
USER MANUAL

MODEL NUMBER:

DS4

DS4K

DS4V

AND RELATED UNITS

**Twin-Line Concentrate Doorway Foam
Unit**

English (Original Instructions)

READ ALL INSTRUCTIONS BEFORE OPERATING EQUIPMENT



WARNING



Read this manual completely and understand the machine before operating or servicing it.

- Read all instructions before installing or operating unit.
- Always wear appropriate personal protective equipment (PPE) when operating or servicing unit.
- Always follow all chemical safety precautions and handling instructions provided by the chemical manufacturer and Safety Data Sheet (SDS).
- If this unit is modified or serviced with parts not listed in this manual, the unit may not operate correctly.
- Do not exceed an incoming air pressure of 100 psi (7 bar).
- Do not exceed a fluid temperature of 100°F (37°C).
- Always flush the unit with fresh water for thoroughly when switching from an alkaline to an acid or an acid to an alkaline.
- Never use unit with hydrocarbons or flammable products.
- Only use clean and dry air. Air must be filtered and free of moisture or pump life will be diminished. If needed, install an air dryer before unit.
- Do not use an air lubricator before the unit.
- Never use unit if it is damaged or leaking.
- Disconnect unit from electrical power source before servicing.

PROTECT THE ENVIRONMENT

Please dispose of packaging materials, old machine components, and hazardous fluids in an environmentally safe way according to local waste disposal regulations.



Always remember to recycle.

*Specifications and parts are subject to change without notice.

OPTIONS

	Pump Seal Material		Number of Nozzles
DS4	Santoprene (<i>standard</i>)	-	One (<i>standard</i>)
	Viton (V)		Two (2)
	Kalrez (K)		Three (3)

Add bold option codes to item number as shown. For standard options, no option code is needed.

Examples:

- DS4 (standard unit with Santoprene pump seals and one nozzle)
- DS4-2 (unit with Santoprene pump seals and two nozzles)
- DS4V-2 (unit with Viton pump seals and two nozzles)

READ ALL INSTRUCTIONS BEFORE OPERATING EQUIPMENT

System Overview:

One control box can support up to three nozzle assemblies.

The combined distance between the control box and the nozzle(s) must equal 100 ft. (30.5 m) or less.

COMPLETE SYSTEMS			
Item Number:	DS4	DS4-2	DS4-3
Includes:	Control box and one nozzle assembly	Control box and two nozzle assemblies	Control box and three nozzle assemblies
Spray tip:	ST80200SS	ST80100SS	ST8060-12SS
Foam pattern:	Up to 9x5 ft. (2.7x1.5 m)	Up to 8x4 ft. (2.4x1.2 m) at each nozzle	Up to 6x3 ft. (1.8x0.9 m) at each nozzle
Tubing (H12CP) included:	50 ft. (15.2 m)	100 ft. (30.4 m)	150 ft. (45.7 m)
Tee fittings (QFT12) included:	0	2	4

REPLACEMENT NOZZLE ASSEMBLIES			
Item Number:	GK7T	GK7T-2	GK7T-3
Includes:	One nozzle assembly with ST80200SS spray tip	One nozzle assembly with ST80100SS spray tip, plus one extra ST80100SS spray tip	One nozzle assembly with ST8060-12SS spray tip
Intended use:	Replacement nozzle for a 1-nozzle system	Replacement nozzle for a 2-nozzle system, or conversion kit to turn an existing 1-nozzle system into a 2-nozzle system	Replacement nozzle for a 3-nozzle system
Spray tip:	ST80200SS	ST80100SS (also includes an extra tip to retrofit an existing nozzle)	ST8060-12SS
Tubing (H12CP) included:	50 ft. (15.2 m)	50 ft. (15.2 m)	50 ft. (15.2 m)
Tee fittings (QFT12) included:	0	2	4

READ ALL INSTRUCTIONS BEFORE OPERATING EQUIPMENT

REQUIREMENTS	
Compressed air requirements	40-80 psi (3-5 bar) with 5-10 cfm (141.6-283.3 l/min)
Water requirements	10-100 psi (0.69-6.9 bar) Backflow prevention is required – consult local plumbing ordinances for more information.
Liquid temperature range	40-100°F (4.4-37°C)
Electrical requirements	120 VAC at 60 Hz, 2 amps (GFCI protected outlet)
Operating voltage	120 VAC
Chemical compatibility	Chemical products used with this equipment must be formulated for this type of application and compatible with unit materials and pump seals. For more information on chemical compatibility, consult the manufacturer or SDS for your product or contact our customer service department.

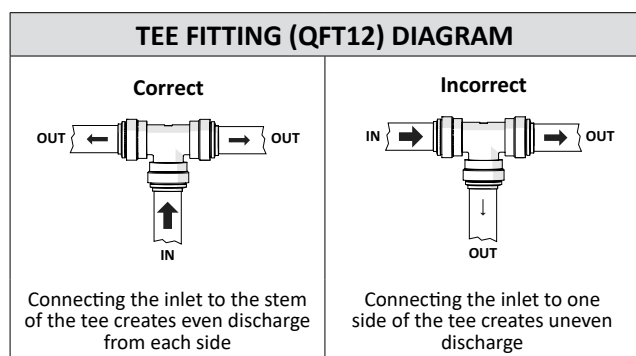
SPECIFICATIONS	
Power type	Compressed air, electricity
Chemical pickup type	Draws from concentrated product
Dilution ratio range (water:chemical)*	38:1 to 183:1
Number of products unit can draw from (and whether it draws simultaneously or one at a time)	One product
Suction line length/diameter	8 ft. (2.4 m) clear hose with 1/4 in. (6.4 mm) inside diameter
Flow rate*	2 gal/min (7.6 l/min)
Pump seals	Santoprene, Viton, or Kalrez
Timer operation type	Repeat cycle
Coverage area	With one nozzle: up to 9x5 ft. (2.7x1.5 m); With two nozzles: up to 8x4 ft. (2.4x1.2 m) at each nozzle; With three nozzles: up to 6x3 ft. (1.8x0.9 m) at each nozzle
Fan tip	With one nozzle: ST80200SS; With two nozzles: ST80100SS; With three nozzles: ST8060-12SS
Nozzle type	Twin-line stainless steel nozzle assembly (GK7T)
Number of nozzles	One control box can support up to three nozzle assemblies
Distance from nozzles to control box	The combined distance between the control box and the nozzle(s) must equal 100 ft. (30.5 m) or less.
Tubing/fitting sizes	Designed for use with 1/2 in. (12.7 mm) outside diameter tubing between control box and nozzle(s)

*Dilution rates and flow rates given are based on chemical with viscosity of water and factory air pressure settings.

READ ALL INSTRUCTIONS BEFORE OPERATING EQUIPMENT

Installation Instructions:

1. Remove all components from packaging.
2. Select an area to mount the control box.
Note: The control box should be mounted to a vertical wall. We recommend mounting the control box at a height of 6 feet or less. The chemical suction line must reach the bottom of the chemical container. The bottom of the chemical container should not be positioned higher than the bottom of the control box.
3. Attach the control box mounting feet to the back of the control box, using the four screws provided in the parts package.
4. Mount the control box to the wall using four of the screws and plastic anchors provided in the parts package.
Note: To drill holes for the plastic anchors, use a $\frac{5}{16}$ inch drill bit.
5. Mount the stainless steel nozzle assembly in the desired location using the two stainless steel brackets, four of the screws, and plastic anchors provided in the parts package. Repeat as needed for multiple nozzles.
Note: The foam pattern dimensions provided in this manual were measured with nozzle assemblies mounted 6 in. (15 cm) above the floor.
6. Run tubing from the solution outlet fitting on the control box to the solution inlet fitting on the nozzle assembly. For multiple nozzles, run the tubing from the control box into a tee fitting, as shown in the diagram. Then, run tubing from the tee fitting to the nozzle assemblies. For systems with three nozzles, use a second tee fitting to split the line again.
7. Run tubing from the air outlet fitting on the control box to the air inlet fitting on the nozzle assembly. For multiple nozzles, split the line using one or more tee fittings, as described in step 6 and shown in the diagram.
Note: The air and solution lines must be routed to the appropriate fittings (as labeled), or the foam quality of the unit will be negatively impacted. Make sure to insert the tubing all the way into the fittings to ensure proper connection.



8. Connect the air inlet hose barb provided in the parts package to the air inlet valve located on the side of the control box. Then attach a $\frac{3}{8}$ inch I.D. air line from your air compressor to the air inlet hose barb, and secure it with the smaller hose clamp provided in the parts package.
9. Connect a water line to the unit. The control box has a $\frac{1}{2}$ inch FPT water inlet fitting.
Note: A back-flow preventer must be installed in the water line – check local plumbing codes to ensure proper installation.
10. Open the cover of the control box. Insert the proper metering tip and connect the chemical intake line to the injector inlet barb.
Note: Use the included metering tip color chart to determine the appropriate metering tip based on the product and dilution rate you will be using.

INJECTION RATES		
METERING TIP COLOR	OZ./GAL.	RATIO*
TAN	0.70	183-1
ORANGE	0.90	142-1
TURQUOISE	1.15	111-1
PINK	1.55	83-1
LIGHT BLUE	1.80	71-1
BROWN	1.85	69-1
RED	2.65	48-1
WHITE	3.40	38-1
** Injection rates will vary based on chemical viscosity, air pressure, and many other factors. We recommend testing unit output to verify injection rate prior to use.		

11. Place the other end of the chemical intake line into a chemical container.
Note: The chemical suction line must reach the bottom of the chemical container. A strainer must be used on the chemical intake line.
12. Set the timer for the desired on time and off time, as described in the Timer Adjustment Instructions.
13. With the power switch in the OFF position, plug the unit into a GFCI protected 120 VAC power outlet.

READ ALL INSTRUCTIONS BEFORE OPERATING EQUIPMENT

Operation Instructions:

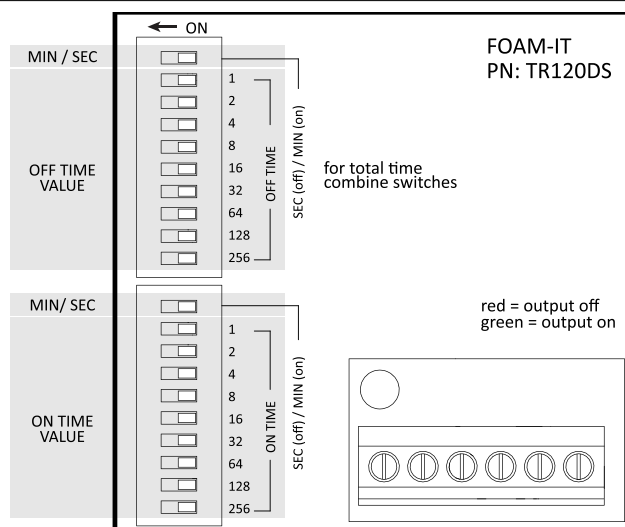
1. Verify that the unit is connected to compressed air, water, power, and chemical.
2. Open the compressed air inlet valve.
3. To activate the unit, turn the power switch ON. The unit will begin cycling through the on time and off time intervals set on the timer, beginning with the on time.
4. While the unit is running and discharging product, adjust the needle valve, located inside the control box, as needed to regulate the wetness or dryness of the foam following the steps below:
 - a. Close needle valve completely in clockwise direction.
 - b. Open needle valve in counter-clockwise direction 2 complete turns.
 - c. Continue to open needle valve in ¼ turn increments, allowing 30 seconds between adjustments, until desired consistency of foam is achieved.
5. To deactivate the unit, turn the power switch OFF.

TIMER ADJUSTMENT INSTRUCTIONS

The TR120DS-A is an adjustable repeat cycle timer with the ON time operating first. ON and OFF times can range from 1 second to 511 minutes.

To set the timer:

1. Starting with the OFF time, move the top dip switch to the left for MIN (minutes) or to the right for SEC (seconds) to select the desired time interval.
2. The next 9 dip switches will be used to control the total active time. To the left is active and to the right is inactive. Combine the numbers of active dip switches to achieve the desired time. The increments are 1, 2, 4, 8, 16, 32, 64, 128, 256.
3. Repeat the above steps for the ON time setting.
4. Timer indicator light will appear red when unit output is off. The indicator turns green when output is on.



READ ALL INSTRUCTIONS BEFORE OPERATING EQUIPMENT

Maintenance Instructions:

To keep your foam unit operating properly, periodically perform the following maintenance procedures:

Note: Before performing any maintenance, ensure that the unit has been turned OFF, unplugged from the electrical power source, and disconnected from the air/water supply.

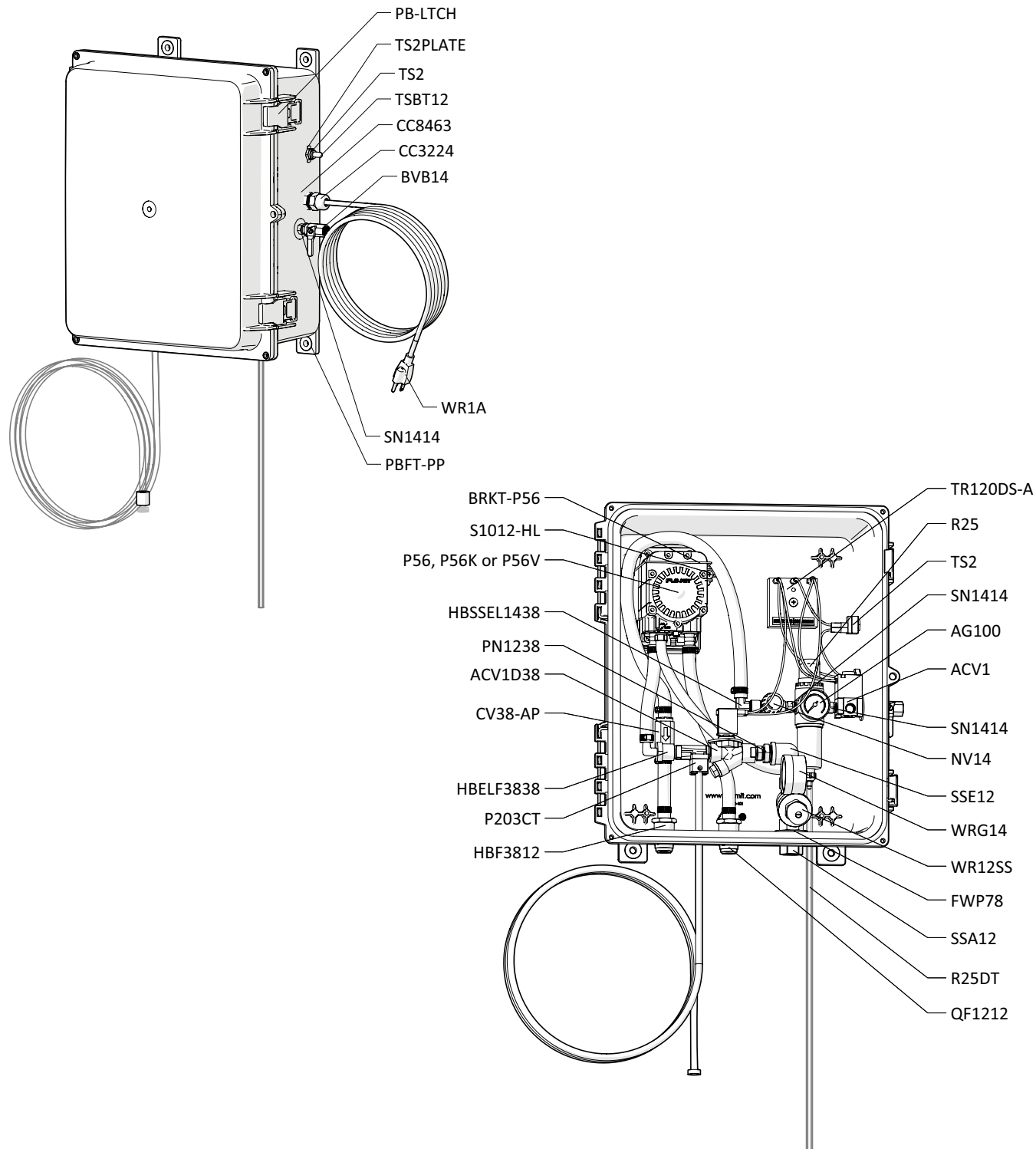
- Inspect the pump for wear and leaks.
- Inspect all hoses for leaks or excessive wear. Make sure all hose clamps and push-fittings are in good condition and properly secured.
- Replace the filter located within the air regulator as needed. Clean by unthreading the air regulator bowl from the air regulator.
- Check the chemical metering tip, suction line and strainer for debris and clean as needed.
- Drain your air compressor tank on a regular basis to help extend pump life. An air source with a high moisture content will accelerate pump wear. **Note:** If your air source has a high moisture content, you may wish to install a water separator (sold separately) before the unit.

Troubleshooting Instructions:

- Check the air regulator bowl and air filter for debris such as water, oil, or rust particles. Clean by unthreading the air regulator bowl from the air regulator.
- If the needle valve is open too far, the pump may cycle improperly due to lack of air pressure. If this occurs, close and readjust the needle valve as described in *Operation Instruction #2*.
- Make sure proper foaming chemical and concentration are being used.
- If air passes through the pump without cycling, the pump needs to be replaced.
- If solution backs up into the air regulator bowl, the check valve needs to be replaced.
- If foam comes out wet, no matter where the needle valve is positioned, the check valve may need to be replaced.
- Check for proper air pressure on the air gauge. The air regulator is factory set at 50 psi (3.4 bar). Operating range is 40 to 80 psi (3 to 5 bar) with 3.5 to 8 CFM (99 to 226.5 l/min).
- If the unit operates at a reduced pressure:
 - o Check the air compressor supplying the unit. If the pressure is less than 40 psi, turn the unit off until the compressor can catch up.
 - o If the air supply is 50 psi (3.4 bar) or above, check the air gauge, which should read near 50 psi (3.4 bar). If the air gauge reads more or less than 50 psi (3.4 bar), adjust the pressure by turning the knob on the top of the air regulator.
- Check the chemical metering tip, suction line and strainer for debris or damage. Clean or replace as needed. To prevent damage to the unit, the strainer must always be used.
- Check for proper water pressure on the water pressure gauge. To check the pressure:
 - o Activate the unit and allow it to run through an on time cycle.
 - o During the subsequent off time cycle, check the water pressure gauge. The pressure should read 30 psi (2.1 bar) during the off time cycle or when deadheaded.
 - o If necessary, adjust the water regulator using the flathead screw on the regulator body. The water pressure should be set at 30 psi (2.1 bar) when deadheaded. Setting the pressure higher or lower may damage the unit or cause it to malfunction.

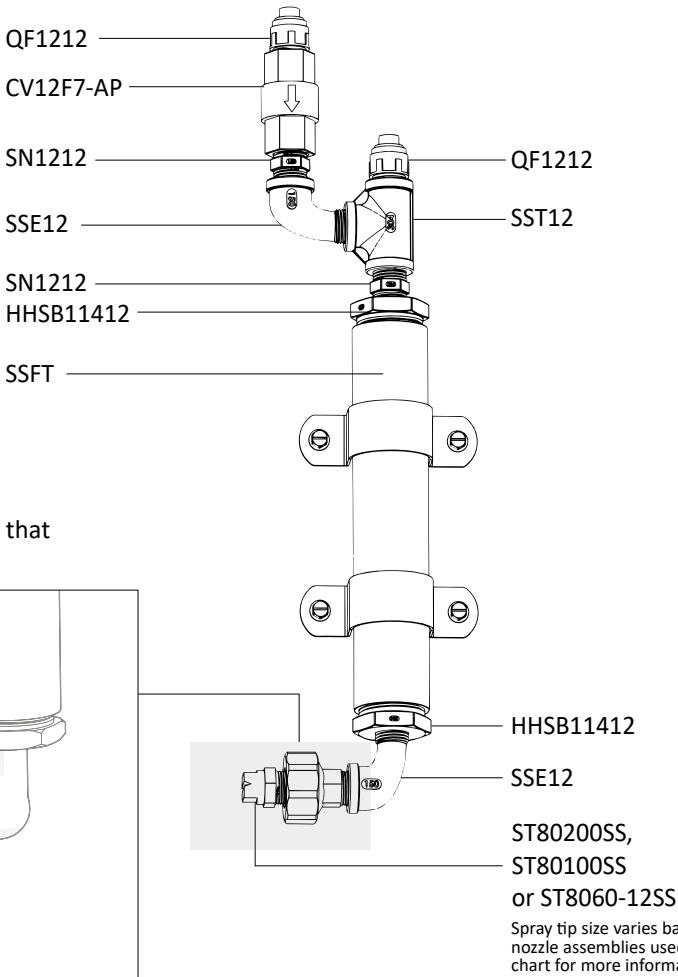
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CONTROL BOX ASSEMBLY



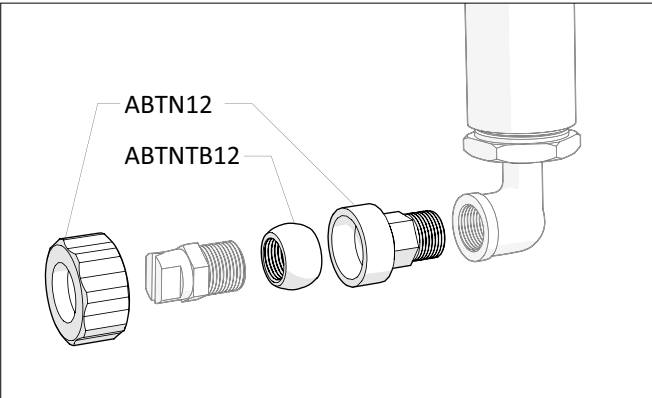
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NOZZLE ASSEMBLY



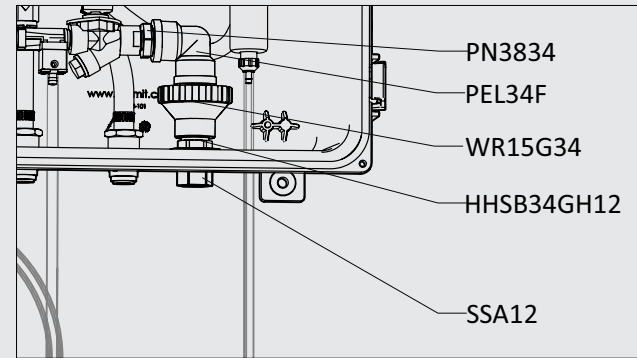
NOZZLE ASSEMBLY DETAIL

This unit includes an adjustable ball-type nozzle that may be installed to hold the spray tip as shown.



PARTS INFORMATION - LEGACY/DISCONTINUED COMPONENTS

LEGACY WATER REGULATOR ASSEMBLY
LEGACY PARTS DIAGRAM



LEGACY PARTS LIST

ITEM NUMBER	DESCRIPTION
HHSB34GH12	STAINLESS HEX HEAD BUSHING 3/4in MGH BY 1/2 FPT
PEL34F	3/4in FEMALE POLY PIPE ELBOW 90
PN3834	POLY REDUCER NIPPLE 3/8in MPT X 3/4in MPT
WR15G34	WATER PRESSURE REGULATOR - 3/4in FGH BY 3/4in MPT Body ABS, internal parts, SS, PP and Santo

Conversion kit to upgrade to current water inlet: CK-WR12SS.

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ITEM NUMBER	DESCRIPTION
ABTN12	1/2 MPT x 1/2 FPT ADJUSTABLE BALL SOCKET - PP
ABTNTB12	1/2 MPT THREADED BALL FOR ABTN12 - PP
ACV1	MAC VALVE 1/4in 110VAC
ACV1D38	3/8 NPT SOLENOID VALVE - 110VAC
AG100	AIR GAUGE-1/8IN NPT-100 PSI DRY MODEL
B10321	10-32 X 1 PHIL TRUSS MACH SCR 18-8
B10321.25	10-32 X 1 1/4 PHIL TRUSS MACH 18-8
BRKT-P56	PUMP BRACKET- STAINLESS STEEL
BVB14	AIR INLET VALVE-1/4IN FPT X 1/4IN FPT
CB-5	5 AMP CIRCUIT BREAKER-UL1077
CB-B	CLEAR BOOT FOR CIRCUIT BREAKER
CC3224	1/2 NPT STRAIN RELIEF GRIP FITTING - BLACK
CC8463	1/2 NPT LOCKNUT - BLACK
CV12F7-AP	1/2 CHECK VALVE 7 LB SPRING - HASTELLOY SPRING - EP SEALS - ACID PROOF - BLK/WHT CHK
CV38-AP	CHECK VALVE-3/8IN BARBS-PVC BODY-HASTELLOY SPRING-TEFLON BALL-WHITE
EC14	OETIKER EAR CLAMP FOR 1/4IN HOSE
FWLG14	FLAT WASHER-0.569 ID X 1.28 OD X .078 THK-18-8 SS
FWP12	7/8 ID X 1.5 OD X 0.05 THK SSFW
FWP78	FLAT WASHER-7/8 F/W-.937 ID X 1.75 OD X .134 THK-18-8 SS
H12CP	1/2IN OD POLYETHYLENE TUBING - NATURAL COLOR
H14BL-F	1/4IN BLUE HOSE-HYBRID TPE-AVAILABLE PER FT
H38BL-F	3/8IN BLUE HOSE-HYBRID TPE-AVAILABLE PER FT
HBELF3838	HOSE BARB ELBOW 3/8" BY FPT 3/8"
HBF3812	HOSE BARB 3/8 X FEMALE PIPE THREAD 1/2 IN
HBSS1438	STAINLESS HOSE BARB 1/4 MPT X 3/8 BARB
HBSEL1438	STAINLESS HOSE BARB 1/4 MPT X 3/8 BARB ELBOW
HBSEL1814	STAINLESS HOSE BARB 1/8 MPT X 1/4 BARB ELBOW
HHSB11412	HEX HEAD STAINLESS BUSHING 1-1/4 MPT X 1/2 FPT
NV14	NEEDLE VALVE-1/4IN NPT-INCLUDES BLACK KNOB
<i>NV14-HNDL</i>	BLACK KNOB FOR NEEDLE VALVE
P203CT	PLASTIC INJECTOR KIT INCLUDES INJECTOR - INTAKE HOSE - FOOT STRAINER AND WEIGHT - TIP KIT
P56	PUMP WITH SANTOPRENE SEALS - INCLUDES HOSE BARBS, AIR FITTING, AND EXHAUST BARB
P56K	PUMP WITH KALREZ SEALS - INCLUDES HOSE BARBS, AIR FITTING, AND EXHAUST BARB
P56V	PUMP WITH VITON SEALS - INCLUDES HOSE BARBS, AIR FITTING, AND EXHAUST BARB
<i>20756103B</i>	Polypro G57 Air Port x HB Straight, w/ Viton o-ring
<i>HB14P</i>	1/4in BRASS HB AIR FITTING /G57/P56
<i>HB5638</i>	HOSE BARB FOR P56 PUMP
<i>HB5638K</i>	HOSE BARB FOR P56K PUMP
<i>HB5638V</i>	HOSE BARB FOR P56V PUMP

PB16138	POLYPROPYLENE CONTROL BOX - WORKING DIMS 16x13x8 - PUMP MOUNT
PBFT-PP	MOUNTING FEET FOR POLYBOX - PB16138 - POLYPROPYLENE
PB-LTCH	POLY BOX LATCH FOR PB16138 AND PB12117
PB-PIN	STAINLESS STEEL HINGE PIN FOR PB16138 AND PB12117
PL16138	CONTROL BOX LID 16X13X8-POLYPROPYLENE-HINGED LOCKABLE LID-INCLUDES GASKET-WITH LABEL
PN1238	1/2in MPT X 3/8 in MPT POLY NIPPLE
QF1212	QUICK FIT-1/2 MPT X 1/2 OD TUBE-POLYPROPYLENE
QFT12	UNION TEE 1/2in TUBE - POLYPROPYLENE
R25	AIR REGULATOR-TWO 1/4IN FPT PORTS-TWO 1/8IN FPT PORTS-INCLUDES FILTER AND BOWL
<i>AFR25</i>	AIR FILTER for R25
<i>ABR25</i>	METAL AIR BOWL for R25
R25DT	3/16 X 5/16 CLEAR PVC TUBING - Available per ft.
S1012-HL	10-16 X 1/2 IN SCREW-STAINLESS-HI LO
S1034FHL	10 X 3/4 PHIL FLAT HI-LO THRD SCREW 18-8
SN1212	STAINLESS HEX NIPPLE 1/2 MPT X 1/2 MPT
SN1414	STAINLESS HEX NIPPLE 1/4 MPT X 1/4 MPT
SSA12	STAINLESS ADAPTOR 1/2 MPT X 1/2 FPT
SSC38	STAINLESS SCREW BAND CLAMP FOR 3/8 IN HOSE
SSE12	STREET ELBOW 1/2in - 316 S.S.
SSFT	POLISHED - STAINLESS FOAM TUBE 1-1/4 FPT - 9-1/2 IN LONG
SSFTB	STAINLESS FOAM TUBE BRACKET
SSMESH	STAINLESS STEEL MESH- 1 ball
SSST114	SCREEN DISC 1 1/4IN DIAMETER - SS
SST12	STAINLESS TEE 1/2 FPT
ST80100SS	SPRAY TIP-80 DEGREE-10.0 GPM-STAINLESS-1/2 MPT
ST80200SS	SPRAY TIP-80 DEGREE-20.0 GPM-STAINLESS-1/2 MPT
ST8060-12SS	SPRAY TIP-80 DEGREE-6.0 GPM-STAINLESS-1/2 MPT
TR120DS-A	REPEAT CYCLE TIMER - ADJUSTABLE DIGI-SET - 120 VAC
TS2	TOGGLE SWITCH SPST
TS2PLATE	ON/OFF SWITCH PLATE
TSBT12	TOGGLE SWITCH BOOT
WCB14F	14-16 - 1/4 FEM INSULATED CONNECTOR
WCB14FY	10-12 - 1/4in FEMALE INSULATED CONNECTOR
WMS14	14 X 1 1/4 HEX W/H SMS SLOTT, S/S
WMS14A	5/16 X 1 1/2 STRAIGHT PLASTIC ANCHOR
WR12SS	WATER PRESSURE REGULATOR - STAINLESS STEEL - 1/2 INCH FPT
WR1A	18/3 POWER CORD WITH GROUNDED PLUG-9FT LONG-BLACK
WRG14	WATER PRESSURE REGULATOR GAUGE FOR WR12SS