



# Wastewater Division Specifications

## Sample Only

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**BIOLINE® CONTINUOUS SELF-CLEANING, PRESSURE COMPENSATING DRIPLINE**

**Description**

Bioline® is low volume dripline designed for use with onsite wastewater drip dispersal systems. It has integral and evenly spaced pressure compensating drippers inside the tubing, and it is available in three discharge rates (0.4, 0.6, and 0.9 gallons per hour [GPH]) evenly spaced on 12", 18", or 24" centers. Bioline is available in 500' and 1,000' coils. Blank Tubing is available in 250' coils.

**Construction**

Bioline shall consist of nominal sized one-half inch (½") low-density linear polyethylene tubing with internal pressure compensating, continuously self-cleaning, integral drippers at a specified spacing, (12", 18", or 24" centers) or blank tubing without drippers. The tubing shall be purple in color and shall conform to an outside diameter (O.D.) of 0.66 inches and an inside diameter (I.D.) of 0.57 inches. Individual pressure compensating drippers shall be welded to the inside wall of the tubing as an integral part of the tubing assembly and shall be impregnated to prevent the buildup of microbial slime. These drippers shall be constructed of plastic with a continuously self-flushing silicon diaphragm capable of flushing dirt or debris that may enter the dripper. Each dripper shall have an individual filter at the inlet and it shall be integral to the dripper. The dripper shall have a built-in physical root barrier whereby water/effluent shall exit the dripper from a point different than where it shall exit the tubing. This physical barrier shall create an air gap inside the exit portion of the dripper.

**Operation**

Each dripper shall have the ability to independently regulate discharge rates, with an inlet pressure between seven to fifty-eight (7 - 58) pounds per square inch (psi), at a constant rate of flow and with a manufacturer's coefficient of variability (Cv) of 0.03 or less. Recommended operating pressure shall be up to 58 psi. The dripper discharge rate shall be 0.4, 0.6, or 0.9 gallons per hour (GPH) utilizing a combination turbulent flow/reduced pressure compensation cell mechanism and diaphragm to maintain uniform discharge rates. The drippers shall be capable of continuously cleaning themselves while in operation. The dripline shall be available with 12", 18", and 24" spacing between drippers unless otherwise specified. Filtration shall be 120 mesh (130 microns) or finer. Bending radius shall be 7".

Bioline shall be Netafim Model Number 08WRAM\_-. Bioline Blank Tubing shall be Netafim Model Number 08WRAM-250.

## **BIOLINE® FITTINGS (0.57")**

### **Description**

Bioline® fittings shall be constructed in one of the following end configurations:

- Barbed insert fittings only,
- Male pipe threads (MPT) with barbed insert fittings, or
- Female pipe threads (FPT) with barbed insert fittings.

### **Construction**

All fittings shall be constructed of injection molded, brown plastic having a nominal outside dimension of 17mm (0.57"). Female and male threaded ends shall be capable of mating to standard PVC pipe with tapered threads.

### **Operation**

Bioline fittings shall be mated with Netafim Bioline dripline by pushing the fitting into the tubing while twisting side to side until the tubing abuts to either adjoining tubing or a fitting stop.

Bioline fittings shall be Netafim Model Numbers TLTEE, TLCOUP, TL2W075MA, TLELL, TLCROS, TL050MA, TL075MA, TL075FTEE, TLIAPE, and TLIAPVC.

## **BIOLINE® SPECIALTY FITTINGS**

### **Bioline® Insert Adapter for Polyethylene**

#### **Description**

The Bioline® Insert Adapter for Polyethylene shall be a 2-piece threaded-connection fitting designed to transition from 1" or larger polyethylene pipe to Bioline.

#### **Construction**

The Bioline Insert Adapter for Polyethylene shall be constructed of injection-molded plastic.

#### **Operation**

The fitting shall unthread to allow the inlet end of the fitting to be pressed into a pre-drilled 11mm, 15/32" or 1/2" hole created using a Forstner-style drill bit or punch in 1" or larger medium or higher density PE pipe. The fitting shall be tightened by threading the 2 pieces together to create a watertight connection.

The Bioline Insert Adapter for Polyethylene shall be Netafim Model Number TLIAPE-B.

## **Bioline® Insert Adapter for PVC**

### **Description**

The Bioline® Insert Adapter for PVC shall be a two-piece fitting designed to transition from rigid 1½" or larger CL160, CL200 or Sch. 40 PVC pipe to Bioline.

### **Construction**

The Bioline Insert Adapter for PVC shall consist of a rubber grommet and an injection molded plastic insert adapter.

### **Operation**

The rubber grommet shall fit into a hole drilled with a Netafim TDBIT16.5 drill bit or other pre-drilled 16.5mm (21/32") hole in rigid 1½" or larger CL160 or Sch. 40 PVC pipe. The flared top of the grommet shall seat against the outside of the PVC pipe. The short end of the insert adapter is then press-fit into the seated rubber grommet.

The Bioline Insert Adapter for PVC shall be Netafim Model Number TLIAPVC-B.

## **½" AIR/VACUUM RELIEF VENT**

### **Description**

The Air/Vacuum Relief Vent serves two purposes:

- To evacuate air from the Bioline® laterals during system start-up and,
- To prevent a vacuum from occurring after the remote control valve has closed, thus preventing debris intrusion into the drippers via back siphonage.

### **Construction**

The Air/Vacuum Relief Vent shall be constructed of thermoplastic with male or female pipe thread capable of mating to a threaded fitting.

### **Operation**

Bioline® installations require that air/vacuum relief vents be installed at the highest elevation in each zone (some zones may require more than one) in order to expel air and relieve vacuum. In a zone where the highest elevation occurs between the supply and return manifolds (headers), such as a mound or berm, an air/vacuum relief lateral shall interconnect all the Bioline driplines to avoid the necessity of installing one air/vacuum relief valve on each Bioline lateral. Air/Vacuum Relief Vents can be installed below grade in valve boxes to allow for periodic inspection.

The Air/Vacuum Relief Vent shall be Netafim Model Number TLAVRV.

## **GUARDIAN AIR/VACUUM VENT**

### **Description**

The Guardian Air/Vacuum Vent serves two purposes:

- To discharge air from the Bioline® laterals during system start-up and,

- To admit air into the piping network at high flow rates during drain down to prevent a vacuum from occurring, and thus preventing debris intrusion into the drippers via back siphonage.

**Construction**

The Guardian Air/Vacuum Vent shall allow for high flow rate air discharge, up to 8 psi differential for the 2" & 3" models and up to 5 psi for the ¾" & 1" model, thus preventing premature closure. It shall be constructed of UV-protected materials as follows:

<b>Part</b>	<b>¾" &amp; 1"</b>	<b>2"</b>	<b>3"</b>
Body	Polypropylene	Reinforced Nylon	Reinforced Nylon
Cover	Polypropylene	Polypropylene	Reinforced Nylon
Disc	-	Reinforced Nylon	Reinforced Nylon
Seal	BUNA-N	E.P.D.M.	E.P.D.M.
Float	Polypropylene	Reinforced Nylon	Polypropylene

The ¾" & 1" Guardian Air/Vacuum Vents shall be available with or without a Schrader valve. The Schrader valve shall allow pressure readings during system operation. The base of the ¾" and 1" Guardian shall be MPT. The base of the 2" & 3" Guardian shall be FPT. Maximum working pressure range shall be 3 - 150 psi (0.2 - 10 bar).

**Operation**

Bioline® installations require that air/vacuum vents be installed at the highest elevation in each zone (some zones may require more than one) in order to expel air and relieve vacuum. In a zone where the highest elevation occurs between the supply and return manifolds (headers), such as a mound or berm, an air/vacuum lateral shall interconnect all the Bioline driplines to avoid the necessity of installing one air/vacuum vent on each Bioline lateral. Air/Vacuum Vents can be installed below grade in vented valve boxes to allow for periodic inspection.

The Guardian Air/Vacuum Relief Air Vent shall be Netafim Model Number 65ARIA\_\_\_\_\_.

**1" & 2" COMBINATION AIR/VACUUM & CONTINUOUS ACTING AIR VENTS**

**Description**

The Combination Air/Vacuum & Continuous Acting Air Vent serves three purposes:

- To discharge air from the Bioline® laterals during system start-up and,
- To admit air into the piping network at high flow rates during drain down to prevent a vacuum from occurring, and thus preventing debris intrusion into the drippers via back siphonage.
- Continue to dispel air when the system is operating under pressure.

**Construction**

The Combination Air/Vacuum & Continuous Acting Air Vent shall allow for high flow rate air discharge, up to 10 psi differential, thus preventing premature closure. It shall be constructed of UV-protected materials as follows:

Model Number	Size	Body	Base	Maximum Operating Pressure (psi)
65ARIB1	1"	Reinforced Nylon	Reinforced Nylon	150
65ARIB1-B	1"	Reinforced Nylon	Brass	150
65ARIB2	2"	Reinforced Nylon	Reinforced Nylon	240
65ARIB2-B	2"	Reinforced Nylon	Brass	240
65ARIB2PP	2"	Polypropylene	Polypropylene	150
65ARIB2-BPP	2"	Polypropylene	Brass	150

The body shall be made of high strength plastic and all operating parts shall be designed and manufactured from specially selected corrosion-resistant materials. Due to its light weight, the vent shall be capable of being installed on plastic piping systems, as well as other lightweight piping. A threaded drainage outlet (1½" on the 2" vent and ⅜" on the ¾" & 1") shall enable removal of excess fluids.

The base shall be MPT. Maximum working pressure range shall be as noted in table. Testing pressure shall be 365 psi (25 bar) for the 240 psi valves and 240 psi (16 bar) for the 150 psi valves. Maximum working temperature shall be 194° F (90° C).

### **Operation**

The vent's large orifice air/vacuum component shall be designed to discharge large volumes of air during the filling of the system and shall admit air into the system at high flow rates, during its drainage and/or at water column separation. At any time during system operation, should internal pressure fall below atmospheric pressure (negative pressure), air will enter the system through the air valve. Admitting air in response to negative pressure shall protect the system from destructive vacuum conditions, and prevent damage caused by water column separation. The vent shall incorporate a small orifice component that shall release entrapped air in the system while it is under pressure.

The Combination Air/Vacuum Relief & Continuous Acting Air Vent shall be Netafim Model Number 65ARIB\_\_\_\_\_.

## **PRESSURE REGULATOR - HIGH FLOW PRESSURE REGULATOR**

### **Description**

The purpose of the Pressure Regulator is to maintain downstream pressure at or below the specified system operating pressure. Unregulated pressures in excess of the recommended operating ranges can cause the Bioline® fitting connections to weaken or fail.

### **Construction**

The Pressure Regulator shall be a Netafim spring-operated piston-type regulator with an externally accessible regulation unit that can be serviced without removing the valve body from the piping. The body shall be molded of black plastic with a combination of male/female pipe threaded inlet and outlet.

### **Operation**

The Pressure Regulator shall have a built-in indicator that indicates when it is operating. It shall be able to respond immediately to any inlet pressure variation. The regulator shall be capable of

regulating downstream pressure to 15 psi, 20 psi, 25 psi, 35 psi, or 43 psi in ¾" or 1½" configurations. The Pressure Regulator shall operate in a flow range of 3.5 - 17.6 GPM in the ¾" configuration and 7 - 35 GPM in the 1½" configuration. Maximum pressure at inlet shall be 145 psi.

The Pressure Regulator shall be a Netafim Model Number PRV \_\_\_\_\_ V2K.

## **PRESSURE REGULATOR - IN-LINE LOW FLOW PRESSURE REGULATOR**

### **Description**

The purpose of the Pressure Regulator is to control downstream pressure at or below the specified system operating pressure. Unregulated pressures in excess of the recommended operating ranges can cause the Bioline fitting connections to weaken or fail.

### **Construction**

The Pressure Regulator shall be a Netafim spring-operated, in-line piston-type regulator. The body shall be molded of black plastic with ¾" female/female pipe threaded inlet and outlet. Directional arrows shall indicate flow direction of water.

### **Operation**

The Pressure Regulator shall be able to respond immediately to any inlet pressure variation. The regulator shall be capable of regulating downstream pressure to 15 psi, 20 psi, 25 psi, 35 psi, or 43 psi. The Pressure Regulator shall operate in a flow range of 0.25 - 4.4 GPM. Maximum pressure at inlet shall be 145 psi.

The Pressure Regulator shall be a Netafim Model Number PRV075LF \_\_\_\_\_ V2K.

## **DISC FILTER**

### **Description**

The purpose of the Disc Filter is to capture and retain water-transported debris or sediment.

### **Construction**

The filter shall be a multiple disc filter with color-coded filter elements indicating the mesh size of the element being used. The discs shall be constructed of chemical-resistant thermoplastic for corrosion resistance.

The disc filter body shall be molded of black plastic with male pipe threads for both inlet and outlet. The disc filter shall be capable of periodic servicing by unscrewing a threaded cap or unlatching the band. The ¾" DFV model shall have an integral manual shut-off valve.

Disc filter ring color-coding shall be: Yellow (80 Mesh / 200 Micron), Red (120 Mesh / 130 Micron), Black (140 Mesh / 100 Micron), or Green (200 Mesh / 70 Micron).

### **Operation**

Installation of the Disc Filter shall be as detailed. Disc filters can be installed downstream of the remote control valve to allow for periodic servicing when the remote control valve is not operating. It can be installed upstream of the remote control valve if the disc filter is specified with manual shut-off

valve or when a line-sized shut-off valve is also specified to allow for periodic servicing with a pressurized main line. Recommended installation of disc filters shall be as specified. It may be installed below grade positioned in a valve box large enough to remove the disk filter cap and internal disc element, or above grade. A gravel sump in the bottom of the valve box is recommended.

The Disc Filter shall be a Netafim Model Number \_\_\_\_\_.

## **2" COMPACT LP AUTOMATIC DISC-KLEEN FILTER**

### **Description**

The purpose of the 2" Compact LP Disc-Kleen Filter is to capture and retain water-transported debris or sediments, is pre-assembled for easy installation and is designed to fit into small, tight locations.

The filter shall be available in AC and DC models - The AC models shall use 110VAC and DC models shall use 2-each 9V lithium batteries.

The automatic backflush controller functions by pressure differential and/or time and an easily accessible bypass screen filter ensures supply water is cleaned before being utilized for backflushing.

### **Construction**

The filter shall be a multiple disc filter with color-coded filter elements indicating the mesh size of the element being used. The discs shall be constructed of chemical-resistant polypropylene thermoplastic for corrosion resistance.

Disc filter ring color-coding shall be: Red (120 Mesh / 130 Micron), or Black (140 Mesh / 115 Micron).

Standard with plastic backwash valves and digital pressure differential switch.

The filter body inlet shall be 2" MPT, the outlet shall be 2" FPT with union assembly, and the flush port shall be 2" FPT.

Minimum allowable pH shall be 5.

### **Operation**

Installation of the Disc Filter shall be as detailed.

**Standard Model** The 2" Compact standard model filter shall be designed to operate in the 1 - 80 GPM range, (approximately 35 GPM maximum in very poor water with 80 & 120 mesh filtration) with a minimum pressure for backflush of 30 psi and a minimum flow for backflush of 35 GPM. It shall have a maximum operating pressure of 90 psi and a maximum allowable temperature of 158°F.

**Low Flow Model** The 2" Compact low flow model filter shall be designed to operate in the 1 - 40 GPM range, (approximately 20 GPM maximum in very poor water with 80 & 120 mesh filtration) with a minimum pressure for backflush of 30 psi and a minimum flow for backflush of 20 GPM. It shall have a maximum operating pressure of 90 psi and a maximum allowable temperature of 158°F.



The backflush cycle shall be activated by a digital pressure differential switch (PDS) without the need of an outside controller.

**Dimensions**

- Overall Dimensions: 30" x 25"
- Inlet to Outlet: 21½"
- Inlet to Outlet offset: 8<sup>5</sup>/<sub>8</sub>"
- Height: 25"
- Weight: 32 lbs.

**Ordering Information**

Power Source	Flow Range	Model Number
110 VAC	1-80 GPM	DFALP200-***AC
	1-40 GPM	DFALPLF200-***AC
2-each 9V Lithium Batteries	1-40 GPM	DFALP200-***DCL
	1-80 GPM	DFALPLF200-***DCL

\*\*\* Substitute proper mesh size - 120 or 140 mesh is standard.