FLTR
Purple Engineering

Tekleen

CSF OWNERS MANUAL

Check List for Optimal Filter Performance

[ ] There should be no back-pressure on the flush line. A 2” valve should have a 3” waste line. Do not use rubber hosing or flexible tubing for the waste line.

[ ] The differential pressure gauge should be mounted within 3 feet of the filter. Long tubing lines will result in faulty gauge readings.

[ ] Sealant should be applied to the wiring contact points on the backside of the d/p gauge to protect it from water. The d/p gauge should be mounted up-side down to prevent shorting of the contact points in the event of a water leak.

[ ] If the filter outlet discharges to a tank, or to open atmosphere, a valve should be installed at the filter outlet to maintain a minimum working pressure of 40 PSI during the cleaning cycle.

[ ] If the flush valve fails to open or close, verify the connections to the controller are wired correctly.

[ ] A surge protector should be installed before the electronic controller.

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SECTION I INTRODUCTION

1.1 Description

The CSF series features automatic, self cleaning screen type water filters. The filtration system consists of a filter body with a fine screen, a flushing valve, and an electronic controller.

1.2 Theory of operation

Pressurized water enters the filter inlet and travels through a mesh stainless steel screen where contaminants are filtered out. The clean water then exits through the outlet of the filter.

When the screen becomes contaminated, a pressure differential is sensed causing the automatic controller to open the flush valve. When the flush valve opens, an atmospheric pressure path is established, causing an orthogonal flow across the filter element. This process removes contaminants from the screen, sending the dirty water through the flush valve.

The entire cleaning cycle takes approximately 4-6 seconds. It should be noted that even during the flush cycle, the filtration process and main flow continues uninterrupted.

1.3 Recommended Applications

Tekleen CSF water filters are ideal for filtering oversized particles in any water source. Applications include cooling water, drinking water, instrument and sensor protection, pump seals, irrigation, and many more.

1.4 Design Features

Among the many features of the CSF models is an avoidance of forcing contaminated water back into the system, which often happens with sand media filters. CSF filters will deliver clean water or no water at all.

The backwash cycle, Tekrinse, uses 90% less rinse water than other filters on the market today.

1.5 Filter Specification Chart

Model	Flange Size	Screen Area	Max. Flow	Empty Weight	Service Area
	Inch	Sq. Ft.	GPM	Lbs.	Inch
CSF 3	3	2	300	100	12
CSF 4	4	2	500	120	12
CSF 6	6	2.5	800	140	14
CSF 8	8	3.9	1320	200	21
CSF 10	10	5.6	1750	300	25
CSF 12	12	8.4	2630	400	36.5
CSF 14	14	9.5	4000	500	36.5
CSF 16-L	16	12.4	6000	600	36.5
CSF 16-S	16	18	10000	1000	36.5

SECTION II INSTALLATION AND HOOK-UP

2.1 Mechanical Hook-Up and Orientation

The positioning of the filter tank should be determined by the disposal of waste water and to allow easy access and removal of filter element (see Filter Specifications Chart for the required service area).The Tekleen filter can rest on the inlet and outlet flanges or can be mounted on a stand if desired. In fact, the filter can be mounted in any position (vertical, upside down, etc.). The electronic controller should be mounted in close proximity to the filter housing.

2.2 Plumbing Hook-Up

The waste discharge pipe should be at least one inch larger in diameter than the size of the flush valve (2" valve to 3" pipe). The waste pipe should be kept as short as possible with no more than one elbow. This will minimize back pressure on the flush line.

Flush lines should not be elevated. This will affect the pressure difference required for the cleaning cycle. If it is necessary to run flush lines uphill, please consult with the manufacturer.

Flush line pipe must be ridged. It should not be made out of flexible tube or rubber hosing. Any restrictions in the flush line will reduce the cleaning ability of the filter.

A block valve should be installed at the inlet of the filter. During start-up, the block valve should be only slightly open to prevent a surge of pressure across the filter when the pump is started. Once the pump is on-line, slowly open the block valve. This will prevent any possible damage to the filter due to a pressure surge.

2.3 GB6, DP Gauge, and Electric Ball Valve Connection

Before power is applied to the electronic controller, make all connections between the controller, DP Gauge, and electric ball valve (see page 15).

1. BALL VALVE: Connect the ball valve to the controller as shown in the wiring diagram (page 15). Activate the manual start switch on the GB6 controller and visually inspect the open and close movement of the ball valve.

2. FLUSHING TIME ADJUSTMENT: The flush time is normally set to 4-6 seconds. NOTE: Excessive flush time will not improve cleaning, and may lead to unnecessary wear and tear on filter equipment.

3. PRESSURE DIFFERNTIAL ADJUSTMENT: The differential switch is preset for 7 PSI. It can be changed to different set points (see your electronic controller manual).

USING 1/4 INCH DIAMETER TUBING

1. Attach tubing to the low pressure ¼" fitting (on the outlet flange). Attach the other end of the tubing to the fitting on the DP switch marked "low" pressure.

2. Attach tubing to the high pressure ¼" fitting (on the inlet flange). Attach the other end of the tubing to the fitting on the DP switch marked "high" pressure.

Notes: Do not run tubing more than three feet in length (preferably two feet or less). Due to the pressure drop across the tubing, the electronic controller may not operate properly if tubing is too long.

SECTION III OPERATION AND ADJUSTMENTS

3.1 Start-Up

During start-up, the block valve at the filter inlet should be only partially open to prevent a surge of pressure across the filter when the pump is started. Once the pump is on-line, slowly open the block valve. This will prevent any possible damage to the filter due to a pressure surge.

During the initial filling of the main pipeline, there may not be enough back-pressure downstream from the filter to allow the cleaning cycle to function properly. Therefore, it is necessary to install a valve at the outlet to be partially closed (i.e., gate valve, ball valve or butterfly valve).

If a downstream main line valve is partially closed, enough to provide 40 PSI at the filter inlet pressure gauge, the self cleaning cycle will operate properly.

Once the total system is fully charged, the downstream valve can be adjusted, as long as 40 PSI is maintained at the filter inlet during the cleaning cycle.
In applications where the main flow to the filter is intentionally interrupted and the line is drained, it is advisable to install a flow control or pressure sustaining valve downstream from the filter. This will create back pressure on the filter in order to enable proper flushing while main line pressurizes.

Once the system is fully pressurized, push the manual flush button on the electronic controller, and verify that the piston is moving and the flush valve is opening all the way. During the first cleaning cycle, air in the system will be expelled, so it may require more than one cycle to achieve proper cleaning.

3.2 Cleaning Cycle Requirements

WORKING PRESSURE
The filter requires a minimum pressure of 40 PSI at the inlet during the cleaning cycle for effective cleaning.

Maintaining the necessary minimum working pressure during the cleaning cycle requires a pump with sufficient capacity. Pump selection will depend on three key parameters: the required working pressure (40 PSI), the process flow of the system, and the flush flow of the filter.

PROCESS FLOW
Process flow is the volumetric rate of water that will pass through the filter during normal operation (when the filter is not in a cleaning cycle).

FLUSH FLOW
The flush flow is the volumetric rate of water that will be used during a cleaning cycle. This rate depends on the size of the flush valve used.

To determine if a pump will satisfy the performance needs of your system, add the process flow of the system to the flush flow of the filter to find the total flow.

Process Flow + Flush Flow = Total Flow

Consult the pump curve provided by the pump manufacturer to determine if it meets the performance requirements. The pump curve describes the performance of the pump in terms of flow and pressure. Locate your total flow on the graph to determine what pressure will be maintained at that flow. If the pressure is greater than 40 PSI, then the pump satisfies the requirements.

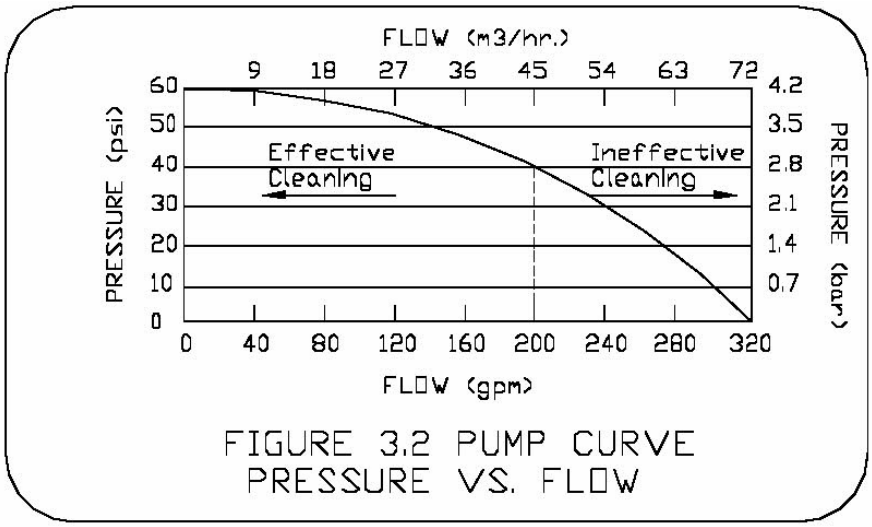


FIGURE 3.2 PUMP CURVE
PRESSURE VS. FLOW

Figure 3.2 shows an example of a pump curve. Since a minimum of 40 PSI must be maintained, the critical point for this pump is at 200 gpm. Any flow greater than this will not yield effective cleaning during the backwash cycle.

If, for example, the process flow were to be 190 gpm and the flush flow 40 gpm, the total flow would be 230 gpm. This would produce an inlet pressure less than the required 40 PSI and as a result the filter would not be able to perform an effective cleaning cycle.

If the process flow were to be 150 gpm with a flush flow of 40 gpm, the total flow would be 190 gpm. This would produce an inlet pressure greater than the required 40 PSI and result in an effective cleaning cycle.

SECTION IV MAINTENANCE

4.1 Shutdown Procedure

When shutting down the filter, steps must be taken to ensure that there will be no reverse flow across the screen that may damage components. The proper shutdown sequence is as follows:

1. Open the bypass valve.
2. Close the outlet valve completely.
3. Close the inlet valve completely. The filter is now isolated and the system flow is bypassed.
4. Relieve any residual pressure in the filter housing by detaching the 1/4" plastic tubing from any fitting.

4.2 Filter Cleaning

It is recommended that the screen be inspected periodically for wear and tear. The flush valve and differential pressure gauge should be inspected at this time as well. Inspection should be performed every three months to ensure that the filter is operating effectively.

To inspect the CSF filter, follow the shutdown procedures outlined in Section 4.1 and proceed as follows:

1. Switch the controller to the “Off” position and unplug it from the power source.
2. Disconnect the valve from the controller.
3. Remove all ¼” tubing from the filter housing.
4. Disconnect the flush line from the filter.
5. Remove cover.

4.3 Periodic Inspection

The following parts should be inspected annually for wear and tear and should be replaced if necessary:

- Cover Seal
- Screen
- Air/Water Connections
- Flush Valve

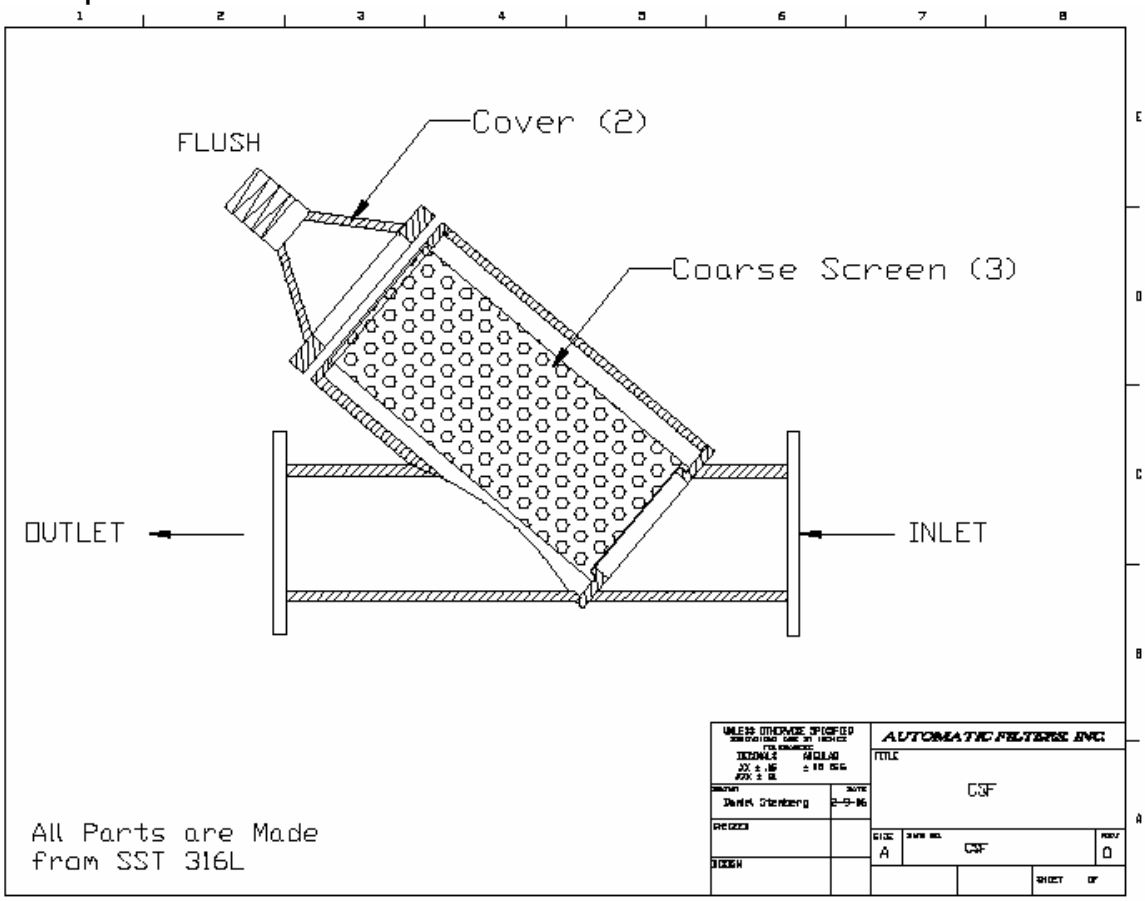
SECTION V SPARE PARTS

5.1 Recommended Spare Parts

The following are recommended spare parts to keep in stock:

- Coarse Screen (3)
- D/P Switch (34)
- Controller Board

5.2 Spare Parts List



Appendix
Special Installation

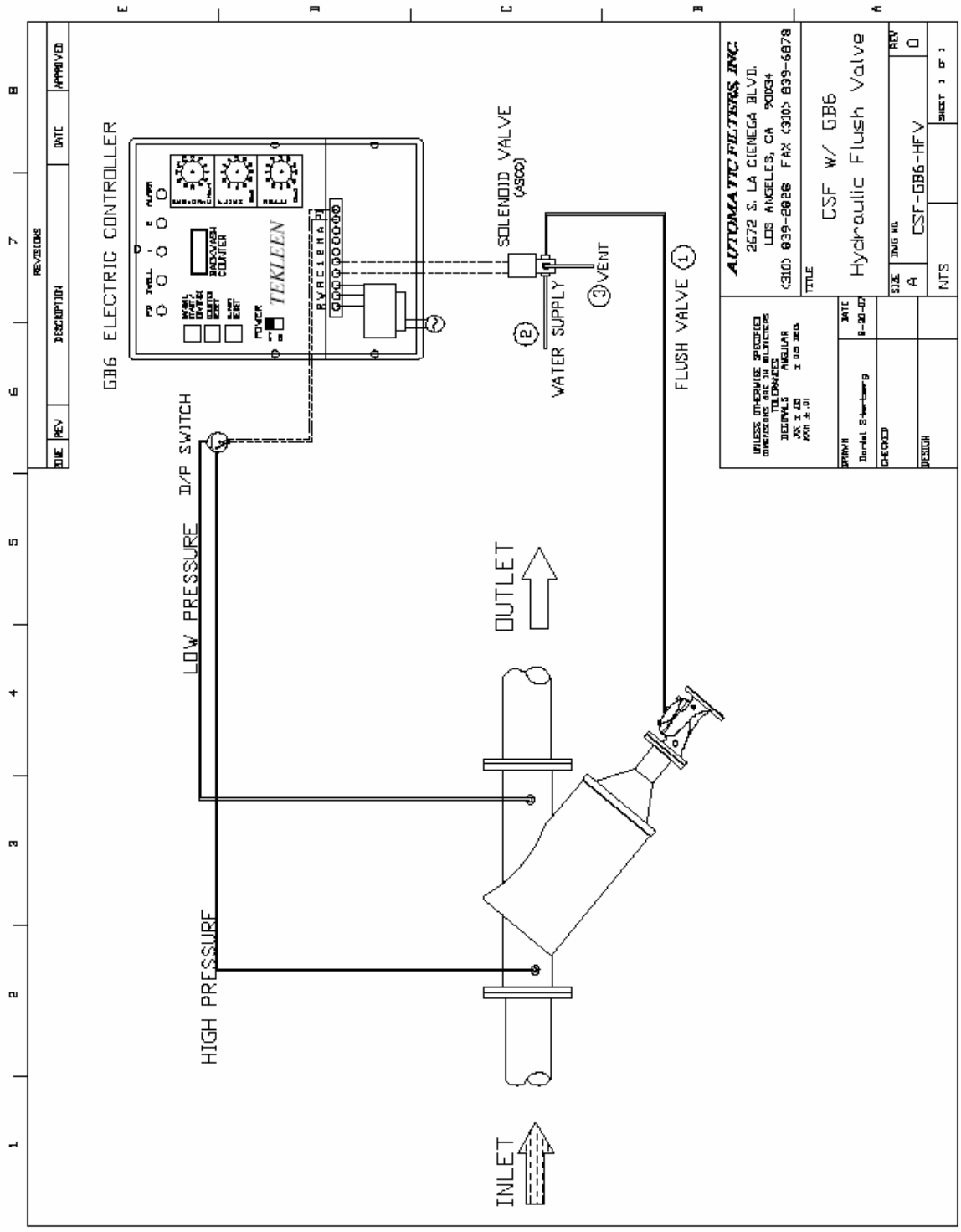
I. AUTOMATIC BYPASS

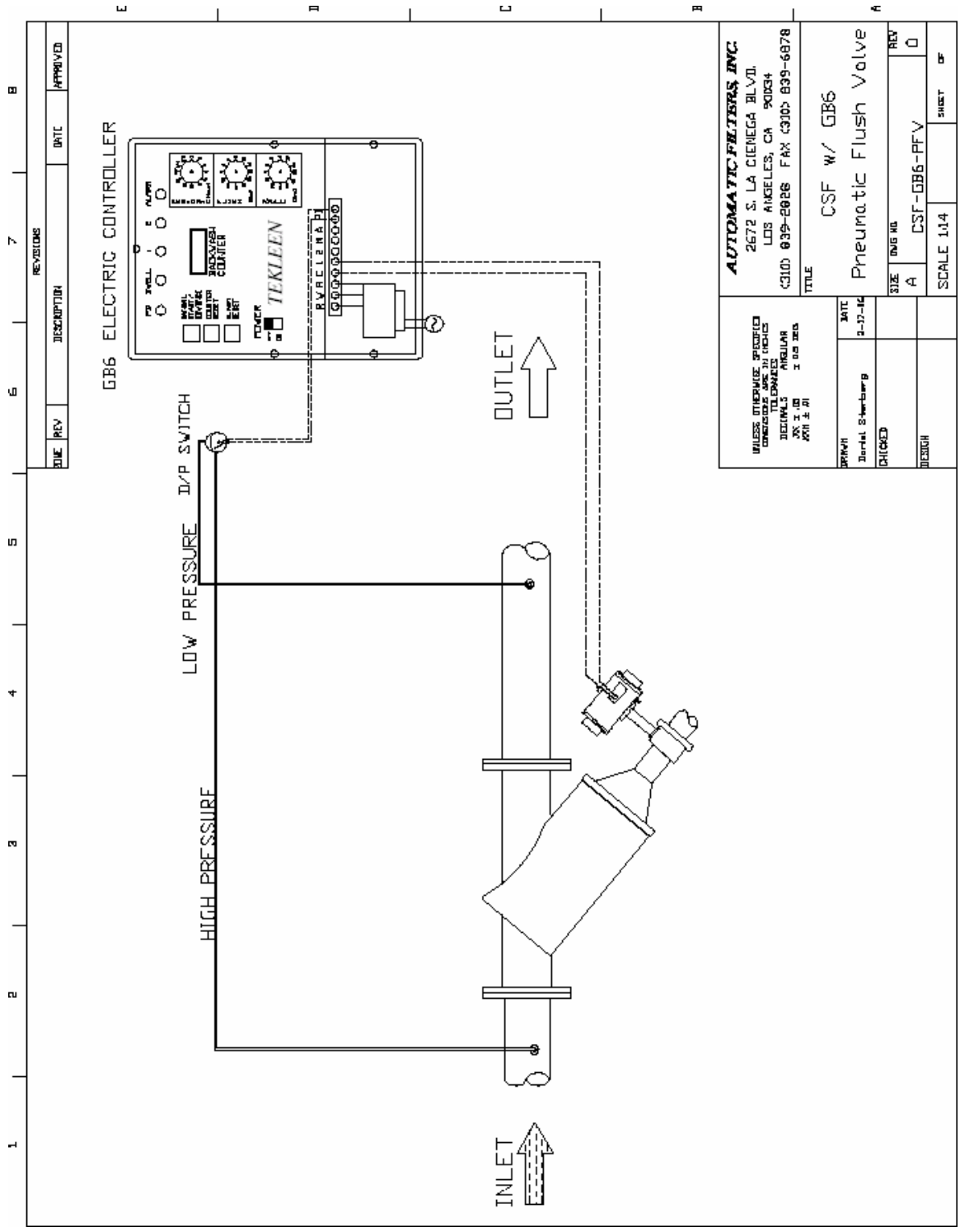
Sometimes it is necessary to have flow even when the filter is out off service for periodic maintenance. In this situation, it is recommended to create a by-pass.

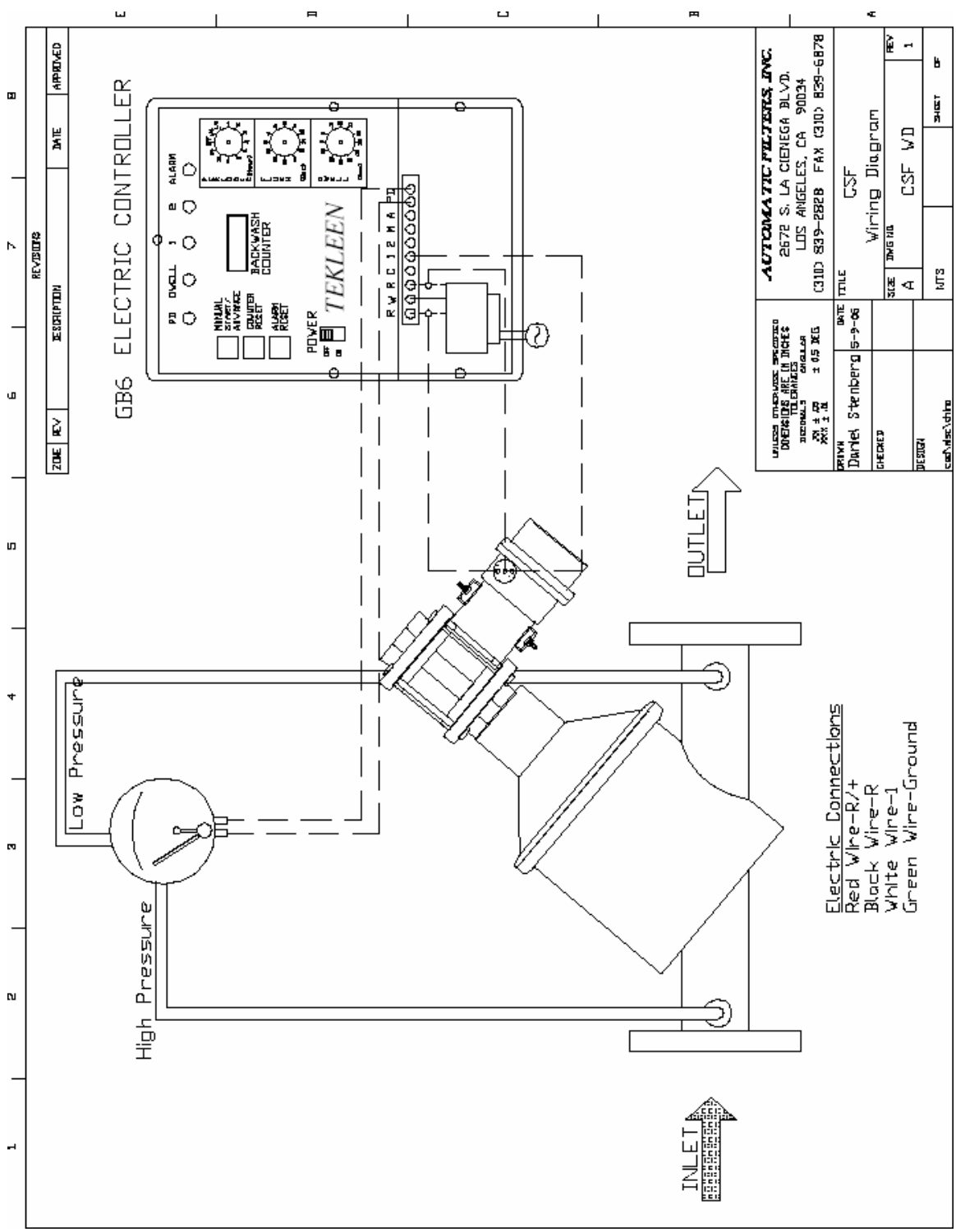
FILTER BYPASS

To install a bypass, add a block valve on both the inlet and outlet and a bypass with another block valve (see drawing).

If the bypass valves are provided with actuators, it can be converted into an automatic bypass system by wiring them to the controller (consult controller manual).






GB6 ELECTRIC CONTROLLER
TEKLEEN
BACKWASH COUNTER
POWER
ALARM
REVISIONS
ZONE
REV
DESCRIPTION
DATE
APPROVED
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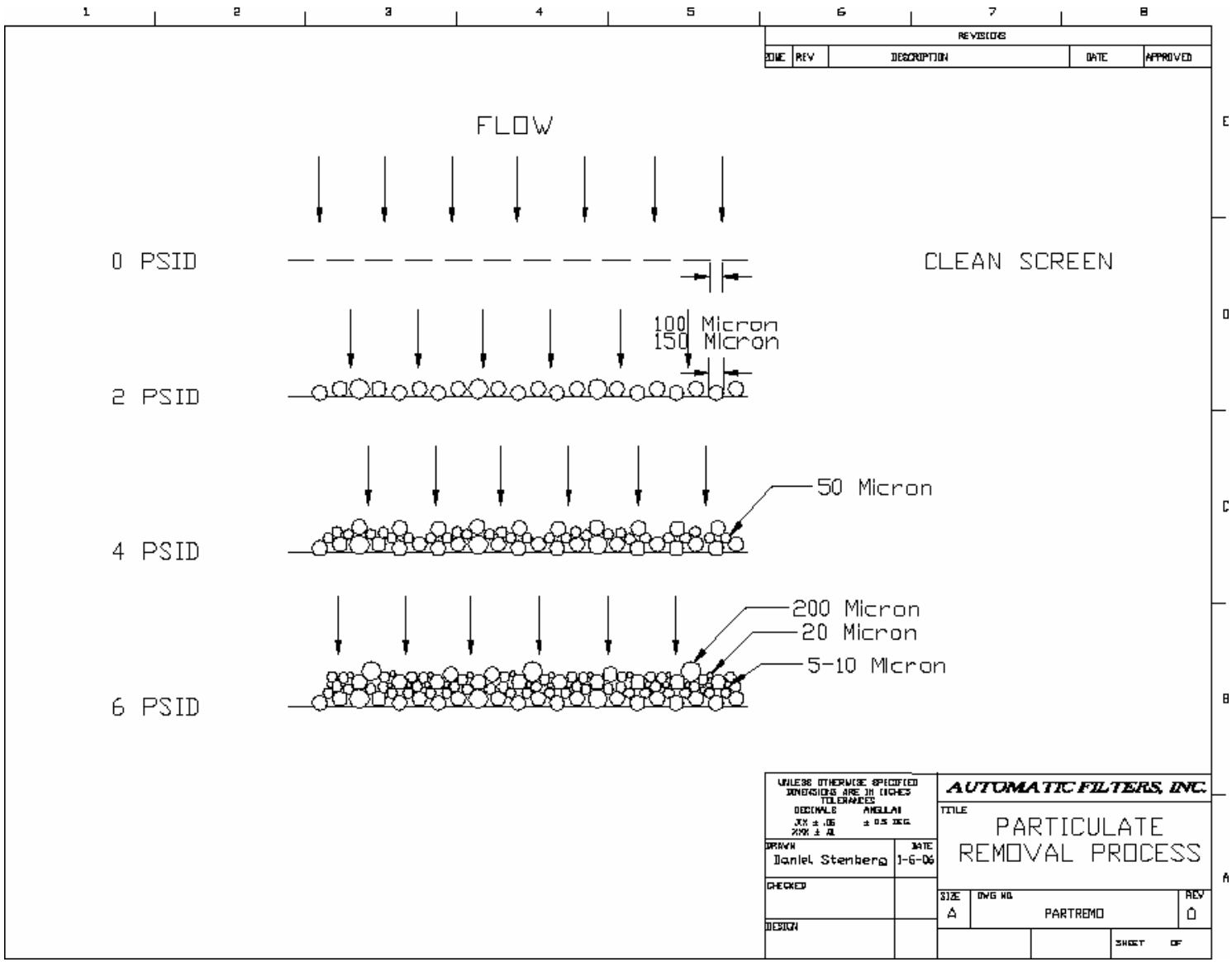
Red Wire-R/+
Black Wire-R
White Wire-1
Green Wire-Ground



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WARRANTY

Automatic Filters, Inc. (AFI) warrants its filters and controllers to be free from original defects for one year from the date of original sale. The manufacturer will replace, free of charge, any part found defective under normal use and service within the guarantee period, provided the product is installed, used, and maintained in accordance with good engineering practice and all applicable instructions or limitations issued by AFI. The manufacturer assumes no liability for incidental or consequential damage sustained in the adoption or use of our engineering data, service, or products. Liability is limited to the repair or replacement of the products. No agent or representative of AFI has the authority to waive or add to this agreement. Altered products or use of products in a manner not intended shall void this warranty. All warranty claims must be sent along with the defective product, freight prepaid to AFI at its business address. All warranty shipments are for the account of the buyer. The warranty period shall be 12 months from the date of shipment to the client.