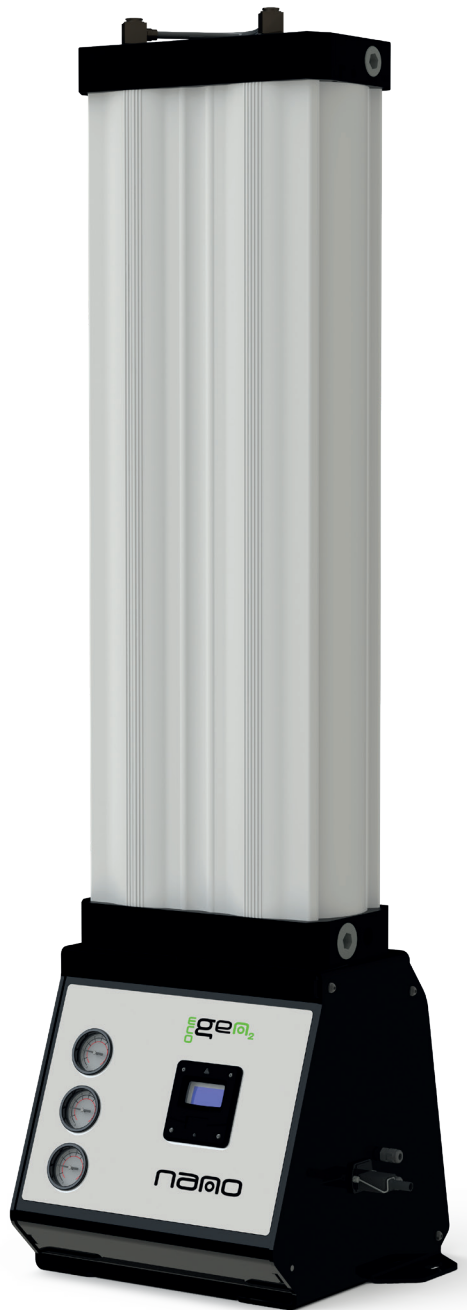


nano



User guide

ECO GEN₂ nitrogen generator

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www.n-psi.co.uk

about us

The logo for nano, consisting of the word "nano" in a bold, blue, sans-serif font, enclosed within a thin grey circular border.

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.

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1. manufacturers details and support

nano-purification solutions ltd. (Manufacturer)

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NE11 0PZ
United Kingdom

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internet: www.n-psi.co.uk

email: sales@n-psi.co.uk

usa - nano-purification solutions inc.

address: 5509 David Cox Road
Charlotte, NC 28269
USA

telephone: +1 (704) 897-2182

internet: www.n-psi.com

email: support@n-psi.com

canada - nano-purification solutions inc.

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Ontario L2P 3J6
Canada

telephone: +1 (905) 684-626

internet: www.n-psi.com

email: support@n-psi.com

germany - nano-purification solutions inc.

address: Mommenpesch, 46
D-47839
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2. general information

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2.1 document introduction

This manual provides factory prescribed maintenance procedures for the nitrogen 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.

2.2 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.

Only authorized, competent and trained personnel are permitted to work on this product. This user guide is intended solely for such personnel and is to be used only as a reference; it should not be used to replace conventional training.

2.3 packaging

All products are securely packaged in a specifically designed wooden packing box. The dryer will be held in a horizontal position by wooden struts; using straps to secure the product to the box base. The box top cover can be removed by removing the 4 fixing screws and lifting off in one piece.

2.4 intended use of the product

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

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



annotations



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



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



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



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3. technical specification

specifications	standard	options
minimum operating pressure	6 barg (87 psig)	
maximum operating pressure	10 barg (145 psig)	
recommended operating temperature range	20 to 25°C (68 to 77°F)	
design operating temperature range	5 to 50°C (41 to 122°F)	
inlet air quality	-40°C pdp (-40°F pdp)	3°C pdp (37°F pdp)
power supply requirements	100 to 240V AC @ 50 or 60 Hz	24V DC

 All generators should be preceded by a coalescing filter regardless of oil or oil free applications, a 0.01mg/m³ grade coalescing filter must be installed on the inlet to the generator.

3.1 flow rates

model	rated outlet flow for nitrogen purity outlet (maximum oxygen content)													
	99.9% (0.1%)		99.5% (0.5%)		99% (1%)		98% (2%)		97% (3%)		96% (4%)		95% (5%)	
	Nm ³ /hr	scfh	Nm ³ /hr	scfh	Nm ³ /hr	scfh	Nm ³ /hr	scfh	Nm ³ /hr	scfh	Nm ³ /hr	scfh	Nm ³ /hr	scfh
ECO-GEN ₂ 090	1.4	49.4	2.2	77.7	2.7	95.3	3.7	130.6	4.6	162.4	5.3	187.1	5.9	208.3
ECO-GEN ₂ 110	2.4	87.7	3.4	120.0	4.3	151.8	5.8	204.8	7.2	254.2	8.4	296.6	9.4	331.9
ECO-GEN ₂ 130	4.0	141.2	5.6	177.7	7.1	250.7	9.6	339.0	12.0	423.7	13.9	490.8	15.5	547.3

3.2 correction factors

Inlet Pressure Correction Factors					
barg	6	7	8	9	10
psig	87	101	116	130	145
correction factor	0.88	1	1.10	1.20	1.20

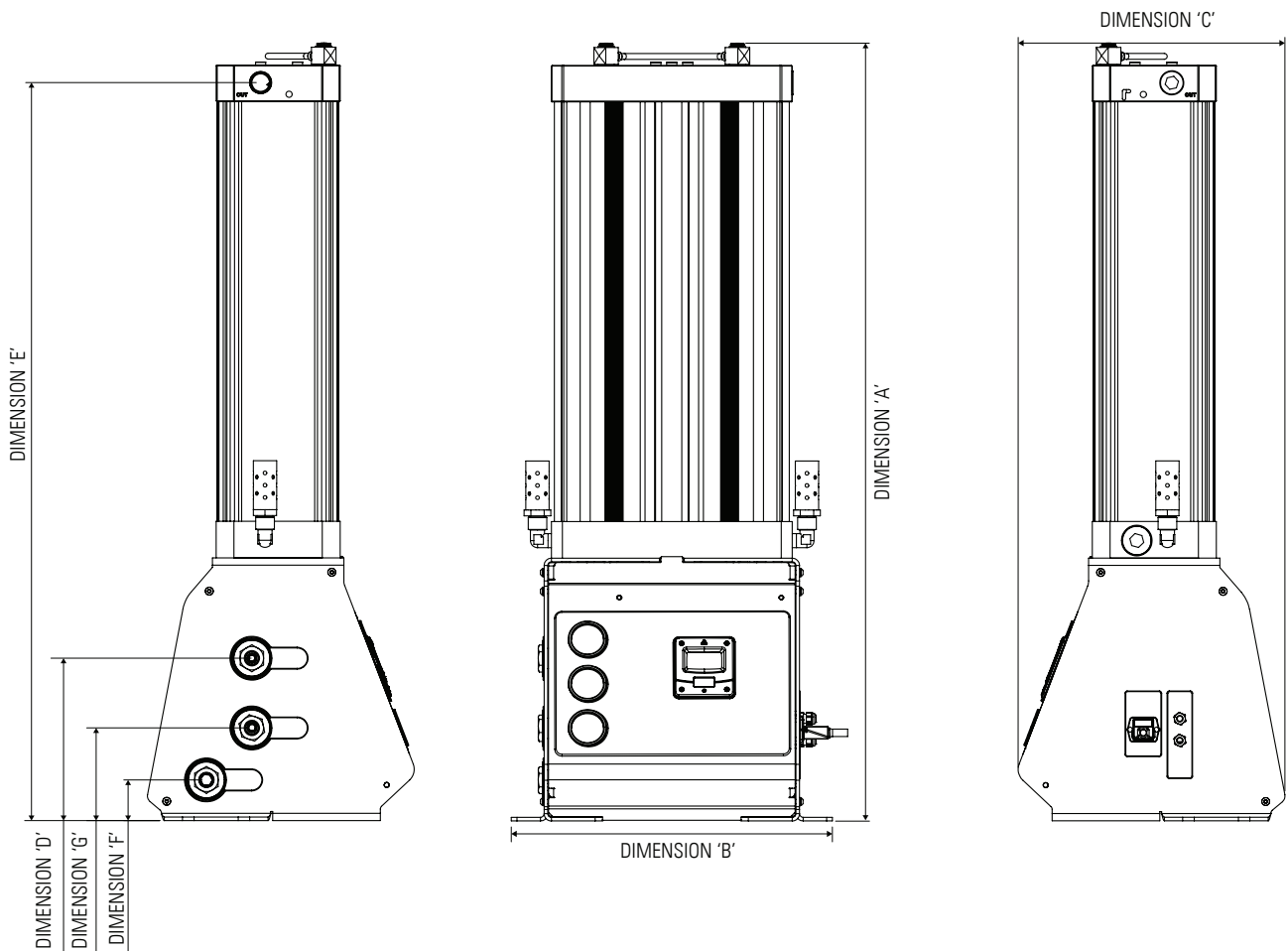
Inlet Temperature Correction Factors										
°C	5	10	15	20	25	30	35	40	45	50
°F	41	50	59	68	77	86	95	104	113	122
correction factor	0.8	0.9	0.94	1	1	0.98	0.95	0.9	0.85	0.72

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3.3 product dimensions



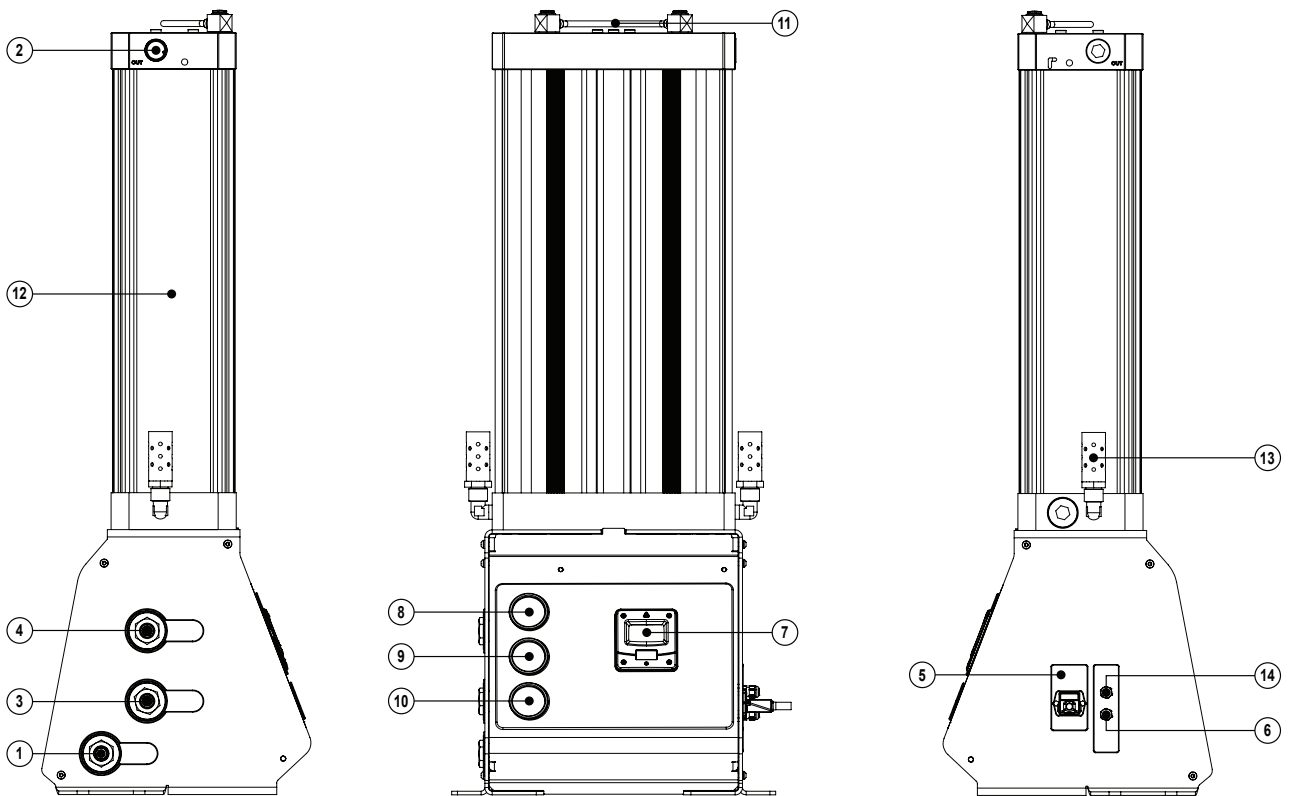
model	dimension													
	A		B		C		D		E		F		G	
	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches
ECO-GEN ₂ 090	1064	42	440	17	366	14	225	7¾	110	4	60	2¼	125	5
ECO-GEN ₂ 110	1391	55	440	17	366	14	225	7¾	110	4	110	2¼	125	5
ECO-GEN ₂ 130	1991	78	440	17	366	14	225	7¾	110	74.25	110	2¼	125	5



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4. product overview



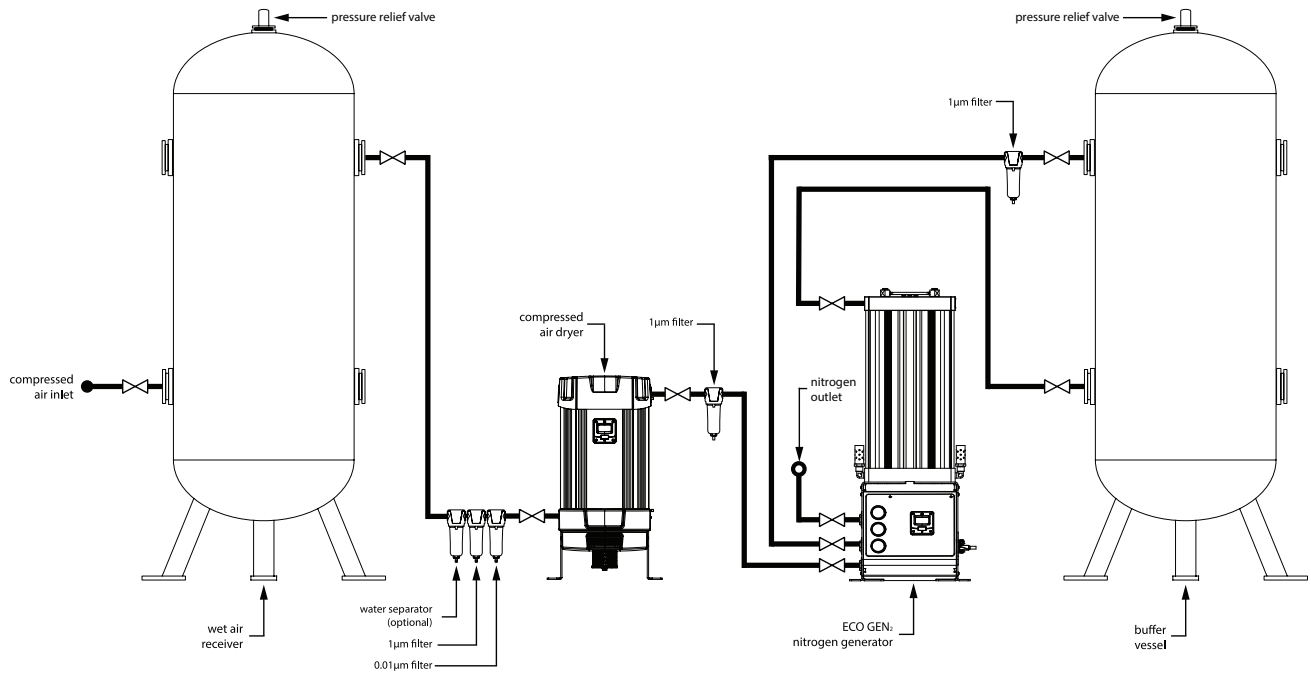
number	description	number	description
1	compressed air inlet (1/2" BSPP)	8	regulated outlet pressure gauge
2	to buffer (1" BSPP or NPT)	9	online column pressure gauge
3	from buffer (1/2" BSPP)	10	compressed air inlet pressure gauge
4	nitrogen outlet (1/2" BSPP)	11	purge flow control
5	mains inlet (electrical supply)	12	generator column
6	remote start/stop	13	exhaust silencer
7	control panel display	14	alarm output

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4.1 typical system layout



IMPORTANT: It is essential that the system into which the generator is installed is fitted with a pressure limiting/relief device. This device should be installed between the compressor and the product.



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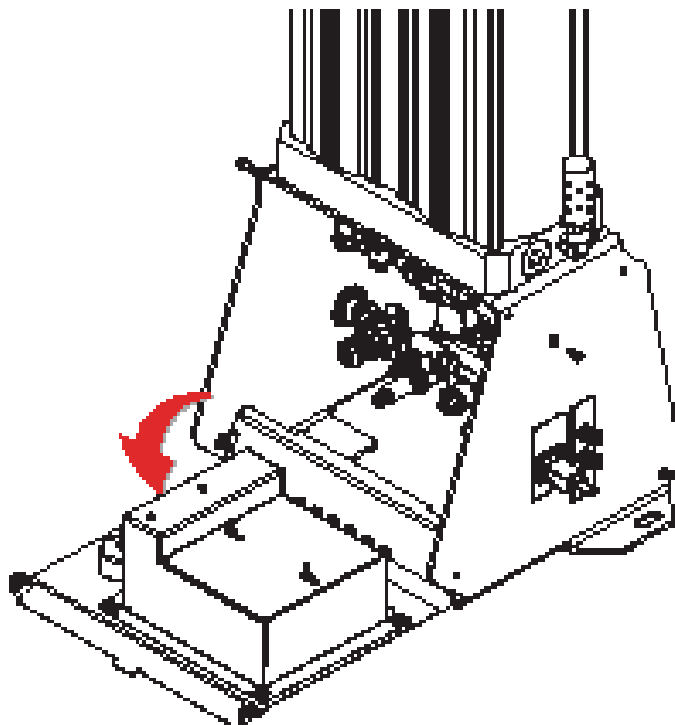
4.2 remote start/stop control

To gain access to the remote start/stop feature:

- Remove the two M6 screws from each side of the enclosure.
- Open the front cover and locate the flying lead on the bottom of the control plate and remove the insulating sheath.
- There are six wires;
 1. Red Wire - Remote Stop
 2. Black Wire - Remote Start/Stop
 3. Blue Wire - Alarm Output (Zero volt contact)
 4. White Wire - Alarm Input (Zero volt contact)
 5. Green Wire - 24V DC Output
 6. Yellow Wire - 24V DC Output
- To set up the Remote Start/Stop control, remove/break the connection between the Black wires and green wires connect externally to a remote switch or relay.
- A 24V DC Output must be connected to the Black wire to enable the dryer to operate, if the connection is broken or if there is no voltage the generator will switch off and revert to shutdown mode, displaying **"REMOTE STOP ACTIVE"** on the controller display.



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



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4.3 start-up procedure

- Ensure the inlet air temperature is between 5°C and 50°C (41°F and 122°F).
- Ensure that all compressed air isolation valves are fully closed before operating.
- Power up the generator, this will automatically start the generator and the display will illuminate.
- Slowly open the air inlet valve (*see page 10/11*) and check for any leaks. Continue to open the air inlet valve until fully open.
- Allow the generator to cycle at least two times.
- Slowly open the 'To buffer tank' isolation valve (*see page 10/11*) until the buffer tank is at full pressure (*this will take a few cycles*)
- Slowly open the 'From buffer tank' isolation valve (*see page 10/11*). At this point the generator control system will be able to operate fully.



Beware it can take up to *two* hours to clean the buffer tank, and hit required purity



Please ensure the correct shut down procedure is followed to shut the generator down.

4.4 shutdown procedure

Please ensure this procedure is followed when shutting down the generator.

- Do not turn off the power to the generator
- Isolate all compressed air connections to the Nitrogen Generator and buffer vessel.
- Allow the generator to continue to operate until the display indicates low pressure
- Once low pressure is indicated the generator will depressurise itself through the exhaust valves.
- Once the generator is fully depressurised the power can be switched off and the mains power isolated.



CAUTION: The generator may still retain trapped pressure!



Do not switch off or isolate the power to the generator before the generator is isolated from the compressed air source and fully depressurised.



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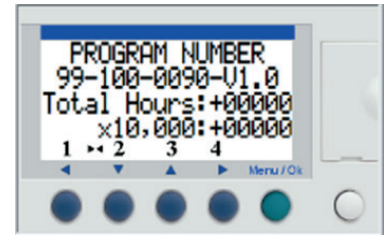
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4.5 control panel displays

1. Power-up Display (only visible on power start-up for 10 seconds)

During power-up the screen will display:

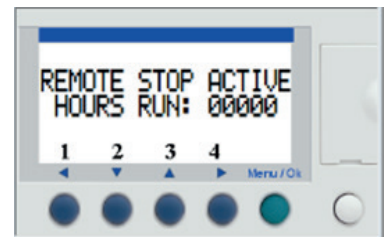
- Program number followed by the revision.
- Total hours dryer has operated.



2. Power-up Display Continued

During power-up the screen will display:

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

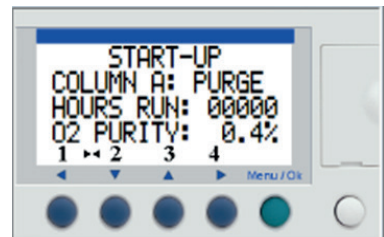


3. Start-up Sequence

During the start-up sequence the screen will display:

- Start-up will be displayed until the half cycle count has met the de-sired set point
- Column 'A' status and Column 'B' status, this will be shown as online
- Hours the generator has run between services
- Hours the generator has run in Economy mode

NOTE: Purity only shown if option is fitted

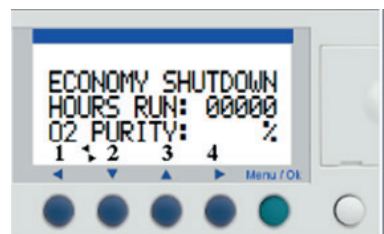
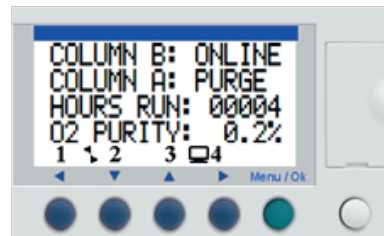


4. Normal Operation Display

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

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

Speak to the manufacturer about your requirements.



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3. maintenance



Maintenance operations should only be carried out by authorized, suitably trained personnel.

- maintenance operation should only be conducted when the system has been shut down and fully depressurized.
- all connections must be isolated and removed with care, paying particular attention to the areas that become pressurized.
- do not modify or adjust the control settings.
- only certified and approved replacement parts should be used.
- always check all connections for leakage and secure seating.
- ensure all loose parts are removed or secured to the dryer before operation.

3.1 cleaning

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

3.2 daily checks

- check the generator for any external damage assess and eliminate any defects found.
- if the red service light appears, the generator must be serviced to ensure the best quality possible. contact the service provider and request a service kit for the product.
- remove any loose dust or dirt from the generator, clean all surfaces that appear to have attracted unwanted contaminants.
- always check all connections for leakage and secure seating.
- ensure all loose parts are removed or secured to the generator before operation.

3.3 servicing guidelines

- maintenance operation should only be conducted when the system has been shut down and fully depressurized.
- isolate the generator from the compressed air and electrical supply ensuring the system is in a safe condition for maintenance to be carried out on.
- all connections must be removed with care, paying particular attention to the areas that become pressurized.
- all gasket seals removed during maintenance operations must be replaced with new gaskets.
- only certified and approved replacement parts should be used.
- do not modify or adjust the control settings.
- always 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.
- always check all connection and sealing faces for any leakage, if any found resolve and check again.
- ensure the product is left operating in a safe working condition after completion of maintenance.



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5.4 service schedule and breakdown

service	year 1 (12 mths)	year 2 (24 mths)	year 3 (36 mths)	year 4 (48 mths)	year 5 (60 mths)
A	✓	✓	✓	✓	✓
B		✓		✓	
C				✓	
D					✓



When contacting your service provider be sure to provide the part number and serial number of your generator, this can be found on the rating plate located top right hand side of the generator.

- **Service A** - Every 1 Year 12 Months)
Replace External Exhaust Silencers
- **Service B** - Every 2 Year (24 Months)
Replace Exhaust Valves
Replace Inlet Valves
Replace Nitrogen Outlet Valve
Replace Solenoid Coils
- **Service C** - Every 4 Year (48 Months) Replace:
Oxygen analyzer solenoid valve
- **Service D** - Every 5 Year (60 Months) Replace:
Oxygen analyzer sensor (if fitted).

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5.5 service kits and spares

model	service A	service B	service C	service D
ECO-GEN2-090	31-100-5009	31-100-5150		
ECO-GEN2-110	31-100-5011	31-100-5160	31-100-1525 31-100-5260	31-100-1530
ECO-GEN2-130	31-100-5013	31-100-5200 [x2]		

kit number	description	kit contents
31-100-5009	Replacement Exhaust Silencers	(x2) Exhaust Silencers
31-100-5011	Replacement Exhaust Silencers	(x2) Exhaust Silencers
31-100-5013	Replacement Exhaust Silencers	(x2) Exhaust Silencers
31-100-5150	Replacement Exhaust Valves	(x2) Exhaust Valves
31-100-5160	Replacement Normally Closed Inlet Valves	(x2) N/C Inlet Valves
31-100-5260	Replacement Nitrogen Outlet Valve	(x1) Outlet Valve & Coil 24v
31-100-5200	Replacement Solenoid Coils	(x2) 24v DC Coils
31-100-1525	Oxygen analyzer solenoid valve	(x1) N ² Solenoid Valve
31-100-1530	Oxygen analyzer sensor	(x1) N ² Analyzer
31-100-????	Replacement solenoid coil	(x1) Coil 24v



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6. trouble shooting

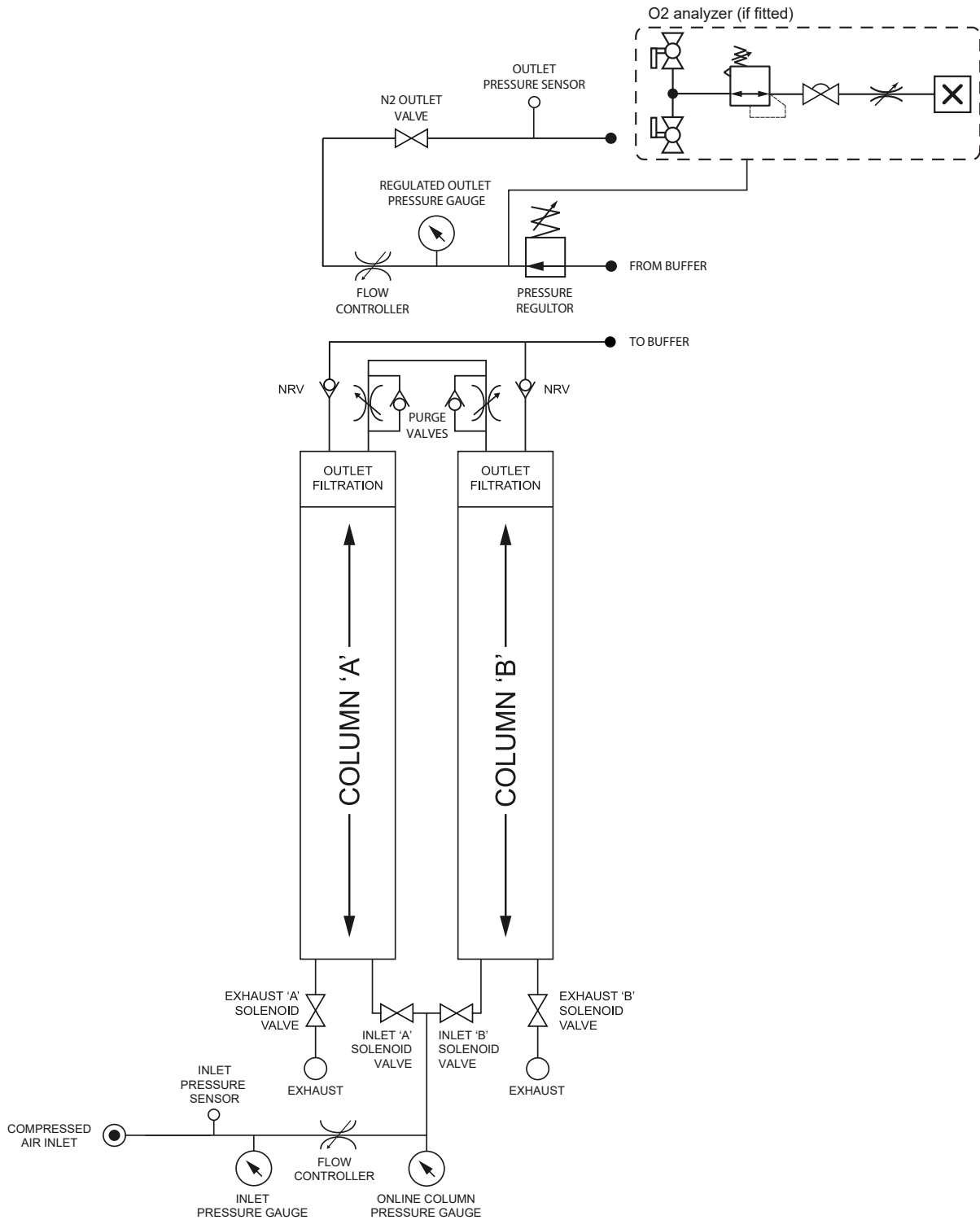
problem	problem caused	solution
poor performance	Insufficient inlet pressure	Inlet pressure should be a minimum of 6barg (87psig) if not then adjust inlet pressure settings.
	Electrical fault	Ensure the power is on and the generator front panel is illuminated; check the generator is cycling correctly
	Excessive inlet air temperature	Check against the technical specification
	Insufficient purge air	Purge incorrectly adjusted, consult the service personnel to adjust settings (factory pre-set).
	Exhaust silencer blocked	Replace exhaust silencer/muffler element.
failure to cycle	Controller not functioning correctly	Ensure the controller is powered up, check the on screen column status to ensure it is powering the solenoid valves during operation
	Insufficient inlet pressure	Inlet pressure should be a minimum of 6barg (87psig) if not then adjust inlet pressure settings.
	Controller not illuminated	Check power supply to the dryer, check fuse and replace.
	Failure to de-pressurize when cycling	Solenoid valve not functioning correctly; if there is power to the coil, replace valve.
	Outlet flow stops	Check inlet air supply
	Failure to initialize	Ensure that all isolation valves are fully closed, power up the generator, slowly open the air inlet valve and allow the generator to cycle.
	Erratic air flow from exhaust	Faulty or damaged valves, carry out service

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7. process and instrumentation diagram

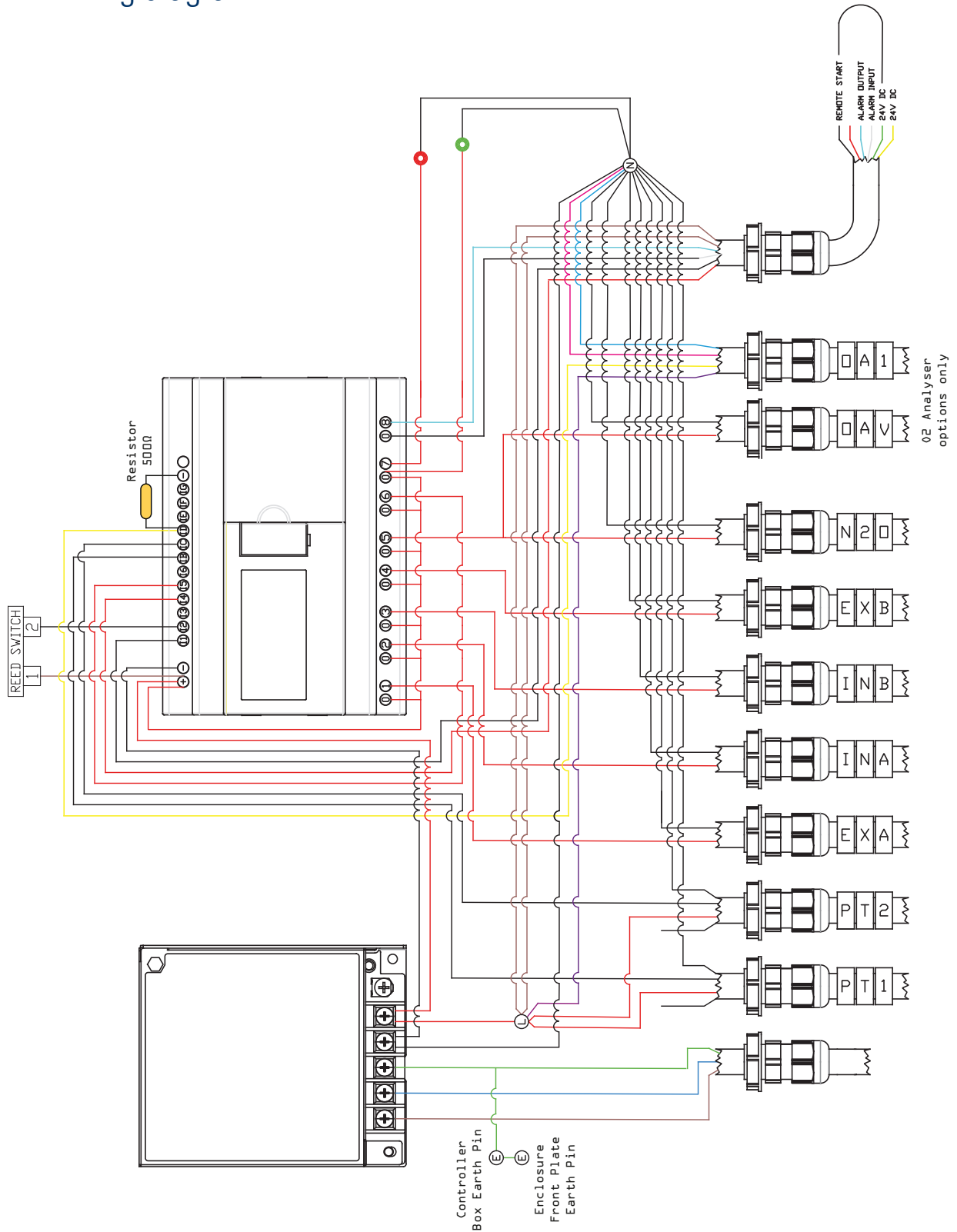




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7.1 wiring diagram





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