

Maintenance & Service Manual heatless desiccant air dryer

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GENERAL INFORMATION

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©2021 nano purification solutions limited Heatless Desiccant Air Dryer: D-Series3 Service Manual Models: NDL-2110, 2120,2130, 3130, 4130, 6120, 6130 (Including ES Model) Document number: 17-100-0141 Issue: 001

Document Introduction

This manual provides manufacturers prescribed procedures for the maintenance and service procedures for a nano purification solutions limited compressed air dryer. The procedures illustrated in this document are only to be performed by authorised personnel. For further information regarding the procedures outlined in this document contact nano purification solutions limited before proceeding. Read this document carefully before attempting to service the dryer.

General Safety

For your own safety, when carrying out maintenance work on the dryer, all relevant national safety regulations must be complied with relating to pressurised and electrical systems. Only authorised, competent and trained personnel should maintain the dryer. 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.



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.

Warranty Guidelines

All dryers are supplied with a 2 year manufacturer's warranty from the date of purchase. The dryer should be installed, operated and maintained in accordance with the manufacturer's guidelines. Only genuine service parts should be used and no modifications made. For further information please refer to the 'warranty guidelines' section on our website: www.n-psl.com

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CONTENTS

1.	SERVICE INTERVALS	4
1.1	SERVICE KITS	5
2.	PRODUCT ASSEMBLY	7
3.	RECOMMENDED TOOLS	8
4.	DRYER SHUT DOWN PROCEDURE	8
4.1	DRYER START-UP PROCEDURE	8
5	SERVICE 'A' INSTRUCTIONS - Silencers/Mufflers	9
6.	SERVICE 'B' INSTRUCTIONS - Desiccantchange	10
6.1	SERVICE 'C' INSTRUCTIONS - Exhaust valves	12
6.2	SERVICE 'C' INSTRUCTIONS - Outlet valves	13
6.3	SERVICE 'C' INSTRUCTIONS - Inlet valve	14
6.4	SERVICE 'C' INSTRUCTIONS - Pilot valves	15
7.	SERVICE 'D' INSTRUCTIONS - Dew point sensor	16
8.	RE-SETTING THE DRYER	18
9.	TOP & BOTTOM MANIFOLD TIGHTENING SEQUENCES	19
10.	OTHER DRYER CHECKS & NON-SERVICEABLE ITEMS	21
11.	TROUBLESHOOTING	22
12.	SERVICE RECORD & NOTES	23
13.	NOTES	24

1.1 SERVICE INTERVALS

The following table details the recommended service intervals for this product and the service kits to be used.

Comico Turo	Recommended Service Intervals				
Service Type	Year 1 or 6.000 Hours	Year 2 or 12.000 Hours	Year 3 or 18.000 Hours	Year 4 or 24.000 Hours	
А	\checkmark	\checkmark	\checkmark	\checkmark	
В		\checkmark		\checkmark	
С				\checkmark	
D (ES Models)	\checkmark	\checkmark	\checkmark	\checkmark	

- Service A Every year Replace external exhaust silencers/mufflers Applicable on all models
- Service B Every 2 years
 Replace desiccant and top cap filtration
 Replace top manifold gasket seals
 Replace exhaust valves
 Replace inlet valves
 Replace outlet valves
 Applicable on all models
- Service C Every 4 years Replace control valves Applicable on all models
- Service D Every 1 years (Re-) Calibrate dew-point sensor Applicable on ES models only

Note; The serial/part number of the nitrogen generator must be supplied when requesting any of the services listed above, this is to ensure the correct service parts are selected.

1.2 SERVICE KITS

Model (example) Kit number		Description		
Service A - Replace external exhaust silencers/mufflers				
10-110- G **-0000-** BSP - 130		BSPT Exhaust Silencer element		
40-110- A **-0000-**	NPT - 130	NPT Exhaust Silencer element		
	Service B - Desiccant F	Replacement kit		
40-110- **T-2110 - * *	NDA-110 (x2)			
40-110- **T-2120 - * *	NDA-120 (x2)			
40-110- **T-2130 - * *	NDA-130 (x2)			
40-110- **T-3130 - * *	NDA-130 (x3)	Loose fill desiccant and gaskets		
40-110- **T-4130 - * *	NDA-130 (x4)			
40-110- **T-6120 - * *	NDA-120 (x6)			
40-110- **T-6130 - * *	NDA-130 (x6)			
40-110- **S-2110 - * *	NDK-110 (x2)			
40-110- **S-2120 - * *	NDK-120 (x2)			
40-110- **S-2130 - * *	NDK-130 (x2)			
40-110- **S-3130 - * *	NDK-130 (x3)	desiccant cartridge and gaskets		
40-110- **S-4130 - * *	NDK-130 (x4)			
40-110- **S-6120 - * *	NDK-120 (x6)			
40-110- **\$-6130 - * *	NDK-130 (x6)			
40-110- **L-2110 - **	NDA-110-LDP (x2)			
40-110- **L-2120 - **	NDA-120-LDP (x2)			
40-110- **L-2130 - * *	NDA-130-LDP (x2)			
40-110- **L-3130 - **	NDA-130-LDP (x3)	Low point desiccant (LDP) cartridge and gaskets		
40-110- **L-4130 - **	NDA-130-LDP (x4)			
40-110- **L-6120 - **	NDA-120-LDP (x6)			
40-110- **L-6130 - **	NDA-130-LDP (x6)			
40-110- **M-2110 - * *	NDK-110-LDP (x2)			
40-110- **M-2120 - * *	NDK-120-LDP (x2)			
40-110- **M-2130-* *	NDK-130-LDP (x2)			
40-110- **M-3130 - * *	NDK-130-LDP (x3)	Loose fill low dew point (LDP) desiccant and gaskets		
40-110- **M-4130 - * *	NDK-130-LDP (x4)	0		
40-110- **M-6120 - **	NDK-120-LDP (x6)			
40-110- **M-6130 - **	NDK-130-LDP (x6)			

Model (example)	nple) Kit number Description	
Service C - Va	Ive Servicing (NOT)	E; you may require more than one kit)
ALL MODELS	EVK-6130	2 internal exhaust valves
ALL MODELS	IVK-6130	2 internal inlet valves
ALL MODELS	OVK-6130	2 internal outlet valves
40- *** - * 0 * -0000-Q *	PVKO-6130-024	24v pilot normally open operation valves
40- *** - * 0 * -0000-S *	PVKO-6130-240	240v pilot normally open operation valves
40- *** - * 0 * -0000-R *	PVKO-6130-110	110v pilot normally open operation valves
40- *** - * C * -0000-Q *	PVKC-6130-024	24v pilot normally closed operation valves
40- *** - * C * -0000-S *	PVKC-6130-240	240v pilot normally closed operation valves
40- *** - * C * -0000-R *	PVKC-6130-110	110v pilot normally closed operation valves
Service C - OVERHAL	L KITS	
40- *** - * 0 * -0000-Q *	NOKO-6130-024	PVKO-6130-024, EVK-6130, IVK-6130 & OVK-6130
40- ** *- * 0 * -0000-S *	NOKO-6130-240	PVKO-6130-240, EVK-6130, IVK-6130 & OVK-6130
40- *** - * O * -0000-R *	NOKO-6130-110	PVKO-6130-110, EVK-6130, IVK-6130 & OVK-6130
40- * * * - * C * -0000-Q *	NOKC-6130-024	PVKC-6130-024, EVK-6130, IVK-6130 & OVK-6130
40- * * * - * C * -0000-S *	NOKC-6130-240	PVKC-6130-240, EVK-6130, IVK-6130 & OVK-6130
40- * * * - * C * -0000-R *	NOKC-6130-110	PVKC-6130-110, EVK-6130, IVK-6130 & OVK-6130
	Service D - Dew p	oint sensors (optional)
40- *** - ** S-0000- * E 40- *** - ** T-0000- * E	NSK-130	Dew point sensor calibration for standard -40C (-40F)
40- * * * - ** L-0000- * E 40- * * * - ** M-0000- * E	NSK-130-LDP	Dew point sensor calibration for standard -70C (-95F)
Energy saving upgrade kits		
40- *** - ** S-0000- ** 40- *** - ** T-0000- * *	ESU-130	Energy saving upgrade kit; Dewpoint sensor and accessories
40- *** - ** L-0000- ** 40- *** - ** M-0000- **	ESU-130-LDP	Energy saving upgrade kit; Low-dewpoint sensor and accessories

2. PRODUCT ASSEMBLY

The following illustration details the basic assembly of the dryer. Model shown is an NDL-6130.



3. RECOMMENDED TOOLS

The following tools will be required to service the dryer:

Strap Wrench Terminal Screw Driver 2mm, 3mm Allen Key M10, M12 Socket 8mm, 11mm, 12mm Spanner Small adjustable spanner M12 Guide pins Suitable Vacuum Cleaner Large Flat Driver

4.1 DRYER SHUT DOWN PROCEDURE



Before performing any maintenance or service operations on this product, ensure the product is isolated from the compressed air supply and fully depressurised. Also ensure the product is switched off and/or isolated from the mains power.

Isolate the compressed air supply to the dryer (Inlet and outlet)

In order to fully depressurise the dryer;

- Allow the dryer to cycle twice to ensure the dryer exhausts and is completely depressurised.
- When fully depressurised the 'clicking' of the exhaust valves will be heard but no air exhausted.

- If Energy Saving enables, you may need to power down the dryer, wait 5 minutes, and restart to prevent ES Mode enabling to fully shut down.

• When the dryer is fully depressurised, isolate from the power supply.

4.2 DRYER START-UP PROCEDURE

- Ensure all pipe work is connected.
- Ensure all isolation valves are closed
- Ensure the inlet operating pressure parameters are between 58-145 psig (4-10 barg).
- Ensure the inlet air temperature is between 35°F 122°F.
- Slowly open the inlet valve and allow dryer to pressurise.
- Turn on the power to the dryer.
- Open the outlet valve.
- The dryer will display its status and commence normal operation. When the dryer is powered up the display will show "Starting" for approximately 20 seconds, untill displays the columns status, "purge" or "online".

5. SERVICE 'A' INSTRUCTIONS - Silencers/Mufflers

REPLACE EXTERNAL EXHAUST SILENCERS/MUFFLERS

(Every year or 6,000 hours)



6. SERVICE 'B' INSTRUCTIONS - Desiccant change **REPLACING DESICCANT CONTENTS**

(Every 2 years or 12,000 hours)



- 6. If a dewpoint sensor is fitted, disconnect the nut attached at outlet block [Fig B.4] and pull through the tubing, (maintain attachment to the sensor assembly).
- 7. Remove the black plastic conduit, if present, from the top of the dryer's top manifold.
- 8. Remove the front door. Pins located inside on the left (The door will be unsupported once the top manifold is removed).
- 9. Undo the M12 retaining bolts from the top manifold. (8 bolts per column)
- 10. Remove the top manifold (care should be taken not to damage the sealing face).
- 11. Remove all of the column caps exposing the drying media.
- 12. Using a suitable vacuum cleaner, remove the expended dessicant media from each column.
- 13. Remove any contaminants from the columns internal surface.
- 14. Using a nano suitable snow storm filler, replace the dessicant media ensuring continuous filling is maintained. A gap of 30mm must be left free at the top of each column for the column cap [figure B.5].
- 15. Install a new 150mm diameter media disc onto the top of the dessicant fill and fit column caps.
- 16. New column top caps must be installed. (Caps should stand approx.2mm above column length).
- 17. Clean top manifold and replace all gaskets (use a suitable grease to hold gaskets into place).
- 18. Ensure all column sealing faces are clean and free from dust.
- 19. Reassemble the dryer by replacing the top manifold ensuring it is lined up correctly with the columns, using Guide Pins (see parts list). Insert all M12 bolts and torque to a setting of 80Nm following the correct tightening sequence on page 19-20.
- 20. Refit the door.
- 21. Refit the black plastic conduit to the top of the manifold and re-connect the 4 x plastic 6mm tube to the exhaust valves and control solenoid valves. (If E.S. is fitted re-connect the 4mm clear tube).
- 22. Re-connect the outlet manifold connection using 4 x M10 bolts.
- 23. Replace the top cover.
- 24. Start up the Dryer (see page 8)



Figure B.4; Disconnect nut to release dewpoint sensor tube



Page 11



- 5. lightly grease and insert the new inlet valves into the valve block ensuring the flow direction arrow is pointing as shown and the valve ridge details cover the spill port. (See figures C.1.1, and C.1.2).
- 6. Reassemble valve block to the bottom manifold (torque setting; 40Nm). Refer to page 19-20 and follow the correct tightening sequence when replacing block.
- 7. Refit the bottom cover.
- 8. Start up the Dryer (page 8), or continue to complete service C

6.2 SERVICE 'C' INSTRUCTIONS - Outlet valves

REPLACING OUTLET NON-RETURN VALVES

(Every 4 years or 24,000 hours)



If the Outlet valves are not intented to be serviced, continue to page 14

- 1. Ensure the dryer is shut down and fully depressurised (See page 8, section 4.1).
- 2. Remove the 8 x M10 socket head cap screws and 8 x washers to release the outlet manifold from the top manifold. Figure C.2
- 3. Remove 4 x M10 bolts holding the outlet flange
- 4. Remove the non return valve from the valve orifice within the top manifold and discard.
- 5. Lightly grease and insert the new non return valves into the valve orifices within the top manifold ensuring the valve has been insert in the correct orientation. Refer to figure C.2.1
- 6. Place the valve block to the top manifold and insert the 8 x M10 socket head cap screws and the 8 x washers to complete the assembly. Refer to page 19-20 and follow the correct tightening sequence when replacing the valve block
- 7. Refit the flange
- 8. Start up the Dryer (page 8), or continue to complete service C

6.3 SERVICE 'C' INSTRUCTIONS - Inlet valve

REPLACING INLET CONTROL VALVES

(Every 4 years or 24,000 hours)



- 4. light grease and insert the valves into the orifices within the bottom manifold ensuring the flow direction arrow is pointing as shown and the valve ridge details [Fig C.3.1] cover the spill port. (See figure C.3.2).
- 5. Place the valve block to the bottom manifold and insert the 8 x M10 socket head cap screws and the 8 x washer, tightening to a torque setting of 40Nm. Refer to page 19-20 and follow the correct tightening sequence when replacing the valve block.
- 6. Refit the inlet flange and start up the Dryer (page 8)



Figure C.4

If the pilot valves are not intented to be serviced, continue to start up the dryer, see page 8

- 1. Ensure the dryer is shut down and fully depressurised (See page 8, section 4.1)
- 2. Disconnect and note configuration of the tubing, cables and variation between the pilot valves (Normally Open and/or Normally Closed)
- 3. Remove the 4 screws to release the pilot valve assembly
- 4. Remove the elbows and joints
- 5. Refit the elbows and joints with thread sealing material to the new pilot valve
- 6. Refit the pilot valve assembly and tubing
- 7. Start up the Dryer (page 8)

7. SERVICE 'D' INSTRUCTIONS - Dew point sensor REPLACING OR RECALIBRATING THE DEW POINT SENSOR - ES MODELS ONLY

(Every 1 year or 6,000 hours)





8. RE-SETTING THE DRYER RESETTING THE PLC DISPLAY UNIT



1. Ensure the dryer is on and running, see dryer start up procedure on page 8.

2. Place a magnet over the controller reset area shown for 8-10 seconds until the dryer re-sets.

3. Once re-set the hours run counter will show '00000'.

NOTE: Magnet not included in the service kit.

9. TOP & BOTTOM MANIFOLD TIGHTENING SEQUENCES

MODELS: NDL-2110, NDL-2120 & NDL-2130



MODEL(S): NDL-3130



MODEL(S): NDL-4130



Repeat torque sequence to ensure all bolts are fully seated

23	15 8	5 14	21 48	39 31	30 37	45
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<u> </u>	<u> 10 1 </u>	<u> </u>	<u> </u>	<u> </u>	2835	43
	00	00	00	00	00	
20	=11.4	29	= 18:44 =	= 36 [°] 27 ==	= 26 34 =	<u> 42 </u>
						۲
0 O	0 O	00	00	00	00	O 0
22	13 6	7 16	24 46	38 29	32 40	47

9.2 VALVE BLOCK TIGHTENING SEQUENCES

ALL MODELS



10. OTHER DRYER CHECKS & NON-SERVICEABLE ITEMS

DAILY CHECKS

Visual and functional check of the dryer should be carried out daily:

- Check the dryer for any external damage. Assess and eliminate any defects found.
- If the red service light appears, the dryer must be serviced. Contact the distributor service department and request a dryer service kit.
- Remove any loose dust or dirt from the dryer; clean all surfaces that appear to have attracted unwanted contaminants.
- Check the dewpoint sensor display (where applicable). If the dew point is not achieved the dewpoint reading on the display will alternate with "dewpoint alarm" every 5 seconds. The no-volt alarm will also activate.

Contact the distributor service department and request a product service.

MAINTENANCE GUIDELINES

- Maintenance operations only to be conducted when the system has been shut down, fully depressurised and isolated from the power and air supply.
- All connections must be undone with care, paying particular attention to the areas that become pressurised.
- Do not modify or adjust the control settings.
- Only certified n-psl approved replacement parts to be used.
- Always check all connections for leakage and secure seating.
- Ensure all loose parts are removed or secured to the dryer before operation.

11. TROUBLESHOOTING

Problem	Problem Caused	Solution	
	1. Insufficient inlet pressure	1. Inlet pressure min 4 barg. If not adjust inlet pressure settings.	
	2. Electrical Fault	2. Ensure the power is on and the dryer front panel is illuminated: check the dryer is cycling correctly.	
Poor dew point	3. Moist or contaminated desiccant	3. Eliminate the cause of contamination. Replace cartridges – do not re-use.	
performance	4. Too high air consumption	 Ensure the performance of the dryer matches the required system air consumption. 	
	5. Excessive inlet air temperature	5. Check against technical specification.	
	6. Insufficient purge air	6. Purge incorrectly adjusted. Consult service personnel to	
		adjust settings (Factory pre-set).	
	7. Exhaust silencer blocked	7. Consult service personnel.	
	8. Controller not functioning correctly	8. Ensure the controller is powered; check the on screen	
		column status to ensure it is powering the solenoid valves	
		during normal cyclic operation.	
Failure of dryer to	9. Controller not illuminated	9. Check power to unit & fuse: I 2A 250V (located at Fig 8.A).	
	To, insuncient met pressure	settings.	
cycle	11. Failure to de-pressurise when	11. Solenoid valve not functioning correctly; if there is power	
	cycling	to the coil, replace valve. A correctly working valve outputs an	
		audible click when it energises.	
	12. Outlet flow stops	12. Check inlet air supply.	
	13. Failure to initialise dryer	13. Switch off and restart dryer. Ensure dryer is pressurised	
Constant		before powering dryer to allow dryer to initialise before	
depressurisation		commencing operation.	
	14. Erratic air flow from exhaust	14. Faulty or damaged valve; service required.	

REFERENCE TO KNOWN ISSUE

Opening the inlet valve too quickly - Valve should be opened slowly allowing the pressure to build up gradually. Inlet/outlet head pipe - Diameter too small.

Pipe work unsupported.

Inlet pipe work from low point in system, allowing bulk water to collect and enter the dryer.

Electrical controller

- Incorrect fuse fitted or fuse blown. Check the plug and fuse located on bottom of the controller back plate inside the dryer front door.

Additional Items

- Use of non-authorised components.
- Untrained / unauthorised maintenance / installation personnel used.
- Increase in air consumption without relation to the flow capacity of the dryer.
- Purging the dryer with cleaning agents that could damage the components or the desiccant.
- Covers removed or loose during operation.
- Failure to carry out a service when indicated by the dryer.

- Do not allow the dryer to flow air unless powered up, switched on and cycling. Resulting effect could be dessicant contamination; requiring replacement dessicant.

12. SERVICE RECORD & NOTES

The following table allows the customer to document the service history of the product and to make notes related to each service.

DRYER SERVICE RECORD				
PRODUCT CODE:	PRODUCT SERIAL NO.			
SERVICE TYPE A / B / C	DATE	SERVICED BY (PRINT/SIGN)	NOTES	



Experience. Customer. Service.



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