

nano



User Guide

GEN2 i4.0 nitrogen gas generator

revision: 2022-059 document: 17-100-0145

www.n-psi.co.uk



Experience.

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



Customer.

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



Service.

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



Experience. Customer. Service.

table of contents

section	description	page
1	1.1 general information	4
	1.2 manufacturer details and support	4
	1.3 document introduction	5
	1.4 warranty guidelines	5
	1.5 packaging	5
	1.6 general safety	5
	1.7 intended use of product	5
	1.8 safe handling	6
	1.9 technical description	6
2	2.1 specification	7
	2.2 sizing	8
	2.3 product dimensions	9
	2.4 product overview	10
	2.5 typical system layout	11
	2.6 site location and installation	12
	2.7 electrical installation	13
	2.8 remote start/stop control	14
	2.9 remote alarms & dryer control	15
3	3.1 user interface	16/17
	3.2 start-up procedure	18
	3.3 shutdown procedure	18
	3.4 economy	19
	3.5 purity dependent energy saving (PDES)	19
4	4.1 maintenance	20
	4.2 cleaning	20
	4.3 daily checks	20
	4.4 % purity generator service schedule	21
	4.5 ppm purity generator service schedule	21
	4.6 service kits	22
	4.7 service record	23
	4.8 piping and instrumentation diagram	24/25
	4.9 notes	26/27



nitrogen gas generator

1.1 general information

This manual is copyrighted, all rights reserved. It may not, in whole or in part, be copied, photocopied, reproduced, translated, or reduced to any electronic medium or machine readable form without prior consent in writing from nano purification solutions ltd. It may not be distributed through the internet or computer bulletin board systems without prior consent from nano purification solutions ltd.

©2021 Air and Gas Solutions LLC.

range: GEN2 i4.0 PSA nitrogen gas generators
models: GEN2- 1110, 2110, 3110, 2130, 3130, 4130, 6130, 8130, 10130 & 12130
doc no: 17-100-0145
issue: 2022-059

1.2 manufacturers details and support

nano-purification solutions ltd. (Manufacturer)

address: Dukesway,
Team Valley Trading Estate
Gateshead
NE11 0PZ
United Kingdom
telephone: +44 (0) 191 497 7700
internet: www.n-psi.co.uk
e-mail: sales@n-psi.co.uk

nano-purification solutions inc.

address: 509 David Cox Road
Charlotte, NC 28269
USA
telephone: +1 (704) 897-2182
internet: www.n-psi.com
e-mail: support@n-psi.com

nano-purification solutions inc.

address: 7 Petrie Street
St. Catharines,
Ontario
L2P 3J6
Canada
telephone: +1 (905) 684-6266
internet: www.n-psi.com
e-mail: support@n-psi.com

nano-purification solutions GmbH

address: Maastrichter Straße 12
D-41812 Erkelenz
Germany
telephone: +49 2151 4828 418
internet: www.n-psi.de
e-mail: sales@n-psi.de



annotations



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



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



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

nitrogen gas generator



1.3 document introduction

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

1.4 warranty guidelines

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

1.5 packaging

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

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



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

1.6 general safety

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



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

1.7 intended use of the product

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

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



This product is designed to operate at a maximum operating pressures of between 6 to 12 barg (87 to 174 psig). It is not suitable for pressures in excess of 12 barg (174 psig) although a higher pressure system is available upon request.



nitrogen gas generator

1.8 safe handling

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



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

1.9 technical description

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

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

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

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

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

nitrogen gas generator



2.1 specification

specifications	standard	optional
recommended inlet air quality	ISO class 2.2.1	-
max. water content (ISO class)	class 2 -40°C (-40°F) pdp	-
min. operating pressure	6 barg (87 psig)	-
max. operating pressure	12 barg (174 psig)	16 barg (232 psig)
recommended operating temp range	20...25°C (68...77°F)	-
min./max. operating temperature range	5...50°C (41...122°F)	-
supply voltage	85...264V AC	-
fuse rating	3A 'T'	-
frequency	50...60Hz	-
max. power consumption	72W	-
IP rating	IP31 (NEMA 2)	-

model	connections			
	compressed air inlet	to buffer vessel	from buffer vessel	nitrogen outlet
GEN₂ i4.0 - 1110				
GEN₂ i4.0 - 2110				
GEN₂ i4.0 - 3110				
GEN₂ i4.0 - 2130				
GEN₂ i4.0 - 3130				
GEN₂ i4.0 - 4130	1" BSPP or NPT	1" BSPP or NPT	1/2" BSPP	1/2" BSPP
GEN₂ i4.0 - 6130				
GEN₂ i4.0 - 8130				
GEN₂ i4.0 - 10130				
GEN₂ i4.0 - 12130				

symbol	description	symbol	description
	always take caution while using the equipment		ear protection recommended
	beware, pressurised component(s)		the generator can be controlled remotely and may start without warning
	risk of electric shock		use a fork lift to move the nitrogen generator
	always read the user manual before operating the equipment		



nitrogen gas generator

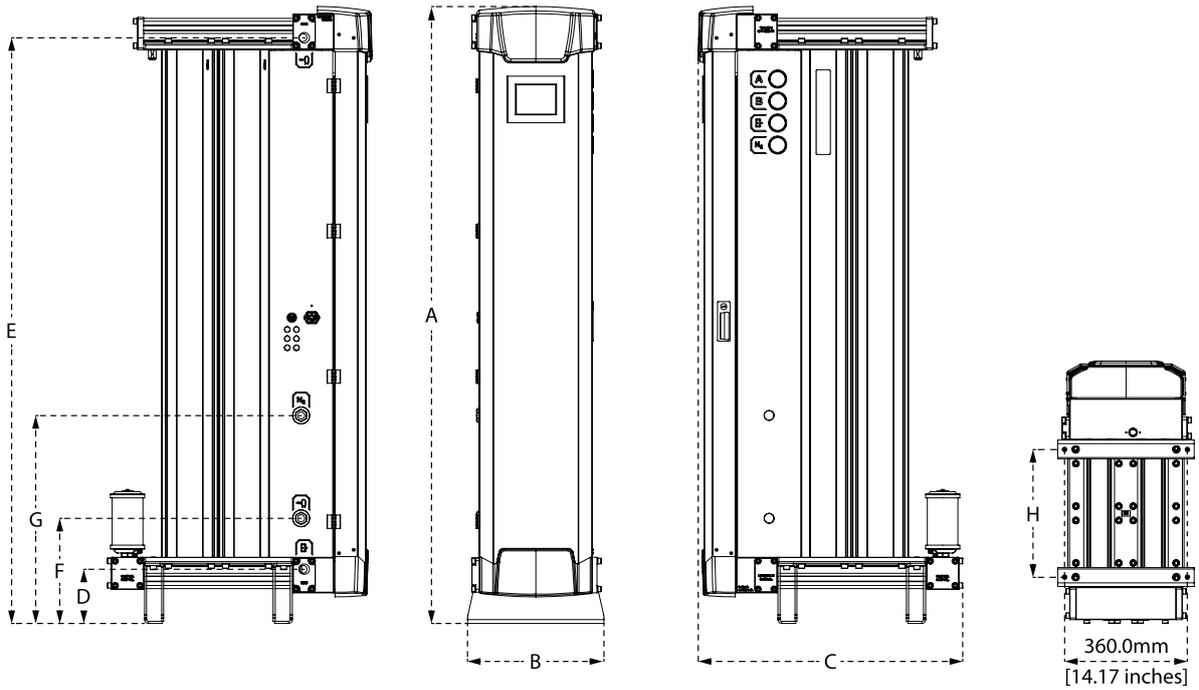
2.2 sizing

purity		model											
		1110	2110	3110	2130	3130	4130	6130	8130	10130	12130		
5%	Nm3/h	10.3	20.6	30.9	37.5	56.3	75.0	112.5	150.0	172.5	200.3		
	SCFH	363	727	1091	1324	1988	2648	3972	5297	6091	7073		
4%	Nm3/h	9.5	19.0	28.5	34.5	51.8	69.0	103.5	138.0	158.7	184.2		
	SCFH	335	670	1006	1218	1829	2436	3655	4873	5604	6504		
3%	Nm3/h	8.3	16.7	25.0	30.3	45.5	60.6	90.9	121.2	139.4	161.8		
	SCFH	293	589	882	1070	1606	2140	3210	4280	4922	5713		
2%	Nm3/h	7.3	14.5	21.8	26.4	39.6	52.8	79.2	105.6	121.4	141.0		
	SCFH	257	512	769	932	1398	1864	2796	3729	4287	4979		
1%	Nm3/h	5.8	11.6	17.3	21.0	31.5	42.0	63.0	84.0	96.6	112.1		
	SCFH	204	409	610	741	1112	1483	2224	2966	3411	3958		
0.5%	Nm3/h	5.2	10.4	15.6	18.9	28.4	37.8	56.7	75.6	86.9	100.9		
	SCFH	183	367	550	667	1002	1334	2002	2669	3068	3563		
0.1%	Nm3/h	3.6	7.2	10.8	13.2	19.8	26.4	39.6	52.8	60.7	70.5		
	SCFH	127	254	381	466	699	932	1398	1864	2143	2489		
500ppm	Nm3/h	3.0	6.0	9.0	11.4	17.1	22.8	34.2	45.6	52.4	60.9		
	SCFH	105	211	317	402	603	805	1207	1610	1850	2150		
250ppm	Nm3/h	2.5	5.0	7.5	10.0	15.0	20.0	30.0	40.0	46.0	53.3		
	SCFH	88	176	264	353	529	706	1059	1412	1624	1882		
100ppm	Nm3/h	2.0	4.0	6.0	8.9	12.6	16.8	25.2	33.6	38.6	44.9		
	SCFH	70	141	211	314	444	593	889	1186	1363	1586		
50ppm	Nm3/h	1.7	3.4	5.1	7.2	10.8	14.4	21.6	28.8	33.1	38.4		
	SCFH	60	120	180	254	381	508	762	1017	1168	1356		
10ppm	Nm3/h	0.9	1.8	2.7	5.1	7.7	10.2	15.3	20.4	23.5	27.2		
	SCFH	31	63	95	180	271	360	540	720	829	960		
		10ppm	50ppm	100ppm	250ppm	500ppm	0.10%	0.50%	1%	2%	3%	4%	5%
air factor		6.8	5.1	4.6	3.6	3.5	3.4	2.8	2.7	2.4	2.2	2.1	2.0
inlet air temperature correction factors													
°C		5	10	15	20	25	30	35	40	45	50		
°F		41	50	59	68	77	86	95	104	113	122		
correction factor		0.80	0.90	0.94	1.00	1.00	0.98	0.95	0.90	0.85	0.72		
pressure correction factors													
barg		6	7	8	9	10	11	12	13	14	15	16	
psig		87	101	116	130	145	159	174	188	203	217	232	
correction factor		0.88	1.00	1.10	1.20	1.30	1.40	1.50	1.50	1.50	1.50	1.50	1.50

nitrogen gas generator



2.3 product dimensions

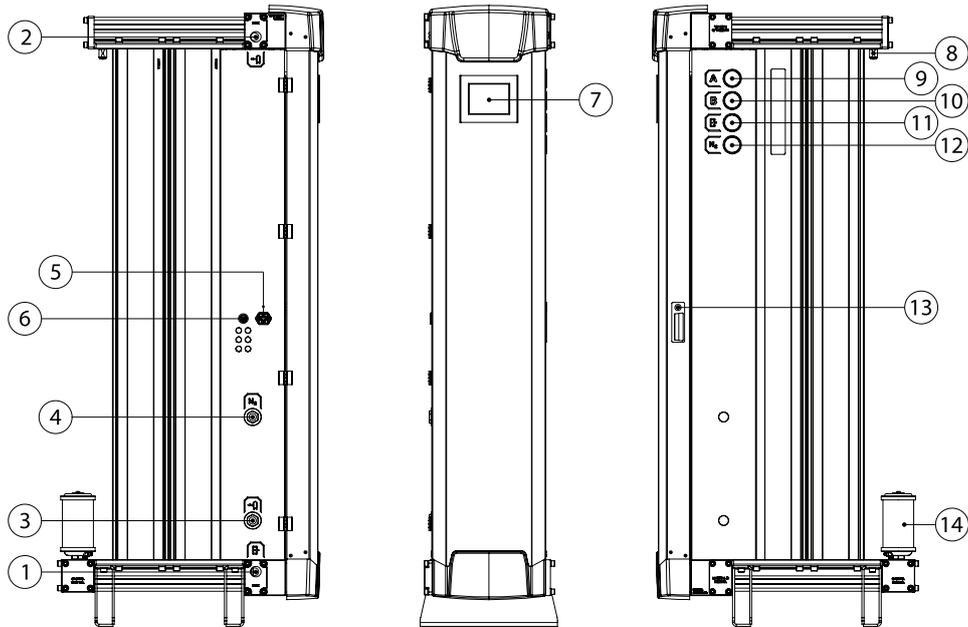


Model	A		B		C		D		E		F		G		H	
	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches
1110	1223	48.15	400	15.75	605	23.82	161	6.34	1131	44.53	266	10.47	377	14.84	211	8.31
2110	1223	48.15	400	15.75	773	30.43	161	6.34	1131	44.53	266	10.47	377	14.84	379	14.92
3110	1223	48.15	400	15.75	941	37.05	161	6.34	1131	44.53	266	10.47	377	14.84	547	21.53
2130	1823	71.77	400	15.75	773	30.43	161	6.34	1731	68.15	311	12.24	615	24.21	379	14.92
3130	1823	71.77	400	15.75	941	37.05	161	6.34	1731	68.15	311	12.24	615	24.21	547	21.53
4130	1823	71.77	400	15.75	1109	43.66	161	6.34	1731	68.15	311	12.24	615	24.21	715	28.15
6130	1823	71.77	400	15.75	1445	56.89	161	6.34	1731	68.15	311	12.24	615	24.21	1051	41.38
8130	1823	71.77	400	15.75	1781	70.12	161	6.34	1731	68.15	311	12.24	615	24.21	1387	54.60
10130	1823	71.77	400	15.75	2117	83.34	161	6.34	1731	68.15	311	12.24	615	24.21	1723	67.84
12130	1823	71.77	400	15.75	2453	96.57	161	6.34	1731	68.15	311	12.24	615	24.21	2059	81.06



nitrogen gas generator

2.4 product overview



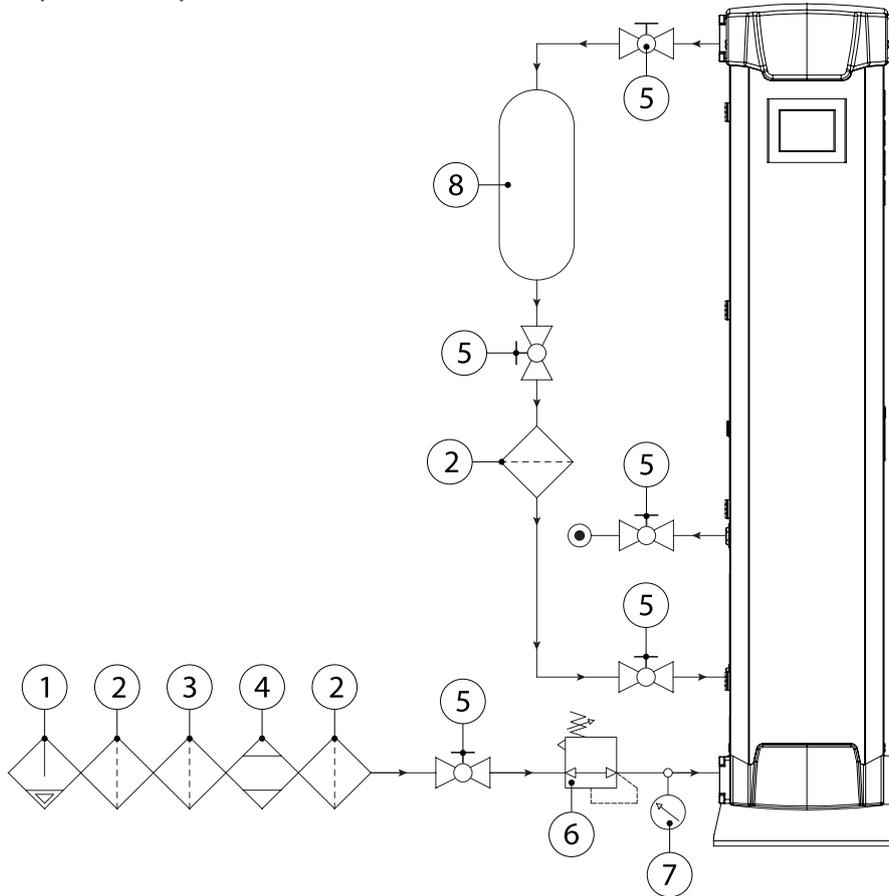
number	description	number	description
1	compressed air inlet	8	purge control
2	to buffer/mixing vessel	9	column A pressure gauge
3	from buffer/mixing vessel	10	column B pressure gauge
4	nitrogen outlet	11	compressed air inlet pressure gauge
5	IEC mains power	12	nitrogen outlet pressure gauge
6	RS485 (Modbus or EthernetIP) (Optional)	13	enclosure panel lock
7	generator interface/display	14	exhaust silencers/mufflers

symbol	description	symbol	description
	compressed air inlet		nitrogen outlet
	to buffer/mixing vessel		column A
	from buffer/mixing vessel		column B

nitrogen gas generator



2.5 typical system layout



number	description	number	description
1	water separator (optional)	5	manual ball valve
2	1 µm filter	6	pressure regulator (optional)
3	0.1 µm filter	7	pressure gauge (optional)
4	desiccant air dryer	8	nitrogen buffer/mixing vessel



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



It is essential that the system into which the product is installed is fitted with a pressure limiting/relief device. This device should be between the compressor and the generator. The device must be set to prevent the maximum working pressure of 12 barg (174 psig) or 16 barg (232 psig) from being exceeded.



nitrogen gas generator

2.6 site location and installation

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

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



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

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

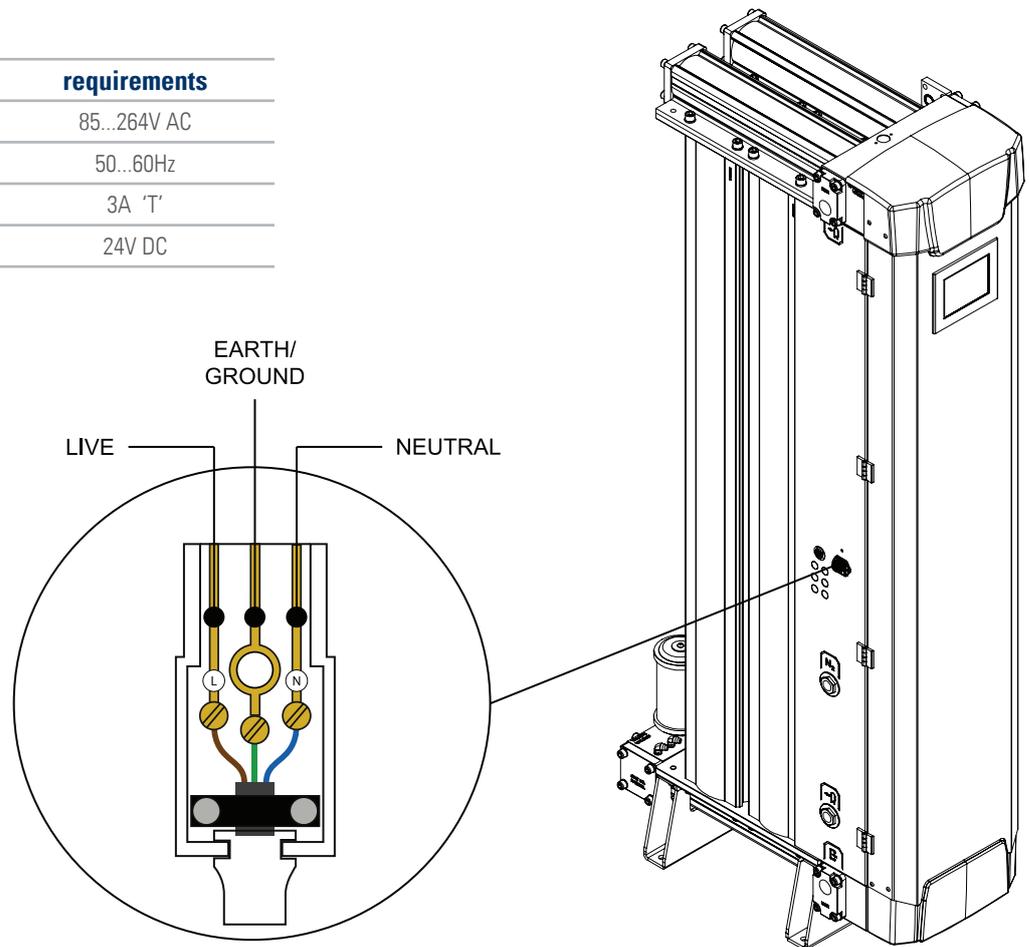
nitrogen gas generator



2.7 electrical installation

Once in position, locate and remove the IEC plug from the side of the generator enclosure. Remove the back of the IEC plug and wire in your desired cable using the diagram below, we recommend using at least 0.75mm² (20AWG) gauge cable although this will vary depending on the cable run length. Each C13 IEC plug is rated to 10A / 250V AC and can accommodate a cable size of up to 1.00mm² (18AWG) .

description	requirements
supply voltage	85...264V AC
frequency	50...60Hz
fuse rating	3A 'T'
operating voltage	24V DC



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



nitrogen gas generator

2.8 remote start/stop control

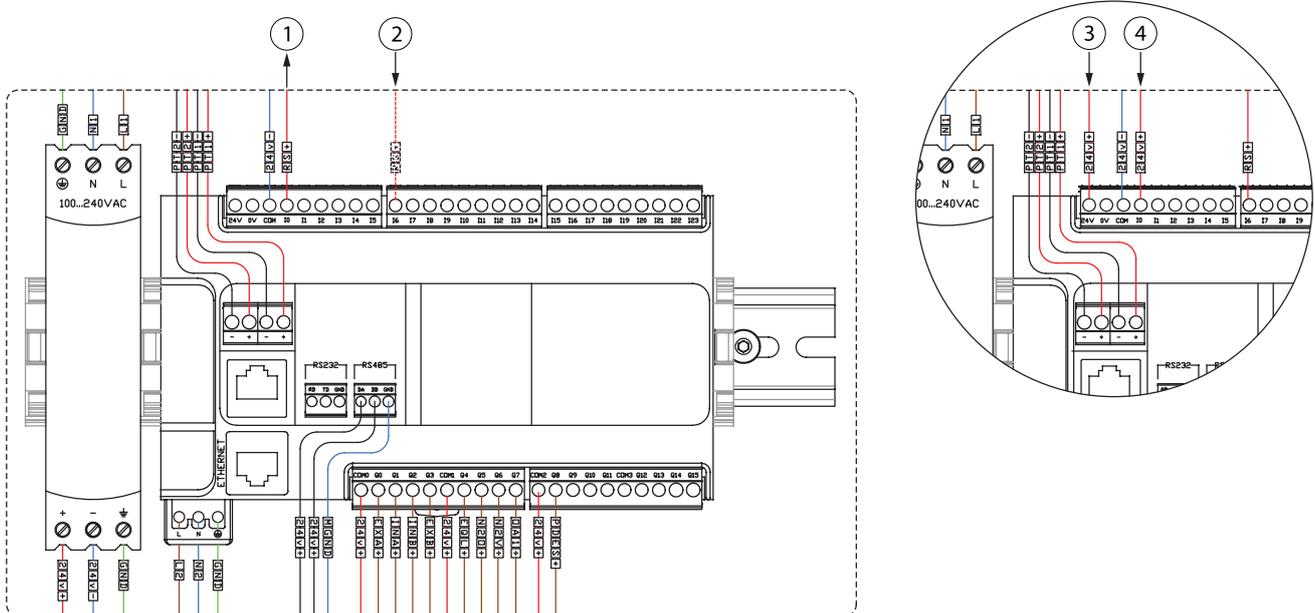
To use the remote start/stop feature, open the enclosure and locate the wire link marked as 'RS' on the PLC (see item No.1 for reference). Remove the wire link from terminal i0 and move it across to redundant terminal i6 (see item No. 2 for reference).

In order to control the generator remotely via the start/stop feature you are required to install an additional two connections. First, an additional wire connection is required into the terminal '24V DC output' (see item No.3 for reference) this must be wired externally to the input of a switch or relay. Once this connection has been made you will need to add an additional connection on the output of the switch or relay, this should then be wired back to the PLC into terminal i0 (see item No.4 for reference).

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



Under no circumstances should an external voltage or current be applied to any of these terminals, as damage to the control system will occur, negating the warranty.

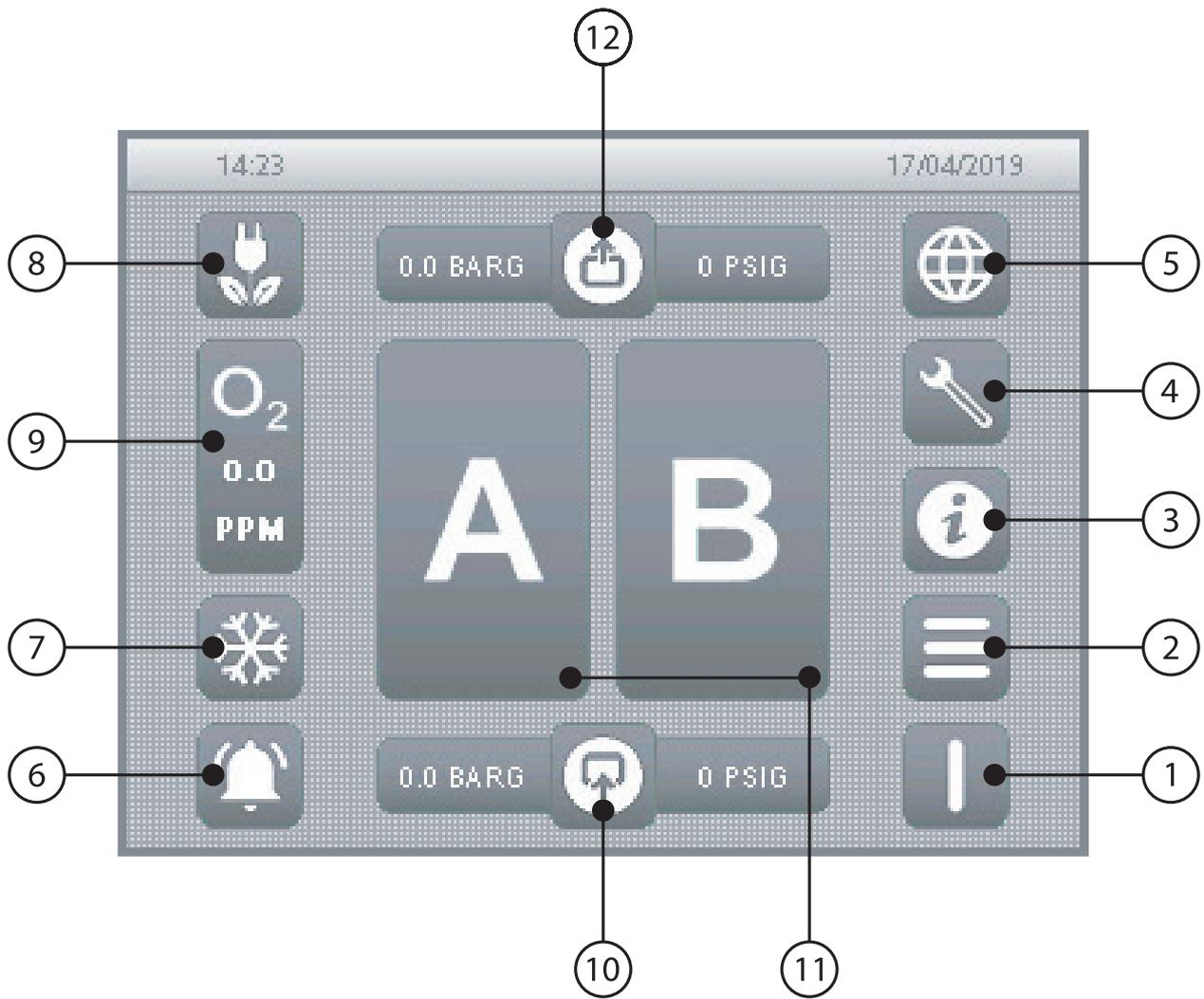




nitrogen gas generator

3.1 user interface quick reference

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



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

nitrogen gas generator



No.	symbol	description
1		start button; the generator is ready to start-up.
		stop button; the generator is ready to shutdown.
2		menu; access to the generator menu structure.
3		general information view the model number, serial number, build date, software version and installation date.
4		service information; access total hours, hours run since last service and service provider details.
		service reminder; the generator will require a service soon.
		service required the generator requires a service.
5		language selection; access to different languages such as french and german.
6		alarm records; access alarm and event logs such as low inlet pressure and high purity alarm.
		alarm records; minor alarm is active.
		alarm records; major alarm is active
7		dew point status; access to inlet or outlet dew point measurement (optional extra)
		flowrate status; access to external flow meter measurement (optional extra)
8		economy; access total hours in economy, percentage savings and total hours in PDES (optional extra)
		economy; the generator is in it's final stage of economy and has shut down.

No.	symbol	description
9		oxygen content; when grey, the generator is in standby.
		oxygen content; when amber, the generator is starting up.
		oxygen content; when green, the nitrogen outlet purity is within specification.
		oxygen content; when red, the outlet purity is out of specification.
10		inlet pressure; no compressed air is detected at the inlet of the generator.
		inlet pressure; the nitrogen generator is starting up.
		inlet pressure; compressed air is detected at the inlet of the generator.
		inlet pressure; low inlet pressure alarm, insufficient compressed air to run the generator.
		column status; when grey, column A and/or B is offline.
11		column status; when amber, column A and B is equalising.
		column status; when green, column A or B is online and producing gas.
12		outlet pressure; the nitrogen outlet valve is closed.
		outlet pressure; the nitrogen outlet valve is open.
		outlet pressure; low outlet pressure alarm.

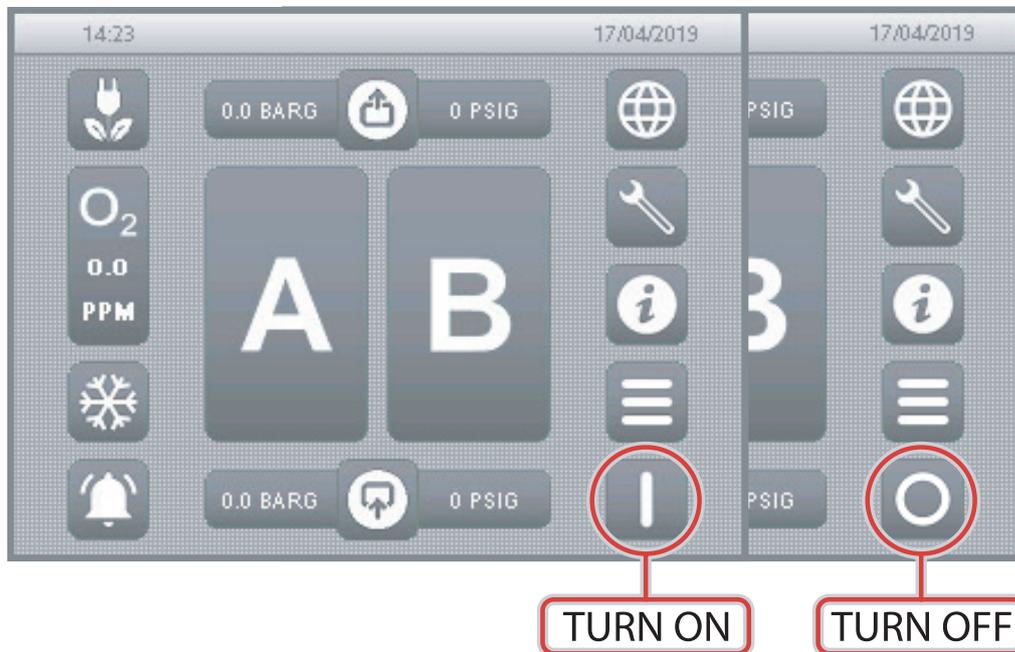


nitrogen gas generator

3.2 start-up procedure

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

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



3.3 shutdown procedure

- Fully close the nitrogen outlet isolation valve.
- Locate the 'STOP' button in the bottom right of the HMI screen and hold down for 3 seconds, the generator will begin it's shutdown procedure. At this point the generator will complete it's half cycle and then exhaust both columns until fully de-pressurized.
- The generator will remain in standby until manually re-started. When the generator is in standby mode all symbols will revert to their grey color to symbolize no activity within the system.

nitrogen gas generator



3.4 economy mode

When under normal operation, the generator continuously monitors the nitrogen outlet pressure. When the outlet pressure reaches the pre-determined set-point for 5 minutes, the generator will automatically close the nitrogen outlet valve and stop supplying gas. This first stage is indicated by the solid green economy symbol. If the outlet pressure continues to remain equal to or greater than the pre-determined set-point for an additional 5 minutes, the generator will stop cycling and enter economy mode. This second stage is indicated by the flashing green economy symbol.

When the nitrogen outlet pressure drops below the pre-determined set-point, the generator will instantly begin its start-up cycle to ensure the CMS is primed before resuming normal operation.



3.5 purity dependent energy saving (PDES)

When fitted, the PDES system adds an additional O₂ analyzer assembly which constantly monitors the oxygen content of the gas stored within the buffer vessel, the purpose of the PDES system is to reduce air consumption and maximize efficiency. The PDES system works along side with the standard O₂ analyzer which monitors the purity of the gas being produced and supplied to the application. Under normal operation, if the oxygen content stored within the buffer vessel and the gas being supplied to the application are within specification, the generator control system will extend the cycle time delaying the column change over. When the PDES function is active the green O₂ symbol will begin to flash indicating the generator is extending the cycle time.

If at any point either the gas stored within the buffer vessel or the gas being supplied to the application falls outside of the required specification, the PDES feature will deactivate and the generator will resume normal operation.



nitrogen gas generator

4.1 maintenance



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

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

4.2 cleaning

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

4.3 daily checks

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

nitrogen gas generator



4.4 % purity generator service schedule



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

% purity generators without PDES functionality (Part No. 46-110-XX-XXXXX-XXZC-NXX-XXX)											
ref.	kit no.	time period (months)									
		12	24	36	48	60	72	84	96	108	120
A	31-100-XXXX	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
B	31-100-1510		✓		✓		✓		✓		
C	31-100-1520				✓				✓		
D	31-100-1530					✓					✓

% purity generators without PDES functionality (Part No. 46-110-XX-XXXXX-XXZC-PXX-XXX)											
ref.	kit no.	time period (months)									
		12	24	36	48	60	72	84	96	108	120
A	31-100-XXXX	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
B	31-100-1510		✓		✓		✓		✓		
C	31-100-1521				✓				✓		
D	31-100-1530					✓(x2)					✓(x2)

4.5 ppm purity generator service schedule

ppm purity generators without PDES functionality (Part No. 46-110-XX-XXXXX-XXZP-NXX-XXX)											
ref.	kit no.	time period (months)									
		12	24	36	48	60	72	84	96	108	120
A	31-100-XXXX	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
B	31-100-1510		✓		✓		✓		✓		
C	31-100-1520				✓				✓		
D	31-100-1531					✓					✓

ppm purity generators with PDES functionality (Part No. 46-110-XX-XXXXX-XXZP-PXX-XXX)											
ref.	kit no.	time period (months)									
		12	24	36	48	60	72	84	96	108	120
A	31-100-XXXX	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
B	31-100-1510		✓		✓		✓		✓		
C	31-100-1521				✓				✓		
D	31-100-1531					✓(x2)					✓(x2)



nitrogen gas generator

4.6 service kits

ref.	kit number	kit contents	image
A	31-100-1160	BSPT exhaust silencer/muffler (x1)	
	31-100-1161	NPT exhaust silencer/muffler (x1)	
	31-100-1170	BSPT exhaust silencer/muffler (x2)	
	31-100-1171	NPT exhaust silencer/muffler (x2)	
B	31-100-1185	piston valve seals (x8) required o-ring seals	
C	31-100-1520	pilot valves & seals (x5) diaphragm valves (x2) 24V DC solenoid coils (x2) O ₂ sensor solenoid valve (x1)	
	31-100-1521	pilot valves & seals (x5) diaphragm valves (x2) 24V DC solenoid coils (x2) O ₂ sensor solenoid valve (x2)	
D	31-100-1530	% purity oxygen sensor (x1)	
	31-100-1531	PPM purity oxygen sensor (x1)	

nitrogen gas generator



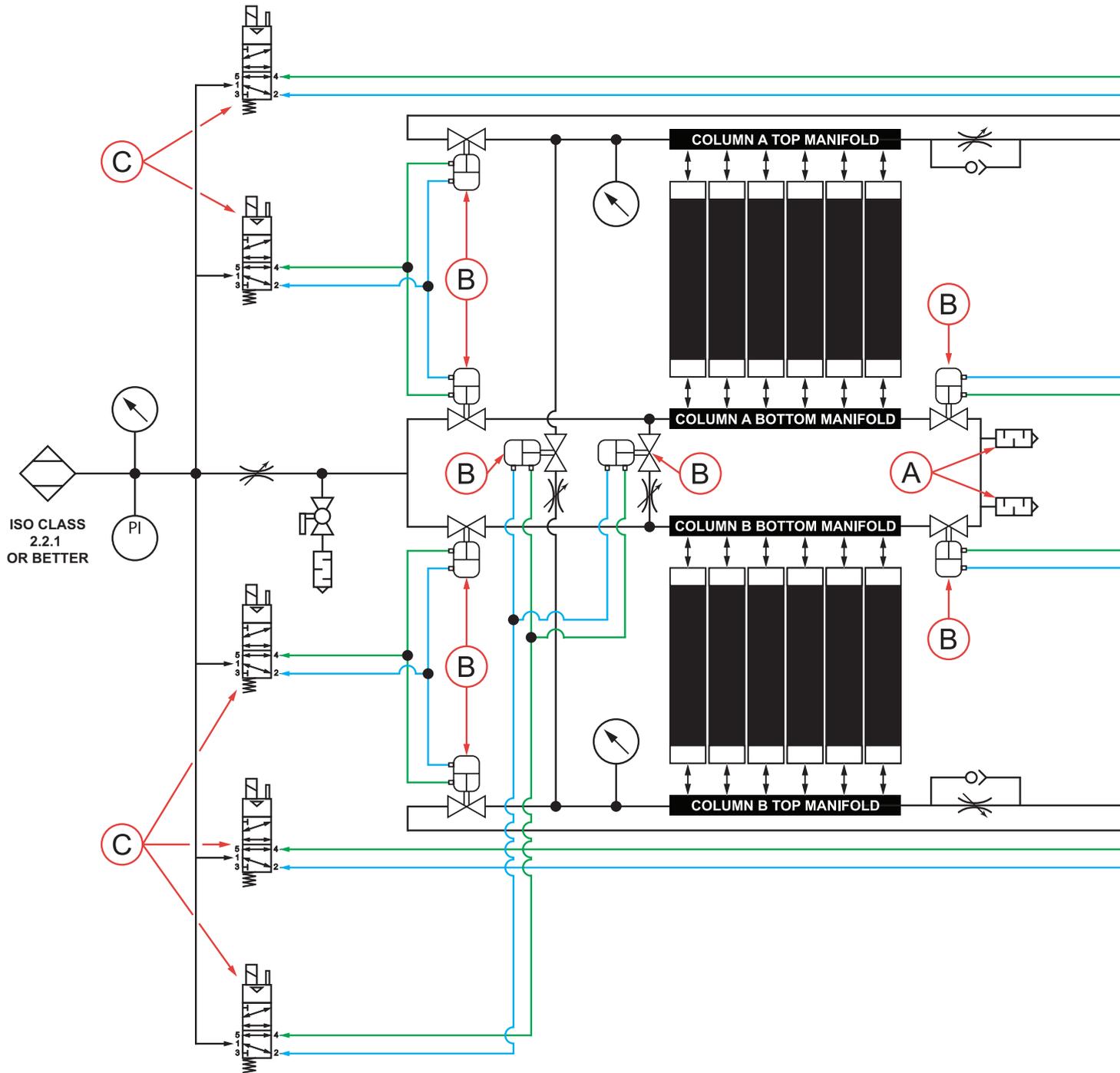
4.7 service record

part number		serial number			
installed by		installation date			
interval	hours run	date	serviced by		comments / observations
			print	sign	
12 months					
24 months					
36 months					
48 months					
60 months					
72 months					
84 months					
96 months					
108 months					
120 months					

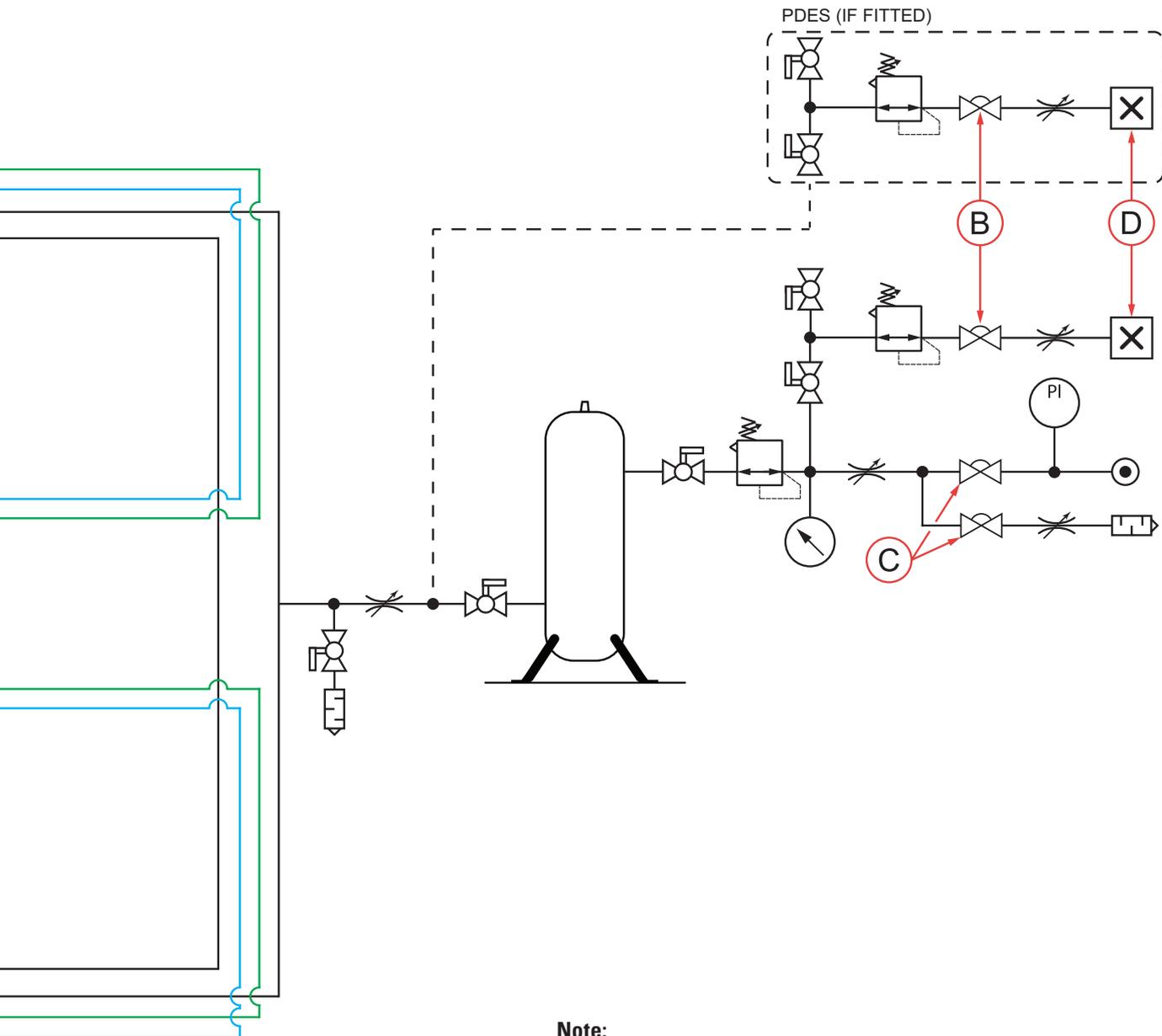


nitrogen gas generator

4.8 process and instrumentation diagram



nitrogen gas generator



Note:

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

Service **A**: Replace exhaust silencer(s)/muffler(s)

Service **B**: Replace piston valve seals and oxygen analyzer control valve(s)

Service **C**: Replace all pilot valves, diaphragm valves and solenoid coils

Service **D**: Replace oxygen analyzer(s)

For more information about service kits see pages 21 and 22.

For more information about service schedules and prices please contact your service provider.



nano

Experience. Customer. Service.



nano-purification solutions

gateshead, united kingdom
tel: +44 (0) 191 497 7700
sales@n-psi.co.uk
www.n-psi.co.uk



nano-purification solutions

erkelenz, germany
tel: +49 (0) 2151 482 8218
sales@n-psi.de
www.n-psi.de



nano-purification solutions

st. catharines, ontario, canada
tel: +1 905 684 6266
support@n-psi.com
www.n-psi.com



nano-purification solutions

new bethlehem, pennsylvania
tel: +1 724 297 3416
airtak@airtak.com
www.airtak.com



nano-purification solutions

charlotte, north carolina
tel: +1 704 897 2182
support@n-psi.com
www.n-psi.com