



Village Marine CMF Media Filtration

Part Number: 95-0019

# CMF Media Filtration Systems

CMF-400, CMF-2000

Installation, Operation & Maintenance

aerospace  
climate control  
electromechanical  
filtration  
fluid & gas handling  
hydraulics  
pneumatics  
process control  
sealing & shielding



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# CMF Media Filtration Systems

CMF-400  
CMF-2000

## Standard Features:

- All wetted parts are of non-reactive materials such as schedule 80 PVC, FRP and 316 stainless steel to ensure long life and trouble free operation
- Glycerine filled pressure gauges for accurate indication of media backflush requirement
- Backflush sight glass allows operator to diagnose filter performance and efficiency
- Specially engineered media packages reduces iron and manganese to reduce damage to membranes and requires no regeneration
- Three-way control valves simplify valve operation for backwash
- 3/4" hose barb connections for inlet, outlet and drain



## Optional:

- Boost pump and Control Box provides extra feed pressure to unit. 110/220/440 Volts, 50/60 Hertz available

Model	part #	Max Flow GPM/LPH	Dimensions inch/cm (WxDxH)	Dry Weight lbs/kg
<b>CMF-400</b>	CMF400	3/700	16/41x15/39x31/79	50/23
1/3 hp pump 110/1/60	90-3778		16/41x8/20x8/20	16/7
1/3 hp pump 220/1/60/50	90-3078		16/41x8/20x8/20	16/7
<b>CMF-2000</b>	CMF2000	8/1800	16/41x15/39x42/107	90/41
1/2 hp pump 110/1/60	90-3693		17/43x9/23x9/23	35/16
1/2 hp pump 220/1/60/50	90-3056		17/43x9/23x9/23	35/16
1/2 hp pump 220/3/60/50	90-3546		17/43x9/23x9/23	35/16
1/2 hp pump 440-380/3/60/50	90-3501		17/43x9/23x9/23	35/16

To maintain peak performance always use genuine Parker-Racor/Village Marine Tec. replacement parts. We reserve the right to change our specifications or standards without notice.

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The following are the types of flags used in this technical manual. They designate safety related items and important operational instructions and should be given special attention when they appear in the text:

**WARNING**

Text formatted in this manner concerns an operating procedure or practice that, if not strictly observed, can result in injury to personnel or loss of life.

**CAUTION**

Text formatted in this manner concerns an operating procedure or practice that, if not strictly observed, can result in damage to or destruction of equipment.

**NOTE**

Text formatted in this manner concerns an operating procedure or condition that warrants special attention

MODEL: \_\_\_\_\_

SERIAL NUMBER: \_\_\_\_\_

DATE OF PURCHASE: \_\_\_\_\_

PURCHASED FROM: \_\_\_\_\_

INVOICE #: \_\_\_\_\_

VESSEL NAME: \_\_\_\_\_

INSTALLED BY: \_\_\_\_\_

DATE OF INITIAL STARTUP: \_\_\_\_\_

Village Marine Tec's Commercial Media Filters (CMF) units are used as optional pretreatment to reduce suspended solids before RO watermakers. A multimedia filter design is employed to trap particles in the raw inlet water. Trapped material can be cleaned away by periodic backwashing.

## INSTALLATION

The CMF unit should be installed in a dry, sheltered location protected from direct weather and from freezing. Drainage should be provided beneath the unit to allow standing water to drain when performing maintenance or repair. If the optional boost pump is installed, the boost pump should be below water line to achieve a flooded suction of seawater from the through-hull. The boost pump is for flooded suction with the static pressure of the sea, and will not withstand a highly pressurized inlet. If a pressurized inlet is used, install a regulating valve to limit pressure to 15 psi. The media tank can be above waterline as the boost pump will lift water to it. Connect electrical power to the option boost pump. Select the circuit breaker size of at least 50% more than the operating amps shown on the serial number tag.

### CAUTION

Inlet and discharge interconnecting lines should be constructed of a NON-FERROUS material. Examples of some suitable materials are PVC, copper-nickel, 316 stainless steel pipe or a reinforced non-collapsing hose. Ferrous piping introduces iron that will compromise performance of the downstream RO system.

### NOTE

Avoid connecting the seawater source to a water line that services another piece of equipment. Air bubbles or cross contamination could create possible operational issues. The best practice is a dedicated through hull for the watermaker, with a separate seacock and strainer.

### CAUTION

Strictly observe all applicable electrical codes and regulations governing the installation and wiring of electrical equipment. Typical codes specify the type and size of conduit, wire diameter and class of wire insulation depending upon the amperage and environment. The power supply should always be of a greater service rating than the requirements of the unit. Never connect the unit to a line that services another electrical device, the CMF boost pump should have its own breaker.

### WARNING

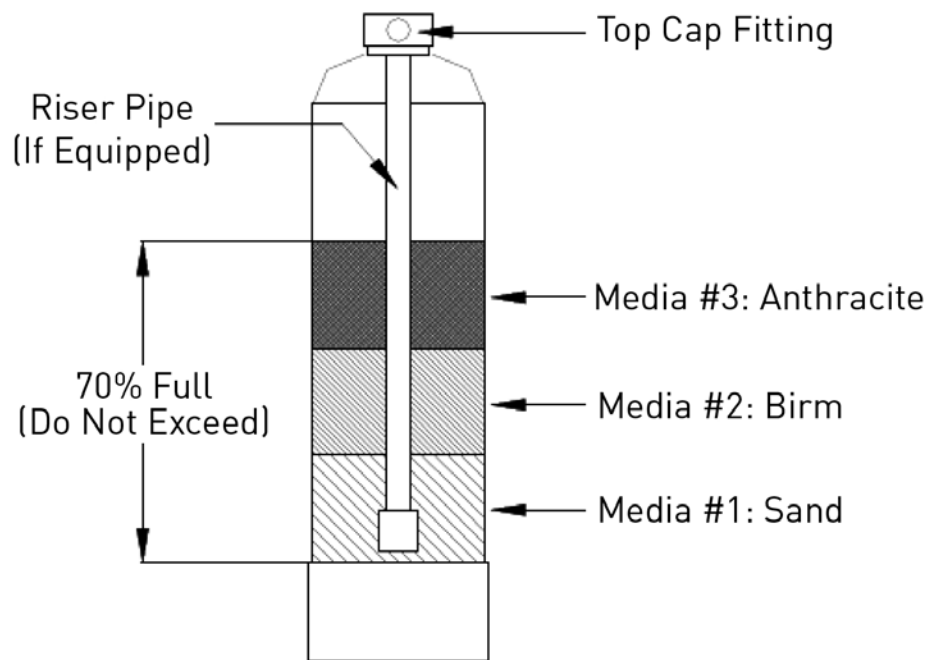
Disconnect electrical power to RO unit prior to servicing the equipment.

## CONNECTIONS AND MEDIA LOADING

The single line connection drawing at the back of this manual shows the plumbing connections required. Seawater inlet, filtered water outlet and backwash to drain can all be  $\frac{3}{4}$ " hose. If the hose run from the seawater supply before the boost pump is longer than a few feet, it can be advantageous to increase that one hose to 1" size on the model CMF-2000.



The CMF is shipped without media inside to allow easier installation in the boat. The media is shipped separately in plastic pails. Before first operation, the media must be loaded, and backwashed clean.



Media Filter Loading

Divide the supplied media evenly by the numbers marked on the pails. Some excess media may be supplied- under no circumstances, DO NOT fill beyond the capacity of 70% full. The media should be poured into the filter in order through the top cap fitting on the tank. The riser pipe must be covered with tape to prevent media falling into the pipe. Filling the tank one-third full of water prior to filling with media will help reduce dust. After loading the media, through the use of a hose or bucket, gradually fill the media tank with water until full. Allow the media tank to stand idle for six to eight hours or overnight. This allows media contents to saturate, settle, and release any trapped air. After the initial media loading, clean the media filter by backwashing several times until the backwash runs crystal clear.

## OPERATING PROCEDURE

There are two operating modes. In service mode, the inlet water enters the top of the media filter, is filtered by passing downwards through the bed and enters the strainer at the bottom of the tank, flows upwards through the riser pipe, and out as filtered water. In backwash mode, inlet water flows down the riser tube and out the strainer, flow upwards through the media bed lifting dirt and collected solids, out the top of the tank and to drain.

The arrows on the valve handles and the labels for valve direction will clarify the valve positions for each mode. At first, it may be helpful to trace the pipe directions to confirm your understanding of flow in the two operating modes.

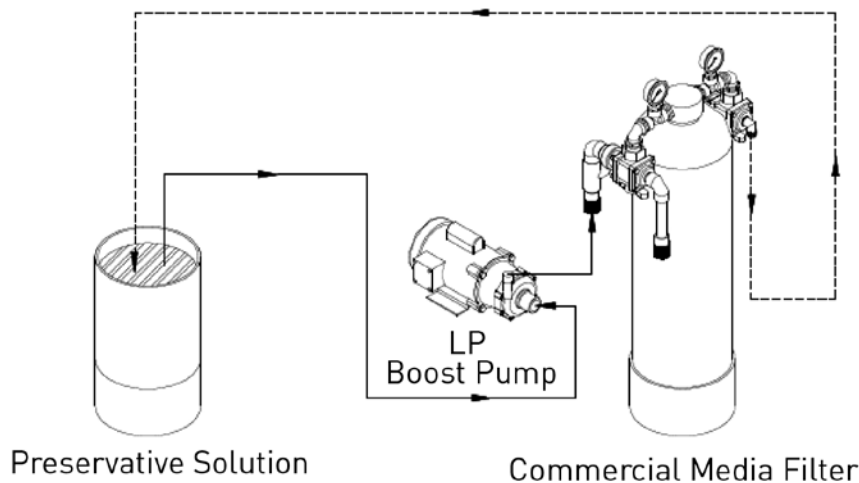
Filter condition can be monitored from the pressure gauges on top of the tank. Make a note of the inlet/outlet pressure difference when the filter is 100% clean, and set a schedule that backwashes when the differential increases about 5 psi higher than the “clean” differential. To backwash, stop the pump, turn both 3-way valves 180 degrees and restart the pump. There is a section of clear pipe on the backwash drain discharge to give a confirmation that dirt is being lifted out of the filter. Let the backwash runs for 2 to 3 minutes before stopping the pump, then put the unit back in service by switching the valves both back 180 degrees.

## PRESERVATION AND FREEZE PROTECTION

During regular operation, regular backwashing will keep the CMF clean. However during long idle periods there is the opportunity for biological growth inside, building up organic matter and creating unwanted odors. If the CMF cannot be backwashed clean once per week, the a longer term preservation can be used.

Village Marine can product a preservative chemical (part 85-0038, labeled cleaner #3) that will impede biological growth for up to 4 months.

Step 1: Dissolve 300 grams (  $\frac{3}{4}$  lb) of preservative chemical #3 with five gallons of water in a pail.

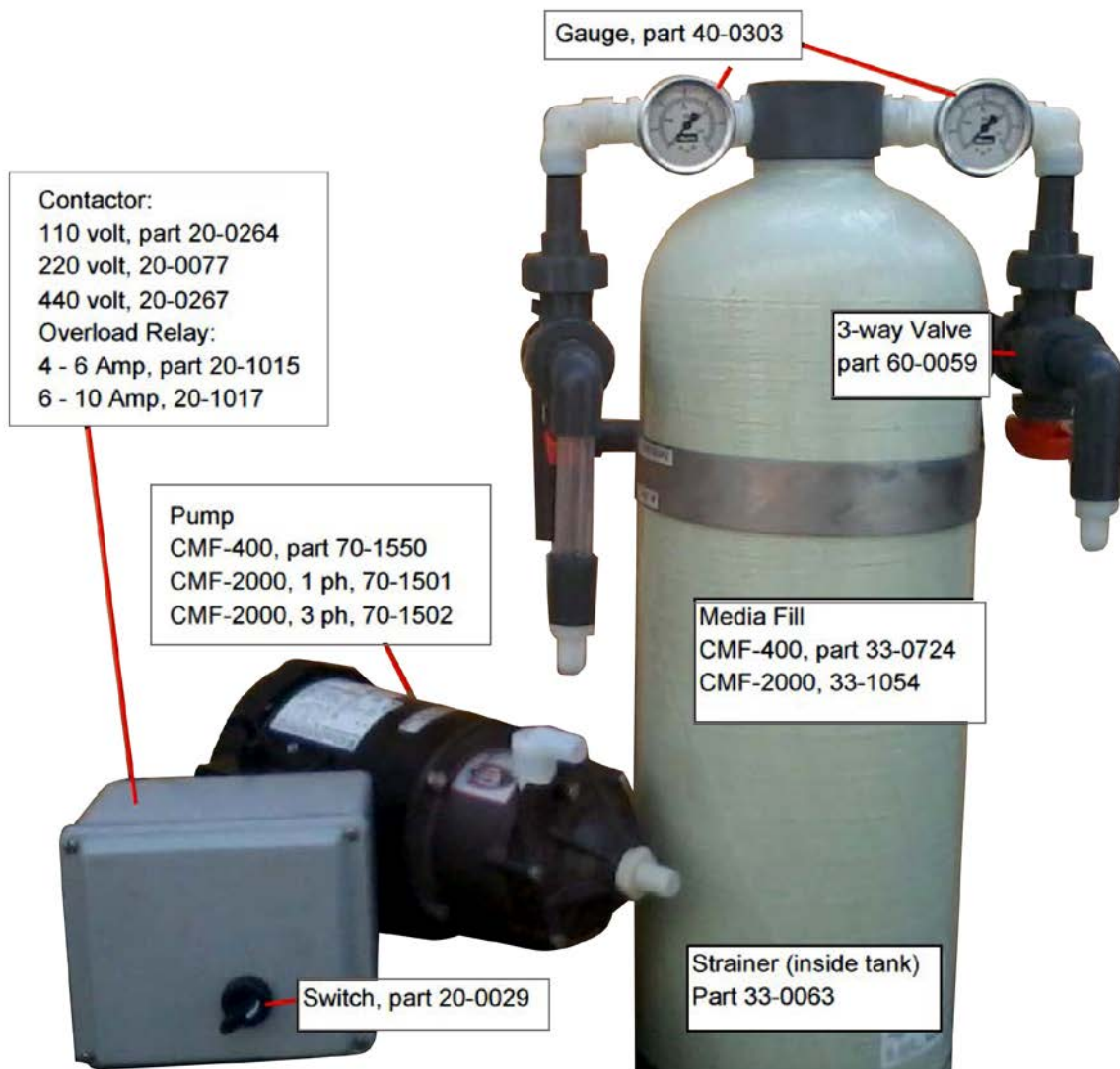


Step 2: Temporarily reroute inlet the outlet hoses to make a closed loop with the pail as shown in the diagram above.

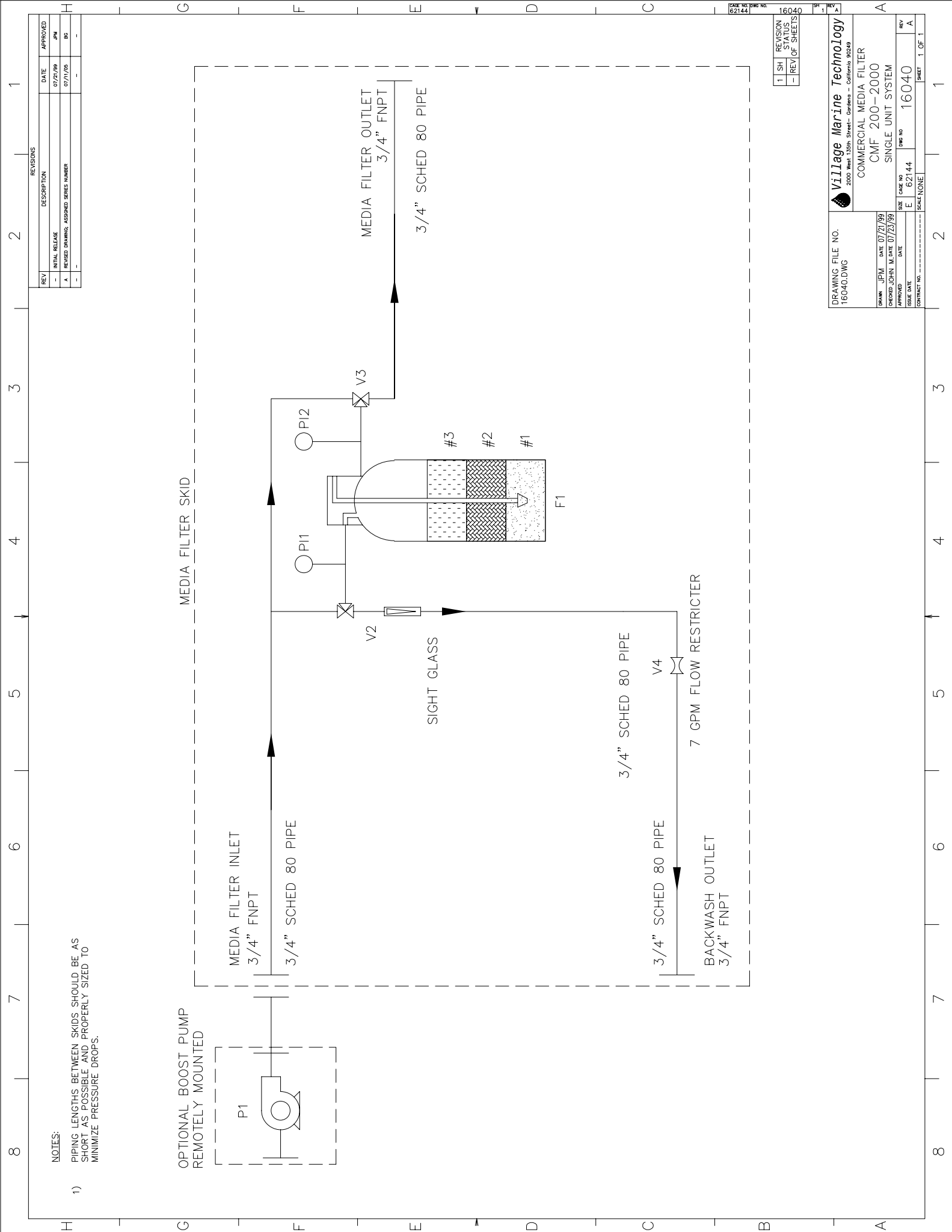
Step 3: Start the boost pump to circulate preservative through the CMF for 10 minutes.

Step 4: The CMF filter is now preserved and can be reconnected to original connections. The CMF may be left idle for an extended period of time. This preservation procedure should be repeated at least EVERY FOUR MONTH INTERVAL during the shutdown. In colder climates, the interval between preservation cycles may be extended up to 6 months. Remember to backwash out old preservative before re-preserving or before resuming use of the watermaker.

In cold climates, winter freeze protection is sometimes necessary. If it is impractical for the CMF system to be drained dry to protect it, then an alternate freeze protection is also to circulate propylene glycol (sold in cold climates as RV antifreeze) using the same procedure as above.







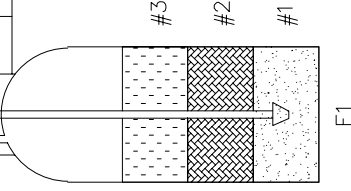
NOTES:  
 1) PIPING LENGTHS BETWEEN SKIDS SHOULD BE AS SHORT AS POSSIBLE AND PROPERLY SIZED TO MINIMIZE PRESSURE DROPS.

OPTIONAL BOOST PUMP  
 REMOTELY MOUNTED

MEDIA FILTER SKID

MEDIA FILTER INLET  
 3/4" FNPT

3/4" SCHED 80 PIPE



SIGHT GLASS

3/4" SCHED 80 PIPE

3/4" SCHED 80 PIPE

7 GPM FLOW RESTRICTER

BACKWASH OUTLET  
 3/4" FNPT

MEDIA FILTER OUTLET  
 3/4" FNPT

3/4" SCHED 80 PIPE

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
-	INITIAL RELEASE	07/27/99	JPM
A	REVISED DRAWING, ASSIGNED SERIES NUMBER	07/17/05	BS

1	SH	16040
-	REV	OF SHEETS

**Village Marine Technology**  
 2000 West 135th Street - Gardena - California 90249

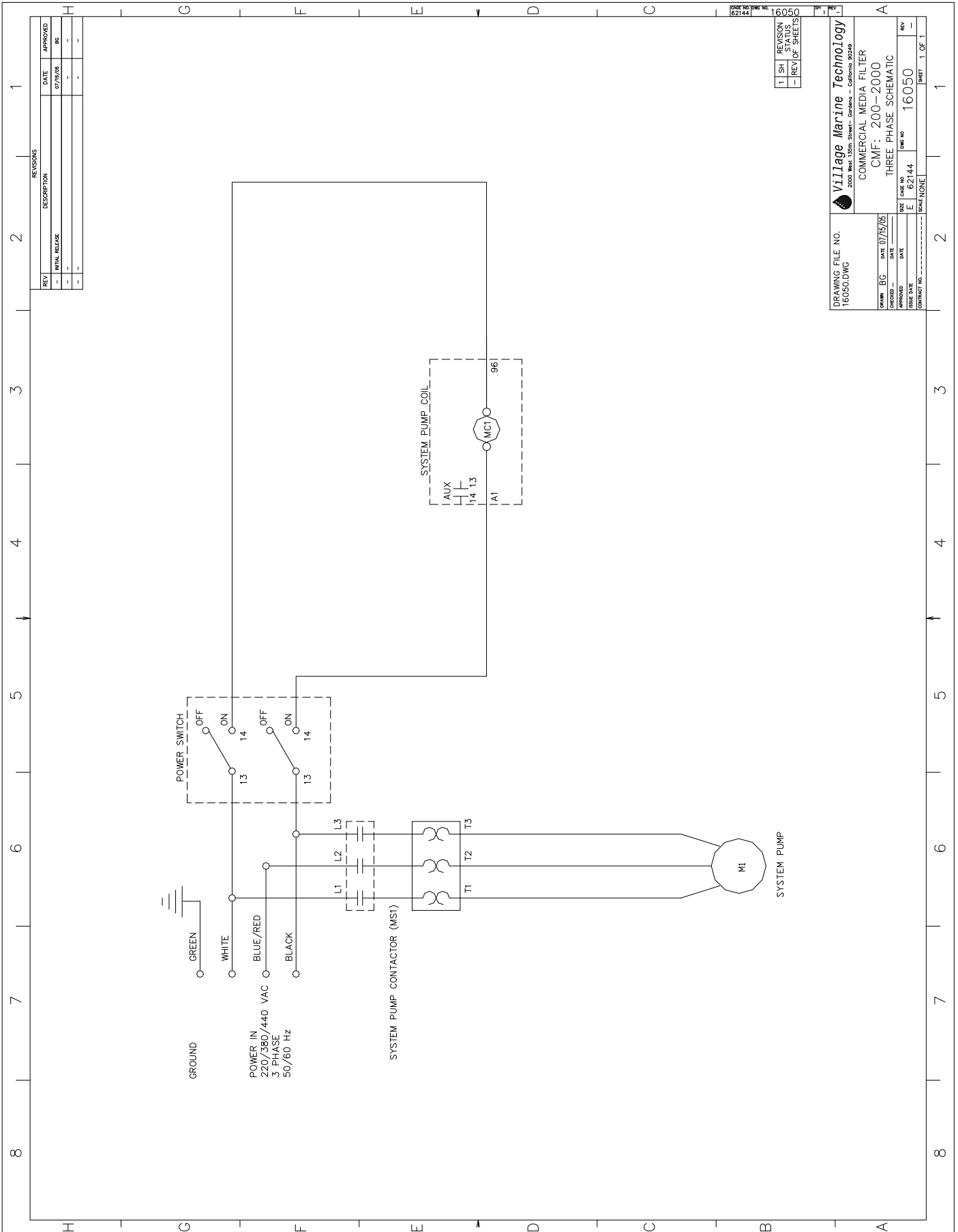
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DRAWN: JPM DATE: 07/27/99  
 CHECKED: JOHN M. DATE: 07/23/99  
 APPROVED: DATE:  
 CONTRACT NO.:

COMMERCIAL MEDIA FILTER  
 CMF - 200 - 2000  
 SINGLE UNIT SYSTEM

DATE	REV
07/27/99	1
07/17/05	A

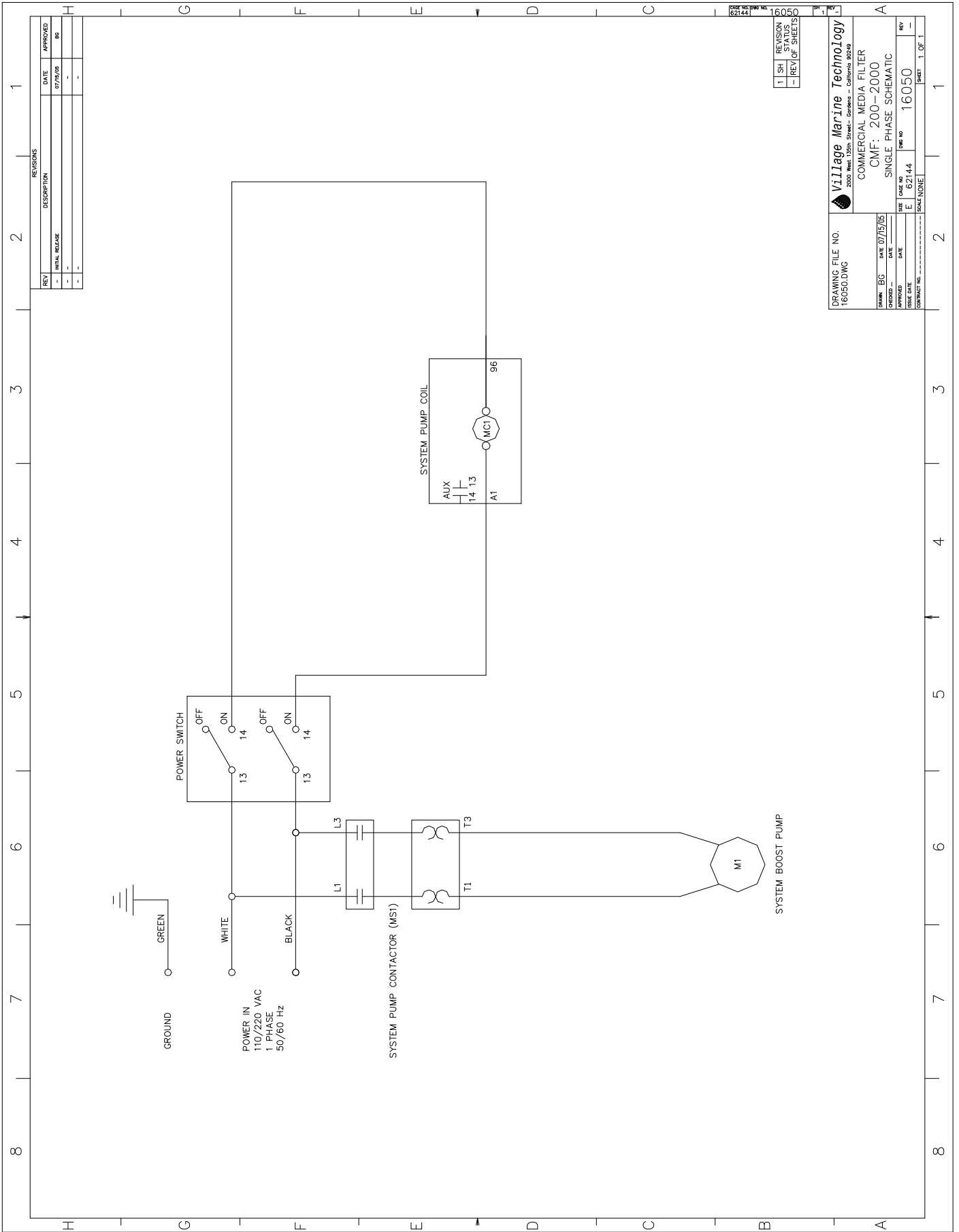
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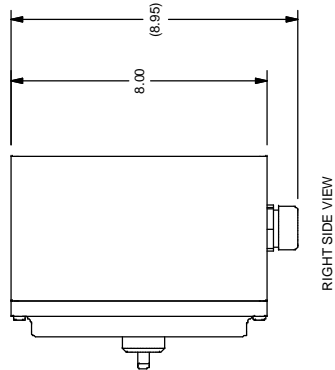
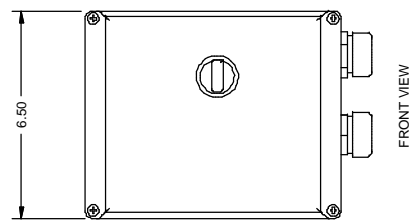
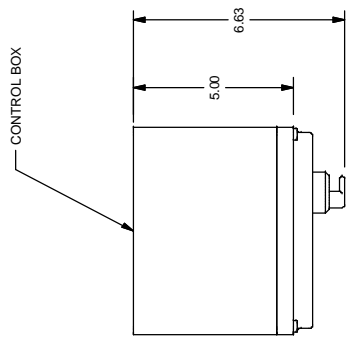
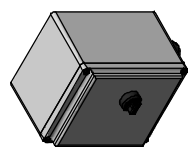
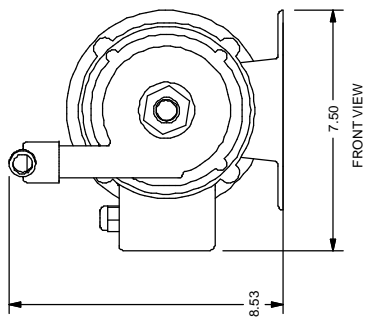
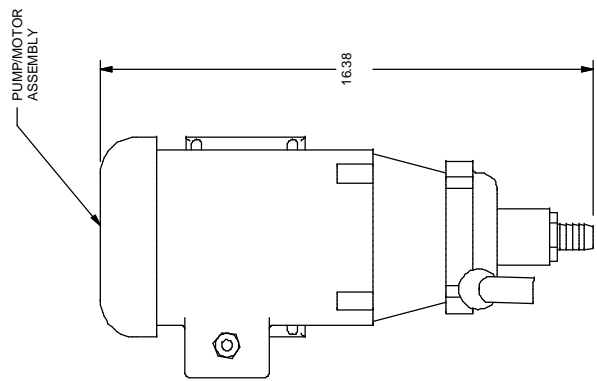
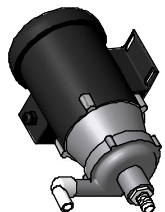
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9	10	11	12	13	14	15	16
H	G	F	E	D	C	B	A



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