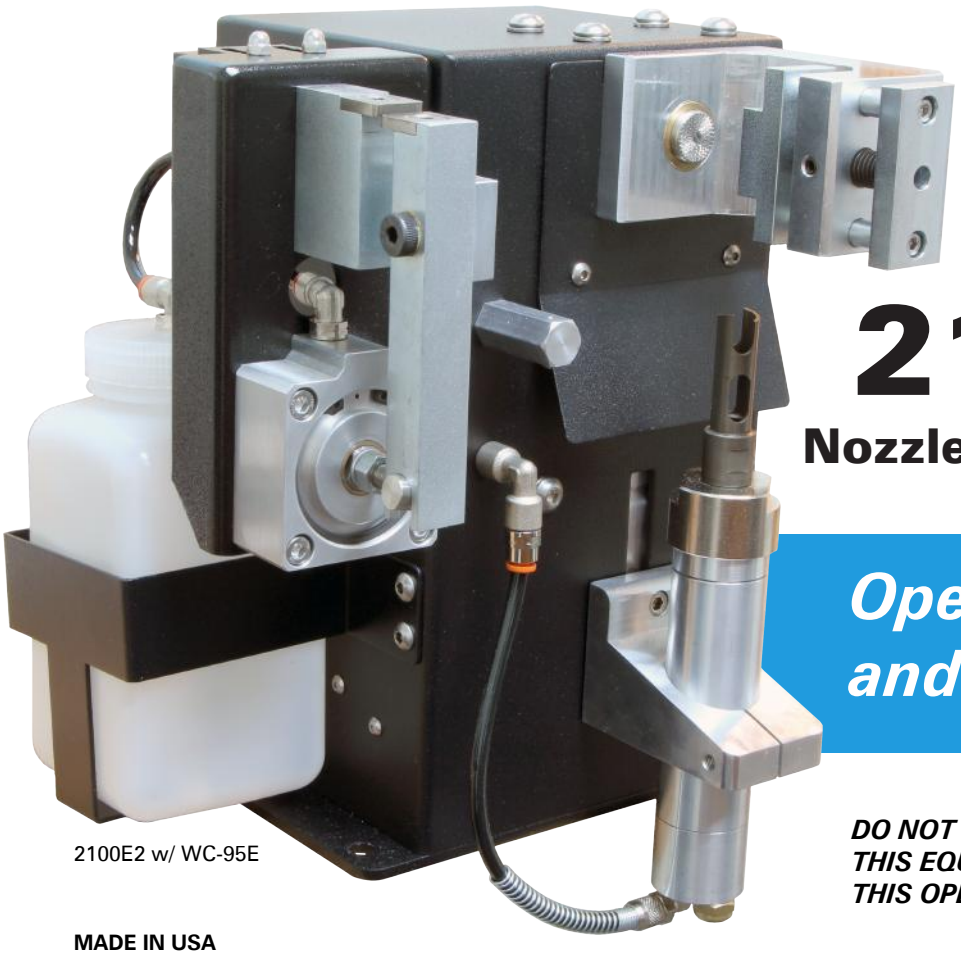
KOOL RUN®

Driven by Performance

AUTO-REAMER



2100E2 w/ WC-95E

2100E2

Nozzle Cleaning Station

Operating Manual and Parts List

DO NOT INSTALL, OPERATE, OR REPAIR THIS EQUIPMENT WITHOUT READING THIS OPERATING MANUAL

MADE IN USA

CM INDUSTRIES INC.

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Operations Manual Index

Introduction:

The CM Industries product you have purchased has been carefully manufactured, assembled and fully tested in our factory prior to shipment. This manual contains information on the operation of this CM Industries product. While every precaution has been taken to assure the accuracy of this manual, CM Industries, Inc. assumes no responsibility for errors or omissions. CM Industries, Inc. assumes no liability for damages resulting from the use of the information contained herein. CM Industries, Inc. shall have no liability to the buyer for consequential damages or be liable to the in tort for any negligent manufacture of the goods or for the omissions of any warning therefrom.

Warranty:

Warranty is extended to the original distributor purchasing the product from CM Industries, Inc. for resale. Any CM Industries product found defective because of material or workmanship under normal intended use within 90 days after installation will, at CM Industries discretion, be repaired, replaced, or credit issued for the purchase price of the product.

Upon notification from the original purchaser of a possible defect or failure, CM Industries, Inc. will issue instructions for the procedure to follow to return the merchandise to CM Industries, Inc. Appropriate adjustments will be made when the claim is verified. Genuine CM Industries parts must be used for safety and performance reasons or the warranty becomes invalid.

Specifications:

AIR REQUIREMENT:
80-120 PSI @ 8 S.C.F.M. (MIN) CLEAN SHOP AIR

REAMER STROKE: 2”

DIMENSIONS: 6-1/2” X 6” X 12”

WEIGHT: 27 LBS. 2100E2
31 LBS. 2100E2 w/ WC-95E

ELECTRICAL REQUIREMENTS:

(4) ROBOT OUTPUTS AND (1) ROBOT INPUT

OUTPUT: 0V DC SWITCHABLE GROUND

OUTPUT: 24V DC CONTINUOUS SUPPLY

INPUT: 24V DC SIGNAL RETURN

NOTE: WIRED FOR STANDARD “SINKING” LOGIC

Installation/Setup:

Step 1: Mounting

Mount the nozzle cleaning station within easy access of the robot. For proper operation, a solid, vibration free stand or mount is required. Mounting dimensions are shown below in Fig. 1.

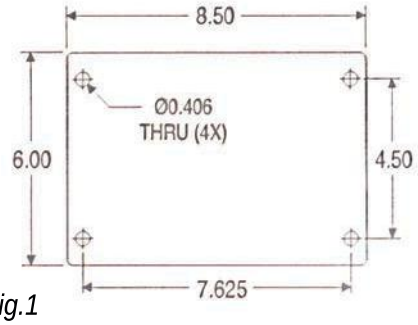


Fig.1

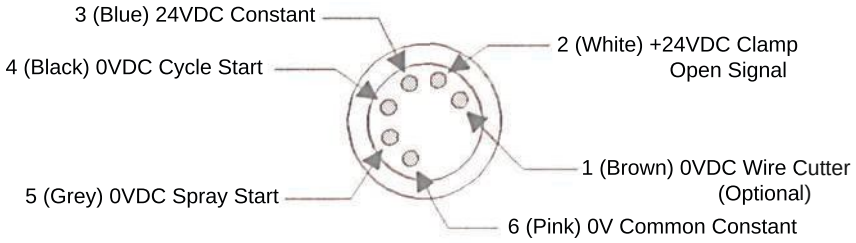


Fig. 2

NOTE: WIRING SHOWN FOR STANDARD "SINKING" LOGIC

Step 2: Electrical Connection

Electical connection information for the nozzle cleaning station cordset is given in Fig. 2.

NOTICE:

Line 1 (brown wire) on cordset must be connected to a robot output capable of supplying a timed "ground". This ground "pulse" determines the length of time the wire cutting action will take place. (Optional)

Line 2 (white wire) on cordset must be connected to a robot input of receiving a +24VDC signal from the nozzle cleaning station. This "cycle status signal" informs the robot when the clamp is open.

Line 3 (blue wire) on cordset must be connected to a robot output capable of supplying a continuous 24VDC.

Line 4 (black wire) on cordset must be connected to a robot output capable of supplying a timed "ground". This ground "pulse" determines the length of time the reaming action will take place.

Line 5 (grey wire) on cordset must be connected to a robot output capable of supplying a timed "ground". This ground "pulse" determines the length of time the spraying action will take place.

Step 3: Air Supply

The nozzle cleaning station requires 80-120 psi clean shop air (@ 8 S.C.F.M.) minimum for proper operation. The unit is equipped with a 1/4" NPT female fitting for the air supply connection.

Step 4: Reamer Tooling

1. Choose the appropriate size reamer blade for your welding nozzle I.D. (see page 7 for available sizes). To remove/install reamer blade: Use an adjustable wrench to hold the top of the air motor cap, then use a 17mm wrench to remove the reamer, in a counter-clockwise direction. Considerable force may be needed to remove the reamer blade (as much as 20 ft. lbs.) as the blade self-tightens during use. Installation is the opposite of removal.

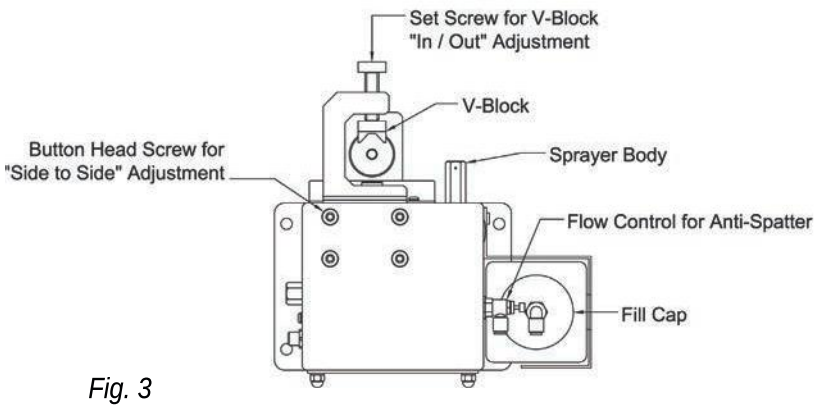


Fig. 3

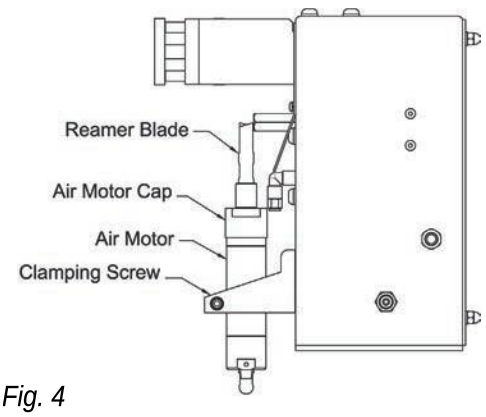


Fig. 4

Step 5: Nozzle Alignment / Nozzle Clamp Adjustment

1. Correct alignment of the welding nozzle is critical to the proper operation of the unit. The clamping V-Block must be adjusted according to the nozzle diameter, so as to center the nozzle above the reamer when the clamp is closed. The V-Block is adjusted by turning the set screw behind the V-Block in or out as shown in Fig. 3.

2. The “side to side” alignment of the clamping unit with repsect to the reamer is set at the factory and normally will not require adjustment. However, if realignment is necessary, the entire clamping unit can be moved from “side to side” by loosening the (4) button head screws located on the top of the nozzle cleaning station as shown in Fig. 3.

3. Insertion depth of the reamer blade into the welding nozzle is controlled by the robot torch/nozzle. Adjustments should be made by the robot torch operator with the robot torch with respect to the nozzle placement into the clamping unit.

   Caution: Use caution to avoid possible interference with the reamer to the robot torch head or nozzle components when setting this adjustment. Additional adjustment can be accomplished by loosening the clamp screw on the reamer motor clamping arm and moving the motor up or down (see Fig. 4).

   Caution: Use caution to avoid possible interference between the reamer blade and clamping device.

Step 6: Anti-Spatter Solution

1. Anti-Spatter solution is added to the unit by romoving the fill cap on top of the bottle (see Fig. 3). The bottle capacity is approximately 1 quart.

Operation:

Step 1: Robot Programming / Ream Function

1. The cycle time for nozzle cleaning (reaming) is controlled by the robot program. With the ground “on” on Line 4 (see Fig. 2), the reamer starts upward travel, the blade begins rotating, and the clamp secures the welding nozzle in place. With the ground still applied, the reamer reaches the top of it’s stroke (cleaning position), and remains there as long and the ground is “on”. When the ground is turned “off”, the reamer will begin it’s downward travel, continuing to rotate with the clamp still closed. Upon reaching the bottom of it’s stroke (home position), the blade will stop rotating and the clamp will open.

2. Line 2 (see Fig. 2) is a “cycle status” line which informs the robot of the clamp status. When the clamp is open, the robot will see a 24VDC signal on this line. As the clamp is closed (during the cleaning cycle), Line 2 will read 0VDC. The robot program should not allow any robot movements when Line 2 is a 0VDC.

Step 2: Robot Programming / Spray Function

1. The anti-spatter sprayer is activated by the same type of signal as the “cycle” Line 4 (see Fig. 2). The robot should be programmed by Line 5, to move directly over the sprayer body to spray either before or after the reaming process. With the ground “on” on Line 5 (see Fig. 2), the sprayer will dispense anti-spatter until the ground is turned “off”. Spray dispensation should be determined by the robot operator.

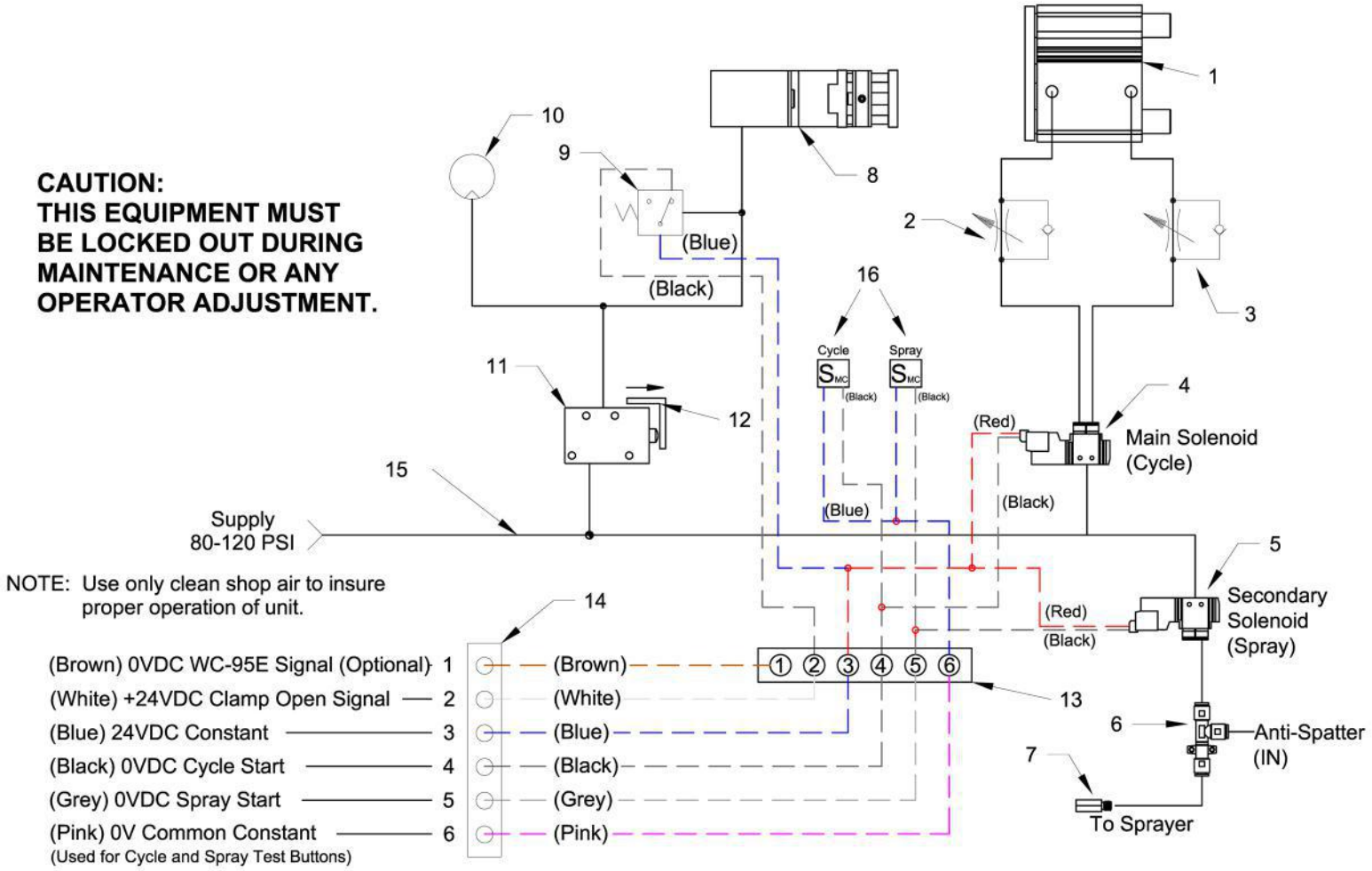
2. The amount of anti-spatter delivered can be controlled in (2) ways. First, the length of time that the Line 5 is activated to ground “on”, and second is the adjustment of the flow control located on the side of the unit directly above the anti-spatter bottle. The flow control can be used to richen or lean the anti-spatter mixture.

Step 3: Feed Rate Adjustment

1. Feed rate “up” or “down” can be controlled by adjusting the flow control fittings (see item 8 in Parts Breakdown) located inside the unit. The top fitting controls the speed of the “up” direction. The bottom fitting controls the speed of the “down” direction.

Wiring Schematic for 2100E2 Nozzle Cleaning Station

CAUTION:
THIS EQUIPMENT MUST BE LOCKED OUT DURING MAINTENANCE OR ANY OPERATOR ADJUSTMENT.



NOTE: WIRING SHOWN FOR STANDARD "SINKING" LOGIC.

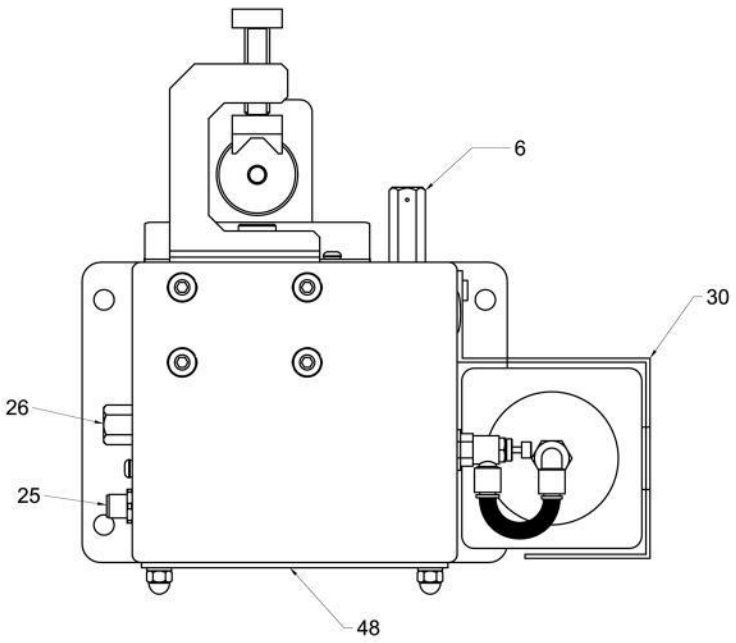
Item	Part No.	Description
1	650-25-236	Lift Cylinder
2	650-25-256	Speed Control Fitting (Down)
3	650-25-256	Speed Control Fitting (Up)
4	650-25-251	Solenoid Valve, 24V DC, Cycle
5	650-25-251	Solenoid Valve, 24V DC, Spray
6	650-25-716	Venturi Valve
7	650-25-271	Sprayer Body
8	650-25-217	Clamp Block Assembly
9	650-25-259	Pressure Switch
10	650-25-105	Pneumatic Motor
11	650-25-247	Mechanical Valve
12	650-25-237	Valve Actuating Bracket
13	650-25-273	Terminal Block
14	650-25-260	Plug, 6-Poles
15	650-25-279	1/4" O.D. Tubing, Polyurethane
16	650-25-360	Momentary Test Buttons

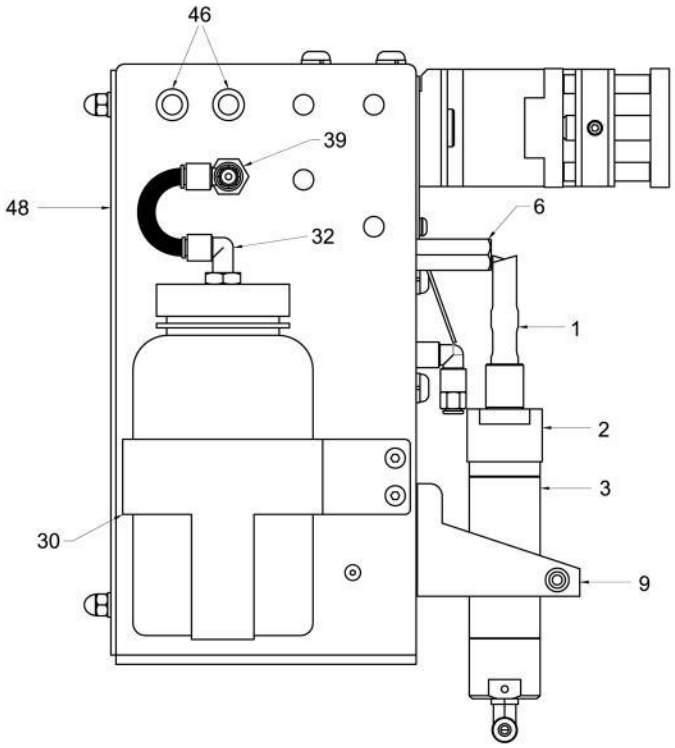
REAM FUNCTION:

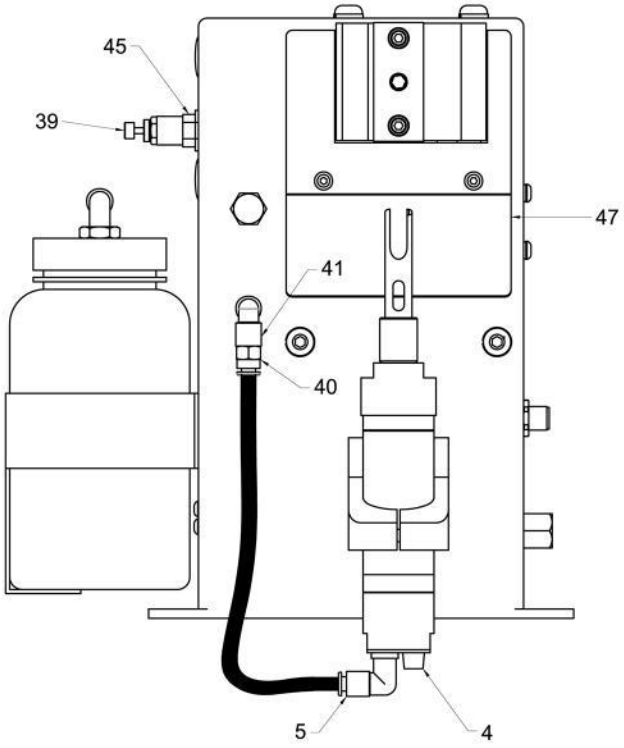
OPERATION SEQUENCE	VALVE ACTION	CYCLE STATUS
GROUND "OFF" (LINE 4)	VALVE 11 "ON"	REAMER OFF, CLAMP OPEN
GROUND "ON" (LINE 4)	VALVE 4 "ON"	REAMER UPWARD TRAVEL
HOLD GROUND "ON" (LINE 4)	VALVE 11 "OFF"	REAMER ON, CLAMP CLOSED
" "		REAMER AT TOP OF STROKE
GROUND "OFF" (LINE 4)	VALVE 4 "OFF"	REAMER DOWNWARD TRAVEL
" "	VALVE 11 "ON"	REAMER OFF, CLAMP OPEN

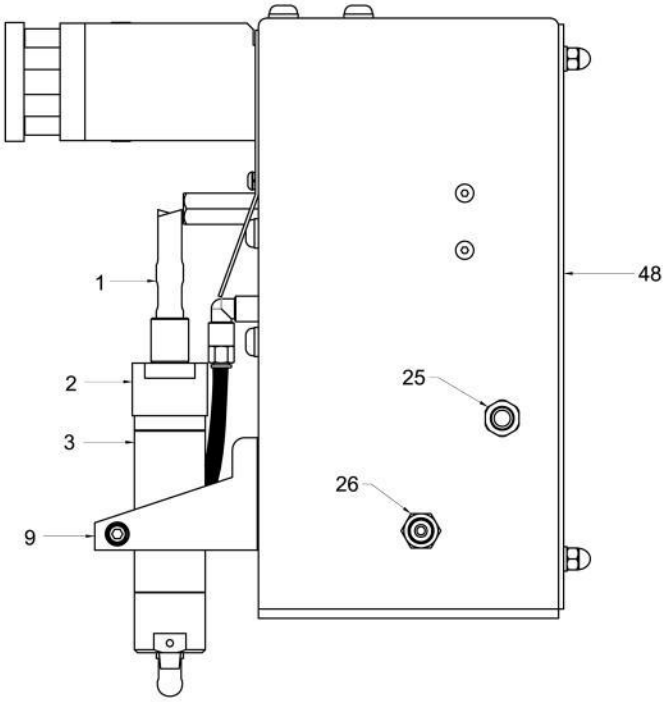
SPRAY FUNCTION:

OPERATION SEQUENCE	VALVE ACTION	CYCLE STATUS
TORCH IN SPRAY POSITION	VALVE 5 "ON"	SPRAYER ON
TORCH AWAY	VALVE 5 "OFF"	SPRAYER OFF



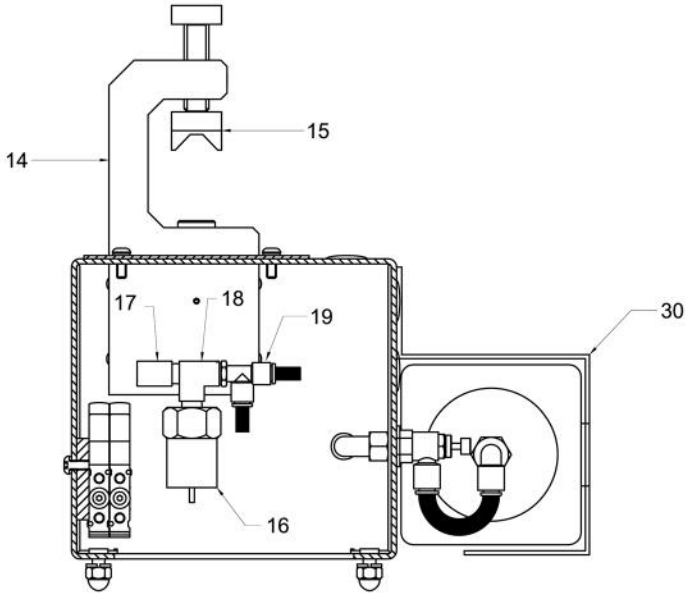


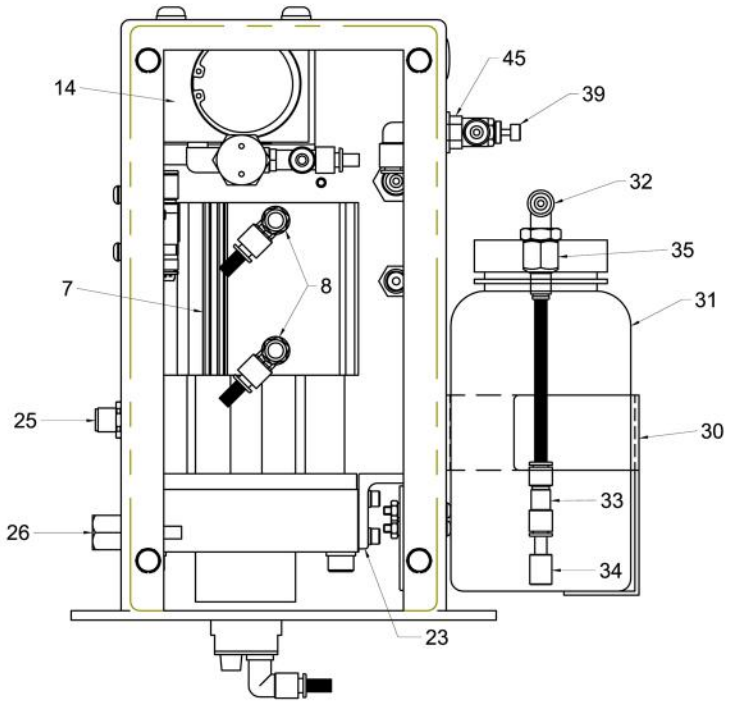


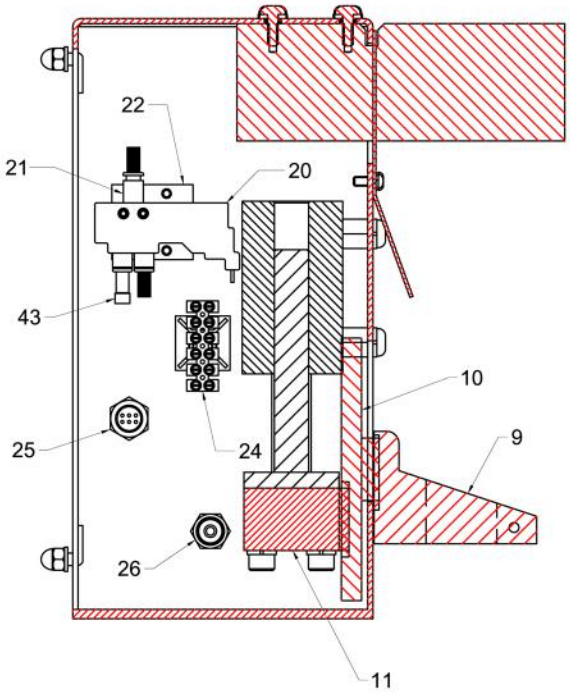


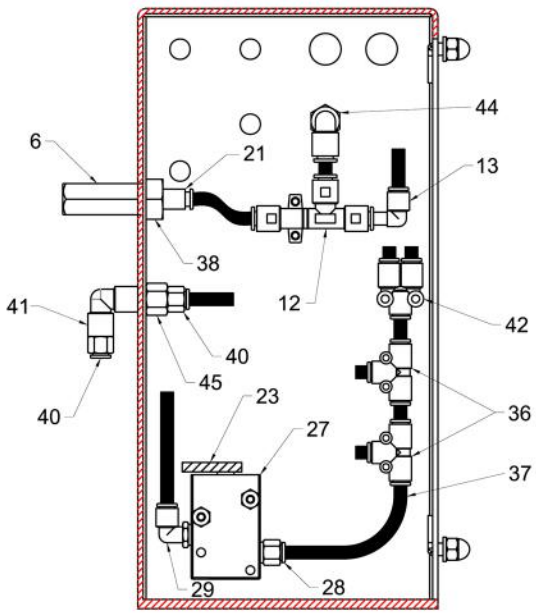
Item #	Part #	Description
1		See Reamer Chart
2	650-25-126	Air Motor Cap
3	650-25-105	Pneumatic Motor Assembly
4	650-25-289	Motor Muffler
5	650-25-272	Fitting, Elbow 1/4" NPT x 1/4" Comp.
6	650-25-271	Sprayer Body
7	650-25-236	Lift Cylinder
8	650-25-256	Fitting, Flow Control
9	650-25-701	Motor Clamp Block
10	650-25-702	Motor Clamp Block Slide Plate
11	650-25-703	Motor Clamp Block Base
12	650-25-716	Venturi Valve, 1/4" Tube

Item #	Part #	Description
13	650-25-731	Fitting, Plug-In Elbow, 1/4" Push
14	650-25-217	Clamping Cylinder Assembly
15	650-25-230	V-Block, Clamping Cylinder
16	650-25-259	Pressure Switch
17	650-25-257	90° Street Elbow 1/8" NPT
18	650-25-258	Street Tee 1/8" NPT
19	650-25-261	Fitting, Lateral Tee 1/8" NPT
20	650-25-251	Solenoid Valve (2), Cycle & Spray
21	650-25-278	Fitting, Male Connector 10-32 x 1/4" Push
22	650-25-239	Valve Mounting Plate
23	650-25-237	Valve Actuating Bracket
24	650-25-273	Terminal Block









Item #	Part #	Description
25	650-25-260	Receptacle 6-Pin
26	650-25-717	Bulkhead Connector 1/4" NPT x 1/4" Push
27	650-25-247	Mechanical Valve
28	650-25-263	Fitting, Male Connector 1/8" NPT x 1/4" Push
29	650-25-264	Fitting, Elbow 1/8" NPT x 1/4" Push
30	650-25-209	Bottle Bracket
31	650-25-290	Bottle, Anti-Spatter (Part# 650-25-291 - Complete w/ Fittings)
32	650-25-730	Fitting, Elbow 1/4" x 1/4" Push
33	650-25-287	Unidirectional Valve
34	650-25-288	Filter, Anti-Spatter
35	650-25-732	Fitting, Female Connector 1/4" x 1/4" Push
36	650-25-268	Fitting, Union Tee 1/4" Push

Item #	Part #	Description
37	650-25-279	Polyurethane Tubing 1/4" O.D.
38	650-25-276	Hex Nut, 7/16-20
39	650-25-715	Flow Control - Metal
40	650-25-733	Fitting, Male Connector 1/8" x 1/4" Push
41	650-25-734	Fitting, Female Elbow 1/8" x 1/8"
42	650-25-735	Fitting, Union "Y" 1/4" Push
43	650-25-737	Plug, 1/4"
44	650-25-729	Fitting, Elbow 1/8"F x 1/4" Push
45	650-25-736	Adaptor, 1/8"M x 1/8"F
46	650-25-360	Momentary Test Buttons
47	650-25-207	Angled Guard Plate
48	650-25-214	Rear Cover Plate

Reamer Blade Sizes Available

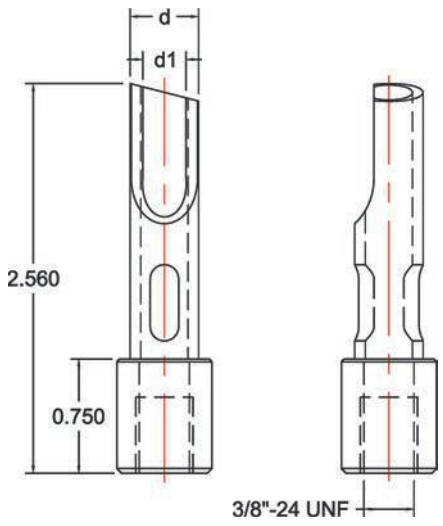
1 Blade Reamers

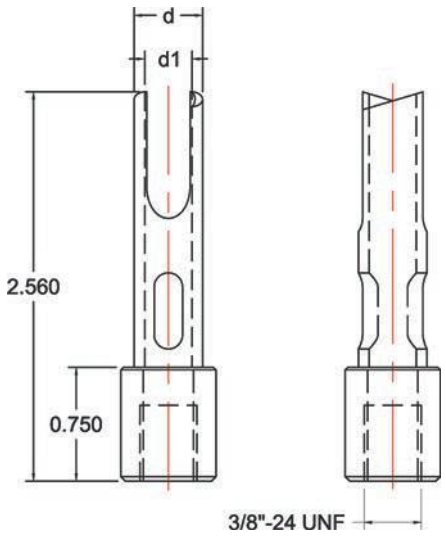
Part Number	d=O.D. (mm)	d1=O.D. (mm)	Nozzle Size
651-09-07	9	7	3/8" - 10mm
651-09.5-07	9.5	7	3/8" - 10mm
651-10-08	10	8	3/8" - 10mm
651-10.5-08	10.5	8	7/16" - 11mm
651-11-07	11	7	7/16" - 11mm
651-11.5-08.5	11.5	8.5	7/16" - 11mm
651-12-07	12	7	1/2" - 13mm
651-12-08-46	12	8	1/2" - 13mm
651-12-09	12	9	1/2" - 13mm
651-12-10	12	10	1/2" - 13mm
651-12.5-09	12.5	9	1/2" - 13mm
651-12.5-10	12	10	1/2" - 13mm
651-13-09	13	9	14mm
651-14-09	14	9	9/16" - 15mm
651-14-11	14	11	9/16" - 15mm
651-14-12	14	12	9/16" - 15mm
651-14.5-12.5	14	12.5	
651-15-09	15	9	5/8" - 16mm
651-15-11	15	11	5/8" - 16mm
651-15-13	15	13	5/8" - 16mm
651-15.5-08	15.5	8	5/8" - 16mm
651-15.5-13	15.5	13	5/8" - 16mm
651-16-11	16	11	16mm
651-17-11	17	11	11/16"- 17mm
651-17-14	17	14	11/16"- 17mm
651-18-11	18	11	3/4" - 18mm
651-18-13	18	13	3/4" - 18mm
651-18-13-80	18	13	3/4" - 18mm
651-19-15	19	15	3/4" - 19mm

2 Blade Reamers

Part Number	d=O.D. (mm)	d1=O.D. (mm)	Nozzle Size
652-09-07	9	7	3/8" - 10mm
652-10-07	10	7	3/8" - 10mm
652-10.5-08	10.5	8	7/16" - 11mm
652-11-07	11	7	7/16" - 11mm
652-11-08.5	11	8.5	7/16" - 11mm
652-12-09	12	9	1/2" - 13mm
652-12-10	12	10	1/2" - 13mm
652-12.5-09	12.5	9	1/2" - 13mm
652-12.5-10	12.5	10	1/2" - 13mm
652-13-09	13	9	14mm
652-13-10.5	13	10.5	14mm
652-14-09	14	9	9/16" - 15mm
652-14-11	14	11	9/16" - 15mm
652-15-10.5-80	15	9	5/8" - 16mm
652-15-11	15	11	5/8" - 16mm
652-15-11-80	15	11	5/8" - 16mm
652-15-12	15	12	5/8" - 16mm
652-15-12.5	15	12.5	5/8" - 16mm
652-15-12.5-80	15	12.5	5/8" - 16mm
652-15.5-13	15.5	13	5/8" - 16mm
652-15.5-13-75	15.5	13	5/8" - 16mm
652-16-11	16	11	16mm
652-16-11-80	16	11	16mm
652-16-12.5	16	12.5	16mm
652-17-11	17	11	11/16"- 17mm
652-17-11-80	17	11	11/16"- 17mm
652-17-14	17	14	11/16"- 17mm
652-17-15	17	15	11/16"- 17mm
652-17-15-80	17	15	11/16"- 17mm
652-18-13	18	13	3/4" - 18mm
652-18-13-80	18	13	3/4" - 18mm
652-19-15	19	15	3/4" - 19mm

Custom reamer blade sizes available upon request





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WARNING

Read and follow the manufacturer's instructions, employer's safety practices, and Material Safety Data Sheets (MSDSs).

Only qualified personnel should install, use, or service this material and/or equipment.

WELDING SPARKS can cause fire or explosion

- Do not weld near flammable material
- Do not weld on closed containers.
- Remove combustibles from the work area and/or provide a fire watch.
- Avoid oily or greasy clothing as a spark may ignite them.

ARC RAYS can injure eyes and burn skin

- Always wear correct eye, ear, and body protection
- Always wear a welding helmet with the proper grade filter lens. Protect yourself and others from spatter arc flash rays by using protective screens, barriers and welding curtains.
- Always wear protective gloves and clothing to cover exposed skin. This will aid in the prevention of arc and spatter burns.

ELECTRIC SHOCK can kill.

- Always wear dry installing gloves
- Do not touch live electrical parts.
- Always disconnect power source before hooking up or changing electrodes, nozzles and other parts.

FUMES AND GASES can be hazardous to your health.

- Keep your head out of the fumes
- Use enough ventilation or exhaust at the arc to keep fumes and gases from your breathing zone, and general area.
- Fumes from cutting and welding can deplete air quality, causing injury or death. Always wear an air supplied respirator in confined areas, or if breathing air is not safe.

LOUD NOISE can damage hearing.

- Always wear protective hearing devices to ensure protection when noise levels exceed OSHA standards

CALIFORNIA PROPOSITION 65 WARNING

This product contains chemicals, including lead, know to the State of California to cause cancer, birth defects, or other reproductive harm. Wash hands after use.

(California Health & Safety Code Section 25249.5)