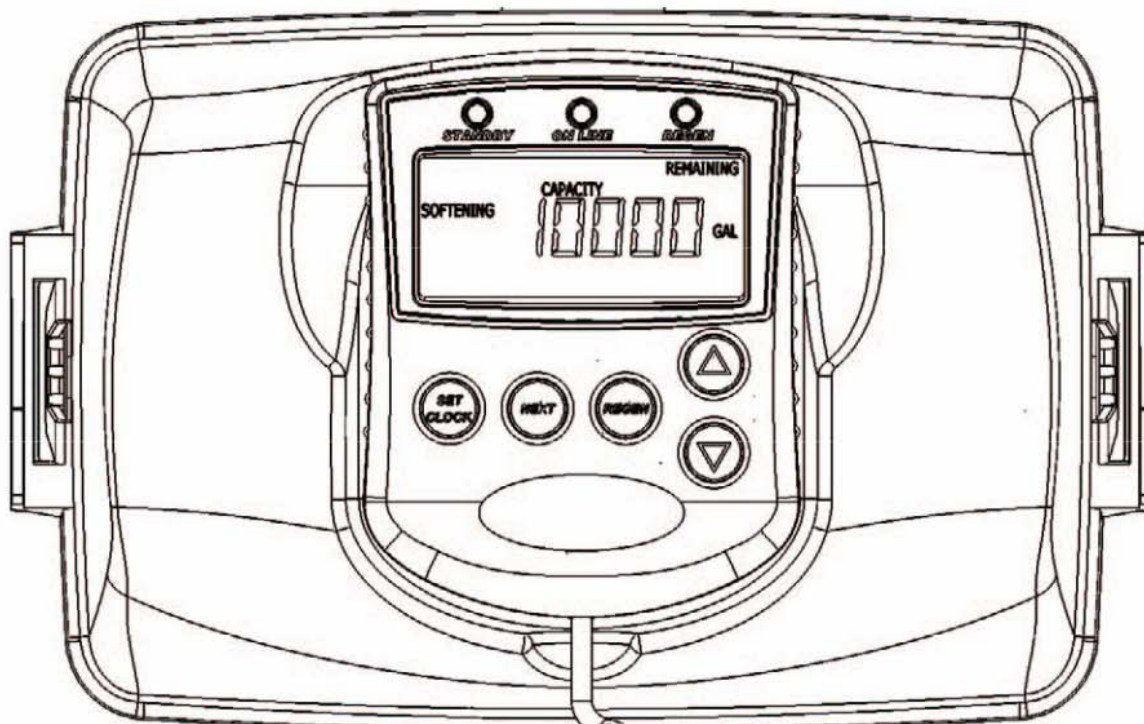


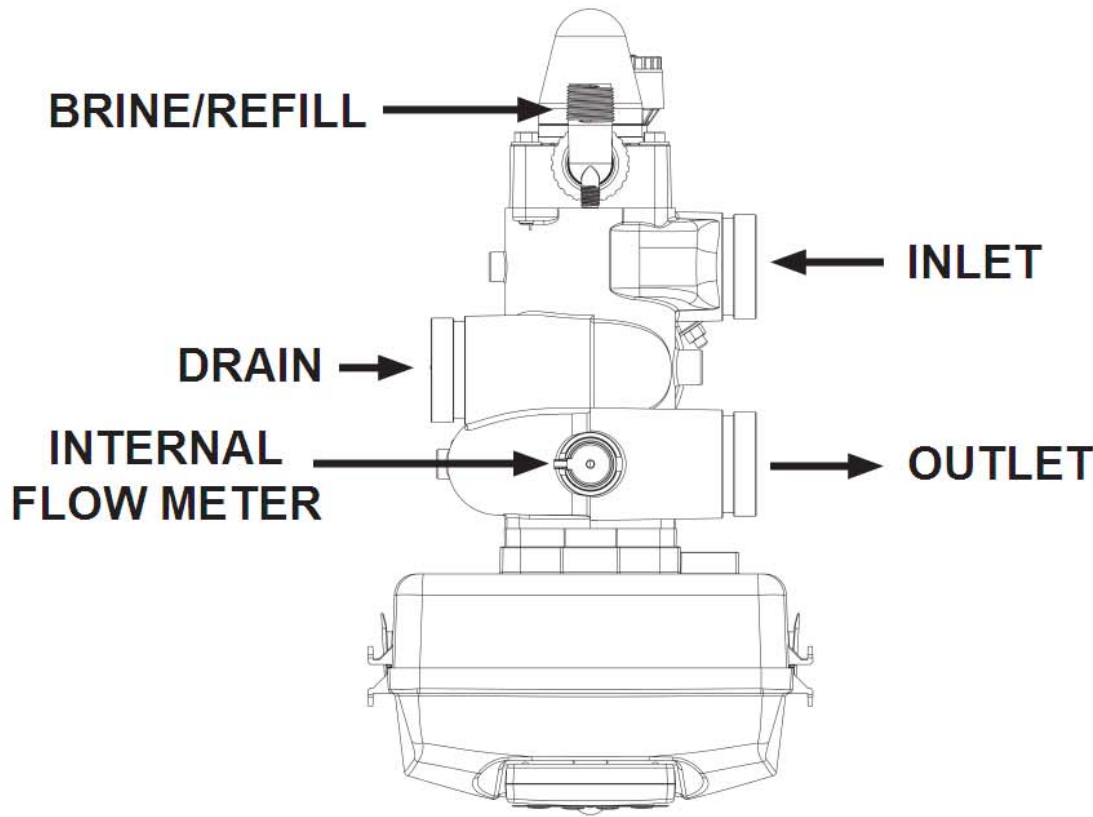
Water Specialist WS2H and WS3 Control Valve Drawings and Service Manual



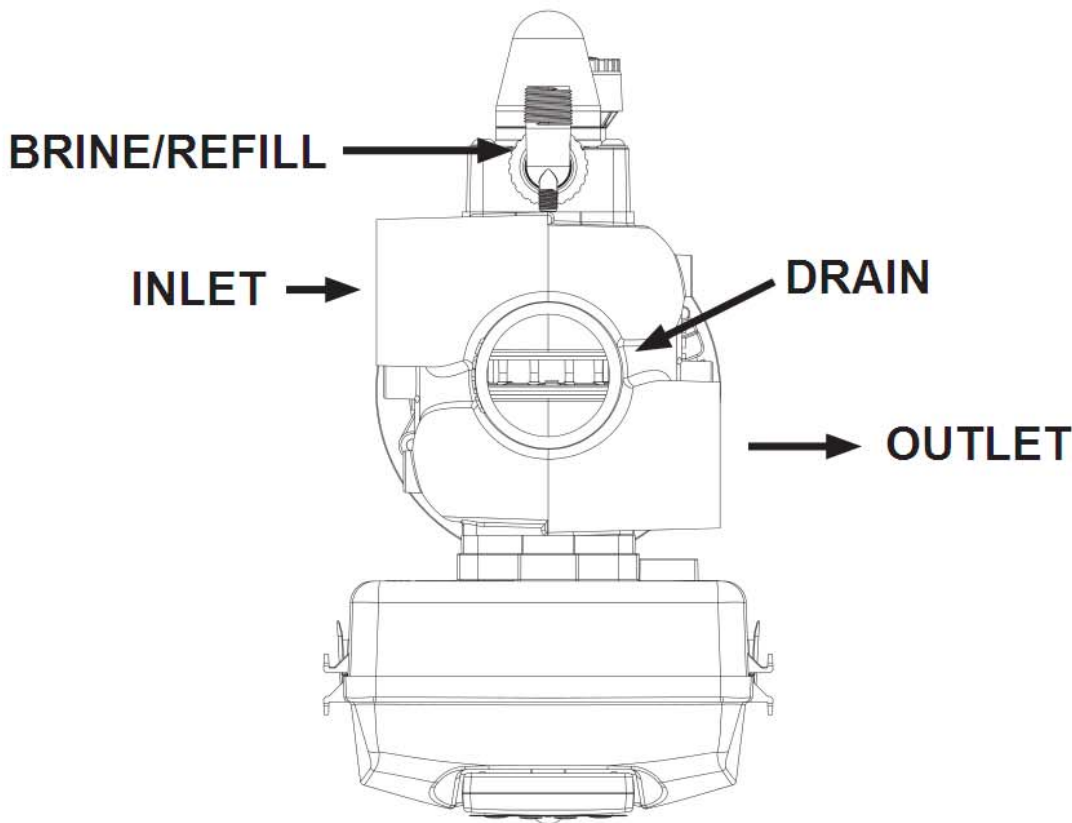
HYDROCARBONS SUCH AS KEROSENE, BENZENE, GASOLINE, ETC., MAY DAMAGE PRODUCTS THAT CONTAIN O-RINGS OR PLASTIC COMPONENTS. EXPOSURE TO SUCH HYDROCARBONS MAY CAUSE THE PRODUCTS TO LEAK. DO NOT USE THE PRODUCT(S) CONTAINED IN THIS DOCUMENT ON WATER SUPPLIES THAT CONTAIN HYDROCARBONS SUCH AS KEROSENE, BENZENE, GASOLINE, ETC.

Installation:

WS2H CONTROL VALVE TOP VIEW



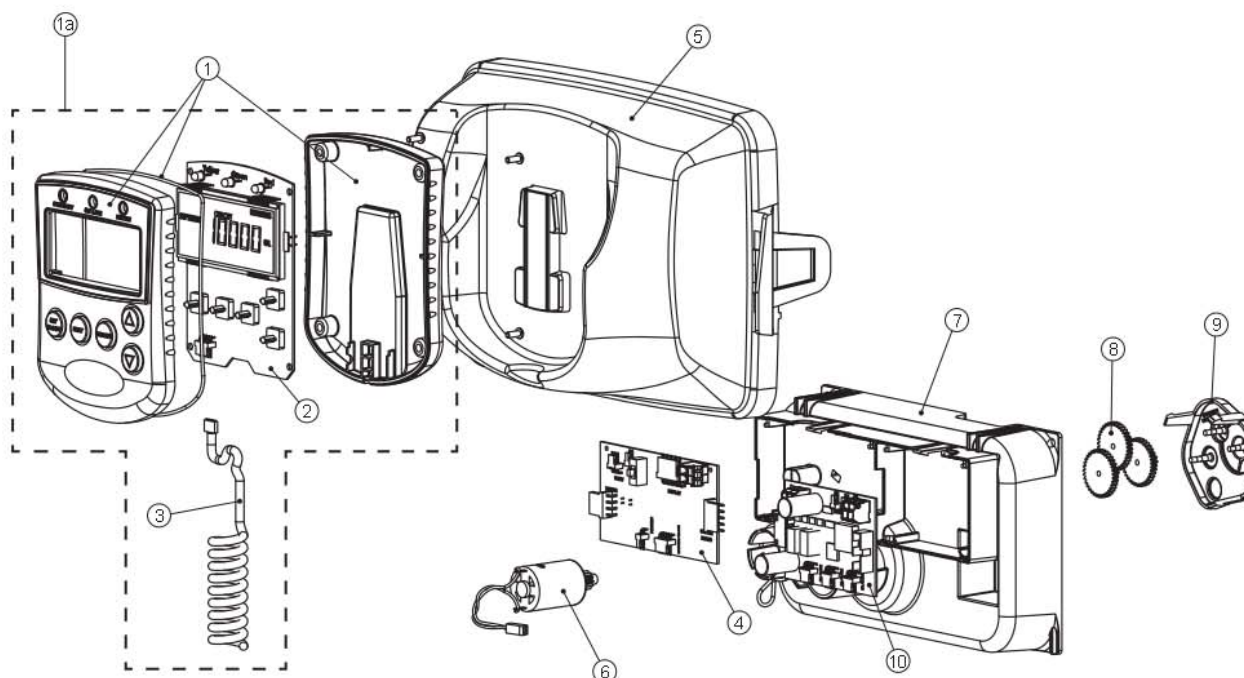
WS3 CONTROL VALVE TOP VIEW



Front Cover and Drive Assembly

Drawing No.	Order No.	Description	Quantity
1	V3068	WS2H/3 POD FRNT-BK COVERS	1
1a	V3082	WS2H/3 POD ASY COMPLETE W/BOARD*	Optional
2	V3241-01 BOARD	WS2H/3 PC BOARD DISPLAY	1
3	V3248	WS2H/3 CABLE DISPLAY POD	1
4	V3242-01BOARD	WS2H/3 PC BOARD VALVE	1
5	V3224-01R	WS2H/3 COVER ASY PLATINUM	1
6	V3107-01	WS1 MOTOR ASY	1
7	V3226-01	WS2H/3 DRIVE BRACKET ASY	1
8	V3110	WS1 DRIVE GEAR 12X36	3
9	V3109	WS1 DRIVE GEAR COVER	1
Not Shown	V3461	WS2H/3 AC ADAPTER (shipped less cord)	1 See Table 2 Software and Power Supply Compatibility for option selection
	V3461EU	WS2H/3 AC ADAPTER EU	
	V3461UK	WS2H/3 AC ADAPTER UK	
	V3461-01	WS2H/3 AC ADAPTER 20VAC	
	V3461EU-01	WS2H/3 AC ADAPTER EU 20VAC	
	V3461UK-01	WS2H/3 AC ADAPTER UK 20VAC	
10	V3243-01BOARD	WS2H/3 PC BOARD SYSTEM	Optional
Not Shown	V3475-12	WS2H/3 SYS CONNECT CORD 12 FT RED	Optional
Not Shown	V3475-24	WS2H/3 SYS CONNECT CORD 24 FT BL	Optional
Not Shown	V3475-36	WS2H/3 SYS CONNECT CORD 36 FT YEL	Optional

* Contains items 1, 2 & 3 Pod Assembly, PC Board and Cable



WS2H Drive Cap Assembly, Downflow Piston, Regenerant Piston, Spacer Stack Assembly,
Drive Back Plate, Main Body and Meter

Drawing No.	Order No.	Description	Quantity
1	V3275	WS2H/3 SCREW BTNSKT HD SS3/8-16X2-1/4 (7/32" hex allen wrench required)	4
2	V3291	WS2H/3 WASHER SS 3/8	4
3	V3225	WS2H/3 BACK PLATE	1
4	V3066	WS2H DRIVE ASY	1
5	V3289	O-RING 344	1
6	V3204-01	WS2H PISTON	1
7	V3238-01***	WS2H/3 BRINE PISTON	1
8	V3065	WS2H STACK ASY	1
Not Shown	V3468	WS2H/3 PLUG 1/4 HEX NPT (included when ordering V3201-03)	2
	V3465	WS2H/3 PLUG 1/4 HEX BSPT (included when ordering V3201BSPT-03)	
9	V3201-03	WS2H BODY W/V 3468 PLUG	1
	V3201BSPT-03	WS2H BSPT BODY W/V 3465 PLUG	
10	V3632*	WS1.5/2/3 METER RETAINING CLIP	1
11	V3003-02	WS1.5/2H METER COMMERCIAL ASY	1
12	V3118-03	WS1.5/2 TURBINE ASY	1
13	V3105	O-RING 215	1
14	V3501	WS1.5/2 TURBINE CLIP	1
15	V3279	O-RING 346	1
16	V3280	O-RING 332 FOR VALVE BODIES WITH NPT THREADS	1
	V3452	O-RING 230 FOR VALVE BODIES WITH BSPT THREADS	
17	V3054**	WS2H 4 IN BASE CLAMP ASY	1
18	V3276	WS2H/3 BOLT HEX SS 5/16-18X1-3/4	1
19	V3269	WS2H/3 NUT 5/16-18 SS HEX	1
Not Shown	D1300-01	TOP BAFFLE DF SR CLACK 2/63MM	1

* In 2008 a modification was made to Meter Housings to use V3632 WS1.5/2/3 Meter Retaining Clip. Do not use V3632 on old style housings which have holes through the castings to accept the U-shaped V3223 WS2 Meter Clip.

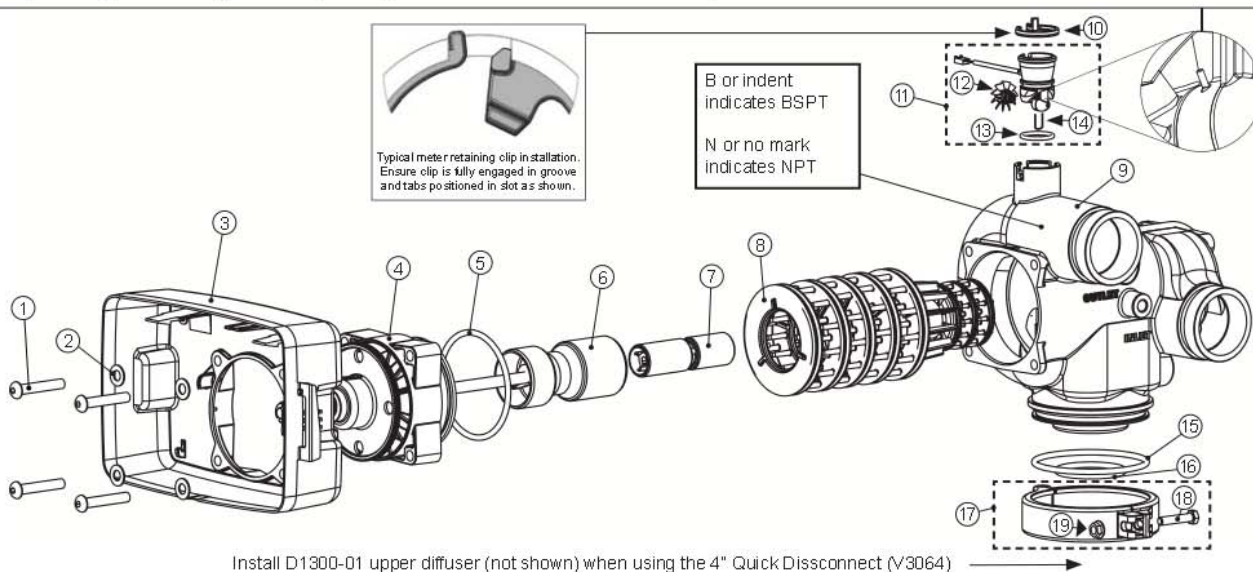
** V3054 WS2 4IN BASE CLAMP ASY includes a V3276 WS2 BOLT HEX SS 5/16-18X1-3/4 and V3269 WS2 NUT 5/16-18 SS HEX.

*** V3238-01 Brine Piston is used for Backwash Only valves.

THIS WATER METER SHOULD NOT BE USED AS THE PRIMARY MONITORING DEVICE FOR CRITICAL OR HEALTH EFFECT APPLICATIONS.

Service or replace the turbine by:

1. Turn the bypass for the system off and relieve the pressure on the system.
2. Press downward on the remote meter assembly to relieve tension on the retaining clip V3632 (or the U-shaped V3223 WS2 Meter Clip). Remove the clip and take the meter assembly out of the housing.
3. Remove the bend from the two exposed tips of the retaining clip V3501 and remove clip.
4. Service or replace the V3118-03 WS1.5/2 Turbine Assembly and place it back in the turbine shaft.
5. Insert the V3501 WS1.5/2 Turbine Clip and re-bend the exposed ends of the clip. The V3118-03 turbine has a groove to line up with the V3501 WS1.5/2 Turbine Clip.
6. Insert meter assembly back into the meter housing.
7. Re-install the meter retaining clip V3632 as shown below (or the U-shaped V3223 WS2 Meter Clip).
8. Open the bypass for the system slowly to bring back into service and check to be sure you have no water leaks.

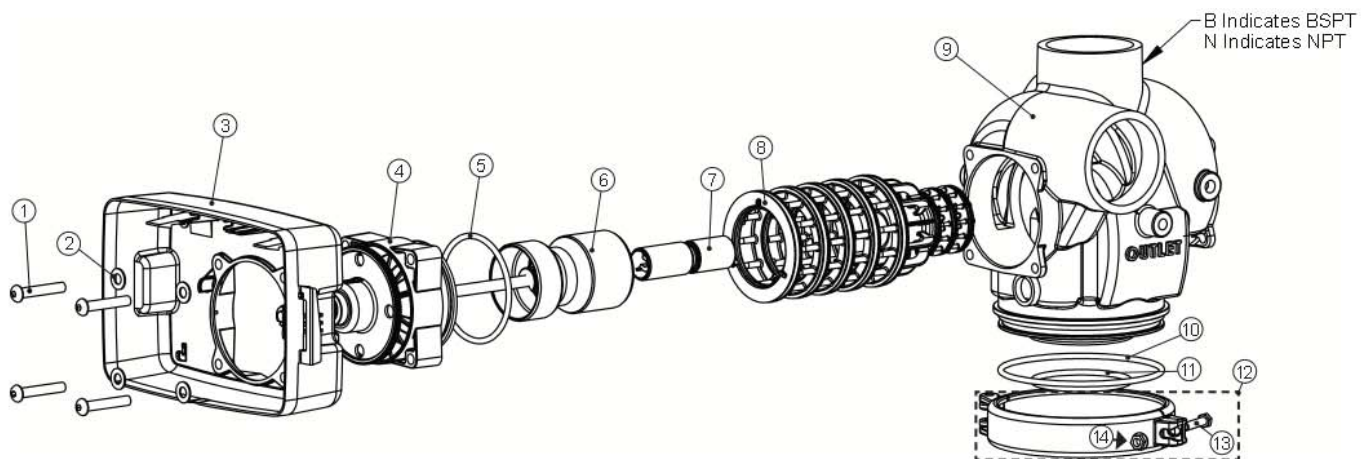


WS3 Drive Cap Assembly, Downflow Piston, Regenerant Piston, Spacer Stack Assembly,
Drive Back Plate and Main Body

Drawing No.	Order No.	Description	Quantity
1	V3274	WS2H/3 SCREW BTNSKT HD SS3/8-16X2 (7/32" hex allen wrench required)	4
2	V3291	WS2H/3 WASHER SS 3/8	4
3	V3225	WS2H/3 BACK PLATE	1
4	V3093	WS3 DRIVE ASY	1
5	V3289	O-RING 344	1
6	V3666-01	WS3 PISTON	1
7	V3238-01**	WS2H/3 BRINE PISTON	1
8	V3092	WS3 STACK ASY	1
Not Shown	V3468	WS2H/3 PLUG 1/4 HEX NPT (included when ordering V3667-03)	2
	V3465	WS2H/3 PLUG 1/4 HEX BSPT (included when ordering V3667BSPT-03)	
9	V3667-03	WS3 BODY W/V3468 PLUG	1
	V3667BSPT-03	WS3 BSPT BODY W/V3465 PLUG	
10	V3763	O-RING 361	1
11	V3762	O-RING 341 FOR VALVE BODIES WITH NPT OR BSPT THREADS	1
12	V3091*	WS3 BASE CLAMP ASY	1
13	V3276	WS2H/3 BOLT HEX SS 5/16-18X 1-3/4	1
14	V3269	WS2H/3 NUT 5/16-18 SS HEX	1
Not Shown	V3672	TOP BAFFLE DF SR CLACK 3/90MM	1

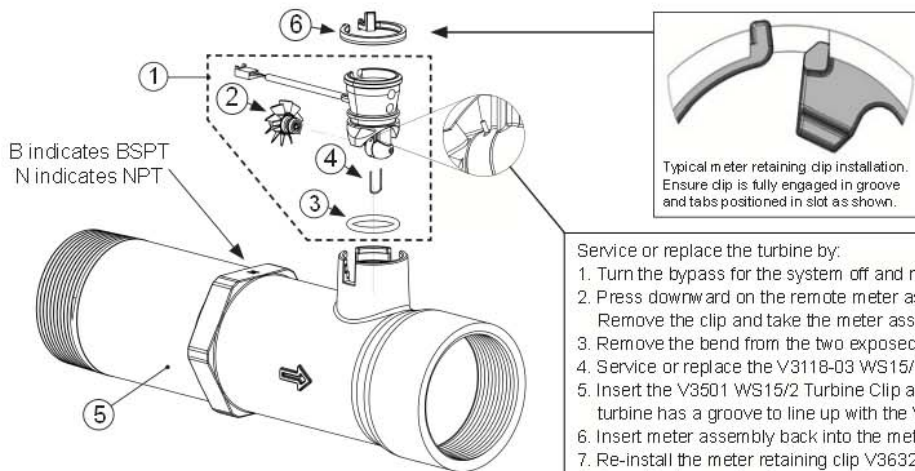
* V3091 WS3 BASE CLAMP ASY includes a V3276 WS2H/3 BOLT HEX SS 5/16-18X 1-3/4 and V3269 WS2H/3 NUT 5/16-18 SS HEX.

** V3238-01 Brine Piston is used for Backwash Only valves.



Install V3672 upper diffuser (not shown) when using the 6" Flange Base (V3090) →

V3095 WS3 Meter NPT MxF Assembly and V3095BSPT-15 WS3 Meter BSPT MxF Assembly
 V3095-15 WS3 Meter ASY NPT MxF 15FT and V3095BSPT-15 WS3 Meter ASY BSPT MxF 15FT



B indicates BSPT
 N indicates NPT

- Service or replace the turbine by:
1. Turn the bypass for the system off and relieve the pressure on the system.
 2. Press downward on the remote meter assembly to relieve tension on the retaining clip V3632. Remove the clip and take the meter assembly out of the housing.
 3. Remove the bend from the two exposed tips of the retaining clip V3501 and remove clip.
 4. Service or replace the V3118-03 WS15/2 Turbine Assembly and place it back in the turbine shaft.
 5. Insert the V3501 WS15/2 Turbine Clip and re-bend the exposed ends of the clip. The V3118-03 turbine has a groove to line up with the V3501 WS15/2 Turbine Clip.
 6. Insert meter assembly back into the meter housing.
 7. Re-install the meter retaining clip V3632 as shown above.
 8. Open the bypass for the system slowly to bring back into service and check to be sure you have no water leaks.

Drawing No.	Order No.	Description	V3095	V3095BSPT	V3095-15	V3095BSPT-15
1	V4039	WS3 METER COMMERCIAL ASY 4 FT CORD (includes V3118-03, V3105 & V3501)	1	1		
	V3221	WS REMOTE METER ASY 15 FT CORD (includes V3118-03, V3105 & V3501)			1	1
2	V3118-03	WS15/2 TURBINE ASY	1	1	1	1
3	V3105	O-RING 215	1	1	1	1
4	V3501	WS15/2 TURBINE CLIP	1	1	1	1
5	V3844-01	WS3 METER NPT MxF HOUSING	1		1	
	V3844BSPT-01	WS3 METER BSPT MxF HOUSING		1		1
6	V3632	WS1.5/2/3 METER RETAINING CLIP	1	1	1	1
Not shown	V3602	WS3 FLOW STRAIGHTENER (located inside meter housing)	1	1	1	1

Installation

Installation of the V3075 WS3 Meter NPT Assembly can be accomplished with 3" NPT pipe. For V3075BSPT WS3 Meter BSPT Assembly use 3" BSPT pipe. It is recommended that the meter assembly be installed horizontally or in a downflow vertical position to reduce turbine bearing wear.

WHEN INSTALLING THE METER, MAKE SURE THE ARROW ON THE METER BODY IS GOING THE SAME DIRECTION AS THE WATER FLOW. THE METER CAN BE INSTALLED IN HORIZONTAL OR VERTICAL APPLICATIONS.

THIS WATER METER SHOULD NOT BE USED AS THE PRIMARY MONITORING DEVICE FOR CRITICAL OR HEALTH EFFECT APPLICATIONS.

OPERATING PRESSURES: 20 PSI MINIMUM / 125 PSI MAXIMUM

OPERATING TEMPERATURES: 40°F MINIMUM / 110°F MAXIMUM

The 22 gauge wire crimp terminals are Molex Series 41572 or 40445. The housing connector is Molex Series 2695 White Housing, P/N 22-01-3037.

The housing connector diagram shows the proper installation of the RED, WHITE and BLACK wires for CLACK CORPORATION CONTROL VALVES.

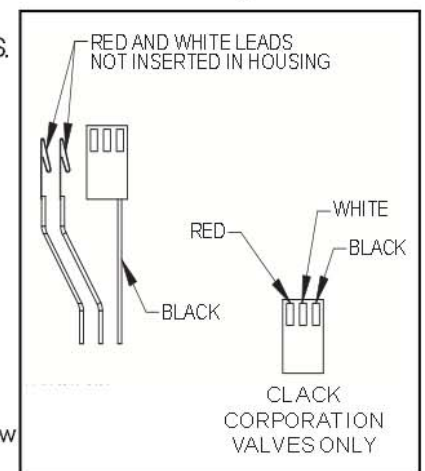
When connecting to other manufacturers control valves please contact your original equipment manufacturer for proper wiring instructions.

Wiring:

- The meter must be supplied with a DC voltage between 4 and 24 volts
- The RED wire is positive
- The BLACK wire is negative
- The WHITE wire is the meter output

Calibration:

- For WS2H valves select 8 pulses if valve software records in gallons and 2.1 if valve software records in liters.
- The calibration factor for the WS3 Meter Assembly is 8 pulses per gallon when used on applications other than WS2H valves.
- The meter flow range is 3.5-350 gpm \pm 5% (output signal 0.46 Hz to 46.6 Hz). NOTE: Not all flow monitors will register accurately at either the low or high flow range of this meter. Contact your flow monitor manufacturer for limitations.
- Pressure drop at 350 gpm is 7.3 PSI

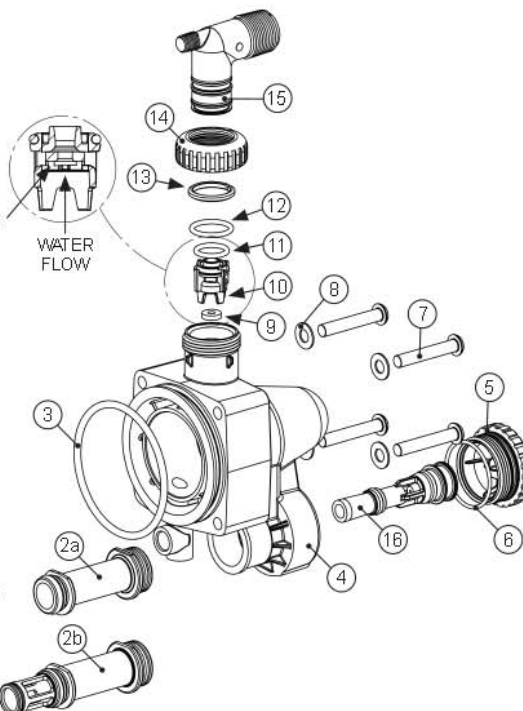


WS2H and WS3 Brine Valve Body and Injector Components

Drawing No.	Order No.	Description	Quantity	
			WS2H	WS3
1	V3237-01	WS2H/3 SOFT FILL TUBE ASY	1	1
2a	V3236-04*	WS2H INJECTOR TUBE ASY FOR A THRU H	1	
2b	V3670-01**	WS3 INJECTOR TUBE DOWNFLOW ASY		1
3	V3289	O-RING 344	1	1
4	V3067	WS2H/3 BRINE BODY ASY	1	1
5	V3477	WS2H/3 INJECTOR CAP	1	1
6	V3152	O-RING 135	1	1
7	V3275	WS2H/3 SCREW BSHD SS 3/8-16X2-1/4 (7/32" hex allen wrench required)	4	4
8	V3291	WS2H/3 WASHER SS 3/8	4	4
9	V3162-022***	WS1 DLFC 022 FOR 3/4	1	1
10	V3231	WS2H/3 REFILL FLOW CNTRL RETAINER	1	1
11	V3277	O-RING 211	1	1
12	V3105	O-RING 215	1	1
13	V3150	WS1 SPLIT RING	1	1
14	V3151	WS1 NUT 1 QC	1	1
15	V3149	WS1 FTG 1 PVC MALE NPT ELBOW	1	1
Not Shown	V3189	WS1 FTG 3/4& 1 PVC SLVNT 90	Optional	Optional
16****	V3010-2A	WS2/2H/3 INJECTOR ASY A		
	V3010-2B	WS2/2H/3 INJECTOR ASY B		
	V3010-2C	WS2/2H/3 INJECTOR ASY C		
	V3010-2D	WS2/2H/3 INJECTOR ASY D		
	V3010-2E	WS2/2H/3 INJECTOR ASY E		
	V3010-2F	WS2/2H/3 INJECTOR ASY F		
	V3010-2G	WS2/2H/3 INJECTOR ASY G		
	V3010-2H	WS2/2H/3 INJECTOR ASY H		
Not Shown	V3499*****	WS2H/3 FITTING CAP 1 IN THREADED	1	1
Not Shown	V3797*****	WS1 FTG 1 PVC MALE BSPT ELBOW	BSPT Only	BSPT Only



Proper RFC orientation directs refill water flow towards the washer face with radius and text.



*V3236-04 WS2H INJECTOR TUBE ASY A thru H contains a V3285 O-RING 213 and a V3286 O-RING 216.

**V3670-01 WS3 INJECTOR TUBE DOWNFLOW ASY contains a V3285 O-RING 213, V3286 O-RING 216 and a V3163 O-RING 019.

***Any V3162-XXX flow control may be used. V3237-01 WS2H SOFT FILL TUBE ASY contains a V3155 O-RING 112, V3287 O-RING 110 and a V3288 O-RING 206.

****V3010-2A through V3010-2G injectors contain a V3283 O-RING 117 and a V3284 O-RING 114. V3010-2H injectors use a V3283 O-RING 117 and D1263 O-RING 116.

Backwash Only Valves include a V3499 but do not include the following parts: V3189, V3162-022, V3231 and V3277.

***** Install V3499 on V3149 if valve is to be set up as a backwash only valve.

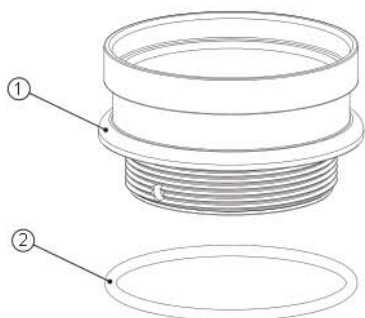
***** BSPT valves also include a V3797 WS1 FTG 1 PVC MALE BSPT ELBOW

***V3236-01. Could be used "as is" with A-C injectors.

Diffuser is snipped off if using D through G injectors. Order V3236-04 if using H injector.

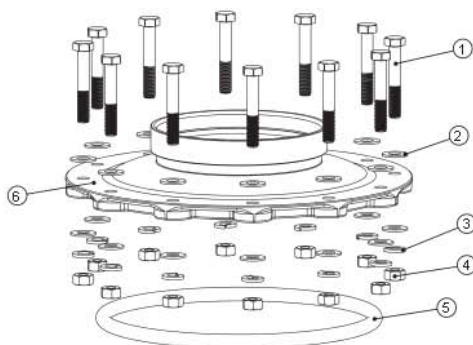


V3064 WS2H/2QC 4 INCH BASE ASY (For use on WS2H or WS2QC only)



Drawing No.	Order No.	Description	Quantity
1	V3202-01	WS2H BASE	1
2	V3419	O-RING 347	1

V3055 WS2H/2QC 6 INCH FLANGE BASE ASY or V3090 WS3 6 INCH FLANGE BASE ASY

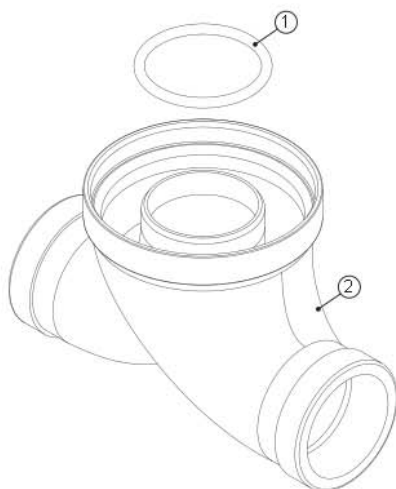


Drawing No.	Order No.	Description	Quantity	
			V3055	V3090
1	V3444	WS2H SCREW HEXCAP 5/16-18X2 SS	12	12
2	V3293	WS2H WASHER SS 5/16 FLAT	24	24
3	V3445	WS2H WASHER SPLIT LOCK 5/16 SS	12	12
4	V3447	WS2H NUT HEX 5/16-8 FULL SS	12	12
5	COR60FL	O RING 6 FLANGE ADAPTER	1	1
6	V3261-01	WS2H FLANGE BASE	1	
	V3671-01	WS3 FLANGE BASE		1



Order No.	Description	Inlet/Outlet	For Valve
V3260-02	WS2H/2QC SIDE MOUNT NPT ASY	2" Female NPT or 2.5" Groove Lock	WS2H NPT
V3674-02	WS3 SIDE MOUNT NPT ASY	3" Female NPT	WS3 NPT
V3674BSPT-02	WS3 SIDE MOUNT BSPT ASY	3" Female BSPT	WS3 BSPT

V3260BSPT-02 WS2H SIDE MOUNT BASE BSPT ASY



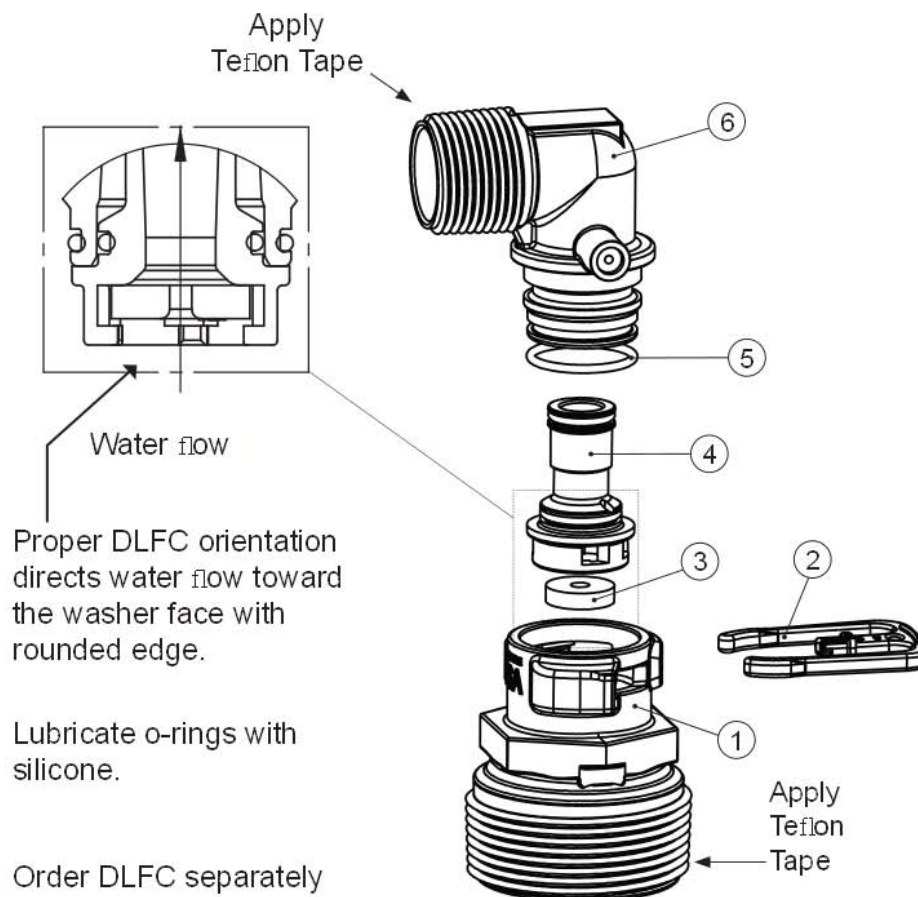
Drawing No.	Order No.	Description	Quantity
1	V3280	O-RING 332	1
2	V3260BSPT-01	WS2H SIDE MOUNT BASE BSPT	1

When using a side mount base with 2H BSPT valves replace distributor pilot o-ring V3452 O-RING 230 with V3280 O-RING 332. See exploded view of 2H valve for specific location of distributor pilot o-ring.

Order No. V3158-04**Description: WS2 Drain Elbow 3/4" Male NPT without Silencer**

DRAWING NUMBER	ORDER NUMBER	DESCRIPTION	QTY
1	V3983	WS2 DLFC ADAPTER	1
2	H4615	CLIP RETAINING 474/WS1	1
3	V3162-007	WS1 DLFC 0.7 gpm for 3/4	ONE DLFC MUST BE USED IF 3/4" FITTING IS USED.
	V3162-010	WS1 DLFC 1.0 gpm for 3/4	
	V3162-013	WS1 DLFC 1.3 gpm for 3/4	
	V3162-017	WS1 DLFC 1.7 gpm for 3/4	
	V3162-022	WS1 DLFC 2.2 gpm for 3/4	
	V3162-027	WS1 DLFC 2.7 gpm for 3/4	
	V3162-032	WS1 DLFC 3.2 gpm for 3/4	
	V3162-042	WS1 DLFC 4.2 gpm for 3/4	
	V3162-053	WS1 DLFC 5.3 gpm for 3/4	
	V3162-065	WS1 DLFC 6.5 gpm for 3/4	
	V3162-075	WS1 DLFC 7.5 gpm for 3/4	
V3162-090	WS1 DLFC 9.0 gpm for 3/4		
V3162-100	WS1 DLFC 10 gpm for 3/4		
4	V3159-01	WS1 DLFC RETAINER ASY	1
5	V3163	O-RING 019	1
6	V3158-03	WS1 DRN ELBOW 3/4 MALE NO HOLE	1

This assembly is shipped without drain line flow control (DLFC) – install DLFC before using. Use a minimum drain line size of 3/4".

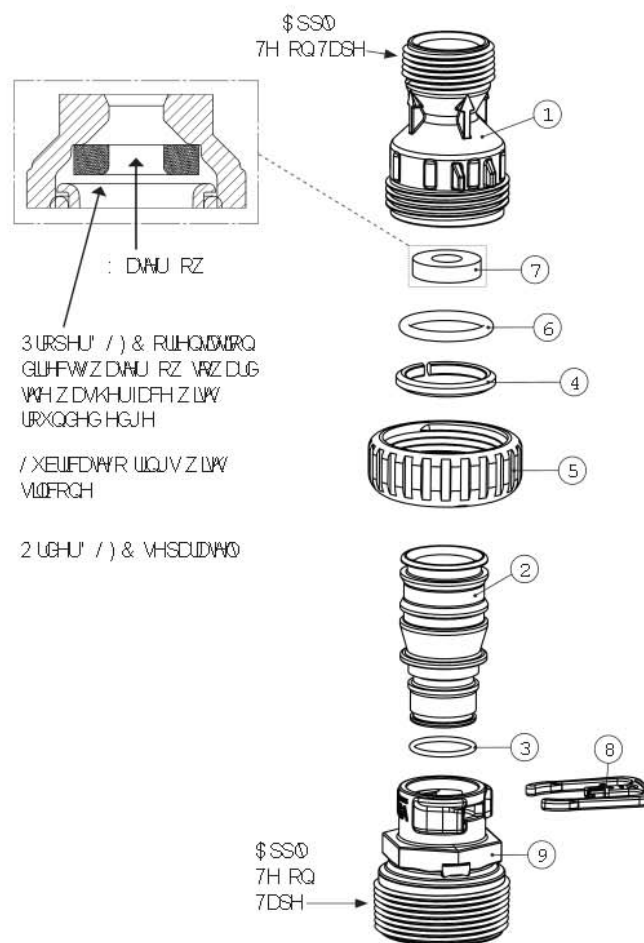


Order No. V3008-05

Description: WS2 Drain Fitting 1" Male NPT Straight without Silencer

DRAWING NUMBER	ORDER NUMBER	DESCRIPTION	QTY
1	V3166-01	WS1 FTG FLOW CONTROL BODY	1
2	V3167	WS1 DRAIN FTG ADAPTER 1	1
3	V3163	O-RING 019	1
4	V3150	WS1 SPLIT RING	1
5	V3151	WS1 NUT 1" QC	1
6	V3105	O-RING 215	1
7*	V3190-090	WS1 DLFC 9.0 GPM FOR 1	ONE DLFC MUST BE USED IF 1" FITTING IS USED.
	V3190-100	WS1 DLFC 10.0 GPM FOR 1	
	V3190-110	WS1 DLFC 11.0 GPM FOR 1	
	V3190-130	WS1 DLFC 13.0 GPM FOR 1	
	V3190-150	WS1 DLFC 15.0 GPM FOR 1	
	V3190-170	WS1 DLFC 17.0 GPM FOR 1	
	V3190-200	WS1 DLFC 20.0 GPM FOR 1	
	V3190-250	WS1 DLFC 25.0 GPM FOR 1	
8	H4615	CLIP RETAINING	1
9	V3414	WS1.5 DLFC ADAPTER	1
10	V3649	BUSHING PVC SCH 80 1.5 TO 1.25 NPT	1

* Order DLFC separately.

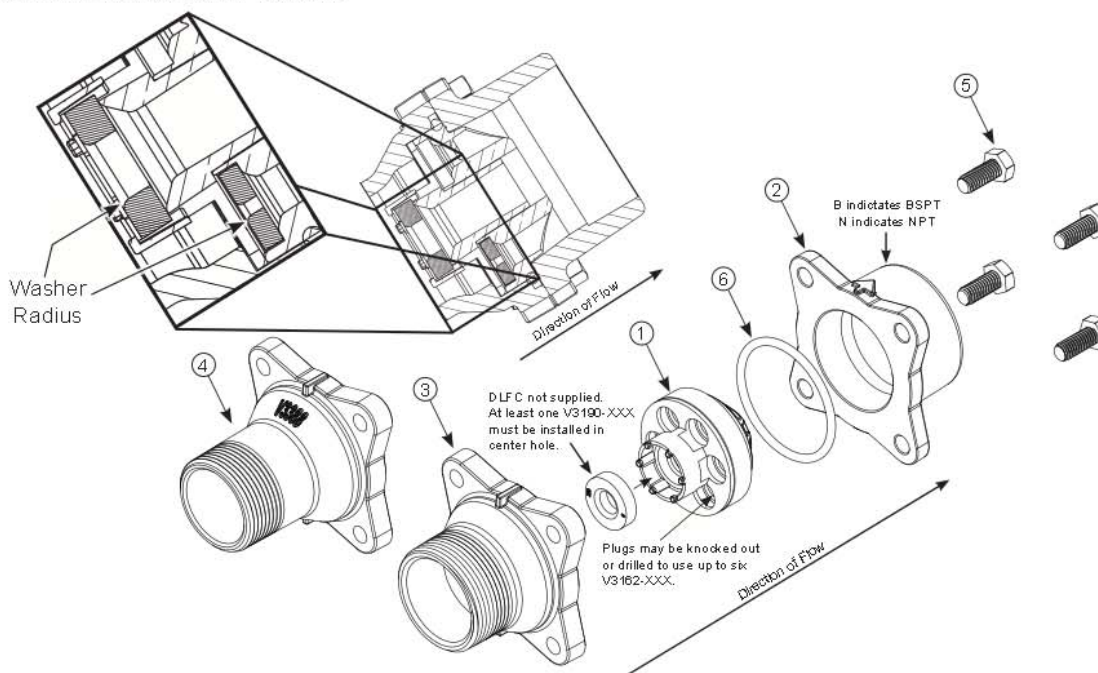


V3079 WS DLFC ASY 125 MNPT/15 FNPT, V3079BSPT WS DLFC ASY 125 MNPT/15 FBSPT,
V3080 WS DLFC ASY 15 MNPT/15 FNPT and V3080BSPT WS DLFC ASY 15 MNPT/15 FBSPT

Drawing No.	Order No.	Description	Quantity			
			V3079	V3079BSPT	V3080	V3080BSPT
1	V3081	WS15 RETAINER DLFC ASY	1	1	1	1
2	V3845	WS15 DLFC FLANGE OUTLET FNPT	1		1	
	V3845BSPT	WS15 DLFC FLANGE OUTLET FBSPT		1		1
3	V3848	WS15 DLFC FLANGE INLET MNPT			1	1
4	V3388	WS125 DLFC FLANGE INLET MNPT	1	1		
5	V3852	BOLT HEXHD S/S HCS 5/16-18x3/4	4	4	4	4
6	V3441	O-RING 226	1	1	1	1
Not Shown	V3162-007	WS1 DLFC 0.7 gpm for 3/4	Install at least one V3190-XXX in center hole. Knock out plugs allow installation of up to 6 more of V3162-XXX.			
	V3162-010	WS1 DLFC 1.0 gpm for 3/4				
	V3162-013	WS1 DLFC 1.3 gpm for 3/4				
	V3162-017	WS1 DLFC 1.7 gpm for 3/4				
	V3162-022	WS1 DLFC 2.2 gpm for 3/4				
	V3162-027	WS1 DLFC 2.7 gpm for 3/4				
	V3162-032	WS1 DLFC 3.2 gpm for 3/4				
	V3162-042	WS1 DLFC 4.2 gpm for 3/4				
	V3162-053	WS1 DLFC 5.3 gpm for 3/4				
	V3162-065	WS1 DLFC 6.5 gpm for 3/4				
	V3162-075	WS1 DLFC 7.5 gpm for 3/4				
	V3162-090	WS1 DLFC 9.0 gpm for 3/4				
	V3162-100	WS1 DLFC 10.0 gpm for 3/4				
	V3190-090	WS1 DLFC 09.0 gpm for 1				
	V3190-100	WS1 DLFC 10.0 gpm for 1				
	V3190-110	WS1 DLFC 11.0 gpm for 1				
	V3190-130	WS1 DLFC 13.0 gpm for 1				
	V3190-150	WS1 DLFC 15.0 gpm for 1				
V3190-170	WS1 DLFC 17.0 gpm for 1					
V3190-200	WS1 DLFC 20.0 gpm for 1					
V3190-250	WS1 DLFC 25.0 gpm for 1					

Assemblies are shipped without drain line flow control (DLFC). Assembly instructions:

- Determine the desired flow rate. Select one V3190-XXX for the center hole and a combination of V3162-XXX to arrive at the desired flow rate. At least one V3190-XXX must be used and up to six of the V3162-XXX may be used.
- Using a drill or punch remove the desired knockout(s) in V3081.
- Smooth holes.
- Install appropriate size(s) of drain line flow control washers. Pay close attention to proper DLFC orientation.
- Fit V3441 o-ring onto V3081 Retainer DLFC Asy and assemble. Properly orientate the V3081 in direction of flow.
- Inlet threads for 1.25" female are NPT. Inlet threads for 1.5" male are NPT. Outlet threads for 1.5" are either female NPT or BSPT. 1.5" female outlet is stamped with N or B to indicate NPT or BSPT.



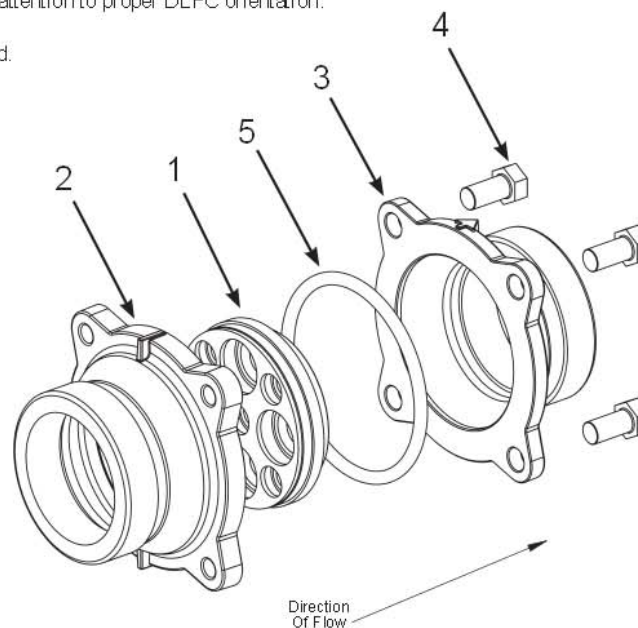
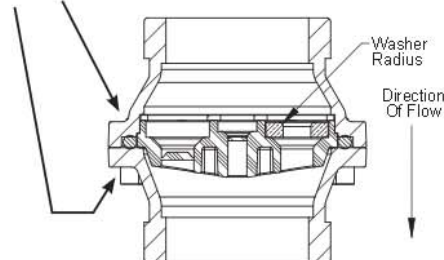
V3051 WS2 DLFC ASY NPT and V3051BSPT WS2 DLFC ASY BSPT

Drawing No.	Order No.	Description	Quantity
1	V3052	WS2 DLFC Retainer ASY	1
2	V3245	WS2 DLFC FLANGE INLET NPT	1
	V3245BSPT	WS2 DLFC FLANGE INLET BSPT	
3	V3246	WS2 DLFC FLANGE OUTLET NPT	1
	V3246BSPT	WS2 DLFC FLANGE OUTLET BSPT	
4	V3273	BOLT HEX HD S/S HCS 3/8-16X3/4	4
5	V3278	O-ring 338	1
Not Shown	V3162-007	WS1 DLFC 0.7 gpm for 3/4	Install One or More DLFC's. Up to 5 of the V3162-XXX may be installed in the small holes. Up to 4 of the V3190-XXX may be installed in the large holes.
	V3162-010	WS1 DLFC 1.0 gpm for 3/4	
	V3162-013	WS1 DLFC 1.3 gpm for 3/4	
	V3162-017	WS1 DLFC 1.7 gpm for 3/4	
	V3162-022	WS1 DLFC 2.2 gpm for 3/4	
	V3162-027	WS1 DLFC 2.7 gpm for 3/4	
	V3162-032	WS1 DLFC 3.2 f gpm or 3/4	
	V3162-042	WS1 DLFC 4.2 gpm for 3/4	
	V3162-053	WS1 DLFC 5.3 gpm for 3/4	
	V3162-065	WS1 DLFC 6.5 gpm for 3/4	
	V3162-075	WS1 DLFC 7.5 gpm for 3/4	
	V3162-090	WS1 DLFC 9.0 gpm for 3/4	
	V3162-100	WS1 DLFC 10.0 gpm for 3/4	
	V3190-090	WS1 DLFC 9.0 gpm for 1	
	V3190-100	WS1 DLFC 10.0 gpm for 1	
	V3190-110	WS1 DLFC 11.0 gpm for 1	
	V3190-130	WS1 DLFC 13.0 gpm for 1	
V3190-150	WS1 DLFC 15.0 gpm for 1		
V3190-170	WS1 DLFC 17.0 gpm for 1		
V3190-200	WS1 DLFC 20.0 gpm for 1		
V3190-250	WS1 DLFC 25.0 gpm for 1		

Assemblies are shipped without drain line flow control (DLFC). Assembly instructions:

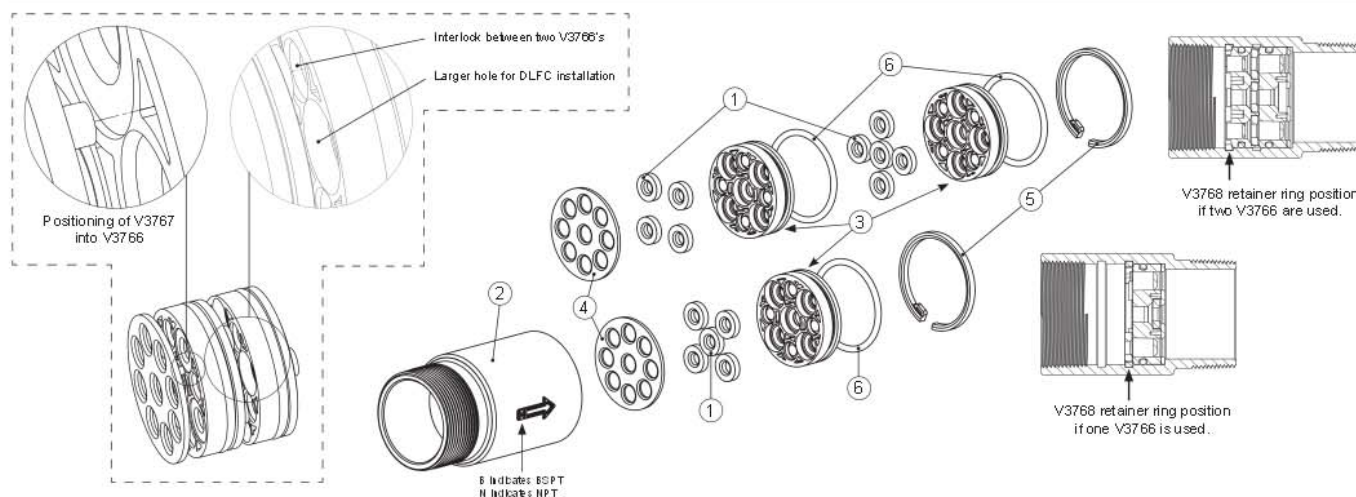
- Determine the desired flowrate. Select a combination of V3162-XXX's and V3190-XXX's to arrive at the desired flow rate. Up to five of the smaller V3162-XXX's may be used. Up to four of the larger V3190-XXX's may be used.
- Using a drill or punch remove the desired knockout(s) in V3052.
- Smooth hole(s).
- Install appropriate size(s) of drain line flow control washers. Pay close attention to proper DLFC orientation.
- Assemble. Properly orientate the V3052 in the direction of flow.
- Inlet and outlet threads are 2". Couplings for iron pipe may also be used.

B indicates BSPT
N indicates NPT



V3764 WS3 DLFC NPT ASY or V3764BSPT WS3 DLFC BSPT ASY

Drawing No.	Order No.	Description	Quantity
1	V3190-090	WS1 DLFC 9.0 gpm for 1	Install One or More DLFC washers. DLFC washers must be purchased separately. When using one retainer and one o-ring up to 5 DLFC washers can be used for flow rates from 9 gpm up to 125 gpm. When using two retainers and two o-rings, 5 DLFC washers are used in one of the retainers and up to 4 more DLFC washers can be used in the other retainer for flow rates from 9 gpm up to 225 gpm.
	V3190-100	WS1 DLFC 10.0 gpm for 1	
	V3190-110	WS1 DLFC 11.0 gpm for 1	
	V3190-130	WS1 DLFC 13.0 gpm for 1	
	V3190-150	WS1 DLFC 15.0 gpm for 1	
	V3190-170	WS1 DLFC 17.0 gpm for 1	
	V3190-200	WS1 DLFC 20.0 gpm for 1	
	V3190-250	WS1 DLFC 25.0 gpm for 1	
2	V3765-01	WS3 DLFC HOUSING NPT	1
	V3765B-SPT-01	WS3 DLFC HOUSING BSPT	
3	V3766	WS3 DLFC RETAINER	1 or 2
4	V3767	WS3 DLFC RETAINER COVER	1
5	V3768	WS3 DLFC RETAINER RING	1
6	V3769	O-RING 336	1 or 2



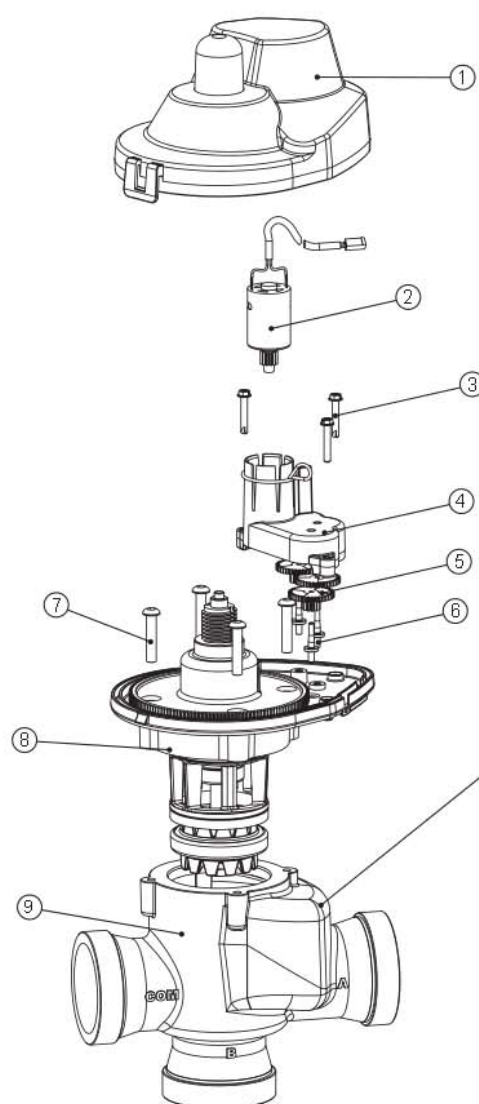
Assemblies are shipped without drain line flow control (DLFC) washers.

Assembly instructions:

1. Determine the desired flow rate. Select a combination of V3190-XXX's to arrive at the desired flow rate.
2. Using a drill or punch remove the desired knockout(s) in V3766. Each V3766 retainer contains two types of knockouts. The larger knockouts are removed to install a DLFC. If two V3766 retainers are needed remove the smaller diameter knockout that lines up with the DLFC installed in the other retainer. One or two V3766 retainers may be used. When using one V3766 retainer V3190-XXX must be installed in the center hole. When using two V3766 retainers a V3190-XXX must be installed in the center hole of one of the retainers and the center hole on the other retainer must remain open.
3. Smooth hole(s).
4. Install appropriate size(s) of drain line flow control washers. Pay close attention to proper DLFC orientation.
5. Assemble. Each V3766 retainer must have a V3769 o-ring installed. One each of the V3767 retainer cover and V3768 retainer ring must be used whether one or two V3766 retainers are used. The positioning of the V3768 retainer ring varies depending on the number of V3766 retainer(s) used. Properly orientate the V3766(s) in the direction of flow.
6. Properly orientate the complete assembly in the direction of flow. Inlet and outlet threads are 3".

V3063 MOTOR ALTERNATING VLV 2 NPT and V3063BSPT MOTOR ALTERNATING VLV 2 BSPT

Drawing No.	Order No.	Description	Quantity
1	V3056	WS1.5&2ALT/2BYPASS AUTO CVRASY	1
2	V3476	WS MOTOR ASY 8 FT	1
3	V3272	WS2 SCREW 8X1 SS HEX SELF TAP	3
4	V3262-01	WS1.5&2ALT/2BY REDUCGEARCVRASY	1
5	V3110	WS1 DRIVE REDUCING GEAR 12X36	3
6	V3264	WS2 BYPASS REDUCTION GEAR AXLE	3
7	V3292	WS2 SCREW BSHD SS 1/4-20X1-1/2	4
8	V3059	WS1.5&2ALT/2BYPAS AUTODRIVEASY	1
9	V3298-01	WS2 ALT VALVE BODY NPT	1
	V3298BSPT-01	WS2 ALT VALVE BODY BSPT	
Not Shown	V3474	WS ALT CONNECT CORD 8 FT BLK	1



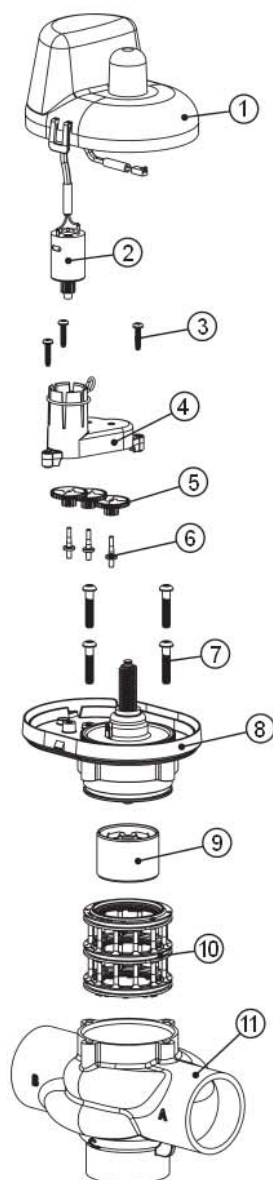
•Operating Pressures:
20 PSI Minimum / 125 PSI Maximum

•Operating Temperatures:
40°F Minimum / 110°F Maximum

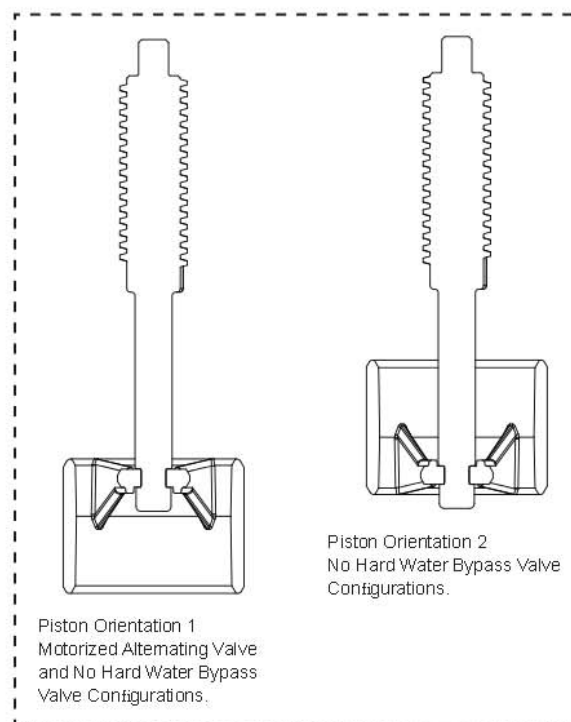
N - Stamp means threads are NPT
B - Stamp means threads are BSPT

Order No. V3076 • Description: MOTOR ALT VLV 2 NPT REV2 or
 Order No. V3076BSPT • Description: MOTOR ALT VLV 2 BSPT REV2

Drawing No.	Order No.	Description	Quantity	
			V3076	V3076BSPT
1	V3073	MAV/NOHWBY COVER ASY	1	1
2	V3476	WS MOTOR ASY 8 FT	1	1
3	V3592	SCREW #8-1 PHPN T-25 SS	3	3
4	V3262-01	WS1.5&2ALT/2BY REDUCGEARCVRAS	1	1
5	V3110	WS1 DRIVE REDUCING GEAR 12X36	3	3
6	V3264	WS2 BYPASS REDUCTION GEAR AXLE	3	3
7	V3642	SCREW 1/4-20 X 1 1/4 BHSCS SS	4	4
8	V3078	MAV/NOHWBY 2 DRIVE ASY	1	1
9	V3634-01	MAV/NOHWBY 2 PISTON	1	1
10	V3077	MAV/NOHWBY 2 STACK ASY	1	1
11	V3633-01	WS2 MAV BODY NPT	1	N/A
	V3633-01BSPT	WS2 MAV BODY BSPT	N/A	1
Not Shown	V3474	WS ALT CONNECT CORD 8FT BLK	1	1

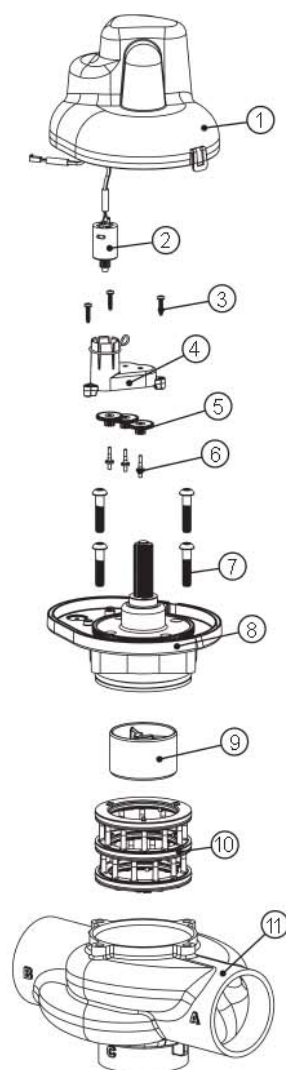


- Operating Pressures:
20 PSI Minimum / 125 PSI Maximum
- Operating Temperatures:
40°F Minimum / 110°F Maximum

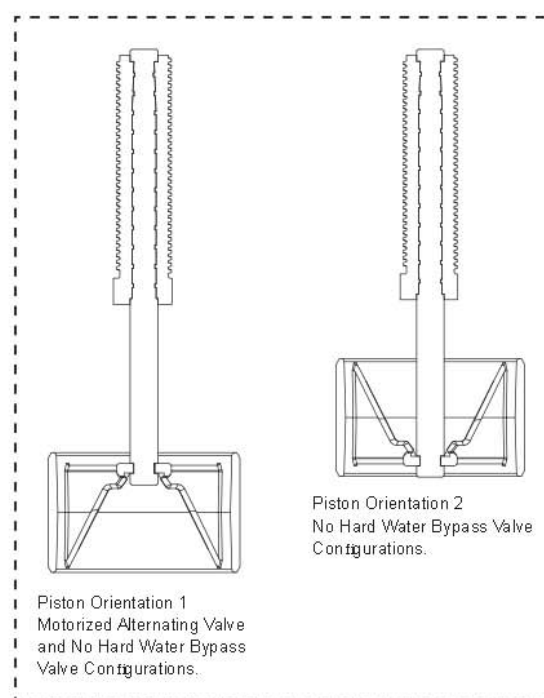


Order No. V3083 • Description: MOTOR ALT VLV 3 NPT or
Order No. V3083BSPT • Description: MOTOR ALT VLV 3 BSPT

Drawing No.	Order No.	Description	Quantity	
			V3083	V3083BSPT
1	V3696	WS3 MAV COVER	1	1
2	V3476	WS MOTOR ASY 8 FT	1	1
3	V3592	SCREW #8-1 PHPN T-25 SS	3	3
4	V3262-01	WS 1.5&2ALT/2BY REDUCGEARCVRASY	1	1
5	V3110	WS1 DRIVE REDUCING GEAR 12X36	3	3
6	V3264	WS2 BYPASS REDUCTION GEAR AXLE	3	3
7	V3789	SCREW 3/8-16 X 1.75 BHCS SS (7/32" hex allen wrench required)	4	4
8	V3085	WS3 MAV DRIVE CAP ASY	1	1
9	V3695-01	WS3 MAV PISTON	1	1
10	V3084	WS3 MAV STACK ASY	1	1
11	V3693-01	WS3 MAV BODY NPT	1	N/A
	V3693BSPT-01	WS3 MAV BODY BSPT	N/A	1
Sold Separately	V3475-12	WS2H/WS3 SYSTEM CONNECTION CORD 12 FOOT RED	One must be used for twin tank operation.	
	V3475-24	WS2H/WS3 SYSTEM CONNECTION CORD 24 FOOT BLUE		
	V3475-36	WS2H/WS3 SYSTEM CONNECTION CORD 36 YELLOW		



- Operating Pressures:
20 PSI Minimum / 125 PSI Maximum
- Operating Temperatures:
40°F Minimum / 110°F Maximum

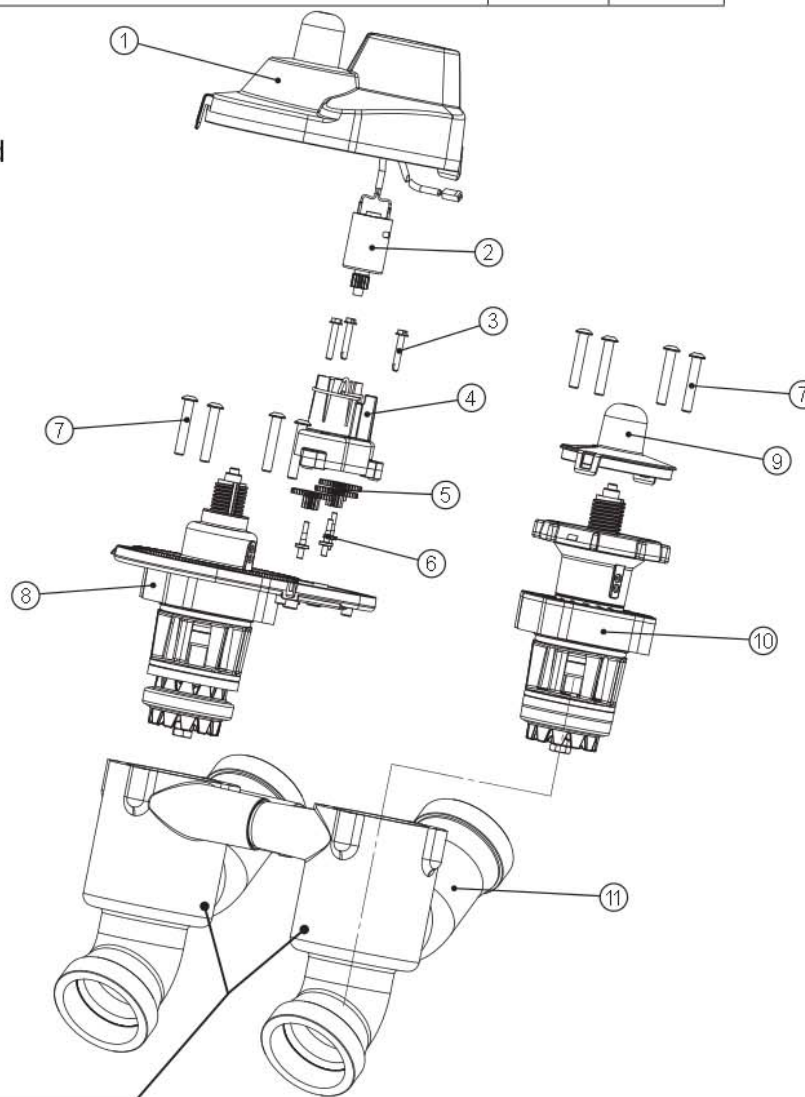


V 3060 WS2H BYPASSAUTO NPT, V3060BSPT WS2H BYPASSAUTO BSPT,
V3061BSPT WS2H BYPASSMANUAL BSPT and V3061 WS2H BYPASSMANUAL NPT

Drawing No.	Order No.	Description	Quantity	
			V3060	V3061
1	V3056	WS1.5&2ALT/2BYPASSAUTO CVRASY	1	N/A
2	V3476	WS MOTOR ASY 8 FT	1	N/A
3	V3272	WS2H SCREW 8X1 SS HEX SELF TAP	3	N/A
4	V3262-01	WS1.5&2ALT/2BY REDUCGEARCVRASY	1	N/A
5	V3110	WS1 DRIVE GEAR 12X36	3	N/A
6	V3264	WS2H BYPASS REDUCTION GEAR AXLE	3	N/A
7	V3292	WS2H SCREW BSHD SS 1/4-20X 1-1/2	8	8
8	V3059	WS1.5&2ALT/2BYPASAUTODRIVEASY	1	N/A
9	V3268	WS2H BYPASS COVER DOME MANUAL	1	2
10	V3058	WS2H BYPASS MANUAL DRIVEASY	1	2
11	V3057	WS2H BYPASS BODY ASY NPT	1	1
	V3057BSPT	WS2H BYPASS BODY ASY BSPT		
Not Shown	V3053	WS2H 2-1/2 GROOVELOCK CLAMPASY	2	2

Treated water is used for refill whether or not an auto or manual bypass is installed to either the inlet or outlet of a control valve. The Auto Drive Assembly may be connected to the inlet or outlet of the control valve to achieve no hard water bypass. If the Auto Drive Assembly is connected to the control valve:

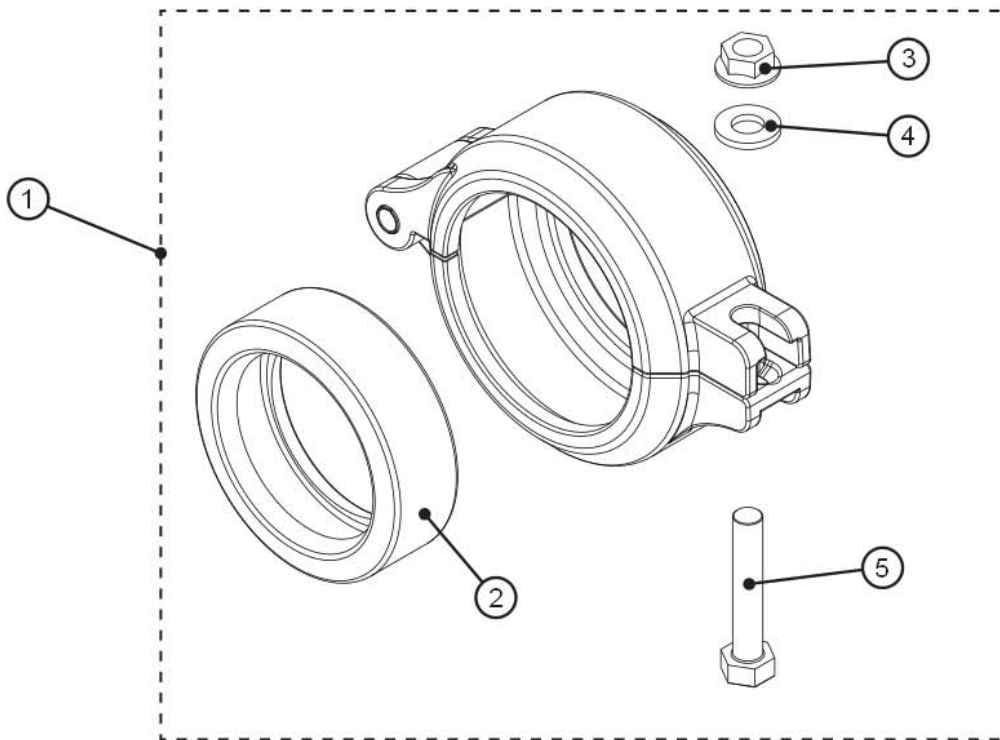
- inlet then all regeneration cycles occur with treated water.
- outlet then all regeneration cycles except for refill occur with untreated water.



B indicates BSPT
N indicates NPT

V3053 WS2 2-1/2 GROOVE LOCK CLAMP ASY

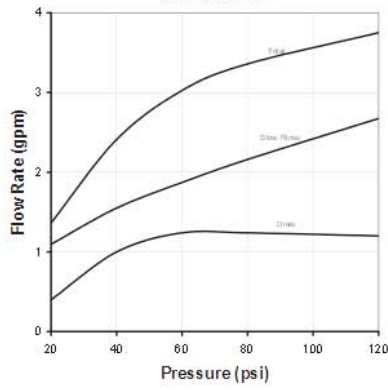
Drawing No.	Order No.	Description	Quantity
1	V3053	WS2 2-1/2 GROOVE LOCK CLAMP ASY	1
2	V3290	WS2 GROOVE LOCK SEAL 2.5	1
3	V3269	WS2H NUT 5/16-18 SS HEX	1
4	V3293	WS2H WASHER SS 5/16 FLAT	1
5	V3276	WS2H BOLT HEX SS 5/16-18X 1-3/4	1
Not Shown	S3086	SILICONE LUBRICANT	1



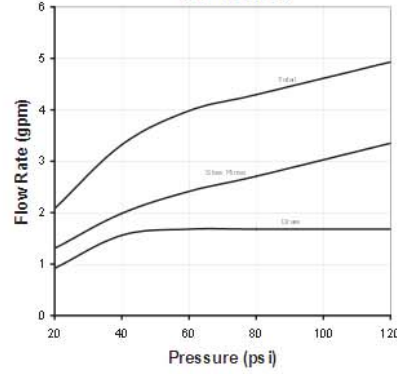
WS2H/ WS3 Error Codes

Possible Errors	
Code	Description
1001	No Encoder Pulses
1002	Unexpected Stall, Main Drive
1003	Run Time To Long, Main Drive
14001	Message Queue Full
15003	Run Time To Long, Bypass Drive
15010	Run Time To Short, Bypass Drive Could Not Drive Offline
15011	Run Time To Short, Bypass Drive Could Not Drive Online
16001	Communication Lost With Unit 2
16002	Communication Lost With Unit 3
16003	Communication Lost With Unit 4
16004	Regen List Full
17000	Run Time To Long, Separate Source Drive
17002	Run Time To Short, Separate Source Drive
18000	Reset Performed
18001	Power Loss
18002	Power Restored

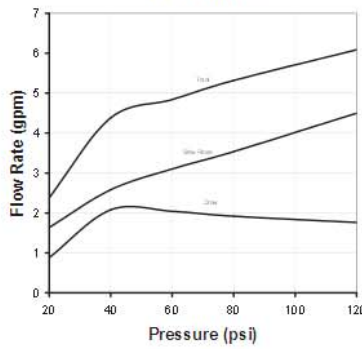
**Order No. V3010-2A
US Units**



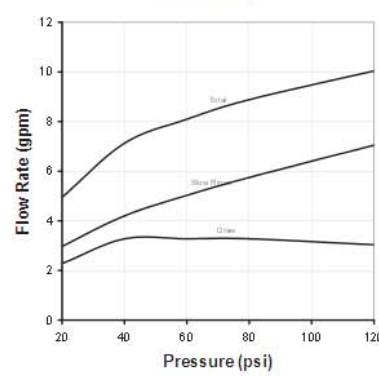
**Order No. V3010-2B
US Units**



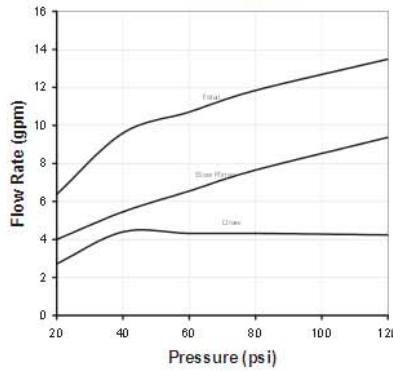
**Order No. V3010-2C
US Units**



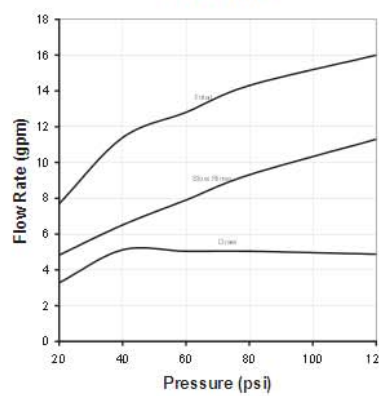
**Order No. V3010-2D
US Units**



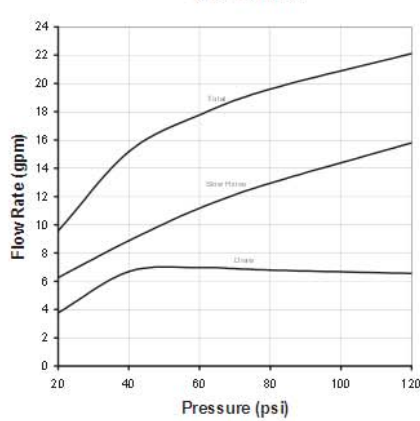
**Order No. V3010-2E
US Units**



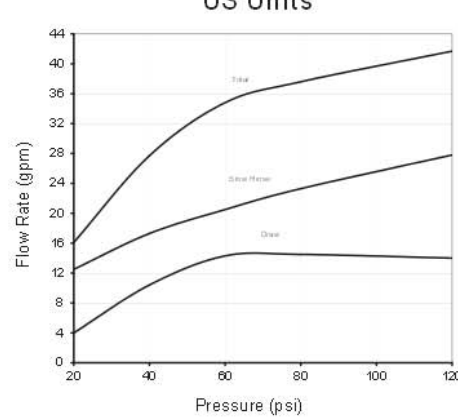
**Order No. V3010-2F
US Units**



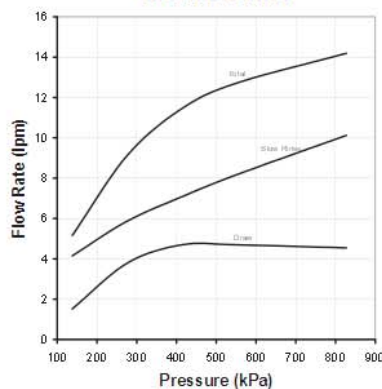
**Order No. V3010-2G
US Units**



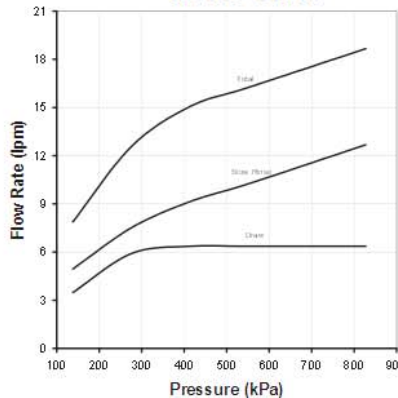
**Order No. V3010-2H
US Units**



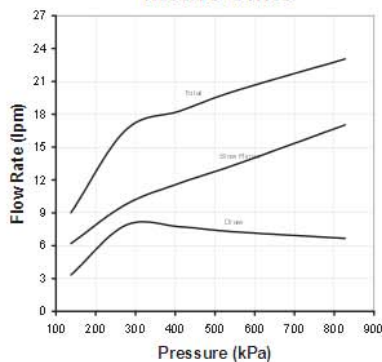
**Order No. V3010-2A
Metric Units**



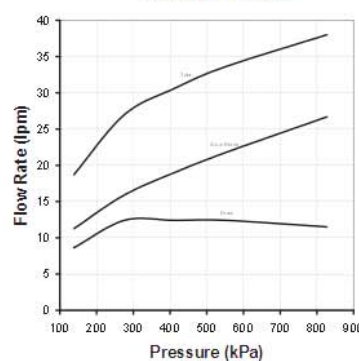
**Order No. V3010-2B
Metric Units**



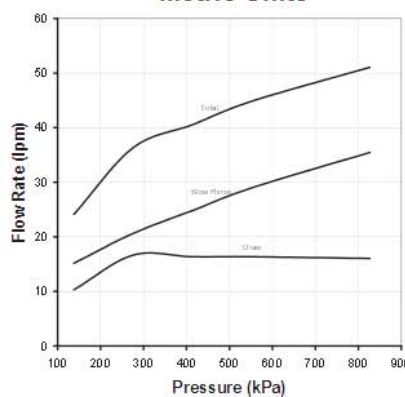
**Order No. V3010-2C
Metric Units**



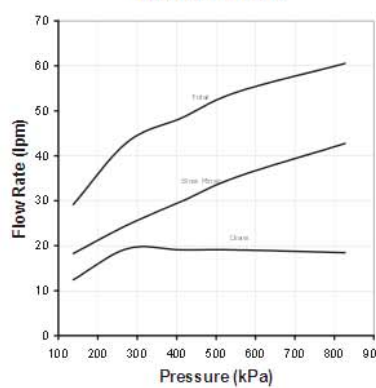
**Order No. V3010-2D
Metric Units**



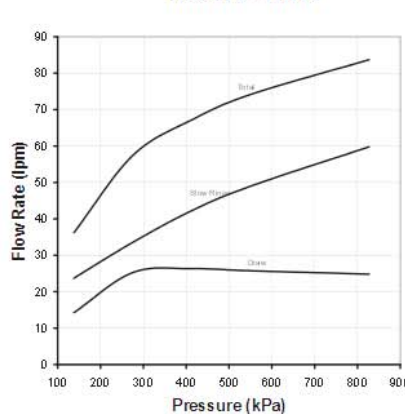
**Order No. V3010-2E
Metric Units**



**Order No. V3010-2F
Metric Units**



**Order No. V3010-2G
Metric Units**



**Order No. V3010-2H
Metric Units**

