# *Model #202*
# *Shotmeter*

***Notron Manufacturing, Inc.***
***801 Milford St***
***Glendale, California 91203***
***(818) 247-7739 Fax: (818) 247-7689***
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# 202 SHOT METER

## DESCRIPTION

The Model 202 Shot Meter is a remotely actuated, positive displacement shot meter, capable of filling materials ranging in viscosity from that of syrup to about 8,000 poise of paste or of caulking compound. As a test to determine the viscosity limit, the material in question should seek its own level within about 15 seconds after a cavity is created in the surface by a spoon. Supply to the machine is through a Hopper-Reservoir or may be pumped directly to the main valve. Average cycle time varies from 3 to 15 seconds, depending on material and sizes of container to be filled. The Model 202 Shot Meter produces volumes ranging from 0 to 30 ounces with three different valve meter assemblies, reproducible to plus or minus 1
percent.

### Service Required

Pressurized Air Supply: 10 cfm @ 90-100 PSI, dry filtered and oiled

***Caution: Always wear safety glasses when operating or cleaning equipment.***

## INSTALLATION

Uncrate and set all machines according to drawing 227678 and following instructions:

***Caution: The base of the metering unit must be secured to the table at the back of the machine, to prevent tipping over of the top heavy 202 machine.***

1. Install required Valve Meter Assembly 9 ounce volume capacity (p/n 227666), using single ½-13 cap screw through bottom of frame.

2. Insert pin through Stop Ring Assembly (p/n 228758) to lock valve piston to air cylinder piston.

3. Install nozzle-bottom fill at bottom of valve meter assembly.

4. Install and set up Foot Valve (p/n 227295) according to assembly drawing.

5. Install empty Hopper-Reservoir, (p/n 229217 - optional equipment) or connect to source material for filling.

**Note:**
There must be an uninterrupted supply of material to the Valve Meter Assembly without air locks to avoid any variations in fill weight and volumes. Be sure that Hopper-Reservoir is screwed on tight.

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## OPERATING INSTRUCTIONS

1. Pull piston forward by hand and add material to be filled down side of Hopper-Reservoir. This will prevent air entrapment.

   **Note:**
   Some materials are either too thin or too thick for satisfactory operation in this machine. The viscosity range recommended is between 1.0 poise to 9,000 poise.

2. Connect air supply to air inlet on machine using a quick disconnect hose fitting. Do not plumb air into machine permanently.

***Caution:***
***Always disconnect air supply when machine is not in use, and before cleaning or disassembling machine, or before Hopper-Reservoir is moved. Always save Safety Shield in place over Stop Ring Assembly when air supply is connected!***

3. Perform a series of test shots to eliminate air from the Valve Meter Assembly.

4. To set the fill-weight of the material, adjust the forward and backward strokes of the machine as follows:

   A. Set air pressure on back of cylinder for forward stroke to 60 PSI

   B. Set air pressure on front of cylinder for backward stroke to 30 PSI

   Object:
   To extrude material in forward stroke as fast, smooth and even as possible without spitting and to return cylinder as quickly as possible without drawing air into the Valve Meter Assembly.
   **Above settings will vary with material and weights.**

   C. Set hand wheel (p/n 227677) for correct shot volume of material. **Clockwise** turning pulls piston back and increases shot volume of material and vice versa.

   Make as many sample shots as necessary in paper cups or disposable containers until correct fill-weight is obtained.

**Machine is now ready for operation!**

**Maintenance Instructions**

1. Empty Hopper-Reservoir. Increase shot volume to maximum with hand wheel and empty reservoir by multiple shots into suitable container.

2. **Disconnect air line.**

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3. Remove Hopper-Reservoir. Be careful to avoid spillage.

4. Pull pin which connects Stop Ring Assembly with Piston

5. Loosen bolt, and remove Valve Meter Assembly.

6. Remove cylinder and piston. **Use Strap Wrench. Do not use Pipe Wrench as this will damage cylinder.**

7. Remove nozzle.

8. Remove Teflon Valve Spool from Valve Body. Recommended procedure is to press spool out using hand press, vise, hydraulic press, or a wooden or plastic mallet and soft plastic or wooden bar. **Be careful not to damage spool or Valve Body.**

9. Clean all parts with appropriate solvent. **Do not Soak Valve Body or O-Ring in solvent.**

10. Grease O-Rings, valve spool, etc. before replacing with a good grade of clear, non-contaminating grease.

**Trouble Shooting Tips**

1. For long life of air cylinder, regulators, flow controls and valves, it is important that moisture and foreign particles be removed, and that oil be added to the air supply before entering the machine on a continuous basis.

2. Way Blocks (p/n 227661) must be tight against the Valve Meter Assembly Plate. These blocks help to keep Valve Meter from moving out of alignment with the piston and sleeve.

3. Poppet Valve (p/n 221342), O-Rings will eventually wear out. If trouble occurs with the Poppet Valve, try adjusting air and speed. If piston still will not return to position, replace Poppet Valve.

4. Variations in weights of fill may be caused by:

   a. Change in material level in Hopper-Reservoir.

   b. Piston is not aligned with Sleeve, or Sleeve is not completely screwed into the Metering Valve.

   c. Nozzle or Valve may be plugged with solids or cured material.

   d. Air being drawn into Valve Meter Assembly by cylinder moving too fast. Adjust air pressure with regulators.

# *O-Rings Used in Valve Meter Assemblies.*

| *LOCATION* | *STD VITON* | *TEFLON* |
|---|---|---|
| Valve Body: inside of rear end of spool | 286208 | 286120 |
| Valve Body: rear of cylinder seat | 286202 | 286114 |
| Valve Hub (Spool) | 286205 | 286117 |
| PISTON (2 required) | | |
| 1 ounce size (P/N 232239) | 286184 | 286096 |
| 2 ounce size (P/N 228799) | 286192 | 286104 |
| 9 ounce size (P/N 277666) | 286200 | 286112 |
| 20/32 ounce size (P/N 232585) | 286226 | 286129 |
| 20/32 ounce adapter (P/N 230142) | 286486 | 286433 |

Notes:

1. When installing Teflon O-Rings, soak in boiling water for 4 to 5 minutes to soften rings before using.
2. For 1 ounce volume capacity, see drawing 232239.*
3. For 2 ounce volume capacity, see drawing 228779.*
4. For 20/32 ounce volume capacity, see drawing 232585.*

* Optional Items.

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# Model 202 Shot Meter

## Valve Meter Assemblies

| *DESCRIPTION* | *QUANTITY* | *1 oz. 232239* | *2 oz. 228779* | *9 oz. 227666* | *32 oz. 232585* |
|---|---|---|---|---|---|
| Piston | 1 ea. | 231485 | 228743 | 228746 | 230141 |
| O-Ring: Piston | 2 ea. | 286184 | 286192 | 286200 | 286226 |
| O-Ring: Valve Body-Rear | 1 ea. | 286202 | 286202 | 286202 | 286202 |
| O-Ring: Valve Hub | 1 ea. | 286205 | 286205 | 286205 | 286205 |
| O-Ring Valve Body-Side | 1 ea. | 286208 | 286208 | 286208 | 286208 |
| Sleeve | 1 ea. | 231486 | 228744 | 228745 | 230140 |
| Valve Hub | 1 ea. | 228738 | 228738 | 228738 | 227738 |
| Valve Body | 1 ea. | 228747 | 228747 | 228747 | 228747 |
| Washer | 1 ea. | 231656 | 231656 | 231656 | 231656 |
| Slide Plate | 1 ea. | 228740 | 228740 | 228740 | 228740 |
| Adapter | 1 ea. | N/A | N/A | N/A | 230142 |
| O-Ring: Adapter | 1 ea. | N/A | N/A | N/A | 286486 |

Note: All rings are Viton O-Rings

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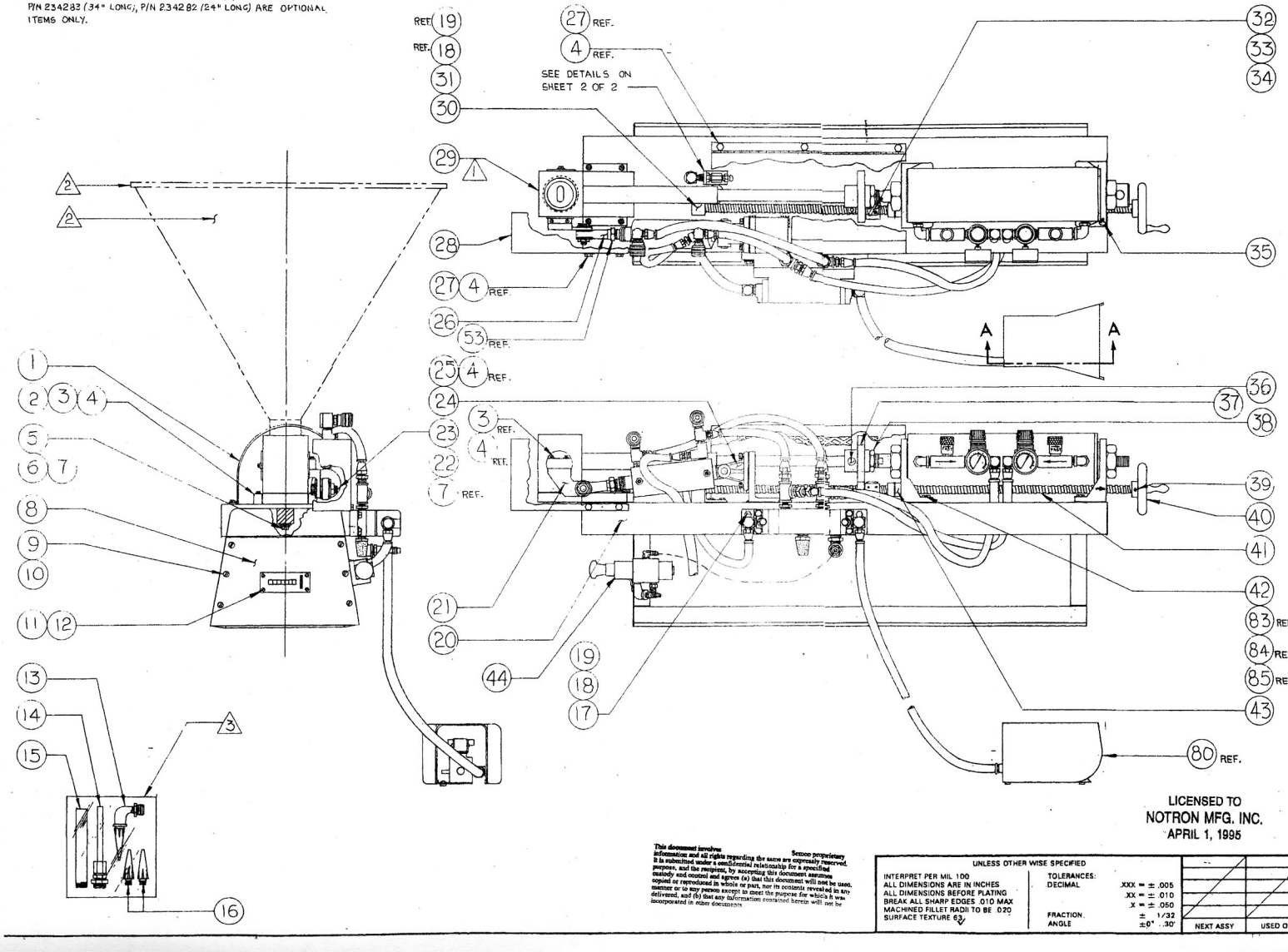
## NOTES:

1. FOR 2 OZ. VALVE METER ASSY. SEE DWG. 228779
   FOR .1 OZ. VALVE METER ASSY. SEE DWG. 232239
   FOR 20 AND 32 OZ. VALVE METER ASSY. SEE DWG. 232585
2. P/N 229390 (COVER) AND P/N 229217 (RESERVOIR) ARE OPTIONAL ITEMS ONLY
3. NOZZLES ARE PACKAGED IN SEALED POLY BAG WHEN SHIPPED
4. P/N 233289 (MODEL 31-C NO DRIP NOZZLE) & HOSE ASSEMBLIES P/N 234283 (34" LONG), P/N 234282 (24" LONG) ARE OPTIONAL ITEMS ONLY.

| REVISIONS | | | |
|---|---|---|---|
| LTR | DESCRIPTION | BY | DATE |
| | REVISION NOTE SEE SHEET 2 OF 2 | | |




| QTY | SIZE | ITEM | PART NO. | DESCRIPTION OR MATERIAL |
|---|---|---|---|---|
| 1 | C | 44 | 233966 | LOCK-OUT VALVE ASSEMBLY |
| 1 | A | 43 | 228821 | COLLAR |
| 4 | | 42 | | SCREW, HEX. HD. STL., 3/8-16 X 1 1/4" LONG |
| 1 | B | 41 | 228807 | SCREW ASSEMBLY |
| 1 | A | 40 | 227677 | HAND WHEEL |
| 1 | | 39 | | SCREW, SOCK. SET, STL., 10-32 X 3/8" LONG |
| 1 | | 38 | | JAM NUT, HEX., 1-14 THD. X 9/16" THICK |
| 1 | A | 37 | 228758 | STOP RING ASSEMBLY |
| 1 | A | 36 | 227303 | DETENT PIN, 1/4" DIA. |
| 1 | | 35 | | THUMB SCREW, 1/4-20 X 1" LONG |
| 1 | A | 34 | 221798 | BALL NUT |
| 2 | | 33 | | SCREW, SOCK. SET, STL., 10-32 X 1/4" LONG |
| 1 | A | 32 | 227672 | CLAMP BLOCK |
| 2 | | 31 | | SCREW, SOCK. HD. CAP, STL., 1/4-20 X 3/4" LG. |
| 1 | A | 30 | 227662 | END BLOCK |
| 1 | C | 29 | 227666 | VALVE METER ASSEMBLY. 9 OZ. ⚠1 |
| 1 | C | 28 | 232264 | GUARD, CYLINDER |
| 5 | | 27 | | SCREW, HEX. HD. STL., 1/4-20 X 1/2" LONG |
| 1 | B | 26 | 231558 | ROD END |
| 1 | B | 25 | 231384 | CLEVIS BRACKET KIT |
| 4 | | 24 | | SCREW, SOCK. HD. STL. CAP, 1/4-20 X 3/4" LONG |
| 1 | | 23 | 265628 | SCREW SHOULDER, 1/2" DIA. X 1-1/4" LONG |
| 1 | | 22 | | NUT, SELF-LOCKING, 3/8-16 THD. |
| 1 | B | 21 | 231136 | BRACKET |
| 1 | D | 20 | 227657 | BASE ASSEMBLY |
| 6 | | 19 | | WASHER, FLAT, STL., 1/4" DIA. |
| 6 | | 18 | | WASHER, SPRING LOCK, STL., 1/4" DIA. |
| 4 | | 17 | | SCREW, HEX. HD. STL., 1/4-20 X 1" LONG |
| 2 | C | 16 | 220540 | NOZZLE, MODEL NO. 254 |
| 1 | A | 15 | 230321 | NOZZLE - BOTTOM FILL |
| 1 | A | 14 | 230320 | NOZZLE ASSY. - NECK FILL |
| 1 | A | 13 | 230322 | NOZZLE ASSY. - DASHER ROD FILL |
| 4 | | 12 | | NUT, HEX., STL., NO. 6 |
| 4 | | 11 | | SCREW, RND. HD. SLOTTED MACH. NO. 6 X 3/8" LG. |
| 6 | | 10 | | WASHER, FLAT, STL., .159" DIA. |
| 6 | | 9 | | SCREW, RND. HD. STL., 10-32 X 3/8" LONG |
| 1 | C | 8 | 228753 | FRONT PANEL |
| 4 | | 7 | | WASHER, FLAT, STL., 1/2" DIA. |
| 1 | | 6 | | WASHER, SPRING LOCK, STL., 1/2" DIA. |
| 1 | | 5 | | SCREW, HEX. HD. STL., 1/2-13 X 1" LONG |
| 13 | | 4 | | WASHER, INTERNAL TYPE, SHKPRF. LOCK, 1/4" DIA. |
| 6 | | 3 | | SCREW, SOCK. HD. CAP, STL., 1/4-20 X 1-1/2" LG. |
| 2 | A | 2 | 227661 | WAY BLOCK |
| 1 | C | 1 | 227674 | GUARD ASSEMBLY |

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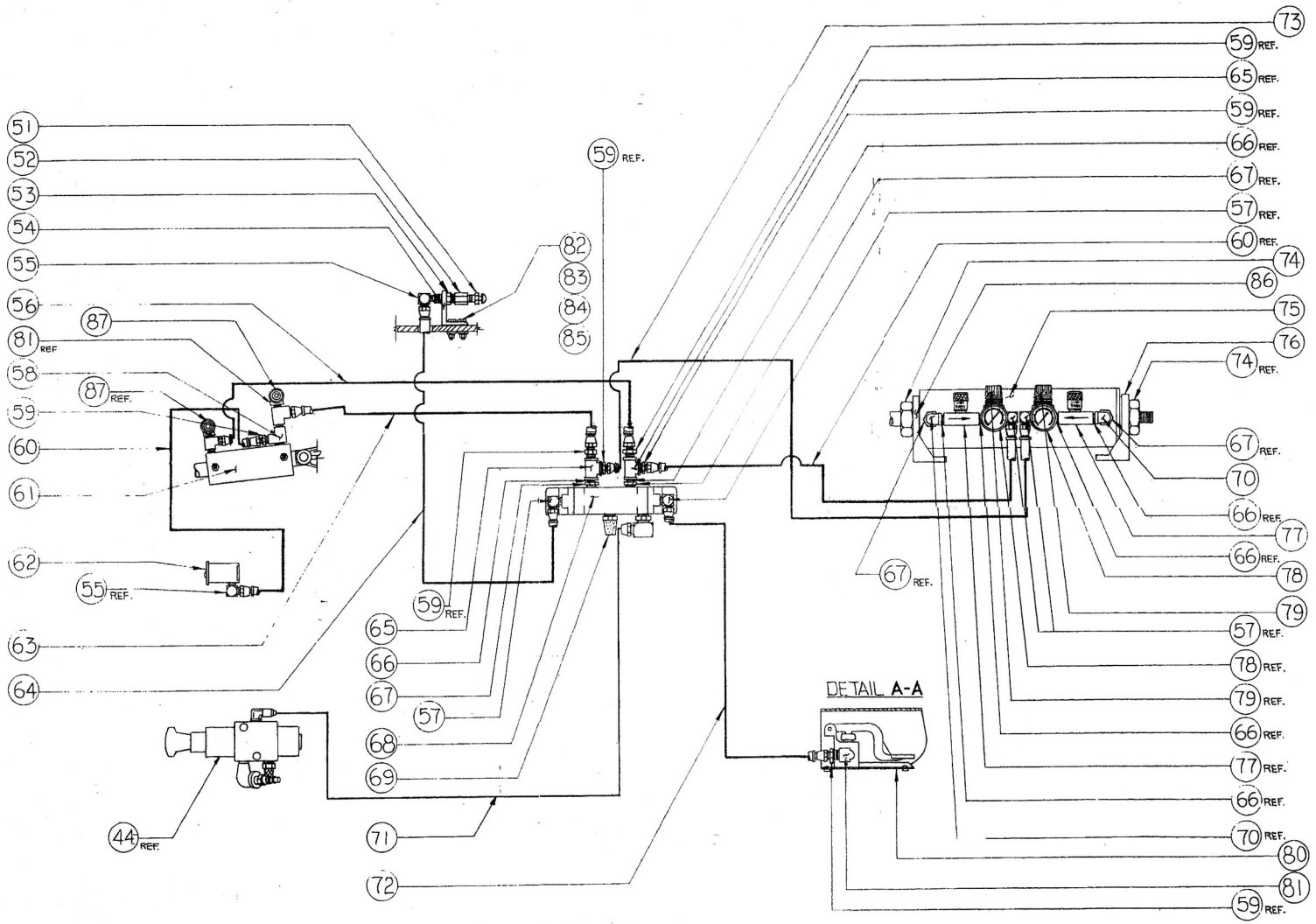
UNLESS OTHER WISE SPECIFIED
INTERPRET PER MIL 100
ALL DIMENSIONS ARE IN INCHES
ALL DIMENSIONS BEFORE PLATING
BREAK ALL SHARP EDGES .010 MAX
MACHINED FILLET RADII TO BE .020
SURFACE TEXTURE 63
TOLERANCES:
DECIMAL .XXX = ± .005, .XX = ± .010, .X = ± .050
FRACTION ± 1/32
ANGLE ±0° 30'

NEXT ASSY | USED ON

DRN RB | APPRV | PART NO.
6-27-84 | REL DATE 8/1/84
MATERIAL | FINISH

TITLE MODEL 202 METERING UNIT ASSEMBLY
SIZE D | CODE IDENT 92108 | PART NO. 227678
SCALE 1:4 | SHEET 1 OF 2

| REVISIONS | | | |
|---|---|---|---|
| LTR | DESCRIPTION | BY | DATE |
| P | -REDRAWN<br>- ADDED NOTE (4)<br>-ADDED PLUMBING DIAGRAM | RB/RK | 8-15-84 |
| Q | DELETED P/N 227256 FROM ITEM (74) | RB/DN | 2-7-85 |
| R | P/N 284105 WAS 280105 ITEM (64) | RB/RK | 3-6-85 |
| S | ADDED ITEM (44) (P/N 233966), QTY. ITEM (10) WAS 3, ITEM (11) WAS P/N 221444 QTY ITEM (57) WAS 6; ECN 92-097 QTY ITEM (61) WAS 1 EA.; ITEM (63) WAS 6 EA.; ITEM (68) WAS 1 EA.; ADDED P/N 228322 ADDED NOTE #4 | NTD/RB | 10/14/92 |




PLUMBING DIAGRAM

| QTY | SIZE | ITEM | PART NO. | DESCRIPTION OR MATERIAL |
|---|---|---|---|---|
| 2 | A | 87 | 228322 | COUPLER, 1/4 NPT |
| 1 | A | 86 | 227667 | FOOT MOUNT |
| 6 | | 85 | | WASHER, FLAT, STL., 3/8" DIA. |
| 6 | | 84 | | WASHER, INTERNAL TYPE, SHKPRFLOCK, 3/8" DIA. |
| 6 | | 83 | | NUT, HEX. STL., 3/8-16 THD. |
| 2 | | 82 | | SCREW, HEX. HD. STL., 3/8-16 X 7/8" LONG |
| 3 | | 81 | | ELBOW, STREET BRASS, 90°, 1/4 NPT |
| 1 | A | 80 | 227295 | FOOT VALVE |
| 2 | A | 79 | 222170 | REGULATOR, 1/4 NPT |
| 2 | B | 78 | 222164 | GAUGE, 0-160 P.S.I., 1/8 NPT |
| 2 | A | 77 | 228289 | VALVE, FLOW CONTROL, 1/4 NPT |
| 1 | A | 76 | 227670 | FOOT MOUNT |
| 1 | A | 75 | 227658 | AIR CYLINDER |
| 2 | | 74 | | NUT, HEX. STL., 1-3/4 -12 THD. 3/4" THK. |
| 1 | | 73 | 280057 | HOSE ASSY, BLK. RUBBER, 1/4" I.D. X 24" LG. |
| 1 | | 72 | 280076 | HOSE ASSY., BLK. RUBBER, 1/4" I.D. X 66" LG. |
| 1 | | 71 | 280051 | HOSE ASSY, BLK. RUBBER, 1/4" X 14.5" LG. |
| 2 | | 70 | | ELBOW, STREET, 90°, IRON GALV., 1/4 NPT |
| 1 | A | 69 | 229362 | EXHAUST MUFFLER, 1/2 NPT |
| 1 | A | 68 | 228152 | DIRECTIONAL CONTROL VALVE, 1/2 NPT |
| 5 | | 67 | | BUSHING, OUTS. HEX., IRON GALV., 1/2 NPT X 1/4 NPT |
| 6 | | 66 | | CLOSE NIPPLE, 1/4 NPT X 7/8" LONG |
| 2 | | 65 | | TEE, IRON GALV., 1/4 NPT |
| 1 | | 64 | 284105 | HOSE ASSY. BLK. RUBBER, 1/4" ID X 19" LG. |
| 1 | | 63 | 280048 | HOSE ASSY., BLK. RUBBER, 1/4" I.D. X 10" LG. |
| 1 | A | 62 | 228727 | COUNTER |
| 1 | B | 61 | 231931 | AIR CYLINDER, MODIFIED |
| 2 | | 60 | 280047 | HOSE ASSY., BLACK RUBBER, 1/4" I.D. X 18" LG. |
| 8 | | 59 | 284036 | HOSE ADAPTER, 1/4 NPT X 7/16-20 THD. |
| 3 | | 58 | | TEE, BRASS, 1/4 NPT |
| 5 | | 57 | 284162 | HOSE ADAPTER, 90°, 1/4 NPT X 7/16-20 THD. |
| 1 | | 56 | 280046 | HOSE ASSY., BLK. RUBBER, 1/4" I.D. X 17.5" LG. |
| 2 | | 55 | 284161 | HOSE ADAPTER, 90°, 1/8 NPT X 7/16-20 THD. |
| 1 | C | 54 | 228804 | BRACKET, MOUNTING |
| 2 | | 53 | | NUT, HEX. JAM, 1/2-20 THD. |
| 1 | A | 52 | 229415 | STAND PIPE |
| 1 | B | 51 | 221342 | POPPET VALVE |



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TOLERANCES:
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FRACTION ± 1/32
ANGLE ° ±0° 30'

NEXT ASSY | USED ON

DRN RB | APPRV
6-27-84 | REL DATE 8/10/84
MATERIAL
FINISH

TITLE MODEL 202 METERING UNIT
SIZE D | CODE IDENT 92108 | PART NO. 227678
SCALE NONE | SHEET 2 OF 2

DRAWING 46329