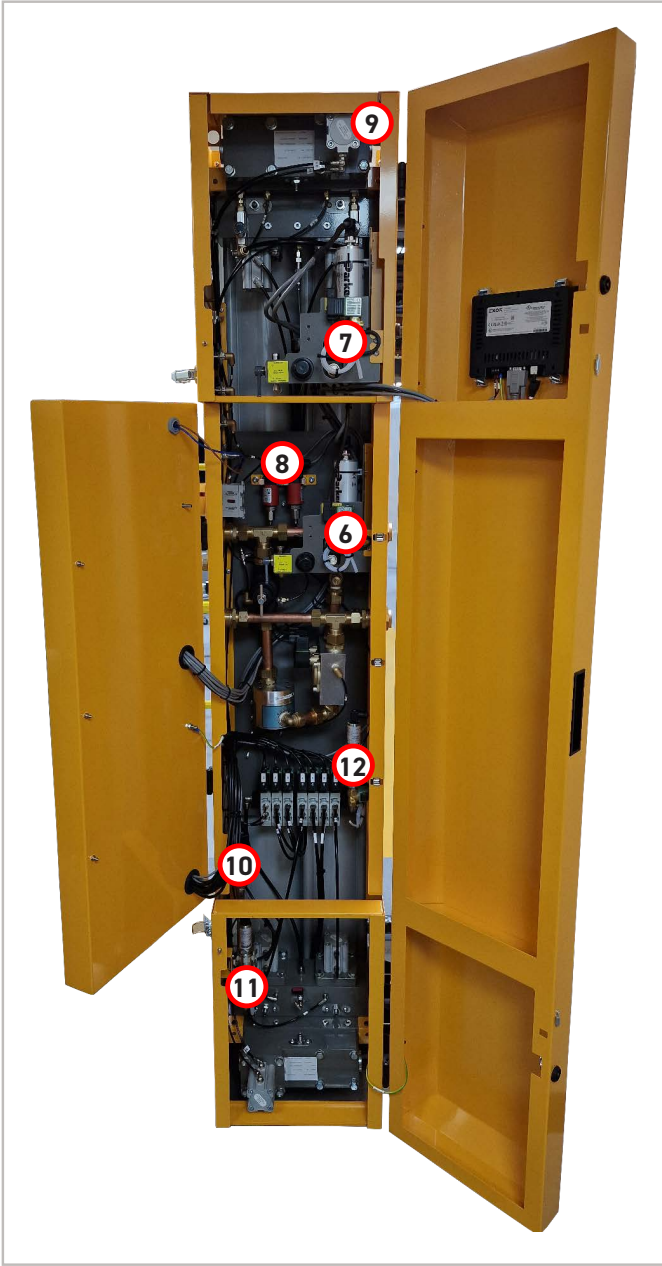
PNEUMATIC SCHEMCATIC



ELECTRICAL INSTALLATION

ELECTRICAL COMPONENT IDENTIFICATION

Highlighted below are all the critical electrical components and sensors found within the process enclosure on all nitrogen generator models. The image below may not include some optional sensors such as inlet or outlet dewpoint monitoring or the Energy Saving Technology (EST).



1	MCB	7	Energy Saving Technology (EST)
2	Multi-voltage / Multi-frequency Power Supply	8	Column Pressure Monitoring
3	Programable Logic Controller (PLC)	9	Ambient Temperature Monitoring
4	PLC Expansion Module	10	Inlet / Outlet Pressure Monitoring
5	Touchscreen HMI	11	Inlet Dewpoint Monitoring
6	Nitrogen Outlet Oxygen Analyser	12	Outlet Dewpoint Monitoring

CONNECTING THE INCOMING POWER SUPPLY



All cable selection, cable connection (wiring), set-up, electrical commissioning and servicing must be carried out by a fully qualified and competent electrical engineer in accordance with local electrical regulations.

Electrical Supply

Refer to the technical specification section of this manual for voltages, frequencies, tolerances and power consumption. Ensure adequate isolation and fusing is provided at the distribution board and correct cable sizing for the installation. Main power supply cable not supplied.

All models require a single phase power cable. This should be selected by a qualified electrical engineer and based upon local electrical regulations. 3 core (LIVE/NEUTRAL/EARTH) and a minimum cross sectional area of 1.5mm² is recommended.

1. Feed the single phase electrical supply cable through the cable gland located on the left side of the process enclosure.
2. Remove cable insulation and prepare cable ends (each wire should be terminated using suitable ferrules).
3. Remove safety shroud covering input connections located at the bottom of the isolator
4. Connect the LIVE core to T1 of the electrical isolator
5. Connect the NEUTRAL core to the bottom of the auxiliary contact marked N (left side connection of the isolator).
6. Connect safety shroud on isolator when all contacts are made.
7. Connect the earth core to the shroud earth stud next to the isolator
8. For 120V operation move input selection switch on the Power Supply to 120V

IMPORTANT NOTE:

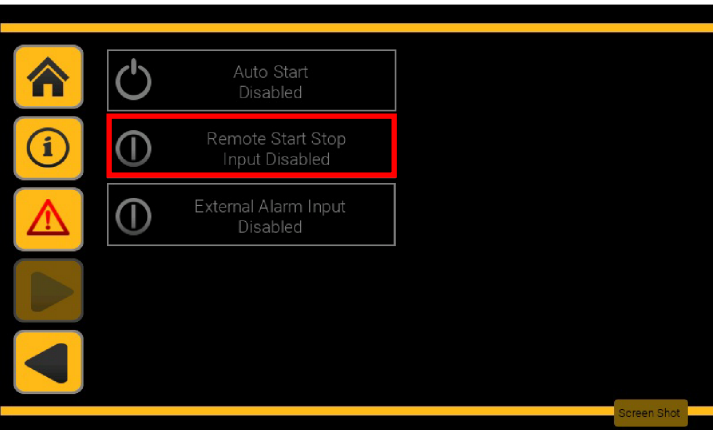
- The generator will be set for 200V-500V operation at the factory.
- For 120V operation, the power supply must be switched to 120V.
- Do not switch the power supply to 120V if the input voltage is above 132V or power supply will be damaged!



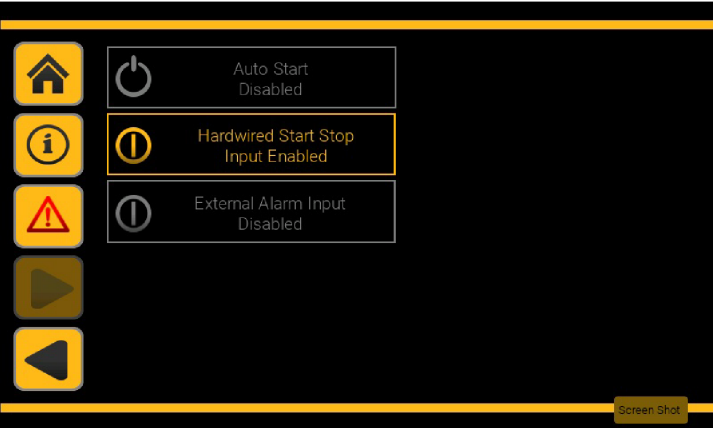
Software Activation

Access Level: Service 1
Menu: Generator Set Up
Sub Menu: Digital Inputs

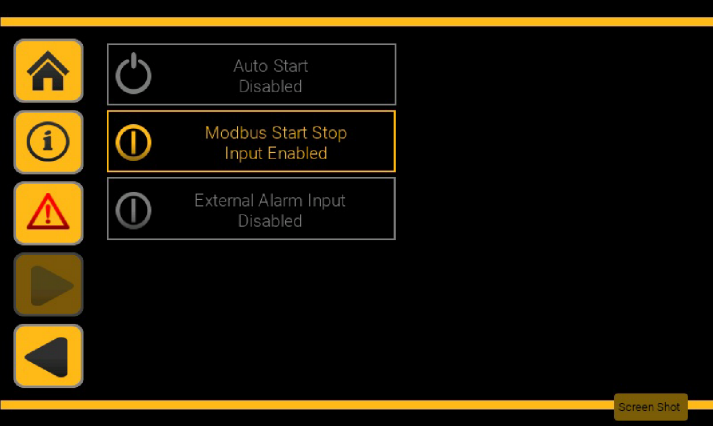
Enable the Remote Start/Stop Input
The button will toggle between disabled and two enabled states.



Hardwired Start/Stop Input Enabled



Modbus Start/Stop Input Enabled



CONNECTING THE EXTERNAL ALARMS

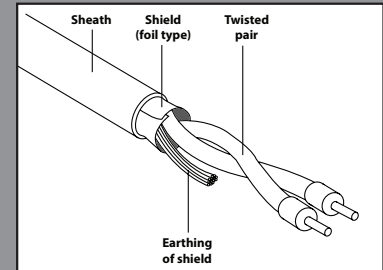
External Alarm 1 & External Alarm 2

NITROSource Plus generator controller includes two external alarm connections. By Default, External Alarm 1 is configured as a dedicated O2 Purity Alarm and External Alarm 2 is a General Alarm. External Alarm 2 can also be reconfigured to represent another alarm condition if required. The External Alarm 1 & External Alarm 2 connections provide a pair of volt free contacts. The alarm contacts are rated 1A @ 24Vdc.

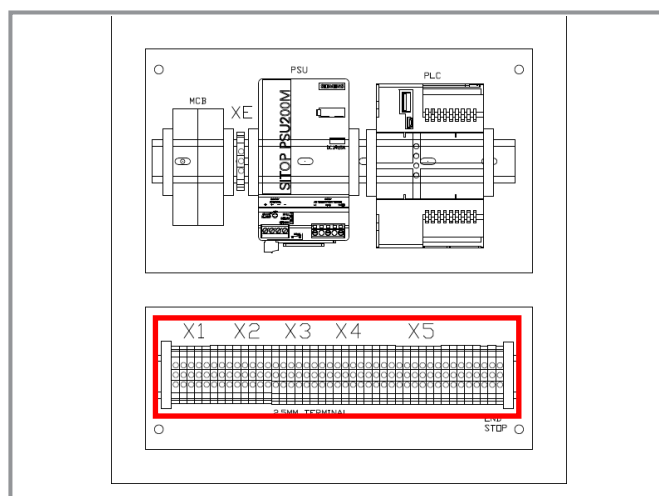
Cable Recommendation: Auxiliary Feature Connections

When connecting the above features, it is recommended that:

1. Cable lengths do not exceed 30m in length.
2. Twisted pair, screened cables (minimum 0.75mm²) are used
3. Low voltage cables are routed away from high voltage supply cables
4. Ferrite's are fitted if supplied or are advised.
5. Ferrules should be fitted.



Terminal Locations



Description	External Alarm 1
Panel	Top
Alarm Connection	X5-3
Alarm Common	X5-4

Description	External Alarm 2
Panel	Top
Alarm Connection	X5-7
Alarm Common	X5-8

Warning: DO NOT connect mains electricity to the Remote Start/Stop terminals

		X1-1		
		X1-2		
		X1-3		
		X1-4		
		X2-1		
		X2-2		
		X2-3		
		X2-4		
		X2-5		
		X2-6		
		X2-7		
		X2-8		
		X3-1		
		X3-2		
		X3-3		
		X3-4		
		X3-5		
		X3-6		
		X3-7		
		X3-8		
		X3-9		
		X3-10		
		X3-11		
		X4-1		
		X4-2		
		X4-3		
		X4-4		
		X4-5		
		X4-6		
		X4-7		
		X4-8		
		X5-1		
		X5-2		
		X5-3		
		X5-4		
		X5-5		
		X5-6		
		X5-7		
		X5-8		
		X5-9		
		X5-10		
		X5-11		
		X5-12		

Alarm Output States

Alarm Output	Power Off / Loss	Power On - Alarm Deactivated	Power On - Alarm Activated
External Alarm 1	CLOSED CURCUIT	OPEN CURCUIT	CLOSED CURCUIT
External Alarm 2	OPEN CIRCUIT	OPEN CIRCUIT	CLOSED CIRCUIT

Software Activation

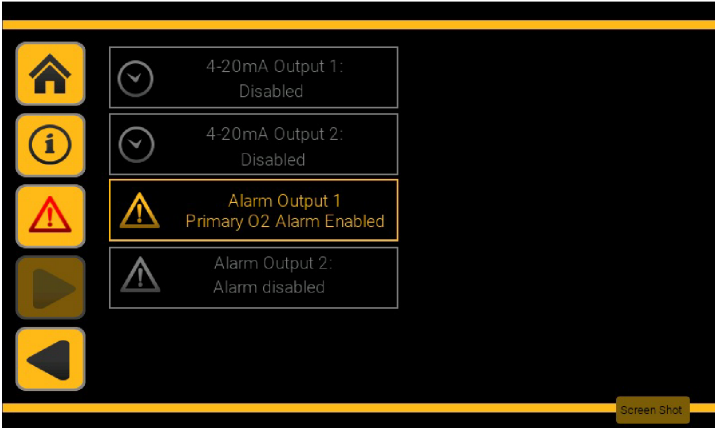
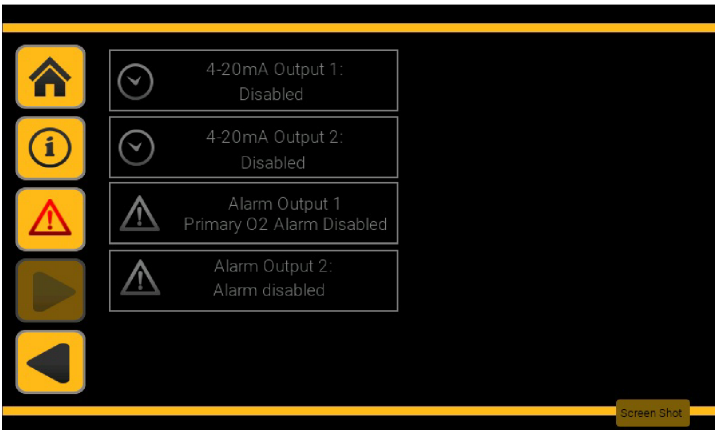
Access Level: Service 1
Menu: Generator Set Up
Sub Menu: Digital / Analog Outputs

Enable the Alarm Output 1 or 2
The button will toggle between disabled and a number of enabled states.

Alarm Output 1
Pimary O2 Alarm Activation

Alarm Output 2
General Alarm Activation

Alarm Output 2
General Alarm Custom Output



External Alarm 1	External Alarm 2
Primary O2 Alarm	General Alarm
	Ambient Temperature
	Inlet Pressure
	Outlet Pressure
	Inlet Dewpoint
	Outlet Dewpoint

CONNECTING THE ANALOGUE OUTPUTS

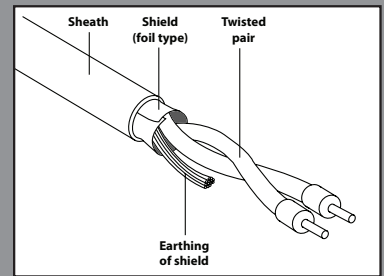
Analogue Output 1 & Analogue Output 2 (4-20mA Retransmission)

NITROSource Plus generators have two configurable 4-20mA analogue outputs. These can be configured for the retransmission of any on-board 4-20mA sensors that are fitted and enabled.

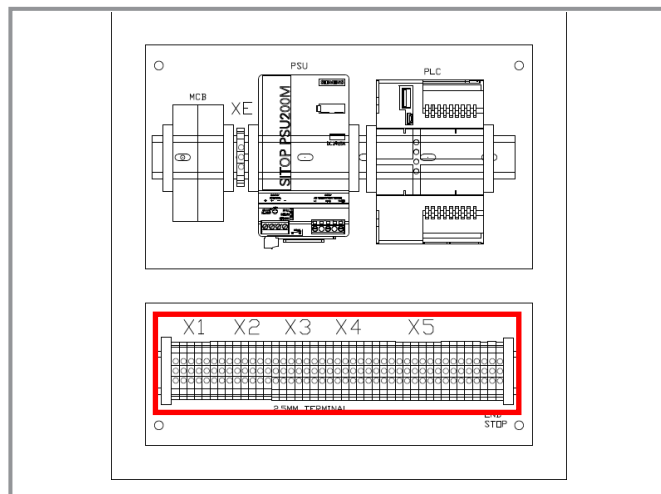
Cable Recommendation: Auxiliary Feature Connections

When connecting the above features, it is recommended that:

1. Cable lengths do not exceed 30m in length.
2. Twisted pair, screened cables (minimum 0.75mm²) are used
3. Low voltage cables are routed away from high voltage supply cables
4. Ferrite's are fitted if supplied or are advised.
5. Ferrules should be fitted.



Terminal Locations



Description	Analogue Output 1
Panel	Top
Signal	X1-1
Common	X1-2

Description	Analogue Output 2
Panel	Top
Signal	X1-3
Common	X1-4

Warning: DO NOT connect mains electricity to the Remote Start/Stop terminals

●		X1-1	○
●		X1-2	○
●		X1-3	○
●		X1-4	○
○		X2-1	○
○		X2-2	○
○		X2-3	○
○		X2-4	○
○		X2-5	○
○		X2-6	○
○		X2-7	○
○		X2-8	○
○		X3-1	○
○		X3-2	○
○		X3-3	○
○		X3-4	○
○		X3-5	○
○		X3-6	○
○		X3-7	○
○		X3-8	○
○		X3-9	○
○		X3-10	○
○		X3-11	○
○		X4-1	○
○		X4-2	○
○		X4-3	○
○		X4-4	○
○		X4-5	○
○		X4-6	○
○		X4-7	○
○		X4-8	○
○		X5-1	○
○		X5-2	○
○		X5-3	○
○		X5-4	○
○		X5-5	○
○		X5-6	○
○		X5-7	○
○		X5-8	○
○		X5-9	○
○		X5-10	○
○		X5-11	○
○		X5-12	○

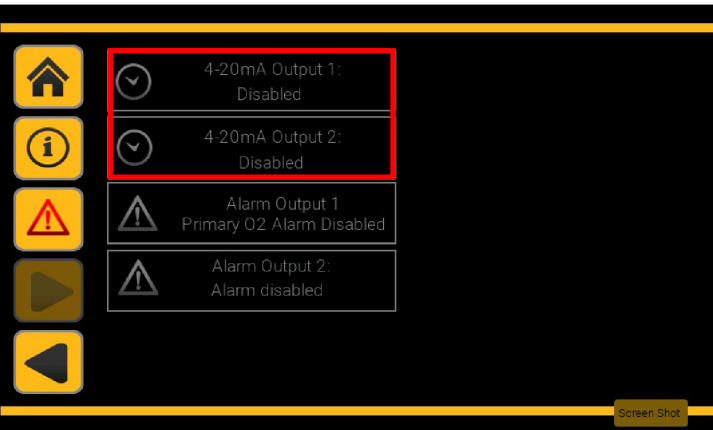
Alarm Output States

Sensor	Range Minimum	Range Maximum	Unit of Measure
Ambient Temperature	-25	+75	°C
Inlet Pressure	0	+16	bar(g)
Outlet Pressure	0	+16	bar(g)
Inlet Dewpoint	-100	+20	°C
Outlet Dewpoint	-100	+20	°C
Inlet Flow Rate	Customer Specific		
Outlet Flow Rate	Customer Specific		
Outlet O2 Purity	Purity Specific		
EST O2 Purity	Purity Specific		

Software Activation

Access Level: Service 1
Menu: Generator Set Up
Sub Menu: Digital / Analog Outputs

Enable the 4-20mA Output 1 or 2
The button will toggle between disabled and one of the enabled states.



4-20mA Output 1 & 2
Custom Outputs

4-20mA Output 1	4-20mA Output 2
Ambient Temperature	Ambient Temperature
Inlet Pressure	Inlet Pressure
Outlet Pressure	Outlet Pressure
Inlet Dewpoint	Inlet Dewpoint
Outlet Dewpoint	Outlet Dewpoint
Inlet Flow Rate	Outlet Dewpoint
Outlet Flow Rate	Outlet Flow Rate
Outlet O2 Purity	Outlet O2 Purity
EST O2 Purity	EST O2 Purity

CONNECTING THE EXTERNAL O2 ALARM

External Oxygen Analyser

Should there be a need to install an independent oxygen analyser to monitor the purity at point of use, it is possible to connect the external oxygen analysers to the nitrogen generators external alarm providing it has a relay/digital output. In the event the purity measured at point of use is outside of specification, the external oxygen analysers relay/digital output will transmit a 24V signal to the nitrogen generator resulting in the nitrogen process/outlet valve closing and the nitrogen vent valve opening, venting the out of specification gas to atmosphere. Once the purity recovers and falls within specification, the signal will be broken, resulting in the nitrogen vent valve closing and the nitrogen process/outlet valve opening to supply gas to the process.

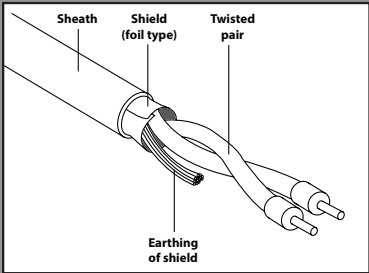
First Steps Prior to Connection

- Obtain a suitable 2-core cable for use as the Purge Economy cable (not supplied)
- Open the generator enclosure and identify the purge economy terminals, these are used to form a digital switch.

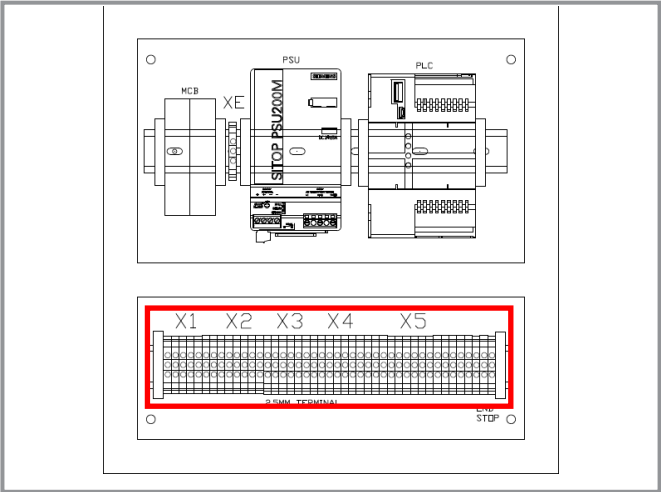
Cable Recommendation: Auxiliary Feature Connections

When connecting the above features, it is recommended that:

- Cable lengths do not exceed 30m in length.
- Twisted pair, screened cables (minimum 0.75mm²) are used
- Low voltage cables are routed away from high voltage supply cables
- Ferrite's are fitted if supplied or are advised.
- Ferrules should be fitted.



Terminal Locations



Panel	Bottom
24V Output	X5-9
External Alarm Input	X5-10

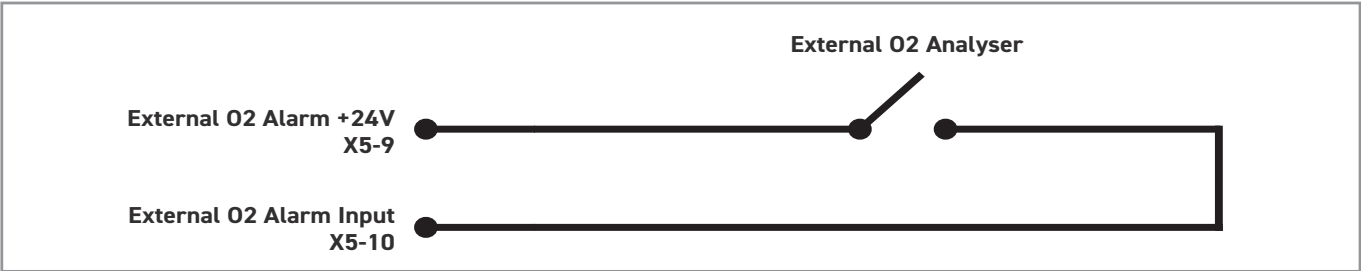
AT THE GENERATOR

Using the recommended cable type, connect one core of the External O2 Alarm connection cable to +24V, Terminal **X5-9** of the generator controller.

Connect the other core of the External O2 Alarm cable to the input, Terminal **X5-10** of the generator controller.

Warning: DO NOT connect mains electricity to the Purge Economy terminals

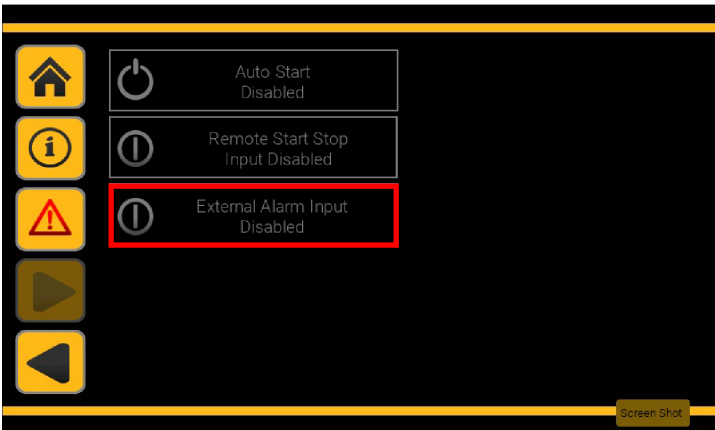
		X1-1				X2-1				X2-5				X2-6						X3-3						X3-10																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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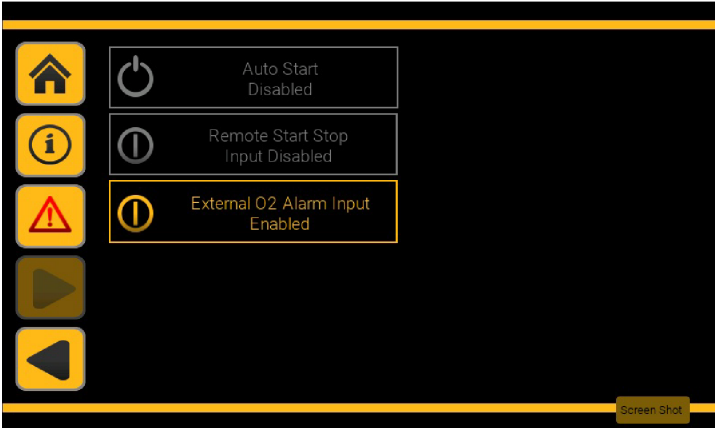
Software Activation

Access Level: Service 1
Menu: Generator Set Up
Sub Menu: Digital Inputs

Enable the External O2 Alarm Input
The button will toggle between disabled and enabled.



External O2 Alarm Enabled



FACTORY FITTED AND OPTIONAL SENSORS

Highlighted below are all the sensor which are installed as standard on all NITROSource Plus nitrogen generators.
The factory fitted sensors are connected to the following terminals:

Sensor	Panel	Ground Terminal	Power Terminal	Signal Terminal
Ambient Temperature	Top	X3-5	-	X4-1
Inlet Pressure	Bottom	X9-5	X8-11	X10-4
Outlet Pressure	Bottom	X9-6	X8-12	X10-5
Column 1 Pressure	Top	X3-2	X2-2	X4-5
Column 2 Pressure	Top	X3-3	X2-3	X4-6
Outlet Oxygen Content	Top	X3-11	X2-8	-

Highlighted below are the optional sensors which can be installed

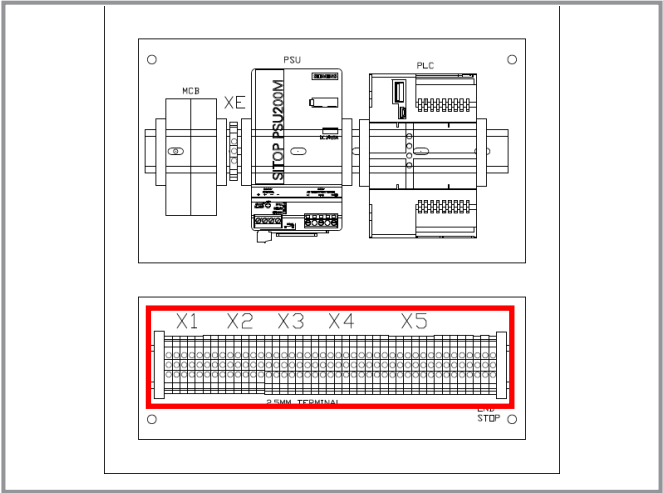
Sensor	Panel	Ground Terminal	Power Terminal	Signal Terminal
Inlet Pressure Dewpoint	Bottom	X9-2	X8-9	X10-1
Outlet Pressure Dewpoint	Bottom	X9-3	X8-10	X10-2
Inlet Flow Rate	Top	X3-6	X2-4	X4-3
Outlet Flow Rate	Top	X3-7	X2-4	X4-4
Energy Saving Technology (EST)	Top	X3-11	X2-8	-

Inlet dewpoint, outlet dewpoint and Energy Saving Technology (EST) can all be specified as a factory fitted option or alternatively installed as part of a retrofit kit at a later date. The inlet flow and outlet flow options are simply connectivity options to accept a 3d party supplied flow meter.



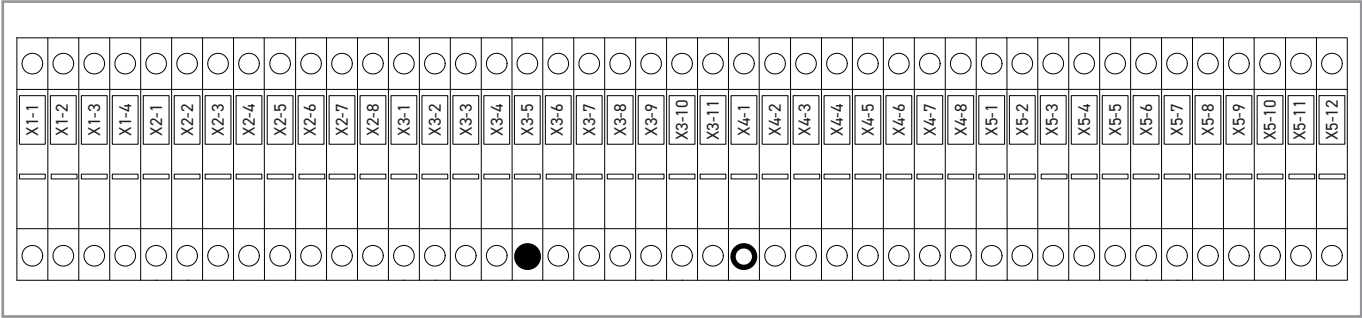
All cable selection, cable connection (wiring), set-up, electrical commissioning and servicing must be carried out by a fully qualified and competent electrical engineer in accordance with local electrical regulations.

Ambient Temperature Sensor - Terminal Locations

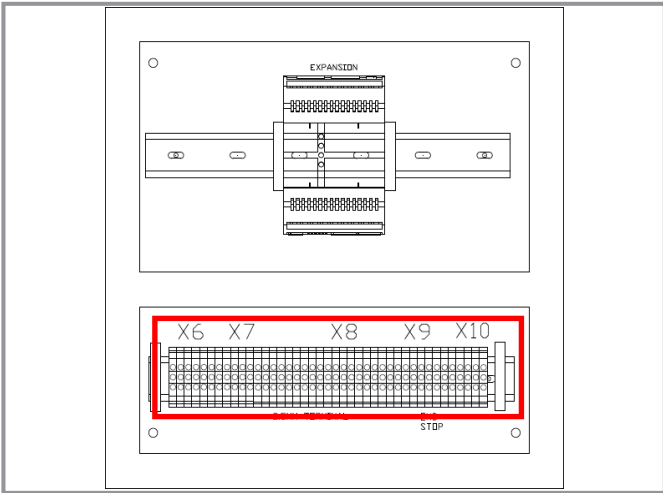


Sensor	Ambient Temperature
Communication Method	-
Panel	Top
Ground Terminal	X3-5
Power Terminal	-
Signal Terminal	X4-1

Important Note: The Inlet pressure sensor continuously monitors the incoming pressure to the generator and is considered a critical component in relation to the gas generation process. If you have any concerns over the performance of this sensor please contact your service partner/provider.

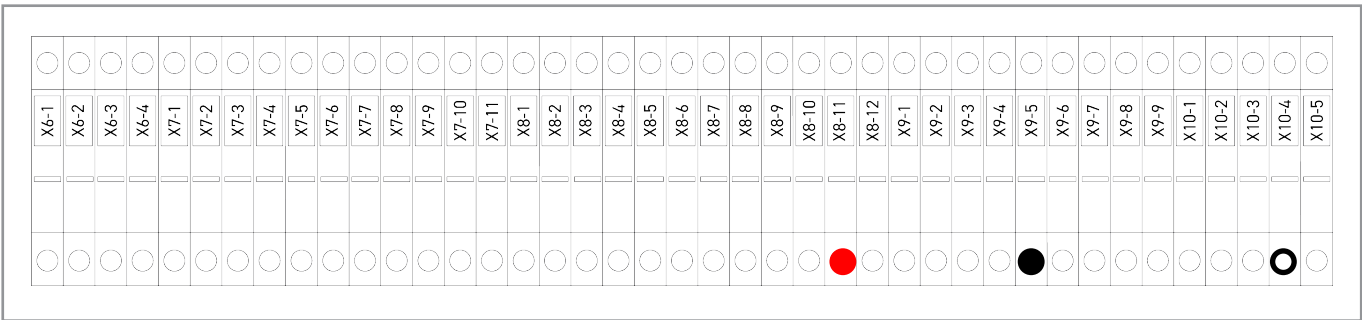


Inlet Pressure Sensor - Terminal Locations

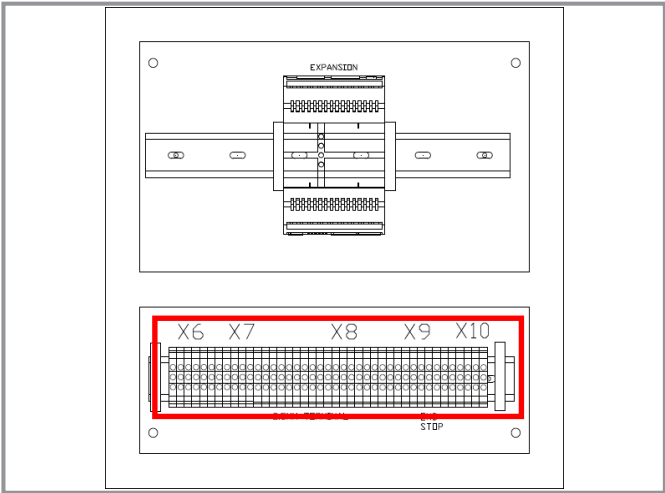


Sensor	Inlet Pressure
Communication Method	4...20mA
Panel	Bottom
Ground Terminal	X9-5
Power Terminal	X8-11
Signal Terminal	X10-4

Important Note: The Inlet pressure sensor continuously monitors the incoming pressure to the generator and is considered a critical component in relation to the gas generation process. If you have any concerns over the performance of this sensor please contact your service partner/provider.

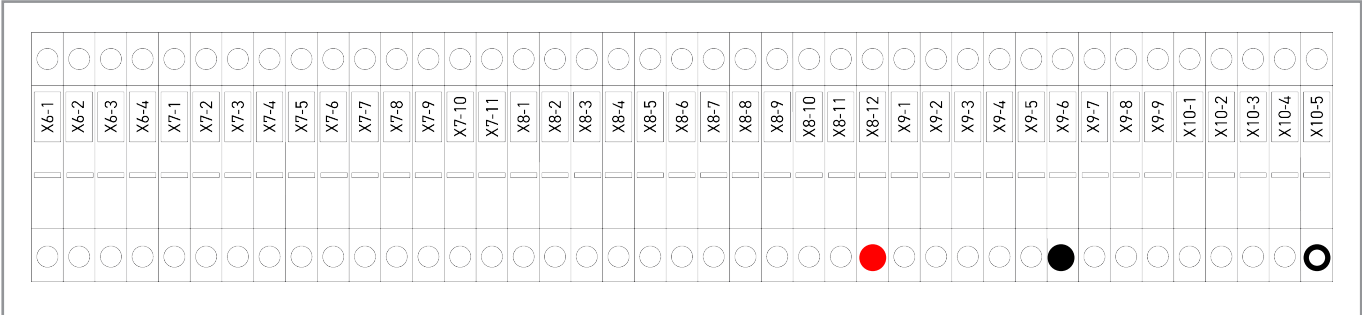


Outlet Pressure Sensor - Terminal Locations

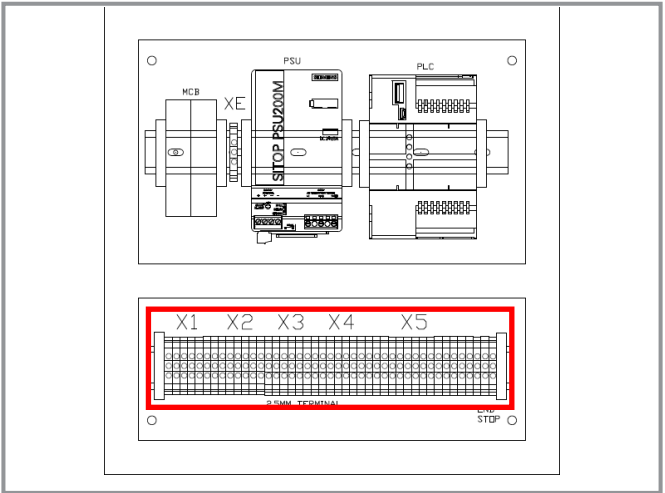


Sensor	Outlet Pressure
Communication Method	4...20mA
Panel	Bottom
Ground Terminal	X9-6
Power Terminal	X8-12
Signal Terminal	X10-5

Important Note: The Outlet pressure sensor continuously monitors the outlet pressure of the generator and is considered a critical component in relation to the gas generation process. If you have any concerns over the performance of this sensor please contact your service partner/provider.

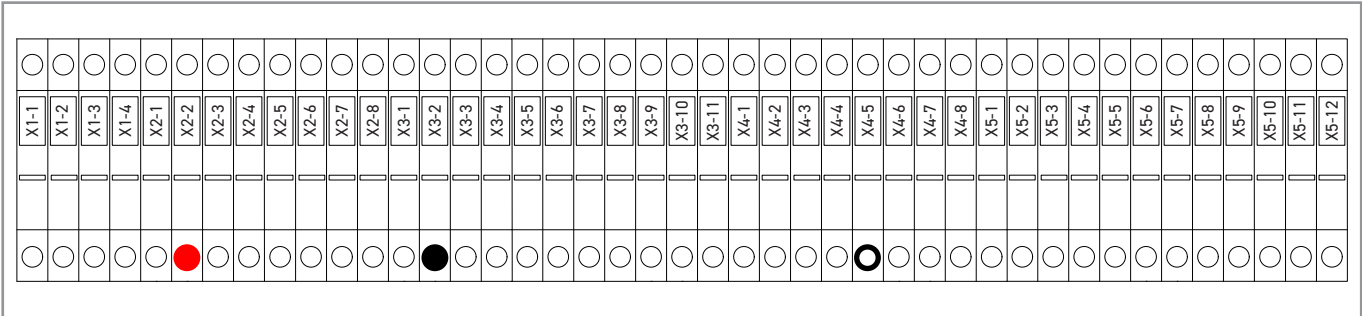


Column 1 Pressure Sensor - Terminal Locations

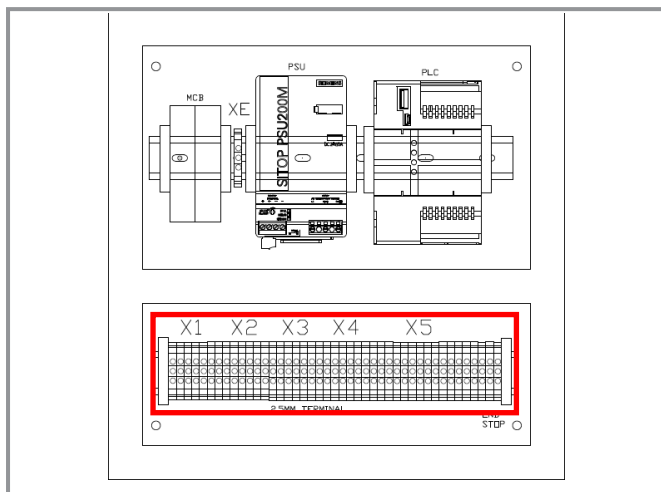


Sensor	Column 1 Pressure
Communication Method	4...20mA
Panel	Top
Ground Terminal	X3-2
Power Terminal	X2-2
Signal Terminal	X4-5

Important Note: If you have any concerns over the performance of this sensor please contact your service partner/provider.

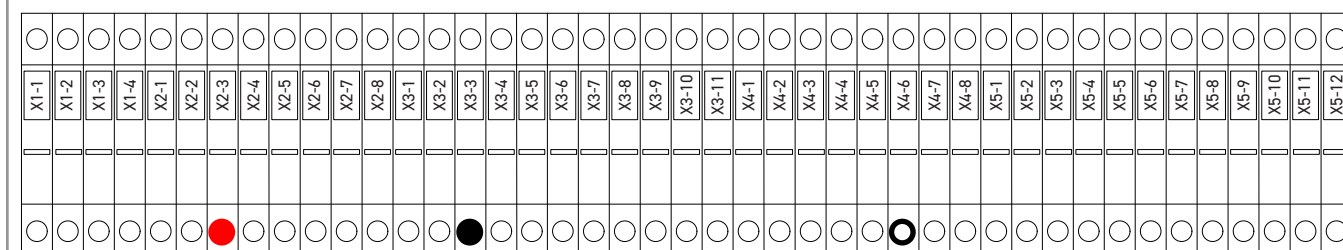


Column 2 Pressure Sensor - Terminal Locations

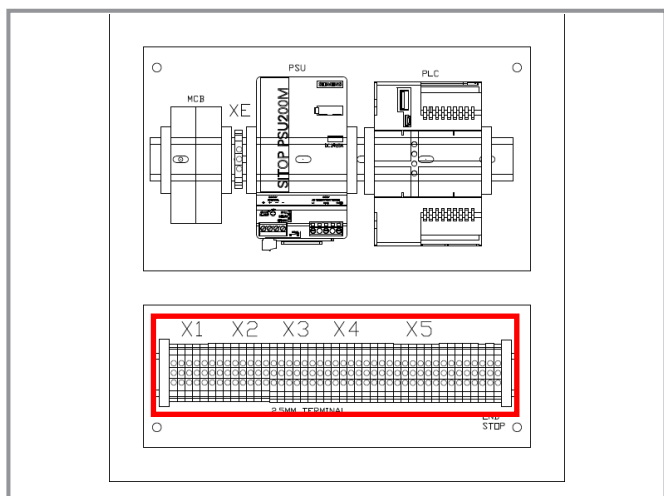


Sensor	Column 2 Pressure
Communication Method	4...20mA
Panel	Top
Ground Terminal	X3-3
Power Terminal	X2-3
Signal Terminal	X4-6

Important Note: If you have any concerns over the performance of this sensor please contact your service partner/provider.

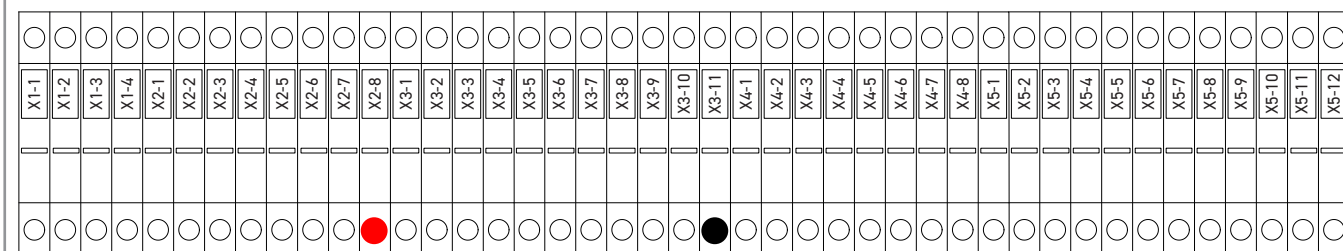


Outlet Oxygen Sensor - Terminal Locations



Sensor	Outlet Oxygen Sensor
Communication Method	Modbus RTU via RS485
Panel	Top
Ground Terminal	X3-11
Power Terminal	X2-8
RS485+	Modbus_2+
RS485-	Modbus_2-

Important Note: The Outlet Oxygen sensor continuously monitors the purity of the generator and is considered a critical component in relation to the gas generation process. If you have any concerns over the performance of this sensor please contact your service partner/provider.

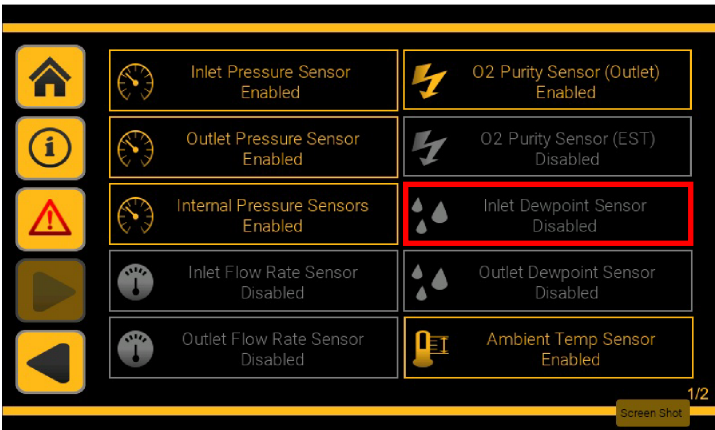


Software Activation

Access Level: Service 1
Menu: Generator Set Up
Sub Menu: Sensor Enable/Disable

Enable the Inlet Dewpoint Sensor
(Button toggles between Enabled and Disabled)

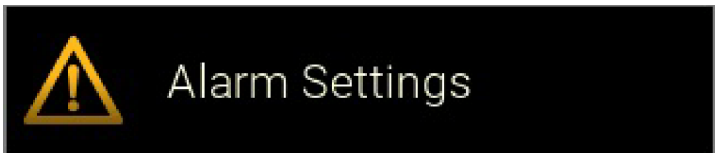
Once the sensor has been enabled, the alarm setpoints will need configuring.



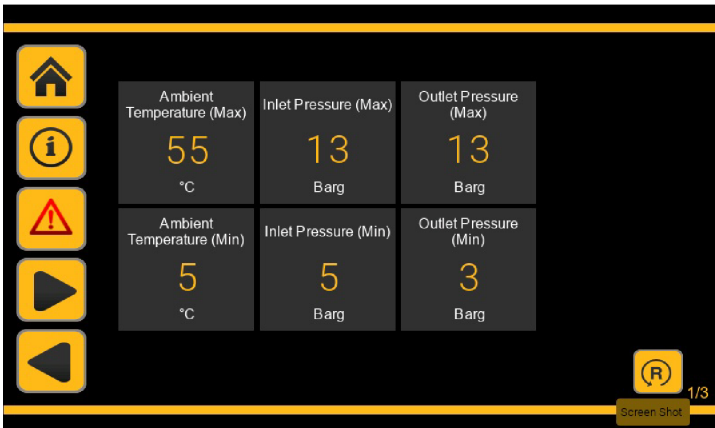
Press LEFT key



Press the Alarm Settings button



Alarm Settings sub-menu level



Press the RIGHT key to access Page 2 or 3



On Page 2 you are able to adjust the alarm limits.
On Page 3 you are able to adjust the alarm delay.



OPTIONAL - OUTLET DEWPOINT SENSOR

The purpose of the Outlet Dewpoint Sensor is to continuously monitor the dewpoint of the nitrogen gas exiting the system. If the dewpoint is reading higher than the alarm setpoint for a prolonged period of time, the advanced controller will notify the user of poor outlet dewpoint. If the dewpoint recovers and is reading equal too or less than the alarm setpoint, then the system will deactivate the alarm. **This feature has no effect on operation of the gas generation process.**

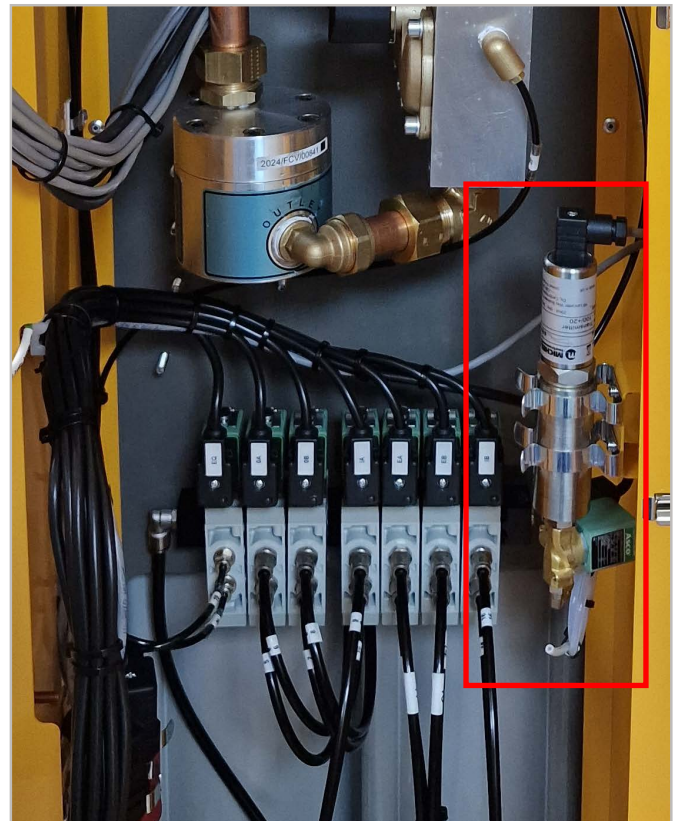
The Outlet Dewpoint Sensor kit is supplied with:

- (1x) Sensor Assembly
- (1x) Mounting Kit
- (1x) Piping Kit

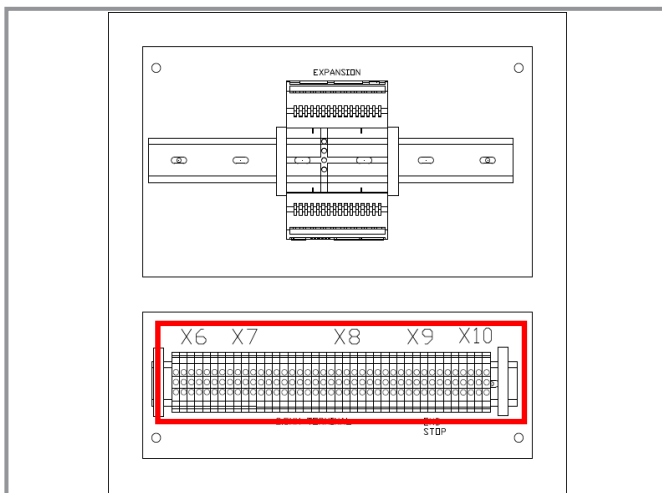
WARNING: Before installing the Inlet Dewpoint Sensor you must first ensure the generator is pneumatically and electrically isolated and fully depressurised.

Mechanical Installation

- Locate the Outlet Dewpoint Sensor mounting bracket and sensor cables, these can be found next to pilot valves in the middle of the process enclosure.
- Attach the tool clips using the fixings and insert the assembly.
- Locate the pipe connecting the pressure regulator to the outlet pressure gauge.
- Cut the pipe somewhere near the centre.
- Insert the 4mm push-in tee piece and 4mm black pipe.
- Connect the pipe to the Outlet Dewpoint Sensor.
- Remove the heatshrink cover from both sensor cables and attached them to the assembly.



Terminal Locations



Sensor	Outlet Dewpoint
Communication Method	4...20mA
Panel	Bottom
Ground Terminal	X9-3
Power Terminal	X8-10
Signal Terminal	X10-2

Important Note: If you have any concerns over the performance of this sensor please contact your service partner/provider.

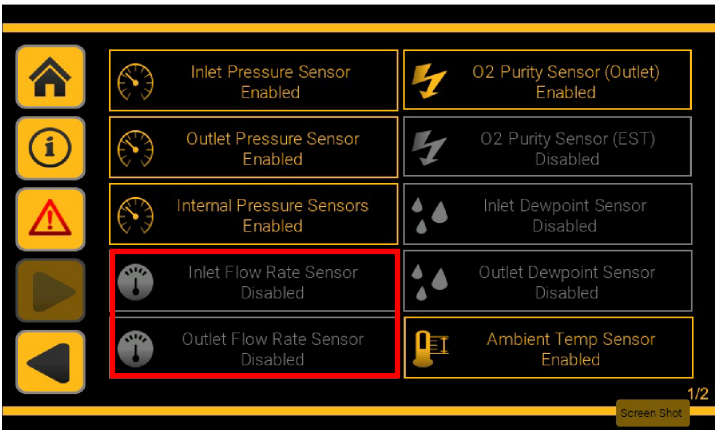
○	□	X6-1	○
○	□	X6-2	○
○	□	X6-3	○
○	□	X6-4	○
○	□	X7-1	○
○	□	X7-2	○
○	□	X7-3	○
○	□	X7-4	○
○	□	X7-5	○
○	□	X7-6	○
○	□	X7-7	○
○	□	X7-8	○
○	□	X7-9	○
○	□	X7-10	○
○	□	X7-11	○
○	□	X8-1	○
○	□	X8-2	○
○	□	X8-3	○
○	□	X8-4	○
○	□	X8-5	○
○	□	X8-6	○
○	□	X8-7	○
○	□	X8-8	○
○	□	X8-9	○
○	□	X8-10	○
○	□	X8-11	○
●	□	X8-12	○
○	□	X9-1	○
○	□	X9-2	○
○	□	X9-3	○
○	□	X9-4	○
○	□	X9-5	○
●	□	X9-6	○
○	□	X9-7	○
○	□	X9-8	○
○	□	X9-9	○
○	□	X10-1	○
○	□	X10-2	○
○	□	X10-3	○
○	□	X10-4	○
○	□	X10-5	○

Software Activation

Access Level: Service 1
Menu: Generator Set Up
Sub Menu: Sensor Enable/Disable

Enable the Inlet Dewpoint Sensor
(Button toggles between Enabled and Disabled)

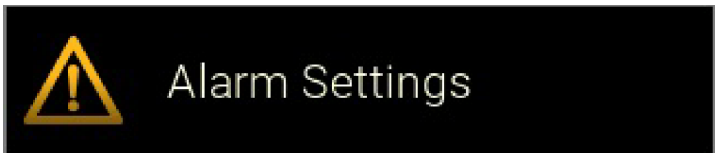
Once the sensor has been enabled, the alarm setpoints will need configuring.



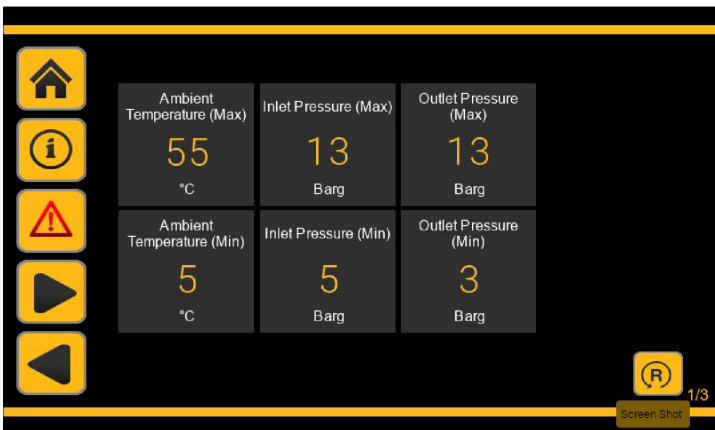
Press **LEFT** key



Press the **Alarm Settings** button



Alarm Settings sub-menu level



Press the **RIGHT** key to access Page 2 or 3



On Page 2 you are able to adjust the alarm limits.
On Page 3 you are able to adjust the alarm delay.



CONNECTING A USER SUPPLIED FLOW METER

Each nitrogen generator has the capability to accept up to two mass flow meters providing they are powered by 24VDC and offer a 4...20mA output. A single mass flow meter can be installed to measure the inlet or outlet flow rate or you can install both and measure inlet and outlet flow rates simultaneously. Once the sensors have been installed and activated within the software, you simply input the measurement range of the sensor and The Advanced Controller will monitor and store the data from both flow meters for up to 3 years depending on measurement interval and can be extracted from the PLC via USB drive to interoperate on a PC or Laptop.

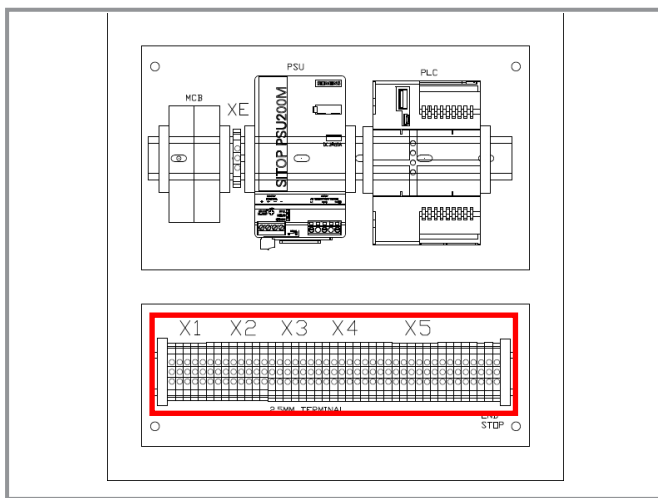
WARNING: Before installing the Inlet Dewpoint Sensor you must first ensure the generator is pneumatically and electrically isolated and fully depressurised.

Mechanical Installation

Both flow meters should be installed correctly according to the manufacturers instructions/recommendations.

The power supply and 4...20mA connections to the generators controller can be made through the knock out holes located in the bottom half of the control panel where a suitable cable gland will need to be installed to ensure correct cable retention.

Terminal Locations



Sensor	Inlet Flow
Communication Method	4...20mA
Panel	Top
Ground Terminal	X3-6
Power Terminal	X2-4
Signal Terminal	X4-3
Sensor	Outlet Flow
Communication Method	4...20mA
Panel	Top
Ground Terminal	X3-7
Power Terminal	X2-4
Signal Terminal	X4-4

		X1-1		
		X1-2		
		X1-3		
		X1-4		
		X2-1		
		X2-2		
		X2-3		
		X2-4		
		X2-5		
		X2-6		
		X2-7		
		X2-8		
		X3-1		
		X3-2		
		X3-3		
		X3-4		
		X3-5		
		X3-6		
		X3-7		
		X3-8		
		X3-9		
		X3-10		
		X3-11		
		X4-1		
		X4-2		
		X4-3		
		X4-4		
		X4-5		
		X4-6		
		X4-7		
		X4-8		
		X5-1		
		X5-2		
		X5-3		
		X5-4		
		X5-5		
		X5-6		
		X5-7		
		X5-8		
		X5-9		
		X5-10		
		X5-11		
		X5-12		

Software Activation

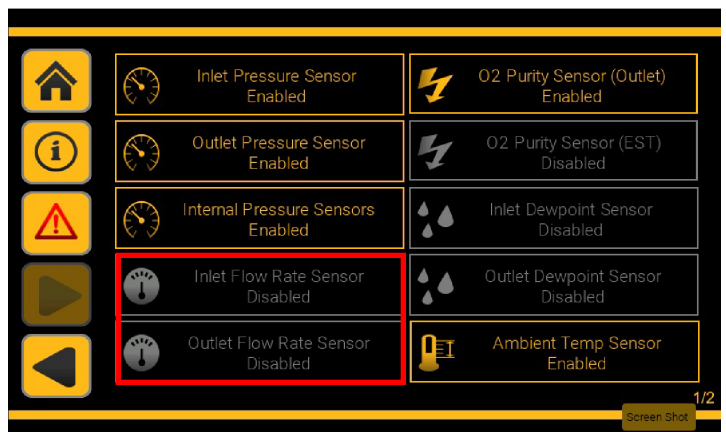
Access Level: Service 1

Menu: Generator Set Up

Sub Menu: Sensor Enable/Disable

Enable the Inlet, Outlet Flow Rate Sensor or both.
(Button toggles between Enabled and Disabled)

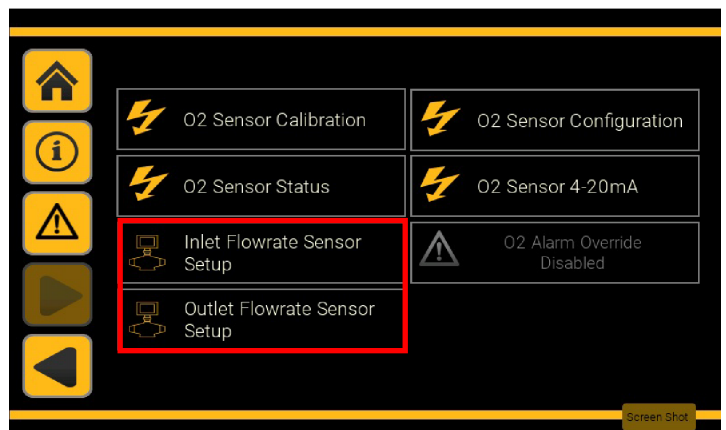
Once the sensor(s) has been enabled, the 4...20mA scaling must be set.



Press **LEFT** key twice to return to the main menu



Press the **Sensor Setup** button and then either **Inlet or Outlet Flowrate Sensor Setup**



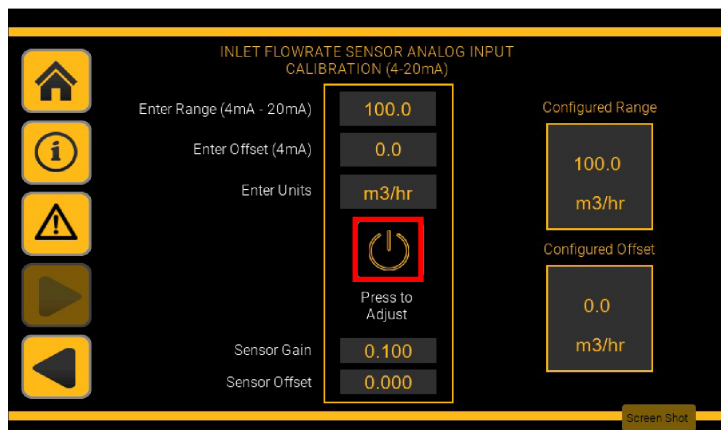
Enter the maximum range (4mA-20mA) for the installed flow sensor.

Enter the offset (4mA).

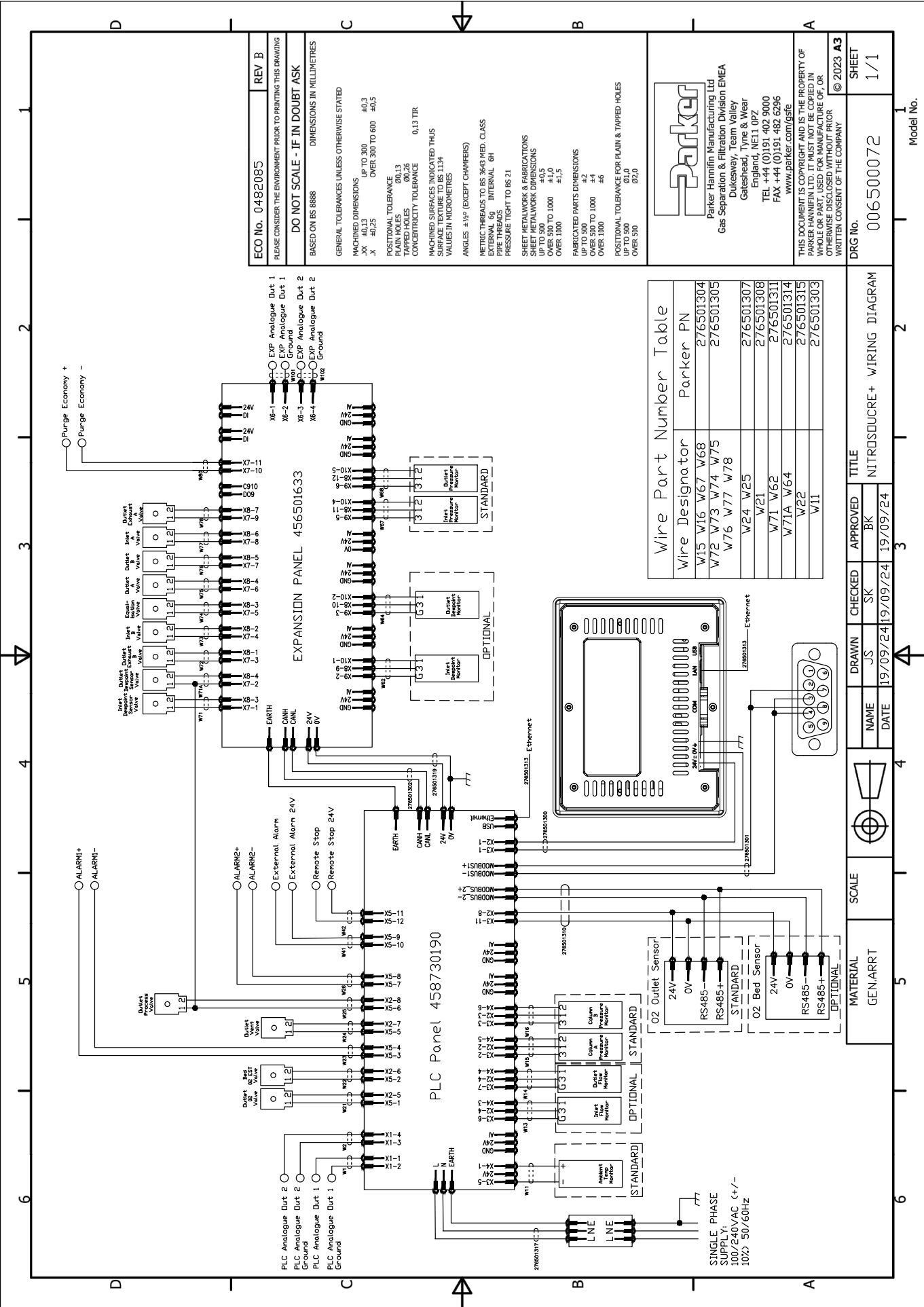
Pressing the units button will toggle the flow measurement unit between:

- m³/hr
- cfm
- cfh
- kg/hr

Once complete, press the power button to apply the settings for either inlet or outlet flow measurement.

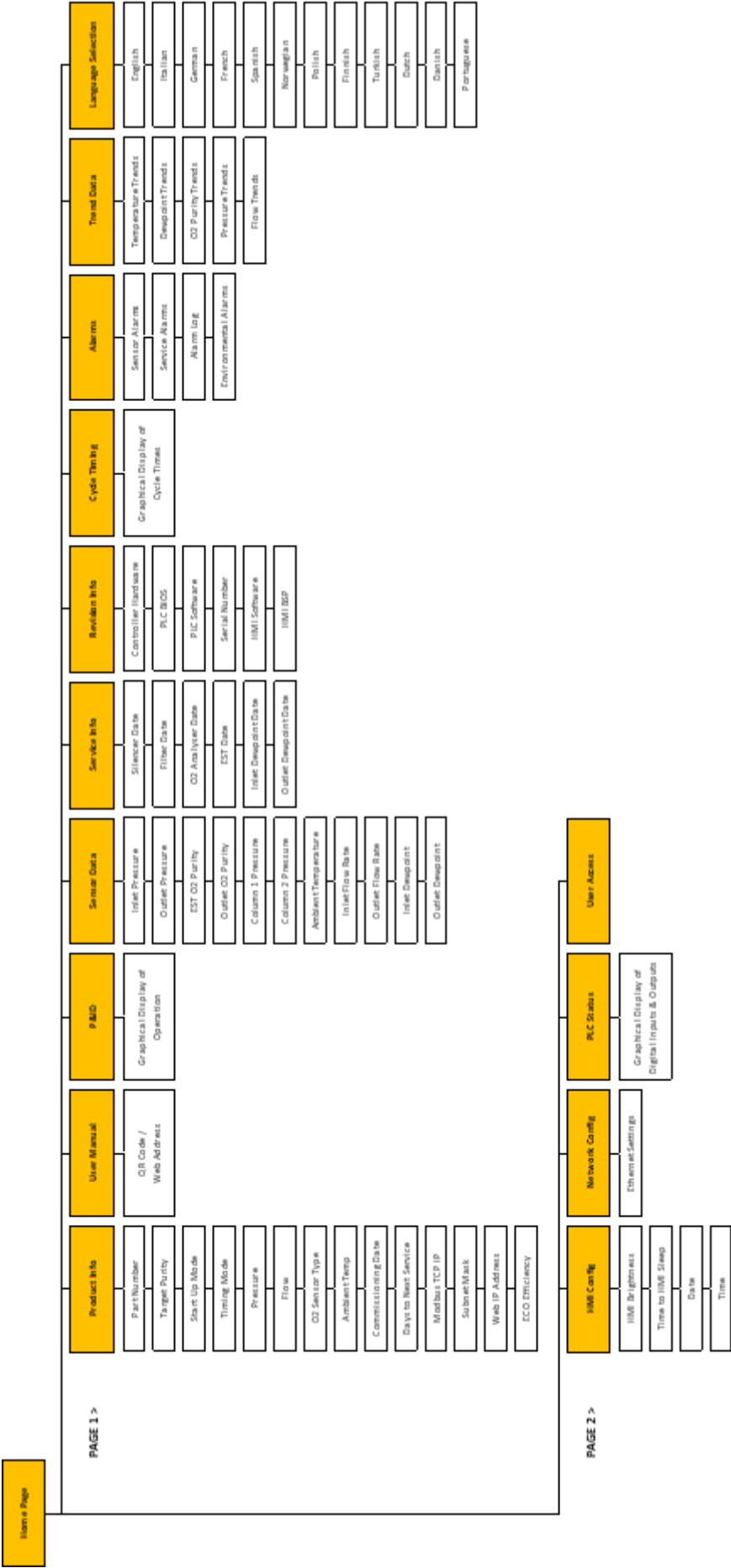


ELECTRICAL SCHEMATIC



HMI MENUS & SCREENS (USER LEVEL ACCESS)

USER ACCESS SOFTWARE MENU MAP



MENU MAP BREAKDOWN

Power on Splash Screen

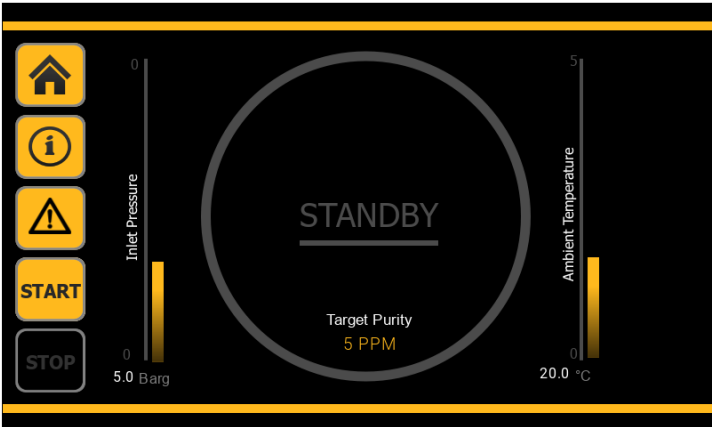
Upon power up, the splashscreen will be displayed for 30 seconds before showing the **HOMEPAGE**



HOMEPAGE

Standby Screen

The buttons on the HOMEPAGE are identified below:



HOME Button



INFORMATION Button



ALARMS Button



START Button



STOP Button





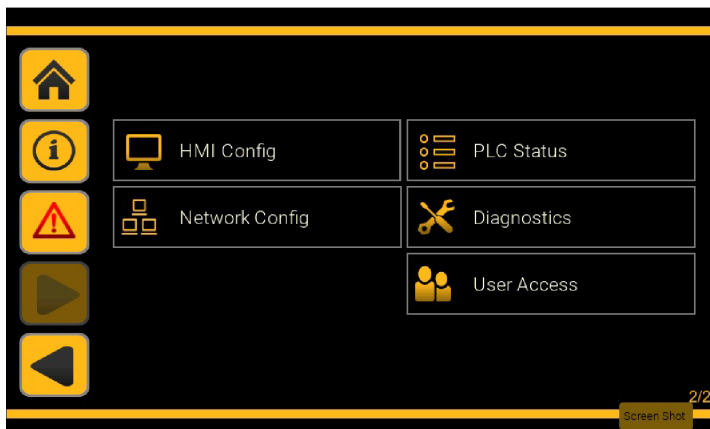
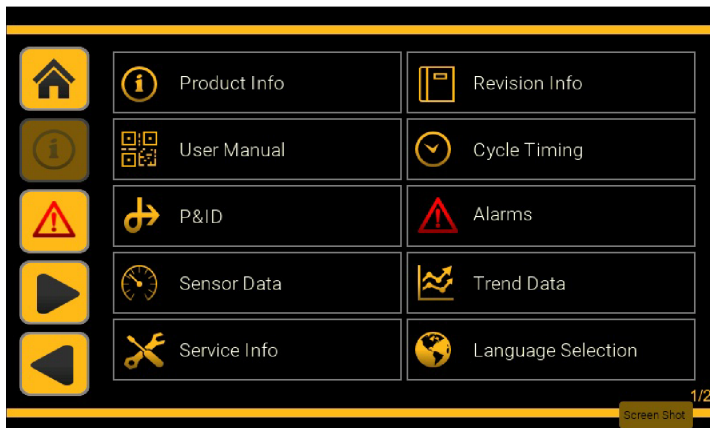
Pressing the **INFORMATION** button will bring up the following menu page.



Pressing the **RIGHT** button will move you to the next page



Pressing the **LEFT** button will return you to the previous page, in this case back to Page 1



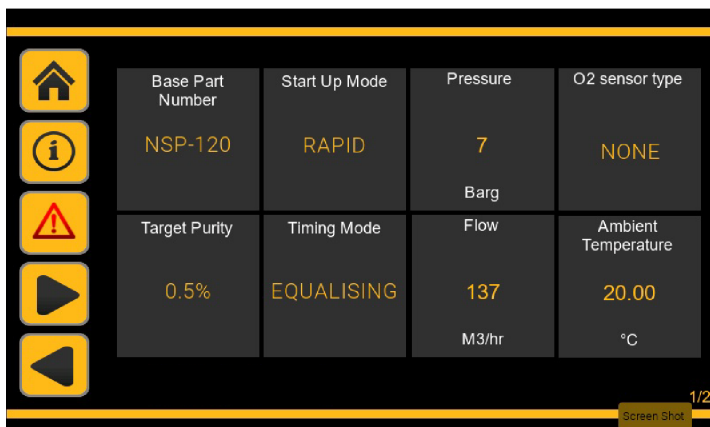
Pressing the **PRODUCT INFO** button will bring up the following menu page.

Product Info Page 1 (Read Only)

This page contains information regarding the configuration of the product.



Pressing the **RIGHT** button will move you to the next page

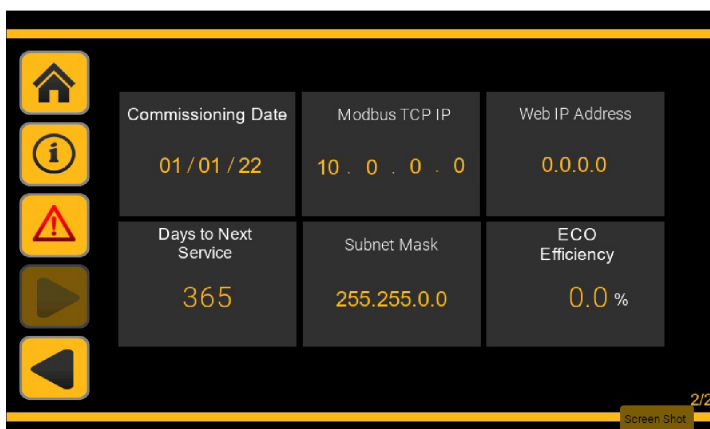


Product Info Page 2 (Read Only)

This page contains information regarding the commissioning, service and communications.



Pressing the **LEFT** button once will return you to the previous page, pressing twice will return you to the main menu.



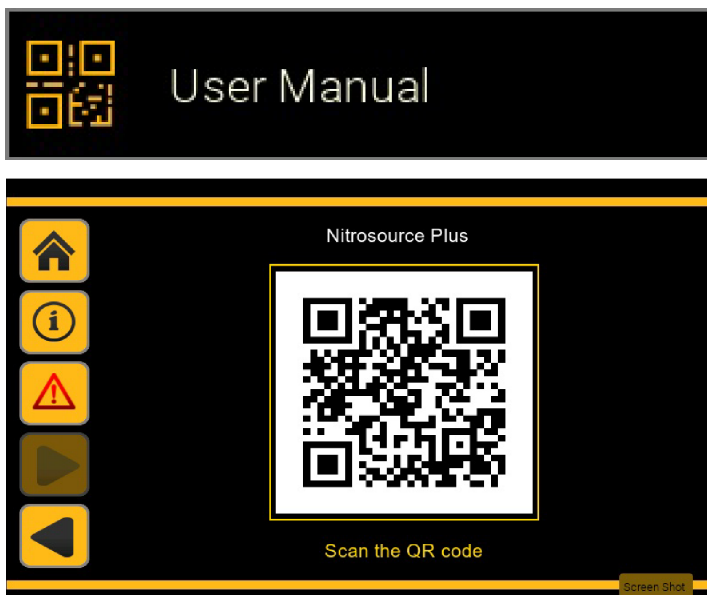
Pressing the **USER MANUAL** button will bring up the following menu page.

User Manual Page 1 (Read Only)

This page contains the product QR code which can be scanned with a smart phone and will direct you to the correct product page on Parker.com containing the user manual.



Pressing the **LEFT** button once will return you to the previous page, pressing twice will return you to the main menu.



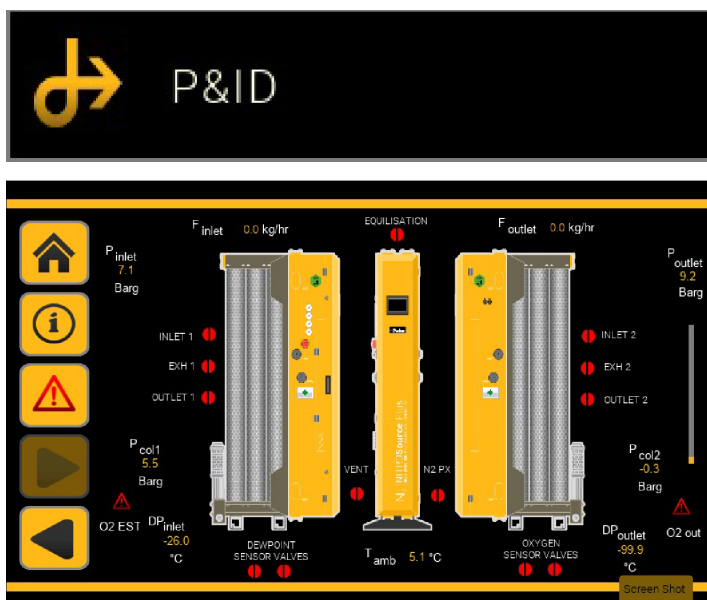
Pressing the **P&ID** button will bring up the following menu page.

P&ID Page 1 (Read Only)

This page contains a graphical representation showing real-time operation and sensor data.



Pressing the **LEFT** button once will return you to the main menu.



Important Notes:

- The image above has all the optional sensors enabled
- If an optional sensor is not fitted/enabled within the software then it will not be displayed on this page.
- Depending on the configuration of your generator, some sensor data may not be displayed depending on what is enabled/disabled.

Pressing the **SENSOR DATA** button will bring up the following menu page.

Sensor Data Page 1 (Read Only)

This page contains real-time data from all the factory fitted sensors. If an optional sensor such as EST is not fitted/enabled then no reading will be displayed and "Disabled" will appear under that section.



Pressing the **RIGHT** button will move you to the next page

 **Sensor Data**



Inlet Pressure 5.00 Barg	EST O2 Purity 3.00 %	Col 1 Pressure 5.0 Barg	Ambient Temp 20.0 °C
Outlet Pressure 5.00 Barg	Outlet O2 Purity 3.00 %	Col 2 Pressure 5.0 Barg	

1/2

Important Note: Each section can be toggled to display the reading in different units such as bar(g) and psi(g) or °C and °F.

Sensor Data Page 2 (Read Only)

This page contains real-time data from both inlet and outlet flow meters and inlet and outlet dewpoint sensors. If any of the optional sensors are not fitted/enabled then no reading will be displayed and "Disabled" will appear under each section.



Pressing the **LEFT** button once will return you to the previous page, pressing twice will return you to the main menu.



Inlet Flow Disabled m3/hr	Inlet Dewpoint Disabled °C
Outlet Flow Disabled m3/hr	Outlet Dewpoint Disabled °C

2/2
Screen Shot

Pressing the **SERVICE INFO** button will bring up the following menu page.

Service Info Page 1 (Read Only)

This page contains service countdown for each servicable part. Each section can show last service date or days remaining to next service.



Pressing the **LEFT** button once will return you to the main menu.

 **Service Info**



Valve Overhaul 25/11/24 Last Service Date	Silencer 25/11/24 Last Service Date	O2 EST Sensor 25/11/24 Last Service Date	Outlet Dewpoint Sensor 25/11/24 Last Service Date
	Filter 25/11/24 Last Service Date	O2 Outlet Sensor 25/11/24 Last Service Date	Inlet Dewpoint Sensor 25/11/24 Last Service Date

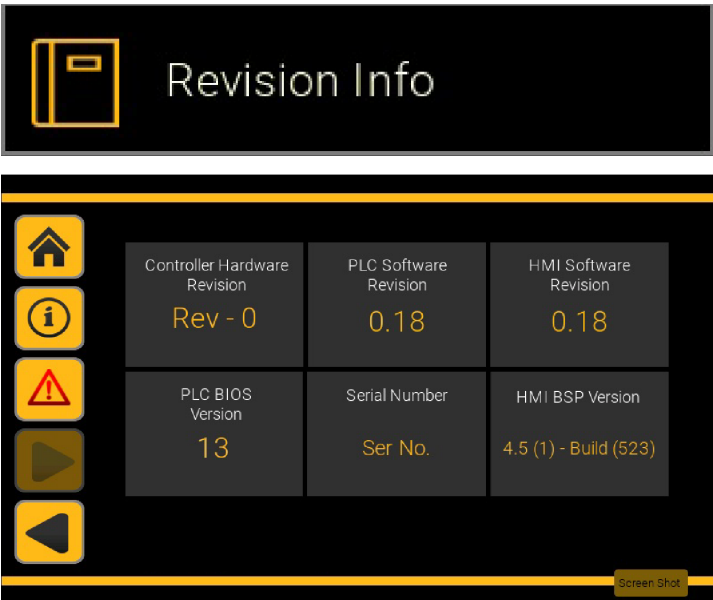
Pressing the **REVISION INFO** button will bring up the following menu page.

Revision Info Page 1 (Read Only)

This page contains the PLC and HMI software revision information as well as the generator serial number.



Pressing the **LEFT** button once will return you to the main menu.



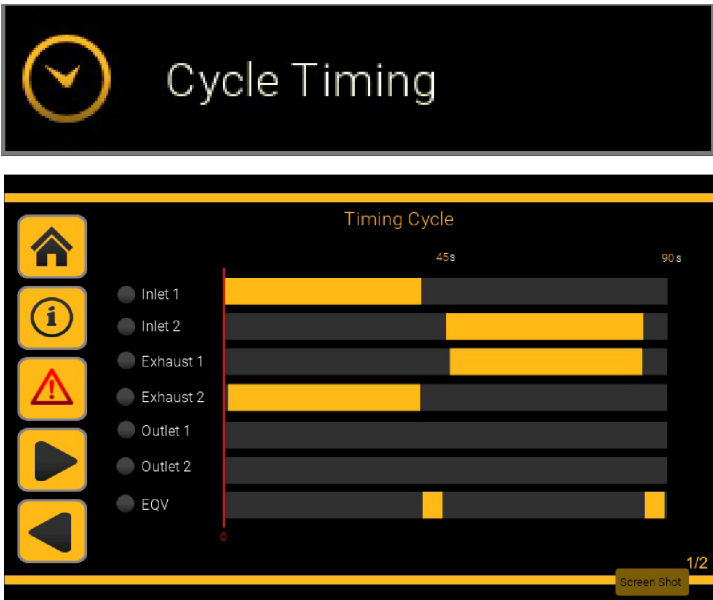
Pressing the **CYCLE TIMING** button will bring up the following menu page.

Cycle Timing Page 1 (Read Only)

This page contains a graphical overview of the cycle timing process and which valves are directly activated/deactivated



Pressing the **LEFT** button once will return you to the main menu.



Pressing the **ALARMS** button will bring up the following menu page.

Alarms Sub Menu (Read Only)

Important: An active alarm is indicated by a red warning triangle



Pressing the **LEFT** button once will return you to the main menu.



Pressing the **SENSOR ALARMS** button will bring up the following menu page.

Sensor Alarms (Read Only)

This page contains real-time display of all the sensor alarms.

Yellow = Alarm Low Limit
Red = Alarm High Limit



Pressing the **LEFT** button once will return you to the Alarms sub menu.

Pressing the **SERVICE ALARMS** button will bring up the following menu page.

Service Alarms (Read Only)

This page contains real-time display of all the service alarms.

Yellow = Service Imminent
Red = Service Overdue



Pressing the **LEFT** button once will return you to the Alarms sub menu.

Pressing the **ALARM LOG** button will bring up the following menu page.

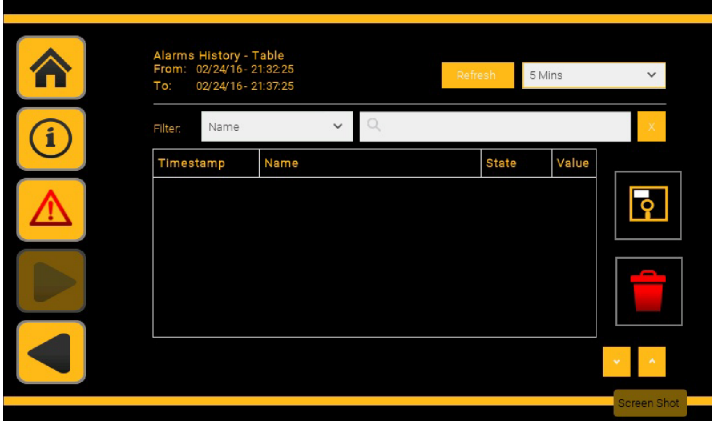
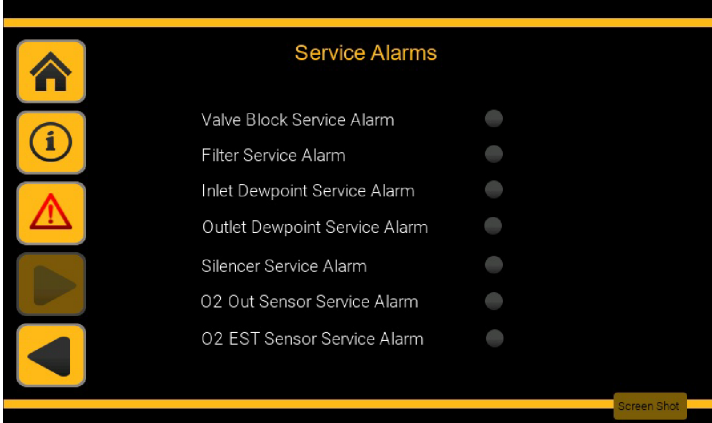
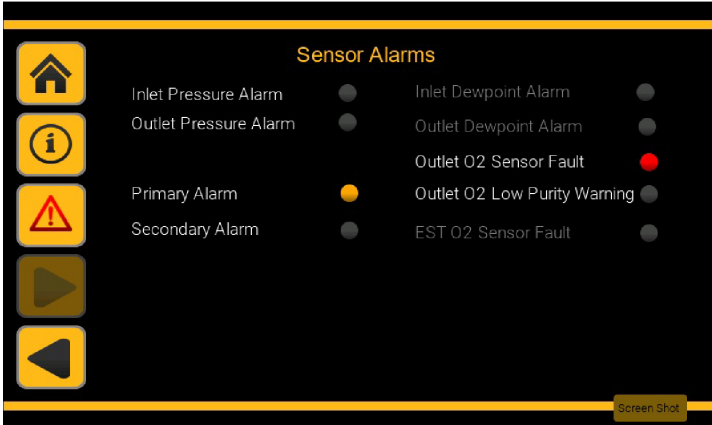
Alarm Log

This page contains a history of all alarm events. These can be reviewed by the user on the HMI or saved to a USB drive and then viewed on a PC.

Alarm logs are saved to USB in .csv format.



Pressing the **LEFT** button once will return you to the Alarms sub menu.



Pressing the **TREND DATA** button will bring up the following menu page.

Trend Data Sub Menu



Pressing the **LEFT** button once will return you to the main menu.

Pressing the **TEMPERATURE TRENDS** button will bring up the following menu page.

Temperature Trends

This page contains the real-time and historical ambient temperature trend data.



Pressing the **LEFT** button once will return you to the main menu.

Pressing the **DEWPOINT TRENDS** button will bring up the following menu page.

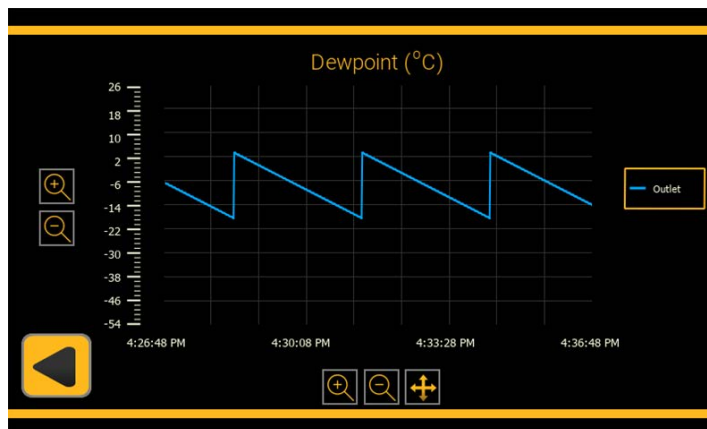
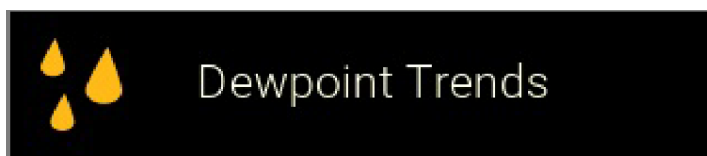
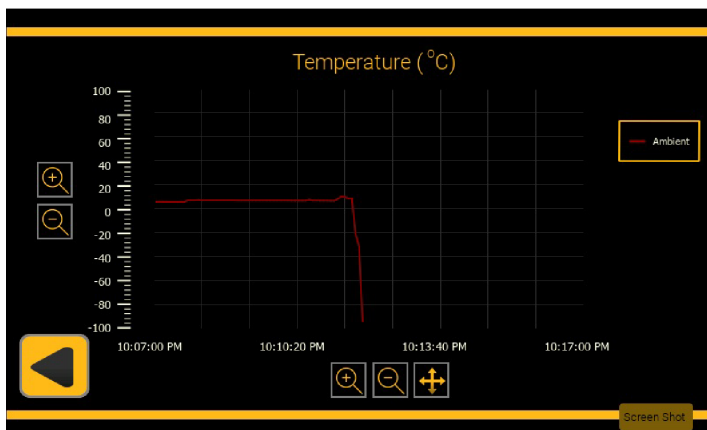
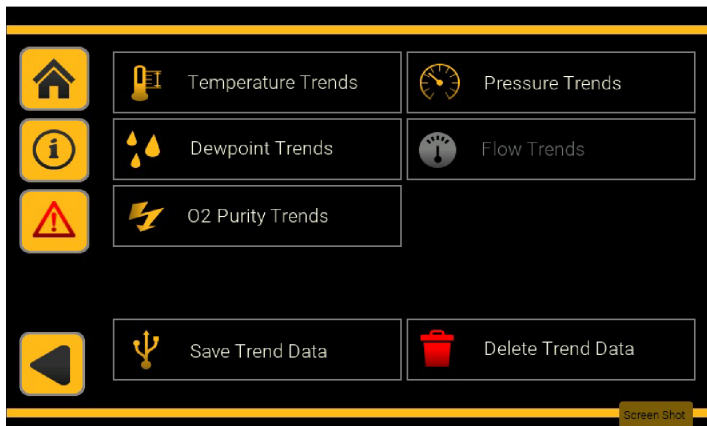
Dewpoint Trends

This page contains the real-time and historical inlet and/or outlet dewpoint trend data.

Important Note: If the Inlet or Outlet Dewpoint Sensor option(s) are not fitted/enabled you will not be able to access the dewpoint trends.



Pressing the **LEFT** button once will return you to the main menu.



Pressing the **O2 PURITY TRENDS** button will bring up the following menu page.

O2 Purity Trends

This page contains the real-time and historical O2 purity trend data for both outlet and EST (If option is fitted).

IMPORTANT NOTE: If the generator is fitted with a Zirconia sensor, you may see some sporadic readings due to low end sensitivity of the sensor.
(See page 22 for manufacturers recommendation)



Pressing the **LEFT** button once will return you to the main menu.

Pressing the **PRESSURE TRENDS** button will bring up the following menu page.

Pressure Trends

This page contains the real-time and historical inlet, outlet and column pressure trend data.



Pressing the **LEFT** button once will return you to the main menu.

Pressing the **FLOW TRENDS** button will bring up the following menu page.

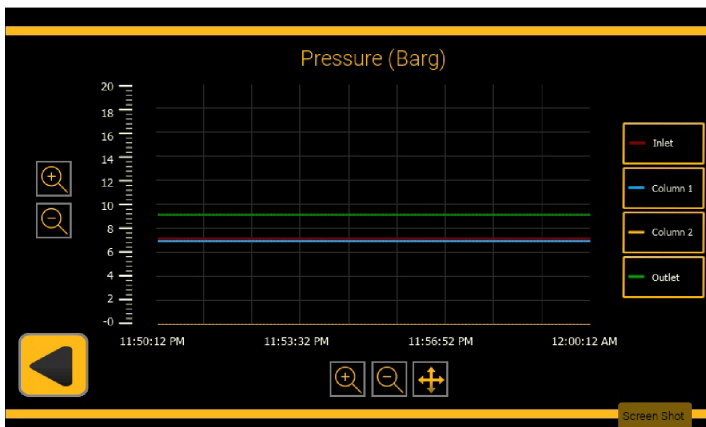
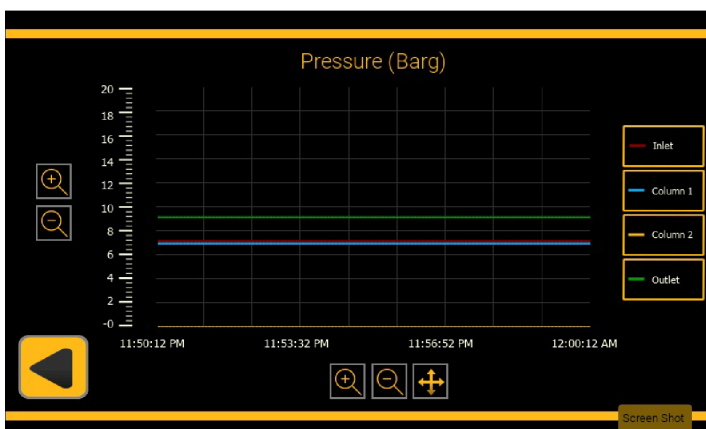
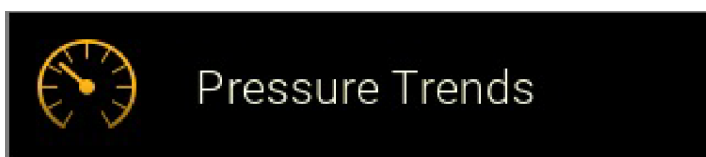
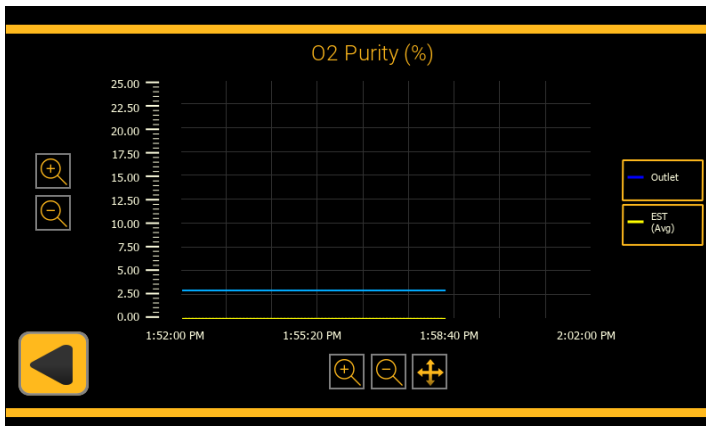
Flow Trends

This page contains the real-time and historical inlet and outlet flow trend data.

Important Note: If the Inlet or Outlet flow Sensor option(s) are not fitted/enabled you will not be able to access the flow trends.



Pressing the **LEFT** button once will return you to the main menu.



Pressing the **INSERT USB DRIVE** button will have no effect until a USB drive is inserted.

Inserting a USB drive will change the **INSERT USB DRIVE** to **SAVE TREND DATA**.

Pressing the **SAVE TREND DATA** button will save all trend data to the USB drive.



Pressing the **LEFT** button once will return you to the main menu.

Pressing the **DELETE TREND DATA** button will illuminate the button whilst all stored data is deleted.



Pressing the **LANGUAGE SELECTION** button will bring up the following menu page.

Language Selection Page 1

This page contains the various languages which can be selected.



Pressing the **LEFT** button once will return you to the main menu.



Language Selection Page 2

This page contains the various languages which can be selected.



Pressing the **LEFT** button once will return you to the previous page, pressing twice will return you to the main menu.



Pressing the **HMI CONFIG** button will bring up the following menu page.

HMI Config Page 1

This page contains the adjustment for HMI brightness and the time before the HMI screen goes to sleep.



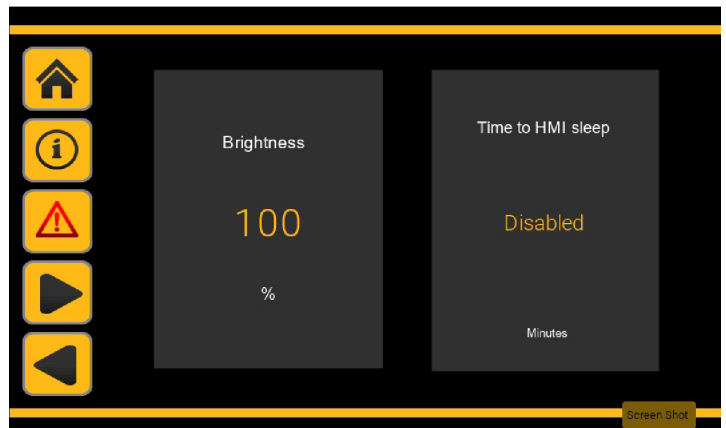
Pressing the **LEFT** button once will return you to the main menu.

HMI Config Page 2

This page contains the date and time settings used in the HMI.



Pressing the **LEFT** button once will return you to the previous page, pressing twice will return you to the main menu.



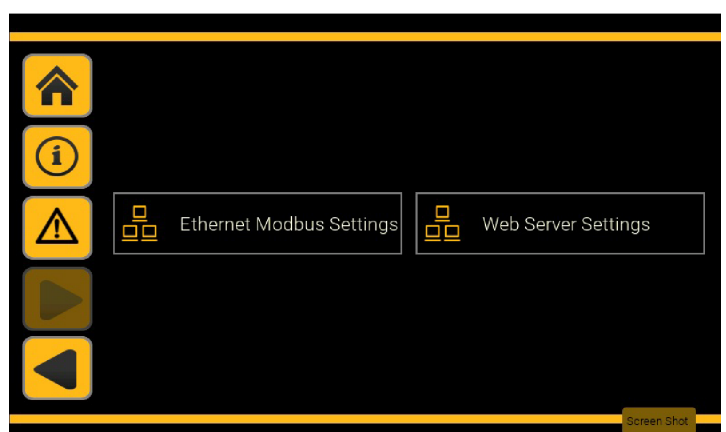
Pressing the **NETWORK CONFIG** button will bring up the following menu page.

Network Config Page 1

This page contains the Ethernet settings. From here you can adjust the Modbus TCP/IP settings and network adapter parameters.



Pressing the **LEFT** button once will return you to the main menu.



Pressing the **PLC STATUS** button will bring up the following menu page.

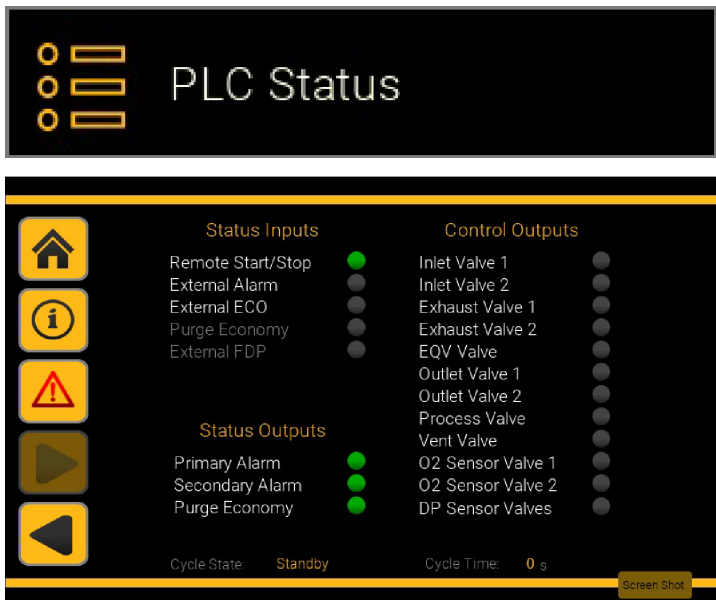
PLC Status

This page contains a visual representation of each digital input and output from the PLC.

An active input is represented by a solid green light.



Pressing the **LEFT** button once will return you to the main menu.



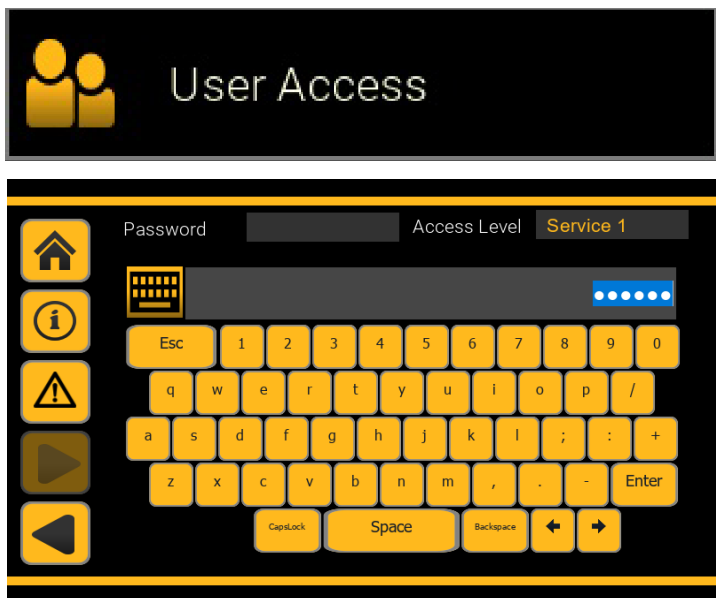
Pressing the **USER ACCESS** button will bring up the following menu page.

User Access

This page provides a service engineer with access to commissioning & setup sub menus and is not required by an end user. Access to these menus requires a service level password.



Pressing the **LEFT** button once will return you to the main menu.



Important Note: This level provides access to menus that can have a direct impact on the operation and performance. Only trained service personnel should access this level

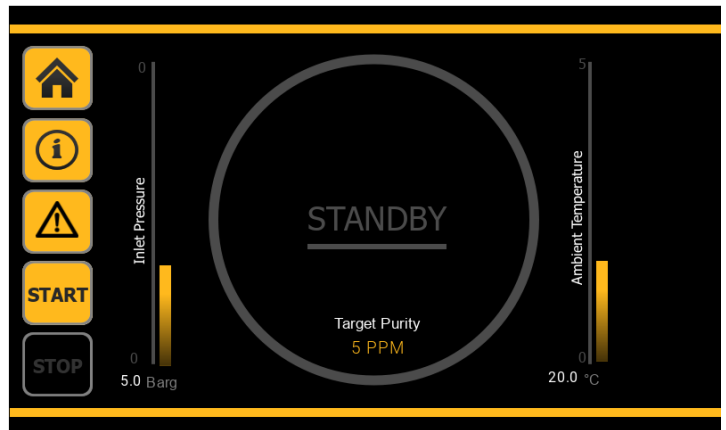
Home Page - Standby

Generator in standby mode and not cycling.

Pressing the 'Start' button will activate the gas generation cycle. On the first start-up you must complete the commissioning checklist to be able to start the machine.



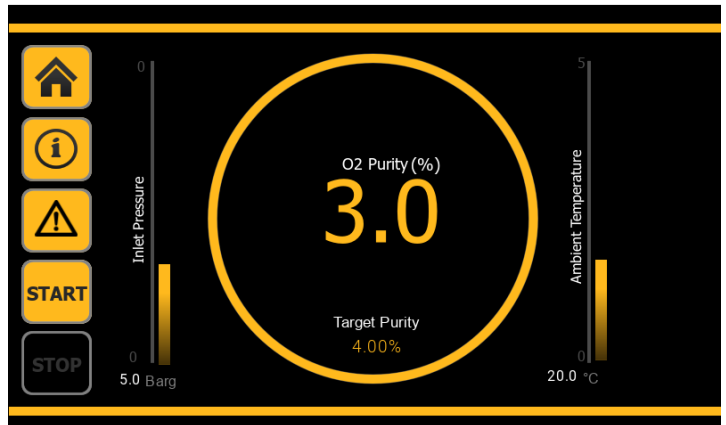
Pressing the **LEFT** button once will return you to the main menu.



Home Page - Standard Cycling

Generator operating normally

Yellow circle highlights position in gas generation cycle



Remote Start/Stop

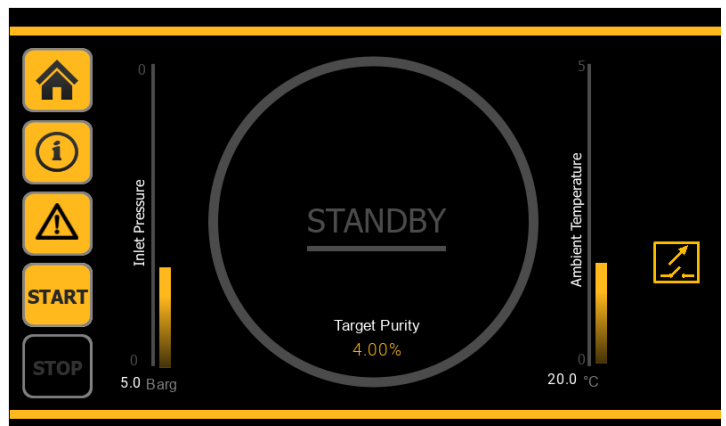
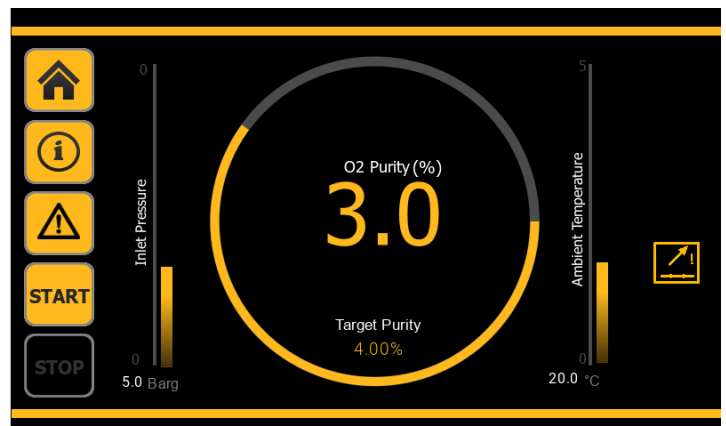
The symbol below can be shown in two states, open circuit which denotes the generator has been remotely stopped and is in standby.



Alternatively the symbol shows a closed circuit which denotes the generator is remotely started and is under normal operation.



All generators have the ability to start and stop their operation remotely. This requires a remote connection, either by a dedicated hard wired connection to the start / stop connections or via RJ45 MODBUS TCP/IP connection.



Optional - Energy Saving Technology (EST)

STATUS: Generator Operating Normally, EST Energy Saving Mode Active



When the above symbol is shown on the screen, the generator is operating in an extended cycle. During this period, less energy is consumed.

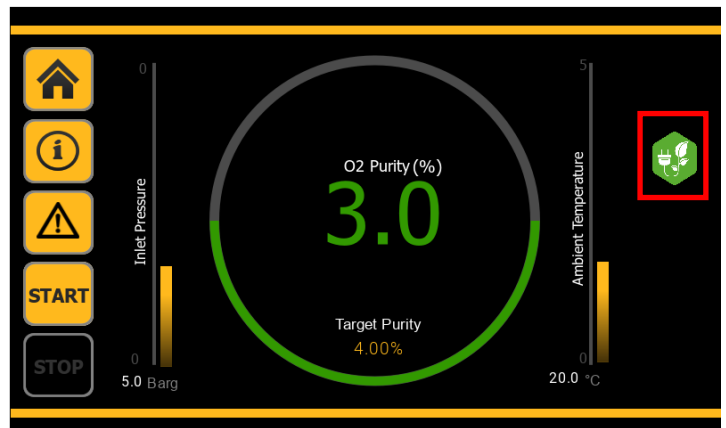
Note: The green circle (Cycle Position Indicator) denotes generator in EST energy saving mode and highlights position in extended cycle.

Pressing the INFORMATION button then CYCLE TIMING button will show position in cycle and status of valves.

Once EST is active, the generator will remain in Energy Saving Mode until either the outlet Purity or EST purity reaches the pre-determined set point at which point the columns will change over. Other features such as Economy do have priority over EST and will result in EST deactivation if active.

Important Notes:

- When the EST is active, the cycle can be extended from 55 seconds up to 250 seconds (depending on purity).
- When in EST Extended cycle, the timing bars for Inlet 1 / Inlet 2 will show green.



Economy

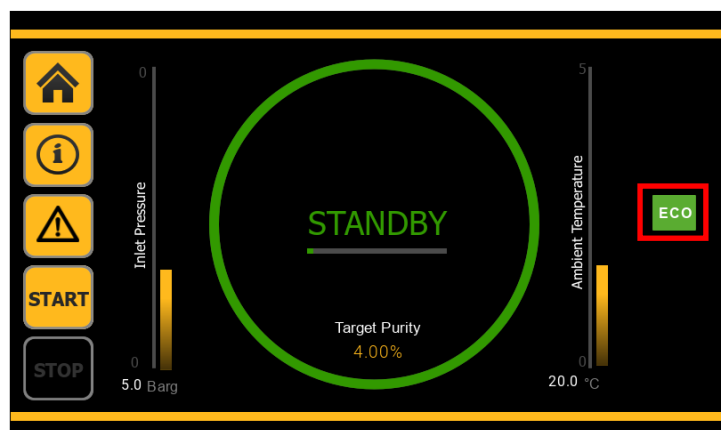
Generator In Standby, Economy Shutdown Mode Active



The symbol above can be shown in two colours, amber and green. Amber denotes the generator is still online, operating, but the outlet/process valve is closed due to no demand (high outlet pressure). Green denotes the generator is offline, in standby due to no demand (high outlet pressure)

If the generator is online and under normal operation, the outlet pressure is continuously measured to determine demand from the generator. If the pressure remains less than the setpoint the generator will continue to operate under normal operating parameters. If the outlet pressure is equal too or greater than the setpoint, this denotes low or no demand on the system. The Advanced Controller will then begin a countdown and providing the outlet pressure remains equal too or greater than the setpoint for 5 minutes, the outlet/process valve will close to preserve energy and gas, this is classified as Economy Stage 1. If at any point during this first 5 minute period should the outlet pressure drop below the setpoint, the timer will reset to 0 and the outlet/process valve will open.

Once Economy Stage 1 is complete, an additional countdown begins and providing the outlet pressure remains equal too or greater than the setpoint for a further 5 minutes, the generator will shutdown and enter standby to reduce energy/air consumption, this is classified as Economy Stage 2 or Economy Shutdown. If at any point during this second 5 minute period should the outlet pressure drop below the setpoint, both timers will reset to 0 and the outlet/process valve will open. If the generator has entered Economy Shutdown and the outlet pressure were to drop below the setpoint, then the generator will automatically re-start.



EXTERNAL CONNECTIVITY

WEBSERVER CONNECTION

The NITROSource Plus units have the ability to provide simultaneous remote communications via a Webserver and / or MODBUS TCP/IP.

The Webserver connection is provided by the HMI touch screen and requires connection to a Local Area Network (LAN) using an RJ45 Ethernet connection located on the side of the generator.

Connecting to the Generator

Located on the left side of the process enclosure you can find two RJ45 Ethernet ports, one dedicated to Webserver and the other for Modbus TCP/IP communications.

- Connect a suitable Ethernet to Local Area Network
- Route the Ethernet cable to the generator
- Connect the Ethernet cable into the RJ45 port on the right of the process enclosure (circled in picture)
- The generator HMI touch screen is now electrically connected for the Webserver function
- A static IP address should be applied to the MODBUS communication channel in the controller software

Webserver
RJ45 Connection



Software Activation

Access Level: User

Menu: Network Config

Sub Menu: Web Server Settings

Enable the Inlet, Outlet Flow Rate Sensor or both.
(Button toggles between Enabled and Disabled)

Once the sensor(s) has been enabled, the 4...20mA scaling must be set.

Press **Webserver Settings** button

If you wish to use automatically generated settings, press **the drop down** button next to **Mac ID**.

Select **Auto** from the drop down menu.

The IP address, Subnet Mask and Gateway address will automatically populate itself.

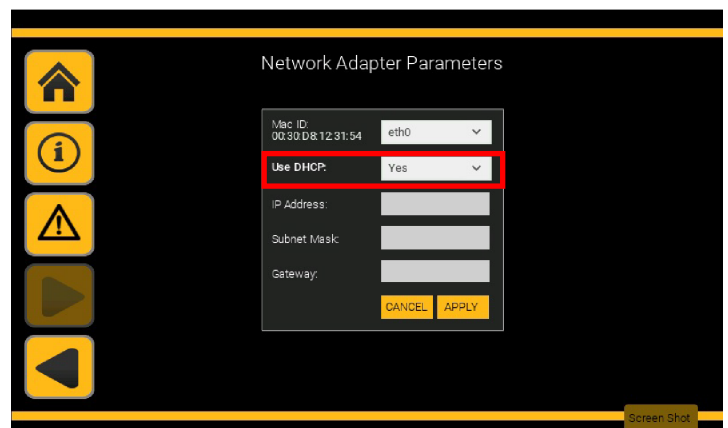
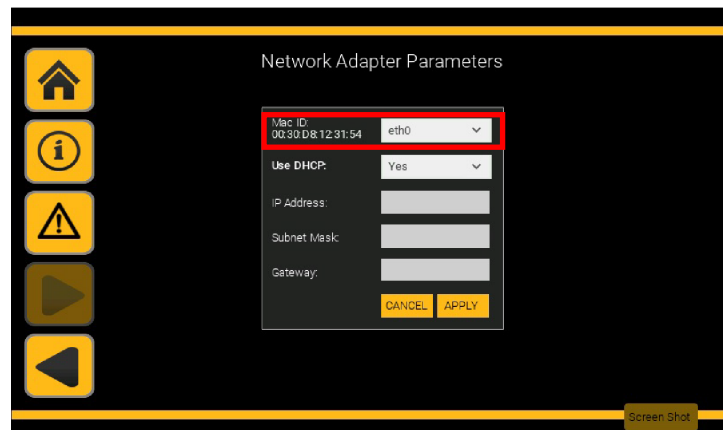
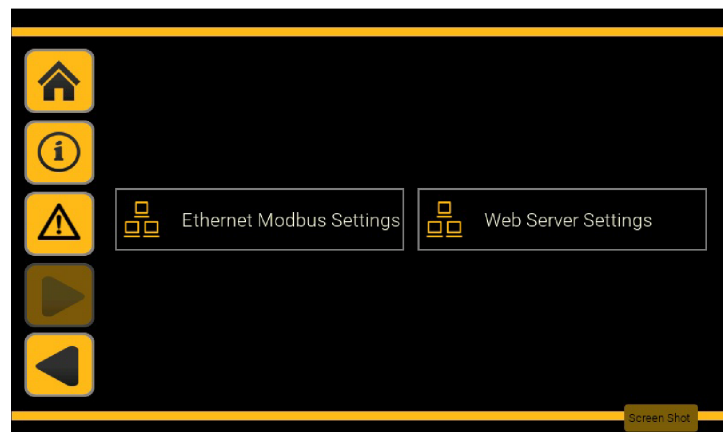
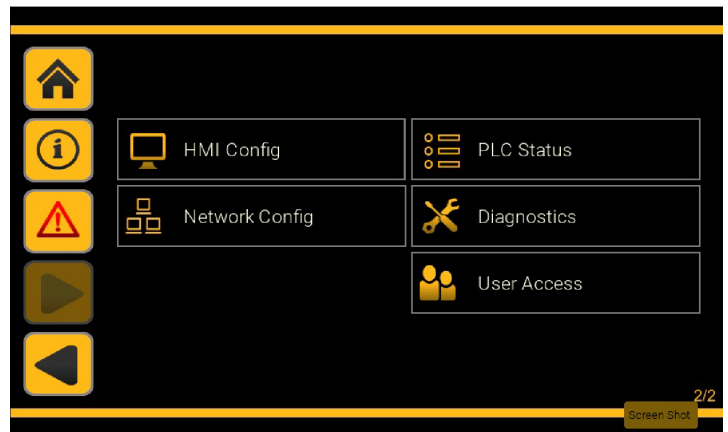
Press **Apply**.

Note: You will need the IP Address to access Webserver.

If you wish to manually enter your own settings, press **the drop down** button next to **Use DHCP**.

Select **No** from the drop down menu.

Enter your own IP address, Subnet Mask and Gateway address and press Apply.



ACCESSING WEBSERVER

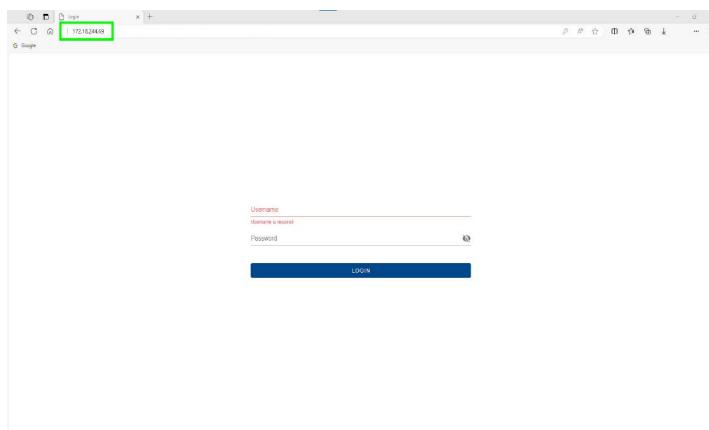
On a PC connected to the same LAN, open a web browser.

Enter the generators IP address into the browser bar

When prompted enter the username and password

Username: user

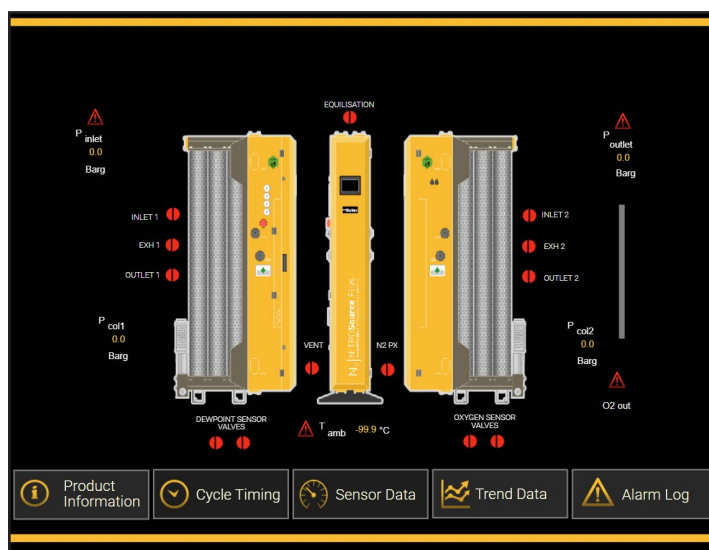
Password: PARKER-User24



Once connected to the Webserver, the P&ID will be displayed.

The P&ID will allow the user to view the current status of the generator including sensor data and valve position (open / closed).

The 5 tabs below the P&ID image will provide further information.



Clicking the **Product Info** tab will open the generator info Page 1.

This page will display:

- Part Number
- Start-up Mode
- Operating Pressure
- O2 Sensor Type
- Target Purity
- Timing Mode
- Flow Rate
- EST Efficiency
- Controller Hardware Revision
- PLC Software Revision
- HMI Software Revision
- Serial Number



Clicking the Right Arrow will take the user to Dryer Info Page 2

This page will display the service timers for each individual service requirement.

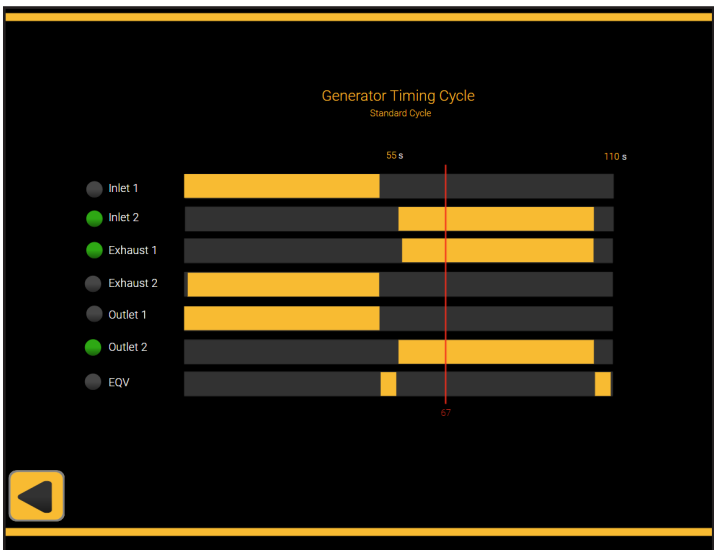
Note: Clicking on a box showing temperature will toggle between °C and °F and Clicking on a box showing pressure will toggle between bar(g) and psi(g).



Clicking the **Cycle Timing** tab will open the Cycle Timing page.

This page will display the position in the nitrogen generation cycle and indicate if a valve is open or closed.

The image shows the cycle timing page when in standard cycle.

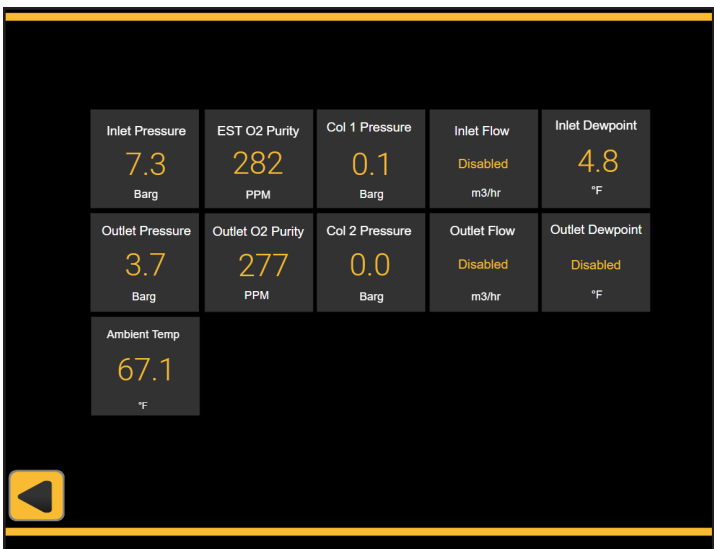


Clicking the **Sensor Data** tab will open the Sensor Data page.

This page will display the real time values of any sensors fitted to the generator system.

As Standard, the nitrogen generators are fitted with:

- Ambient Temperature Sensor
- Inlet Pressure Sensor
- Outlet Pressure Sensor
- Column 1 Pressure Sensor
- Column 2 Pressure Sensor
- Outlet O2 Sensor

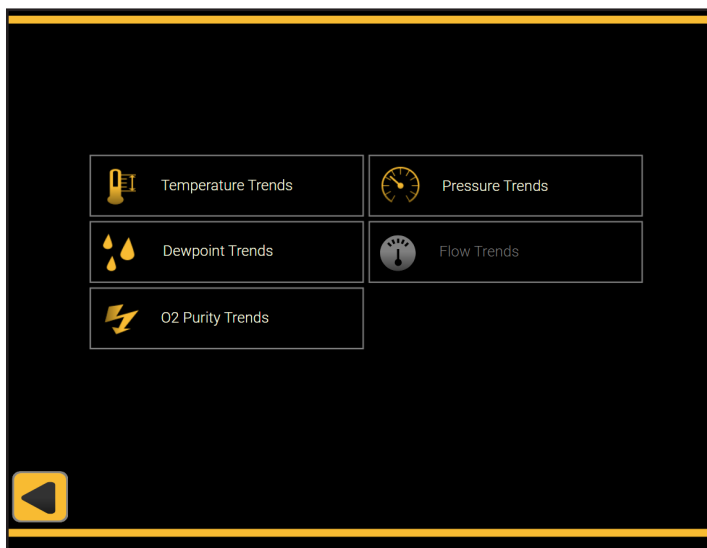


Clicking the **Trend Data** tab will open the Trend Data page.

The trend data logs are available for:

- Temperature
- Pressure
- Dewpoint
- Flow
- O2 Purity

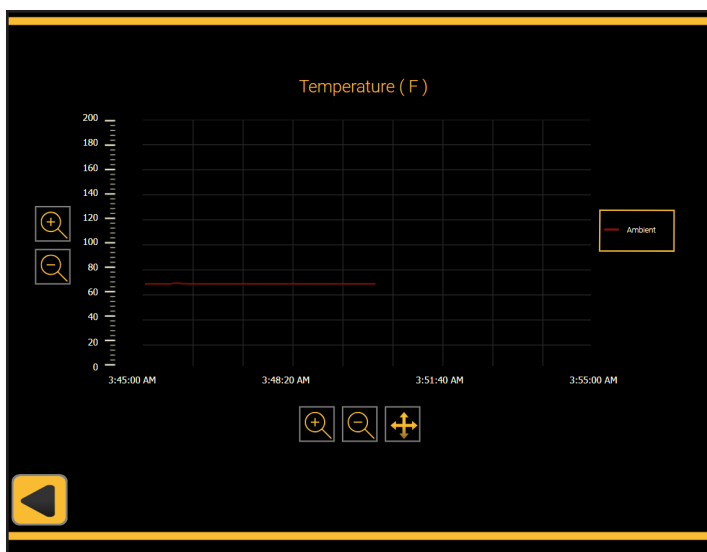
These can be viewed by clicking the required tab.



The Temperature Trends Tab will display a graph for all connected temperature sensors.

Standard Sensors

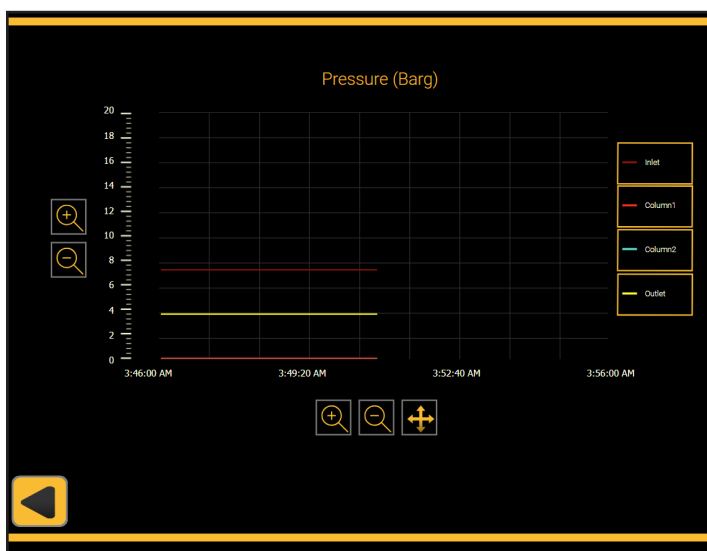
- Ambient Temperature



The Pressure Trends Tab will display a graph for all connected pressure sensors.

Standard Sensors

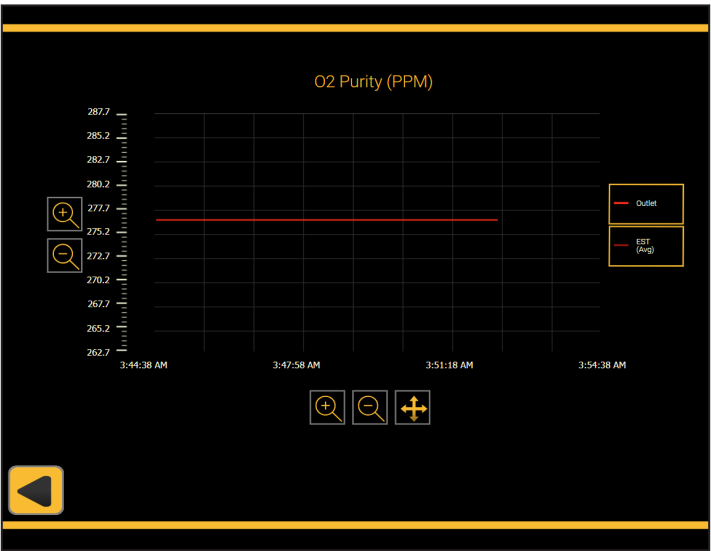
- Inlet Pressure
- Outlet Pressure
- Column 1 Pressure
- Column 2 Pressure



The Dewpoint Trends Tab will display a graph for the optional dewpoint sensors.

Optional Sensors

- Inlet Dewpoint
- Outlet Dewpoint



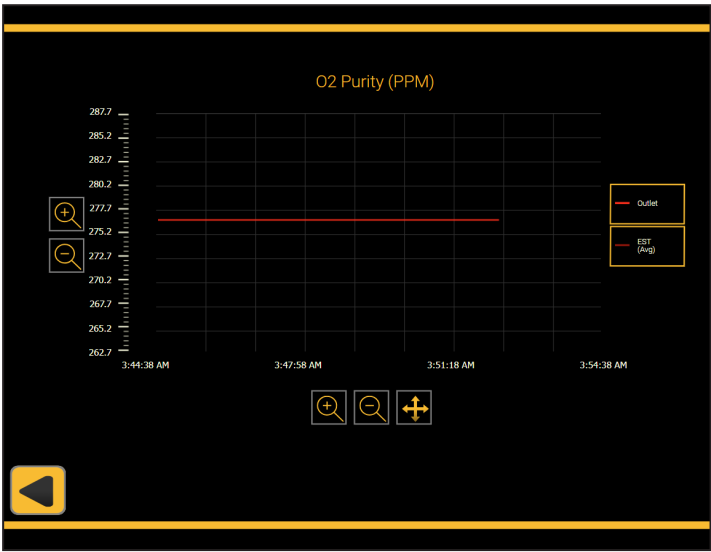
The O2 Purity Trends Tab will display a graph for the O2 Purity sensors.

Standard Sensor

- Outlet O2 Purity

Optional Sensors

- Energy Saving Technology (EST)



Clicking the Alarm Log Tab will open the Alarm Log page.

This page allows the user to view and download the generators alarm log.

The screenshot shows the "Alarm History - Table" page. It includes a "Refresh" button and a "5 Mins" dropdown menu. Below the table is a "Filter" section with a "Name" dropdown and a search icon. The table has columns for "Timestamp", "Name", "State", and "Value". To the right of the table are icons for a printer and a trash can, and a "Download" button at the bottom right. A back arrow is at the bottom left.

Timestamp	Name	State	Value
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MODBUS TCP/IP CONNECTION

The NITROSource Plus units have the ability to provide simultaneous remote communications via a Webserver and / or MODBUS TCP/IP.

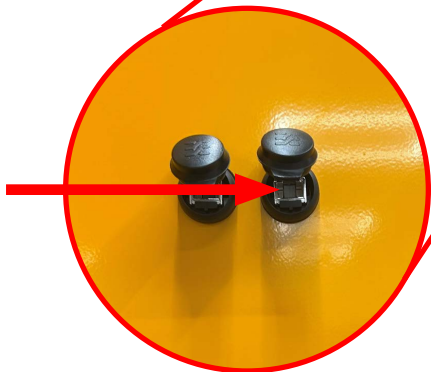
The Webserver connection is provided by the HMI touch screen and requires connection to a Local Area Network (LAN) using an RJ45 Ethernet connection located on the side of the generator.

Connecting to the Generator

Located on the left side of the process enclosure you can find two RJ45 Ethernet ports, one dedicated to Webserver and the other for Modbus TCP/IP communications.

- Connect a suitable Ethernet to Local Area Network
- Route the Ethernet cable to the generator
- Connect the Ethernet cable into the RJ45 port on the right of the process enclosure (circled in picture)
- The generator HMI touch screen is now electrically connected for the Modbus TCP/IP function
- A static IP address should be applied to the MODBUS communication channel in the controller software

Webserver
RJ45 Connection



Default MODBUS Settings

Each unit (master & slaves) on the MODBUS network must have matching communication settings and a unique unit identification (ID). The default MODBUS settings for the NITROSource Plus controller are shown below.

DEFAULT MODBUS SETTINGS

Baud Rate	19200
Number of Data Bits	8
Parity	None
Number of Stop Bits	1
Modbus Unit ID (Node)	100

MODBUS STRINGS

Available via Controller Screen	Variable Type	Read / Write Type	Modbus Address
Machine Status	Boolean	Read Only	0896
Inlet Valve 1 Status	Boolean	Read Only	9158
Inlet Valve 2 Status	Boolean	Read Only	9159
Exhaust Valve 1 Status	Boolean	Read Only	9160
Exhaust Valve 2 Status	Boolean	Read Only	9161
Vent Valve Status	Boolean	Read Only	9166
Process / Outlet Valve Status	Boolean	Read Only	9165
Primary O2 Alarm Status	Boolean	Read Only	9171
Secondary General Alarm Status	Boolean	Read Only	9172
Purge Economy Status	Boolean	Read Only	9173
External O2 Alarm Input Status	Boolean	Read Only	9153
EST Activation Status	Boolean	Read Only	9268
Economy Activation Status	Boolean	Read Only	9259
Inlet Pressure Reading	Real / Float	Read Only	9014
Outlet Pressure Reading	Real / Float	Read Only	9020
Column 1 Pressure Reading	Real / Float	Read Only	9016
Column 2 Pressure Reading	Real / Float	Read Only	9018
Ambient Temperature Reading	Real / Float	Read Only	9002
Inlet Dewpoint Reading	Real / Float	Read Only	9026
Outlet Dewpoint Reading	Real / Float	Read Only	9028
Inlet Flow Rate Reading	Real / Float	Read Only	9032
Outlet Flow Rate Reading	Real / Float	Read Only	9034
Outlet O2 Reading	Real / Float	Read Only	9000
EST O2 Reading	Real / Float	Read Only	8998
Model	String	Read Only	16384
Serial Number	String	Read Only	16395
Software Revision	String	Read Only	16385
Remote Start / Stop	Boolean	Write	9150

START UP & SHUTDOWN PROCEDURE

START UP PROCEDURE



Warning

Only competent personnel trained, qualified, and approved by Parker Hannifin should perform installation, commissioning, service and repair procedures.

1. Inspect all of the system connection points and verify that they are secure.
2. With both the inlet and outlet ball valves of the buffer vessel closed, open the ball valve on the air inlet port to allow the compressed air into the generator.
3. Switch the electrical power on to the generator and wait whilst it runs through the controller initialisation routine.
4. If the generator was in standby mode when the electrical power was removed it will default to standby mode on completion of the initialisation routine.
5. Press to initiate the start up routine.

If the start clean up option is enabled the generator will run through the Rapid Cycle before opening the buffer valve and the N₂ outlet valve. The clean up cycle, which takes approximately 160 seconds, is designed to clean the CMS bed of impurities, bring the generator up to production purity more rapidly, and prevent poor quality gas flowing into the buffer.

IMPORTANT NOTE: Any nitrogen generator operating at 5ppm, 10ppm or 50ppm may require a longer duration of operation before the outlet purity falls within desired specification.

If the generator was running when the electrical power was removed (e.g. power failure) it will automatically run through a start up cycle (if enabled) and then commence normal operation. Wait until this cycle is complete and the menu displays "Running". This may take several minutes for high purity generators.

6. Partially open the ball valve on the inlet to the buffer vessel to allow it to pressurise slowly. When the pressure gauge on the buffer vessel reads within 0.5 barg (7psig) of the inlet pressure, check for leaks in the buffer vessel inlet piping and then fully open the ball valve.
7. Open the ball valve on the outlet of the buffer vessel and check for leaks in the piping between the vessel and the generator.
8. Open the ball valve on the Nitrogen outlet.

If the purity of the gas is not within specification it will be vented to atmosphere through a vent solenoid within the generator and not delivered to the application. When the required purity is achieved the vent valve will close and the process valve will open delivering gas to the application.

SHUTDOWN PROCEDURE



Warning

Only competent personnel trained, qualified, and approved by Parker Hannifin should perform installation, commissioning, service and repair procedures.

1. Close the ball valve on the N2 Outlet port.
2. Press the Stop button on the HMI touch screen.
3. The generator will complete the current cycle and then exhaust both beds, this will take approximately 40 seconds.
- 4.
5. When the generator is depressurised it will revert to standby mode.

Important Note:

A small amount of air may be trapped between the inlet isolation valve and the dryer inlet.

Emergency Shut-down

In the event of an emergency the system can be shut-down using the electrical isolator switch located on the side of the dryer control enclosure.

Activating this switch disconnects the electrical power to the dryer and the pump.

COMMISSIONING

During the commissioning, features will need to be Enabled / Disabled / Configured to suit the installation. Incorrect set up can lead to damage of the product, therefore this product must only be installed and commissioned by a Parker trained engineer.

IMPORTANT NOTES:

- Parker will not be held responsible for any damages relating to incorrect configuration by non-trained personnel.
- Incorrect set up will invalidate warranty.

To set up the product, the commissioning engineer must be familiar with the software menu structure and operation. Commissioning set up requires service access level 1.

Service Level Passwords are provided to trained engineers following completion of service training and are provided via the Parker GSFE TechNet site. Contact Parker GSFE Technical Support Group for further information.

Prior to being able to start the generator for the first time, the commissioning engineer will need to review and answer select questions which pop up on the generator touch screen.

During the first Start-up of the generator, the commissioning engineer will be prompted with various questions before enabling the Start button.

The questions asked are:

1. Commissioning Engineer Name
2. Distributor Company Name
3. Site Location Company Name
4. Have all installation checks and instructions been considered as detailed within the user guide?
5. Is the generator to be started with the settings detailed on the rating label?
6. If the original settings are to be changed, have the critical calibrated components been correctly adjusted?
7. Is the generator part of a multi-bank installation?
8. As detailed on the rating label, is the correct inlet pressure available and seen on the pressure gauge?
9. Is the O2 purity alarm being changed, if yes to what value?
10. Is the remote start/stop feature being used?
11. Is the purge economy feature being used?
12. are any external alarm signals being used which may affect the performance of the generator?
13. Is Modbus TCP/IP being used?
14. Is Webserver being used?
15. Have you discussed the preventative maintenance schedules with the end user as detailed within the user guide?
16. Have you discussed the daily, weekly & monthly checks that are required as detailed within the user guide?

The screenshot shows a commissioning screen with a sidebar on the left containing icons for Home, Information, Warning, Play, and Previous. The main area contains a list of questions and answers. The questions are: 'Commissioning engineer name:', 'Distributor company name:', 'Site location company name:', 'Have all installation checks & instructions been considered as detailed within the user guide?', 'Is the generator to be started with the settings detailed on the rating label?', 'If the original settings are to be changed, have the critical calibrated components been correctly adjusted?', 'Is this generator part of a multi-bank installation?', and 'As detailed on the rating label, is the correct inlet pressure available and seen on the pressure gauge?'. The answers are: 'owen scorfer', 'ogs', 'parker', 'YES', 'YES', 'YES', 'YES', and 'YES'. At the bottom, there is a 'Screen Shot' button, a 'Unit: Ser No.' label, and 'Next' and 'Close' buttons.

Commissioning engineer name:	owen scorfer
Distributor company name:	ogs
Site location company name:	parker
Have all installation checks & instructions been considered as detailed within the user guide?	YES
Is the generator to be started with the settings detailed on the rating label?	YES
If the original settings are to be changed, have the critical calibrated components been correctly adjusted?	YES
Is this generator part of a multi-bank installation?	YES
As detailed on the rating label, is the correct inlet pressure available and seen on the pressure gauge?	YES

Screen Shot Unit: Ser No. Next Close

OXYGEN ANALYSER CALIBRATION

CALIBRATION PROCESS

Whether the generator is fitted with the Zirconia or Electrochemical Oxygen Analyser, the calibration process remains the same. If an Electrochemical Oxygen Analyser is fitted then we recommend the sensor is checked 3 months and calibrated if needed/. If a Zirconia Oxygen Analyser is fitted then we recommend the sensor is checked 12 months and calibrated if needed. Calibration intervals are as per manufacturers recommendations and should be used as a guide only, if the gas produced by the generator is considered critical to the process then it is recommended to carry out the calibration more frequently.

If the generator is a low purity machine (3%, 2%, 1% or 0.5% purity) then it is possible to use a standard compressed air source to calibrate the sensor althoughn this is not recommended if the gas is considered critical to the process.

If the sensor is fitted to a High or Ultra High purity machine (0.1%, 500ppm, 250ppm, 100ppm, 50ppm, 10ppm or 5ppm purity) then a suitable calibration gas should be used. It is recommended to use a calibration gas as close to the production gas/purity of the generator as possible (minimum of 50ppm) and should not exceed 7.0 bar(g) (101.5 psi(g)) pressure.

NOTE: If the generator is fitted with the optional Energy Saving Technology (EST) then it is recommended both sensors are calibrated at the same time.

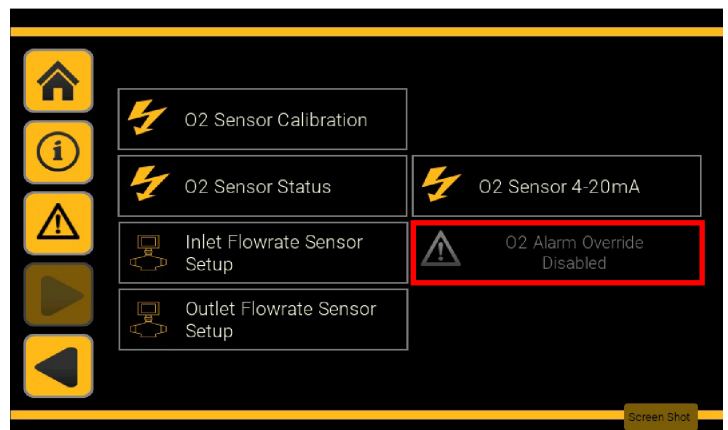


Warning

Only competent personnel trained, qualified, and approved by Parker Hannifin should perform installation, commissioning, service and repair procedures.

1. Navigate to the **User Access** menu page and enter the **Service level 1** password
2. Once logged in, return to the main menu and access the **Sensor Setup** menu
3. Enable the O2 Alarm Override

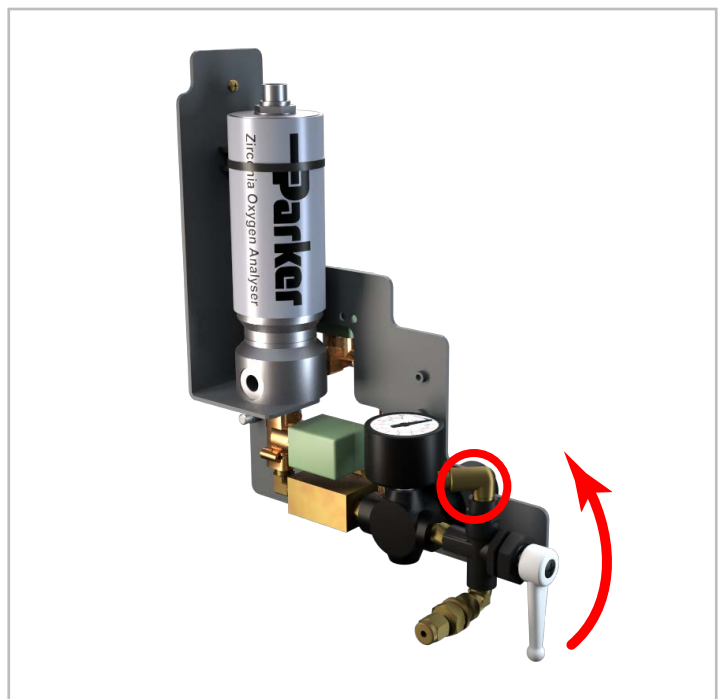
NOTE: While the O2 Alarm Override is active, the O2 alarms will be ignored and the generator will continue to cycle under normal operation



4. Connect the calibration gas to the Calibration Port located on the analyser assembly (see image below)

NOTE: The calibration port will be blanked off and a suitable fitting will need to be installed to connect the calibration gas (1/8" BSPT Port)

5. Rotate the 3 way ball valve handle clockwise so that it is pointing upwards towards Calibration (as indicated on the calibration label)
6. Wait approximately fifteen minutes for the O2 analyser reading to stabilise



7. Navigate to the O2 Sensor Calibration menu and enter the purity of the calibration gas.

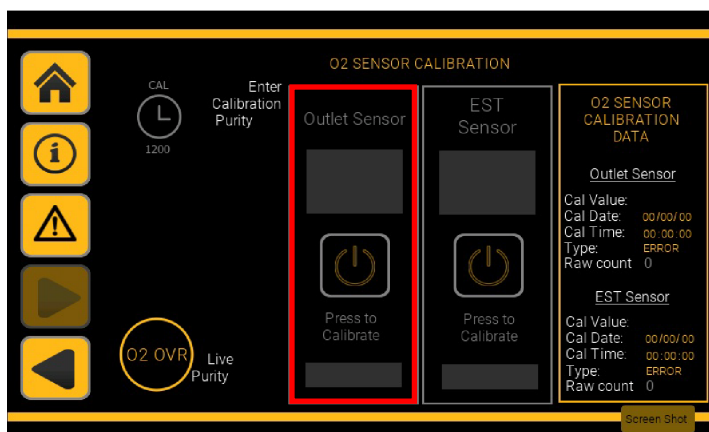
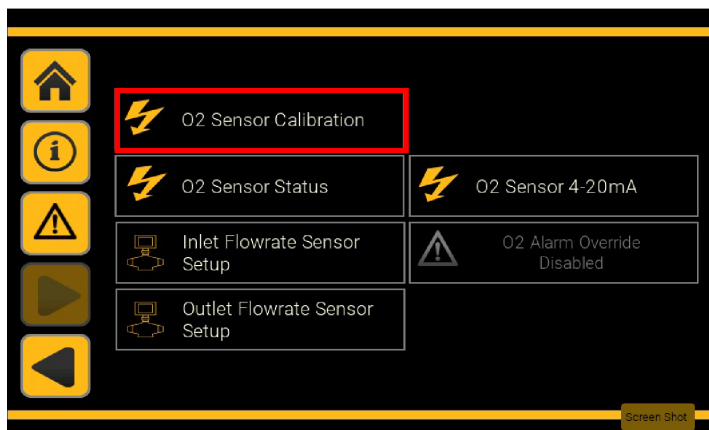


8. Press the calibrate button to send the calibration level to the O2 Analyser. On successful completion of the calibration the new O2 reading will be shown in the box below

If the calibration is not successful the original reading from the analyser will be loaded. Should this occur repeat the above steps

NOTE: Repeat all steps for the EST sensor (if fitted)

9. On completion of the calibration, return the ball valves back to their original position and remove the regulated calibration gas supply as applicable
10. Navigate back to the Sensor Setup menu and disable the O2 Alarm Override.
11. When returning to the main operating menu, "CAL" will be shown on the display. This will remain for a period of twenty minutes after the calibration. Throughout this time period the O2 alarm is overridden, to allow the sensor(s) to return to the required level



PREVENTATIVE MAINTENANCE

SERVICE INTERVALS

Description of Service Required		Service Recommended Every:									
No.	Operation	Daily	Weekly	Monthly	3 Months	6 Months	12 Months	24 Months	36 Months	48 Months	60 Months
1.0	Check POWER ON and STATUS / FAULT indicators.										
2.0	Check for air leaks.										
3.0	Check the pressure gauges during purging for excessive back pressure.										
4.0	Check the condition of electrical supply cables and conduits.										
5.0	Check cyclic operation.										
6.0	Calibrate Electrochemical Oxygen Analyser (if fitted)										
7.0	Replace Electrochemical Oxygen Analyser Cell (if fitted)										
8.0	Calibrate Zirconia oxygen analyser										
9.0	Replace Zirconia oxygen analyser (if fitted)										
10.0	Replace exhaust silencer element(s)										
11.0	Replace buffer vessel filter element and float drain.										
12.0	Replace Inlet Dewpoint Hygrometer transmitter (if fitted)										
13.0	Replace Outlet Dewpoint Hygrometer transmitter (if fitted)										
14.0	Check Operation of 5/2 Valves & Replace if Required										
15.0	Replace control valves, cylinders and sealing discs										

Key

	Check
	Recommended Service

CLEANING

Clean the equipment with a damp cloth only and avoid excessive moisture around any electrical sockets. If required you may use a mild detergent, however do not use abrasives or solvents as they may damage the warning labels on the equipment.

Service Kits

CATALOGUE NUMBER	DESCRIPTION	TO SUIT MODELS	12	24	36	48	60	QTY
M12.EXH.0001	Exhaust Silencer & Filter Element Replacement	NSP-020 to 090	✓	✓	✓	✓	✓	1
M12.EXH.0002	Exhaust Silencers & Filter Element Replacement	NSP-100 to 120	✓	✓	✓	✓	✓	1
M12.EXH.EST.0001	Exhaust Silencer, Filter Element & EST Filter Replacement	NSP 020 to 090	✓	✓	✓	✓	✓	1
M12.EXH.EST.0002	Exhaust Silencer, Filter Element & EST Filter Replacement	NSP-100 to 120	✓	✓	✓	✓	✓	1
M12.PDP.0001	Inlet/Outlet Dewpoint Replacement	NSP-020 to 120	✓	✓	✓	✓	✓	1
M24.EPPM.0001	Electrochemical PPM Cell Replacement	NSP-020 to 120		✓		✓		1
M60.VOH.0001	Pilot & Control Valves Overhaul	NSP-020 to 090					✓	1
M60.VOH.0002	Pilot & Control Valves Overhaul	NSP-100 to 120					✓	1
M60.ZPPM.0001	Mini-Zirconia PPM Analyser Replacement	NSP-020 to 120					✓	1
M60.ZPCT.0001	Mini-Zirconia PCT Analyser Replacement	NSP-020 to 120					✓	1

Catalogue Number	Description	To Suit Model	Kit Contents	Qty
M12.EXH.0001	Exhaust Silencer & Filter Element Replacement	NSP-020 to 090	Exhaust Silencer Core	1
			Dry Particulate Filter Element	1
M12.EXH.0002	Exhaust Silencers & Filter Element Replacement	NSP-100 to 120	Exhaust Silencer Core	3
			Dry Particulate Filter Element	1
M12.EXH.EST.0001	Exhaust Silencer, Filter Element & EST Filter Replacement	NSP-020 to 090	Exhaust Silencer Core	1
			Dry Particulate Filter Element	1
			EST In-line Filter	1
M12.EXH.EST.0001	Exhaust Silencers, Filter Element & EST Filter Replacement	NSP-100 to 120	Exhaust Silencer Core	1
			Dry Particulate Filter Element	1
			EST In-line Filter	1
M12.PDP.0001	Inlet/Outlet Dewpoint Replacement	NSP-020 to 120	Dewpoint Hygrometer	1
M24.EPPM.0001	Electrochemical PPM Cell Replacement	NSP-020 to 120	Electrochemical PPM Cell	1
M60.VOH.0001	Pilot & Control Valve Overhaul	NSP-020 to 090	5/2 Pilot Valves	7
			Inlet/Outlet Cylinders and Seals	4
			Exhaust Cylinders and Seals	2
			Process Control Valves	2
M60.VOH.0002	Pilot & Control Valve Overhaul	NSP-100 to 120	5/2 Pilot Valves	7
			Inlet/Outlet Cylinders and Seals	4
			Exhaust Cylinders and Seals	2
			Process Control Valves	2
M60.ZPPM.0001	Mini-Zirconia PPM Analyser Replacement	NSP-020 to 120	Mini-Zirconia ppm Oxygen Analyser	1
M60.ZPCT.0001	Mini-Zirconia PPM Analyser Replacement	NSP-020 to 120	Mini-Zirconia ppm Oxygen Analyser	1

[illegible]

EU Declaration of Conformity

EN

Parker Hannifin Manufacturing Limited GSFE
Dukesway, Team Valley Trading Estate, Gateshead, Tyne & Wear, NE11 0PZ, UK

Nitrosource N2 Nitrogen Generator

NSP-20 to NSP-120

Directives	PED	2014/68/EU
	LVD	2014/35/EU
	EMC	2014/30/EU

PED Generally in accordance with ASME VIII Division 1 : 2023

Standards used	LVD	EN 61010-1 : 2010 / A1:2019
	EMC	EN 61326-1 : 2013

PED Assessment Route: Module B + D

PED Certificate Number 50351

Notified body for PED: Notified Body Number: 0525
LRQA Deutschland GmbH
Curienstraße 1,
D-20095 Hamburg, Deutschland

Authorised Representative Steven Rohan
Division Engineering Manager,
Parker Hannifin Manufacturing Limited GSFE

Declaration

This declaration of conformity issued under the sole responsibility of the manufacturer and the essential safety requirements have been demonstrated and fulfilled as set out in Annex 1

Signature:



Date: 07 August 2024

Declaration Number:
00331 / 7.8.24

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