

Autotrol Performa™ Cv

Conditioner/Filter

Water Control System

Installation, Operation and Maintenance Manual

— n a :



Table of Contents

1.0	၈၈၀	၈	.....	3								
1.1	၈	.....	3									
1.2	I	၈၈	.....	5								
1.3	၈	၈၈၀	C /F	၈	.....	7						
1.4	D	၈	C	.....	8							
2.0	၈၈၀	၉၆၂	C	.....	9							
2.1	I	၈	၈၈၀	C	၈	F	၈		9			
2.2	၈၈၈	၈	A	၈	.....	10						
2.3	C	၈၈၈	၈	.....	16							
3.0	၈၈၀	F	၈	၈	C	, ၉၆၂F, ၉၆၂F	C, ၉၄၂F		18			
3.1	၈၈၈	၈	A	၈	.....	18						
3.2	E _γ	၈၈	၈၈၈	၈	၈	၉၆၂	၈	၈၈	၈	C		24
4.0	၈၈၀	၈၈	၈	၈	၈	G	၈		27			
4.1	G	၈	၈	.....	27							
4.2	I	C	.....	28								
4.3	၈၈၀	C	၈၈	D	၈၈		31					
5.0	၈၈၀	၈	၈	.....	34							
5.1	H	၈	D	၈၈	.....	34						
5.2	၈	V	၈	၈	.....	35						
5.3	၈	၈	၈	A	၈		36					
5.4	၈	၈	C	.....	36							
5.5	I	၈	C	၈	.....	38						
5.6	၈	D	၈	၈	.....	38						
5.7	၈၈၀	C	F	D	၈၈		38					
5.8	၈၈၀	F	F	D	၈၈		40					
5.9	၈	.....	41									
6.0	၈၈၀	၈	.....	44								
6.1	၈	C	၈	E _γ	.....	44						
6.2	၈	L	.....	45								
6.3	၈၈၀	C	.....	46								

1.0 Performa Cv System

1.1 Specifications

1.1.1 Performa Cv Conditioner

Flow Rates (Valve Only)

@ 15 (1.03 a)	25.0	η (5.7 η ³)
Ba a (C) @ 25 (1.72 a)	20.0	η (4.5 η ³)
	C = 6.5	(K = 5.58)
Ba a C	C = 4.0	(K = 3.46)

Control Configurations

962 Microprocessor Demand System and 962 Electronic Timeclock

Ba a	4	60 η
B	E	a a a
	7	125 η
Fa	2	19 η
E _γ a B a - η F		

Valve Connections/Dimensions

a a	2-1/2	- 8, η a
I l	E _γ 18.3()-19.D5.5(.-)	

1.1.2 Performa Cv Filter Specifications

Flow Rates (Valve Only)

@ 15 (1.03 a)	25.0	η (5.7 η ³)
Ba a (F) @ 25 (1.72 a)	25.0	η (4.5 η ³)
	C = 6.5 (K = 5.58)	
Ba a F	C = 5.0 (K = 5.78)	

Control Operation

942F Mechanical Clock Timer - 7 Day or 12 Day

Ba a	8-30 η
F ₂ Fa	9 η

962F Microprocessor Demand

Ba a	4 60 η
Fa	2 19 η

962 FTC Electronic Time Clock

Ba a	4 60 η
Fa	2 19 η

Interval Regeneration.....Da - a

Valve Connections/Dimensions

a - a	2-1/2 - 8, ηa
I ↓	1-3/4 - 12 C-2A, ηa
D a L	3/4- , ηa
B L	3/8- , ηa
D ↓ .D.	1.050 - (27 ηη)
D L -	1/2 1/2 - (13 ηη 13 ηη) a a

Operating

a B	Ga - a
C η	C η a
- (a - C)	4.5 (2.0)
a η ↓	12 AC 400 ηA (4.6 A)
a η I	115 50/60 H , 230 50/60 H
	100 50/60 H
↓ a	10 120 (1.37 8.27 a)
	Ca a a: 20 100 (1.37 6.89 a)
a η a	34° 100°F (1° 38°C)

Options

B a a , V _a 1265	1-3/4 - 12 C - 2A ηa
B a I ↓ F K :	
C , a A a	1-1/4- , 1- , 3/4- , 28-ηη, 22-ηη
C C, A a	1- , 3/4- , 25-ηη
a B A a	1- ηa , 3/4- ηa
B a B A a	1- ηa , 3/4- ηa

Flow Meter 962 Control 1- - A

4.1 a a .

1.2 Installation

A. The water supply line should be installed in a location that is accessible and not subject to freezing temperatures.

Location Selection

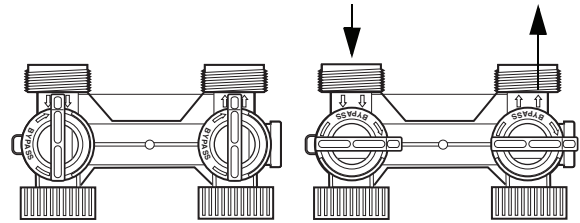
1. The water supply line should be installed in a location that is accessible and not subject to freezing temperatures.
 2. The water supply line should be installed in a location that is accessible and not subject to freezing temperatures.
 3. The water supply line should be installed in a location that is accessible and not subject to freezing temperatures.
 4. The water supply line should be installed in a location that is accessible and not subject to freezing temperatures.
- If a check valve is installed, make certain the water heating unit is equipped with a properly rated temperature and pressure safety relief valve. Also, be certain that local codes are not violated.

5. The water supply line should be installed in a location that is accessible and not subject to freezing temperatures.
6. The water supply line should be installed in a location that is accessible and not subject to freezing temperatures.
7. The water supply line should be installed in a location that is accessible and not subject to freezing temperatures.

Water Line Connection

The water supply line should be installed in a location that is accessible and not subject to freezing temperatures. The water supply line should be installed in a location that is accessible and not subject to freezing temperatures. The water supply line should be installed in a location that is accessible and not subject to freezing temperatures.

Not in Bypass



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1265 B a a

F 1.2 - a G a B a n

Drain Line Connection

Note: The drain line should be installed in a location that is accessible and not subject to freezing temperatures.

1. The drain line should be installed in a location that is accessible and not subject to freezing temperatures.
2. The drain line should be installed in a location that is accessible and not subject to freezing temperatures.
3. The drain line should be installed in a location that is accessible and not subject to freezing temperatures.

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1.3 Placing Performa Cv Conditioner/Filter into Operation

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Note: —

— **COUNTERCLOCKWISE** . (

2. a a COUNTERCLOCKWISE
BACKWASH.

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- BRINE REFILL . H a—
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- COUNTERCLOCKWISE —
- BRINE/SLOW RINSE

Troubleshooting

COUNTERCLOCKWISE
REGENERATION COMPLETE

Filter

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 a a a a **BACKWASH**
COMPLETE.

Electrical Connection

100 VAC, 115 VAC, and 230 VAC units:

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12 VAC: C — — a ၈ ()
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1.4 Disinfection of Water Conditioners

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Sodium or Calcium Hypochlorite

Application

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5.25% Sodium Hypochlorite

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Calcium Hypochlorite

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a a a a a a

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2.2 Programming and Application

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Day of Week/Time of Day

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 DOWN ARROW (↓)
 LEFT ARROW (←)
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Level I Parameters (Table 2.1)

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 DOWN ARROW (↓)
 LEFT ARROW (←)
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 DOWN ARROW (↓)
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 LEFT ARROW (←)
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Salt Amount

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ARROW (↓) .

Capacity

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Table 2.2 - Suggested Settings for P4, P5, P6, P7

P5 Capacity Setting K a (K aη)	η a ()				
	3 3 (85)	4 3 (113)	5 3 (142)	6 3 (170)	7 3 (198)
P4 Salt Setting: () a					
60 (3.9)	18 (8.2)	-	-	-	-
80 (5.2)	-	24 (10.9)	-	-	-
84 (5.4)	30 (13.6)	-	-	-	-
90 (5.8)	45 (20.4)	-	-	-	-
100 (6.4)	-	-	30 (27.2)	-	-
112 (7.2)	-	40 (18.1)	-	-	-
120 (7.7)	-	60 (27.2)	-	36 (16.3)	-
140 (9.0)	-	-	50 (22.7)	-	42 (19)
150 (9.7)	-	-	75 (34)	-	-
168 (10.8)	-	-	-	60 (27.2)	-
180 (11.6)	-	-	-	90 (40.8)	-
196 (12.7)	-	-	-	-	70 (31.8)
210 (13.6)	-	-	-	-	105 (47.6)

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2.4. a L a a , a a
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ARROW (↑) . A a
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DOWN ARROW (↓) a a a a
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a (↓) a a a
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ARROW (↑) , a 30
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 ၁၂၈ ၁၂၉ ၁၂၈ (၁၀) ၁၂၉
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 a a — LEFT ARROW (←)
 a — DOWN ARROW (↓)
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#	Description of Parameter	Set as required 0 = No - 1 = yes	Notes
1	a	A	0 = a a 1 = a a - a
2	1 a	A	0 = a a 1 = a a - a
3	a	A	0 = a a 1 = a a - a
4	a	A	0 = a a 1 = a a - a
5	- a	A	0 = a a 1 = a a - a
6	F a	A	0 = a a 1 = a a - a
7	a a	A	0 = a a 1 = a a - a

Fixed Reserve

[illegible]

2.3 Conditioner Programming Tables

Table 2.4 - Level II Programming Performa Cv 962 Parallel Multi Tank or Single Tank Conditioner

Parameter	Description	Range of Values	Minimum Increment	Recommended Program Value	Units of Measure	Notes
6		2-200	1	Selected from Table 2.2		
7	B	2-200	1	Selected from Table 2.2		
9	Ba	4-60	1	14*	Vb	*Vb

Table 2.5 - Programming Performa Cv 962TC Electronic Time Clock Conditioner

Parameter	Description	Range of Values	Minimum Increment	Recommended Program Value	Units of Measure	Notes
1	Daily Data	(1-7) 1:00-12:59 A (1-7) 0:00-23:59	(1 -) 1	Current Day and Time	H	a =1, =2, E=3, ED=4, H =5, F I=6, A =7,. HI I HE LEF DIGI HE DI LA
2	Time	1:00-12:59 A 00:00-23:59		As required	H	a 13
3	A			10		
4	al	.5-125.0 .2-50.0	.5 .2	Selected from Table 2.2	K al	
5	al			10		
6		2-200	1	Selected from Table 2.2		
7	B al	2-200	1	Selected from Table 2.2		
9	Ba al	4-60	1	14*	V	*V al
10		7-125	1	40*	V	*V al
11	Fa	2-60	1	4*	V	*V al
12		0-1	1	0		0 = , 1 = V
13	C	0-1	1	0		0 = 12 , 1 = 24
14	I al Ca al	0-30	1	0	Da al	0 = al - *V al al
15	D al			0		
16	D al			30		
17		3-4	1	6		6 = 962 C
18	al L	0-1	1	0		0 = , 1 = al /Ca al
19	D al					
20	D al					
21		0-254	1	60		
22	Fa D CHA GE			99		

G 3.2 a y a a — a a a a a — a .

3.0 Performa Cv Filter Valve and Controls, 962F, 962FTC, 942F

3.1 Programming and Application

Table 3.1 - Programming Performa Cv 962F Three Cycle Filter

Parameter	Description	Range of Values	Minimum Increment	Recommended Program Value	Units of Measure	Notes
1	Day of the Week	(1-7) 1:00-12:59 A/V (1-7) 0:00-23:59	(1 a) 1 V	Current Day and Time	H V	13. F a =1, V =2, E=3, ED=4, H =5, F I=6, A =7, HI I HE LEF V DIGI HE DI LA
2	Filter Cycle Time	1:00-12:59 A/V 00:00-23:59		As required	H V	a 13
3	Filter Cycle Time			10 100	V	
4	Filter Cycle Time			0.5		
5	Filter Cycle Time			As required	V	D - n a a (a) - 100 a 5. D - n a a (n) 10 a n 5.
6	Filter Cycle Time			200		
7	Filter Cycle Time			200		
9	Backwash Time	7-60	1	14*	V	*V a a a .
10	Filter Cycle Time			8		
11	Filter Cycle Time	9-60	1	9*	V	*V a a a .
12	Filter Cycle Time	0-1	1	0		0 = , 1 = V
13	Filter Cycle Time	0-1	1	0		0 = 12 1 = 24
14	Filter Cycle Time	0-30	1	0	Da	0 = a - *V a a a
15	Filter Cycle Time	0-3	1	0	F a a a a E a a a a a 2 a 24.	0 = na , 1 = F 2 = na na a a , 3 = F a na
16	F a	0-70	1	30		a Da A a .
17	a	0-7	1	4		4 = F na C
18	a e a L	0-1	1	0		0 = , 1 = a /Ca a - a
19	F	1-4	1	1		1 = 1 A , 3 = D K- a , 2 = 2 A 4 = D E a
20	K- a E a	0.01-255.0	0.01	0.01		n V K- a E a .
21	n - D a	0-254	1	60		n n - n a a a a a
22	Fa D - CHA GE			99		

Table 3.2 - Programming Performance Cv 962F Five Cycle Filter

Parameter	Description	Range of Values	Minimum Increment	Recommended Program Value	Units of
-----------	-------------	-----------------	-------------------	---------------------------	----------

G 2.2 a 2 a a 1 1000 1000 1 a .

Table 3.3 - Programming Performa Cv 962 TC Electronic Time Clock Filter

Parameter	Description	Range of Values	Minimum Increment	Recommended Program Value	Units of Measure	Notes
1	Day of the Week	(1-7) 1:00-12:59 A V _h V _h V _h (1-7) 0:00-23:59	(1 a) 1 V _h	Current Day and Time	H V _h F a	a =1, V _h =2, E=3, 13.

G 2.2 a χ a a 1 a a a a 1 a .

Electronic Time Clock Operation

When the system is in the "On" position, the clock will automatically start the backwash cycle. The backwash cycle will run for a set time, typically 10 to 15 minutes, and then stop. The system will then return to the "On" position and continue to operate normally.

The backwash cycle is controlled by a timer. The timer is set to run for a specific duration, which can be adjusted. The backwash cycle is initiated when the system is in the "On" position and the timer starts. The backwash cycle will run until the timer reaches the set duration, at which point it will stop and the system will return to the "On" position.

Interval Backwash — E The clock will automatically start the backwash cycle at a set interval, typically every 30 minutes. The backwash cycle will run for a set time, typically 10 to 15 minutes, and then stop. The system will then return to the "On" position and continue to operate normally.

Day of Week Backwash — E The clock will automatically start the backwash cycle at a set time of day, typically every 2.3 hours. The backwash cycle will run for a set time, typically 10 to 15 minutes, and then stop. The system will then return to the "On" position and continue to operate normally.

Application

The system is used for water filtration. The backwash cycle is used to clean the filter media. The backwash cycle is initiated when the system is in the "On" position and the timer starts. The backwash cycle will run until the timer reaches the set duration, at which point it will stop and the system will return to the "On" position.

Dual and Triplex Conditioners and Filters

The system is used for water filtration. The backwash cycle is used to clean the filter media. The backwash cycle is initiated when the system is in the "On" position and the timer starts. The backwash cycle will run until the timer reaches the set duration, at which point it will stop and the system will return to the "On" position.

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Da Da Ba a a
na a a a 942F

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C Da a a
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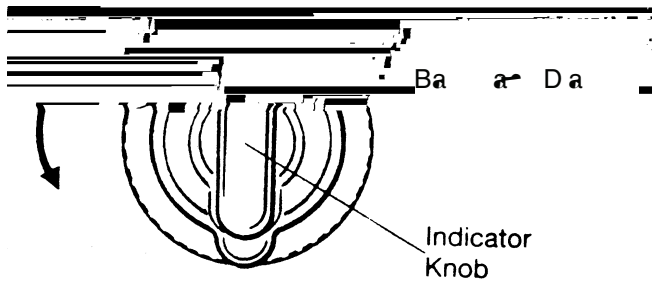
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Adjusting the Backwash Setting

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F 3.2 Ba a C n

Table 3.4 - Cycle Times for 942F Control

Cycle	Time (Minutes)
Ba a	8 - 30
	9

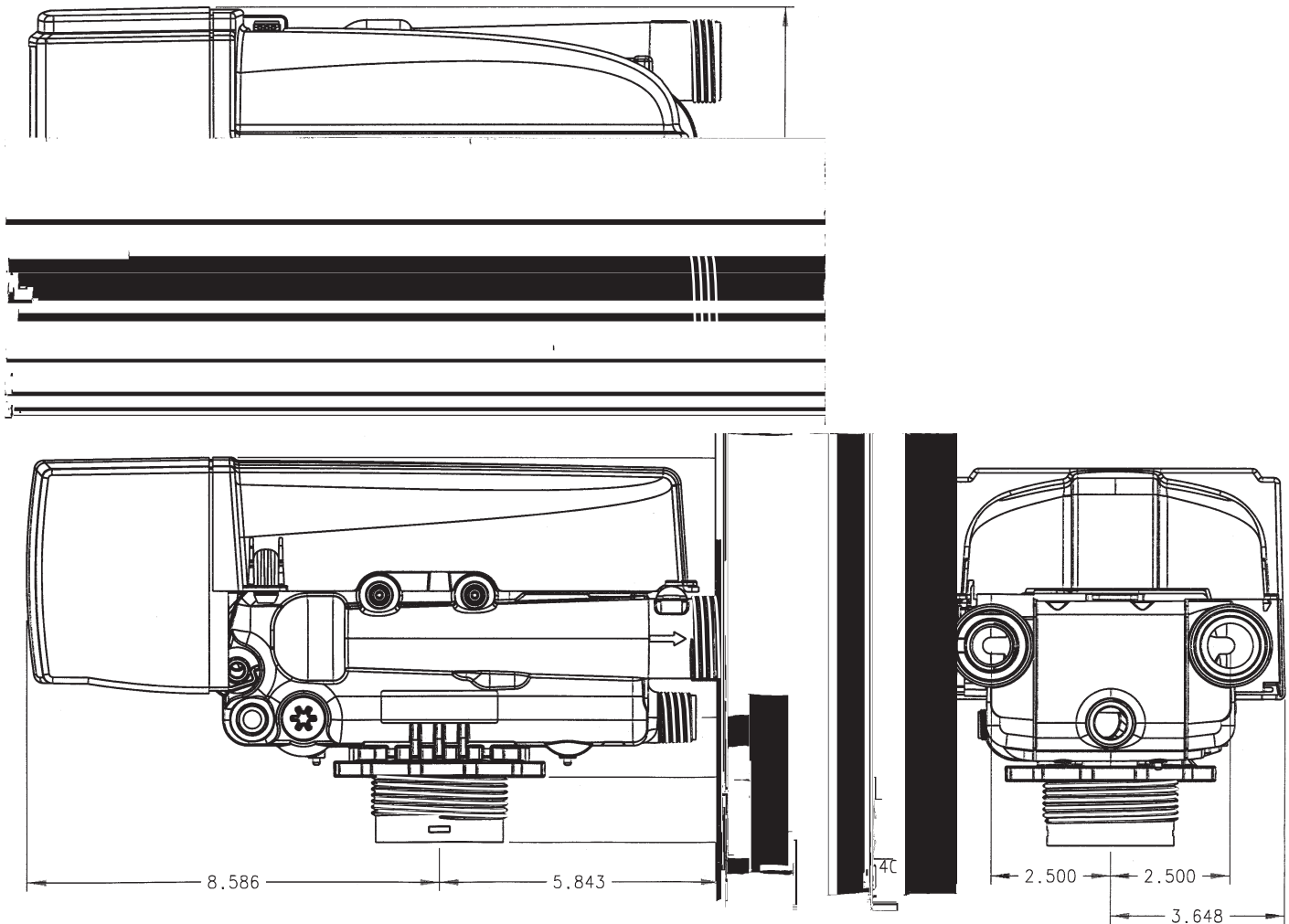
3.3 Explanation of Parameter Values for the 962 Single and Parallel Tank Controls

— a a a γ a a — an n a an — 962 .

Number	Description of Program Values	Explanation
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4.0 Performa Cv Performance Charts and Graphs

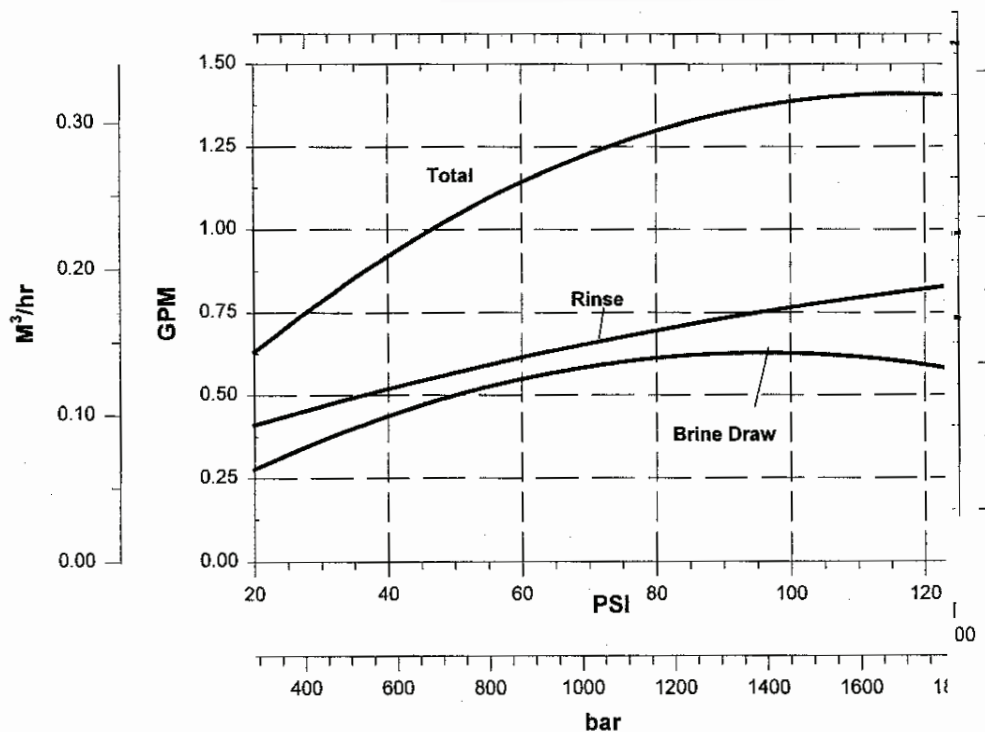
4.1 General Specification



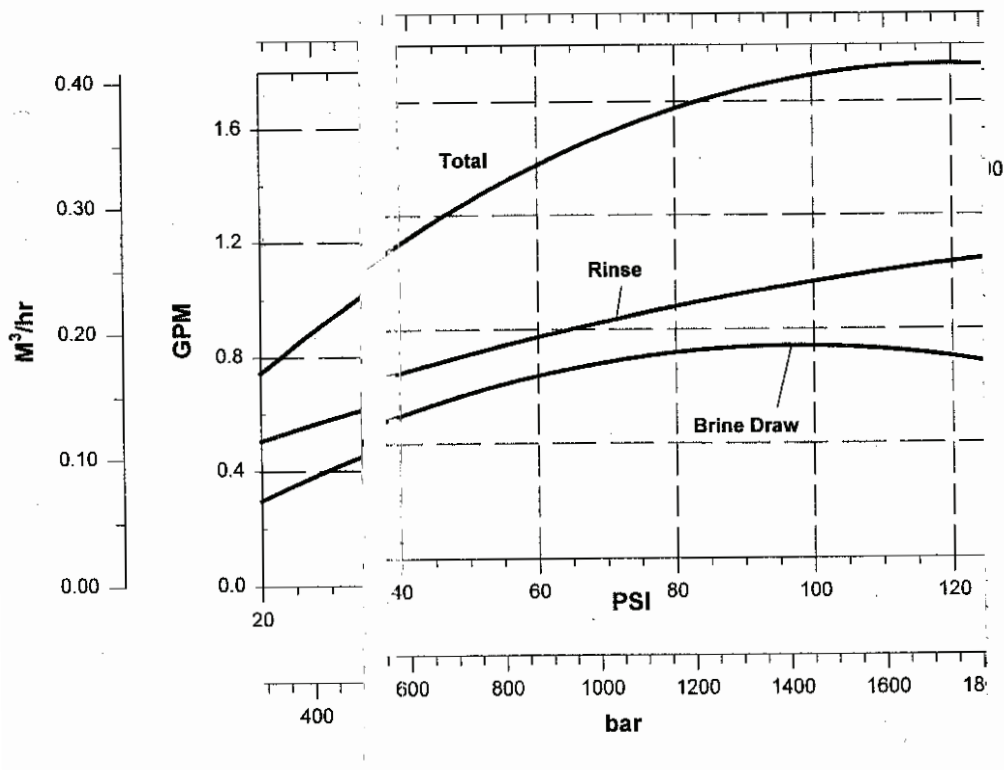
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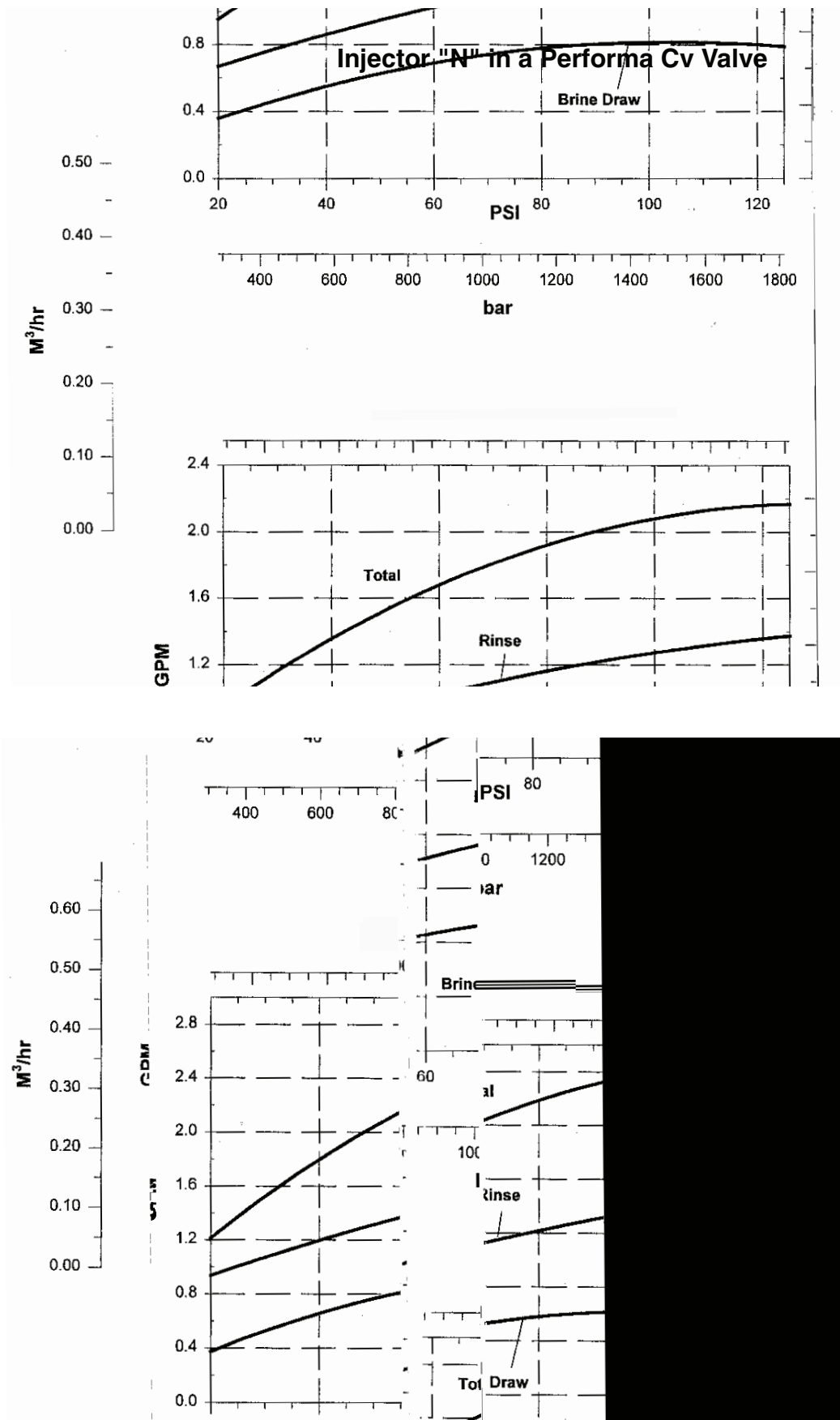
4.2 Injector Curves

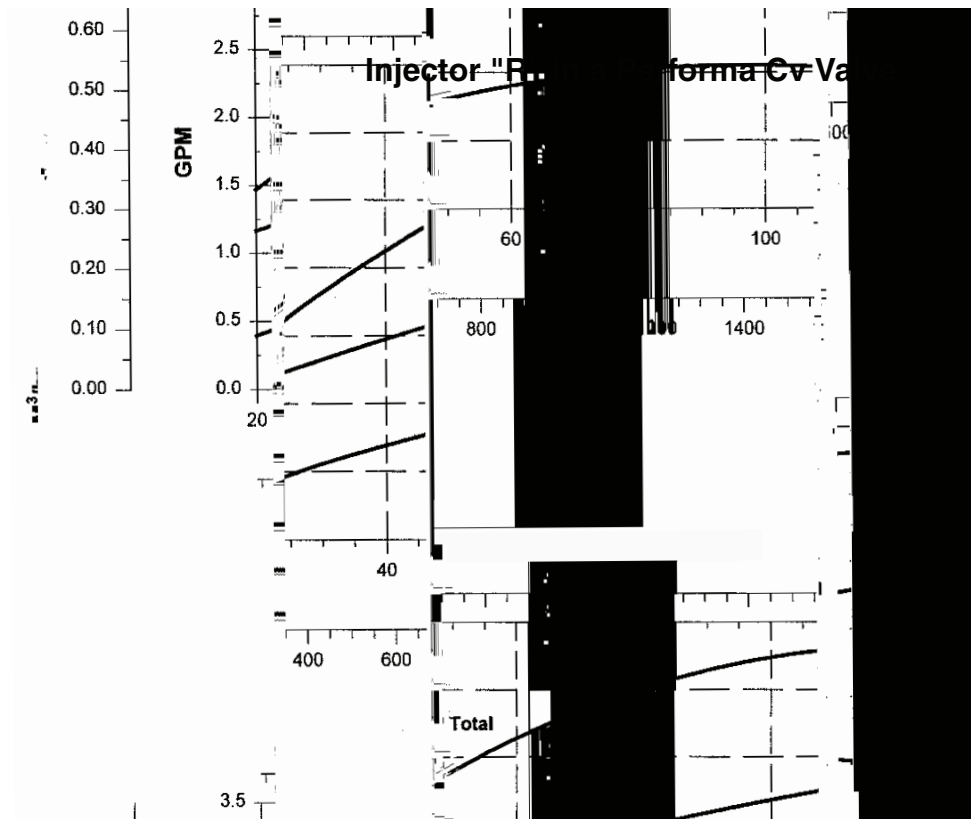
Injector "L" in a Performa Cv Valve



Injector "M" in a Performa Cv Valve







4.3 Performa Cv Conditioner Performance Data

Table 4.1 - Performa Cv Injector Performance Chart

Injectors L - R Flow Rate Charts (gpm)										
PSI	L		M		N		Q		R	
	Draw	Rinse	Draw	Rinse	Draw	Rinse	Draw	Rinse	Draw	Rinse
20	0.26	0.4	0.3	0.5	0.4	0.65	0.4	0.9	0.45	1.2
30	0.3	0.45	0.4	0.55	0.45	0.75	0.5	0.95	0.5	1.3
60	0.5	0.6	0.6	0.8	0.75	1	0.82	1.4	0.9	1.75
80	0.6	0.65	0.7	0.85	0.8	1.1	0.9	1.6	1	2
100	0.6	0.76	0.7	0.9	0.8	1.6	0.95	1.8	1.1	2.2
Injectors L - R Flow Rate Charts (Lpm)										
Bar	L		M		N		Q		R	
	Draw	Rinse	Draw	Rinse	Draw	Rinse	Draw	Rinse	Draw	Rinse
1.4	0.98	1.5	1.1	1.9	1.5	2.5	1.5	3.4	1.7	4.5
2.1	1.1	1.7	1.5	2.1	1.7	2.8	1.9	3.6	1.9	4.9
4.2	1.9	2.3	2.3	6	2.8	3.8	3.1	5.3	3.4	6.6
5.6	2.3	2.5	2.6	3.2	3	4.2	3.4	6	3.8	7.6
7	2.3	2.9	2.6	3.4	3	4.9	3.6	6.8	4.2	8.3

Table 4.2 - Service and Backwash Flow Performance Data

Flow vs Pressure Drop (gpm)			Flow vs Pressure Drop (Lpm)		
PSI	Service (Cv 6.5)	Backwash (Cv 4.0)	Bar	Service (Cv 6.5)	Backwash Cv 4.0)
5	15	9	0.35	56	34
10	20	13	0.7	76	49
15	25	16	1	95	61
20	29	18	1.4	109	68
25	32	20	1.7	121	76
30	35	22	2.1	132	83

Table 4.3 - Recommended Drain Flow Controls (Backwash Anion and Cation Resin @ 55°F (12.7°C) Water Temperature

Tank Diameter Inches (mm)	Bed Area sq. ft.	Anion Resin @ 3 gpm/sq ft (m ³ /h/sq ft)	Cation Resin @ 5 gpm/ sq ft (m ³ /h/sq ft)
14 (35.6)	1.02	3 (.7)	5 (1.1)
16 (40.6)	1.38	4 (.9)	7 (1.5)
18 (45.7)	1.76	5 (1.1)	8 (1.8)
21 (53.3)	2.4	7 (1.5)	12 (2.7)

Table 4.4 - Performa Filter

Pressure Loss vs Flow (gpm)		
PSI	Service (Cv 6.5)	Backwash (Cv 5.0)
5	15	11
10	20	16
15	25	19
20	29	22
25	32	25
30	35	27
Pressure Loss vs Flow (Lpm)		
Bar	Service (Kv 5.6)	Backwash (Kv 5.8)
0.35	56	42
0.7	76	61
1	95	72
1.4	109	83
1.7	121	95
2.1	132	102

Table 4.5 - Typical Backwash Flow Requirements for Various Filter Medias (based on 55°F (12.7°C) water temperature)

		GAC/CARBON FILTER-AG, CALCITE			
		GREENSAND			
			BIRM		
				SAND, MULTI-MEDIA	
Tank Dia. inches (mm)	Bed Area sq. ft.	8 gpm/sq ft (Lpm/sq ft)	10 gpm/sq ft (Lpm/sq ft)	12 gpm/sq ft (Lpm/sq ft)	15 gpm/sq ft (Lpm/sq ft)
14 (35.6)	1.02	8 (30)	10 (38)	12 (45)	15 (57)
16 (40.6)	1.38	11 (42)	13 (49)	16 (61)	20 (76)
18 (45.7)	1.76	14 (53)	17 (64)	21 (79)	*26 (98)
21 (53.3)	2.4	19 (72)	24 (91)	*29 (98)	
24 (60.9)	3.14	25 (95)			

* $V_{max} = 25 \text{ ft/hr}$ 1.72 gpm/sq ft 1.72 gpm/sq ft

Table 4.6 - Performa Cv Filter Sizing Selection Guide for Dual Unit Filters.

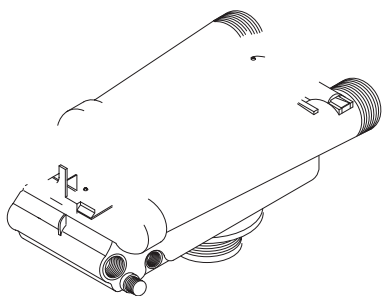
Typical backwash flow requirements for various filter medias (based on 55°F (12.7°C) water temperature.					
		GAC/CARBON FILTER-AG, CALCITE			
		GREENSAND			
			BIRM		
				SAND, MULTI-MEDIA	
Tank Dia. inches (mm)	Bed Area sq. ft.	8 gpm/sq ft (Lpm/sq ft)	10 gpm/sq ft (Lpm/sq ft)	12 gpm/sq ft (Lpm/sq ft)	15 gpm/sq ft (Lpm/sq ft)
14 (35.6)	1.02	8 (30)	10 (38)	12 (45)	
16 (40.6)	1.38	11 (42)	13 (49)		
18 (45.7)	1.76	*14 (53)			
21 (53.3)	2.4				

* $V_{\text{max}} = \frac{Q}{A} = \frac{15 \text{ gpm} \times 1.76 \text{ sq. ft.}}{1.76 \text{ sq. ft.}} = 15 \text{ gpm/sq ft.}$

5.2 Preventative Maintenance

Injector Screen and Injector

1. Turn the engine off.
 2. Remove the fuel line from the injector.
 3. Turn the engine off.
 4. Remove the fuel line from the injector.
 5. Clean the fuel line with a wire.
 6. Turn the engine off.
 7. Turn the engine off.
 8. Turn the engine off.
 9. Turn the engine off.
 10. Turn the engine off.
- IMPORTANT: D**
11. Turn the engine off.
 12. Turn the engine off.



F 5.1

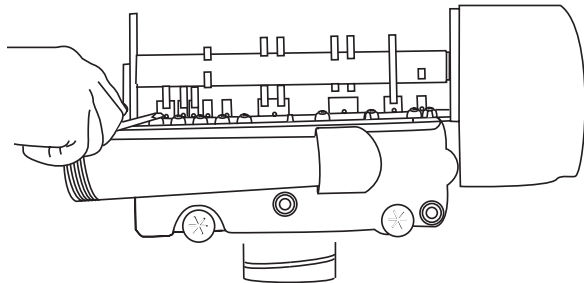
Water Meter Maintenance

1. Turn the engine off.
2. Turn the engine off.
3. Turn the engine off.
4. Turn the engine off.
5. Turn the engine off.
6. Turn the engine off.
7. Turn the engine off.
8. Turn the engine off.
9. Turn the engine off.

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5.3 Removing the Valve Assembly for Servicing

1. Turn the engine off.
2. Remove the air filter ()
3. Turn the air filter (F 5.2).



F 5.2

4. Turn the air filter (F 5.3).
5. Turn the air filter (F 5.4).
6. Turn the air filter (F 5.5).

5.4 Removing the Control

- C 960
1. Turn the engine off.
 2. Remove the air filter ()
 3. Turn the air filter (F 5.3. L)

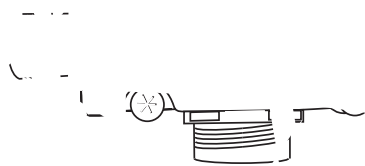
F 5.3

4. Turn the air filter (F 5.4).

F 5.4

5. Turn the air filter (F 5.5).
6. Turn the air filter (F 5.6).

F 5.5



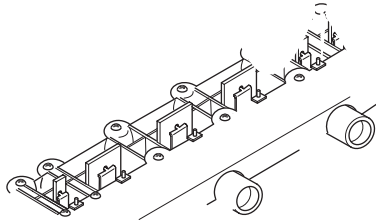
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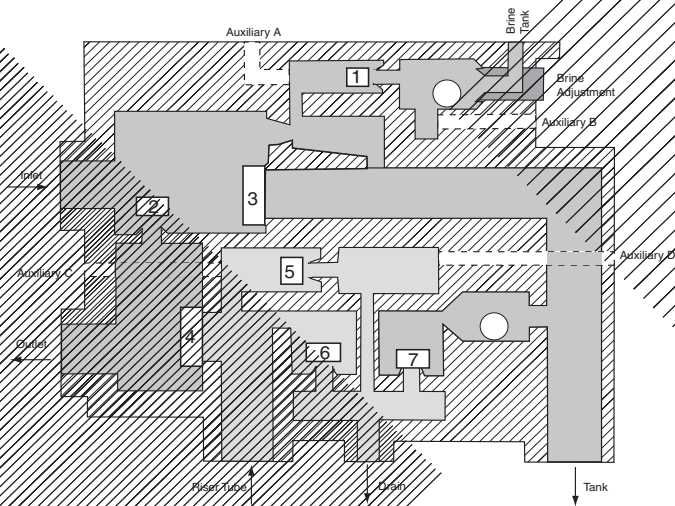
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5.5 Identification of Cor | v

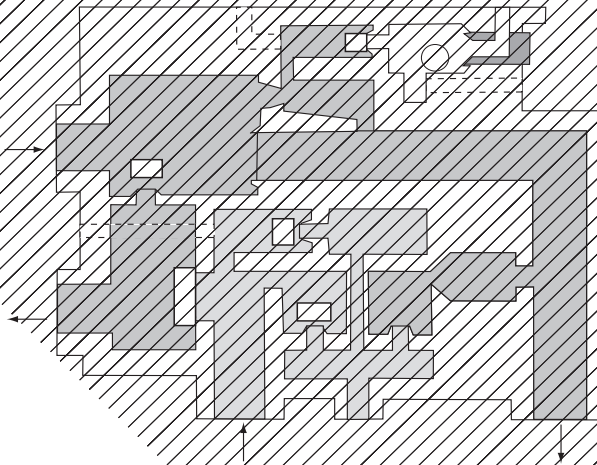


3 Brine/Slow Rinse Position



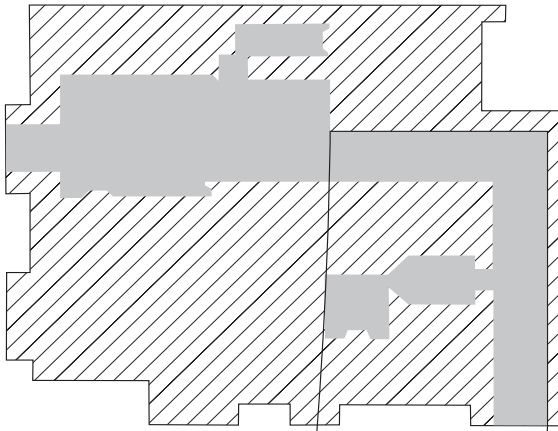
Name	Valve No
Brine	1 - Open
By Pass	2 - Open
Inlet	3 - Closed
Outlet	4 - Closed
and Tank Top	5 - Open
Purge	6 - Open
Backwash	7 - Closed

4 Fast Rinse Position

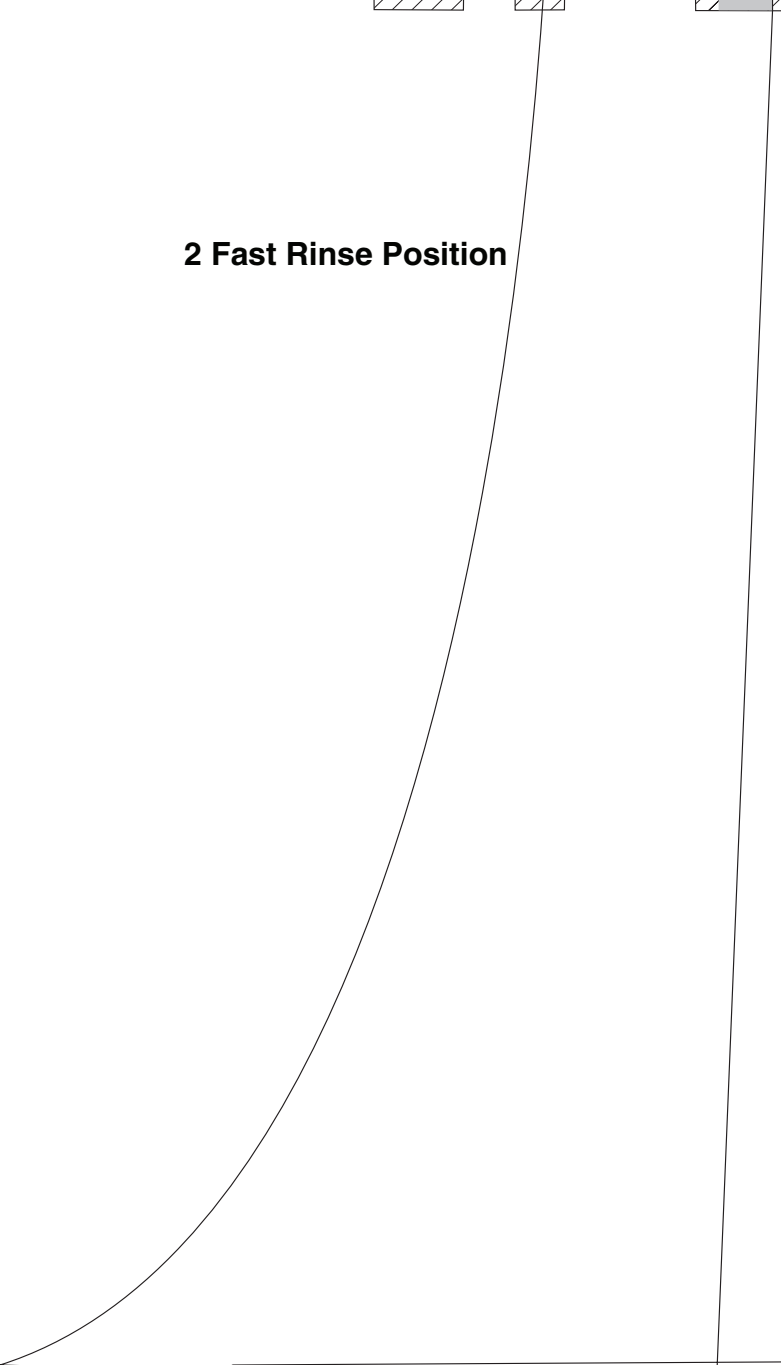


5.8 Performa Cv Filter Flow Diagrams

1 Backwash Position



2 Fast Rinse Position



5.9 Troubleshooting

IMPORTANT:

1. If the engine does not start, check the following:

- A. Fuel: Is the fuel tank full? Is the fuel valve open? Is the fuel filter clean?
- B. Spark: Is the spark plug clean? Is the spark plug gap correct? Is the spark plug tight?
- C. Air: Is the air filter clean? Is the air intake duct open?
- D. Oil: Is the oil level correct? Is the oil clean?
- E. Battery: Is the battery fully charged? Is the battery terminal clean?
- F. Ignition: Is the ignition switch in the "ON" position? Is the ignition key in the ignition switch?

Replacement Parts

Valve Troubleshooting

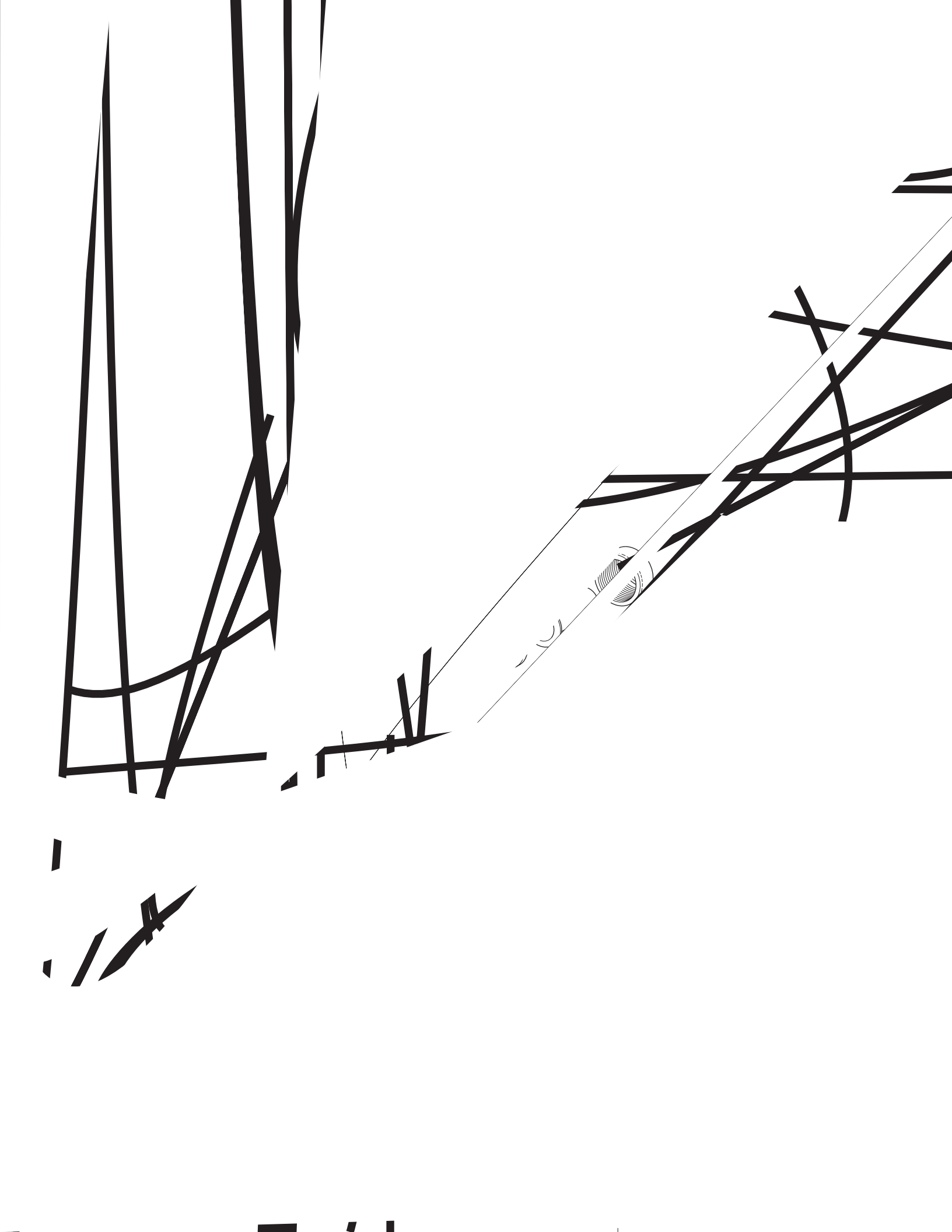
Problem	Possible Cause	Solution
1. C	a. L a . . I ! . I ! . a (2 a / 4)	a. ท ทลล 30 ล . . ท . C a ล . . ล . ท ทล ท ล - ท. ล
2. B a .	. Dana a. B a (1) - . a ! . a (3 4) . A a	a. V a ล ล ท - a ล . ท ลล ล . . F - ทล - ล ทล ล ล ท. . E ล .
3. ท ท a - a ล	a. I a ล . . F ทล a ! a	a. C . ท ลล a ล - ทล . V a ล ล (ล , ท ท ล).
4. I ท a .	a. L a . . D !	a. ท ทลล 30 ล . . ล - ล .
5. a a	a. a . . a !	a. E . A a . . C a . F - a .
6. C a a - a .	a. I a a . F ทล a a !	a. ล - . ท ล ล . F - a .
7. F a a a .	a. D a ล (6 7) a (1) ทล a . . ล ท a a .	a. V a ล ล ท - a ล . ล .
8. Ha a a a	8-1.2724()-0.68 J *-0. -1.2724.2()-2-30.2(ท29.77(9.8(9.8()29.8()0.1()-30.2()9.8(()0.1()2)0.1()30.4(-15.7(a)30.4(9.8()49.	

962 Control Troubleshooting

Alarms

— V 962 n a

Problem	Possible Cause	Solution
6. $\frac{1}{2} \frac{1}{2} \frac{1}{2}$ a) ()	a. B a a a V a a a a a a a a ! D a D a a	a. $\frac{1}{2} \frac{1}{2} \frac{1}{2}$ F a a a a a a a a a a a a a a a a a a a
7. C a a a a a a	a. B a a a	a. $\frac{1}{2} \frac{1}{2} \frac{1}{2}$ a a a
8. C a a a a a a	a. a a a a a a a a	a. a a a a a a a a a a a a a a a
9. a a a	a. V a a V a a a a a a I a (H). B a D a A a a (a a) B a a a a a a a 125 a a D a a	a. a a a a a a a a a / a a a a a (H). a I a a a a a a a
10. C a a a C a a a	a. B a a D a	a. a a a a
11. C a a a a EGE	a. a a a D a a B a B a a D a	a. C a a a a a a
12. C a a a a EGE	a. I a a a a , a 5 a a I a a a a D a a	a. a 5 a a a a a a a a a a
13. a a a	a. I a a a F a I a a I a ! E a a a 1/5 a a	a. a / a



6.3 Performa Cv Controls

