**PERMANENT MEDIA FILTER SYSTEM**

**SECTION \_\_\_\_\_**

# PART I – GENERAL

* 1. **Summary**

Furnish and install a Puroflux PF-50 series media filter for closed loop applications as specified herein.

**Primary Purpose:** To remove unwanted solids from the closed loop fluid by utilizing a permanent media filter. A fully assembled media filter system shall be supplied to prevent the accumulation of troublesome solids in the system. The influent fluid shall be dispersed evenly over the filter media. The systems suspended solids shall be trapped in the pores formed between the media. The effluent fluid will then pass from the vessel through the under-drain and return to the system.

The differential pressure will increase as the trapped particles load the media until such time a backwash cycle is required. The filtration control valves shall be repositioned to “closed”, fully isolating the vessel. Once the filtration valves are fully closed, the backwash control valves shall be repositioned to “open” reversing the flow via city water and the media is backwashed. The reverse flow fluidizes the media causing a scouring action which releases the trapped debris. The trapped debris shall then be pushed up through the over-drain and flushed to an existing drain. On completion of the backwash cycle, the valves positioning cycle is reversed and the filtration process continues.

The permanent media filter system will: help prevent particle fouling of the cooling system’s components, reduce maintenance and servicing routines, maintain optimum energy efficiency of the heat exchange process, reduce chemical usage, and aid in the control of harmful bacterial growth.

**PART II – PRODUCTS**

* 1. **Design Criteria**

1. Identification – Permanent media filter package is a model PF-50\_\_-02-02 and is manufactured, assembled, and tested by Puroflux Corporation.
   1. Flow rate shall be \_\_\_\_(U.S. GPM / m3/hr).
   2. Maximum working pressure: 150 psi (10.3 bar).
   3. **Construction**

**Package** - A complete factory assembled unit with: non-code carbon steel vessel, filtration media, manual/auto air vent assembly, pressure gauges, and valves. (Automatic backwash includes electric actuators and control panel.) (Optional system specific pump and motor, pre-strainer, skid, face piping available upon request.)

1. Filter Vessel and Vessel Components - The filter vessel, along with manway/hand-holes, shall be fabricated of non-code carbon steel with a UV resistant fusion bonded epoxy lining and polyester coating (Sizing of manways/hand-holes varies depending on vessel size). The vessel shall have a maximum operating pressure of 150 psi (10.3 bar). Filter vessel shall have properly sized inlet and outlet connections, drain connection, access ports, and vent fittings.
   1. Optional ASME code stamp (available upon request)
   2. Optional higher pressure ratings (available upon request)

Filter unit shall have removable under-drain laterals, which are to be constructed of schedule 304-stainless steel. Additionally, the filter unit shall have a Schedule 80 PVC 3-point distribution over-drain (304-stainless steel for hot water applications) for even flow across media. The filter vessel shall have a drain screen installed at the bottom of the filter vessel in order to retain media during scheduled draining of vessel.

1. **Filter Media** - The filter media shall be permanent type. Periodic backwashing at a flow rate of 20 GPM/ft2 for three minutes will be required to eliminate accumulated suspended particulate and to regrade the filter bed. Filter manufacturer shall supply all required 5-micron media. Media shall meet AWWA and NFS standard.
   1. The media will filter 98% (nominal) of 5-micron particulate or larger, and has achievable filtration down to 0.25 micron.
   2. Optional 0.5 and 0.25 micron media available
2. **Valves** – Valves shall be four industrial grade 2-way ball type with a brass body and chrome plated brass ball for vessels 30” and smaller. For vessels 36” and larger, valves shall be four industrial grade cast iron lug style butterfly valves with stainless steel discs.
   1. To eliminate the potential of “water hammer” and out of sequence operation, the control valves shall be mechanically linked in two sets (one set for filtration and one set for backwash)
   2. The valve shall be configured to isolate the filter vessel when changing to/from filtration/backwash modes.
3. **Connections (city water backwash configuration)** 
   1. (30” vessel and smaller) \_\_” fpt inlet/outlet /waste/city water inlet (backwash)
   2. (36” vessel and larger) \_\_” flange inlet/outlet /waste/city water inlet (backwash)
4. **Actuator (Automatic backwash units only)** - Dual motorized type electric actuators shall be utilized to cycle valves between filtration and backwash modes, and isolate the filter from potential “mixing” during changeover.
5. **Electrical Control** **(Automatic backwash units only)** - NEMA type 4X polycarbonate enclosure with; adjustable solid state timer and 24-hour backwash clock, and manual backwash push button. (Power requirement: 120V, 1-phase, 60Hz)
   1. **Control panel options available upon request**:
      1. Status lights (specify function)
      2. 7- day time clock (in lieu of 24-hour time clock)
      3. Remote dry contacts (specify function)
      4. Backwash counter (internally mounted)
      5. Backwash lockout (two filter maximum)
      6. For units with optional pump/motor only: Provide 3-phase (208, 230 or 460V) UL labeled and listed control panel with door disconnect switch, motor starter with short circuit/overload protection, step-down transformer and remote start-stop with pump Hand-Off-Auto (HOA) switch in addition to backwash controls
6. **Optional Pump** **& Motor** – Cast iron bronze fitted, close coupled end suction centrifugal pump.
   1. Design conditions: \_\_\_\_\_\_\_\_\_\_GPM @ 50’ TDH.
   2. \_\_\_\_\_\_\_\_\_H.P., energy efficient TEFC motor.
7. **Optional Piping** - Schedule 80 PVC
   1. Optional Schedule 40 coated carbon steel (available upon request)
8. **Optional Structural Skid** – shall be constructed of UV resistant fusion bonded polyester coated carbon steel framework for maximum rigidity.
   1. **Manufacturers**

The permanent media filter system shall be manufactured by Puroflux Corporation in Simi Valley, California, USA. Specific model designation is PF-50\_\_-02-02.

# PART III – EXECUTION

* 1. **Installation**

1. Coordinate with the installing contractor to ensure equipment is installed in conformance with manufacturer’s recommendations and those found in the specification.
2. Start up and commissioning shall be performed by factory authorized representatives.