Autotrol Performa™ Cv

Conditioner/Filter

Water Control System

Installation, Operation and Maintenance Manual

This system installed by

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1.0 Performa Cv System

1.1 Specifications

1.1.1 Performa Cv Conditioner

1.1.2 Performa Cv Filter Specifications

Flow Rates (Valve Only)

S rvic @ 15 psi (1.03 bar) p . . . . . 25.0 pm (5.7 m³/h)
Bac ash (iX r) @ 25 psi (1.72 bar) p . . . . . 25.0 pm (4.5 m³/h)
S rvic . . . . . Cv = 6.5 (v = 5.5)
Bac ash iX r . . . . . Cv = 5.0 (v = 5.7)

Control Operation

942F Mechanical Clock Timer - 7 Day or 12 Day

Bac ash . . . . . -30 minut s
i ast Rins . . . . . minut s

962F Microprocessor Demand

Bac ash . . . . . 4 to 60 minut s
ast Rins . . . . . 2 to 1 minut s

962 FTC Electronic Time Clock

Bac ash . . . . . 4 to 60 minut s
ast Rins . . . . . 2 to 1 minut s

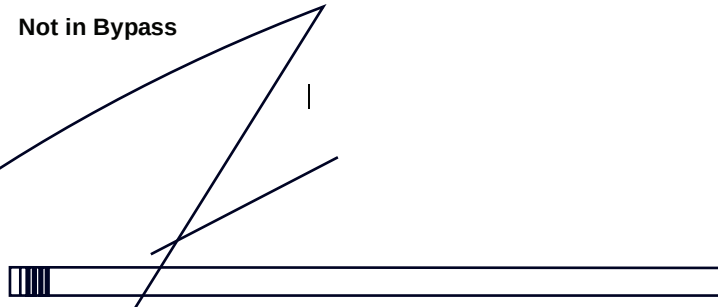
Interval Regeneration . . . . . a fh W R n rati n

Valve Connections/Dimensions

Tan Th r a . . . . . 2-1/2 inb s - , maX
InX t/OutX t . . . . . 1-3/4 inb s - 12 N C-2 , maX
rain in . . . . . .

1.2 Installation

Not in Bypass



Inspect unit carefully for any shipping damage and report any damage to the carrier.

Location Selection

1. The distance between the unit and air handler should be as short as possible.
2. If it is not known whether adequate equipment room will be available, a certain amount of space is available.
3. Since access must be provided for service, the location should be accessible.
4. Do not install an unit closer than 10 feet (3 m) of piping between the outside condensing unit. Water hammer can cause time to time to the pipe into the unit connections.

   At least 10-feet (3-m) to avoid noise, etc. is a reasonable distance to provide adequate service. Positive at prevent the possibility. Select a location considering situation, is to installa

4. Wh r th rain Xn is Xvat but mpti s int a rain b X th X v X fth c nt Xva Y , f rm a -inb (1 -cm) X p ath far n fth Xn s th at th b tt m fth X p is Xv X th th rain Xn c nn cti n. Th is iXpr vi an a uat sip n trap.
5. Wh r th rain mpti s int an v m a s r Xn , a sin -t p trap must b us .

IMPORTANT: N v r ins rt rain Xn int a rain, s r Xn r trap. X a s aXX an air ap b t nth rain Xn an th ast at r t pr v nth p ssibiXt f s a b in bac -sip n int th c n iti n r.

i ur 1.3

Note.7(an ov)-6.592681n ov ba0.6(l)8.1( )prac-6.6(t)15.3(e)-16.3(lc-6.6(e)0.6(l)17.9( )ha)-6.6(enbeien-23.8( )2TJ62681n o

1.3 Placing Performa Cv Conditioner/Filter into Operation

ft r a X or vi us st ps av b n c mp X t ,h unit is r a t b p Xac int p rati n. X h s st ps car fu X.

1. R m v c nt s X vaX c v r b first pr ssin h p Xstic cX os fr mh fr nt fh c v r. u X fr nt f c v r up.

   Note Th t X in st ps i Xr uir turnin h c cX in icat r t vari us p siti ns. Manua X s tat h cam aft **COUNTERCLOCKWISE**, nX until c cX in icat r p ints t ir p siti n. (S manua X r a n rati n s cti ns f r ab c nt s X manua X p rati n.)

2. R tat c cX in icat r **COUNTERCLOCKWISE** until it p ints ir ct t h r **BACKWASH**.

3. i X m ia tan h at r.

   a. Wh at r suppX ff, p Xac h b pass vaX (s) int h s rvic p siti n.

   b. Op n at r suppX vaX v r s X X t appr imat X h 1/4 p n p siti n.

IMPORTANT: If p n t rapi X rt far, m ia ma b X st. In h 1/4 p n p siti n, u s uX h ar air scapin s X X fr mh r rain X n .

Conditioner

   a. Wh n aX fh ain as b n pur d fr mh tan (at r b ins t fX st a iX fr mh rain), p nh main suppX vaX aX a .

   b. X at r t run t rain until c X ar.

   c. Turn ff at r suppX an X th unit stan f r ab ut fiv minut s. Th is i XaX aXtrapp air t scap fr mh tan .

4. at r t brin tan (initia X fi X.

   Wh a buc t h n s , a appr imat X 4 aX ns (15 X t rs) f at r t brin tan . If h tan h as a saX pXatf rm ab v h b tt m fh tan , a at r until it X v X is appr imat X 1 inb (25 mm) ab v h pXatf rm.

5. Xac h c n iti n r int p rati n.

   a. Wh h at r suppX vaX c mpX t X p n, car fu X a vanc h c cX in icat r **COUNTERCLOCKWISE** t h c nt r fh **BRINE REFILL** p siti n. X ath is p siti n until at r starts t fX h r uh h brin X n int h brin tan . n t run f r m r h an t minut s.

   b. vanc h c cX in icat r **COUNTERCLOCKWISE** until it p ints t h c nt r fh **BRINE/SLOW RINSE** p siti n.

   c. Wh h c n iti n r in h is p siti n, b c t s if at r is b in ra n fr mh brin tan . Th at r X v X nh brin tan i Xr c v r s X X. Obs rv at r X v X f r at X ast h r minut s. If h at r X v X s n t r c , r if it a s up, r f r nc h **Troubleshooting** s cti n.

   . vanc h c cX in icat r **COUNTERCLOCKWISE** t h **REGENERATION COMPLETE** p siti n an run at r fr m a n arb fauc t until at r is cX ar an s ft.

Filter

X fiX r m ias c pt carb n

   a. ft rh ain as b n pur d fr mh tan (at r b ins t fX st a iX fr mh rain) p nh main suppX aX a . Bac ash m ia f r a minimum f 15 minut s. r X n r if n c ssar . Wat r runnin at h rain s u X b cX ar.
   Carb n m ia s u X b aX t s a f r a minimum f 12h urs t aX air bubb X s t scap pri r t bac ash in .

   b. ft rh bac ash is c mpX t pXu in c nt s X an aX it t a vanc t **BACKWASH COMPLETE**.

Electrical Connection

100 VAC, 115 VAC, and 230 VAC units: R m v t ist ti fr mh p r c r an t n c r t its fu X n h . Ma sur p r s urc matb sh rating print n h c nt s XB c rtain a aXs itb s n t c nt s X ut X t.

12 VAC: C nn cth pXu fh transf rm r (suppX) s c n ar cabX t h matin s c t ath r ar r b tt m fh tim h usin . B c rtainh transf rm r is s cur an is pXu d int a p r s urc f c rr ct v Xa h at is n t c nt s X b a aXs itb .

1.4 Disinfection of Water Conditioners

Th mat ria s f c nstructi n fth m rn at r c n iti n r ix n t supp rt bact ria Xa , th , n r ix th s mat ria s c ntaminat a at r suppX. v r, th n rmaXc n iti ns istin urin a ippin , st ra an ins taXati n in icat th a vis abiXt f isinf ctin a c n iti n r aft r insta Xati n, b f r th c n iti n r is us t tr at p tabX at r. In a iti n, urin n rmaX us , a c n iti n r ma b c m f uX th r anic matt r, r in s m cas s th bact ria f s mth at r suppX.

Th us v r c n iti n r s uX b isinf ct aft r insta Xati n, s m ix r uir p ri ic isinf cti n urin th ir n rmaXt , an in a f cas s isinf cti n th v r r a n rati n uX b r c mm n .

p n ina up nth c n iti ns f us , th st X f c n iti n r, th t p f i n b ana r, an th isinf ctant avai Xab X, a b ic can b ma am n th f X in m th s.

Sodium or Calcium Hypochlorite

Appli mtion

Th s mat ria s ar satisfact r f r us th p Xst r n r sins, s rth tic a X Xt , or nsan an b nt nit s.

5.25% Sodium Hypochlorite

Th s s Xti ns ar avai Xab X un r tra nam s sub as C X BXab *. If st n r s Xti ns ar us , sub ash s s X f r c mm rcia Xaun ri s, a just th a ina acc r in X.

1. a
   a. X st r n r sin 1.2 fXu unc s p r cubic f t.
   b. N n-r sin us b ana r 0. fXu unc p r cubic f t.
2. Brin tan c n iti n rs
   a. Bac ab th c n iti n r an a th r uir am unt fh p b Xrit s Xti n t th brin fth brin tan . (Th brin tan s u h av at r in it t p rmith s Xti n t b carri int h (b (i)-u5.3(s n)-23.-16.(c24.0053 Tc6i) (r p)-16.(c)-

csir5

foot.

2

a. Bacl

2.2 Programming and Application

This section covers aspects of programming the 262 controller.

Note that some parameters have units of measure option such as Run Time which is in minutes. Other parameters have units such as Sample Time which is in 1/4 seconds. The units that can be programmed in Level I parameters. This section covers the programming and application notes of Table 2.1 and Table 2.4. It is for reference and other parameters that uses the units are active. For example, parameter 12 (Table 2.4) selects U.S. units if it is set to **"0"** and (c)hic if it is set to **"1."**

Level I Parameters (Table 2.1)

Salt Amount

Sax m unt ish n t vaxu ispx . Th fax
vaxu f r Sax m unt is 6 p un s (2.7 ix rams). f

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

P5 Capacity Setting iX grains (iX grams)	R sin V. Xm p r Tan (Xt rs)				
	3 ft^3 (5)	4 ft^3 (113)	5 ft^3 (142)	6 ft^3 (1V0)	V ft^3 (1J)
	P4 Salt Setting: . un*s (a). f SaX				
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)**
P6 Refill Setting: 14 inb tan = **74 (.74 gpm)** 16 inb ht ru 21 inb tan s = **130 (1.39 gpm)**					
P7 Brine Draw Setting. XvaXu s ar bas *. n 50 psi (3.5 bar) inXt pr ssur . r pr ssur ht an 50 psi r f r t brin *ra b arts in S cti n 4.0.					
Tan iam t r	Inj ct r	arN umb r	**P7 equals**	C. Xr	
14 in (35.5 cm)	M	1055V3V	**60**	B n	
16 in (40.6 cm)	Q	1035V3J	**80**	urpX	
1 in (45.V cm)	Q	1035V3J	**80**	urpX	
21 in (53.3 cm)	R	1035 4	**83**	ar r	

Level II Parameters (Table 2.4)

Th v XII aram t rs ar 6h r uh 22 in TabX 2.4. T acc ss v XII aram t rs, simuXan u sX pr ss an h X h **DOWN ARROW** (↓) an **UP ARROW** (↑) butt ns f rh r s c n s. " numb r iX isp Xa .

R f r t TabX 2.4 t fin h param t r ass ciat h ab " numb r. s h **UP ARROW** (↑) butt n rh **DOWN ARROW** (↓) butt n t m v f m n param t r t h n t. Th isp Xa c cX sh r uh h " numb rs a n in TabX 2.1 an TabX 2.4. Wh n u r ab 22, h n t numb r iX bac t 1.

Wh nh param t r numb r u ant t b an i n h isp Xa , pr ssh **LEFT** (←) butt n t isp Xa h ata ass in t h at param t r. r ssh **SET** butt n an h far rih t numb r nh isp Xa starts fXah in. (←)u ant t b an h (t)15./ 2. RRO12Tj053 Tc1J 56 -1.2h 2 .J(h)-1s

aram t r 22. Sp ciaXc ar nt r ath fact r t pr aram aXX fth p rtin nt Xcati ns f r sp cific c nt Xt; M tric f r ampX. Th is param t r s uX n v r b b an b th n us r.

Electronic Time Clock Operation

r aramming aut matic r n rati n fr u nc

Th EXct nic Tim CXc h as t r n rati n pti ns Int rvaXR n rati n an a f W R n rati n.

T initiat an aut matic r n rati n n r b th fth pti ns must b b n. Th s st m ma aX b r n rat manuaXX b pr ssin th R n rati n butt n f r th r s c n s.

Interval Regeneration Th EXct nic Tim CXc ma b pr aramm t r n rat in int rvaX f up t 30 a s. Th is f atur is aram t r 14 CaXn ar Ov rri (s TabX 2.4). E ampX If 5 is pr aramm int 14th nth st m iXr n rat v r fiv a s ath tim pr aramm int 2.

Day of Week Regeneration Th EXct nic Tim CXc ma b pr aramm t r n rat n a sp cific a r n sp cific a s fth . Th instructi ns f r th is pti n ar f un in TabX 2.3 n pa 15.

Application

Th rf rma Cv J62 C n iti n r an th rf rma Cv J62 iX r ma b p rat as a sinX, uaX r tripX s st m.

Dual and Triplex Conditioners and Filters

Th uaXan tripX s st ms r uir a iff r nt cam th anth camth at is us inth sinX unit s st ms. Th aX r uir an int r nn ctinXc ut cabX. Th is aX sth unitth at is in r n rati n r bac as t siXnaXth th r units an pr v ntsth m fr m startin a r n rati n r bac as untiXth first unit is finis . uaXan tripX units a uX b pXmb in paraXX th ab th r. In a muXi-unit s st m th bac as at r is supX b th th r unit r units inth s st m. In a uaXfiX r s st m c nsi rati n must b aiv nth ath unit in s rvic is abX t satisf s rvic r uir m nts an b abX t suppX suffici nt bac as at r t th th r fiX r h iX it is inth bac as c cX. Th r is a s Xcti n aul , TabX 4.6, in S cti n 4.0 t assist in uaXf inth b ic f a uaX r tripX s st m. Th is s Xcti n aul is bas n m ia bac as r uir m nts an tan iam t r.

paraXX it must b purb as f r muXi-unit p rati n. Th it numb rs ar

uaX araXXC n iti n r	N	1035J23
TripX araXXC n iti n r	N	1035J25
uaX araXX iX r	N	1035J24
TripX araXX iX r	N	1035J26

its inc r paraXX p rati n cams an th p r int r nn ct cabX.

Manual Start Regeneration

T f rc th c nts Xt pr rm a r n rati n, pr ss th **REGEN** butt n. Th is butt n is Xcat n th f nt fth c nts XWh n u pr ss th **REGEN** butt n, th c nts X p rf rms a fuXr n rati n fth c n iti n r.

If you press this button again more than one minute after regeneration begins, but before the regeneration is complete, a second regeneration will start when the first regeneration is finished. Th isp a iXfr an nX s th R n Tim R mainin as an in icati nth ath s c n r n rati n iXb p rf rm . Wh nth first r n rati n is c mpXt , th s c n n iXb gin an th isp a iXaXrnat b t n X an R n Tim R mainin .

Automatic Regeneration

Programming Day of the Week Regeneration/ Backwash

Enter a day of the week regeneration/backwash programming by pressing the **LEFT ARROW** (←) button and the **DOWN ARROW** (↓) button simultaneously for 3 seconds. The day bar begins with "1, "2, "3, etc., and the display will show the day of the regeneration/backwash cycle. Select activate at a, by changing the 0 to a 1. The programming may be bypassed if no water pressure for 30 seconds. If this feature is used in conjunction with a normally closed timer bypass switch on the regeneration/backwash.

Table 2.3 - Day of Week Regeneration/Backwash

#	Description of Parameter

Reserve Options

The reserve type for reserve options is constant fixed reserve and smart reserve (historical water usage pattern). The arrow selects the parameter 15.

Fixed Reserve

When a fixed reserve is selected, the constant multiplied by the maximum set system capacity by the percentage set in parameter 16 and used as the reserve.

Smart Reserve (water usage pattern)

The smart reserve option automatically adjusts the reserve based upon the historical water usage pattern of the system. The controller tracks the water usage for each hour and uses that data to create average usage multiplied by 1.2 as the reserve for that hour. Every regeneration, the controller recalculates the average water usage. If less than 10% of a day's average water usage is used, the controller will change the day's average water usage. If more than the day's average water usage is used, the controller will use the actual water usage in the reserve calculation.

Since an installation has no history of water usage, the controller multiplies the percentage of capacity value set in parameter 16 by the total system capacity to determine starting average for each hour.

The factory set value for 16 is 30 which means that 30% of the total system capacity is used for the starting average for each hour.

Program parameter 15 is also used to select the reserve option with the arrow. Time of Regeneration set in parameter 2 to start a regeneration, if the controller has used up its reserve capacity before the next regeneration immediately begins, maintaining service water.

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	R fi Xo nt Xr	2-200	1	**Selected from Table 2.2**		Ti is numb r t Xh c nt Xrh rat f r fiXbas nh r fiXo nt X insta X . R fiX Xtim is caXuXat t r fih p p r am unt f at r int brin tan .
▼	Brin ra rat	2-200	1	**Selected from Table 2.2**		Ti is numb r t Xh c nt Xrh ra rat bas nh inj ct r si . Ti Xtim inh ra p siti n ish n caXuXat .
J	Bac as tim	4-60	1	**14***	Minut s	*Ma b a just t r appXcati n

 t S cti n 3.2 f r tai pXnati n fh p rammin param t r nh is pa .

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

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

3.1 Programming and Application

This section contains programming instructions for the Performa Cv 962F Three Cycle Filter.

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 week and time of day	(1-7) 1:00-12:59 AM or PM	(1 day) 1 Minute	**Current Day and Time**	Hour Minute	Range of programmable values for correct time. Day of week SUN=1, MON=2, TUE=3, WED=4, THU=5, FRI=6, SAT=7. THIS IS THE CORRECT TIME OF DAY
2	Time of day to start backwash	(1-7) 0:00-23:59 1:00-12:59 AM or PM 00:00-23:59		**As required**	Hour Minute	Range of programmable values for correct time
3	Program assembly number			**10** **100**	LBS. Metric	
4	Program assembly number			**0.5**	LBS.	Five pounds of medium capacity (gallons) of the first filter bed. Enter a.1(n)30. ( ) TJ0 -1
5	Filter capacity			**As required**	Metric	Five pounds of medium capacity uMho (20(p3)(s))12c)-Ti (Mi)--1. ()-3-3 ()-

Refer to Section 2.2 for explanations of the programming parameters listed above.

Table 3.2 - Programming Performa Cv 962F Five Cycle Filter

Parameter	Description	Range of Values	Minimum Increment	Recommended Program Value	Units of
					U0(ra)1d1420.8(5d120.8(a4(e)]TJ)]TJ 5() TD0.24..01c[(Pr)-8(ogr)-119ra)1

Electronic Time Clock Operation

To initiate an automatic backwash sequence the following conditions must be present. The system must be in backwash manual or by pressing the Backwash button for the correct system.

Programming automatic regeneration frequency

The Electronic Time Clock has two regeneration options Interval Regeneration and Day of Week Backwash.

Interval Backwash The Electronic Time Clock may be programmed to regenerate at intervals up to 30 days. This feature is also known as Calendar Override. It is necessary that at 14. Example If 5 is programmed into the 14th position of the system it will backwash every fifth day at the time programmed into position 2.

Day of Week Backwash The Electronic Time Clock may be programmed to backwash on a specific day or specific days of the week. The instructions for this option is found in Table 2.3 on page 17.

Application

The information contained in this manual is intended for use with information contained in this manual is intended for use by qualified, trained operators or service technicians.

Dual and Triplex Conditioners and Filters

The dual and triplex systems require a different cam

This is i

3.2 Mechanical

Series 942F Mechanical Control

The Series 942 mechanical controls provide mechanical time functions for fixed or programmable applications.

Figure 3.1

3.2.1 Settings

Setting the Time of Day, Setting the Calendar Cap, and Manual Backup and Initializing the 942 Control.

Setting the Time of Day

Rotate the Clock Gear **clockwise** until the pointer indicates the correct time of day. When the time of day is set, the control initializes and backs up at approximately 2:00 a.m. If it is necessary to change the unit back up at an earlier or later time, simply offset the current time of day accordingly. For example, to have the unit back up at 4:00 a.m., set the Clock Gear to one hour later than the actual current time of day.

Note: Do not rotate the Calendar Cap by hand. The Clock Gear drives the Calendar Cap. To manually initialize the Calendar Cap, rotate the Clock Gear **clockwise**

Adjusting the Backwash Setting

Th Bac ash iaX (igur 3.2) c nta Xth bac ash tim . Wh th In ica r n b inth B C W S COM ETE p siti n, s tat h Bac ash iaX c unt rcXc is at X ast n fuXturn t canc X uth curr nt s ttin . Xh t cXc in s un i Xb r pXac b ah avi r cXc in s un h nh pr v us s ttin is canc X . Onc h h avi r cXc in ish ar ,h n s ttin ma b s t b s tatin th Bac ash iaX, h sir s ttin . Th numb rs nh Bac ash iaX r pr s nt MN TES f bac ash tim .

igur 3.2 Bac ash C mpXt

Table 3.4 - Cycle Times for 942F Control

Cycle	Time (Minutes)
Bac ash	- 30
ur	3

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

This section contains a tabular explanation of the programming parameters in the 962 Electronic Control

Number	Description of Program Values	Explanation

5
pa 12

1	Sax Xcapacit Xc ut	XX s t rh Xc ut f 4 an 5 s h atN O unauth ri b ana s t h pr ramm vaXu s can b ma .
1J	X S ns r S Xct	Th is param t r is us t s Xcth fX s ns rh at is t b us h h s st m. Th fact r -pr s t vaXu is 1 t r a 1-inb turbin . Th rana is 1 -4 1 = fvin( )b3( )-0.2(J(u i)3J.1s b)-0.2(a)2 .1(j5.1 s X2 (25.5(vi)-J (ns X2 (0.0(121 .2(X-J(nv 1 = ut t X1-inb turbin , 2 = ut t X2-inb turbin , 3 = us r pr ramm n pr5rXn , s)0(X( )4-1(v)25.4V)15. h)-2162 T 0.012 TTc-0.013Tr pum.( )1.211TJ35 pr ramm abX -fact r,4 = us r pr ramm abX pux uivaXnt. Th r s p ctiv m t r manufactur r s u s suppX h -fact rs r pux uivaXnts f r in ivi ua Xm t rs.
20	-fact r r pux uivaXnt	

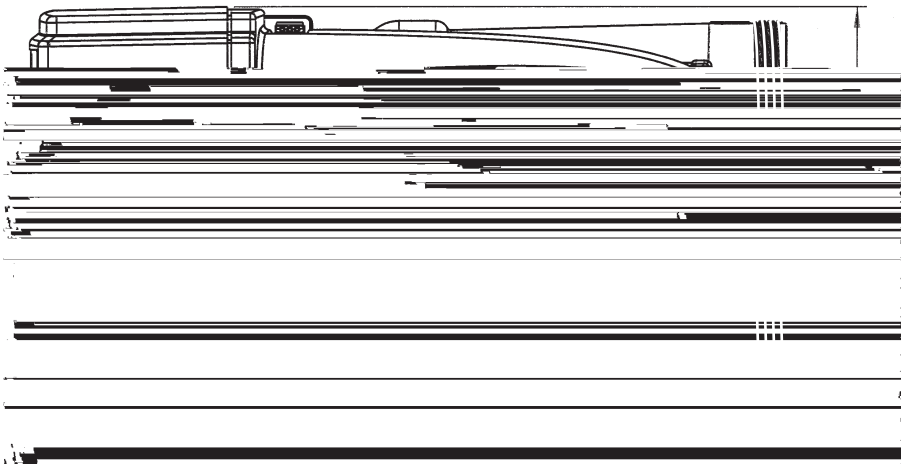
* Th J62 c nt s XX r functi ns in h r a 12h ur r 24h ur cXc m . s ramming 13 (cXc m) b t r 1 r 2 iXX Xminat an c nfusi n h n s ttingh s param t rs.

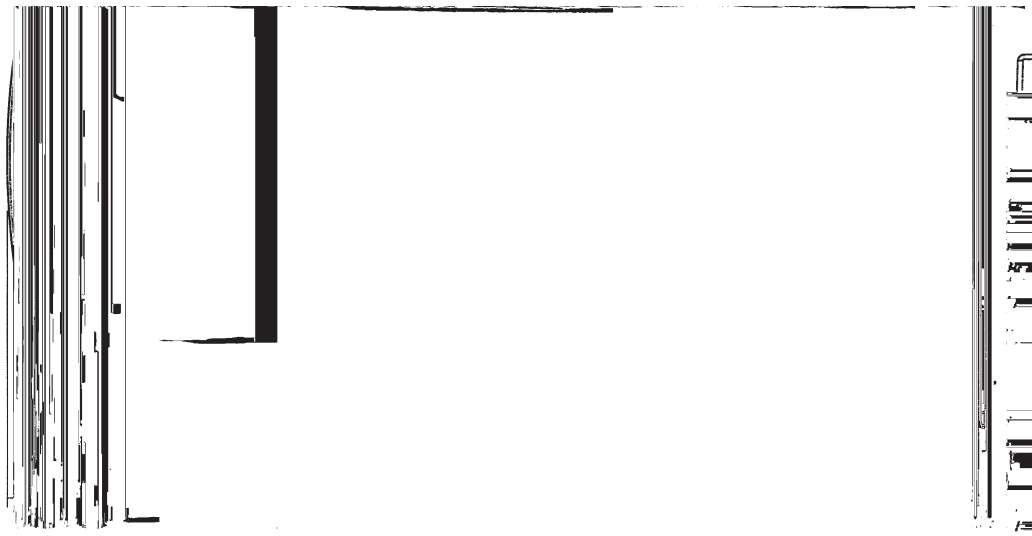
** Th J62 c nt s XX r functi ns in h r .S. r m tric units. s ramming 12 (units f m asur) b t r 3 r 4 iXX Xminat an c nfusi n h n s ttingh s param t rs.

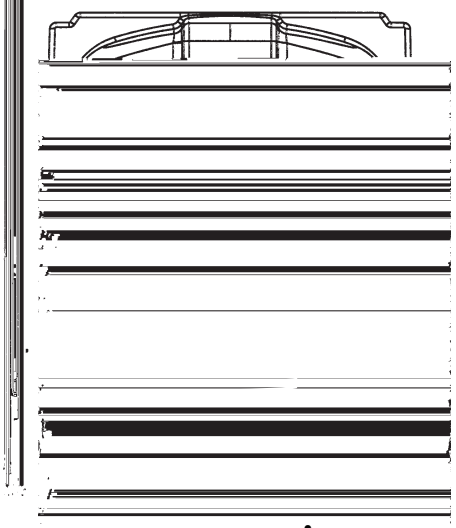
*** Th caXuXt a XX n am unt Xa int h aiX r aist rs (h s uh 13) at ST RT- , us sh is p rc nta f capacit . E ampX J0,000 rains in 5 10 rains in 3, J0,000 / 10 = J,000 aXX n capacit , J,000 .3 (30% in 16) = 2700 aXX ns, h ib is Xa int h s uh 13,h aiX av ra s. rh is amX,h smart r s rv at ST RT- , uX b 2700 aXX n 1.2 (120% fh aiX av ra) = 3240 aXX n. Th is aiX av ra iXb ana as actuaX at r usa int rmati n is ah r .

4.0 Performa Cv Performance Charts and Graphs

4.1 General Specification

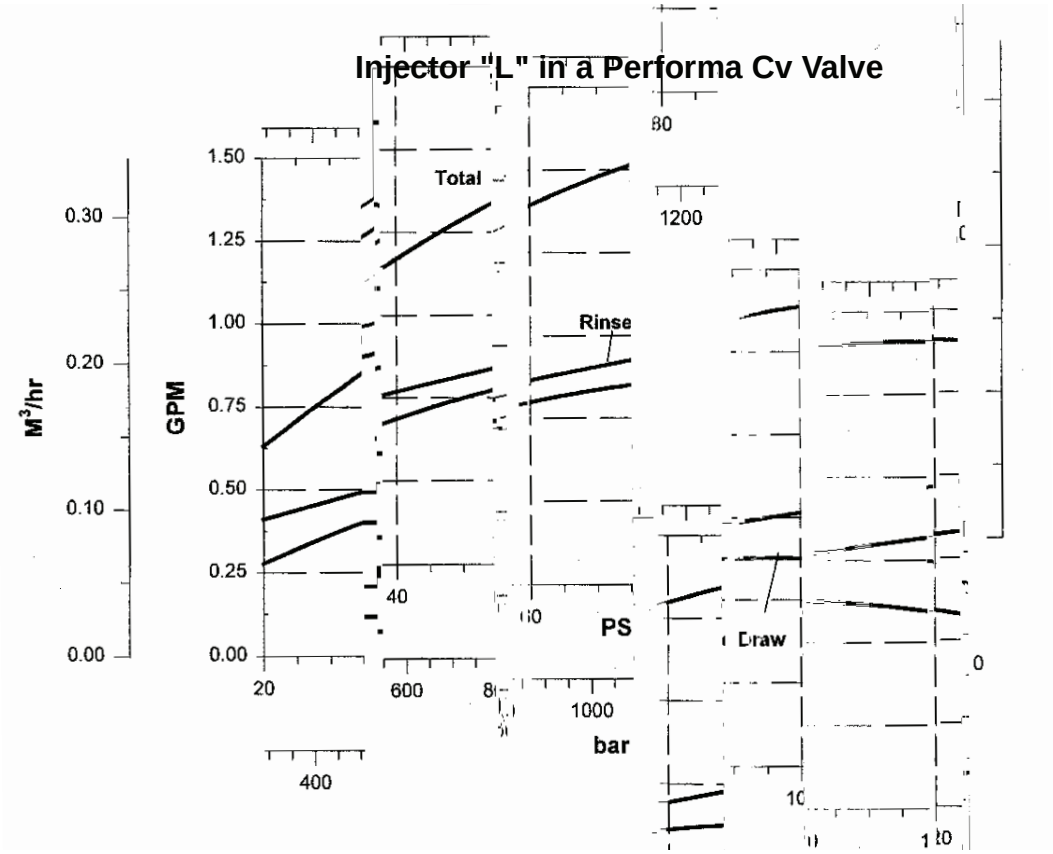


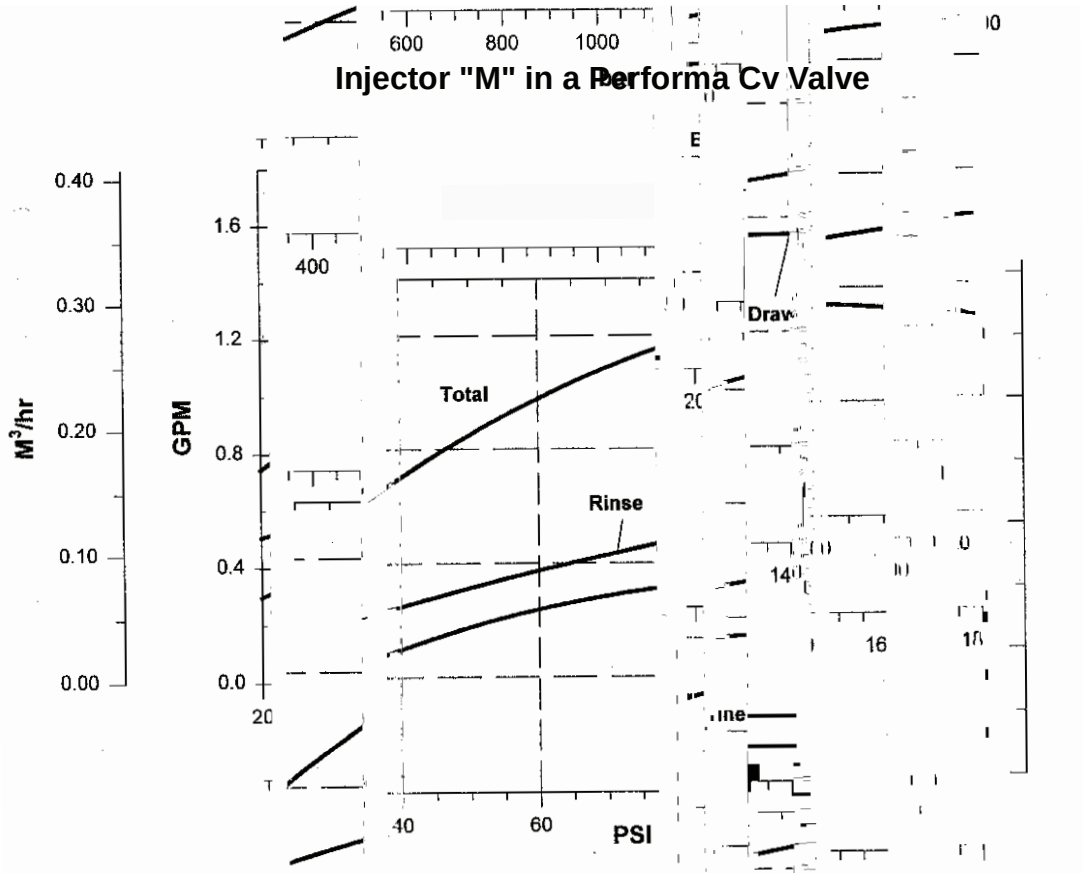




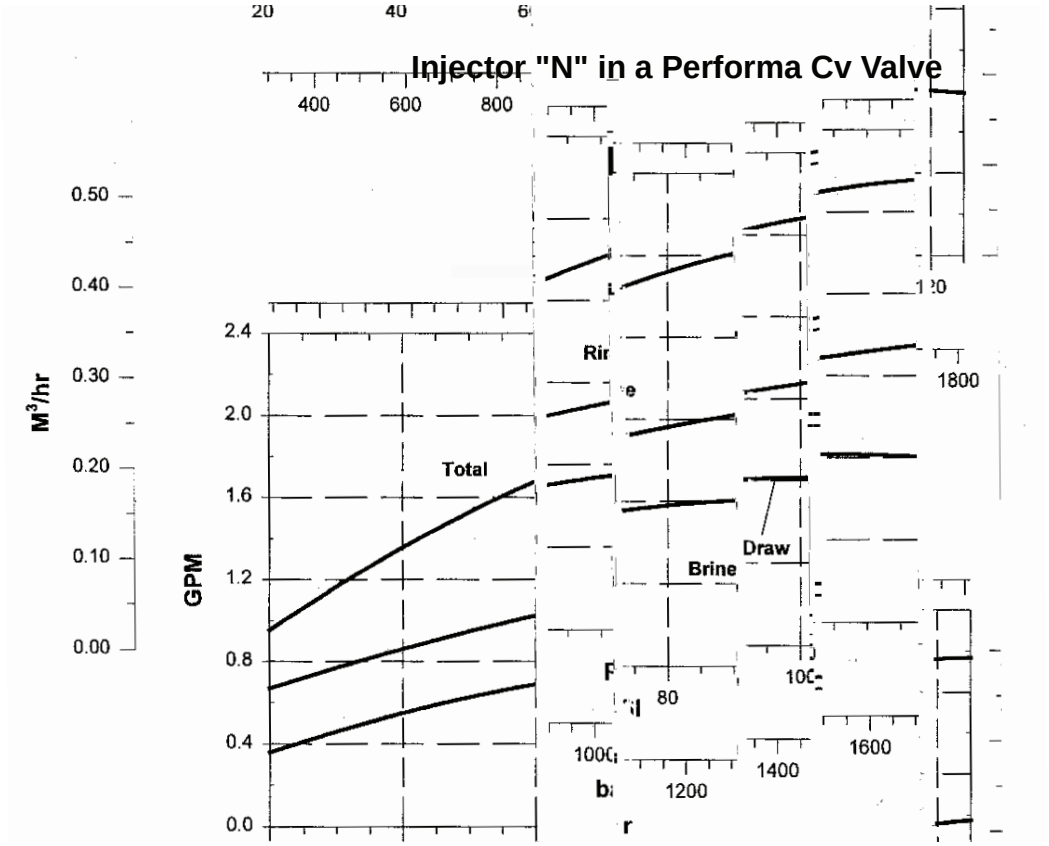
[illegible] static Test Pressure	300 psi (20.6 bar)
Working Pressure	20-120 psi (1.3 - 8.2 bar)
Standard Electrical Rating	3642 series auto transformer 12V 60 , 12V 50
	3642 Valve or 12 Volt /24 hour 50 12 V transformer, 60 120 Vac or 12 V transformer
Electrical Cord (standard rating)	60-inch (1.5-m) 3- wire light plug
Pressure Tank Threads	2-1/2-inch male
Riser pipe diameter Required	1.050-inch OD (26.7-mm)
Riser pipe length	1/2 inch 1/2 inch (13 mm 13 mm) inch right angle to pipe of tank
Standard Connection	1-inch (25.4-mm) copper tube adapters
Optional Connections	1-1/4-inch , 3/4-inch , 22-mm, and 28-mm copper tube adapters
	3/4-inch BSP T, 1-inch BSP T, 1-inch NPT brass pipe adapters
	3/4-inch , 1-inch , 1-1/4-inch , 25-mm CPVC tube adapters
Bring in Connection	3/4-inch NPT male
Drain in Connection	3/4-inch NPT male
Optional Bypass Valve	Rotating handle, full 1-inch port, reinforced plastic
Control Mounting	Reinforced plastic
Rubber goods	Compound resistant to ozone attack resistant
Program Cycle (Time r)	3642 valve in 7-day 12-hour English, German, Dutch, Italian, Spanish, Japanese
	3642, 3642 , 3642TC, 3642 TC valve in English, German, Dutch, Italian, Spanish, Japanese
Bring Rise Height	0.74 and 1.3 M
External Back up Control Power	5, 9, 10, 12, 15, 20 VAC. Both 20 VAC must be used.

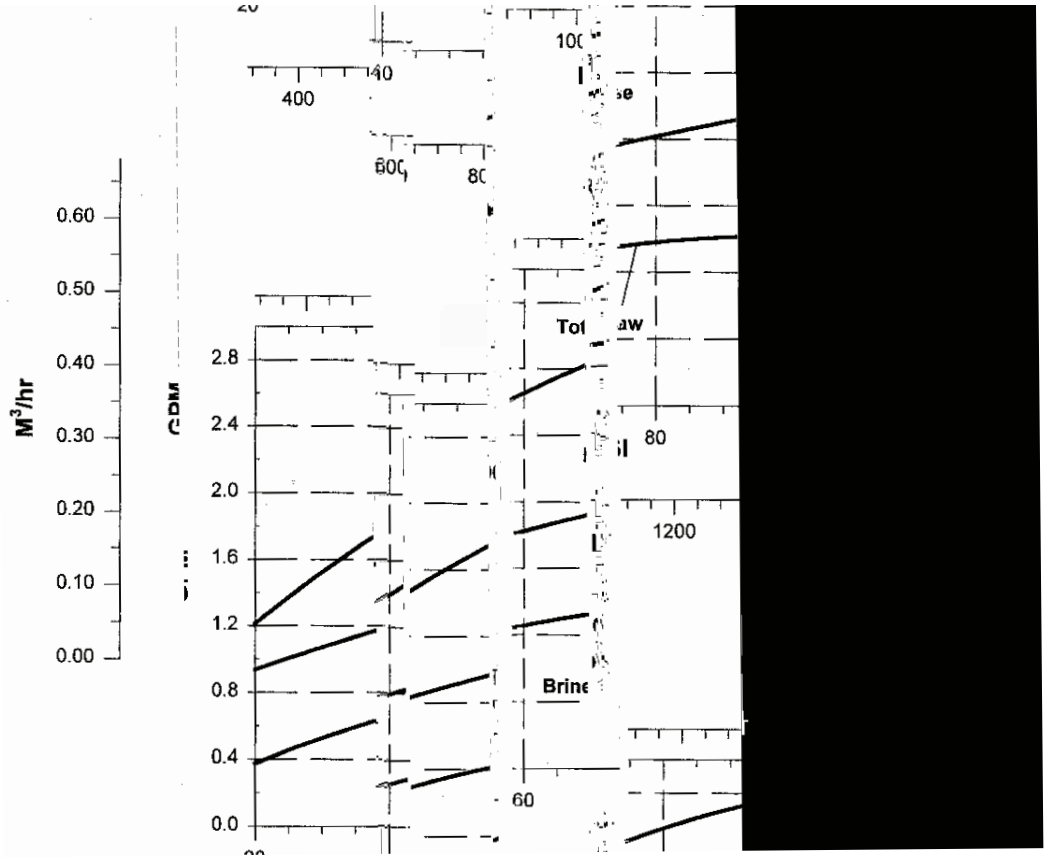
4.2 Injector Curves

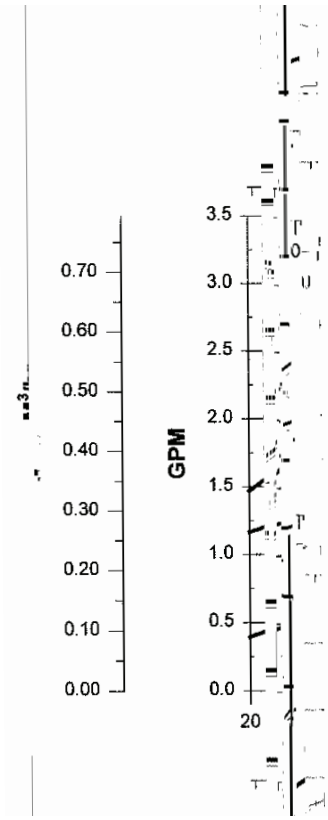




Injector "N" in a Performa Cv Valve







Injector "R" 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.[illegible]	0.45	1.2
30	0.3	0.45	0.4	0.55	0.45	0.[illegible]5	0.5	0.[illegible]5	0.5	1.3
60	0.5	0.6	0.6	0.	0.[illegible]5	1	0. 2	1.4	0.[illegible]	1.[illegible]5
0	0.6	0.65	0.[illegible]	0. 5	0.	1.1	0.[illegible]	1.6	1	2
100	0.6	0.[illegible]6	0.[illegible]	0.[illegible]	0.	1.6	0.[illegible]5	1.	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.[illegible]	1.5	1.1	1.[illegible]	1.5	2.5	1.5	3.4	1.[illegible]	4.5
2.1	1.1	1.[illegible]	1.5	2.1	1.[illegible]	2.	1.[illegible]	3.6	1.[illegible]	4.[illegible]
4.2	1.[illegible]	2.3	2.3	6	2.	3.	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.	[illegible].6
[illegible]	2.3	2.[illegible]	2.6	3.4	3	4.[illegible]	3.6	6.	4.2	.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	[illegible]	0.35	56	34
10	20	13	0.[illegible]	[illegible]6	4[illegible]
15	25	16	1	[illegible]5	61
20	2[illegible]	1	1.4	10[illegible]	6
25	32	20	1.[illegible]	121	[illegible]6
30	35	22	2.1	132	3

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^3h/sq ft)	Cation Resin @ 5 gpm/ sq ft (m^3h/sq ft)
14 (35.6)	1.02	3 ([illegible])	5 (1.1)
16 (40.6)	1.3	4 (.[illegible])	[illegible] (1.5)
1 (45.[illegible])	1.[illegible]6	5 (1.1)	(1.)
21 (53.3)	2.4	[illegible] (1.5)	12 (2.[illegible])

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	1[illegible]
20	2[illegible]	22
25	32	25
30	35	2[illegible]
Pressure Loss vs Flow (Lpm)		
Bar	**Service (Kv 5.6)**	**Backwash (Kv 5.8)**
0.35	56	42
0.[illegible]	[illegible]6	61
1	[illegible]5	[illegible]2
1.4	10[illegible]	3
1.[illegible]	121	[illegible]5
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	(30)	10 (3)	12 (45)	15 (5[illegible])
16 (40.6)	1.3	11 (42)	13 (4[illegible])	16 (61)	20 ([illegible]6)
1 (45.[illegible])	1.[illegible]6	14 (53)	1[illegible] (64)	21 ([illegible][illegible])	*26 ([illegible])
21 (53.3)	2.4	1[illegible] ([illegible]2)	24 ([illegible]1)	*2[illegible] ([illegible])	
24 (60.[illegible])	3.14	25 ([illegible]5)			

*Ma c [illegible] 25 psi[illegible] r 1.[illegible]2 bar pr [illegible][illegible]ur [illegible]e p.

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	(30)	10 (3)	12 (45)	N R
16 (40.6)	1.3	11 (42)	13 (4J)	N R	N R
1 (45.7)	1.76	*14 (53)	N R	N R	N R
21 (53.3)	2.4	N R	N R	N R	N R

* Ma c 25 psi r 1.72 bar pr ssur p urin bac as f s c n unit.

N R = N t R c mm n . f c nt X nh s rvic utX t f ab va ma b r uir t ins ur p p r bac as v Xim t bac as in unit.

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een and Injector

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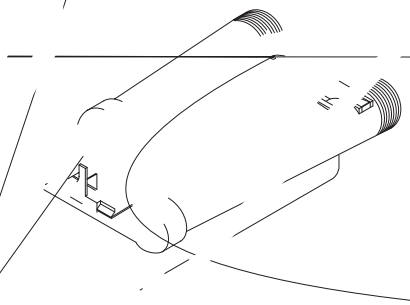

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Water Meter Maintenance

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b pass fr mht inXt an utXt fht vaX b
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in icati n, bXn ina c Xn, nht c nt X isp .

*R V ris a tra mar f ab Ch micaXC mpan .

5.3 Removing the Valve Assembly for Servicing

1. Unplug the power cord.
2. Shut off the water supply and put the bypass valve (3) into bypass position.
3. Remove the cover from the softener, relieve the pressure by pushing in on the valve N.V. (red cap) on the control assembly (see figure 5.2).

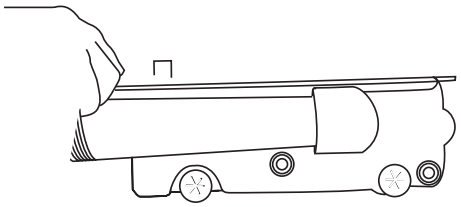


figure 5.2

4. Using the 3/4" bypass valve, loosen the brine tank fitting, and pull the brine line from the valve. If using the 1265 bypass, loosen and remove the valve from the bypass as assembly and remove the brine and drain line from the valve.

Unscrew (counterclockwise) and remove the valve from tank.

5. To replace the control assembly, reverse the above procedure.

5.4 Removing the Control

Complete the following steps to remove the 7360 series control for servicing

1. Unplug the transformer.
2. Shut off the water supply and put the bypass valve (3) into bypass position.
3. Remove the drive cover by pressing in the tabs provided on the cover, figure 5.3. Lift the front of the cover and remove by pulling forward.

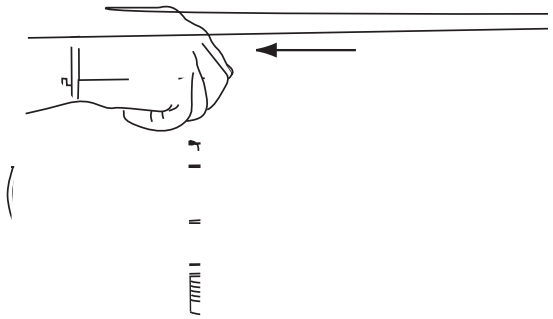
figure 5.3

4. Remove the 3/4" brine valve assembly from the control assembly (see figure 5.4).

figure 5.4

5. To remove the cam and motor assembly, the piston assembly must be pointing at the 12 o'clock position. This is accomplished by manually cycling the unit to the regen position. See figure 5.5.
Remove the cam and motor assembly by pulling straight forward, figure 5.6.

figure 5.5



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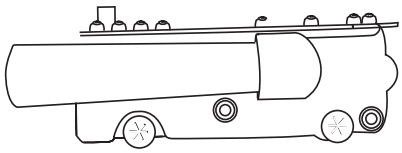

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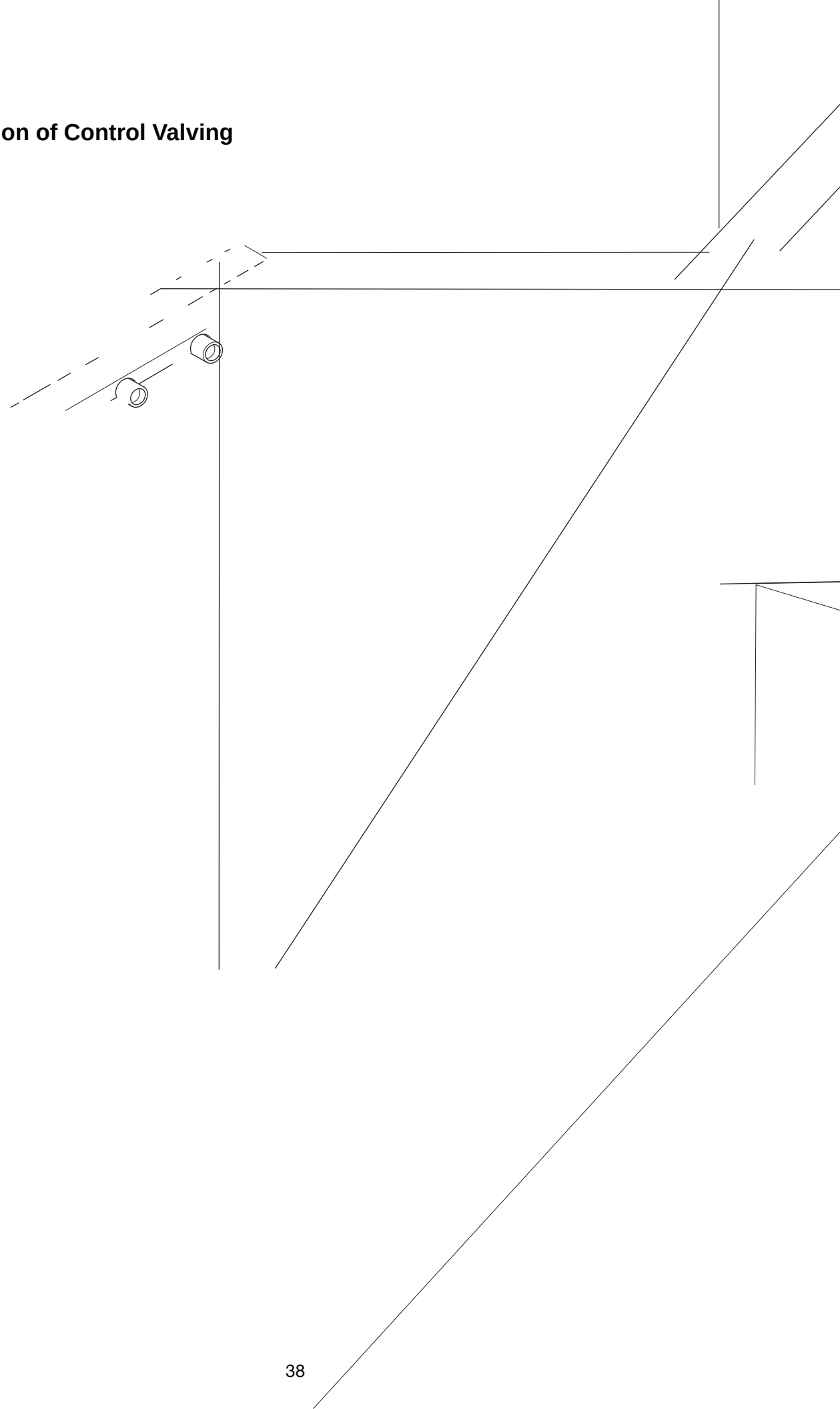
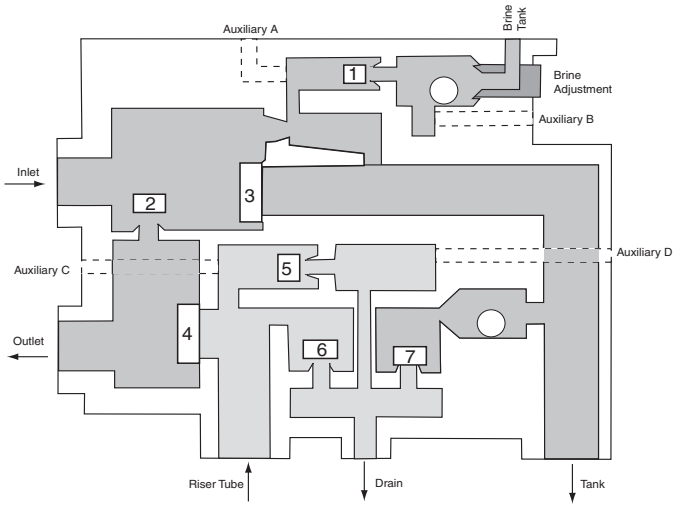
5.5 Identification of Control Valving

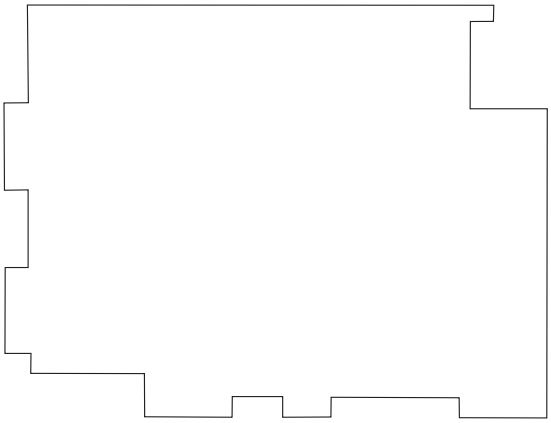


3 Brine/Slow Rinse Position



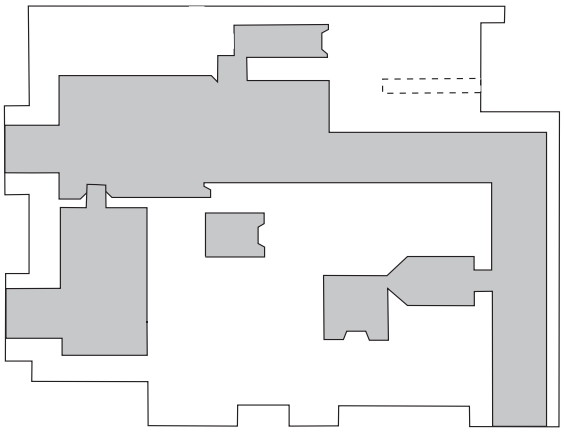
Name	Valve No.
Brine	1 - Open
By-Pass	2 - Open
Inlet	3 - Closed
Outlet	4 - Closed
2nd Tank Top	5 - Open
Purge	6 - Open
Backwash	7 - Closed

4 Fast Rinse Position



5.8 Performa Cv Filter Flow Diagrams

1 Backwash Position



2 Fast Rinse Position

5.9 Troubleshooting

The table on the following page lists some common problems which may be experienced with this equipment, the possible cause of each problem, and the recommended solution. If a problem persists after following the recommended procedures, contact your service provider for assistance. Part numbers and illustrations of replacement parts are provided in the **Replacement Parts** section of this manual.

IMPORTANT: Service procedures should be performed only after verifying that the proper voltage is present at the power supply. Before performing any electrical troubleshooting procedures, make sure all power to the equipment has been turned off and disconnected. Only qualified electrical technicians should perform electrical troubleshooting and repair procedures. Refer to the Electrical Schematics section for wiring diagrams.

Valve Troubleshooting

Problem	Possible Cause	Solution
1. Continuous leakage from drain.	a. Low water pressure.	a. Set pump to maintain 30 psi at generator.
	b. Restricted drain line.	b. Remove restriction.
	c. Injector plugged!	c. Clean and inspect.
	d. Injector defective!	d. Replace injector.
	e. Valve (2 and/or 4) not closing.	e. Remove foreign matter from seat and clean both seating surfaces. Replace if necessary.
	f. Damaged injector O-ring.	f. Replace injector O-ring.
2. Brine tank overflow.	a. Brine valve (1) blocked open.	a. Manually operate valve several times to flush debris.
	b. Incoming water flow restricted!	b. Remove variable water flow restriction.
	c. Valve (3, 4) not closing during brine draw.	c. Visually inspect for debris. Clean and manually operate valve several times.
	d. Air in brine line.	d. Check connections in brine line for air leaks. Refer to instructions.
3. Set mushing more frequently than water softness setting.	a. Inaccurate setting.	a. Correct setting.
	b. Foreign matter in control causing incorrect flow rate!	b. Remove variable water flow restriction. Manually position control brine draw (after refilling, position control to purge then to brine).
	c. Defective control.	c. Replace control.
4. Intermittent or irregular brine draw.	a. Low water pressure.	a. Set pump to maintain 30 psi at generator.
	b. Defective injector!	b. Replace both injector and injector cap.
5. No connection to water softener.	a. Unit in bypass.	a. Check bypass.
	b. No water in brine tank.	b. Refer to water softener service provider.
	c. Kinked injector!	c. Clean injector. Visually inspect.
6. Control box does not receive power.	a. Incorrect box used.	a. Replace with correct box.
	b. Foreign matter affecting control operation!	b. Remove control and clean.
7. Excessive chlorine at water softener drain.	a. Drain valve (6, 7). Brine valve (1) not closing completely. Foreign matter.	a. Manually operate valve several times to flush debris.
	b. Valve set improperly.	b. Replace spring.

962 Control Troubleshooting

Alarms

The Model 962 continuously monitors itself and any sensor unit for an alarm if it detects a malfunction. The alarm is a beeping sound and flashing Err on the display. The alarm can be turned off by pressing any button on the control panel.

When the alarm sounds, the display will show Err and a number from 1 to 4. The table below lists Err numbers, a description of the error, and the solution. To silence the alarm, press any button on the control panel. If the error persists, the alarm will resume beeping after 30 seconds.

Model 960 Alarms

Indication	Description	Cause	Solution
Err1	Electronics failure	Control Settings in the programming	Press any button to clear the fault. Reprogram the Model 960 Control.
Err2	Improper restart from transmission (Transmitter was turned off during a transmission).	Valve cam shaft assembly manually rotated during a transmission.	Press any button to silence the alarm. Do not start automatic cycle at TIME ZERO RESET.
	Valve cam shaft assembly manually rotated out of transmission compartment position.	The Control will return to the previous position.	
	auxiliary motor.	Replace the Control	
	auxiliary motor drive.	Replace the Control	
	auxiliary switch.	Replace the Control	
Err3	Improper finish from transmission (Transmitter was turned off during a transmission).	Valve cam shaft assembly manually rotated out of transmission compartment position.	The Control will return to the previous position.
	auxiliary motor.	Replace the Control	
	auxiliary motor drive.	Replace the Control	
	auxiliary switch.	Replace the Control	
Err4	Improper control settings (one or more settings out of the available range).	One or more settings out of available range.	Any setting from 3 to 250. Capacity from 0.1 to 140.0.

Problem	Possible Cause	Solution
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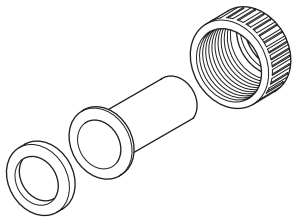
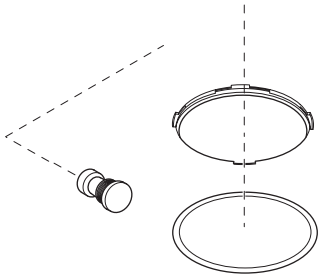
	a. Bac t bac r n rati n• r r •u t •.	a. R f r t h Manua R n rati n • ct n.
	a. • r• uta n •. b. Tim • f•a • t ino rr ctX. c. Tim • f r n rati n • t ino rr ctX.	a. R • t tim • f•a t c rr ct tim • f•a . b. R • t tim • f•a t c rr ct tim • f•a . c. R • t tim X6(t)-30.2J.2(• f•0t)-31.1(i)-30.-25.4224.1( )-30.3

61-4TB.2(Ba)54(4(5anT (14(1•(n) ( )-0.J4(a)4.▼(Jan-2(54ac)3.4(0

6.0 Performa Cv Parts

6.1 Valve Component Exploded View





6.2 Parts List

Code	Part No.	Description	Qty.
1	1000413	rf rma Cv C n"iti n r VaX ss , 6 X C nt X	1
	100041	rf rma Cv iX r VaX ss , 6 X C nt X	
2	1035611	J62 C n"iti n r Cam ss , SinaX nit	1
	10303 7	J62 C n"iti n r Cam ss , MuXi nit	
	10303 0	J62 iX r Cam ss , SinaX nit	
	10303 4	J62 iX r Cam ss , MuXi nit	
3		rain C nt X ss mbX	1
	1030355	C ss , 5 apm	
	1030356	C ss , 6 apm	
	10303	C ss , apm	
	103035	C ss , apm	
	1030360	C ss , 10 apm	
	1000406	C ss , 12 apm	
	100040	C ss , 15 apm	
	100040	C ss , 1 apm	
	100040	C ss , 20 apm	
	1000410	C ss , 25 apm	
4	1030502	BaXX X C nt X	2
5		Inj ct r ss mbX (incX" s O-Rina)	1
	1035 36	" Inj ct r - Orana	
	1035 3	M" Inj ct r - Bl n	
	1035 3	N " Inj ct r - r n	
	1035 3	Q" Inj ct r - urpX	
	1035 4	R" Inj ct r - ar r	
6	100026	Inj ct r Cap ss mbX (incX" s O-RIna)	1
		Brin R fiXC nt X	1
	1000224	4 apm	
	100051	1.3 apm	
	100244	rain ittina EXt (3/4"h s barb ")	1
	1000226	Scr n/Cap ss mbX	1
10	101042	O-Rina	1
11	1035622	Tan Rina	1
12		Xmbina "apt r its	1
	1001606	3/4-inb C pp r Tub "apt r it	
	100167 0	1-inb C pp r Tub "apt r it	
	1041210	1-1/4-inb C pp r Tub "apt r it	
	100160	22-mm C pp r Tub "apt r it	
	100160	2 -mm C pp r Tub "apt r it	
	1001613	3/4-inb C VC Tub "apt r it	
	1001614	1-inb C VC Tub "apt r it	
	1001615	25-mm C VC Tub "apt r it	
	1001 6	3/4-inb N T Xstic ip "apt r it	
	1001603	1-inb N T Xstic ip "apt r it	
	1001604	3/4-inb BS T Xstic ip "apt r it	
	1001605	1-inb BS T Xstic ip "apt r it	
	1001611	3/4-inb BS T Brass ip "apt r it	
	1001610	1-inb N T Brass ip "apt r it	
	1001612	1-inb BS T Brass ip "apt r it	
13	1033444	Turbin ss mbX	1
14	10015 0	Sprina, Xapp r VaX	
15	10303 2	C v r	1
*		VaX isc it	
	10411 4	Stan"ar"	
	10411 5	S v r S rvic	
*	1034312	Int ro nn ct CabX , uaXOp rati n	
	10355 3	Int ro nn ct CabX , TripX Op rati n	
*	10 5 6	Batt r , -V XR b ara abX	
*		araX X its, MuXi-unit Op rati n	
*	1035 23	uaX araX XC n"iti n r it	
*	1035 25	TripX araX XC n"iti n r it	
*	1035 26	TripX araX X iX r	

Not Sh n

6.3 Performa Cv Controls