

Instruction Sheet P/N 1619699-01

UV Test Tool Kit



WARNING: Allow only qualified personnel to perform the following tasks. Follow the safety instructions in this document and all other related documentation.

This document provides instruction for the use of each tool included in the UV test tool kit. For detailed maintenance procedures, refer to the proper manual for the system, such as the *Nordson CoolWave*[®] 2 410 manual or *Nordson CoolWave* 2 610 manual. This kit includes an LCR meter, torque screwdriver, spanner wrench, manometer, and a bulb tester.

Tool Kit Contents



Using a Torque Screwdriver on Nordson CW2 Lampheads

Applying the correct torque values to the M4 screws on the Nordson CoolWave[®] 2 Lamphead is paramount for proper gasket grounding and efficient operation of the system. Over-torquing the M4 screws can distort and damage the RF screen assembly. This section provides proper torque specifications for these screws.



Figure 2 Torque Screwdriver Used on Nordson Coolwave 2



CAUTION: Allow the lamphead blower to complete its cooling cycle before performing maintenance.

See Figure 2.

- 1. Consult the *Nordson Coolwave 2 410* or *Nordson Coolwave 2 610* manual and perform the appropriate procedures for the removal and installation of the RF screen.
- 2. Set tool to the correct torque value of 10 in-lb (1.1 N•m), according to the directions for the torque screwdriver.
- 3. Install the #2 screwdriver bit onto the torque screwdriver.
- 4. Tighten the eight M4-10 mm RF screws to 10 in-lb (1.1 N•m).

Using the Bulb Tester

The bulb tester uses batteries to send power through an extendable antenna. By touching the antenna to the gas bulb to power the bulb outside of the UV system, one can determine the condition of their system's gas bulb to troubleshoot the system.



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WARNING: This device pulses current through an exposed metal antenna. Do not touch the antenna with the power button depressed. Do not operate the bulb tester with damp or wet hands. Touching the powered antenna may result in an electric shock.

Testing UV Bulbs

- 1. Install four new AA batteries into the bulb tester, noting their proper orientation in the device.
- 2. Extend the antenna on the top of the bulb tester and touch it to the gas bulb quartz. It may be necessary to slowly move the antenna along the length of the bulb.
- 3. Press and hold the power button, watching to ensure the LED indicator and the bulb both flash.



WARNING: Do not press the power button while touching the antenna. This may result in an electric shock.

4. If the gas bulb does not flash with the LED indicator on the device, the bulb is due for replacement.

Nordson UV System Unicable Spanner Wrench

Due to the high voltages used in the cable assembly, it is paramount to properly secure the cable to its respective component. A loose cable will promote arcing between pins of the cable and receptacles of the mating connector. The spanner wrench is the correct pin size and diameter for the Nordson connector. Use of a correctly sized spanner wrench for disassembly and assembly of the unicable will eliminate this issue.

Securing the Unicable



CAUTION: The unicable conducts high and low voltage between the system controller and the lamphead. It is important that the unicable connectors be completely engaged and tightened before turning on the UV system. Failure to properly engage these connectors can result in severe damage to the system components.

See Figure 4.

- 1. Ensure unicable connection is straight and will not cross-thread while using the spanner wrench.
- 2. Insert the pin of the wrench in the connector hole and position the wrench within the groove of the connector to allow for proper positioning of the wrench.
- 3. Tighten the connector completely by turning the spanner wrench clockwise.
- 4. Inspect the connection and continue tightening until the red indicator is not visible in the inspection hole of the connector.



Spanner Wrench Seated on Unicable Connector



Red Indicator:

Incorrectly Installed



No Red Indicator: Correctly Installed

Figure 4 Unicable Connection

Using the Digital Manometer on Nordson CW2 Lampheads

The Dwyer[®] digital manometer uses positive and negative ports to measure or monitor positive, negative, and differential pressure up to 20 inches of water column (inch wc). Use the digital manometer to measure and compare expected pressure and actual pressure of the unit.

NOTE: Utilize Dwyer's product manual for correct setup and operation of the digital manometer.



Figure 5 CoolWave External Blower Pressure Measurement

Measuring CoolWave 2 External Lamphead Pressure

See Figure 5.

- 1. Using a Philips head screwdriver, remove the M4 screw near the unicable connector.
- 2. Thread the hose fitting into the lamphead.
- 3. Attach manometer hose to the positive port on top of the device to read the external lamphead pressure.

NOTE: The pressure reading in Figure 5 may not exactly match your system's reading.

Measuring CoolWave 2 Internal Lamphead Pressure

See Figure 6.

- 1. Using a Philips head screwdriver, remove the M4 screw near the unicable connector.
- 2. Thread the hose fitting into the lamphead.
- 3. Attach manometer hose to the positive port on top of the device to read the external lamphead pressure.

NOTE: The exact pressure reading in Figure 6 may not match your system's reading.



Figure 6 CoolWave Internal Blower Pressure Measurement



Using the LCR Meter

The Amprobe[®] LCR55A meter is a 9VDC battery powered instrument used to measure resistance within an unpowered circuit. This LCR meter is used for testing multiple components of the UV system.

NOTE: An aged or discharged battery in the LCR meter can affect proper measurement. Be sure to use a new battery during measurements.

Testing Power Supply Diode Blocks



WARNING: Shut off power to the system controller and allow capacitors time to bleed off voltage. Once voltage has been bled, then remove the diode blocks from the controller before performing the following tests. Failure to observe this warning can result in equipment damage or personal injury.

The LCR meter will be used to test voltage through the diode blocks. Each Nordson MPS2-410V and MPS2-610V power supply contains two high voltage diode blocks used to convert high voltage AC power to very high voltage DC power to power magnetrons located in the Nordson UV Lamphead.

Each diode block contains four high voltage rated diodes connected in a bridge network. Any failed diode will result in a shutdown of UV systems. Typical power supply faults displayed can include a Fault 12 Mag Voltage Error or Fault 24 Low Current on Mags.



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Figure 7 Nordson MPS2 Diode Block

Checking for Failed Diodes

Since the diodes are embedded and not visible within the diode block assembly, a test of each diodes forward and reverse bias needs to be accomplished at the external connection points to determine good or failed diode.

The following procedures show the external connection points for the four diodes in the diode block and the proper testing procedures for each.

See Figures 7 and 8 and refer to Tables 1 and 2.

- 1. Connect the red test lead to the +Rx Input and the black test lead to the -Rx Input of the meter.
- 2. Set the Function/range switch to + M.W.
- 3. For Forward Bias Test: Apply probe tip of red lead to the anode (+) and the black lead to the cathode (-) of the diode to be tested. See Figure 7 for terminal identification. See Table 1 for anode and cathode positions for each diode test.
- For Reverse Bias Test: Reverse the test leads to the diode to perform a reverse bias test. See Table 1 for anode and cathode positions for each diode test.
- 5. Repeat steps 3 and 4 for each diode connection listed in Table 1, ensuring that each diode meets the pass/fail criteria in Table 2.





Figure 8 Forward and Reverse Bias Diode Testing

Test Connection	Anode Position	Cathode Position	
Diode 1	HV	AC1	
Diode 2	HV	AC2	
Diode 3	AC2	С	
Diode 4	AC1	С	

Table 1 Diode Test Connections

Table 2 Diode Test Pass/Fail Criteria

High Voltage Diode Check	Forward Bias Test	Reverse Bias Test
Good	Near 6.6 Volts	Near 7.6 Volts
Failed (Open)	Near 7.6 Volts	Near 7.6 Volts
Failed (Shorted)	Less than 0.5 Volts	Less than 0.5 Volts

Resistance Validation Checks

See Figure 9 and refer to Table 3. The pins on the diode block are sequentially numbered from left to right and top to bottom.

- 1. Power on the LCR meter in resistance mode (Ω).
- 2. Conduct resistance checks utilizing the ground terminal (GND) on the diode block.
- 3. Place probe tips onto the respective pin locations listed in Table 3 below to measure resistance for each circuit.



Figure 9 Diode Block Resistance Checks

Resistance Test	Acceptable Ranges
GND to pin 1	$1005 \ \Omega \pm 1\%$
GND to pin 2	Less than 0.2 Ω (short)
GND to pin 3	20,000 $\Omega \pm$ 1%
GND to pin 4	Less than 0.2 Ω (short)
GND to pin 5	More than 20,000,000 Ω (open)
GND to pin 6	More than 20,000,000 Ω (open)
GND to pin 7	More than 20,000,000 Ω (open)
GND to pin 8	More than 20,000,000 Ω (open)
GND to pin 9	More than 20,000,000 Ω (open)
GND to pin 10	More than 20,000,000 Ω (open)
TP- to pin 2	Less than 0.2 Ω (short)
TP- to TP +	$200~\Omega\pm1\%$
C to FB	$1,000 \ \Omega \pm 1\%$
C to GND	$5 \Omega \pm 1\%$

 Table 3 Resistance Validation Check Ranges

Check Phase Control Board

See Figure 10.

The SCR (silicon controlled rectifier) is a solid-state module located on the phase control board. This module incorporates two inverse-parallel connected SCRs. AC Control module SCRs control the high voltage transformer's input power.

Failure of the AC control module SCR will result in a power supply fault and system shutdown. A shorted measurement on either test below signifies failure of the SCR and a phase control board replacement is necessary.



Figure 10 Phase Control Board

Checking Silicon Controlled Rectifiers (SCRs)

NOTE: Use of the included LCR meter is required for this procedure.

See Figure 11.

- 1. With the power supply de-energized and the cover removed, locate the phase control board.
- 2. Set the LCR meter to the 20M Ω scale.
- 3. With the test leads connected to the + and ports of the meter, place probe ends on the A1 and A2 connection points of the SCR. A normal reading is open. A shorted measurement indicates a failed SCR.

NOTE: Measurements can take place with the phase control board installed in the system or removed completely.

4. Place the probe ends on the G1 and G2 connection points. A normal reading is open. A shorted measurement indicates a failed SCR.





Figure 11 SCR Checks Using the LCR Meter

Parts

To order parts, contact Nordson Industrial Coating Systems Customer Support at (800) 433–9319 or contact a local Nordson representative.

Refer to the following parts list.

Part	Description	Quantity	Note
1619045	KIT, tool, UV test	_	
	 TESTER, lamp tube, LED, handheld 	1	
	 TESTER, component, meter, handheld, LCR 	1	
	MANOMETER, 0-200 inHg, handheld	1	
	WRENCH, spanner, 30-32	1	
	SCREWDRIVER, 1/4 inch hex, torque	1	

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