

CM INDUSTRIES[®] **INC.**



MODEL SC-4

Featuring a Venturi Spray System
to Distribute a Mist of Anti-Spatter.

MODEL SC-4
PART # 650-25-494

MANUFACTURED BY CM INDUSTRIES, INC. IN LAKE ZURICH, IL U.S.A.

NOZZLE CLEANING STATION

SC-4

Operating Manual And Parts List

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

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August 2010

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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" X 8-7/8" X 13-3/4"

WEIGHT: 31 LBS. SC-4

35 LBS. SC-4 w/ WC-92

ELECTRICAL REQUIREMENTS:

(2) ROBOT OUTPUTS AND (1) ROBOT INPUT

OUTPUT: 24V DC SWITCHABLE SIGNAL

OUTPUT: 24V DC CONTINUOUS SUPPLY

INPUT: 24V DC SIGNAL RETURN

NOTE: WIRED FOR "SOURCING" 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.

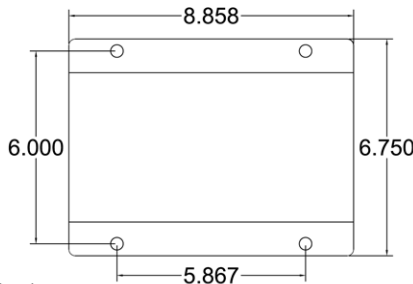


Fig. 1

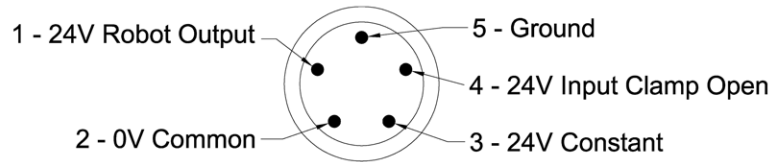


Fig. 2

NOTE: WIRING SHOWN FOR STANDARD "SOURCING" LOGIC

Step 2: Electrical Connection

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

NOTICE:

Line 1 on cordset must be connected to a robot output capable of supplying a timed 24VDC "pulse". This 24VDC "pulse" determines the length of time the reaming action will take place.

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

Line 4 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.

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 6 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.

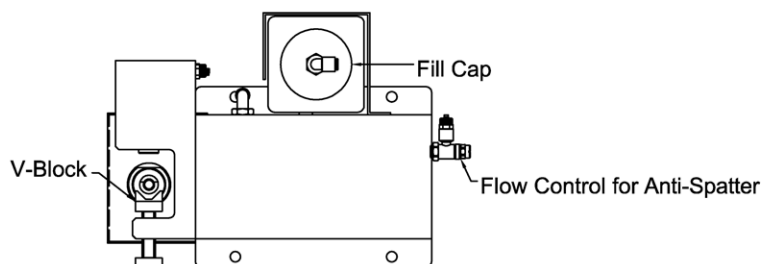


Fig. 3

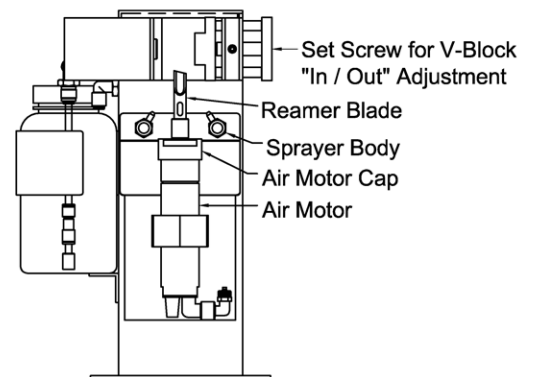


Fig. 4

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 respect 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 (3) button head screws, holding the lift cylinder, located on the side of the unit.
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 removing 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 a 24VDC pulse on Line 1 (see Fig. 2), the reamer starts upward travel, the blade begins rotating, and the clamp secures the welding nozzle in place. With the 24VDC still applied, the reamer reaches the top of its stroke (cleaning position), and remains there as long as the 24VDC is “on”. When the 24VDC is turned “off”, the reamer will begin its downward travel, continuing to rotate with the clamp still closed. Upon reaching the bottom of its stroke (home position), the blade will stop rotating and the clamp will open.
2. Line 4 (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 4 will read 0VDC. The robot program should not allow any robot movements when Line 4 is a 0VDC.

Step 2: Robot Programming / Spray Function

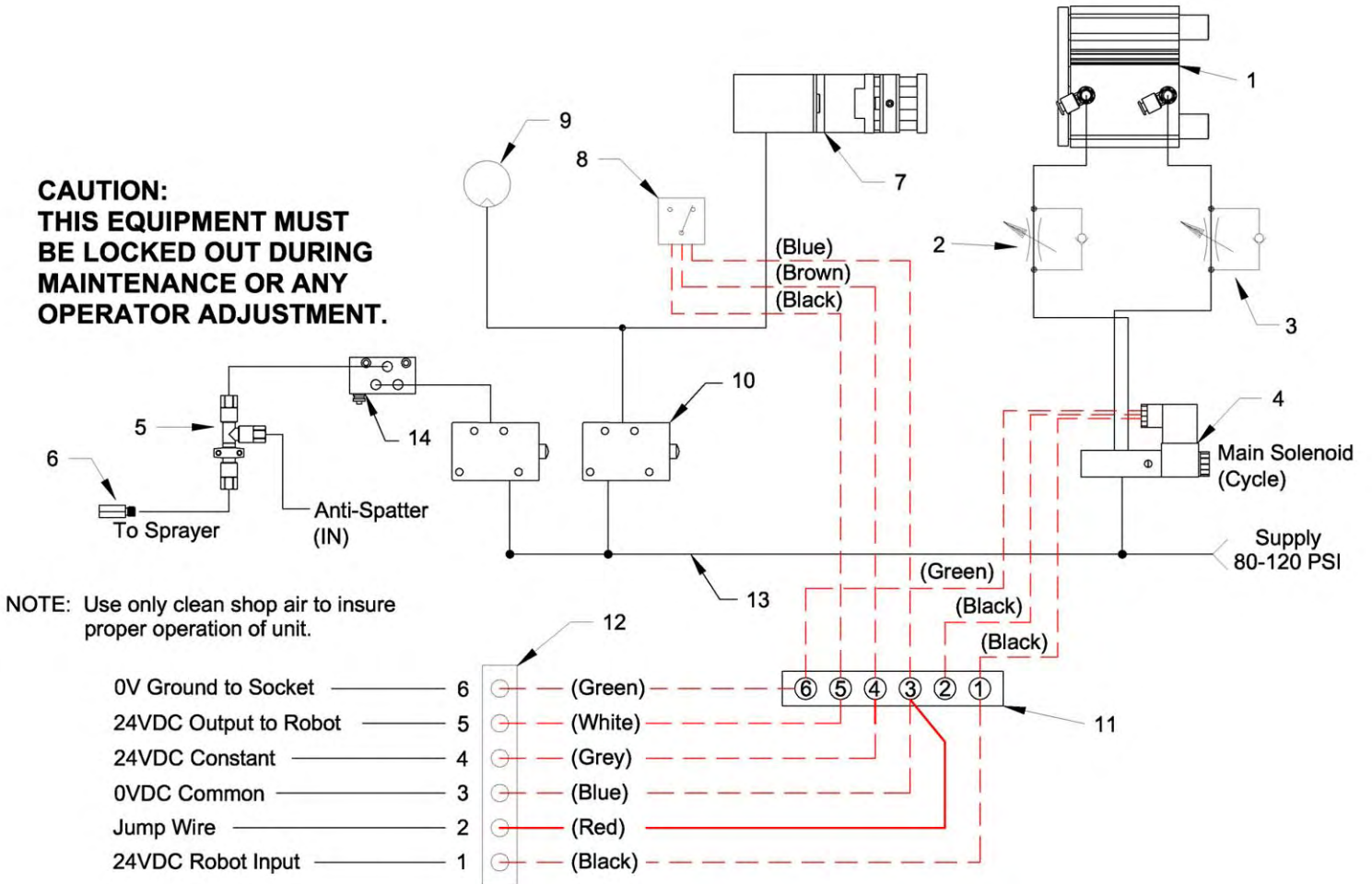
1. The anti-spatter sprayer is activated by a simple action. Once the reaming cycle is complete, and the reamer is in its “home position”, anti-spatter will automatically dispense.
2. The amount of anti-spatter delivered cannot be controlled. You can manually operate the sprayer by pressing the “test” button on the opposite side of the unit.

Step 3: Feed Rate Adjustment

1. Feed rate “up” or “down” can be controlled by adjusting the flow control fittings (see item 12 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.

SCHEMATIC FOR **CM INDUSTRIES** NOZZLE CLEANING STATION

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



NOTE: WIRING SHOWN FOR "SOURCING" LOGIC.

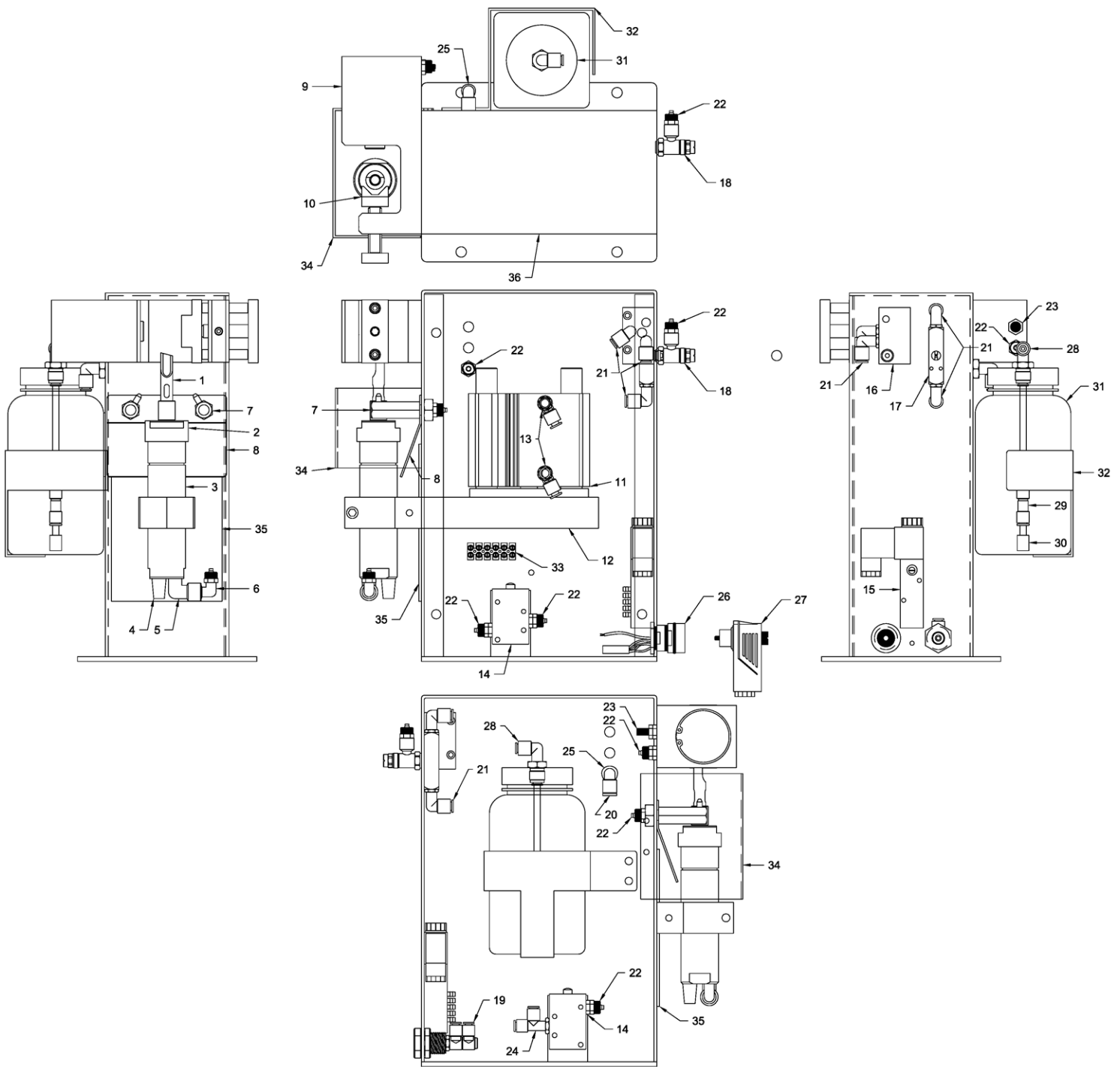
Item	Part No.	Description
1	650-25-236	Lift Cylinder
2	650-25-327	Speed Control Fitting (Down)
3	650-25-327	Speed Control Fitting (Up)
4	650-25-311	Solenoid Valve, 24V DC, Cycle
5	650-25-352	Venturi Valve
6	650-25-308	Sprayer, Complete
7	650-25-002	Clamp Block Assembly
8	650-25-314	Proximity Switch (Sourcing)
9	650-25-101	Pneumatic Motor
10	650-25-355	Mechanical Valve
11	650-25-315	Terminal Block
12	650-25-260	Socket, 5-Pole
13	650-25-333	6mm O.D. Tubing, Polyurethane
14	650-25-310	Interruptor Valve

REAM FUNCTION:

OPERATION SEQUENCE	VALVE ACTION	CYCLE STATUS
24VDC SIGNAL "OFF" (LINE 1)	VALVE 10 "ON"	REAMER OFF, CLAMP OPEN
24VDC SIGNAL "ON" (LINE 1)	VALVE 4 "ON"	REAMER UPWARD TRAVEL
HOLD 24VDC SIGNAL "ON"	VALVE 10 "OFF"	REAMER ON, CLAMP CLOSED
"	"	REAMER AT TOP OF STROKE
24VDC SIGNAL "OFF" (LINE 1)	VALVE 4 "OFF"	REAMER DOWNWARD TRAVEL
"	"	VALVE 10 "ON"
		REAMER OFF, CLAMP OPEN

SPRAY FUNCTION:

OPERATION SEQUENCE	VALVE ACTION	CYCLE STATUS
TORCH IN HOME POSITION	VALVE 10 "OFF"	REAMER CYCLE FINISHED
REAMER AT DOWN STROKE	VALVE 10 "ON"	REAMER RETRACTED
TIMED VALVE ACTIVATED	VALVE 14 "ON"	SPRAYING PROCESS
TORCH AWAY	VALVE 14 "OFF"	SPRAYER OFF

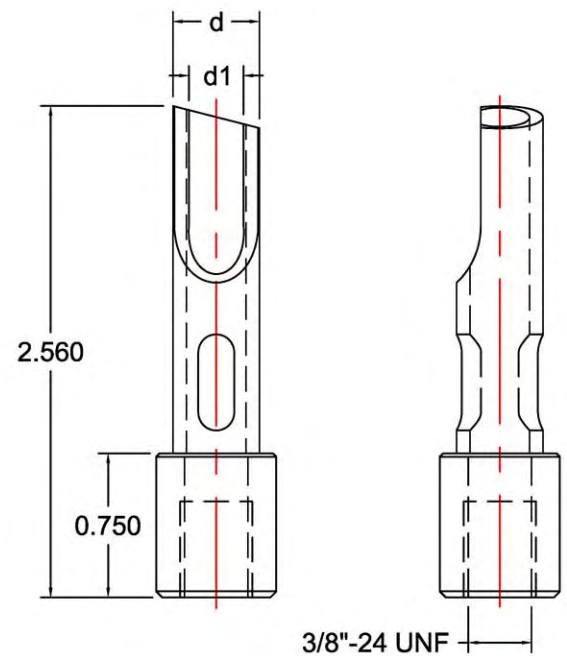


Item #	Part #	Description
1		See Reamer Chart
2	650-25-126	Air Motor Cap
3	650-25-100	Pneumatic Motor
4	650-25-289	Motor Muffler
5	650-25-329	Fitting, Elbow 1/4" F x 1/4" F
6	650-25-330	Fitting, Elbow 1/4" NPT x 6mm Comp.
7	650-25-308	Sprayer, Complete
8	650-25-305	Angled Guard Plate
9	650-25-002	Clamping Cylinder Assembly
10	650-25-230	V-Block, Clamping Cylinder
11	650-25-236	Lift Cylinder
12	650-25-370	Motor Clamp Block
13	650-25-327	Fitting, Flow Control (Lift Cylinder)
14	650-25-355	Mechanical Valve
15	650-25-311	Solenoid Valve, 24V
16	650-25-310	Interruptor Valve
17	650-25-352	Venturi Valve
18	650-25-325	Fitting, Flow Control 1/8" x 1/8" F

Item #	Part #	Description
19	650-25-361	Fitting, Double Branch Elbow 1/4" x 6mm Push
20	650-25-331	Plug, 1/8"
21	650-25-322	Fitting, Elbow 1/8" x 6mm Push
22	650-25-320	Fitting, Male Connector 1/8" x 6mm Comp.
23	650-25-314	Proximity Switch
24	650-25-326	Fitting, Male Run Tee 1/4" x 6mm Push
25	650-25-347	Fitting, Elbow 1/8" F x 1/8" F
26	650-25-119	Socket, 5 Pole
27	650-25-118	Plug, 5 Pole
28	650-25-251	Bulkhead Elbow, 6mm Push x 6mm Push
29	650-25-365	Unidirectional Valve
30	650-25-366	Filter, Anti-Spatter
31	650-25-290	Bottle, Anti-Spatter
32	650-25-209	Bottle Bracket
33	650-25-315	Terminal Block
34	650-25-368	Safety Cover
35	650-25-304	Motor Plate
36	650-25-301	Rear Cover Plate

1 Blade Reamers

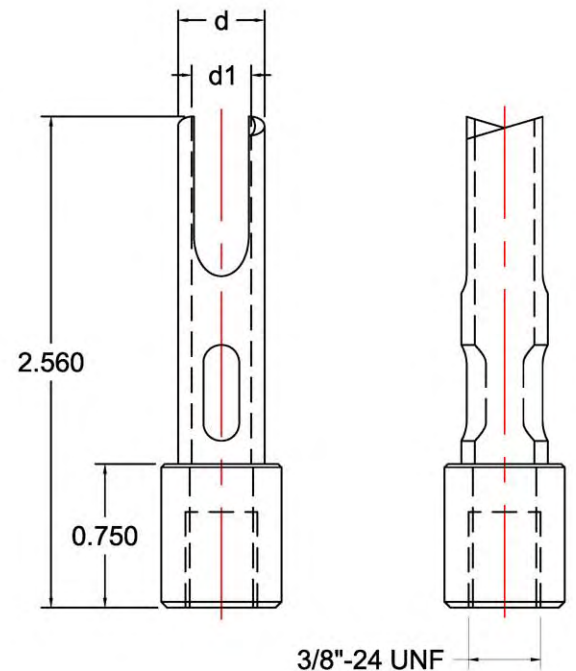
<u>Part Number</u>	<u>d=O.D.</u> (mm)	<u>d1=I.D.</u> (mm)	<u>Nozzle Size</u>
651-09-07	9	7	3/8" - 10mm
651-9.5-07	9.5	7	3/8" - 10mm
651-10-08	10	8	3/8" - 10mm
651-10.5-08-23	10.5	8	7/16" - 11mm
651-11-07	11	7	7/16" - 11mm
651-11-08.5	11	8.5	7/16" - 11mm
651-11.5-8.5	11.5	8.5	1/2" - 13mm
651-12-07	12	7	1/2" - 13mm
651-12-08-46	12	8	1/2" - 13mm
651-12-08.5	12	8.5	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
651-12.5-09-19	12.5	9	1/2" - 13mm
651-12.5-10	12.5	10	1/2" - 13mm
651-12.5-10.5	12.5	10.5	1/2" - 13mm
651-12.5-10.5-19	12.5	10.5	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	14.5	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
651-16-07	16	7	17mm
651-16-08	16	8	17mm
651-16-10	16	10	17mm
651-16-11	16	11	17mm
651-17-11	17	11	11/16" - 18mm
651-17-14	17	14	11/16" - 18mm
651-18-11	18	11	3/4" - 19mm
651-18-13	18	13	3/4" - 19mm
651-18-13-80	18	13	3/4" - 19mm
651-19-15	19	15	3/4" - 19mm



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2 Blade Reamers

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



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