

TORCH WIZARD®

AUTOMATIC ROBOTIC NOZZLE CLEANING STATION

Model EL-NCS-A-TA-14

Operation Manual

**Installation, Maintenance &
Warranty Information**



ELC 
ENTERPRISES, INC.

Ship Date

Serial #

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www.wire-wizard.com

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1.0 INTRODUCTION

This guide is designed to assist the user whose primary responsibility is to maintain and operate the Torch Wizard Nozzle Cleaning Station. This manual provides specific information on installation, safety, basic operation, and maintenance. **Please read, understand and follow all safety procedures.**

One of the unique features of the Torch Wizard is its ability to ream and spray the nozzle simultaneously. This translates into shorter cleaning cycle times and higher production rates. The anti-spatter solution is applied via the center of the cutting tool.

The complete sequence of the Torch Wizard Nozzle Cleaning Station must be started and controlled by a robot controller, programmable logic controller (PLC), or some other superior control system. See electrical schematic on page 9 for details.

In order to obtain the optimum cleaning performance, the interior of the nozzle should be sprayed with **Blue Magic™** or **Blue Chill™** Anti-Spatter after cleaning.

1.1 WARRANTY

TWO YEAR EXTENDED WARRANTY TERMS AND CONDITIONS: ELCo Enterprises, Inc. (hereinafter "ELCo") shall warrant the Torch Wizard Nozzle Cleaning Station (hereinafter "Torch Wizard") to be free of defects in material and/or workmanship for Two (2) Years from the date of shipment to the Buyer. This two year warranty requires the exclusive use of **Blue Magic®** or **Blue Chill®** anti-spatter (or other anti-spatter supplied by ELCo Enterprises), along with an **ELCo supplied Filter/Regulator/Lubricator (FRL) with auto-drain**. The warranty shall cover 100% of all parts and labor with the exception of misuse, abuse, neglect and typical consumables as determined by ELCo. **Failure to follow proper installation and maintenance procedures specified in this operation manual will void this warranty.** ELCo will, at its option, repair, replace or issue a credit for the value of the defective Torch Wizard. The use of anti-spatter agents other than **Blue Magic®** or **Blue Chill®** and non-ELCo parts and/or consumables with the Torch Wizard may damage or limit the performance of the Torch Wizard and will void this extended warranty on all components.

ONE YEAR LIMITED WARRANTY TERMS AND CONDITIONS: For units using anti-spatter agents other than Blue Magic® or Blue Chill®, ELCo Enterprises, Inc. shall warrant the Torch Wizard Nozzle Cleaning Station to be free of defects in material and/or workmanship for One (1) Year from the date of shipment to the Buyer. The warranty shall cover 100% of all parts and labor with the exception of misuse, abuse, neglect and typical consumables as determined by ELCo. This limited warranty excludes all sprayer components, which are warranted to be

free from defects and/or workmanship for 90 days from the date of shipment to the buyer. **Failure to follow proper installation and maintenance procedures specified in this operation manual will void this warranty. This includes the use of a Filter/Regulator/Lubricator (FRL) without auto-drain functionality.** ELCo will, at its option, repair, replace or issue a credit for the value of the defective Torch Wizard.

Buyer accepts all responsibility for compliance with any/all Local, State and Federal Laws or Regulations including Regulations of Foreign Governments.

No equipment shall be returned to ELCo without a Return Authorization Number from ELCo. Upon evaluation and determination of warranty, replacements or repairs will be sent to the Buyer. If a replacement is needed immediately, a purchase order is required to cover the cost of the product until the warranty is determined.

ELCo's warranty is limited to replacing any goods that are proved to be defective and ELCo in no event shall have any liability for paying incidental or consequential damages including and without limitation, damages resulting in personal or bodily injury or death, or damages to, or loss of use of any property. Notwithstanding any of these terms and conditions, the warranties set forth shall apply in connection with any sales of goods, services or design by ELCo and are in lieu of all other warranties, express or implied, including warranties of merchantability and fitness for a particular purpose.

1.2 MODEL INFORMATION

Model EL-NCS-A-TA-14

- Base Unit for Tandem Arc Torches
- Integrated Anti-spatter spray unit
- Anti-Spatter Reservoir

1.3 SAFETY

The Torch Wizard Nozzle Cleaning Station is designed to be safe to operate, provided the user reads, understands and adheres to the safety precautions listed below. Failure to adhere to these precautions may result in personal injury and/or damage to the equipment.

1. Do not remove or deface any labels that are attached to the unit.
2. Ensure that all equipment in the area is disabled and locked out prior to entering the work zone where the Torch Wizard is located.
3. Ensure that all electrical and air power is disconnected prior to performing any maintenance on the Torch Wizard.
4. Keep hands and face away from clamp, reamer and spray operating space during both automatic and manual operation.
5. Ensure that all electrical and pneumatic connections comply with the codes relevant to the country and/or state where the Torch Wizard is installed.
6. Do not exceed the specified operating air pressure.
7. Ensure that there is no equipment (e.g. robot) in the Torch Wizard prior to shutting down the system.
8. Additional safety information can be found at the following websites:
<http://www.osha-slc.gov/SLTC/robotics/index.html>
<http://www.ansi.org>
<http://www.nfpa.org>

2.0 INSTALLATION

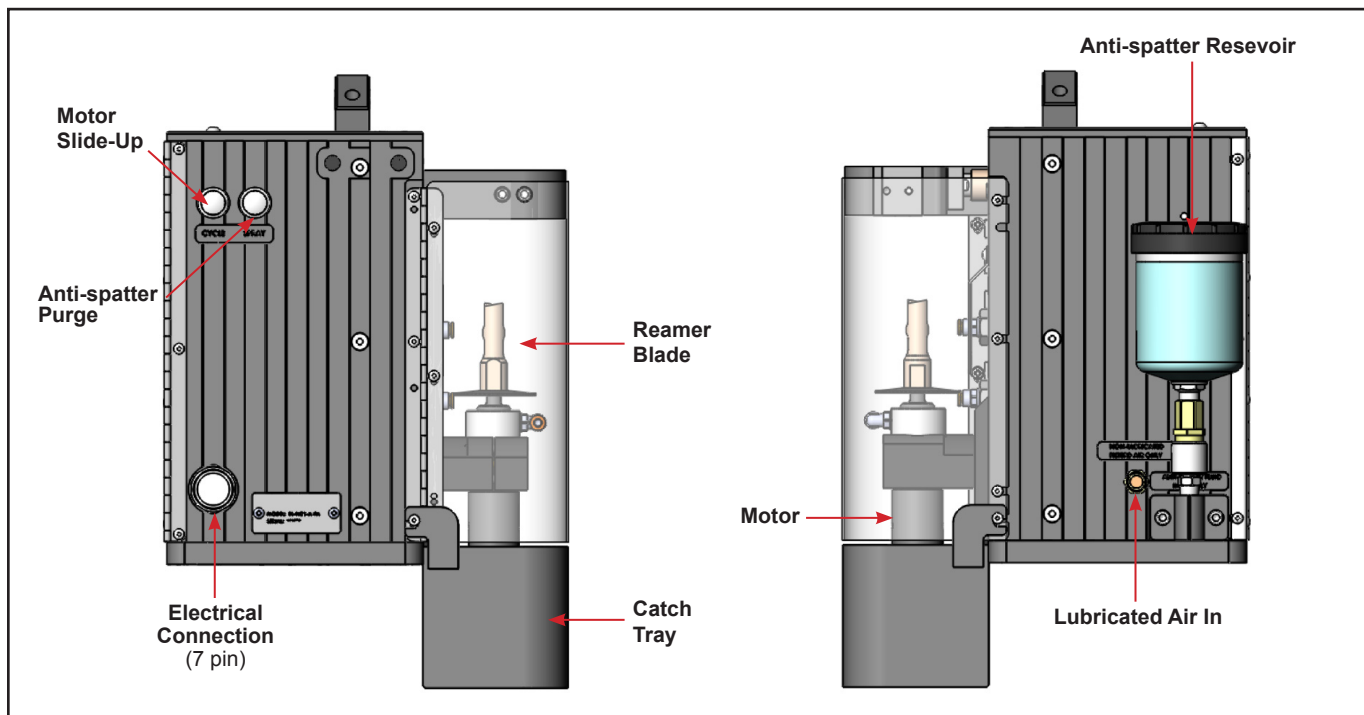
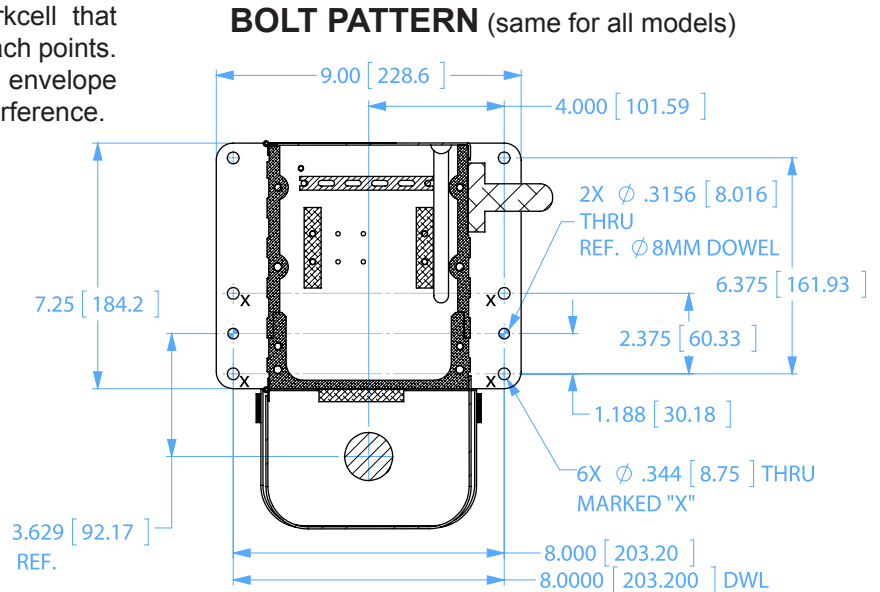


Figure 1: Torch Wizard Components

2.1 MOUNTING THE TORCH WIZARD

Select a location within the robotic workcell that provides the robot with the shortest approach points. It is important to consider the robot work envelope and any fixed obstructions or potential interference.

- Mount the Torch Wizard to a stable platform that is parallel to the floor for best results (an optional stand is available). Use the (4) 11/32 mounting holes provided on base of the Torch Wizard to secure the unit to the platform.
- It is recommended that (4) M8 – 1.25 SHCS (Socket Head Cap Screws) are used to mount the Torch Wizard to the platform (the optional stand provides M8 – 1.25 tapped holes for mounting).



2.2 PNEUMATIC CONNECTION

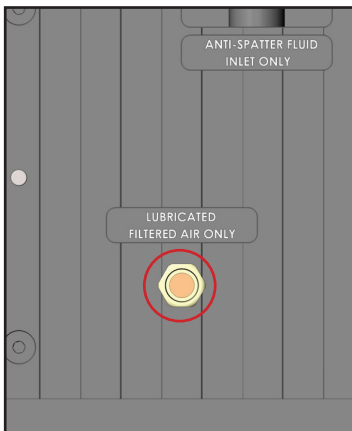


Figure 2

We recommend “Push-to Lock” style fittings on the Torch Wizard for supplying air to the unit. Use an air line with a 5/16” outside diameter to supply air to the Torch Wizard. There is just one location that supplies air to the unit. (Refer to figure 2 at left).

Air Supply Requirements:

Air **must** be filtered & regulated with a Filter/Regulator/Lubricator & **LUBRICATED**.

- Use an AIR SUPPLY LINE with an inside diameter of 3/8”, connect to the 1/4” N.P.T. female inlet located on the side of the Reamer.
- 80 psi recommended at 16 cfm (5.0-7.0 BAR at 450 lpm) at the Reamer during operation.
- **LUBRICATOR ADJUSTMENT:** Set the lubricator to deliver one drop of pneumatic oil for every two minutes of operation. DO NOT OVER-LUBRICATE.

Use of unfiltered, dirty air may result in damage to the unit and will void the warranty.

2.3 ELECTRICAL CONNECTION

The complete sequence of the Torch Wizard Nozzle Cleaning Station must be started and controlled by a robot controller, programmable logic controller (PLC), or other superior control system.

Electrical Draw: 0.5 Amps

See **Electrical Schematic** on page 9 for detailed wiring information and sequence of operations.

2.4 REAMER ADJUSTMENT

POSITIONING ROBOT

The robot **must** be positioned such that the O.D. of the nozzle rests evenly against the nozzle nest block. Failure to program the robot so that the nozzle rests against the block could result damage to the robot due to reactionary forces transmitted to the robot axis when the nozzle is clamped with the air cylinder. **See page 8 for the Sequence of Operations**

WARNING: Ensure that the adjustable nozzle nest block and the air motor have been correctly set prior to positioning the robot and running the Torch Wizard in the automatic mode. Refer to sections 2.5 Adjusting the Nozzle Nest Block and 2.6 Reamer Adjustment. **Failure to adjust these two items properly will result in damage to Torch Wizard and possibly the Robot.**

POSITIONING THE REAMER

In order to ensure adequate cleaning of the gas nozzle, it is essential that the correct reamer insertion depth is obtained. In general, the reamer should only be inserted into the gas nozzle to a depth of 3/8" to 1/2". **It is imperative that the reamer not make contact with the gas diffuser as this will cause damage to both the reamer and the gas diffuser. The Torch Wizard is not designed to clean the contact tip or gas diffuser.**

To adjust the reamer depth, use the following procedure and refer to Figures 8 and 9: **(Ensure that there is no air pressure or electrical power to the unit before performing this procedure)**

1. Open the stainless steel cover and install the reamer blade. Use the slim profile wrench provided to hold the motor in place when securing the reamer bit.
2. With one hand, hold a gas nozzle in the nest block at the position that will be used when programming the robot. With the other hand, pull the neck clamp forward so the torch neck is seated and properly aligned as shown in figure 8.
3. Check the nozzle depth at the reamer blade and ensure it is centered on the contact tip and not making contact with the diffuser or the inside of the torch nozzle. Proper adjustment of the reamer blade depth should look as shown in figure 9.
4. If the insertion depth is incorrect, loosen the Socket Head Cap Screws (1). Move the Air Motor up or down to obtain the correct insertion depth. If the motor will not move screw in the Jack Screw (2) to loosen the motor clamp.
5. Back out the Jack Screw (2) if necessary, and tighten the Socket Head Cap Screws (1). Repeat steps 2-5 until the correct insertion depth is obtained.

Note: The air motor on this reaming station has a max torque of 7.3 ft/lbs @ 90 psi at the motor.

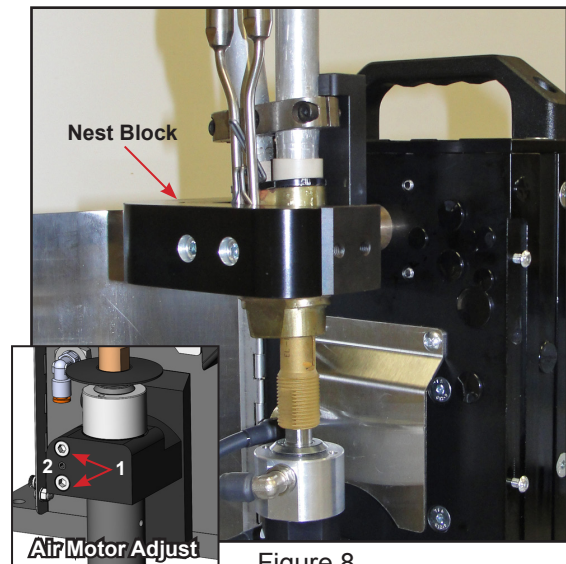


Figure 8



Figure 9

2.5 ANTI-SPATTER DISPENSING

The Torch Wizard with Anti-Spatter option provides the user with the ability to ream and spray the torch nozzle simultaneously. The anti-spatter solution is supplied from the anti-spatter reservoir (included with unit).

Anti-spatter Dispensing with the Reservoir

The Anti-spatter Reservoir dispensing option is shipped loose. On models ordered with the reservoir, simply attach the bowl to the connection point on the side of the unit. For all others, use the following procedure and refer to figure 7-A on how to attach the reservoir bottle to the Torch Wizard:

1. Open the back cover by removing the three screws. Remove the Bulk-head Connector.
2. Attach Reservoir to Reaming Station using the two supplied bolts.
3. Insert the anti-spatter tube (the one that was connected to the bulk-head) into the fitting on the Reservoir assembly.
4. Reattach back cover and ensure all screws and fittings are tight.

Once the Reservoir has been secured, remove the Fill Cap and fill the Reservoir with **Blue Magic™** or **Blue Chill™** anti-spatter solution. **The use of other anti-spatters will void the warranty on sprayer components. This is due to the corrosiveness of many anti-spatters, which is not found in either Blue Magic™ or Blue Chill™.**

The anti-spatter liquid volume and air volume have been factory set and should be evaluated before making any adjustments to the system. You may also adjust the length of the spray time when programming the unit.

Priming the Anti-spatter Sprayers

After filling the reservoir the first time it is important that you prime the anti-spatter sprayers. Follow these steps to do so:

1. Connect the electrical cable to your power supply and turn off the air.
2. Open up the front cover on the unit by loosening the two screws on the side.
3. Press and hold the SPRAY button on the side of the reamer until anti-spatter is coming out both nozzles. If only one nozzle is working, you may need to block the flow of anti-spatter from the working nozzle. Once both nozzles are functioning properly, the unit is ready for operation.

Sprayer Maintenance

Approximately once a month, the sprayers should be purged to clean the lines. To do this, fill the reservoir with approved Torch Wizard® cleaner, then press and hold the SPRAY button for 60 seconds (or until cleaner is gone) to clear any potential build-up in the unit.

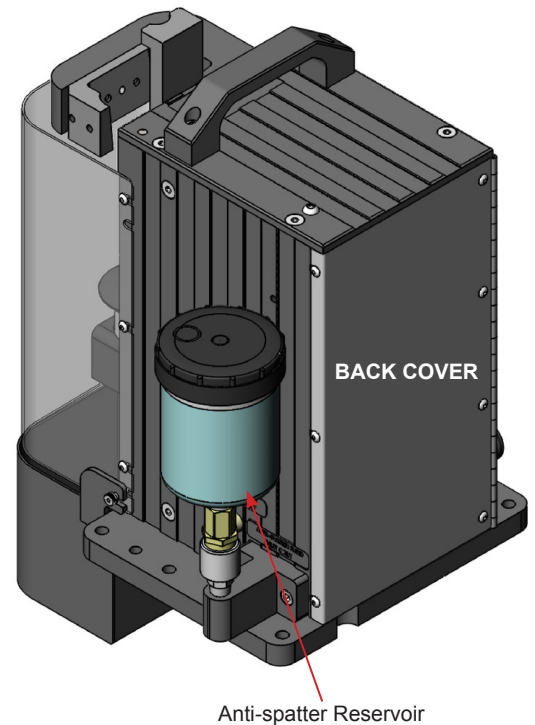


Figure 7-A Anti-spatter Reservoir Attachment

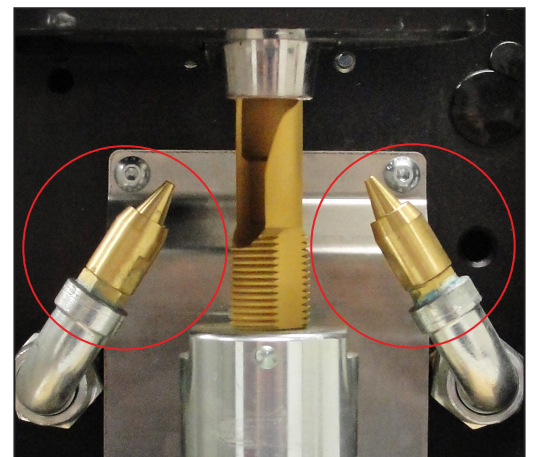
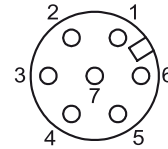


Figure 7-B Anti-spatter Spray Nozzles

2.6 SEQUENCE OF OPERATIONS

MODEL EL-NCS-A-TA-14 SEQUENCE OF OPERATIONS:

1. Verify Signal at Pin #3 is On (Home)
2. Energize Pin #4 - Motor & Clamp On
3. Verify Signal at Pin #3 is Off - Clamped
4. Short Delay
5. Energize Pin #5 - Vert Slide Up
6. Short Dwell for Torch Clean
7. De-energize Pin #5 - Vertical Slide Down
8. Short Delay
9. Pulse Pin #6 - Spatter Spray Application*
10. Short Dwell
11. De-energize Pin #6 - Spatter Spray Off
12. De-energize Pin #4 - Unclamp and Motor Off
13. Verify Signal at Pin #3 is On (Home)
14. Cycle Complete for one half of the TANDEM ARC NOZZLE
15. Robot program to position TANDEM ARC NOZZLE to opposite side of nest block and repeat sequence of operation steps (1) thru (14) as described above.



1. (WHT/BLK) - +24 VDC
2. (BLACK) - 0 VDC
3. (WHITE) - NOZZLE UNCLAMPED / SLIDE DOWN
4. (RED) - AIR MOTOR / CLAMP
5. (ORANGE) - SLIDE UP
6. (BLUE) - SPATTER SPRAY
7. (GREEN) - GROUND

**Duration of pulse determines the amount of spatter spray applied*

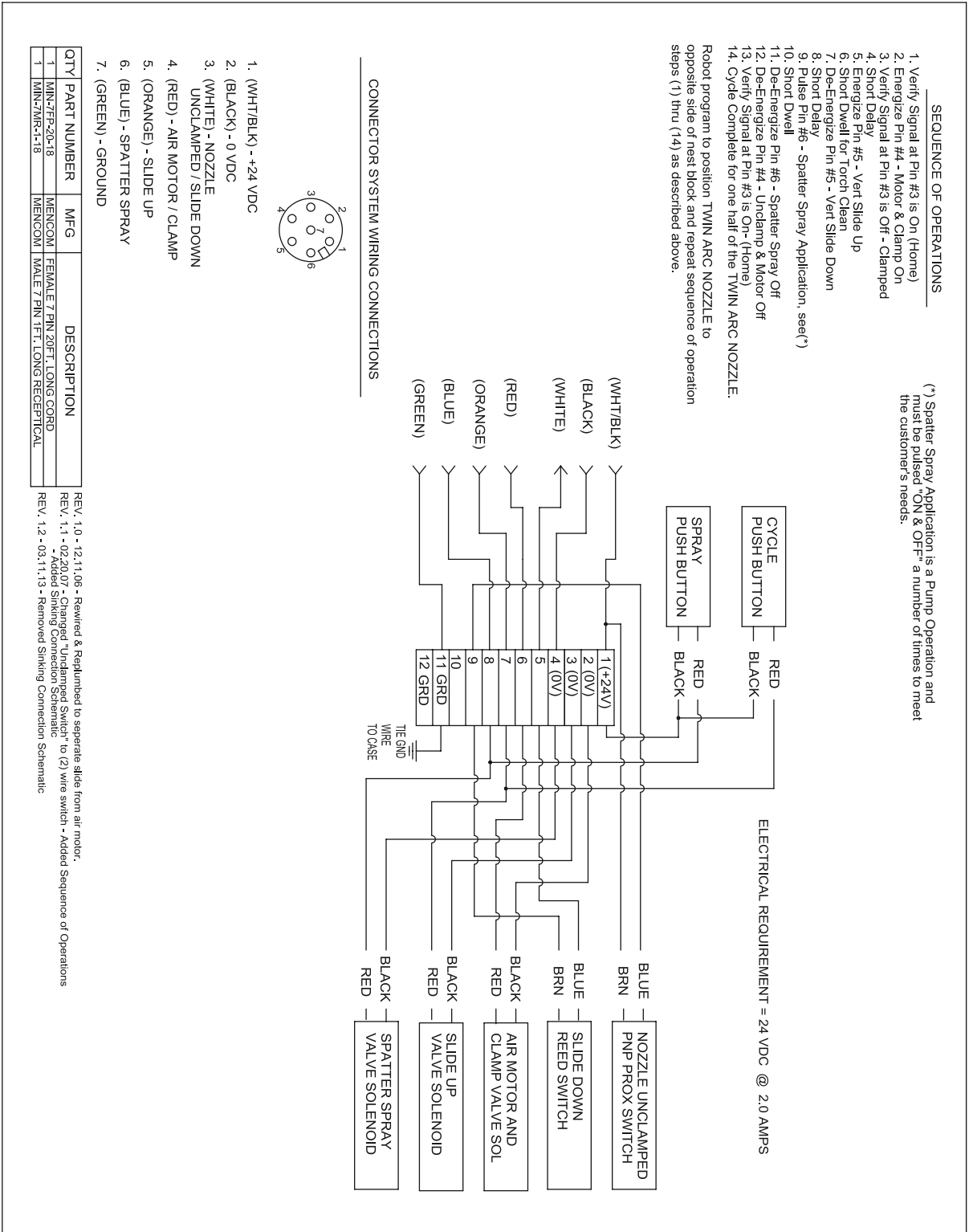
Complete electrical and pneumatic drawings are on pages 9-10

3.0 MAINTENANCE

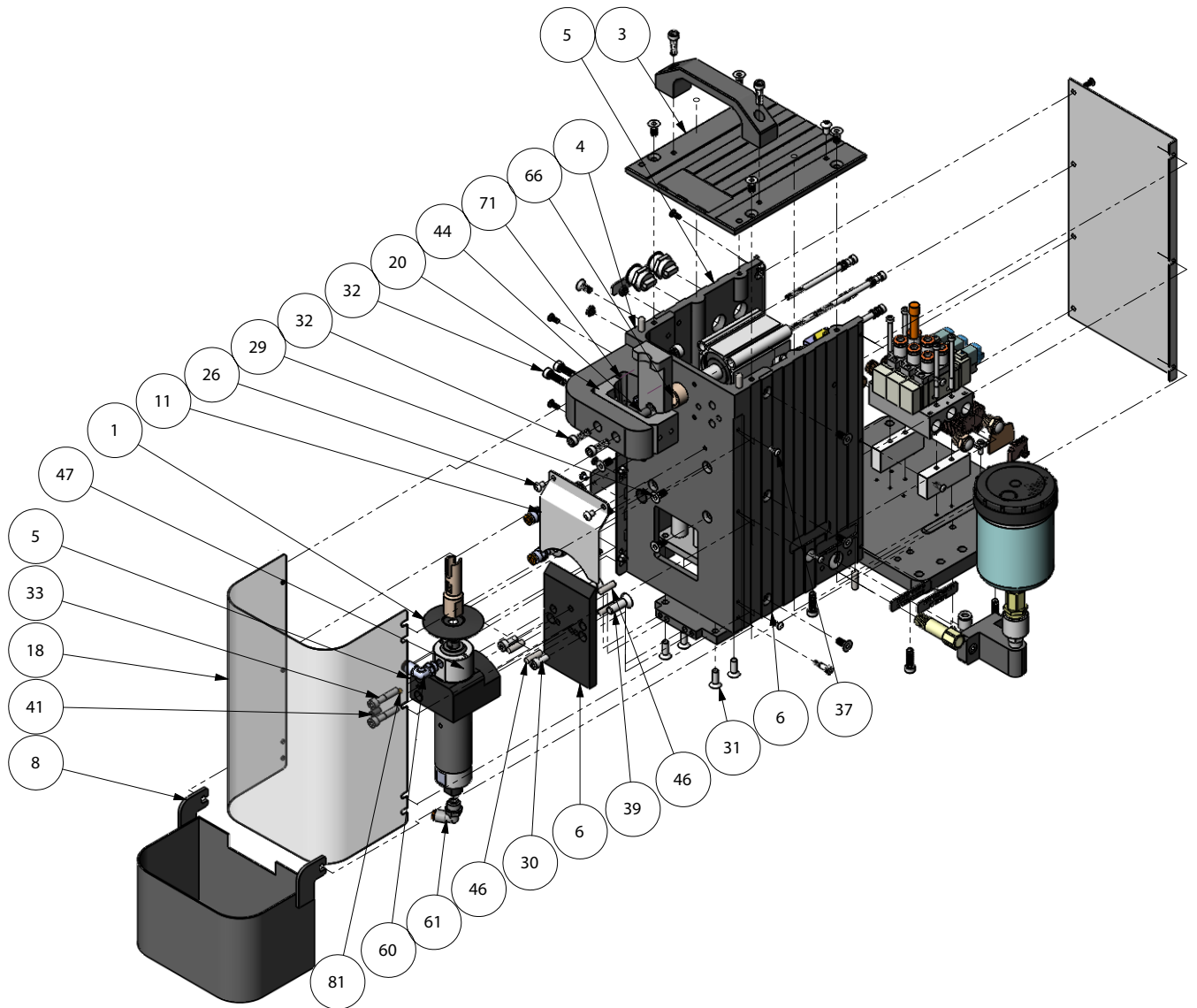
The Torch Wizard is for the most part, a maintenance free peripheral. However, the following should be checked at regular intervals:

- Visually inspect unit for damage, especially mechanically stressed components
- Clean the filter
- Check that the air lines are free of leaks
- Clean anti-spatter hole in reamer blade (does not apply to AVC models)
- Check blade for chips or cracks, replace if necessary
- Check for loose parts
- Ensure the proper depth of blade in the nozzle
- Ensure the blade is not making contact with the diffuser
- Ensure all covers are in place before operating

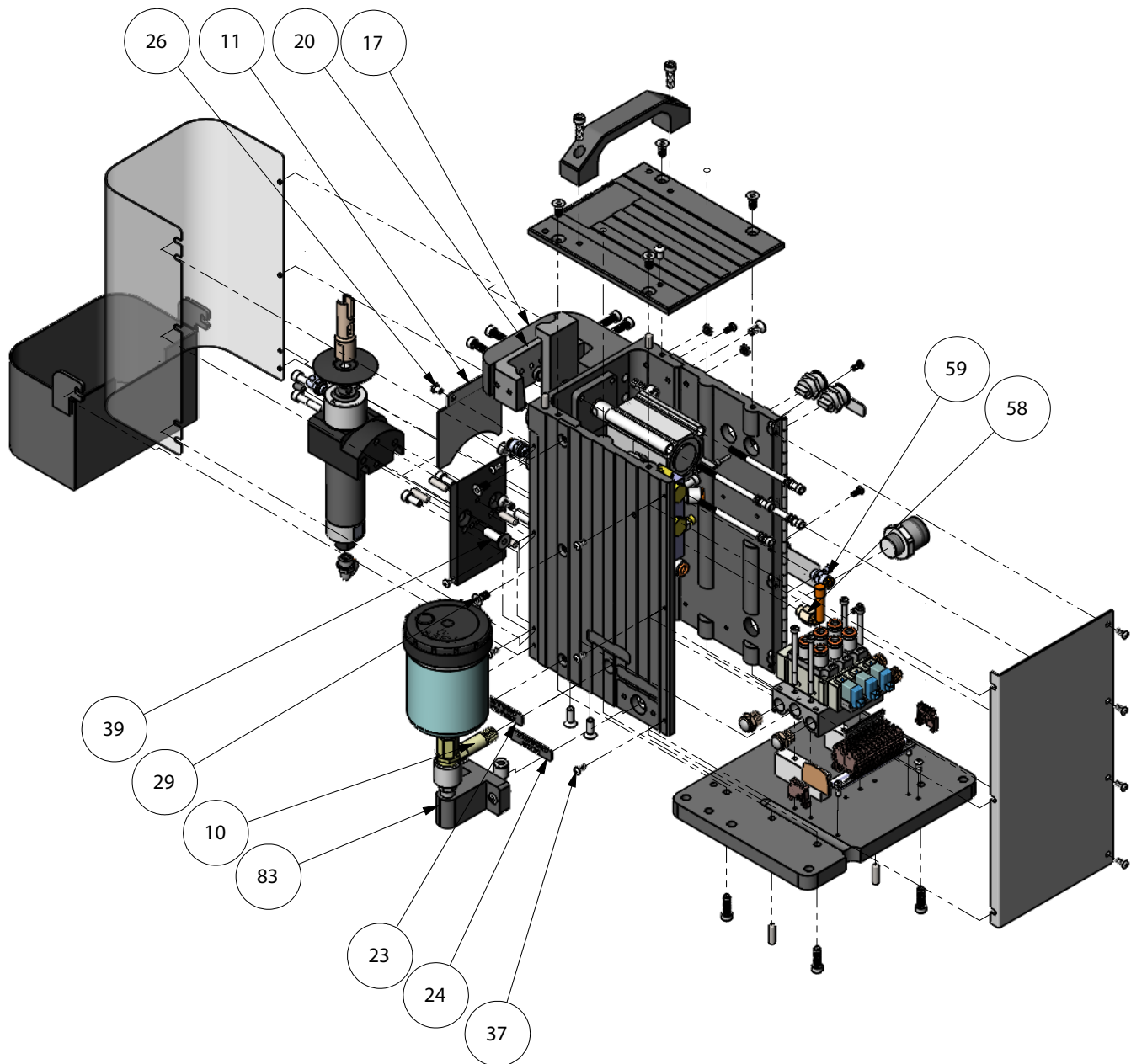
4.1 EL-NCS-A-TA-14 (7-PIN) ELECTRICAL SCHEMATIC



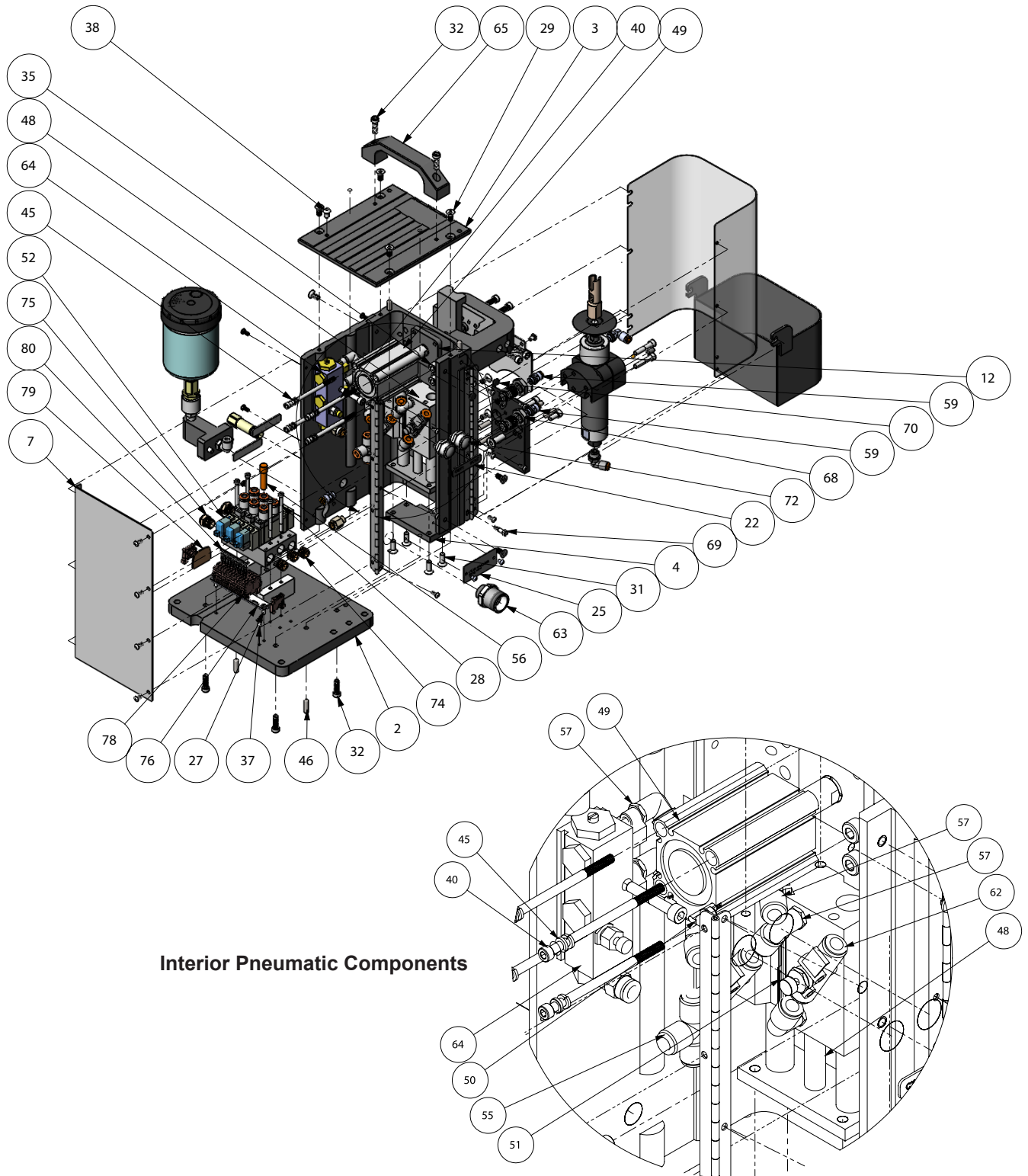
5.0 EXPLODED VIEW w/BOM (1)



5.0 EXPLODED VIEW w/BOM (2)



5.0 EXPLODED VIEW w/BOM (3)



Interior Pneumatic Components

5.1 PARTS LIST

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	NCS-23	DISK	1
2	NCS-25	BASE PLATE	1
3	NCS-29	TOP PLATE	1
4	NCS-31	ADAPTER PLATE	1
5	NCS-33	MOTOR MOUNT	1
6	NCS-34	SADDLE PLATE	1
7	NCS-36	REAR COVER	1
8	NCS-37	CATCH PAN	1
9	NCS-38	RISER BLOCK	2
10	NCS-40	EXTENSION FITTING	1
11	NCS-42	SHIELD	1
12	NCS-45	SPACER PLATE	1
13	NCS-46	HINGE (REAR COVER)	1
14	NCS-26-TA-13	FACE PLATE	1
15	NCS-27-TA-13	SIDE PLATE (LH)	1
16	NCS-28-TA-13	SIDE PLATE (RH)	1
17	NCS-32-TA-13	SUPPORT NEST	1
18	NCS-35-TA-13	FRONT COVER	1
19	NCS-47-TA-13	HINGE (FRONT COVER)	1
20	NCS-TA-6-1-13	NEST-BLOCK	1
21	NCS-TA-7-13	LOCATOR BLOCK	1
22	NCS-TAG-1	TAG	1
23	NCS-TAG-3	TAG	1
24	NCS-TAG-5	TAG	1
25	EL-NCS-A-TA- SERIAL TAG	TAG	1
26	0141307	M5-.8 X 8 BHSCS ZINC	2
27	0135879	M4-.7 X 10 SHCS ZINC	2
28	0135891	M4-.7 X 60 SHCS ZINC	4
29	0141389	M6-1.0 X 14 FHSCS ZINC	14
30	0135915	M6-1.0 X 14 SHCS ZINC	2
31	0141391	M6-1.0 X 18 FHSCS ZINC	4
32	0135918	M6-1.0 X 20 SHCS ZINC	10
33	0135921	M6-1.0 X 30 SHCS ZINC	2
34	0135922	M6-1.0 X 35 SHCS ZINC	1
35	0135934	M8-1.25 X 20 SHCS ZINC	2
36	0141299	M4-.7 X 6 BHSCS ZINC	2
37	0141301	M4-.7 X 10 BHSCS ZINC	19
38	0141317	M6-1.0 X 10 BHSCS ZINC	1
39	0141406	M8-1.25 X 25 FHSCS ZINC	2
40	0141705	M5-.8 X 90 SHCS ZINC	4
41	39850	M6-1.0 X 12 CUP PT. SET SCREW BLK OXIDE	1
42	40147	M4 X 0.7 NYLON LOCK NUT	7
43	40353	4MM FLAT WASHER ZINC	7
44	90598	M8-1.25 X 16 LHSCS BLK OXIDE	1
45	24766	M5 HIGH COLLAR LOCK WASHER	8
46	ST632506020PL	6MM DIA. DOWEL X 20 MM LG.	10
47	LZB-22L-A005	ATR MOTOR	1
48	MGOM25-50	GUIDED AIR ACTUATOR SLIDE	1
49	CDQ2B40-40DZ	COMPACT CYLINDER	1
50	D-A90VL	REED SWITCH	1
51	D-Z80L	REED SWITCH	1
52	HHB-108687	MANIFOLD & VALVES SUB ASSY	1
53	1J-159-01	8mm BLACK POLYURETHANE TUBE	1
54	1J-359-07-01	8mm SPATTER RESISTANT TUBE	1
55	KQ2T08-00	UNION TEE FITTING	1
56	KQ2P-09	5-16 TUBE PUSH-IN PLUG	1
57	KQ2L08-01S	FITTING	6
58	KQ2H09-34AS	FITTING	1
59	2U01007	FITTING	3
60	2U31008	FITTING	1
61	2U31009	FITTING	1
62	AS2052F-08	SPEED FLOW CONTROL	2
63	MIN-7MR2-1-18	7 PIN MALE RECEPTICLE	1
64	YB3786-1B1017	SPRAY INJECTOR PUMP	1
65	5193A2	PLASTIC HANDLE	1
66	5448T21	16MM ID ALLOY 932 FLANGE BUSHING	1
67	5454K87	.25 BULKHEAD FITTING "OPTIONAL" NOT INCLUDED	1
68	50785K272	.125 BULKHEAD FITTING	2
69	92981A030	5 MM DIA. X 10 MM LG.SHOULDER BOLT	2
70	9688K221	PLASTIC PLUG	4
71	98432A206	6MM DIA. PULL DOWEL X 16 MM LG.	2
72	AV191003C900	PUSH BUTTON	2
73	H5161-L27WHP	WARNING TAG "MOVING PARTS"	1
74	109AL-04	1-4 BRASS HEX SOLID PIPE PLUG	2
75	W0970530053U	1-4 NPT SFE MUFFLER	2
76	11751	DIN RAIL	1
77	7920340000	TERMINAL END BRACKET	2
78	1720920000	TERMINAL BLOCK	12
79	1720960000	END PLATE	1
80	1693880000	JUMPER	1
81	U-003	.156 DIA. STEEL BALL	1
82	EL-NCS-CC7-20	20 FT - 7 PIN CONNECTOR CABLE - 300V FEMALE	1
83	EL-NCS-AB-12	ANTI-SPATTER BOWL ASSY	1

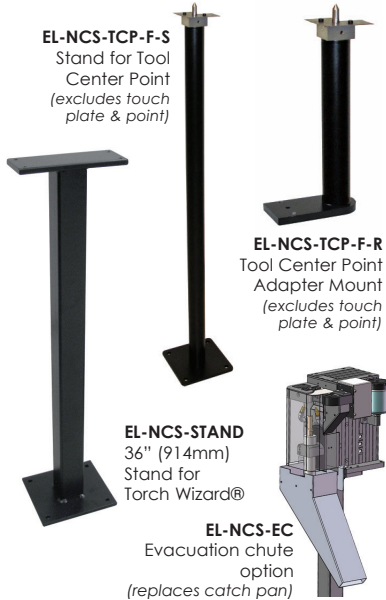
Operation Manual

TORCH WIZARD®

AUTOMATIC ROBOTIC NOZZLE CLEANING STATION

6.0 OPTIONAL COMPONENTS & ACCESSORIES

REAMING BLADES & ACCESSORIES



Reduce downtime & cost by using a multi-station bulk anti-spatter dispensing system



TORCH WIZARD® CLEANING STATION PARTS & ACCESSORIES

ITEM	PART NO.
Reaming Station w/integrated anti-spatter spray (7-pin unit)	EL-NCS-A-16
Reaming Station w/integrated anti-spatter spray & wire cutter (7-pin unit)	EL-NCS-AC-16
Reaming Station w/integrated anti-spatter spray for Tandem Arc Torches	EL-NCS-A-TA-14
36" (914mm) Stand (custom heights available) for EL-NCS models	EL-NCS-STAND
Filter/Regulator/Lubricator	EL-NCS-FRL-14
Torch Wizard® Cleaner for flushing anti-spatter lines	EAS1000-CLEAN
Testing and Diagnostic Box for EL-NCS A/AC-16 Models	EL-NCS-TB
Stand for Tool Center Point - 44.9" H (1141mm) from base to point	EL-NCS-TCP-F-S
Tool Center Point Mount (attaches to reaming station stand)	EL-NCS-TCP-F-R
Integrated Wire Cutter (included on AC & ACD models)	EL-NCS-WCS-12
Stand Alone Wire Cutter	EL-NCS-WCS-SA-12
Evacuation Chute for High Volume Applications (replaces catch pan)	EL-NCS-EC
Compressed Air Sprayer (inc. hose, fitting & blow gun) for clearing out debris	EL-NCS-CH
7 Pin, 20 ft Power/Control Cable (for EL-NCS-A-16 and AC-16 models)	EL-NCS-CC7-20-3

TORCH WIZARD® REAMER BLADES

ITEM	DIA	FLUTES	THREAD	HEIGHT	PART NO.
Reamer Blade	13mm	2	Female	2.558"	EL-NCS-13MM
Reamer Blade	13mm	1	Female	2.687"	EL-NCS-TL-13MMF
Reamer Blade	13mm	1	Female	2.433"	EL-NCS-TS-13MMF
Reamer Blade	15mm	2	Female	2.558"	EL-NCS-15MM
Reamer Blade ⚡	1/2"	2	Female	2.558"	EL-NCS-500
Reamer Blade ⚡	1/2"	1	Female	2.687"	EL-NCS-TL-50F
Reamer Blade ⚡	1/2"	1	Female	2.433"	EL-NCS-TS-50F
Reamer Blade ⚡	5/8"	2	Female	2.558"	EL-NCS-625
Reamer Blade ⚡	5/8"	1	Female	2.687"	EL-NCS-TL-62F
Reamer Blade ⚡	5/8"	1	Female	2.433"	EL-NCS-TS-62F
Reamer Blade ⚡	3/4"	2	Female	2.558"	EL-NCS-750

⚡ Compatible with PowerBall® Welding Consumables

Blue Magic® Anti-spatter

ITEM	PART NO.
32 OZ Spray Bottle	EAS1000-C32
1 GAL Bottle	EAS1000-C1
5 GAL Container	EAS1000-C5
55 GAL Drum	EAS1000-C
5 GAL Concentrate	EAS1000-C-CON

Blue Chill® Anti-spatter

ITEM	PART NO.
32 OZ Spray Bottle	EAS1000-BC32
1 GAL Bottle	EAS1000-BC1
5 GAL Container	EAS1000-BC5
55 GAL Drum	EAS1000-BC

20 ft (7.6 m) power/control cable included. The reamer bit required is based on the I.D. of the gas nozzle being used.

ELCo Enterprises, Inc.

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