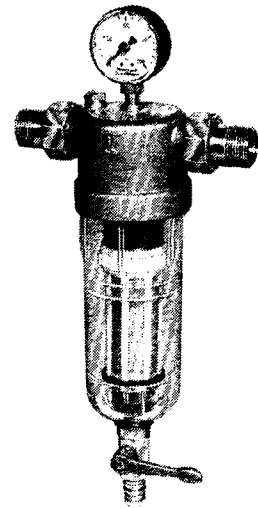


## F76 Water Filters; MV876 Automatic-Backwash Controls

*High flow capacity water filter used to remove sediment and debris from residential or commercial water systems. Used as a prefilter, the F76 Water Filter protects elements of the water system, including specialized treatment devices or other common fixtures and appliances.*



MV876



F76

- The flow, filtering capacity, and ease of cleaning make the F76 the ideal filter for the most demanding applications.
- Uses a built-in backwash impeller for efficient cleaning with supply pressures as low as 21 psi.
- No shut-off or disassembly required for cleaning.
- Design of internal bypass eliminates the possibility of contamination from stagnant water.
- During backwashing, the F76 continues to supply filtered water without interruption through a secondary screen.
- MV876 Automatic-Backwash Controls (order separately) provide automatic backwashing at preprogrammed intervals.

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# Specifications

**IMPORTANT:** *The specifications given in this publication do not include normal manufacturing tolerances. Therefore, units may not exactly match the listed specifications. Also, products are tested and calibrated under closely controlled conditions, and some minor differences in performance can be expected if those conditions are changed.*

**MODELS:**

F76R Water Filter for standard applications.

**MATERIALS OF CONSTRUCTION:**

- Body: Brass
- Sump: Engineered plastic
- Screen: Stainless steel
- Internal Construction: Acetal copolymer
- Seals: NBR
- Ball Valve: Stainless steel with PTFE seals

**INLET PRESSURE:**

- Maximum: 230 psi
- Minimum: 21 psi (with unrestricted backwash discharge)

**DIFFERENTIAL (MAXIMUM RECOMMENDED):** 42 psi

**OPERATING PRESSURE DROP (MAXIMUM RECOMMENDED):** 3 psi (with clean screen)

**TEMPERATURE (MAXIMUM):** 104° F [40° C]

**PIPE SIZES AVAILABLE:** 3/4, 1, 1-1/4 inches.

**SCREEN SIZE:** 100 microns.

**CONNECTIONS:**

Union on inlet and outlet: NPT threaded or sweat.

**DIMENSIONS:** See Fig. 1.

The F76 should be sized based on the required flow rate and the resulting pressure drop across the filter. As a guideline for most applications, the F76 should be sized to avoid pressure drops exceeding 3 psi.

**EXAMPLE:** What size F76 is required to provide a flow rate of 30 gpm? Reading across the chart at a pressure drop of 3 psi, 31.3 gpm can be provided by a 1-1/4 in. filter without exceeding the 3 psi pressure drop.

An increased pressure drop across the filter results when higher velocities are maintained to increase the capacity through any given size filter. Severe pressure drops will be encountered as capacity approaches that of the pipe size.

Capacity in gallons per minute (gpm):

Pressure Drop (psi)	Pipe Size		
	3/4 inch	1 inch	1-1/4 inch
1	6.5	16.7	18.5
2	9.2	24.0	25.8
3	11.4	29.1	31.3
4	13.2	33.9	36.9
5	14.5	37.4	40.7
15	22.0	65.0	70.0
Capacity with backwash port open			
1	4.0	13.0	13.0

NOTE: C<sub>v</sub> is equal to capacity at 1 psi pressure drop.

# Ordering Information

For ordering information when purchasing replacement and modernization products from your TRADELINE® wholesaler or your distributor, refer to the TRADELINE Catalog or price sheets for complete ordering number or specify—

1. Order number.
2. Connections: threaded or sweat.
3. Pipe size.

If you have additional questions, need further information, or would like to comment on our products or services, please write or phone:

1. Your local Honeywell Home and Building Control Sales Office (check white pages of phone directory).
2. Home and Building Control Customer Satisfaction  
 Honeywell Inc., 1885 Douglas Drive North  
 Minneapolis, Minnesota 55422 (612) 542-7500  
 In Canada: Honeywell Controls Limited  
 740 Ellesmere Road  
 Scarborough, Ontario M1P 2V9

International Sales Offices in all principal cities of the world. Manufacturing in Australia, Canada, Finland, France, Germany, Japan, Mexico, Netherlands, Spain, Taiwan, United Kingdom, U.S.A.

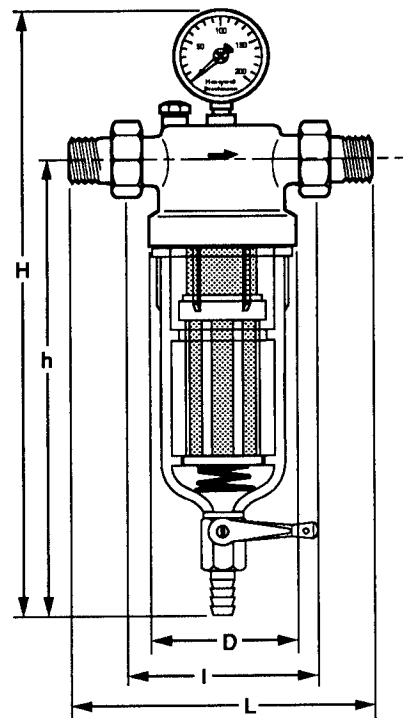
Fig. 1—F76 installation dimensions.

Size	L <sup>1</sup>	I <sup>1</sup>	D <sup>1</sup>	H <sup>1</sup>	h <sup>1</sup>	Weight <sup>2</sup>
3/4 inch	7.0 [178]	4.3 [109]	3.4 [86]	14.5 [368]	10.5 [267]	2.6 [1.2]
1 inch	8.2 [208]	5.1 [130]	3.8 [97]	16.7 [424]	12.6 [320]	4.6 [2.1]
1-1/4 inch	8.7 [221]	5.1 [130]	3.8 [97]	16.7 [424]	12.6 [320]	4.6 [2.1]

<sup>1</sup> Dimensions in inches and [millimeters].

<sup>2</sup> Weight in pounds and [kilograms].

M3230



#### ACCESSORIES:

##### MV876 Automatic-Backwash Controls

Valve with 24 Vac motor and timer replaces ball valve drain port for automatic backwashing at preprogrammed intervals. Intervals are one backwash cycle every day or one backwash cycle every eight days. If more frequent backwashing is required, use an electromechanical timer (S4006B1008, order separately). 24V transformer is not included.

**AT140 General Purpose Transformer.**

**S4006B Electromechanical Timer.**

##### MV876 Specifications:

POWER: 4 VA

CURRENT: 170 mA

VOLTAGE: 24 Vac

CYCLE TIME: 20 seconds (approximate)

TIMER: Variable. One cycle per day or one cycle per eight days.

## Planning the Installation

To ensure the backwash cycle operates properly and cleaning action is not reduced, follow all recommendations in Fig. 2. Refer to Fig. 2a for an ideal installation.

All filter installations are different. The size, type, and amount of dirt and debris and the flow rate must always be considered when choosing a screen and deciding to install F76s in parallel.

#### Commercial and Industrial Installations

Commercial and industrial installations have high flow requirements. For proper operation, the flow across the F76 screen should be limited. For example, larger pipes with high flow may experience linear velocity across a clean screen that exceeds 12 feet per second. This high linear velocity impacts dirt very deeply into the screen, making it difficult to backwash and causing the screen to plug up very quickly. In these situations, multiple F76 should be installed in parallel. Refer

to Fig. 3.

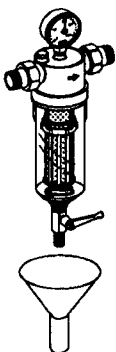
When installing three F76 in parallel, a restriction must be installed in the outlet of the center F76 to maintain even flow through all three F76. Refer to Fig. 3.

Advantages of installing F76 in parallel:

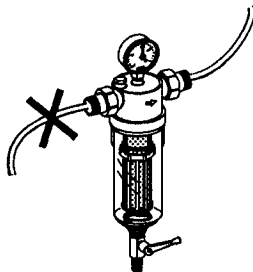
- The cleaning capacity is increased. Screens will not have to be backwashed as often.
- One F76 can be backwashed while the others maintain required downstream flows.

Another consideration in commercial and industrial installations is the backwashing frequency. Because of the high flow requirements, screens need regular cleaning. An MV876 Automatic-Backwash Control can be installed to backwash the F76 automatically either once every day or once every eight days. An optional S4006B1008 Electromechanical Timer can be installed with the MV876 to automatically backwash the F76 as often as once every hour.

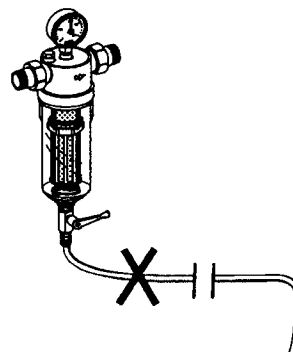
Fig. 2—Installation recommendations.



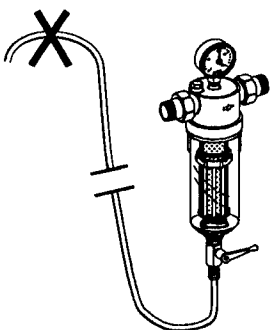
2a. Ideal F76 installation. A funnel mounted directly under the backwash port is the best installation layout.



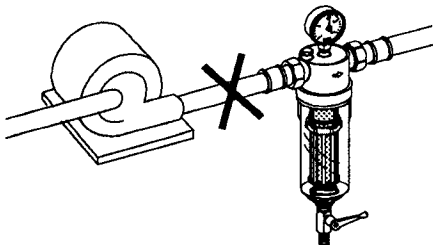
2b. Ensure the inlet pipe is not down-sized. Do not use 1/4 or 3/8 inch tubing on 1/2 or 3/4 inch models.



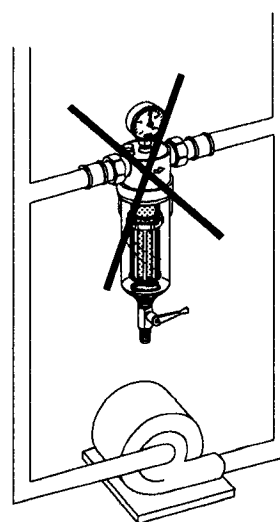
2c. Ensure the backwash outlet pipe is not down-sized, long, or crimped. Instead, install a short oversized pipe on the backwash outlet. Do not use a low capacity solenoid valve to automate the backwash cycle.



2d. Ensure the backwash outlet is not raised above the F76. If the backwash outlet must be raised above the F76, increase inlet pressure 5 psi for every 10 feet it is raised.



2e. Ensure the F76 is not used with an undersize pump. An undersized pump may not provide proper pressure or flow.



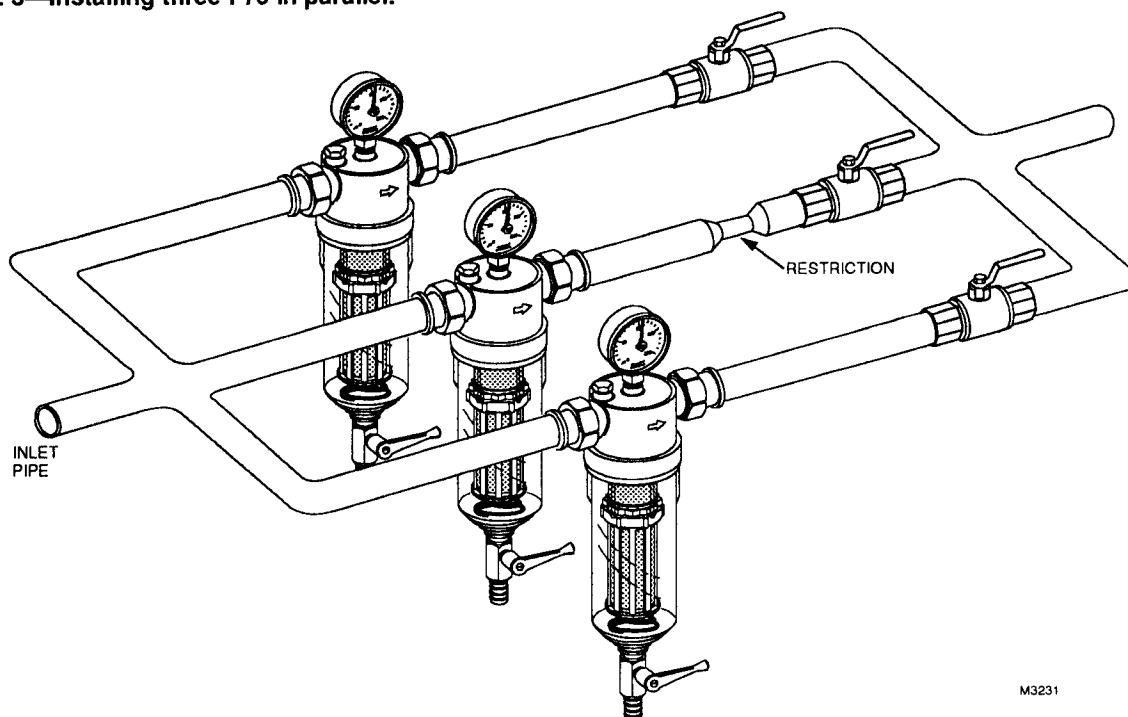
2f. Ensure the F76 is not installed in a bypass across a pump.



 Insufficient inlet pressure will not spin the impeller, reducing cleaning action.

M749A

Fig. 3—Installing three F76 in parallel.



## Installation

### WHEN INSTALLING THIS PRODUCT...

1. Read these instructions carefully. Failure to follow them could damage the product or cause a hazardous condition.
2. Check the ratings given in these instructions and on the product to ensure the product is suitable for your application.
3. Ensure installer is a trained, experienced service technician.
4. After completing installation, use these instructions to check product operation.

### INSTALL THE F76 (REFER TO FIG. 4)

1. Shut off the water supply by closing the water supply valve.
2. Install the F76 in the water line with the arrow pointing in the direction of water flow.
  - Ensure the water temperature will not exceed 104° F [40° C] and the water pressure will not exceed 230 psi.
  - Before sweating, separate the tailpieces and nuts from the filter body. Excessive heating may damage the F76s internal parts.
3. Install pressure gauge in center port of the F76.
4. Install the backwash outlet handle on the F76 backwash outlet. Installation screw is provided in place on the back wash outlet. If installing an MV876, follow the instructions provided below.

5. Install the backwash outlet. For best installation, refer to Fig. 2a.

6. Close the backwash outlet. With the F76 air vent open, slowly open the water supply valve. When the F76 sump is full of water, close the air vent and fully open the supply valve.

### SET THE F76 PRESSURE GAUGE NEEDLES

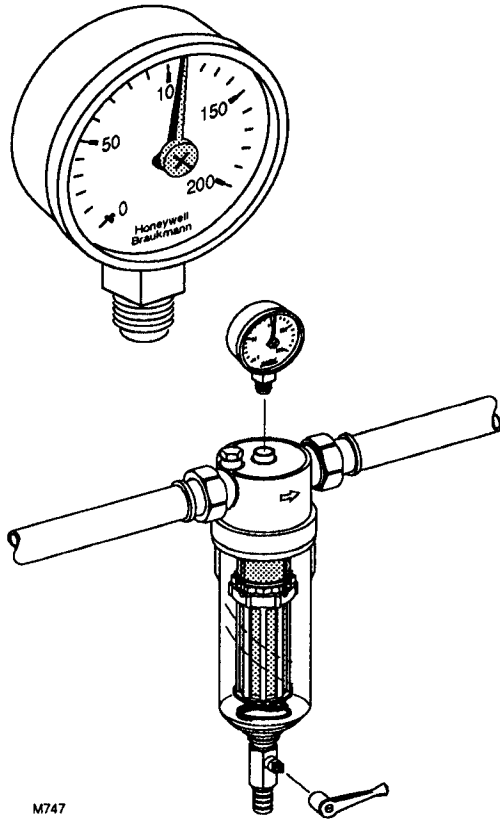
The black needle on the pressure gauge measures the F76 outlet pressure. When the F76 is running with clean screens, there is no pressure drop across the F76 (outlet pressure equals the inlet pressure).

The red needle is a stationary needle that helps monitor backwashing frequency.

1. Backwash the F76 once to ensure the screens are clean.
2. With the F76 in operation, use a screwdriver to set the red needle to the same position as the black needle.

As the F76 operates, the screens become plugged. As a general rule, the F76 should be backwashed when the black needle measures about 5 psi lower than the red needle. However, each installation is different. In residential applications, the F76 may need backwashing once every few weeks or months. In industrial applications, the F76 may need backwashing several times a day. To determine the backwash frequency, follow the instructions on page 8.

Fig. 4—Installing the F76.

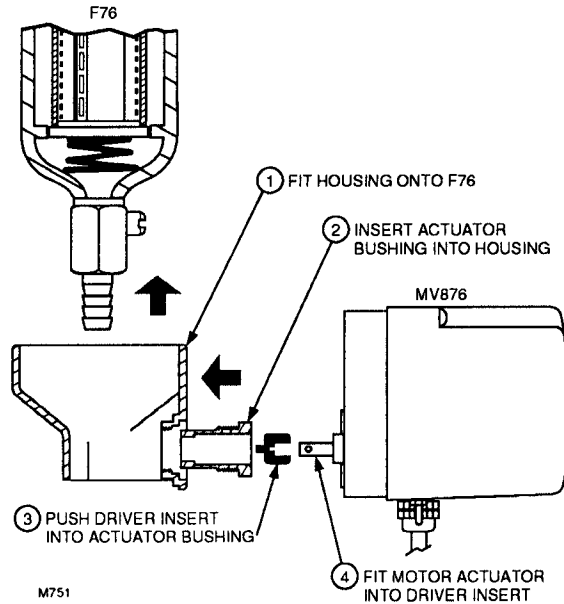


M747

**INSTALL THE MV876**

1. If the MV876 is being added to an existing F76, shut off the water supply by closing the water supply valve. Drain all water from the F76 by opening a fixture downstream, opening the backwash outlet, and loosening the air vent on the top of the F76.
2. Remove the backwash outlet from the F76 sump by turning the outlet counterclockwise (as viewed from the bottom looking up).
3. Install the backwash outlet included with the MV876. Ensure the plastic washer is placed between the filter sump and the backwash outlet. If the washer is not installed, the backwash outlet and the MV876 will not align properly.
4. Close the backwash outlet on the MV876 with a screwdriver.
5. Fit the MV876 brass housing onto the F76. Line up the backwash stem with the opening in the housing.
6. Insert the actuator bushing into the housing opening. Turn until finger tight. Ensure the bushing is in the correct position over the backwash stem as shown in Fig. 5.
7. Push the driver insert adapter into the bushing as shown. The driver head of the insert must engage the slot in the backwash stem. The correct position of the components is shown in Fig. 6.
8. Tighten the actuator bushing.
9. Fit the timer actuator shaft into the driver insert. Ensure the pins in the shaft engage the slots in the driver insert. Fasten the actuator to the brass housing using the screws provided.

Fig. 5—Installing the MV876.



M751

**CAUTION**

- Disconnect power supply before wiring to prevent electrical shock or equipment damage.
- All wiring must comply with applicable codes and ordinances.

10. Mount the AT140 Transformer and wire as shown in Fig. 7.

11. With the F76 air vent open, slowly open the water supply valve. When the F76 sump is full of water, close the air vent and fully open the supply valve.

12. Reconnect power to the system. When the system is powered, the MV876 will run through one backwash cycle (approximately 20 seconds).

13. Set the backwash frequency for the MV876 to the desired setting (one backwash every day or one backwash every eight days). If a greater backwash frequency is required, install an S4006B1008 Electromechanical Timer. Follow the instructions provided below.

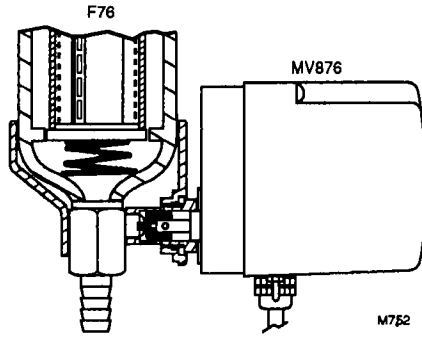
14. Check the operation of the MV876 by interrupting power to the unit. When power is switched back on, the MV876 will backwash the F76 once.

**INSTALLING THE MV876 WITH S4006B1008 ELECTROMECHANICAL TIMER**

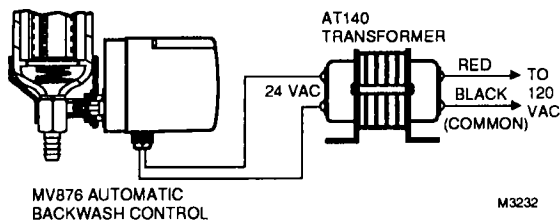
**CAUTION**

- Disconnect power supply before wiring to prevent electrical shock or equipment damage.
- All wiring must comply with applicable codes and ordinances.

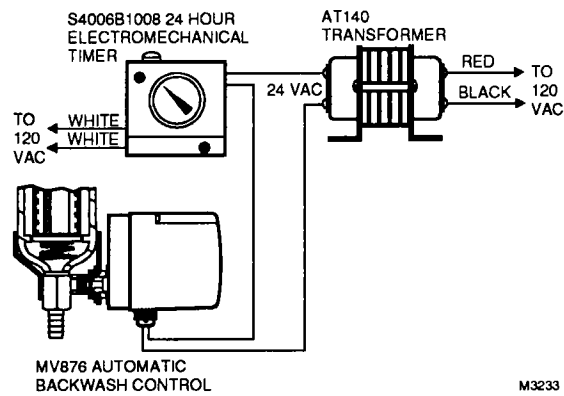
**Fig. 6—Final position of MV876 and F76 components.**



**Fig. 7—Wiring diagram for F76 with MV876.**



**Fig. 8—Wiring diagram for F76 with MV876 and S4006B1008.**



1. Install the MV876 and F76 using the instructions above.
2. Wire the S4006B1008 Electromechanical Timer, AT140 Transformer, and MV876 Automatic-Backwash Control as shown in Fig. 8.
3. Set the timer to the correct time using the S4006B 1008 instructions.
4. To backwash at a selected time, raise the appropriate tripper on the timer. A raised tripper supplies power to the MV876 for one-half hour. The MV876 will complete one backwash cycle each time a tripper switches power on.
5. Ensure the trippers adjacent to a raised tripper are in the down position to remove power at the end of 30 minutes.
6. To backwash once every hour (24 times every day), set the trippers alternately up and down around the dial. This is the maximum number of times per day that the F76 can be backwashed using the S4006B 1008 and MV876.

## Operation

The F76 Water Filter removes sediment and debris from the water using an upper and lower screen. During normal operation, no water passes through the upper screen. Instead, the rapid water flow rushes past the screen, keeping it clean. Debris and sediment removed from the upper screen and in the water supply are removed as water passes through the lower screen. Refer to Fig. 9a.

With continued operation, the lower screen becomes plugged, lowering efficiency and creating a pressure drop across the F76. As a general rule, the F76 should be backwashed when the black needle measures about 5 psi lower than the red needle. However, each installation is different.

To backwash the F76 manually, open the backwash outlet on the bottom of the F76. Opening the backwash outlet reverses the water flow through the lower screen. The reversed water flow is enhanced by water jets from the rapidly spinning impeller. The reverse flow from the impeller removes trapped sediment and debris from the lower filter

and drains it out the backwash outlet. Each installation is different, but approximately 30 seconds are needed to clean the lower screen. Refer to Fig. 9b.

While the lower filter is being backwashed, the upper filter removes sediment and debris from the water. Some of the water that passes through the upper screen is directed through the impeller for backwashing the lower screen and the remaining water is available to meet water needs downstream.

The F76 requires no maintenance if backwashed at the proper frequency.

### DETERMINING THE PROPER BACKWASHING FREQUENCY

All F76 applications are different and require backwashing at different intervals. If the local water supply contains many contaminants, the F76 should be backwashed more often. Also, when water usage is high, the F76 should be backwashed more frequently.

**EXAMPLE:** In the northern states, water usage is higher in the summer months compared to the winter months because people water lawns in the summer. Therefore, the F76 should be backwashed more often during the summer months than the winter months.

By accurately determining a proper backwash frequency, the F76 will operate at a higher efficiency.

To determine the F76 backwash frequency, follow these instructions:

1. Backwash the system once to ensure the lower screen is clean. After backwashing the F76, the black pressure gauge needle measures the F76 outlet pressure. When the screens are clean, the inlet pressure equals the outlet pressure because there is little pressure drop across the F76.
2. Using a screwdriver, set the red needle to the same value as the black needle.
3. Record the date and time.
4. Closely monitor the F76. As the F76 works, the screens will become clogged and the outlet pressure will be reduced.

As a general rule, the F76 should be backwashed when the black needle measures about 5 psi lower than the red needle.

However, each installation is different and requires backwashing at different times.

5. Record the date and time again. In residential applications, the F76 may need backwashing once every few weeks or months. In industrial applications, the F76 may need backwashing several times a day.

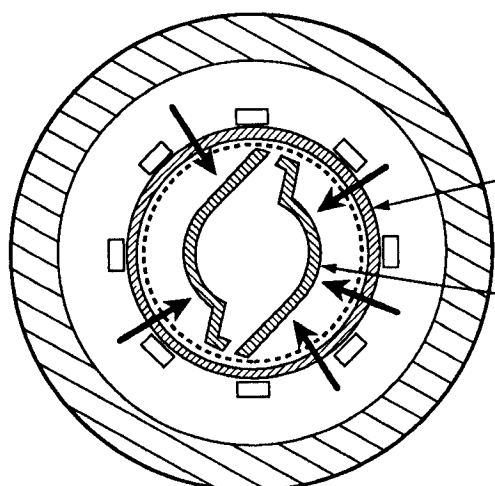
6. Backwash the F76 regularly at the determined interval. Backwashing can be done manually or automatically.

- To backwash the F76 manually, open the backwash outlet for approximately 30 seconds. Each installation is different, but approximately 30 seconds are needed to clean the lower screen.
- To backwash automatically, install an MV876 Automatic-Backwash Control. The MV876 will automatically backwash the F76 either once every day or once every eight days. For more frequent backwashing, install an S4006B1008 with the MV876. The S4008B1008 is an electromechanical timer that can backwash the MV876 as often as once every hour. Refer to page 3 for ordering information and page 6 for installation instructions.

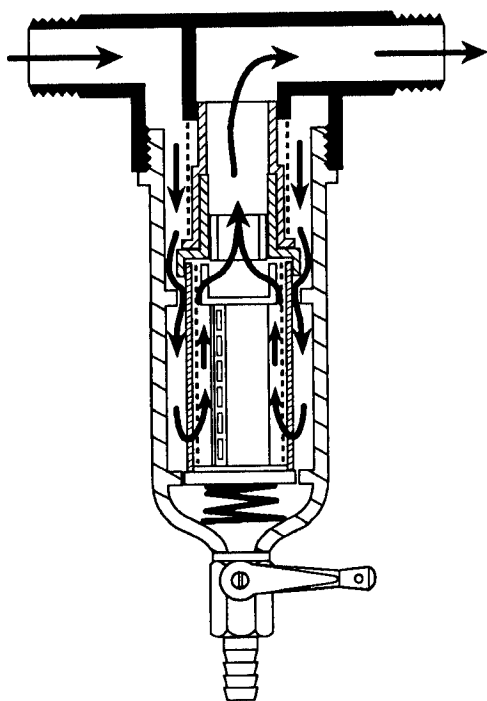


Fig. 9—Water flow through the F76.

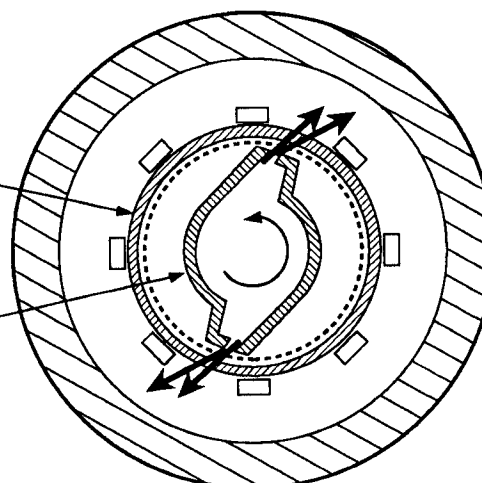
a. F76 DURING NORMAL FLOW



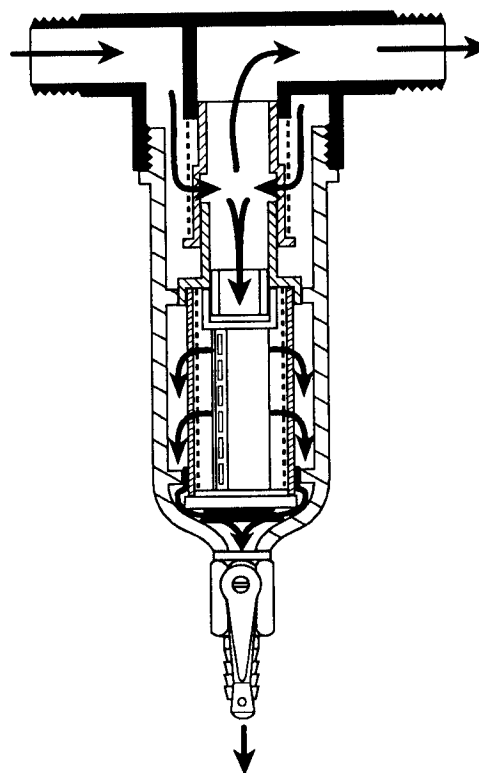
ENLARGED  
CROSS SECTION OF  
LOWER SCREEN



b. F76 DURING BACKWASH CYCLE



ENLARGED  
CROSS SECTION OF  
LOWER SCREEN



M750

# Replacement Parts List

Description	Part Number		
	3/4 inch	1 inch	1-1/4 inch
(A) Pressure Gauge	204320	204320	204320
Union Assembly Sweat Threaded (Shown) Includes: (B) Tailpiece (C) Union Nut (D) Tailpiece Gasket	204310 204307	204311 204308	204312 204309
Screen Kit 100 Micron Includes: (F) Upper Screen (L) Lower Screen	204305	204306	204306
Internal Seal Kit Includes: (H) Barrel O-Ring (K) Screen Seal (Q) Chamber O-Ring (S) Joint Ring Seal	204313	204314	204314
Filter Insert Kit Includes: (E) Brass Ring (G) Upper Guide Barrel (H) Barrel O-Ring (J) Lower Guide Barrel (K) Screen Seal (M) Impeller (N) Lower Screen Support (P) Conical Base Spring (Q) Chamber O-Ring	204303	204304	204304
Filter Sump Kit Clear Plastic Includes: (Q) Chamber O-Ring (R) Sump (S) Joint Ring Seal (T) Drain Tap (Backwash Outlet) (U) Red Handle and Screw	204301	204302	204302
Drain Tap Assembly Includes: (S) Joint Ring Seal (T) Drain Tap (Backwash outlet) (U) Red Handle and Screw	204318	204318	204318
(U) Red Handle and Screw	204319	204319	204319



**Honeywell**

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Golden Valley, Minnesota 55422

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