FLV SERIES, PVC & CPVC DUPLEX BAG FILTER

INSTALLATION, OPERATION
AND MAINTENANCE

PLEASE READ THE FOLLOWING INFORMATION PRIOR TO INSTALLING AND USING HAYWARD VALVES, STRAINERS, FILTERS, AND OTHER ASSOCIATED PRODUCTS. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN SERIOUS INJURY.

1. Hayward guarantees its products against defective material and workmanship only. Hayward assumes no responsibility for damage or injuries resulting from improper installation, misapplication, or abuse of any product.
2. Hayward assumes no responsibility for damage or injury resulting from chemical incompatibility between its products and the process fluids to which they are subjected. Compatibility charts provided in Hayward literature are based on ambient temperatures of 70 ºF and are for reference only. Customer should always test to determine application suitability.
3. Consult Hayward literature to determine operating pressure and temperature limitations before installing any Hayward product. Note that the maximum recommended fluid velocity through any Hayward product is eight feet per second. Higher flow rates can result in possible damage due to the water hammer effect. Also note that maximum operating pressure is dependent upon material selection as well as operating temperature.
4. Hayward products are designed primarily for use with non-compressible liquids. They should NEVER be used or tested with compressible fluids such as compressed air or nitrogen.
5. Systems should always be depressurized and drained prior to installing or maintaining Hayward products.
6. Temperature effect on piping systems should always be considered when the systems are initially designed. Piping systems must be designed and supported to prevent excess mechanical loading on Hayward equipment due to system misalignment, weight, shock, vibration, and the effects of thermal expansion and contraction.
7. Because PVC and CPVC plastic products become brittle below 40 ºF, Hayward recommends caution in their installation and use below this temperature.
8. Published operating torque requirements are based upon testing of new valves using clean water at 70 ºF. Valve torque is affected by many factors including fluid chemistry, viscosity, flow rate, and temperature. These should be considered when sizing electric or pneumatic actuators.
9. Due to differential thermal expansion rates between metal and plastic, transmittal of pipe vibration, and pipe loading forces DIRECT INSTALLATION OF METAL PIPE INTO PLASTIC CONNECTIONS IS NOT RECOMMENDED. Wherever installation of plastic valves into metal piping systems is necessary, it is recommended that at least 10 pipe diameters in length of plastic pipe be installed upstream and downstream of the plastic valve to compensate for the factors mentioned above.

DEPRESSURIZE AND DRAIN SYSTEM PRIOR TO INSTALLING OR MAINTAINING THIS EQUIPMENT.

SOCKET CONNECTION:

Socket end connections are manufactured to ASTM D2467-94. Solvent cementing of socket end connections to pipe should be performed per ASTM specifications D2855-87. Cut pipe square. Chamfer and deburr pipe. Surfaces must be cleaned and free of dirt, moisture, oil and other foreign material. Remove assembly nuts and end connectors from valve body. Slide assembly nuts, with threads facing valve, onto pipe to which the end connector is to be cemented. Apply primer to inside socket surface of end connector. Never allow primer or cement to contact valve ball or end connector o-ring sealing surfaces, as leaking may result. Use a scrubbing motion. Repeat applications may be necessary to soften the surface of the socket. Next, liberally apply primer to the male end of the pipe to the length of the socket depth. Again apply to the socket, without delay apply cement to the pipe while the surface is still wet with primer. Next apply cement lightly, but uniformly to the inside of the socket. Apply a second coat of cement to the pipe, and assemble the end connector to the pipe, rotating the end connector 1/4 turn in one direction as it is slipped to full depth on to the pipe. The end connector should be held in position for approx. 30 seconds to allow the connection to “set”. After assembly wipe off excess cement. Full set time is a minimum of 30 minutes at 60 to 100 F. Full cure time should be based on the chart below.

JOINT CURE SCHEDULE:

The cure schedules are suggested as guides. They are based on laboratory test data, and should not be taken to be the recommendations of all cement manufacturers. Individual manufacturer’s recommendations for their particular cement should be followed.

	Test Pressures for Pipe Sizes ½” to 1-1/4”		Test Pressures for Pipe Sizes 1-1/2” to 3”		Test Pressures for Pipe Sizes 4” & 5”		Test Pressures for Pipe Sizes 6” to 8”	
Temperature Range During Cure Period(B) °F(°C)	Up to 180 PSI (1240 kPa)	Above 180 to 370 PSI (1240 to 2550 kPa)	Up to 180 PSI (1240 kPa)	Above 180 to 315 PSI (1240 to 2172 kPa)	Up to 180 PSI (1240 kPa)	Above 180 to 315 PSI (1240 to 2172 kPa)	Up to 180 PSI (1240 kPa)	Above 180 to 315 PSI (1240 to 2172 kPa)
60 to 100 (15 to 40)	1 hour	6 hours	2 hours	12 hours	6 hours	18 hours	8 hours	1 day
40 to 60 (5 to 15)	2 hours	12 hours	4 hours	1 day	12 hours	36 hours	16 hours	4 days
20 to 40 (-7 to 5)	6 hours	36 hours	12 hours	3 days	36 hours (A)	4 days (A)	3 days (A)	9 days (A)
10 to 20 (-15 to -7)	8 hours	2 days	16 hours	4 days	3 days (A)	8 days (A)	4 days (A)	12 days (A)

Colder than 10 (-15) Extreme care should be exercised on all joints made where pipe, fittings or cement is below 10°F.

A: It is important to note that at temperatures colder than 20°F on sizes that exceed 3 in., test results indicate that many variables exist in the actual cure rate of the joint. The data expressed in these categories represent only estimated averages. In some cases, cure will be achieved in less time, but isolated test results indicate that even longer periods of cure may be required.

B: These cure schedules are based on laboratory test data obtained on Net Fit Joints (NET FIT=in a dry fit the pipe bottoms snugly in the fitting socket without meeting interference).

THREADED CONNECTION:

Threaded end connections are manufactured to ASTM specifications D2464-88. F437-88 and ANSI B2.1. Wrap threads of pipe with Teflon tape of 3 to 3-1/2 mil thickness. The tape should be wrapped in a clockwise direction starting at the first or second full thread. Overlap each wrap by, 1/2 the width of the tape. The wrap should be applied with sufficient tension to allow the threads of a single wrapped area to show through without cutting the tape. The wrap should continue for the full effective length of the thread. Pipe sizes 2" and greater will not benefit with more than a second wrap, due to the greater thread depth. To provide a leak proof joint, the pipe should be threaded into the end connection "hand tight". Using a strap wrench only. (Never use a stillson type wrench) tighten the joint an additional 1/2 to 1-1/2 turns past hand tight. Tightening beyond this point may induce excessive stress that could cause failure.

FLANGED CONNECTION:

Flange bolts should be tight enough to slightly compress the gasket and make a good seal, without distorting or putting excessive stress on the flanges. Suitable washers should be used between the bolt head and flange and the nut and flange. Bolts should be tightened in alternating sequence.

RECOMMENDED FLANGE BOLT TORQUE

FLANGE SIZE	BOLT DIAMETER.	TORQUE FT. LBS.
2″	5/8″	15-25
3″	5/8″	20-25
4″	5/8″	20-25

NOTE: USE WELL LUBRICATED METAL BOLTS AND NUTS. USE SOFT RUBBER GASKETS.

INSTALLATION:

INSPECTION

Upon receipt of the duplex bag filter, inspect it for damage that might have occurred during transit. Report any damage to the carrier immediately.

LOCATION AND SUPPORT

The Hayward duplex bag filter should be installed not less than 24" down stream of a Hayward strainer. The duplex bag filter must be bolted to the floor to insure proper piping installation.

PIPING INSTALLATION

WARNING: WHEN INSTALLED IN A METAL SYSTEM, PIPING SHOULD INCLUDE A MINIMUM LENGTH OF 10 TIMES THE PIPE DIAMETER OF PLASTIC PIPE UPSTREAM AND DOWNSTREAM OF THE FILTER VESSEL.

EXAMPLE:
A 2" PVC/CPVC filter vessel installed in a metal piping system (O.D. of 2" dia. pipe being 2.375") should have at least 24" (NOMINAL) of plastic pipe upstream and downstream of Duplex unit.

OPERATION:

OPERATING INFORMATION

The Hayward PVC and CPVC duplex bag filter is designed as an integral part of the Hayward filtration-duplex bag filter system. Installed downstream of the Hayward strainer, the Hayward duplex bag filter concentrates the solids, and provides convenient, economical removal of the solids from the process with very low liquid loss.

Large solids are separated from the liquid with the Hayward strainer, while smaller solids are separated by the bag filter. The bag filter concentrates the solids in a disposable bag, while clean liquid is piped back to the process.

WARNING: REMOVE PRESSURE FROM VESSEL BEFORE OPENING OR VENTING.
THE PIPING SYSTEM SHOULD BE PURGED OF AIR BEFORE FULL PRESSURE IS APPLIED.

1. Close the valve on the inlet and outlet of the duplex bag filter by moving the handle.
2. Open the vent located on the top of the bag filter away from the arrow on the handle.
3. Slowly, partially open the valves on the bag filter by partially moving handle.
4. Carefully vent all the air from the bag filter. Close the vent when liquid begins to discharge.
5. Fully open the valves by fully moving the handle.

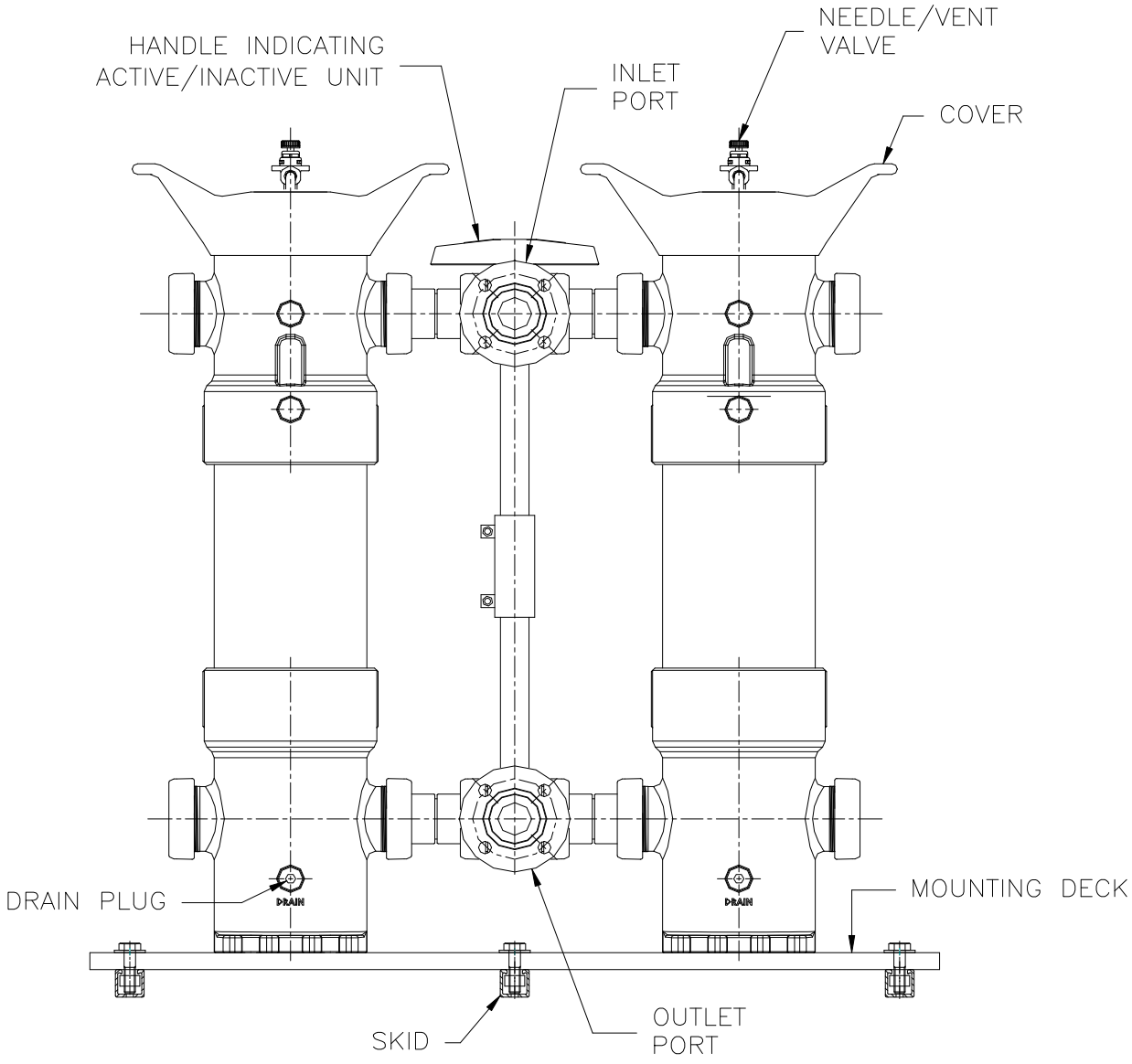
The system is now in operation. Hayward differential pressure gauges should be installed to monitor filter vessel performance and determine when a filter bag requires replacement. A gauge showing a differential pressure of 10 p.s.i. indicates that the filter bag has become "loaded" with solids and should be changed.

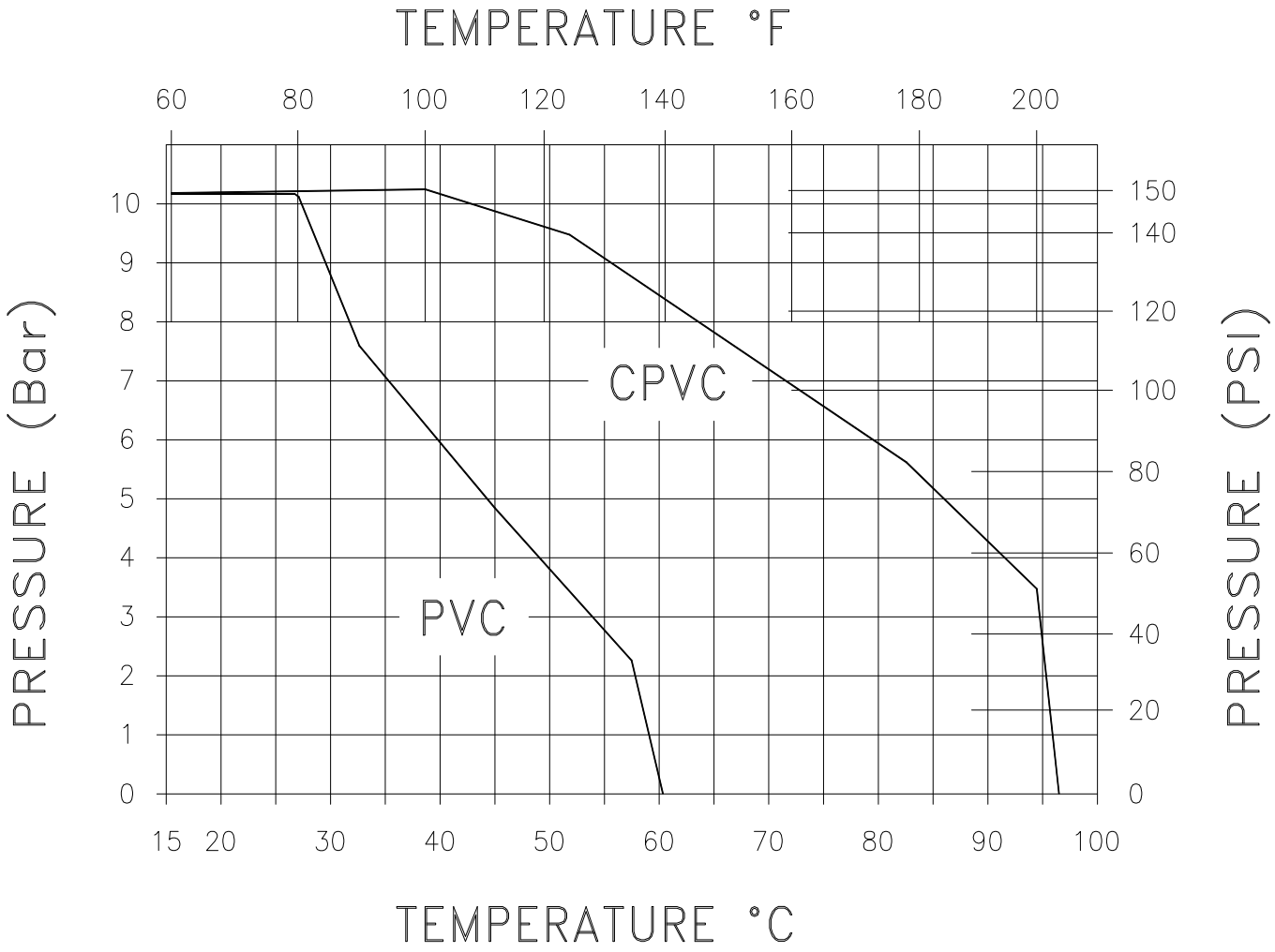
NEVER DISASSEMBLE THE DUPLEX BAG FILTER WHILE IT CONTAINS FLUID. ALWAYS DRAIN ALL PROCESS FLUID BEFORE REMOVING THE COVER.

SPECIFICATIONS

	MAXIMUM WORKING PRESSURE	MAXIMUM WORKING TEMPERATURE	MAXIMUM FLOW	SHIPPING WEIGHT
2" FLV	150 PSIG @ 70° F	140° F, PVC 190° F, CPVC	100 GPM WITHOUT BAG	190 LBS.
3" FLV	150 PSIG @ 70° F	140° F, PVC 190° F, CPVC	150 GPM WITHOUT BAG	
4" FLV	150 PSIG @ 70° F	140° F, PVC 190° F, CPVC	150 GPM WITHOUT BAG	

	SOLIDS COLLECTION CAPACITY	INLET/OUTLET	VENT	SEALS
2" FLV	25 LBS.	2" FLANGED, SOCKETED OR THREADED	¼" NEEDLE VLV.	FPM
3" FLV	25 LBS.	3" FLANGED, OR SOCKETED	¼" NEEDLE VLV.	FPM
4" FLV	25 LBS.	4" FLANGED, OR SOCKETED	¼" NEEDLE VLV.	FPM


HANDLE INDICATING
ACTIVE/INACTIVE UNIT
INLET
PORT
NEEDLE/VENT
VALVE
COVER
DRAIN PLUG
DRAIN
DRAIN
MOUNTING DECK
SKID
OUTLET
PORT


TEMPERATURE °F
60
80
100
120
140
160
180
200
PRESSURE (Bar)
0
1
2
3
4
5
6
7
8
9
10
PRESSURE (PSI)
0
20
40
60
80
100
120
140
150
CPVC
PVC
15
20
30
40
50
60
70
80
90
100
TEMPERATURE °C

FILTER BAG CHANGEOUT / INITIAL INSTALLATION

Removing Filter Bag:

Caution:

a) **Never** open filter vessel while vessel is pressurized!

b) **Always** be aware of what type of media has been flowing through the vessel!

c) **Always** use approved eye and skin protection when opening vessel and during bag removal/change-out!

1.) **Slowly** open vent valve on filter vessel cover to relieve any remaining internal pressure. If vent valve has been connected to some type of external recovery system, carefully disconnect.

2.) With vent valve still open, remove drain plug from lower end of filter vessel body. Unless drain has been connected to an external recovery system, be sure to use a container of adequate size to collect any remaining media that may drain out of filter vessel.

3.) **Carefully** rotate cover counter-clockwise until cover is completely disengaged from filter vessel body being sure not to damage internal threads.

4.) Remove bag retainer to expose top of filter bag.

5.) Grasp bag handle/s (if provided).

6.) Carefully lift/remove bag from inside basket. Take care to avoid possible damage and/or tearing of bag fabric during removal as filtered debris could potentially find its way back into the filter vessel body and downstream.

Installing Filter Bag:

1.) Fold clean filter bag lengthwise.

2.) **Carefully** push filter bag all the way down into basket until top ring of bag rests on top edge of basket. Use bag retainer and cover to completely seat bag ring on top edge of basket during vessel use.