

LANDSCAPE & TURF PRODUCT CATALOG

**DRIP IRRIGATION AND
WATER CONSERVATION
PRODUCTS**





ABOUT NETAFIM

First founded by farmers and agronomists in 1965, who recognized drip irrigation as a solution to one of the world's most urgent problems -- lack of quality water for food production -- Netafim has grown today to become the recognized global leader in the development of low-volume, drip irrigation solutions for a diverse range of applications.

As a pioneer in developing water-conserving irrigation technologies for the world's agricultural community, Netafim continues to leverage its five decades of innovation to provide today's landscape professionals with the industry's most comprehensive and complete offering of innovative, drip irrigation and water conservation products.

With 50 years of expertise, and more than a million miles of dripline installed worldwide, Netafim's technologically advanced and environmentally sound products deliver water savings, low maintenance and worry-free operation in even the most challenging landscapes and soil conditions.

A division of the Netafim International Group, Fresno, California based Netafim USA is committed to working alongside industry professionals to address the design and installation challenges of today's modern landscapes through product innovation, education, training and research.

Together, we can Grow More With Less!

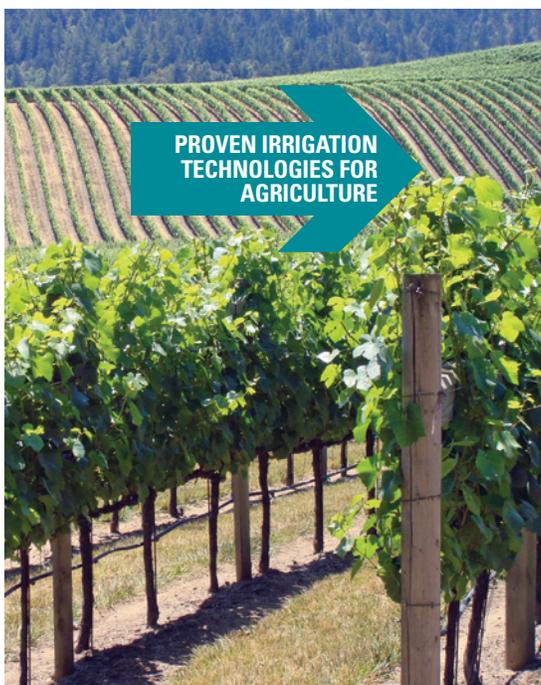
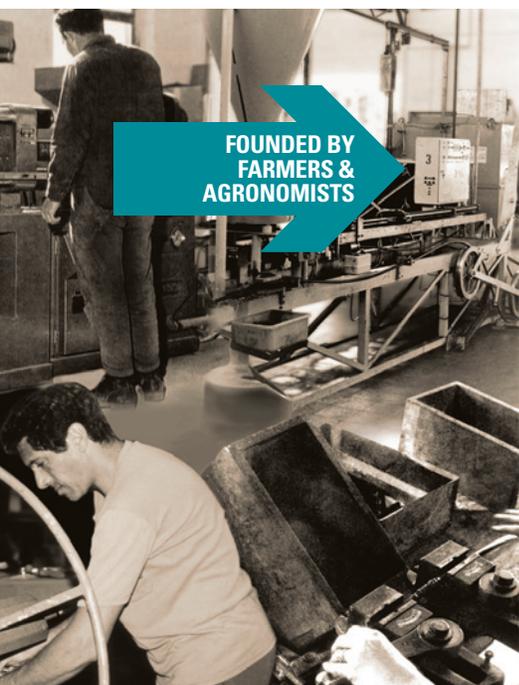


TABLE OF CONTENTS

DRIPLINES

| | |
|--------------------------------------|----|
| Typical Design Layouts | 2 |
| Sizing of Headers | 5 |
| Techline® Labels | 5 |
| Soil Types and Slopes | 6 |
| Techline® Dripline Comparison | 7 |
| Techline® CV | 8 |
| Techline® DL | 11 |
| Techline® RW | 13 |
| Techline® EZ | 15 |
| Techfilter® Systems | 17 |
| 17mm Fittings and Installation Tools | 20 |
| 12mm Fittings and Installation Tools | 22 |
| Air Vents Overview | 23 |
| Air/Vacuum Relief Vents | 24 |
| Combination Air Vents | 24 |
| Automatic Flush Valves | 25 |
| In-Line Check Valve | 25 |
| Operation/Pressure Indicator Stakes | 26 |

CONTROL ZONE KITS

| | |
|------------------------------|----|
| Low Volume Control Zone Kits | 27 |
|------------------------------|----|

REGULATING

| | |
|---------------------|----|
| Pressure Regulators | 29 |
|---------------------|----|

FILTERS

| | |
|---------------------------------|----|
| Filters Comparison | 30 |
| Manual Disc Filters | 31 |
| 2" Compact LP Disc-Kleen Filter | 33 |
| 2" and 3" LP Disc-Kleen Filters | 35 |
| Apollo Disc-Kleen Filters | 37 |

VALVES

| | |
|--------------------------------|----|
| Series 80 Nylon Control Valves | 39 |
| Iron and Bronze Valves | 41 |
| Hydrometers | 43 |

WATER METERS

| | |
|--------------------------------|----|
| Octave Ultrasonic Water Meters | 45 |
| Water Meters | 47 |

CONTROLLERS

| | |
|-----------------------|----|
| NLC-100S Conventional | 51 |
| NLC-100S Hybrid | 53 |
| NLC-100D Decoder | 55 |
| NLC-3D Hybrid | 57 |

POINT SOURCE COMPONENTS

| | |
|----------------------------------|----|
| Point Source Design | 59 |
| Point Source Emitters Comparison | 60 |
| Self-Piercing Emitters | 61 |
| Techflow Emitters | 62 |
| BD & WP Emitters | 63 |
| Polyethylene Tubing | 64 |
| Micro-Tubing | 65 |
| Micro-Tube Fittings | 66 |

DESIGN INFORMATION

| | |
|-----------------------|----|
| Dripline Calculations | 67 |
| Application Rates | 68 |
| Friction Loss | 69 |
| Web Resources | 72 |

WARRANTY

| | |
|----------------------|----|
| Warranty Information | 73 |
|----------------------|----|

TYPICAL DESIGN LAYOUTS

SURFACE DESIGN LAYOUT

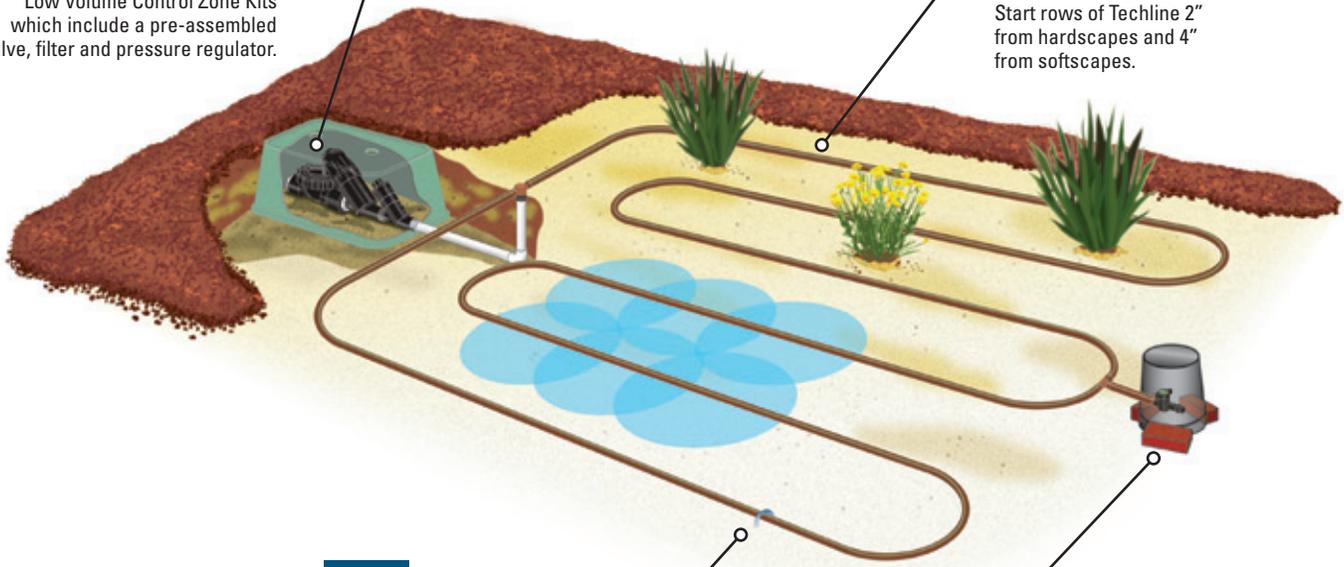
For use with Techline® CV, Techline® DL, Techline® EZ and Techline® RW on-surface designs (on top of soil, covered with mulch).

LOW VOLUME CONTROL ZONE KIT

For easy installation, use Netafim's Low Volume Control Zone Kits which include a pre-assembled valve, filter and pressure regulator.

TECHLINE

Start rows of Techline 2" from hardscapes and 4" from softscapes.



STAPLES

- Use one staple for:
- Every 3' of Techline in sand, every 4' in loam and every 5' in clay.
 - Use two staples over each tee, elbow or cross.
 - Recommend use of a U-shaped staple that is less likely to pinch the dripline.

MANUAL FLUSH VALVE

- Use one Manual Flush Valve for every 15 GPM of zone flow.
- Position as near as possible to the halfway point of the loop.
 - Install in an area where flushing about one gallon of water will not cause flooding.
- For Techline EZ and Techline CV, use a Manual Flush Valve. For Techline DL and Techline RW, use an Automatic Flush Valve and an Air/Vacuum Relief Vent (see Pages 61 and 62).

OPTIONAL COMPONENTS

AIR/VACUUM RELIEF AIR VENT

Place after Pressure Regulator. Guardian Air Vent models available in ¾" and 1" sizes, up to 150 psi. Not required for on-surface installations or any installations using Techline CV.

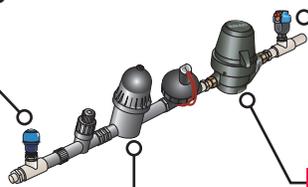
LOW VOLUME CONTROL ZONE KIT

CONTINUOUS ACTING AIR VENT

Place before water meter. Automatic continuous acting MINI Air Vent models available in ½" and ¾" sizes, up to 150 psi.

WATER METER

Sub-meter used to measure water usage for irrigation system. Plastic and Metal versions available in ¾" and 1" sizes. (1 ½" to 6" sizes also available)



TYPICAL DESIGN LAYOUTS

SUBSURFACE/SURFACE DESIGN LAYOUT

For use with Techline® CV, Techline® DL, Techline® EZ and Techline® RW subsurface designs. Bury driplines evenly throughout the zone from 4" to 6" deep or on-surface under mulch.

SUPPLY AND EXHAUST HEADERS

Most often used in subsurface systems. Use Techline Blank Tubing as supply and exhaust headers on zones under 5 GPM.

STAPLES

Use one staple for:

- Every 3' of Techline CV in sand, every 4' in loam and every 5' in clay.
- Use two staples over each tee, elbow or cross.
- Recommend use of a U-shaped staple that is less likely to pinch the dripline.

LOW VOLUME CONTROL ZONE KIT

For easy installation, use Netafim's Low Volume Control Zone Kits which include a pre-assembled valve, filter and pressure regulator.

TECHLINE

Start rows of Techline 2" from hardscapes and 4" from softscapes.

MANUAL FLUSH VALVE

- Normally placed along exhaust header or at the point farthest away from the source.
- Install in a valve box with gravel sump.

NOTES:

- Add Automatic Flush Valve when using Techline DL or Techline RW.
- Add Air Relief Valve at the highest point in the system when using Techline DL or Techline RW.

OPTIONAL COMPONENTS

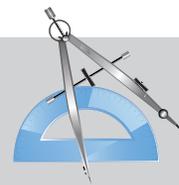
CONTINUOUS ACTING AIR VENT

Place before water meter. Automatic continuous acting MINI Air Vent models available in 1/2" and 3/4" sizes, up to 150 psi.

LOW VOLUME CONTROL ZONE KIT

WATER METER

Sub-meter used to measure water usage for irrigation system. Plastic and Metal versions available in 3/4" and 1" sizes. (1 1/2" to 6" sizes also available)

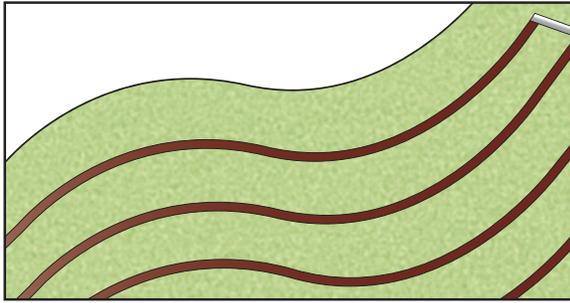


Netafim offers comprehensive design details, installation information and a dripline calculator on our web site.

TYPICAL DESIGN LAYOUTS

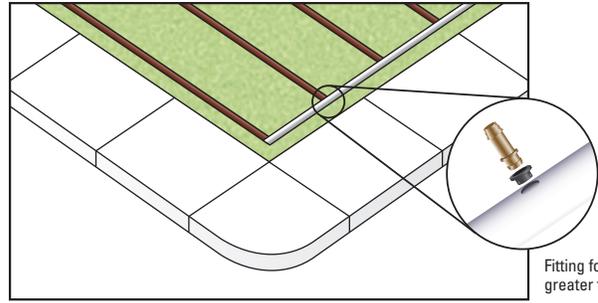
CONTOURS

Driplines provide a flexible solution for irrigating around contoured areas and around confined planters or shrubs.



LATERAL PLACEMENT

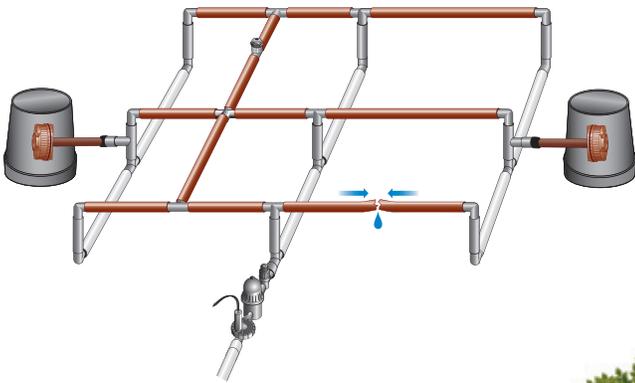
Place laterals 2" from any hardscape or 4" from the outside of uncontained landscapes. Place laterals perpendicular to (across) slopes, if any.



Fitting for PVC greater than 1 1/2"

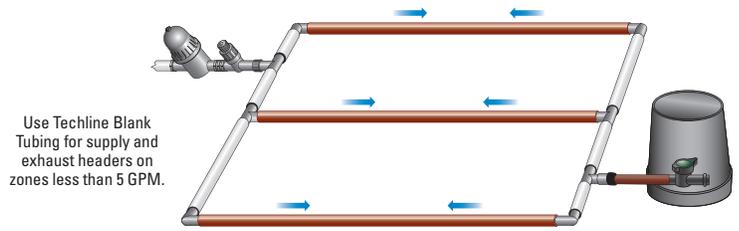
CENTER FEED

For applications in medians or island use center feed configuration for long narrow areas.



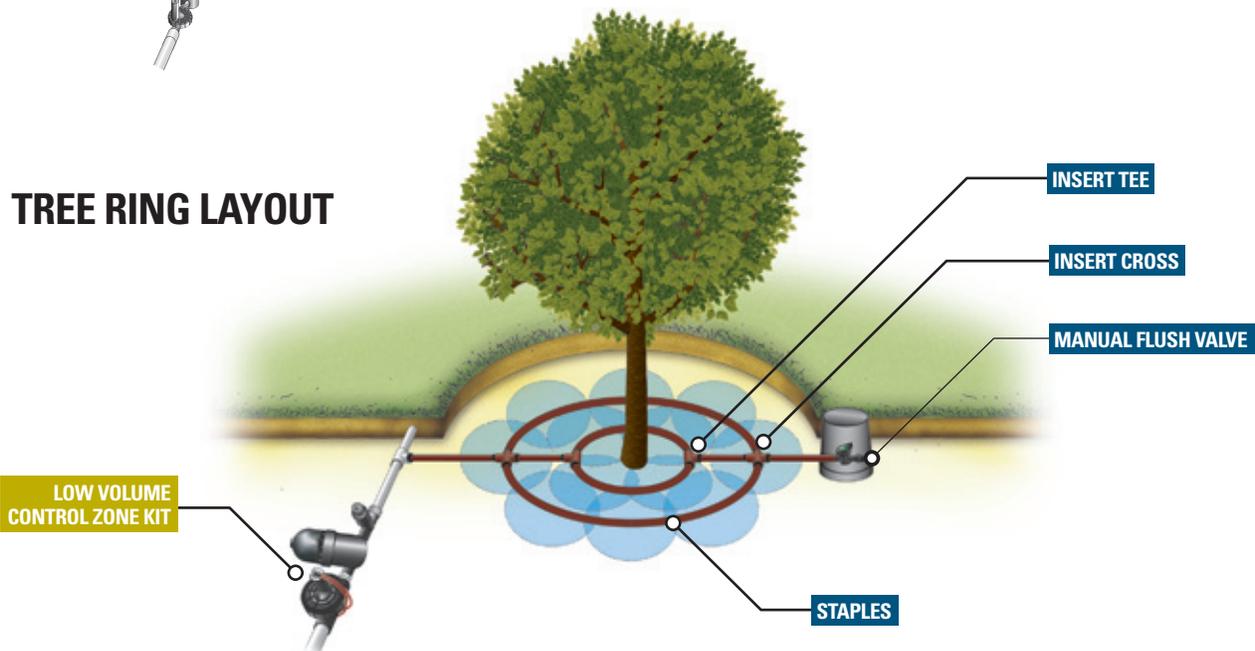
END FEED

End feed configurations are generally used for short or medium length installations.



Use Techline Blank Tubing for supply and exhaust headers on zones less than 5 GPM.

TREE RING LAYOUT



SIZING OF HEADERS

SUPPLY AND EXHAUST

PROPER SIZING OF SUPPLY AND EXHAUST HEADERS (17MM TECHLINE CV, TECHLINE DL OR TECHLINE RW)

| TOTAL ZONE FLOW | PIPE SIZE |
|-----------------|---------------------------------------------------------|
| UP TO 5 GPM | 17mm TECHLINE TUBING OR ½" SCH 40 PVC OR ½" POLY TUBING |
| 5.1 TO 8 GPM | ¾" SCH 40 PVC OR ¾" POLY TUBING |
| 8.1 TO 13 GPM | 1" SCH 40 PVC OR 1" POLY TUBING |
| 13.1 TO 22 GPM | 1 ¼" SCH 40 PVC OR 1 ¼" POLY TUBING |
| 22.1 TO 31 GPM | 1 ½" SCH 40 PVC OR 1 ½" POLY TUBING |

| TOTAL ZONE FLOW | PIPE SIZE |
|-----------------|--------------------|
| UP TO 6 GPM | ½" CLASS 315 PVC |
| 6.1 TO 10 GPM | ¾" CLASS 200 PVC |
| 10.1 TO 17 GPM | 1" CLASS 200 PVC |
| 17.1 TO 27 GPM | 1 ¼" CLASS 200 PVC |
| 27.1 TO 35 GPM | 1 ½" CLASS 200 PVC |

5 feet per second velocity

NOTE: A 45 psi Pressure Regulator is recommended to obtain maximum run lengths and maximum zone size when installing Techline CV, Techline DL or Techline RW dripline.

TECHLINE® LABELS

THE NETAFIM COIL LABEL

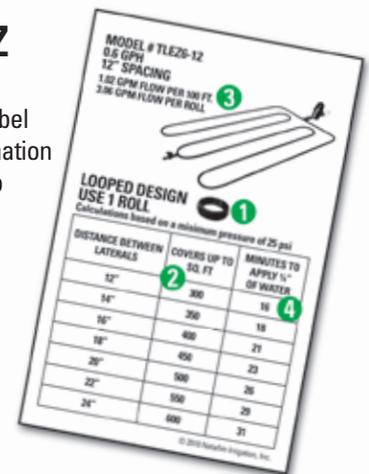
Netafim offers Techline® CV, Techline® DL, Techline® RW and Techline® EZ in a wide range of flow rates and emitter spacings. To make product identification easy, each Netafim coil has a bright colored label, which designates the flow rate, and a large graphic shape, which indicates emitter spacing. Selecting the coil with the right emitter spacing and the right flow rate is easy, even from a distance.

| SHAPE | SPACING | COLOR | FLOW RATE |
|---------------|-------------|--------|-----------|
| ◆ OR NO SHAPE | 6" SPACING | Orange | 0.26 GPH |
| ▼ | 12" SPACING | Blue | 0.4 GPH |
| ■ | 18" SPACING | Red | 0.6 GPH |
| ● | 24" SPACING | Black | 0.9 GPH |

TECHLINE® EZ COIL LABELS

The Techline EZ coil label includes design information which makes it easy to determine the:

- Quantity of rolls
- Area it will cover
- Flow
- System run time



SOIL TYPES AND SLOPES

DETERMINING THE PROPER EMITTER TO USE IS BASED PRIMARILY ON THE SOIL TYPE AND SLOPE

MAXIMUM PRECIPITATION RATES (INCHES PER HOUR)

| | | 0% TO 5% SLOPE | | 5% TO 8% SLOPE | | 8% TO 12% SLOPE | | 12% TO 20% SLOPE | |
|--------------|-----------------------------------------|----------------|------|----------------|------|-----------------|------|------------------|------|
| | | COVERED | BARE | COVERED | BARE | COVERED | BARE | COVERED | BARE |
| SOIL TEXTURE | COARSE SANDY SOIL | 2.00 | 2.00 | 2.00 | 1.50 | 1.50 | 1.00 | 1.00 | 1.00 |
| | COARSE SANDY SOIL OVER COMPACT SUB SOIL | 1.75 | 1.50 | 1.25 | 1.00 | 1.00 | 0.75 | 0.75 | 0.40 |
| | LIGHT SANDY SOIL | 1.75 | 1.00 | 1.25 | 0.80 | 1.00 | 0.60 | 0.75 | 0.40 |
| | LIGHT SANDY SOIL OVER COMPACT SUB SOIL | 1.25 | 0.75 | 1.00 | 0.50 | 0.75 | 0.40 | 0.50 | 0.30 |
| | UNIFORM SILT LOAM | 1.00 | 0.50 | 0.80 | 0.40 | 0.60 | 0.30 | 0.40 | 0.20 |
| | SILT FOAM OVER COMPACT SUB SOIL | 0.60 | 0.30 | 0.50 | 0.25 | 0.40 | 0.15 | 0.30 | 0.10 |
| | HEAVY CLAY / CLAY LOAM | 0.20 | 0.15 | 0.15 | 0.10 | 0.12 | 0.08 | 0.10 | 0.06 |

Note: The above average values are for reference purposes. Data may vary with respect to actual soil and site conditions. Data from USDA.

The Maximum Precipitation Rates Chart from the U.S. Department of Agriculture shows the ability of various soils to absorb water. This information is important because it is the best way to show how different soils manage water. In the case of Coarse Sandy Soil on a 0 to 5% Slope, it can absorb 2.00" of water if covered with vegetation. Conversely, a heavy clay/clay loam soil can only accept about 0.20". This means that sandy soil does not hold water as well as tighter soils. It also means that sandy soil will not radiate the water as far laterally and upward as a tighter soil. As such, care needs to be taken when deciding what emitter flow rate to use and how far apart the emitters can be from each other. And as the slope increases, this takes on even greater importance.

SLOPES AND BERMS

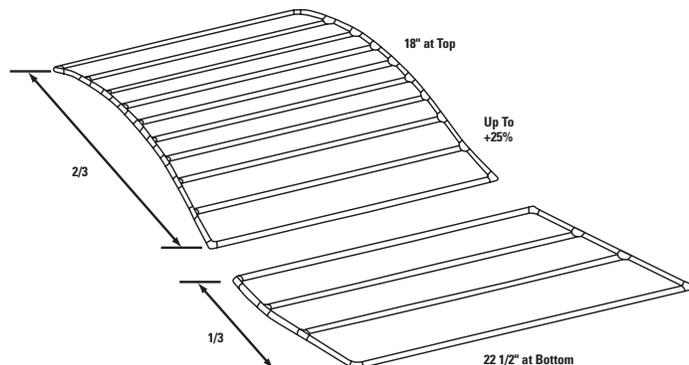
Techline CV has a check valve built into each emitter. This allows the dripline to hold back up to a 4.6' column of water. As such, designing Techline CV on slopes and berms is very easy.

- Techline CV should be installed perpendicular to (across) slopes.
- In the upper 2/3 of the slope, space Techline CV per General Guidelines table, page 9.
- In the lower 1/3 of the slope, increase the distance between rows by 25%.
- For every 4.6' elevation change, either:
 - Split the slope into separate zones, or
 - Install a Netafim In-Line Check Valve (TLCV050M1).

IN-LINE CHECK VALVE

Designed to hold back up to a 13.4' column of water.

Rule of Thumb: Every 1' of water exerts 0.433 psi of pressure at the base of the column. As such, a 100' column of water exerts 43.3 psi at the base.



TECHLINE® DRIPLINE COMPARISON

TECHLINE DRIPLINE COMPARISON CHART

| | TECHLINE CV | | | | TECHLINE DL | | | | TECHLINE RW | | | | TECHLINE EZ | | | | | | |
|--------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------|------|------|-----------------------------------------------------------------------------------|-------|------|------|-------------------------------------------------------------------------------------|------|------|------|-------------------------------------------------------------------------------------|------|-------|-------|-----|--|--|
| | MAXIMUM UNIFORMITY | | | | HIGH UNIFORMITY | | | | RECYCLED/RECLAIMED WATER | | | | SMALL & MEDIUM AREAS | | | | | | |
| | See Pages 8-10 | | | | See Pages 11-12 | | | | See Pages 13-14 | | | | See Pages 15-16 | | | | | | |
| | Emitter Flow Rate (GPH) | | | | 0.26 | | | | 0.4 | | | | 0.6 | | | | 0.9 | | |
| Tubing Color |  | | | |  | | | |  | | | |  | | | | | | |
| | Dark Brown | | | | Brown | | | | Brown with 2 Purple Stripes | | | | Dark Brown | | | | | | |
| DIAMETER | 17mm | | | | 17mm | | | | 17mm | | | | 12mm | | | | | | |
| APPLICATION: TURF | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | | | |
| SHRUB & GROUND COVER | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | | | |
| INSTALLATION: SUBSURFACE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | | | |
| ON-SURFACE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | | | |
| AIR/VACUUM RELIEF VENT REQUIRED FOR SUBSURFACE? | No | No | No | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | | | |
| EMITTER SPACING: 6" | S.O.* | | | | S.O.* | | | | S.O.* | | | | Yes | Yes | S.O.* | S.O.* | | | |
| 12" | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | | | |
| 18" | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | | | |
| 24" | S.O.* | S.O.* | Yes | Yes | S.O.* | S.O.* | Yes | Yes | Yes | Yes | Yes | Yes | S.O.* | | | | | | |
| BUILT-IN CHECK VALVE | Yes | Yes | Yes | Yes | No | No | No | No | S.O.* | | | | No | No | No | No | | | |
| ANTI-SIPHON EMITTER | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | | | |
| PRESSURE COMPENSATING | 14.5 to 58 psi | | | | 6 to 58 psi | | | | 6 to 58 psi | | | | 6 to 58 psi | | | | | | |
| CONTINUOUS SELF-FLUSHING EMITTERS | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | | | |
| MAXIMUM RECOMMENDED SYSTEM PRESSURE | 58 psi | | | | 58 psi | | | | 58 psi | | | | 58 psi | | | | | | |
| MINIMUM PRESSURE REQUIRED | 14.5 psi | | | | 6 psi | | | | 6 psi | | | | 6 psi | | | | | | |
| BENDING RADIUS | 7" | | | | 7" | | | | 7" | | | | 6" | | | | | | |
| QUALIFIES FOR LEED CREDIT | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | | | |
| USE WITH RECLAIMED WATER | No | | | | No | | | | Yes | Yes | Yes | Yes | No | No | No | No | | | |
| MAXIMUM LENGTH OF SINGLE LATERAL (FEET) @ 45 PSI, 18" EMITTER SPACING | 840 | 615 | 485 | 370 | 1,020 | 750 | 595 | 450 | 910 | 670 | 530 | 400 | 535 | 390 | 340 | 310 | | | |
| FLOW PER 100 FEET, 18" EMITTER SPACING (GPH) | 17.6 | 28.2 | 40.5 | 61.6 | 17.6 | 28.2 | 40.5 | 61.6 | 17.6 | 28.2 | 40.5 | 61.6 | 17.6 | 28.2 | 40.5 | 61.6 | | | |

*Note: Special Orders (S.O.) can be placed to accommodate custom spacing or other special considerations. Set-up charge, higher pricing and longer leadtimes may apply.

TECHLINE® CV

Maximum Uniformity in
Subsurface and On-Surface
Including Slopes

17mm DRIPLINE

APPLICATIONS

- Subsurface or on-surface installations
- Turf, shrubs, trees and flowers
- Sports turf, tennis courts, golf courses
- Slopes
- Longer lateral runs
- Curved, angular or narrow planting areas
- High traffic/high liability areas
- Areas subject to vandalism
- High wind areas
- At-grade windows
- Green walls, green roofs
- Raised planters

SPECIFICATIONS

- Broadest choice of emitter flow rates: 0.26, 0.4, 0.6 and 0.9 GPH
- Emitter spacings: 12", 18" and 24" (24" spacing available for 0.6 and 0.9 GPH only)
- Pressure compensation range: 14.5 to 58 psi (stainless steel clamps recommended above 50 psi)
- Bending radius: 7"
- Maximum recommended system pressure: 58 psi
- Minimum pressure required: 14.5 psi
- Tubing diameter: 0.66" OD; 0.56" ID; 0.050" wall
- Coil length: 100', 250', 500', 1,000'
- Recommended minimum filtration: 120 mesh
- Diaphragm made of silicon

FEATURES & BENEFITS

2 psi CHECK VALVE IN EACH EMITTER

All emitters turn on and off at the same time, maximizing balance of application. Holds back up to 4.6' of water (elevation change). No low emitter drainage, great on slopes. Delivers more precise watering.

UNIQUE PATENTED EMITTER DESIGN WITH PHYSICAL ROOT BARRIER

Offset flow path, extra large bath area and raised outlet prevent root intrusion without chemical reliance.

PRESSURE COMPENSATING

Precise and equal amounts of water are delivered over a broad pressure range.

CONTINUOUS SELF-FLUSHING EMITTER DESIGN

Flushes debris as it is detected, throughout operation, not just at the beginning or end of a cycle, ensuring uninterrupted emitter operation.

EMITTER WITH ANTI-SIPHON FEATURE

Prevents ingestion of debris into tubing caused by vacuum.

SELF-CONTAINED, ONE-PIECE DRIPLINE CONSTRUCTION

Assures reliable, easy installation.

FLEXIBLE UV RESISTANT TUBING

Adapts to any planting area shape - tubing curves at a 7" radius. For on-surface installations withstands heat and direct sun.

QUALIFIES FOR USE ON LEED PROJECTS

Contains the required quantity of post-consumer and post-industrial recycled material.

MAKES INSTALLATION QUICKER

Does not require air/vacuum relief vent or automatic flush valve for subsurface installations.



TECHLINE CV
NOW MADE WITH
POST CONSUMER
RECYCLED MATERIAL



17mm DRIPLINE

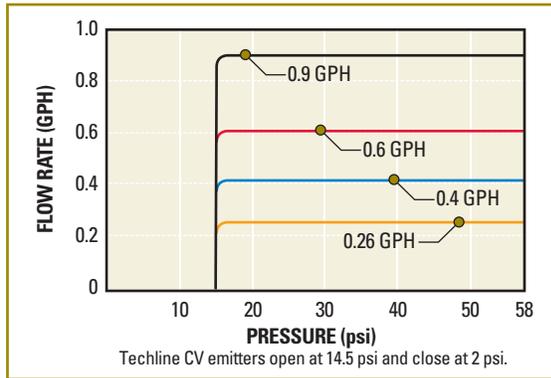
Water flows through the tubing and enters the emitter through the inlet filter. The filter blocks dirt and debris from entering, ensuring only clean water enters the dripline.

| GENERAL GUIDELINES | TURF | | | | SHRUB & GROUNDCOVER | | | |
|-------------------------------------|-----------------------------------------------|----------------|----------------|----------------|------------------------------------------------------------------|----------------|----------------|----------------|
| | CLAY SOIL | LOAM SOIL | SANDY SOIL | COARSE SOIL | CLAY SOIL | LOAM SOIL | SANDY SOIL | COARSE SOIL |
| EMITTER FLOW | 0.26 GPH | 0.4 GPH | 0.6 GPH | 0.9 GPH | 0.26 GPH | 0.4 GPH | 0.6 GPH | 0.9 GPH |
| EMITTER SPACING | 18" | 12" | 12" | 12" | 18" | 18" | 12" | 12" |
| LATERAL (ROW) SPACING | 18" 20" 22" | 18" 20" 22" | 12" 14" 16" | 12" 14" 16" | 18" 21" 24" | 18" 21" 24" | 16" 18" 20" | 16" 18" 20" |
| BURIAL DEPTH | Bury evenly throughout the zone from 4" to 6" | | | | On-surface or bury evenly throughout the zone to a maximum of 6" | | | |
| APPLICATION RATE (INCHES/HOUR) | 0.19 0.17 0.15 | 0.30 0.27 0.25 | 0.98 0.84 0.73 | 1.48 1.27 1.11 | 0.19 0.16 0.14 | 0.30 0.26 0.23 | 0.73 0.65 0.59 | 1.11 0.99 0.89 |
| TIME TO APPLY ¼" OF WATER (MINUTES) | 80 89 97 | 50 55 61 | 15 18 20 | 10 12 13 | 80 93 106 | 50 58 66 | 20 23 26 | 13 15 17 |

Following these maximum spacing guidelines, emitter flow selection can be increased if desired by the designer. 0.9 GPH flow rate available for areas requiring higher infiltration rates, such as coarse sandy soils.

Note: 0.4, 0.6 and 0.9 GPH are nominal flow rates. Actual flow rates used in the calculations are 0.42, 0.61 and 0.92 GPH.

FLOW RATE VS. PRESSURE



MAXIMUM LENGTH OF A SINGLE LATERAL (FEET)

| EMITTER SPACING | 12" | | | | 18" | | | | 24" | | |
|--------------------|--------|-----|-----|-----|------|-----|-----|-----|-----|-----|-----|
| EMITTER FLOW (GPH) | 0.26 | 0.4 | 0.6 | 0.9 | 0.26 | 0.4 | 0.6 | 0.9 | 0.6 | 0.9 | |
| INLET PRESSURE | 20 psi | 331 | 242 | 190 | 144 | 468 | 344 | 270 | 204 | 342 | 260 |
| | 25 psi | 413 | 302 | 238 | 180 | 584 | 429 | 338 | 257 | 430 | 326 |
| | 30 psi | 471 | 345 | 272 | 206 | 668 | 491 | 387 | 293 | 492 | 374 |
| | 35 psi | 518 | 380 | 299 | 227 | 737 | 540 | 426 | 323 | 542 | 412 |
| | 40 psi | 559 | 410 | 323 | 244 | 794 | 584 | 459 | 348 | 584 | 444 |
| | 45 psi | 594 | 436 | 343 | 260 | 845 | 620 | 489 | 371 | 622 | 472 |
| | 50 psi | 626 | 459 | 361 | 274 | 890 | 654 | 515 | 390 | 656 | 498 |
| | 55 psi | 655 | 480 | 378 | 287 | 932 | 684 | 539 | 410 | 686 | 522 |
| 60 psi | 681 | 500 | 393 | 298 | 969 | 713 | 561 | 426 | 716 | 544 | |

Limited Warranty for Driplines

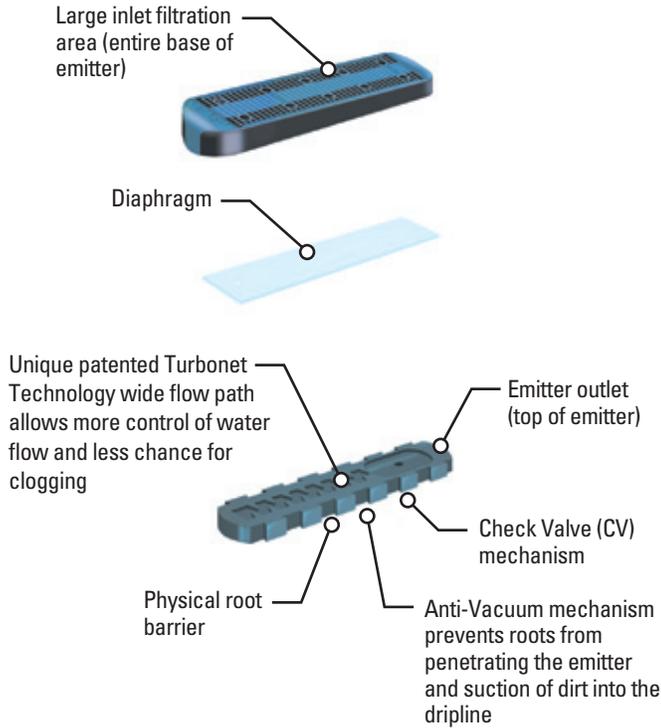
Netafim warrants any polyethylene tubing and driplines (Techline® CV, Techline® DL, Techline® RW and Techline® EZ) sold to be free from environmental stress cracking for a period of seven (7) years from the date of original delivery.

FLOW PER 100 FEET

| EMITTER SPACING | 0.26 EMITTER | | 0.4 EMITTER | | 0.6 EMITTER | | 0.9 EMITTER | |
|-----------------|--------------|------|-------------|------|-------------|------|-------------|------|
| | GPH | GPM | GPH | GPM | GPH | GPM | GPH | GPM |
| 12" | 26.4 | 0.44 | 42.3 | 0.71 | 60.8 | 1.01 | 92.5 | 1.54 |
| 18" | 17.6 | 0.29 | 28.2 | 0.47 | 40.5 | 0.68 | 61.6 | 1.03 |
| 24" | 13.2 | 0.22 | 21.2 | 0.35 | 30.4 | 0.51 | 46.2 | 0.77 |

TECHLINE® CV

EXPLODED VIEW OF TECHLINE CV EMITTER



SPECIFYING MODEL NUMBER

Reference for Ordering Information Chart

A Techline CV Dripline = **TLCV**

SAMPLE MODEL NUMBER

1 2
TLCV4-1210
A 3

| 1 Emitter Flow Rate | 2 Emitter Spacing | 3 Coil Length |
|----------------------|-------------------|--------------------|
| 0.26 GPH = 26 | 12" = 12 | 100' = 01 |
| 0.4 GPH = 4 | 18" = 18 | 250' = 025 |
| 0.6 GPH = 6 | 24" = 24 | 500' = 05 |
| 0.9 GPH = 9 | | 1,000' = 10 |

BLANK TUBING MODEL NUMBERS:

| | |
|------------------|----------------|
| 1,000' = TLCV010 | 500' = TLCV005 |
| 250' = TLCV0025 | 100' = TLCV001 |

ORDERING INFORMATION

| FLOW RATE | EMITTER SPACING | COIL LENGTH | MODEL NUMBER |
|--------------|-----------------|-------------|--------------|
| 0.26 GPH | 12" | 1,000' | TLCV26-1210 |
| | | 250' | TLCV26-12025 |
| | | 100' | TLCV26-1201 |
| | 18" | 1,000' | TLCV26-1810 |
| | | 250' | TLCV26-18025 |
| | | 100' | TLCV26-1801 |
| 0.4 GPH | 12" | 1,000' | TLCV4-1210 |
| | | 250' | TLCV4-12025 |
| | | 100' | TLCV4-1201 |
| | 18" | 1,000' | TLCV4-1810 |
| | | 250' | TLCV4-18025 |
| | | 100' | TLCV4-1801 |
| 0.6 GPH | 12" | 1,000' | TLCV6-1210 |
| | | 500' | TLCV6-1205 |
| | | 250' | TLCV6-12025 |
| | | 100' | TLCV6-1201 |
| | 18" | 1,000' | TLCV6-1810 |
| | | 500' | TLCV6-1805 |
| | | 250' | TLCV6-18025 |
| | | 100' | TLCV6-1801 |
| | 24" | 1,000' | TLCV6-2410 |
| | | 250' | TLCV6-24025 |
| | | 100' | TLCV6-2401 |
| | | | |
| 0.9 GPH | 12" | 1,000' | TLCV9-1210 |
| | | 500' | TLCV9-1205 |
| | | 250' | TLCV9-12025 |
| | | 100' | TLCV9-1201 |
| | 18" | 1,000' | TLCV9-1810 |
| | | 500' | TLCV9-1805 |
| | | 250' | TLCV9-18025 |
| | | 100' | TLCV9-1801 |
| | 24" | 1,000' | TLCV9-2410 |
| | | 250' | TLCV9-24025 |
| | | 100' | TLCV9-2401 |
| | | | |
| BLANK TUBING | | 1,000' | TLCV010 |
| | | 500' | TLCV005 |
| | | 250' | TLCV0025 |
| | | 100' | TLCV001 |



Maximum Uniformity in
Subsurface and On-Surface
Including Slopes

TECHLINE® DL

17mm DRIPLINE

APPLICATIONS

- Subsurface or on-surface installations
- Curved, angular or narrow planting areas
- High traffic/high liability areas
- Areas subject to vandalism
- High wind areas
- Turf, shrubs, trees
- Slopes
- At-grade windows
- Sports turf

SPECIFICATIONS

- Emitter flow rates: 0.26, 0.4, 0.6 and 0.9 GPH
- Emitter spacings: 12", 18" or 24" (24" available in 0.6 and 0.9 GPH only)
- Pressure compensation range: 6 to 58 psi (stainless steel clamps recommended above 50 psi)
- Bending radius: 7"
- Maximum recommended system pressure: 58 psi
- Minimum pressure required: 6 psi
- Tubing diameter: 0.66" OD; 0.56" ID; 0.050" wall
- Coil length: 100', 250', 500', 1,000'
- Recommended minimum filtration: 120 mesh
- Diaphragm made of silicon

FEATURES & BENEFITS

THE FIRST ANTI-SIPHON EMITTER IN LANDSCAPE DRIPLINE

Emitter manufactured and successfully used in harsh agricultural applications since 2000. Emitter is pressure compensating and continuous flushing.

EMITTER WITH ANTI-SIPHON FEATURE

Prevents ingestion of debris into tubing caused by vacuum.

SELF-CONTAINED, ONE-PIECE DRIPLINE CONSTRUCTION

Assures reliable, easy installation.

FLEXIBLE UV RESISTANT TUBING

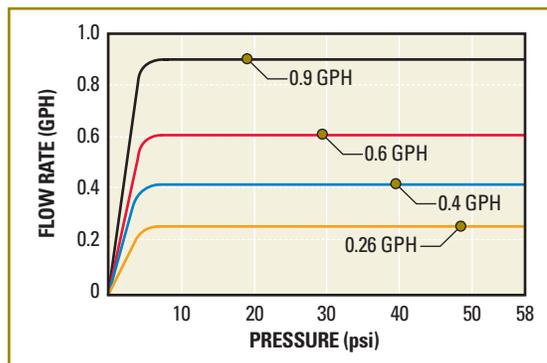
Adapts to any planting area shape - tubing curves at a 7" radius. For on-surface installations withstands heat and direct sun.

QUALIFIES FOR USE ON LEED PROJECTS

Contains the required quantity of post-consumer and post-industrial recycled material.



FLOW RATE VS. PRESSURE



Limited Warranty for Driplines

Netafim warrants any polyethylene tubing and driplines (Techline® CV, Techline® DL, Techline® RW and Techline® EZ) sold to be free from environmental stress cracking for a period of seven (7) years from the date of original delivery.

TECHLINE® DL

| GENERAL GUIDELINES | TURF | | | | SHRUB & GROUNDCOVER | | | | | | | | | | | | | | | | | | | |
|-------------------------------------|-----------------------------------------------|------|-----------|------|---------------------|------|-------------|------|------------------------------------------------------------------|------|-----------|------|------------|------|-------------|------|------|------|------|------|------|------|------|------|
| | CLAY SOIL | | LOAM SOIL | | SANDY SOIL | | COARSE SOIL | | CLAY SOIL | | LOAM SOIL | | SANDY SOIL | | COARSE SOIL | | | | | | | | | |
| EMITTER FLOW | 0.26 GPH | | 0.4 GPH | | 0.6 GPH | | 0.9 GPH | | 0.26 GPH | | 0.4 GPH | | 0.6 GPH | | 0.9 GPH | | | | | | | | | |
| EMITTER SPACING | 18" | | 12" | | 12" | | 12" | | 18" | | 18" | | 12" | | 12" | | | | | | | | | |
| LATERAL (ROW) SPACING | 18" | 20" | 22" | 18" | 20" | 22" | 12" | 14" | 16" | 12" | 14" | 16" | 18" | 21" | 24" | 18" | 21" | 24" | 16" | 18" | 20" | 16" | 18" | 20" |
| BURIAL DEPTH | Bury evenly throughout the zone from 4" to 6" | | | | | | | | On-surface or bury evenly throughout the zone to a maximum of 6" | | | | | | | | | | | | | | | |
| APPLICATION RATE (INCHES/HOUR) | 0.19 | 0.17 | 0.15 | 0.30 | 0.27 | 0.25 | 0.98 | 0.84 | 0.73 | 1.48 | 1.27 | 1.11 | 0.19 | 0.16 | 0.14 | 0.30 | 0.26 | 0.23 | 0.73 | 0.65 | 0.59 | 1.11 | 0.99 | 0.89 |
| TIME TO APPLY ¼" OF WATER (MINUTES) | 80 | 89 | 97 | 50 | 55 | 61 | 15 | 18 | 20 | 10 | 12 | 13 | 80 | 93 | 106 | 50 | 58 | 66 | 20 | 23 | 26 | 13 | 15 | 17 |

Following these maximum spacing guidelines, emitter flow selection can be increased if desired by the designer.
0.9 GPH flow rate available for areas requiring higher infiltration rates, such as coarse sandy soils.

Note: 0.4, 0.6 and 0.9 GPH are nominal flow rates. Actual flow rates used in the calculations are 0.42, 0.61 and 0.92 GPH.

MAXIMUM LENGTH OF A SINGLE LATERAL (FEET)

| EMITTER SPACING | 12" | | | | 18" | | | | 24" | | |
|--------------------|--------|-----|-----|-----|------|-----|-----|-----|-----|-----|-----|
| | 0.26 | 0.4 | 0.6 | 0.9 | 0.26 | 0.4 | 0.6 | 0.9 | 0.6 | 0.9 | |
| EMITTER FLOW (GPH) | 0.26 | 0.4 | 0.6 | 0.9 | 0.26 | 0.4 | 0.6 | 0.9 | 0.6 | 0.9 | |
| INLET PRESSURE | 20 psi | 444 | 326 | 256 | 194 | 631 | 463 | 365 | 277 | 465 | 353 |
| | 25 psi | 496 | 364 | 287 | 217 | 706 | 518 | 409 | 310 | 519 | 395 |
| | 35 psi | 578 | 423 | 333 | 253 | 821 | 604 | 476 | 361 | 605 | 461 |
| | 45 psi | 641 | 470 | 370 | 281 | 913 | 670 | 529 | 401 | 673 | 513 |

FLOW PER 100 FEET

| EMITTER SPACING | 0.26 EMITTER | | 0.4 EMITTER | | 0.6 EMITTER | | 0.9 EMITTER | |
|-----------------|--------------|------|-------------|------|-------------|------|-------------|------|
| | GPH | GPM | GPH | GPM | GPH | GPM | GPH | GPM |
| 12" | 26.4 | 0.44 | 42.3 | 0.71 | 60.8 | 1.01 | 92.5 | 1.54 |
| 18" | 17.6 | 0.29 | 28.2 | 0.47 | 40.5 | 0.68 | 61.6 | 1.03 |
| 24" | 13.2 | 0.22 | 21.2 | 0.35 | 30.4 | 0.51 | 46.2 | 0.77 |

SPECIFYING MODEL NUMBER

Reference for Ordering Information Chart

SAMPLE MODEL NUMBER

A Techline DL Dripline = **TLDL**

1 **2**

TLDL4-1210

A **3**

1 **EMITTER FLOW RATE**

0.26 GPH = **26**
0.4 GPH = **4**
0.6 GPH = **6**
0.9 GPH = **9**

2 **EMITTER SPACING**

12" = **12**
18" = **18**
24" = **24**

3 **COIL LENGTH**

100' = **01**
250' = **025**
500' = **05**
1,000' = **10**

BLANK TUBING MODEL NUMBERS:
1,000' = TLDL010 500' = TLDL005
250' = TLDL0025 100' = TLDL001

ORDERING INFORMATION

| FLOW RATE | EMITTER SPACING | COIL LENGTH | MODEL NUMBER |
|--------------|-----------------|-------------|--------------|
| 0.26 GPH | 12" | 1,000' | TLDL26-1210 |
| | | 250' | TLDL26-12025 |
| | | 100' | TLDL26-1201 |
| | 18" | 1,000' | TLDL26-1810 |
| | | 250' | TLDL26-18025 |
| | | 100' | TLDL26-1801 |
| 0.4 GPH | 12" | 1,000' | TLDL4-1210 |
| | | 250' | TLDL4-12025 |
| | | 100' | TLDL4-1201 |
| | 18" | 1,000' | TLDL4-1810 |
| | | 250' | TLDL4-18025 |
| | | 100' | TLDL4-1801 |
| 0.6 GPH | 12" | 1,000' | TLDL6-1210 |
| | | 500' | TLDL6-1205 |
| | | 250' | TLDL6-12025 |
| | | 100' | TLDL6-1201 |
| | 18" | 1,000' | TLDL6-1810 |
| | | 500' | TLDL6-1805 |
| | | 250' | TLDL6-18025 |
| | | 100' | TLDL6-1801 |
| | 24" | 1,000' | TLDL6-2410 |
| | | 250' | TLDL6-24025 |
| | | 100' | TLDL6-2401 |
| | | 0.9 GPH | 12" |
| 500' | TLDL9-1205 | | |
| 250' | TLDL9-12025 | | |
| 18" | 1,000' | | TLDL9-1810 |
| | 500' | | TLDL9-1805 |
| | 250' | | TLDL9-18025 |
| 24" | 1,000' | | TLDL9-2410 |
| | 250' | | TLDL9-24025 |
| BLANK TUBING | | 1,000' | TLDL010 |
| | | 500' | TLDL005 |
| | | 250' | TLDL0025 |
| | | 100' | TLDL001 |

For Reclaimed
Water Use

TECHLINE® RW

17mm DRIPLINE

APPLICATIONS

- Reclaimed (recycled) water use
- For irrigation with non-potable/ reclaimed water and soil loading

SPECIFICATIONS

- Manufactured with purple stripe for non-potable water applications
- Emitter flow rates: 0.26, 0.4, 0.6 and 0.9 GPH
- Emitter spacings: 12", 18" and 24"
- Pressure compensation range: 7 to 58 psi (stainless steel clamps recommended above 50 psi)
- Bending radius: 7"
- Maximum recommended system pressure: 58 psi
- Minimum pressure required: 6 psi
- Tubing diameter: 0.66" OD; 0.56" ID; 0.050" wall
- Coil length: 1,000'
- Recommended minimum filtration: 120 mesh
- Diaphragm made of silicon

FEATURES & BENEFITS

UNIQUE PATENTED EMITTER DESIGN WITH PHYSICAL ROOT BARRIER

Emitters prevent root intrusion without chemical reliance.

PRESSURE COMPENSATING

Precise and equal amounts of water are delivered over a broad pressure range.

CONTINUOUS SELF-FLUSHING EMITTER DESIGN

Flushes debris as it is detected, throughout operation, not just at the beginning or end of a cycle, ensuring uninterrupted emitter operation.

EMITTER WITH ANTI-SIPHON FEATURE

Prevents ingestion of debris into tubing caused by vacuum.

SELF-CONTAINED, ONE-PIECE DRIPLINE CONSTRUCTION

Assures reliable, easy installation.

FLEXIBLE UV RESISTANT TUBING

Adapts to any planting area shape - tubing curves at a 7" radius. For on-surface installations withstands heat and direct sun.

QUALIFIES FOR USE ON LEED PROJECTS

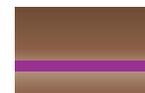
Contains the required quantity of post-consumer and post-industrial recycled material.

TECHLINE RW AND TECHLINE RWP ARE DESIGNED FOR RECLAIMED WATER USE ONLY

Reclaimed, reuse or recycled water is municipally-treated, non-potable water deemed appropriate for use in irrigation systems and not wastewater being dispersed into the soil for additional treatment. Please consult your local Water Management District for regulations regarding the type of water being used, and its proper system design. Netafim USA can provide assistance on drip dispersal that use primary or secondary and tertiary wastewater. Please contact Netafim USA Customer Service for more information.



TECHLINE RW
NOW MADE WITH
POST CONSUMER
RECYCLED MATERIAL



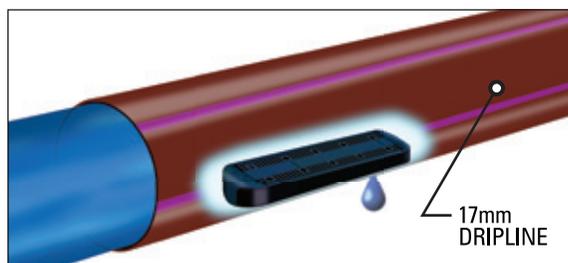
Purple
striped
dripline



TECHLINE RWP
NOW MADE WITH
POST CONSUMER
RECYCLED MATERIAL



Solid
purple
dripline



TECHLINE® RW

| GENERAL GUIDELINES | TURF | | | | SHRUB & GROUNDCOVER | | | | | | | | | | | | | | | | | | | |
|-------------------------------------|-----------------------------------------------|------|-----------|------|---------------------|------|-------------|------|------------------------------------------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| | CLAY SOIL | | LOAM SOIL | | SANDY SOIL | | COARSE SOIL | | | | | | | | | | | | | | | | | |
| EMITTER FLOW | 0.26 GPH | | 0.4 GPH | | 0.6 GPH | | 0.9 GPH | | | | | | | | | | | | | | | | | |
| EMITTER SPACING | 18" | | 12" | | 12" | | 12" | | | | | | | | | | | | | | | | | |
| LATERAL (ROW) SPACING | 18" | 20" | 22" | 18" | 20" | 22" | 12" | 14" | 16" | 18" | 21" | 24" | 18" | 21" | 24" | 16" | 18" | 20" | 16" | 18" | 20" | | | |
| BURIAL DEPTH | Bury evenly throughout the zone from 4" to 6" | | | | | | | | On-surface or bury evenly throughout the zone to a maximum of 6" | | | | | | | | | | | | | | | |
| APPLICATION RATE (INCHES/HOUR) | 0.19 | 0.17 | 0.15 | 0.30 | 0.27 | 0.25 | 0.98 | 0.84 | 0.73 | 1.48 | 1.27 | 1.11 | 0.19 | 0.16 | 0.14 | 0.30 | 0.26 | 0.23 | 0.73 | 0.65 | 0.59 | 1.11 | 0.99 | 0.89 |
| TIME TO APPLY ¼" OF WATER (MINUTES) | 80 | 89 | 97 | 50 | 55 | 61 | 15 | 18 | 20 | 10 | 12 | 13 | 80 | 93 | 106 | 50 | 58 | 66 | 20 | 23 | 26 | 13 | 15 | 17 |

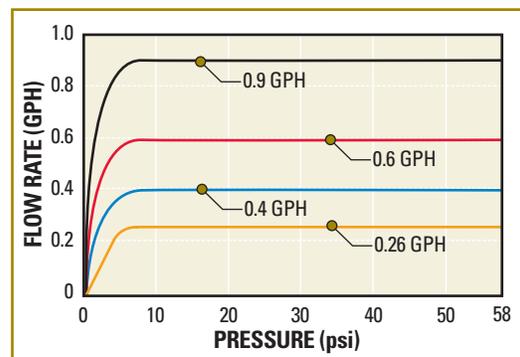
Following these maximum spacing guidelines, emitter flow selection can be increased if desired by the designer. 0.9 GPH flow rate available for areas requiring higher infiltration rates, such as coarse sandy soils.

Note: 0.4, 0.6 and 0.9 GPH are nominal flow rates. Actual flow rates used in the calculations are 0.42, 0.61 and 0.92 GPH.

MAXIMUM LENGTH OF A SINGLE LATERAL (FEET)

| EMITTER SPACING | 12" | | | | 18" | | | | 24" | | |
|--------------------|--------|-----|-----|-----|------|-----|-----|-----|-----|-----|-----|
| | 0.26 | 0.4 | 0.6 | 0.9 | 0.26 | 0.4 | 0.6 | 0.9 | 0.6 | 0.9 | |
| EMITTER FLOW (GPH) | 0.26 | 0.4 | 0.6 | 0.9 | 0.26 | 0.4 | 0.6 | 0.9 | 0.6 | 0.9 | |
| INLET PRESSURE | 20 psi | 444 | 326 | 256 | 194 | 631 | 463 | 365 | 277 | 465 | 353 |
| | 25 psi | 496 | 364 | 287 | 217 | 706 | 518 | 409 | 310 | 519 | 395 |
| | 35 psi | 578 | 423 | 333 | 253 | 821 | 604 | 476 | 361 | 605 | 461 |
| | 45 psi | 641 | 470 | 370 | 281 | 913 | 670 | 529 | 401 | 673 | 513 |

FLOW RATE VS. PRESSURE



FLOW PER 100 FEET

| EMITTER SPACING | 0.26 EMITTER | | 0.4 EMITTER | | 0.6 EMITTER | | 0.9 EMITTER | |
|-----------------|--------------|------|-------------|------|-------------|------|-------------|------|
| | GPH | GPM | GPH | GPM | GPH | GPM | GPH | GPM |
| 12" | 26.4 | 0.44 | 42.3 | 0.71 | 60.8 | 1.01 | 92.5 | 1.54 |
| 18" | 17.6 | 0.29 | 28.2 | 0.47 | 40.5 | 0.68 | 61.6 | 1.03 |
| 24" | 13.2 | 0.22 | 21.2 | 0.35 | 30.4 | 0.51 | 46.2 | 0.77 |

ORDERING INFORMATION

| FLOW RATE | EMITTER SPACING | COIL LENGTH | MODEL NUMBER |
|--------------|-----------------|-------------|--------------|
| 0.26 GPH | 12" | 1,000' | TLRW26-1210 |
| | 18" | 1,000' | TLRW26-1810 |
| 0.4 GPH | 12" | 1,000' | TLRW4-1210 |
| | 18" | 1,000' | TLRW4-1810 |
| | 24" | 1,000' | TLRW4-2410 |
| 0.6 GPH | 12" | 1,000' | TLRW6-1210 |
| | 18" | 1,000' | TLRW6-1810 |
| | 24" | 1,000' | TLRW6-2410 |
| 0.9 GPH | 12" | 1,000' | TLRW9-1210 |
| | 18" | 1,000' | TLRW9-1810 |
| | 24" | 1,000' | TLRW9-2410 |
| BLANK TUBING | | 1,000' | TLRW010 |

*Call Netafim USA Customer Service for ordering information and pricing for Techline RWP.

SPECIFYING MODEL NUMBER

Reference for Ordering Information Chart

A Techline Dripline for Reclaimed Water = **TLRW**

1 EMITTER FLOW RATE
0.26 GPH = 26
0.4 GPH = 4
0.6 GPH = 6
0.9 GPH = 9

2 EMITTER SPACING
12" = 12
18" = 18
24" = 24

3 COIL LENGTH
1,000' = 10

SAMPLE MODEL NUMBER
TLRW4-1210

BLANK TUBING MODEL NUMBER: 1,000' = TLRW010

Limited Warranty for Driplines

Netafim warrants any polyethylene tubing and driplines (Techline® CV, Techline® DL, Techline® RW and Techline® EZ) sold to be free from environmental stress cracking for a period of seven (7) years from the date of original delivery.

Ideal for Small
and Medium Areas

TECHLINE® EZ

12mm DRIPLINE

APPLICATIONS

- Subsurface or on-surface installations
- Bed areas that require shorter lateral lengths
- Areas subject to vandalism
- Planting areas
- Curved, narrow, and angular planting areas
- Flower beds, trees, and shrubs
- Rooftop gardens
- Vegetable gardens
- Green walls
- High traffic or high liability areas
- Raised planters

SPECIFICATIONS

- Emitter flow rates: 0.26, 0.4, 0.6 and 0.9 GPH
- Emitter spacings: 6", 12" and 18" (6" available for 0.26 and 0.4 GPH only)
- Uses 12mm Netafim Insert Fittings or any compression fitting for 0.426" diameter tubing
- Pressure compensation range: 6 to 58 psi (stainless steel clamps recommended above 50 psi)
- Bending radius: 6"
- Maximum recommended system pressure: 58 psi
- Minimum pressure required: 6 psi
- Tubing diameter: 0.510" O.D.; 0.426" I.D.
- Coil length: 200', 250', 300', 500', 1,000'
- Recommended minimum filtration: 120 mesh
- Diaphragm made of silicon

Limited Warranty for Driplines

Netafim warrants any polyethylene tubing and driplines (Techline® CV, Techline® DL, Techline® RW and Techline® EZ) sold to be free from environmental stress cracking for a period of seven (7) years from the date of original delivery.

FEATURES & BENEFITS

THE FIRST ANTI-SIPHON EMITTER IN LANDSCAPE DRIPLINE

Emitter manufactured and successfully used in harsh agricultural applications since 2000. Emitter is pressure compensating and continuous flushing.

LESS VISUALLY OBTRUSIVE

12mm diameter tubing is less noticeable in landscape installations.

EMITTER WITH ANTI-SIPHON FEATURE

Prevents ingestion of debris into tubing caused by vacuum.

SELF-CONTAINED, ONE-PIECE DRIPLINE CONSTRUCTION

Assures reliable, easy installation.

FLEXIBLE UV RESISTANT TUBING

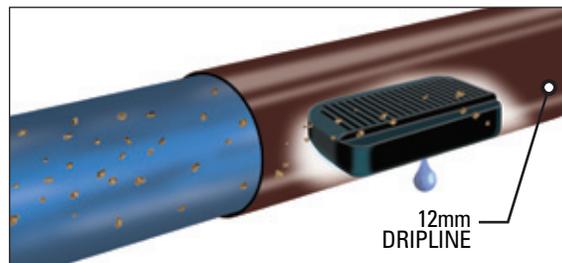
Adapts to any planting area shape - tubing curves at a 6" radius. For on-surface installations withstands heat and direct sun.

QUALIFIES FOR USE ON LEED PROJECTS

Contains the required quantity of post-consumer and post-industrial recycled material.

MORE COST EFFECTIVE IN SMALLER BED AREAS

24% smaller diameter tubing.



TECHLINE® EZ

| GENERAL GUIDELINES | TURF | | | | SHRUB & GROUNDCOVER | | | | | | | | | | | | | | | | | | | |
|-------------------------------------|-----------------------------------------------|-------------|-------------|-------------|------------------------------------------------------------------|-------------|-------------|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| | CLAY SOIL | LOAM SOIL | SANDY SOIL | COARSE SOIL | CLAY SOIL | LOAM SOIL | SANDY SOIL | COARSE SOIL | | | | | | | | | | | | | | | | |
| EMITTER FLOW | 0.26 GPH | 0.4 GPH | 0.6 GPH | 0.9 GPH | 0.26 GPH | 0.4 GPH | 0.6 GPH | 0.9 GPH | | | | | | | | | | | | | | | | |
| EMITTER SPACING | 18" | 12" | 12" | 12" | 18" | 18" | 12" | 12" | | | | | | | | | | | | | | | | |
| LATERAL (ROW) SPACING | 18" 20" 22" | 18" 20" 22" | 12" 14" 16" | 12" 14" 16" | 18" 21" 24" | 18" 21" 24" | 16" 18" 20" | 16" 18" 20" | | | | | | | | | | | | | | | | |
| BURIAL DEPTH | Bury evenly throughout the zone from 4" to 6" | | | | On-surface or bury evenly throughout the zone to a maximum of 6" | | | | | | | | | | | | | | | | | | | |
| APPLICATION RATE (INCHES/HOUR) | 0.19 | 0.17 | 0.15 | 0.45 | 0.41 | 0.37 | 0.96 | 0.83 | 0.72 | 1.44 | 1.24 | 1.08 | 0.19 | 0.16 | 0.14 | 0.29 | 0.24 | 0.21 | 0.72 | 0.64 | 0.58 | 1.08 | 0.96 | 0.87 |
| TIME TO APPLY ¼" OF WATER (MINUTES) | 81 | 90 | 99 | 33 | 37 | 41 | 16 | 18 | 21 | 10 | 12 | 14 | 81 | 94 | 108 | 53 | 61 | 70 | 21 | 23 | 26 | 14 | 16 | 17 |

Following these maximum spacing guidelines, emitter flow selection can be increased if desired by the designer.
0.9 GPH flow rate available for areas requiring higher infiltration rates, such as coarse sandy soils.

Note: 0.4, 0.6 and 0.9 GPH are nominal flow rates. Actual flow rates used in the calculations are 0.42, 0.61 and 0.92 GPH.

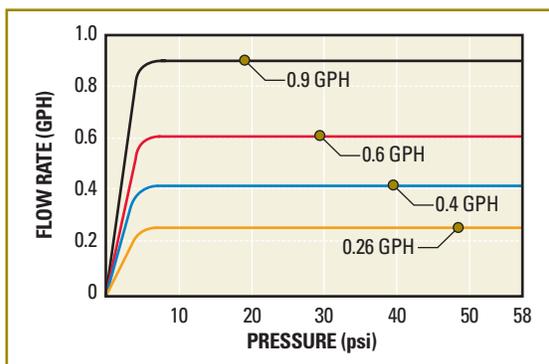
FLOW PER 100 FEET

| EMITTER SPACING | 0.26 EMITTER | | 0.4 EMITTER | | 0.6 EMITTER | | 0.9 EMITTER | |
|-----------------|--------------|------|-------------|------|--------------|------|--------------|------|
| | GPH | GPM | GPH | GPM | GPH | GPM | GPH | GPM |
| 6" | 52.8 | 0.88 | 84.0 | 1.40 | Not Standard | | Not Standard | |
| 12" | 26.4 | 0.44 | 42.3 | 0.71 | 60.8 | 1.01 | 92.5 | 1.54 |
| 18" | 17.6 | 0.29 | 28.2 | 0.47 | 40.5 | 0.68 | 61.6 | 1.03 |

MAXIMUM LENGTH OF A SINGLE LATERAL (FEET)

| EMITTER SPACING | 6" | | 12" | | | | 18" | | | | |
|-----------------|--------|-----|------|-----|-----|-----|------|-----|-----|-----|-----|
| | 0.26 | 0.4 | 0.26 | 0.4 | 0.6 | 0.9 | 0.26 | 0.4 | 0.6 | 0.9 | |
| INLET PRESSURE | 20 psi | 143 | 105 | 265 | 195 | 168 | 153 | 375 | 275 | 238 | 217 |
| | 25 psi | 158 | 116 | 295 | 216 | 187 | 170 | 416 | 307 | 265 | 241 |
| | 35 psi | 183 | 134 | 341 | 250 | 216 | 197 | 482 | 355 | 307 | 280 |
| | 45 psi | 202 | 148 | 377 | 277 | 239 | 218 | 535 | 392 | 340 | 310 |

FLOW RATE VS. PRESSURE



SPECIFYING MODEL NUMBER

Reference for Ordering Information Chart

A Techline EZ Dripline = TLEZ

SAMPLE MODEL NUMBER
TLEZ4-1210

1 EMITTER FLOW RATE
 0.26 GPH = 26
 0.4 GPH = 4
 0.6 GPH = 6
 0.9 GPH = 9

2 EMITTER SPACING
 6" = 6
 12" = 12
 18" = 18

3 COIL LENGTH
 200' = 02
 250' = 025
 300' = 03
 500' = 05
 1,000' = 10

BLANK TUBING MODEL NUMBERS:
 500' = TLEZ005 250' = TLEZ0025

ORDERING INFORMATION

| FLOW RATE | EMITTER SPACING | COIL LENGTH | MODEL NUMBER |
|--------------|-----------------|-------------|--------------|
| 0.26 GPH | 6" | 300' | TLEZ26-0603 |
| | | 500' | TLEZ26-0605 |
| | | 1,000' | TLEZ26-0610 |
| | 12" | 300' | TLEZ26-1203 |
| | | 500' | TLEZ26-1205 |
| | | 1,000' | TLEZ26-1210 |
| | 18" | 300' | TLEZ26-1803 |
| | | 500' | TLEZ26-1805 |
| | | 1,000' | TLEZ26-1810 |
| 0.4 GPH | 6" | 200' | TLEZ4-0602 |
| | | 500' | TLEZ4-0605 |
| | | 1,000' | TLEZ4-0610 |
| | 12" | 200' | TLEZ4-1202 |
| | | 500' | TLEZ4-1205 |
| | | 1,000' | TLEZ4-1210 |
| | 18" | 200' | TLEZ4-1802 |
| | | 500' | TLEZ4-1805 |
| | | 1,000' | TLEZ4-1810 |
| 0.6 GPH | 12" | 300' | TLEZ6-1203 |
| | | 500' | TLEZ6-1205 |
| | | 1,000' | TLEZ6-1210 |
| | 18" | 250' | TLEZ6-18025 |
| | | 500' | TLEZ6-1805 |
| | | 1,000' | TLEZ6-1810 |
| 0.9 GPH | 12" | 200' | TLEZ9-1202 |
| | | 500' | TLEZ9-1205 |
| | | 1,000' | TLEZ9-1210 |
| | 18" | 200' | TLEZ9-1802 |
| | | 500' | TLEZ9-1805 |
| | | 1,000' | TLEZ9-1810 |
| BLANK TUBING | | 250' | TLEZ0025 |
| | | 500' | TLEZ005 |

TECHFILTER® SYSTEMS

APPLICATIONS

- Available for use with all new Techline CV, Techline DL and Techline RW subsurface installations

SPECIFICATIONS

- Filtration: 120 mesh
- Maximum pressure: 140 psi (filter)
- Filter available in ¾", 1", 1" Long, 1 ½" Long & 2"
- Available with Techline CV, Techline or Techline RW Dripline (see ordering information)

FEATURES & BENEFITS

HELPS ELIMINATE ROOT INTRUSION

Evenly delivers a low concentration of trifluralin to all emitters throughout the system.

REPLACEABLE TECHFILTER CARTRIDGE

Easy, no-touch installation and replacement of trifluralin disc rings. Allows for renewal of protection.

SEALED PACKAGING DRAMATICALLY EXTENDS SHELF LIFE

Adds to filter replacement convenience.

PROVIDES ULTRA-EFFICIENT WATER FILTRATION

Performance far superior to screen-type filters.

OPPORTUNITY FOR A LIFETIME OF PROTECTION

Renewable warranty activated when filter cartridges are installed and registered.

INSURANCE AGAINST ROOT INTRUSION

Our revolutionary Techfilter protects against roots invading the system. Here's how it works: trifluralin is incorporated into the replaceable disc ring assemblies inside the filter housing. When water passes through the filter, a very low concentration of trifluralin (parts per billion) is transmitted throughout the system. This technology provides very precise and even distribution of trifluralin throughout the piping network and effectively inhibits root growth into the emitter outlets.



Techfilters are required to be sold with dripline due to EPA regulations.

EXCLUSIVE NETAFIM USA TECHFILTER LIMITED LIFETIME EXTENDED WARRANTY

Every Netafim Techfilter carries a 2-Year-to-Lifetime Warranty. Proper use and timely replacement of the cartridge will keep the Lifetime Extended Warranty in force. Replaceable Techfilter disc cartridges come in conveniently sealed packages with gloves which have two benefits: extended shelf life and simple, clean replacement of the complete cartridge without having to touch the rings.

MINIMUM AND MAXIMUM TOTAL DRIPLINE LENGTH PER FILTER SIZE (FEET)

| | EMITTER FLOW | 0.26 GPH | | 0.4 GPH | | 0.6 GPH | | 0.9 GPH | |
|-----------------------------|------------------|-----------------|--------|---------|--------|---------|--------|---------|-------|
| | | EMITTER SPACING | 12" | 18" | 12" | 18" | 12" | 18" | 12" |
| ¾" FILTER | MIN. FLOW 1 GPM | 220 | 328 | 143 | 213 | 98 | 114 | 65 | 98 |
| | MAX. FLOW 7 GPM | 1,534 | 2,300 | 1,000 | 1,489 | 686 | 795 | 458 | 686 |
| 1" FILTER | MIN. FLOW 3 GPM | 657 | 986 | 429 | 638 | 294 | 341 | 196 | 294 |
| | MAX. FLOW 22 GPM | 4,823 | 7,234 | 3,143 | 4,681 | 2,157 | 2,500 | 1,438 | 2,157 |
| 1" LONG OR 1 ½" LONG FILTER | MIN. FLOW 8 GPM | 1,753 | 2,630 | 1,143 | 1,702 | 784 | 909 | 523 | 784 |
| | MAX. FLOW 40 GPM | 8,770 | 13,153 | 5,714 | 8,511 | 3,922 | 4,545 | 2,614 | 3,922 |
| 2" FILTER | MIN. FLOW 14 GPM | 3,070 | 4,603 | 2,000 | 2,979 | 1,373 | 1,591 | 915 | 1,373 |
| | MAX. FLOW 90 GPM | 19,730 | 29,596 | 12,857 | 19,149 | 8,824 | 10,227 | 5,882 | 8,824 |

TECHFILTER® SYSTEMS

SPECIFYING MODEL NUMBER

Reference for Ordering Information Charts

A Techfilter = TF

SAMPLE MODEL NUMBER

1 **2** **4**
TF075912-100CV
A **3** **5**

1 **FILTER SIZE**
 ¾" = **075**
 1" = **10**
 1" Long = **10L**
 1½" Long = **15L**
 2" = **20**

2 **EMITTER FLOW**
 0.26 GPH = **26**
 0.4 GPH = **4**
 0.6 GPH = **6**
 0.9 GPH = **9**

3 **EMITTER SPACING**
 12" = **12**
 18" = **18**

4 **QUANTITY OF DRIPLINE**
 The length of Techline CV, Techline DL or Techline RW is supplied with each filter ordered. See Minimum and Maximum Dripline Length Chart.

5 Add CV to end of model number to indicate Techline CV.
 Add RW to end of model number to indicate Techline RW.

TECHFILTER REPLACEMENT CARTRIDGE KIT ORDERING INFORMATION

| FILTER SIZE | MODEL NUMBER |
|--------------------|---------------|
| ¾" | TFCARTKIT075 |
| 1" | TFCARTKIT100 |
| 1" LONG & 1½" LONG | TFCARTKITLONG |
| 2" | TFCARTKIT200 |

Due to state EPA regulations, Techfilter is not available in South Dakota.

¾" TECHFILTER ORDERING INFORMATION



| TECHLINE CV MODEL NUMBER | TECHLINE DL MODEL NUMBER | TECHLINE RW MODEL NUMBER | EMITTER FLOW RATE (GPH) | | | | EMITTER SPACING | | ROLLS SUPPLIED | | |
|-----------------------------|-----------------------------|-----------------------------|-------------------------|-----|-----|-----|-----------------|-----|----------------|------|--------|
| | | | 0.26 | 0.4 | 0.6 | 0.9 | 12" | 18" | 100' | 250' | 1,000' |
| TF0752612-100CV | - | - | ✓ | | | | ✓ | | 1 | | |
| TF0752612-1000C | - | - | ✓ | | | | ✓ | | | | 1 |
| TF0752618-200CV | - | - | ✓ | | | | | ✓ | 2 | | |
| TF0752618-1000C | - | - | ✓ | | | | | ✓ | | | 1 |
| TF075412-100CV | TF075412-100 | - | | ✓ | | | ✓ | | 1 | | |
| TF075412-1000CV | TF075412-1000 | TF075412-1000RW | | ✓ | | | ✓ | | | | 1 |
| TF075418-200CV | TF075418-200 | - | | ✓ | | | | ✓ | 2 | | |
| TF075418-1000CV | TF075418-1000 | TF075418-1000RW | | ✓ | | | | ✓ | | | 1 |
| TF075612-100CV | TF075612-100 | - | | | ✓ | | ✓ | | 1 | | |
| TF075612-1000CV | TF075612-1000 | TF075612-1000RW | | | ✓ | | ✓ | | | | 1 |
| TF075618-200CV | TF075618-200 | - | | | ✓ | | | ✓ | 2 | | |
| TF075618-1000CV | TF075618-1000 | TF075618-1000RW | | | ✓ | | | ✓ | | | 1 |
| TF075912-100CV | TF075912-100 | - | | | | ✓ | ✓ | | 1 | | |
| TF075912-250CV | - | - | | | | ✓ | ✓ | | | 1 | |
| TF075912-1000CV | TF075912-1000 | TF075912-1000RW | | | | ✓ | ✓ | | | | 1 |
| TF075918-100CV | TF075918-100 | - | | | | ✓ | | ✓ | 1 | | |
| TF075918-1000CV | TF075918-1000 | TF075918-1000RW | | | | ✓ | | ✓ | | | 1 |

1" TECHFILTER ORDERING INFORMATION



| TECHLINE CV MODEL NUMBER | TECHLINE DL MODEL NUMBER | TECHLINE RW MODEL NUMBER | EMITTER FLOW RATE (GPH) | | | | EMITTER SPACING | | ROLLS SUPPLIED | | |
|-----------------------------|-----------------------------|-----------------------------|-------------------------|-----|-----|-----|-----------------|-----|----------------|------|--------|
| | | | 0.26 | 0.4 | 0.6 | 0.9 | 12" | 18" | 100' | 250' | 1,000' |
| TF102612-400CV | - | - | ✓ | | | | ✓ | | 4 | | |
| TF102612-1000CV | - | - | ✓ | | | | ✓ | | | | 1 |
| TF102618-600CV | - | - | ✓ | | | | | ✓ | 1 | 2 | |
| TF102618-1000CV | - | - | ✓ | | | | | ✓ | | | 1 |
| TF10412-400CV | TF10412-400 | - | | ✓ | | | ✓ | | 4 | | |
| TF10412-1000CV | TF10412-1000 | TF10412-1000RW | | ✓ | | | ✓ | | | | 1 |
| TF10418-600CV | TF10418-600 | - | | ✓ | | | | ✓ | 1 | 2 | |
| TF10418-1000CV | TF10418-1000 | TF10418-1000RW | | ✓ | | | | ✓ | | | 1 |
| TF10612-300CV | TF10612-300 | - | | | ✓ | | ✓ | | 3 | | |
| TF10612-1000CV | TF10612-1000 | TF10612-1000RW | | | ✓ | | ✓ | | | | 1 |
| TF10618-350CV | TF10618-350 | - | | | ✓ | | | ✓ | 1 | 1 | |
| TF10618-1000CV | TF10618-1000 | TF10618-1000RW | | | ✓ | | | ✓ | | | 1 |
| TF10912-100CV | TF10912-100 | - | | | | ✓ | ✓ | | 1 | | |
| TF10912-200CV | TF10912-200 | - | | | | ✓ | ✓ | | 2 | | |
| TF10912-1000CV | TF10912-1000 | TF10912-1000RW | | | | ✓ | ✓ | | | | 1 |
| TF10918-300CV | TF10918-300 | - | | | | ✓ | | ✓ | 3 | | |
| TF10918-1000CV | TF10918-1000 | TF10918-1000RW | | | | ✓ | | ✓ | | | 1 |

TECHFILTER® SYSTEMS



1" LONG TECHFILTER ORDERING INFORMATION

| TECHLINE CV MODEL NUMBER | TECHLINE DL MODEL NUMBER | TECHLINE RW MODEL NUMBER | EMITTER FLOW RATE (GPH) | | | | EMITTER SPACING | | ROLLS SUPPLIED | | |
|-----------------------------|-----------------------------|-----------------------------|-------------------------|-----|-----|-----|-----------------|-----|----------------|------|--------|
| | | | 0.26 | 0.4 | 0.6 | 0.9 | 12" | 18" | 100' | 250' | 1,000' |
| TF10L2612-1000CV | - | - | ✓ | | | | ✓ | | | | 1 |
| TF10L2618-1000CV | - | - | ✓ | | | | | ✓ | | | 1 |
| TF10L412-1000CV | - | - | | ✓ | | | ✓ | | 1 | | |
| - | - | TF10L412-1000RW | | ✓ | | | ✓ | | | | 1 |
| TF10L412-1100CV | TF10L412-1100 | - | | ✓ | | | ✓ | | 1 | | 1 |
| TF10L418-1000CV | TF10L418-1000 | TF10L418-1000RW | | ✓ | | | | ✓ | | | 1 |
| TF10L418-1700CV | TF10L418-1700 | - | | ✓ | | | | ✓ | 2 | 2 | 1 |
| TF10L612-800CV | TF10L612-800 | - | | | ✓ | | ✓ | | 3 | 2 | |
| TF10L612-1000CV | TF10L612-1000 | TF10L612-1000RW | | | ✓ | | ✓ | | | | 1 |
| TF10L618-900CV | TF10L618-900 | - | | | ✓ | | | ✓ | 4 | 2 | |
| TF10L618-1000CV | TF10L618-1000 | TF10L618-1000RW | | | ✓ | | | ✓ | | | 1 |
| TF10L912-100CV | TF10L912-100 | - | | | | ✓ | ✓ | | 1 | | |
| TF10L912-500CV | TF10L912-500 | - | | | | ✓ | ✓ | | | 2 | |
| TF10L912-1000CV | TF10L912-1000 | TF10L912-1000RW | | | | ✓ | ✓ | | | | 1 |
| TF10L918-800CV | TF10L918-800 | - | | | | ✓ | | ✓ | 3 | 2 | |
| TF10L918-1000CV | TF10L918-1000 | TF10L918-1000RW | | | | ✓ | | ✓ | | | 1 |



1 1/2" LONG TECHFILTER ORDERING INFORMATION

| TECHLINE CV MODEL NUMBER | TECHLINE DL MODEL NUMBER | TECHLINE RW MODEL NUMBER | EMITTER FLOW RATE (GPH) | | | | EMITTER SPACING | | ROLLS SUPPLIED | | |
|-----------------------------|-----------------------------|-----------------------------|-------------------------|-----|-----|-----|-----------------|-----|----------------|------|--------|
| | | | 0.26 | 0.4 | 0.6 | 0.9 | 12" | 18" | 100' | 250' | 1,000' |
| TF15L2612-1000CV | - | - | ✓ | | | | ✓ | | | | 1 |
| TF15L2618-1000CV | - | - | ✓ | | | | | ✓ | | | 1 |
| TF15L412-1000CV | TF15L412-1000 | TF15L412-1000RW | | ✓ | | | ✓ | | | | 1 |
| TF15L412-1100CV | - | - | | ✓ | | | ✓ | | 1 | | 1 |
| TF15L418-1000CV | TF15L418-1000 | TF15L418-1000RW | | ✓ | | | | ✓ | | | 1 |
| - | TF15L418-1700 | - | | ✓ | | | | ✓ | 2 | 2 | 1 |
| TF15L612-800CV | TF15L612-800 | - | | | ✓ | | ✓ | | 3 | 2 | |
| TF15L612-1000CV | TF15L612-1000 | TF15L612-1000RW | | | ✓ | | ✓ | | | | 1 |
| TF15L618-900CV | TF15L618-900 | - | | | ✓ | | | ✓ | 4 | 2 | |
| TF15L618-1000CV | TF15L618-1000 | TF15L618-1000RW | | | ✓ | | | ✓ | | | 1 |
| TF15L912-100CV | TF15L912-100 | - | | | | ✓ | ✓ | | 1 | | |
| TF15L912-500CV | TF15L912-500 | - | | | | ✓ | ✓ | | | 2 | |
| TF15L912-1000CV | TF15L912-1000 | TF15L912-1000RW | | | | ✓ | ✓ | | | | 1 |
| TF15L918-800CV | TF15L918-800 | - | | | | ✓ | | ✓ | 3 | 2 | |
| TF15L918-1000CV | TF15L918-1000 | TF15L918-1000RW | | | | ✓ | | ✓ | | | 1 |



2" TECHFILTER ORDERING INFORMATION

| TECHLINE CV MODEL NUMBER | TECHLINE DL MODEL NUMBER | TECHLINE RW MODEL NUMBER | EMITTER FLOW RATE (GPH) | | | | EMITTER SPACING | | ROLLS SUPPLIED | | |
|-----------------------------|-----------------------------|-----------------------------|-------------------------|-----|-----|-----|-----------------|-----|----------------|------|--------|
| | | | 0.26 | 0.4 | 0.6 | 0.9 | 12" | 18" | 100' | 250' | 1,000' |
| TF20L2612-1000CV | - | - | ✓ | | | | ✓ | | | | 1 |
| TF20L2618-2000CV | - | - | ✓ | | | | | ✓ | | | 2 |
| TF20L2618-3000CV | - | - | ✓ | | | | | ✓ | | | 3 |
| TF20L412-1000CV | TF20L412-1000 | TF20L412-1000RW | | ✓ | | | ✓ | | | | 1 |
| TF20L412-2000CV | TF20L412-2000 | - | | ✓ | | | ✓ | | | | 2 |
| TF20L418-1000CV | TF20L418-1000 | TF20L418-1000RW | | ✓ | | | | ✓ | | | 1 |
| TF20L418-3000CV | TF20L418-3000 | - | | ✓ | | | | ✓ | | | 3 |
| TF20L612-1000CV | TF20L612-1000 | TF20L612-1000RW | | | ✓ | | ✓ | | | | 1 |
| TF20L612-1400CV | TF20L612-1400 | - | | | ✓ | | ✓ | | 4 | | 1 |
| TF20L618-1000CV | TF20L618-1000 | TF20L618-1000RW | | | ✓ | | ✓ | | | | 1 |
| TF20L618-1400CV | - | - | | | ✓ | | | ✓ | 4 | | 1 |
| TF20L912-1000CV | TF20L912-1000 | TF20L912-1000RW | | | | ✓ | ✓ | | | | 1 |
| TF20L912-1400CV | - | - | | | | ✓ | ✓ | | 4 | | 1 |
| TF20L918-1000CV | TF20L918-1000 | TF20L918-1000RW | | | | ✓ | | ✓ | | | 1 |
| TF20L918-1400CV | TF20L918-1400 | - | | | | ✓ | | ✓ | 4 | | 1 |

17mm FITTINGS & INSTALLATION TOOLS

FOR TECHLINE® CV, TECHLINE® DL & TECHLINE® RW

APPLICATIONS

- Fits Techline CV, Techline DL and Techline RW Driplines, and PE irrigation hose with inside diameters of 0.56" and 0.60"

SPECIFICATIONS

- Maximum recommended system pressure (without clamps): 50 psi
- Acceptable hose sizes: 0.56" - 0.60" inside diameter
- UV resistant

FEATURES & BENEFITS

BARBED FITTINGS

For secure fit and easy installation without clamps, glue or tools.

UV RESISTANT

Withstands heat, direct sun and harsh chemicals.

ONE-PIECE CONSTRUCTION

For added strength, durability and long-term performance.

ALLOWS FOR EASY ON-SITE INSPECTION

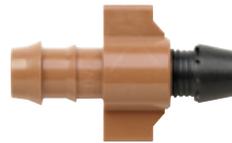
For proper fitting and installation.



INSERT COUPLING
Model TLCOUP



1/2" MPT ADAPTER
Model TL050MA



INSERT ADAPTER FOR 1" OR LARGER PE
(requires 11mm or 7/16" punch)
Model TLIAPE-B



INSERT ADAPTER FOR 1 1/2" OR LARGER PVC
(requires TDBIT16.5)
Model TLIA PVC-B



INSERT ELBOW
Model TLELL



3/4" MPT ADAPTER
Model TL075MA



INSERT CROSS
(requires 11mm or 7/16" punch)
Model TLCROS



EMITTER MICRO-TUBING ADAPTER
Model TLMTUBEADP

17mm FITTINGS



INSERT TEE
Model TLTEE



COMBINATION TEE
INS x INS x 3/4" FPT
Model TL075FTEE



3/4" MPT x V
Model TL2W075MA



6" SOIL STAPLE
(Place approximately every 3' - 5' of tubing, plus two on each tee, elbow or cross)
Model TLS6



FIGURE 8 LINE END
Model TLFIG8



MANUAL FLUSH VALVE
Model TLSOV



WHEELBARROW TUBING DISPENSER
Model WBTD



DRILL BIT FOR PVC INSERT ADAPTER
Model TDBIT16.5



PRESSURE GAUGE
(0 - 30 psi)
Model GAUGE30



PRESSURE GAUGE
(0 - 100 psi)
Model GAUGE100



SHRADER VALVE
(1/8" MPT)
Model 61APS1/8



SHRADER VALVE ADAPTER
Model 61ACG



PRESSURE GAUGE NEEDLE
Model 6809091

MPT = Male Pipe Thread
INS x INS = Insert x Insert
FPT = Female Pipe Thread

12mm FITTINGS & INSTALLATION TOOLS

FOR TECHLINE® EZ

APPLICATIONS

- Fits Techline EZ with inside diameter of 0.426"

SPECIFICATIONS

- Maximum recommended system pressure (without clamps): 50 psi
- Acceptable hose sizes: 0.426" inside diameter

FEATURES & BENEFITS

BARBED FITTINGS

For secure fit and easy installation without clamps, glue or tools.

UV RESISTANT

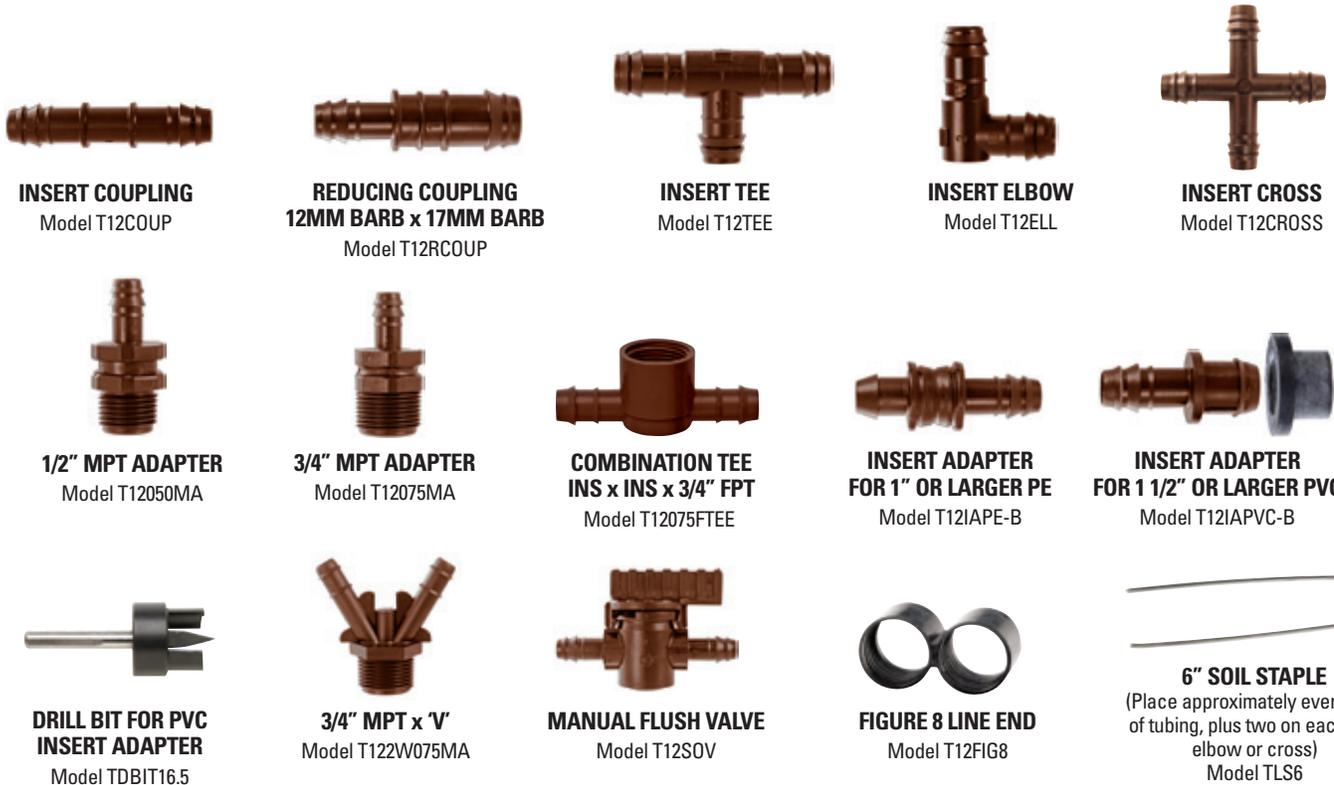
Withstands heat, direct sun and harsh chemicals.

ONE-PIECE CONSTRUCTION

For added strength, durability and long-term performance.

ALLOWS FOR EASY ON-SITE INSPECTION

For proper fitting and installation.



FITTING COMBO PACKS



DRIPLINE COMPONENTS

AIR VENTS OVERVIEW

AIR VENTS ARE USED TO CONTROL THE AIR IN IRRIGATION SYSTEMS FOR PROPER WATERING AND ACCURATE MEASUREMENT FOR FLOW AND WATER METERS

Controlling the air in irrigation systems controls the water flow and the most efficient way to control air is by the proper use of air vents. Both the presence of air and absence of air can cause problems and damage to irrigation systems. Netafim provides air vents to discharge and admit air as required.

Trapped air in pipes impedes water flow and can lower watering uniformity. It can also cause water hammer and damage to pipes and fittings. Air in pipes also produces inaccurate readings for water and flow meters. For reliable and accurate water measurement, flow meters require pipes to be full of water.

The absence of air in pipes can trigger contaminants such as mud and dirt to be drawn into the piping system.

Note: Netafim Techline® CV driplines have built-in check valves with an anti-siphon feature in each emitter that keeps the tubing charged with water. Therefore, air vents are not needed when installing Techline CV and a flow meter is not used. Air vents are also not needed for on-surface installations.

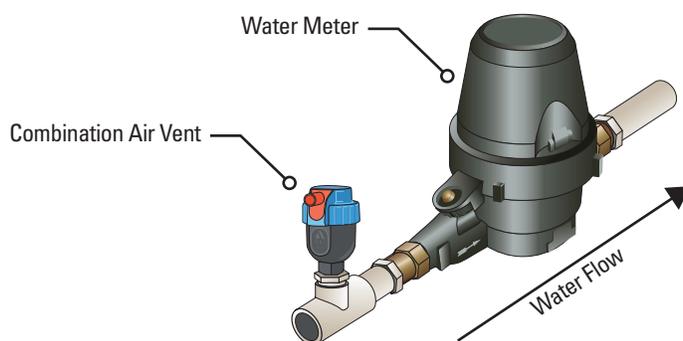
TWO TYPES OF AIR VENTS AVAILABLE:

Air/Vacuum Relief Vents

- Install in subsurface systems
- Not required for on-surface systems or when installing Techline CV dripline
- Discharges large volumes of air before a pipe is pressurized and admits large quantities of air when the pipe drains
- Also known as Large Orifice Air Vents, Vacuum Breakers, Low Pressure Air Vents, or Air Relief Vents

Combination Air Vents

- Install before water meters or metering valves to ensure there is no air in the line for accurate flow readings
- Performs both functions as an Air/Vacuum Relief Vent and Automatic Air Release Vent
- Admits and discharges large volumes of air when needed, and releases small volumes of air continuously when the lines are pressurized
- Also known as Double Acting Air Vents



DRIPLINE COMPONENTS

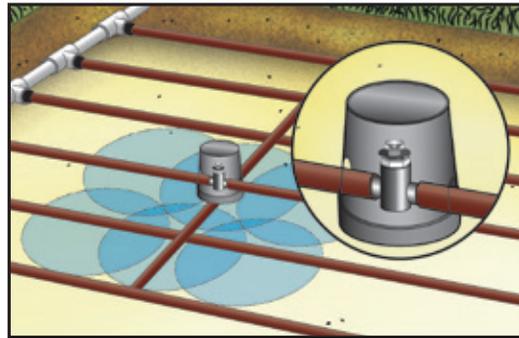
AIR/VACUUM RELIEF VENTS

APPLICATIONS

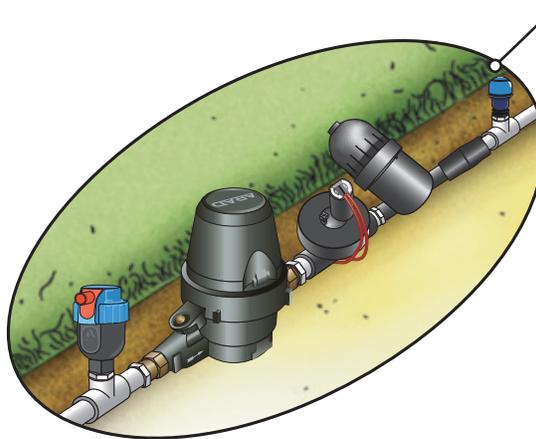
- 1/2"** • Install in subsurface systems
 - Not required when installing Techline® CV or for on-surface installations
- 3/4" and 1"** • Install in subsurface systems
 - Not required when installing Techline CV or for on-surface installations
 - On sloping terrain to prevent collapsing of pipes caused by vacuum when pipe networks drain
 - For air discharge during system start-up

SPECIFICATIONS

- 1/2"**
 - Maximum operating pressure: 140 psi
- 3/4" and 1"**
 - Maximum operating pressure: 150 psi
 - Made of corrosion-resistant reinforced UV protected composite materials - no metal parts to rust or corrode, no need for spare parts



1/2" MPT
Model TLAVRV



Guardian Air/Vacuum Relief Vent



GUARDIAN
3/4" MPT **1" MPT**
Model 65ARIA075 Model 65ARIA100

MPT = Male Pipe Thread

COMBINATION AIR VENTS

APPLICATIONS

- For discharge of large volumes of air, along mains and at the end of mainlines
- Place before water meters and automatic metering valves for accurate flow readings
- At high points in pipe network or upstream of manifolds

SPECIFICATIONS

MINI

- Continuous Acting
- Maximum operating pressure: 150 psi
- Sizes: 1/2" & 3/4" MPT (2.4"w x 4.5"h)

COMBINATION

- Continuous Acting
- Maximum operating pressure: 150 psi
- Size: 1" MPT (3.9"w x 5.5"h)

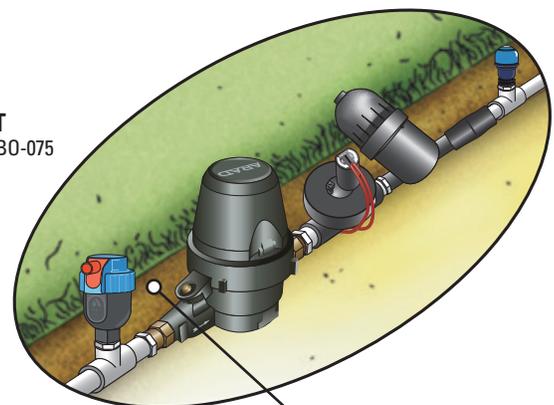


MINI

1/2" MPT **3/4" MPT**
Model AV-COMBO-050 Model AV-COMBO-075



COMBINATION
1" MPT
Model 65ARIB1-150



MINI Combination Air Vent

MPT = Male Pipe Thread

DRIPLINE COMPONENTS

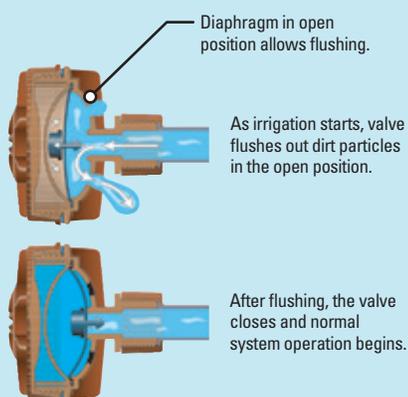
AUTOMATIC FLUSH VALVES

APPLICATIONS

- Drip irrigation systems
- Clean or dirty water

SPECIFICATIONS

- Not required with Techline® CV
- Flushing water volume: approx. 1 gallon per cycle
- Maximum zone flow rate per valve flush: 15 GPM
- Minimum pressure required: 1.5 psi
- Maximum operating pressure: 57 psi



FEATURES & BENEFITS

FLUSHING REDUCES SEDIMENT BUILD-UP

Eliminates clogging. Promotes long-term performance of the drip irrigation system.

AUTOMATIC CLEANING OPERATION

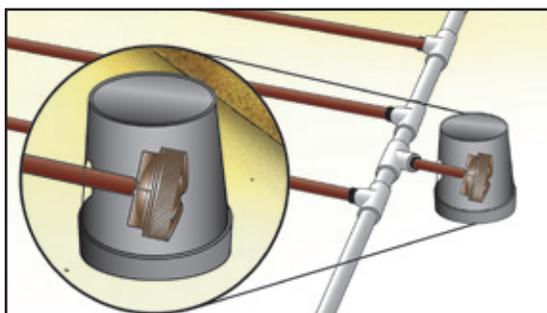
Eliminates periodic manual flushing.

UNIQUE DESIGN REACTS TO FLOW, NOT PRESSURE

Allows operation even at full line pressure.

DISASSEMBLES FOR WINTERIZATION 'BLOWOUT'

Protects your drip system.



AUTOMATIC FLUSH VALVE 1/2" MPT INLET
Model TL050MFV-1



AUTOMATIC FLUSH VALVE INSERT INLET
Model TLFV-1

MPT = Male Pipe Thread

IN-LINE CHECK VALVE

APPLICATIONS

- Prevents back flow of water and drainage of the system into low areas
- Eliminates the need for system water refill at the beginning of the next irrigation cycle
- For irrigating slopes where draining of the headers and laterals is common

SPECIFICATIONS

- Flow rate: 0.9 - 4.4 GPM
- Closing pressure: 5.8 psi (13.4 feet column of water)
- Opening pressure: 10.2 psi

FEATURES & BENEFITS

MANUFACTURED FROM DURABLE MATERIALS

For reliable operation.

LARGE INLET OPENING

Reduces headloss.

WIDE FLOW RANGE

For use in a number of applications.



IN-LINE CHECK VALVE 1/2" MPT
Model TLCV050M1-B

FLOW RATE VS. PRESSURE LOSS

| FLOW RATE (GPM) VS. PRESSURE LOSS (psi) | | | | | | | | | |
|-----------------------------------------|------|------|------|------|------|------|------|-----|--|
| 0.5 | 1 | 1.5 | 2 | 2.5 | 3 | 3.5 | 4 | 4.5 | |
| - | 0.22 | 0.54 | 0.96 | 1.55 | 2.25 | 2.99 | 4.04 | - | |

MPT = Male Pipe Thread

DRIPLINE COMPONENTS

OPERATION/PRESSURE INDICATOR STAKES

TECHLINE® CV MISTER

SPECIFICATIONS

- Fogging rate: less than 2.0 GPH, creating a moistened area approximately 2' outward from nozzle
- Check Valve: opens at 22 psi, closes at 10 psi
- Fogging nozzle maximum flow rate: 2.0 GPH @ 60 psi
- Pre-assembled with fogging nozzle, check valve, anchoring stake, tubing and barb connector

FEATURES & BENEFITS

FOGGING NOZZLE EMITS A FINE MIST

Indicates system operation and minimum required system pressure.

CREATES A MOISTENED AREA SURROUNDING THE FOGGER

Showing zone operation.

OPERATION

- Techline CV emitters open at 14.5 psi line pressure
- Indicator stake's check valve opens and activates the fogging nozzle at 22 psi line pressure



TECHLINE CV MISTER
Model 10-CV-01

OPERATION FLAG

SPECIFICATIONS

- Down flag position (closed): 4.5 psi or lower
- Halfway flag position (45°): 7 psi
- Upright flag position (90° or open): 10 psi or higher
- Pre-assembled with indicator flag, anchoring stake, tubing and barb connector

FEATURES & BENEFITS

FLAG RAISES TO INDICATE SYSTEM OPERATION

With just a minimum of 10 psi operating pressure.



OPERATION FLAG
Model 10-F-01



LOW VOLUME CONTROL ZONE KITS

Low Flow and High Flow Zones

APPLICATIONS

- Designed for all dripline, drip and micro-spray zones
- Residential or commercial landscape irrigation applications
- For zones between 0.25 and 35 GPM

SPECIFICATIONS

3/4" and 1" Low Flow Kits:
 Flow range: 0.25 - 4.4 GPM
 Regulated pressure: 42 psi

3/4" and 1" High Flow Kits:
 Flow range: 4.5 - 17.6 GPM

1 1/2" Kits:
 Flow range: 11 - 35 GPM

- Filter mesh: 140
- 3/4" High Flow and 1 1/2" Kits maximum pressure: 140 psi

FEATURES & BENEFITS

PRE-ASSEMBLED VALVE, FILTER AND PRESSURE REGULATOR

Saves installation and labor costs.

COMPACT DESIGN

3/4", 1" and 1 1/2" kits fit into standard 12" rectangular valve box.

WIDE RANGE OF FLOW RATES

For a variety of applications.

PROVEN DISC FILTER DESIGN

Provides superior filtration with 25 square inches of filtering surface.

AVAILABLE IN TWO STYLES

With a control valve or with no control valve.

| APPLICATION | WITH VALVES | WITHOUT VALVES |
|----------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| COMMERCIAL High Flow: 11 to 35 GPM |  <p>KIT WITH 1 1/2" CONTROL VALVE (1 1/2" FPT Inlet x 1 1/2" MPT Outlet) LVCZ-150</p> |  <p>KIT WITH NO CONTROL VALVE (1 1/2" MPT Inlet x 1 1/2" MPT Outlet) LVCZ-150-NV</p> |
| RESIDENTIAL & COMMERCIAL High Flow: 4.5 to 17.6 GPM |  <p>HIGH FLOW KIT WITH 1" CONTROL VALVE (1" FPT Inlet x 3/4" MPT Outlet) LVCZS8010075-HF</p> |  <p>HIGH FLOW KIT WITH NO CONTROL VALVE (3/4" MPT Inlet x 3/4" MPT Outlet) LVCZNV10075-HF</p> |
| RESIDENTIAL & COMMERCIAL Low Flow: 0.25 to 4.4 GPM |  <p>LOW FLOW KIT WITH 1" CONTROL VALVE (1" FPT Inlet x 3/4" FPT Outlet) LVCZS8010075-LF</p> |  <p>LOW FLOW KIT WITH NO CONTROL VALVE (3/4" MPT Inlet x 3/4" FPT Outlet) LVCZNV10075-LF</p> |

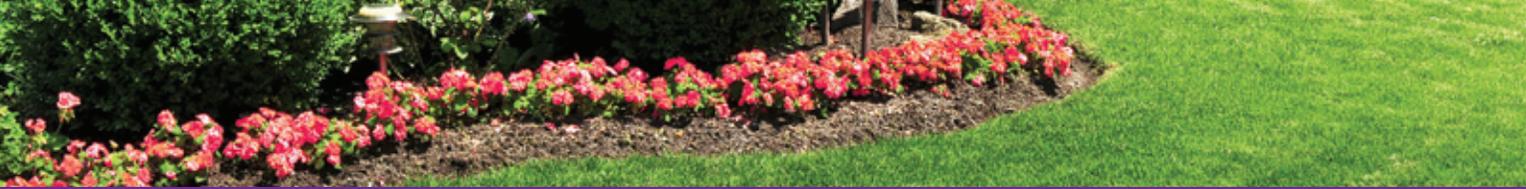
LOW VOLUME CONTROL

LOW VOLUME CONTROL ZONE KITS COMPARISON CHART

| Inlet x Outlet | RESIDENTIAL AND COMMERCIAL LOW FLOW | | RESIDENTIAL AND COMMERCIAL HIGH FLOW | | COMMERCIAL | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|----------------------------------|--------------------------------------|----------------------------------|--------------------------------------|--------------------------------------|
| | 1" FPT INLET x 3/4" FPT OUTLET | 3/4" MPT INLET x 3/4" FPT OUTLET | 1" FPT INLET x 3/4" MPT OUTLET | 3/4" MPT INLET x 3/4" MPT OUTLET | 1 1/2" FPT INLET x 1 1/2" MPT OUTLET | 1 1/2" MPT INLET x 1 1/2" MPT OUTLET |
| VALVE SPECIFICATIONS: | | | | | | |
| SIZE | 1" | No Valve | 1" | No Valve | 1 1/2" | No Valve |
| FLOW RANGE | 0.01 to 44 GPM | No Valve | 0.01 to 44 GPM | No Valve | 0.25 to 110 GPM | No Valve |
| PRESSURE REGULATOR SPECIFICATIONS: | | | | | | |
| SIZE | 3/4" | 3/4" | 3/4" | 3/4" | 1 1/2" | 1 1/2" |
| FLOW RANGE | 0.25 to 4.4 GPM | 0.25 to 4.4 GPM | 4.5 to 17.6 GPM | 4.5 to 17.6 GPM | 11 to 35 GPM | 11 to 35 GPM |
| REGULATED PRESSURE | 42 psi | 42 psi | 45 psi | 45 psi | 45 psi | 45 psi |
| MAXIMUM OPERATING PRESSURE | 145 psi | 145 psi | 145 psi | 145 psi | 145 psi | 145 psi |
| MANUAL FILTER SPECIFICATIONS: | | | | | | |
| SIZE | 3/4" | 3/4" | 3/4" | 3/4" | 1 1/2" | 1 1/2" |
| MESH | 140 Mesh | 140 Mesh | 140 Mesh | 140 Mesh | 140 Mesh | 140 Mesh |
| FLOW RANGE | 0 to 17 GPM | 0 to 17 GPM | 0 to 17 GPM | 0 to 17 GPM | 0 to 35 GPM | 0 to 35 GPM |
| MAXIMUM PRESSURE | 140 psi | 140 psi | 140 psi | 140 psi | 140 psi | 140 psi |
| FILTER TYPE | Disc | Disc | Disc | Disc | Disc | Disc |
| <p>Note: Specifications of the 'Kit' are determined by the combination of the individual components. For example, the Flow Range of the 3/4" and 1" high flow kits is 4.5 to 17.6 GPM. This specifications table is shown for reference only for the individual components.</p> | | | | | | |

ORDERING INFORMATION

| DESCRIPTION | QTY | MODEL NUMBER |
|-----------------------------------------------------------------|-----|-------------------|
| 1" VALVE WITH 3/4" LOW FLOW REGULATOR WITH 3/4" FILTER | 1 | LVCZS8010075-LF |
| | 6 | LVCZS8010075-LF-B |
| 1" VALVE WITH 3/4" HIGH FLOW REGULATOR WITH 3/4" FILTER | 1 | LVCZS8010075-HF |
| | 6 | LVCZS8010075-HF-B |
| 1 1/2" VALVE WITH 1 1/2" HIGH FLOW REGULATOR WITH 1 1/2" FILTER | 1 | LVCZ-150 |
| 3/4" LOW FLOW REGULATOR WITH 3/4" FILTER, NO VALVE | 1 | LVCZNV10075-LF |
| | 10 | LVCZNV10075-LF-B |
| 3/4" HIGH FLOW REGULATOR WITH 3/4" FILTER, NO VALVE | 1 | LVCZNV10075-HF |
| | 10 | LVCZNV10075-HF-B |
| 1 1/2" HIGH FLOW REGULATOR WITH 1 1/2" FILTER, NO VALVE | 1 | LVCZ-150-NV |



PRESSURE REGULATORS

For Constant
Outlet Pressure

REGULATING

APPLICATIONS

- All irrigation systems

SPECIFICATIONS

- 3/4" Low Flow model: 0.25 to 4.4 GPM
- 3/4" High Flow model: 4.5 to 17.6 GPM
- 1 1/2" model: 11 to 35 GPM
- Other models available up to 175 GPM
- Maximum operating pressure: 145 psi

FEATURES & BENEFITS

EASY INLINE ASSEMBLY

Low flow model - female inlet/outlet. 3/4" high flow model - female inlet and male outlet.

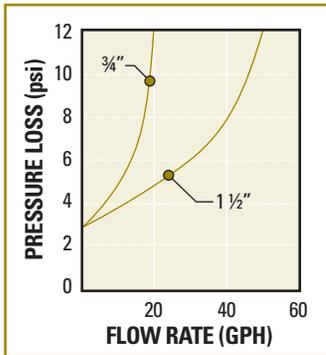
SEALED REGULATING MODULE

Available on 3/4" high flow and 1 1/2" pressure regulators.

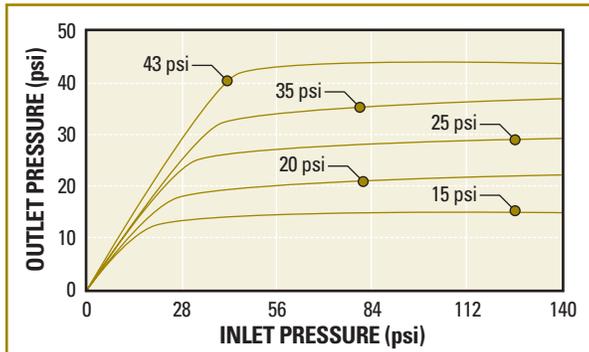
BUILT-IN INDICATOR ON 3/4" HIGH FLOW AND LARGER MODELS

Indicates when proper outlet pressure is achieved.

FLOW RATE VS. PRESSURE LOSS



3/4" LOW FLOW - OUTLET VS. INLET PRESSURE (@13 GPM)



3/4" LOW FLOW



3/4" HIGH FLOW



1 1/2"



Exploded view of 3/4" High Flow Pressure Regulator with replaceable Pressure Regulating module.

ORDERING INFORMATION

| DESCRIPTION | psi | GPM | MODEL NUMBER |
|------------------------------------------------------|-----|-------------------|---------------|
| LOW FLOW INLINE 3/4" FPT INLET x FPT OUTLET | 15 | 0.25 to 4.4 | PRV075LF15V2K |
| | 20 | | PRV075LF20V2K |
| | 25 | | PRV075LF25V2K |
| | 35 | | PRV075LF35V2K |
| | 42 | | PRV075LF42V2K |
| HIGH FLOW 3/4" FPT INLET x MPT OUTLET | 15 | 4.5 to 17.6 | PRV075HF15V2K |
| | 20 | | PRV075HF20V2K |
| | 25 | | PRV075HF25V2K |
| | 35 | | PRV075HF35V2K |
| | 45 | | PRV075HF45V2K |
| 1 1/2" MPT x MPT | 15 | 11 to 35 | PRV15015V2K |
| | 20 | | PRV15020V2K |
| | 25 | | PRV15025V2K |
| | 35 | | PRV15035V2K |
| | 45 | | PRV15045V2K |
| REPLACEMENT PRESSURE REGULATING MODULE | 15 | | PRVU15V2K |
| | 20 | | PRVU20V2K |
| | 25 | | PRVU25V2K |
| | 35 | | PRVU35V2K |
| | 45 | | PRVU45V2K |

For larger Pressure Regulators (above 35 GPM), call Customer Service.

FPT = Female Pipe Thread
MPT = Male Pipe Thread

FILTERS

COMPARISON

| AUTOMATIC DISC FILTERS | | | | |
|---------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| | COMPACT LP DISC-KLEEN | LP DISC-KLEEN | | APOLLO DISC-KLEEN |
| | See Pages 33-34 | See Pages 35-36 | | See Pages 37-38 |
| Size | 2" | 2" | 3" | 4" |
| |  |  |  |  |
| APPLICATION | Residential to Large Commercial | Residential to Large Commercial | Large Commercial | Large Commercial |
| WATER QUALITY | Good, Average, Poor & Very Poor | Good, Average, Poor & Very Poor | Good, Average, Poor & Very Poor | Good, Average, Poor & Very Poor |
| WATER SOURCE | Can Contain Algae and Other Organic Materials | Can Contain Algae and Other Organic Materials | Can Contain Algae and Other Organic Materials | Can Contain Algae and Other Organic Materials |
| FILTER TYPE | Disc | Disc | Disc | Disc |
| MAXIMUM OPERATING PRESSURE | 90 psi | 90 psi | 90 psi | 140 psi |
| FLOW RANGE | 1 to 50 GPM (Low Flow) 1 to 80 GPM (Std Flow) | 60 to 320 GPM | 240 to 750 GPM | 500 to 6,000+ GPM |
| MINIMUM PRESSURE FOR BACKFLUSH | 30 psi | 30 psi (Std Model) 40 psi (HP Model) | 30 psi (Std Model) 40 psi (HP Model) | 30 psi |
| MINIMUM BACKFLUSH FLOW | 35 GPM (Std Model) 20 GPM (Low Flow Model) | 35 GPM | 70 GPM | 190 GPM per pod |
| INCLUDES 110 VAC BACKFLUSH CONTROLLER | Yes | Yes | Yes | Yes |
| NUMBER OF FILTERS | 1 | 2, 3 or 4 | 3, 4 or 5 | 3, 4, 5, 6, 7 or 8 |
| AVAILABLE MESH RATING | 80, 120, 140 | 80, 120, 140 | 80, 120, 140 | 80, 120, 140 |
| ORIENTATION OF INSTALLATION | 90 Degrees | Offset | Inline | Inline |
| FOOTPRINT | Most Compact | Most Compact | Most Compact | Compact |

All CAD drawing are available at www.netafimusa.com.

| MANUAL DISC FILTERS* | | | | | | |
|-----------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| | See Pages 31-32 | | | | | |
| Size | 3/4" | 1" | 1 1/2" | 1 1/2" Long | 2" Dual Lite | 2" Dual HP |
| |  |  |  |  |  |  |
| APPLICATION | Residential and Commercial | Residential and Commercial | Commercial | Large Commercial | Large Commercial | Large Commercial |
| WATER QUALITY | Good to Average | Good to Average | Good to Average | Good to Average | Good to Average | Good to Average |
| WATER SOURCE | City, Well, Surface and Harvested Water with low levels of sand | City, Well, Surface and Harvested Water with low levels of sand | City, Well, Surface and Harvested Water with low levels of sand | City, Well, Surface and Harvested Water with low levels of sand | City, Well, Surface and Harvested Water with low levels of sand | City, Well, Surface and Harvested Water with low levels of sand |
| FILTER TYPE | Disc | Disc | Disc | Disc | Disc | Disc |
| MAXIMUM OPERATING PRESSURE | 140 psi | 140 psi | 140 psi | 140 psi | 115 psi | 174 psi |
| FLOW RANGE | 1 to 17 GPM | 5 to 26 GPM | 10 to 35 GPM | 10 to 52 GPM | 40 to 110 GPM | 40 to 120 GPM |
| AVAILABLE MESH RATING | 40, 80, 120, 140 | 40, 80, 120, 140 | 40, 80, 120, 140 | 40, 80, 120, 140 | 40, 80, 120, 140, 200 | 40, 80, 120, 140, 200 |
| ORIENTATION OF INSTALLATION | Inline | Inline | Inline | Inline | Inline or 90 Degrees | Inline or 90 Degrees |

All CAD drawings are available at www.netafimusa.com.

*Note: Automatic Disc Filters should be considered when manual cleaning is too cumbersome.

MANUAL DISC FILTERS

APPLICATIONS

- Residential
- Commercial
- Municipal
- Institutional

SPECIFICATIONS

- Maximum pressure:
 - ¾", 1", 1 ½": 140 psi
 - 2" Dual Lite: 115 psi
 - 2" Dual HP: 174 psi
- Flow range:
 - ¾" - 1 to 17 GPM
 - 1" - 5 to 26 GPM
 - 1 ½" - 10 to 35 GPM
 - 1 ½" Long - 10 to 52 GPM
 - 2" Dual Lite - 40 to 110 GPM
 - 2" Dual HP - 40 to 120 GPM

MATERIALS

- Filter body & cover: Reinforced polyamide
- Disc rings: Polypropylene
- O-Rings: EPDM rubber
- Clamps: Stainless steel

FEATURES & BENEFITS

DISC FILTER DESIGN

Collects debris along the depth of the discs, not just at the surface like screen filters.

100% THERMOPLASTIC DISCS

Corrosion resistant.

REPLACEMENT FILTER RINGS AVAILABLE

Color-coded for easy mesh identification.

EXTRA LARGE FILTRATION CAPACITY

Means less cleaning.

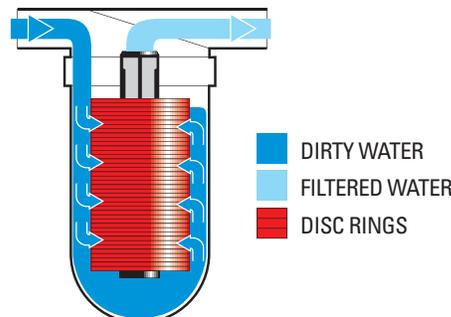


DISC FILTER TECHNOLOGY

Grooves in the disc rings criss-cross to form a network that traps debris between and on the outside of the discs.

HOW IT WORKS

As dirty water is pumped into the filter, and pressure increases, the water compresses the disc rings together tightly. The water is then forced to flow through the grooves of the disc rings, where debris is trapped, releasing only clean water to the irrigation system.



MANUAL DISC FILTERS

FLOW RATE VS. PRESSURE LOSS

| FLOW RATE (GPM) | PRESSURE LOSS (psi) | | | | | |
|-----------------|---------------------|------|--------|-------------|--------------|------------|
| | 3/4" | 1" | 1 1/2" | 1 1/2" LONG | 2" DUAL LITE | 2" DUAL HP |
| 5 | 0.60 | 0.25 | | | | |
| 10 | 2.50 | 0.60 | | | | |
| 13 | 3.40 | 1.34 | | | | |
| 17 | 5.87 | 2.10 | | | | |
| 22 | | 3.24 | 1.10 | | | |
| 26 | | | 1.30 | 1.50 | | |
| 31 | | | 1.70 | 2.10 | | |
| 35 | | | 2.30 | 2.50 | | |
| 44 | | | | 4.20 | 0.30 | 0.30 |
| 66 | | | | | 0.63 | 0.63 |
| 88 | | | | | 1.03 | 1.03 |
| 110 | | | | | 1.47 | 1.47 |

LEGEND

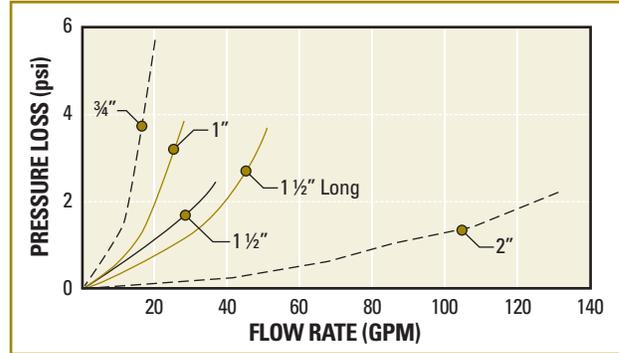
- River, ditch, lake or reservoir water
- Well water containing sand only
- Municipal supply

Losses shown are for filters with 140 mesh.

DISC FILTER RINGS



FLOW RATE VS. PRESSURE LOSS



ORDERING INFORMATION

| FILTER SIZE | MESH | DISC FILTER MODEL NUMBER | REPLACEMENT FILTER RINGS MODEL NUMBER |
|--------------|------|--------------------------|---------------------------------------|
| 3/4" | 40 | DF075-040 | DFR075040 |
| | 80 | DF075-080 | DFR075080 |
| | 120 | DF075-120 | DFR075120 |
| | 140 | DF075-140 | DFR075140 |
| 1" | 40 | DF100-040 | DFR150040* |
| | 80 | DF100-080 | DFR150080* |
| | 120 | DF100-120 | DFR150120* |
| | 140 | DF100-140 | DFR150140* |
| 1 1/2" | 40 | DF150-040 | DFR150040* |
| | 80 | DF150-080 | DFR150080* |
| | 120 | DF150-120 | DFR150120* |
| | 140 | DF150-140 | DFR150140* |
| 1 1/2" LONG | 40 | DF150S-040 | DFR150L040* |
| | 80 | DF150S-080 | DFR150L080* |
| | 120 | DF150S-120 | DFR150L120* |
| | 140 | DF150S-140 | DFR150L140* |
| 2" DUAL LITE | 40 | DF2DL-040 | DFR200040 |
| | 80 | DF2DL-080 | DFR200080 |
| | 120 | DF2DL-120 | DFR200120 |
| | 140 | DF2DL-140 | DFR200140 |
| | 200 | DF2DL-200 | DFR200200 |
| 2" DUAL HP | 40 | DF200-040 | DFR200040 |
| | 80 | DF200-080 | DFR200080 |
| | 120 | DF200-120 | DFR200120 |
| | 140 | DF200-140 | DFR200140 |
| | 200 | DF200-200 | DFR200200 |

* Ring set and filter spine.



Automatic
Self-Cleaning
Disc Filter

2" COMPACT LP DISC-KLEEN FILTER

APPLICATIONS

- Irrigation systems with a capacity of 1 to 80 GPM requiring clean water to operate emitters
- For areas without electricity
- When automation is desirable because manual cleaning is frequent and too cumbersome
- For residential, commercial, industrial, parks, municipal and non-potable water sources

SPECIFICATIONS

- Inlet: 2" male pipe threaded
- Outlet: 2" female pipe threaded
- Flush port: 2" female pipe threaded
- Maximum operating pressure:
Standard and Low Flow Models: 90 psi
High Pressure Model: 140 psi
- Minimum pressure for backflush: 30 psi
- Minimum flow for backflush:
Standard Flow Model: 35 GPM
Low Flow Model: 20 GPM
- Minimum allowable pH: 5
- Weight: 32 lbs.

MATERIALS

- Flush valves: Plastic
- Seals: Nitrilo rubber, EPDM
- Filter and spine: Polypropylene
- Discs: Polypropylene
- Clamp and screws: Stainless steel

FEATURES & BENEFITS

PROVEN DISC TECHNOLOGY DEPTH FILTRATION

Provides highly effective filtering.

MADE OF NON-CORROSIVE MATERIALS

Prevents rusting and corrosion from chemicals and weather.

COMPACT PRE-ASSEMBLED UNIT FOR EASY INSTALLATION

Fits in tight spaces, saves space. Factory assembled and tested. Delivered ready for hook-up and immediate operation.

LESS BACKFLUSH TIME REQUIRED

Optimizes irrigation with a more uniform application of water.

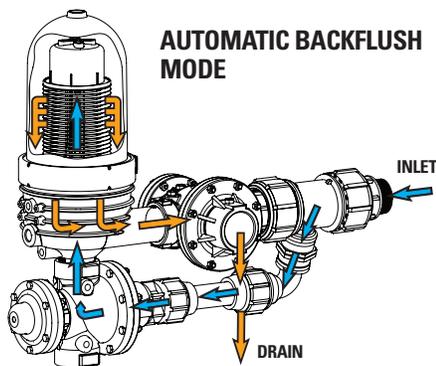
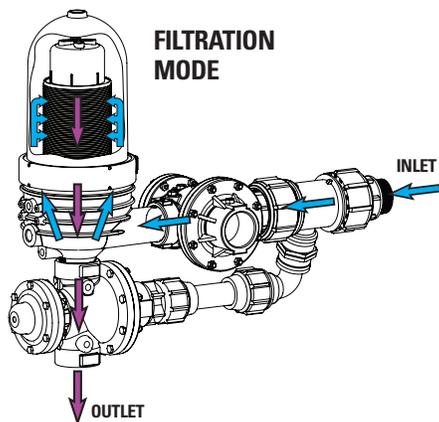
INCLUDES BACKFLUSH CONTROLLER

AC model uses 110VAC power. DC model uses two 9 volt lithium batteries.



FILTERS

2" COMPACT LP DISC-KLEEN



DISC FILTER TECHNOLOGY

Grooves in the disc rings criss-cross to form a network that traps debris between and on the outside of the discs.

HOW IT WORKS

As dirty water is pumped into the filter, and pressure increases, the water compresses the disc rings together tightly. The water is then forced to flow through the grooves of the disc rings, where debris is trapped, releasing only clean water to the irrigation system.

AUTOMATIC BACKFLUSH TECHNOLOGY

The discs separate and nozzles spray the discs with clean water - inside and out, removing debris.

STANDARD FLOW MODEL MAXIMUM FLOW RATE (GPM)

| WATER QUALITY* | 80 & 120 MESH | 140 MESH |
|----------------|---------------|----------|
| GOOD | 80 | 70 |
| AVERAGE | 70 | 60 |
| POOR | 55 | 50 |
| VERY POOR | 35 | 30 |

LOW FLOW MODEL MAXIMUM FLOW RATE (GPM)

| WATER QUALITY* | 80 & 120 MESH | 140 MESH |
|----------------|---------------|----------|
| GOOD | 50 | 40 |
| AVERAGE | 40 | 30 |
| POOR | 30 | 20 |
| VERY POOR | 20 | 10 |

*WATER QUALITY

Good Water Quality: Municipal water supply or well water from a clean aquifer with no sand, iron or manganese.

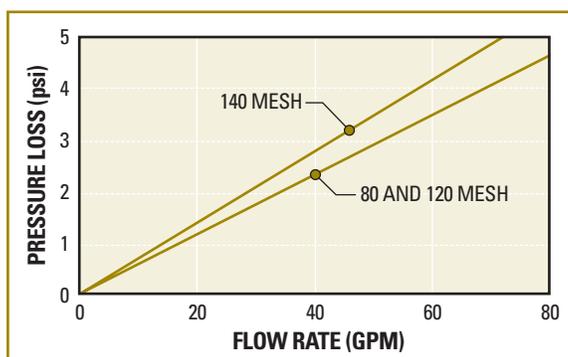
Average Water Quality: Wells with small amounts of sand (< 2 ppm) or clean surface water which includes lakes, ponds, reservoirs and canals.

Poor Water Quality: Well water with sand up to 10 ppm or surface water in hot climates with increased biological growth and no chemical treatment which includes lakes, ponds, reservoirs and canals.

Very Poor Water Quality: Well water with greater than 10 ppm of sand including rivers, muddy canals, lakes and ponds with severe run off deposits and raw municipal wastewater.

Greater than 3 ppm Sand or Silt: May require a pre-filter such as a hydrocyclone.

FLOW RATE VS. PRESSURE LOSS



FLOW RATE VS. PRESSURE LOSS

| FLOW RATES (GPM) | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 |
|---------------------|-----|-----|----|-----|----|----|----|----|
| PRESSURE LOSS (psi) | 0.2 | 0.5 | 1 | 1.4 | 2 | 3 | 4 | 5 |

120 mesh when filter is in a clean state.

ORDERING INFORMATION

| DESCRIPTION | MESH | AC MODEL NUMBER | DC MODEL NUMBER |
|---------------------------------------------|------|------------------|-------------------|
| STANDARD FLOW MODEL 1-80 GPM 1-90 psi | 80 | DFALP200-080AC | DFALP200-080DCL |
| | 120 | DFALP200-120AC | DFALP200-120DCL |
| | 140 | DFALP200-140AC | DFALP200-140DCL |
| LOW FLOW MODEL 1-50 GPM 1-90 psi | 80 | DFALPLF200-080AC | DFALPLF200-080DCL |
| | 120 | DFALPLF200-120AC | DFALPLF200-120DCL |
| | 140 | DFALPLF200-140AC | DFALPLF200-140DCL |

AC Models include installed Backflush Controller for 110VAC power supply.

DC Models include installed Backflush Controller with (2) 9 volt lithium batteries and latching solenoids.

Maximum operating pressure for standard model - 90 psi.



Automatic
Self-Cleaning
Disc Filter

2" AND 3" LP DISC-KLEEN FILTER

APPLICATIONS

- For surface water containing algae and other organic materials such as reservoirs, canals, rivers and wastewater applications
- Residential and multi-family developments
- Commercial landscapes, institutional parks, sports fields
- Golf courses
- Large landscape installations

SPECIFICATIONS

- 2" drain manifold inlet and outlet connections: Grooved
- Backflush valve flush port: 2" MPT
- Maximum operating pressure:
Standard model: 90 psi
High pressure model: 140 psi
- Minimum backflush pressure required:
Standard model: 30 psi
High pressure model: 40 psi
- Minimum backflush flow rate:
2" Filter: 35 GPM
3" Filter: 70 GPM
- Minimum allowable pH: 5
- Inlet/outlet: 4" grooved - 2" Disc-Kleen
6" grooved - 3" Disc-Kleen
- Includes backflush controller

MATERIALS

- Manifold: Polypropylene
- Filter Body: Polypropylene
- Discs: Polypropylene
- O-Rings and Seals: EPDM

FEATURES & BENEFITS

PROVEN DEPTH FILTRATION

Collects debris along the depth of the discs, not just at the surface like screen filters.

MADE OF NON-CORROSIVE MATERIALS

Prevents rusting and corrosion from chemicals and weather.

QUICK INSTALLATION

Factory assembled and tested. Delivered ready for hook-up and immediate operation.

SMALL FOOTPRINT

Saves valuable space.

LESS BACKFLUSH TIME REQUIRED

Optimizes irrigation scheduling for uniform watering.



3" LP DISC-KLEEN FILTER
4-UNIT



2" LP DISC-KLEEN FILTER
3-UNIT

FILTERS

2" AND 3" LP DISC-KLEEN

WATER QUALITY* MAXIMUM FLOW RATE (GPM)

| MESH COLOR | YELLOW | RED | BLACK |
|----------------------|--------|-----|-------|
| MESH SIZE | 80 | 120 | 140 |
| MICRON SIZE | 200 | 130 | 115 |
| 2" X 2 FILTER | | | |
| Good | 160 | 155 | 145 |
| Average | 150 | 140 | 130 |
| Poor | 130 | 120 | 90 |
| Very Poor | 80 | 70 | 60 |
| 2" X 3 FILTER | | | |
| Good | 240 | 230 | 220 |
| Average | 225 | 210 | 195 |
| Poor | 195 | 180 | 135 |
| Very Poor | 120 | 105 | 90 |
| 2" X 4 FILTER | | | |
| Good | 320 | 310 | 290 |
| Average | 300 | 280 | 260 |
| Poor | 260 | 240 | 180 |
| Very Poor | 160 | 140 | 120 |
| 3" X 3 FILTER | | | |
| Good | 480 | 465 | 435 |
| Average | 450 | 420 | 390 |
| Poor | 380 | 340 | 270 |
| Very Poor | 240 | 210 | 180 |
| 3" X 4 FILTER | | | |
| Good | 640 | 620 | 580 |
| Average | 600 | 560 | 500 |
| Poor | 500 | 450 | 340 |
| Very Poor | 320 | 280 | 240 |
| 3" X 5 FILTER | | | |
| Good | 800 | 775 | 725 |
| Average | 750 | 700 | 600 |
| Poor | 650 | 525 | 400 |
| Very Poor | 400 | 350 | 300 |

*WATER QUALITY

Good Water Quality: Municipal water supply or well water from a clean aquifer with no sand, iron or manganese.

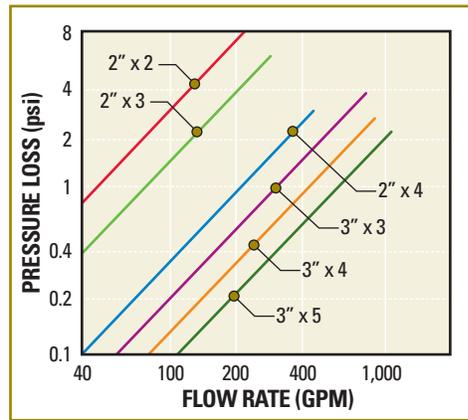
Average Water Quality: Wells with small amounts of sand (< 2 ppm) or clean surface water which includes lakes, ponds, reservoirs and canals.

Poor Water Quality: Well water with sand up to 10 ppm or surface water in hot climates with increased biological growth and no chemical treatment which includes lakes, ponds, reservoirs and canals.

Very Poor Water Quality: Well water with greater than 10 ppm of sand including rivers, muddy canals, lakes and ponds with severe run off deposits and raw municipal wastewater.

Greater than 3 ppm Sand or Silt: May require a pre-filter such as a hydrocyclone.

FLOW RATE VS. PRESSURE LOSS



120 mesh when filter is in a clean state.

ORDERING INFORMATION

| NUMBER OF FILTERS | MESH | MODEL NUMBER | NUMBER OF FILTERS | MESH | MODEL NUMBER |
|-------------------------|------|----------------|-------------------------|------|----------------|
| 2" LP DISC-KLEEN | | | 3" LP DISC-KLEEN | | |
| 2 | 80 | DFALP202-080AC | 3 | 80 | DFALP303-080AC |
| | 120 | DFALP202-120AC | | 120 | DFALP303-120AC |
| | 140 | DFALP202-140AC | | 140 | DFALP303-140AC |
| 3 | 80 | DFALP203-080AC | 4 | 80 | DFALP304-080AC |
| | 120 | DFALP203-120AC | | 120 | DFALP304-120AC |
| | 140 | DFALP203-140AC | | 140 | DFALP304-140AC |
| 4 | 80 | DFALP204-080AC | 5 | 80 | DFALP305-080AC |
| | 120 | DFALP204-120AC | | 120 | DFALP305-120AC |
| | 140 | DFALP204-140AC | | 140 | DFALP305-140AC |

AC Models include installed Backflush Controller for 110VAC power supply.

Solenoids are 24VAC.

Standard with PVC grooved x slip adapters and grooved couplings for connecting the filter to the main PVC line.

Backflush controllers are either 4 or 8 station depending on number of filters.

Maximum operating pressure - 90 psi.

High Pressure Model available for pressures between 91-140 psi.



APOLLO™

High Capacity
Water Filtration
System

DISC-KLEEN FILTER

APPLICATIONS

- For surface water containing algae and other organic materials such as reservoirs, canals, rivers and reclaimed water applications
- Residential and multi-family developments
- Commercial landscapes, institutional parks, sports fields
- Golf courses
- Large landscape installations

SPECIFICATIONS

- 4" drain manifold inlet/outlet connections: Grooved
- Maximum operating pressure: 140 psi
- Minimum pressure required for backflush: 30 psi downstream of filters during backflush
- Maximum operating temperature: 158° F
- Minimum allowable pH: 5
- Minimum operating pressure for filtration: 20 psi
- Backflush flow rate @ 35 psi: 190 GPM
- Includes backflush controller

MATERIALS

- Manifold: High density polypropylene
- Filter body and cover: High density polypropylene
- Discs: Polypropylene
- Backflush Valve: Cast iron

FEATURES & BENEFITS

PROVEN DEPTH FILTRATION

Collects debris along the depth of the discs, not just at the surface like screen filters.

MADE OF NON-CORROSIVE MATERIALS

Prevents rusting and corrosion from chemicals and weather.

QUICK INSTALLATION

Factory assembled and tested. Delivered ready for hook-up and immediate operation.

LESS BACKFLUSH TIME REQUIRED

Optimizes irrigation scheduling for uniform watering.

MORE FILTER AREA

Longer filters with larger discs. Saves money by reducing total number of filter units required.

LESS PRESSURE REQUIRED FOR CLEANING

Saves money by reducing pump size and energy costs.

EASIER ACCESS TO DISCS

Easy to release clamps around each filter unit do not require any tools making maintenance and troubleshooting quick and simple.



FILTERS

APOLLO™ DISC-KLEEN

80 MESH WATER QUALITY MAXIMUM FLOW RATE (GPM)

| YELLOW | WATER QUALITY* | FLOW PER SPINE | 4 UNIT ANGLE | 3 UNIT TWIN | 4 UNIT TWIN | 5 UNIT TWIN | 6 UNIT TWIN | 7 UNIT TWIN | 8 UNIT TWIN |
|--------|----------------|----------------|--------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | GOOD | 200 | 800 | 1,200 | 1,600 | 2,000 | 2,400 | 2,800 | 3,200 |
| | AVERAGE | 195 | 780 | 1,170 | 1,560 | 1,950 | 2,340 | 2,730 | 3,120 |
| | POOR | 175 | 700 | 1,050 | 1,400 | 1,750 | 2,100 | 2,450 | 2,800 |
| | VERY POOR | 120 | 480 | 720 | 960 | 1,200 | 1,440 | 1,680 | 1,920 |

120 MESH WATER QUALITY MAXIMUM FLOW RATE (GPM)

| RED | WATER QUALITY* | FLOW PER SPINE | 4 UNIT ANGLE | 3 UNIT TWIN | 4 UNIT TWIN | 5 UNIT TWIN | 6 UNIT TWIN | 7 UNIT TWIN | 8 UNIT TWIN |
|-----|----------------|----------------|--------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | GOOD | 200 | 800 | 1,200 | 1,600 | 2,000 | 2,400 | 2,800 | 3,200 |
| | AVERAGE | 195 | 780 | 1,170 | 1,560 | 1,950 | 2,340 | 2,730 | 3,120 |
| | POOR | 170 | 680 | 1,020 | 1,360 | 1,700 | 2,040 | 2,380 | 2,720 |
| | VERY POOR | 105 | 420 | 630 | 840 | 1,050 | 1,260 | 1,470 | 1,680 |

140 MESH WATER QUALITY MAXIMUM FLOW RATE (GPM)

| BLACK | WATER QUALITY* | FLOW PER SPINE | 4 UNIT ANGLE | 3 UNIT TWIN | 4 UNIT TWIN | 5 UNIT TWIN | 6 UNIT TWIN | 7 UNIT TWIN | 8 UNIT TWIN |
|-------|----------------|----------------|--------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | GOOD | 200 | 800 | 1,200 | 1,600 | 2,000 | 2,400 | 2,800 | 3,200 |
| | AVERAGE | 175 | 700 | 1,050 | 1,400 | 1,750 | 2,100 | 2,450 | 2,800 |
| | POOR | 125 | 500 | 750 | 1,000 | 1,250 | 1,500 | 1,750 | 2,000 |
| | VERY POOR | 85 | 340 | 510 | 510 | 850 | 1,020 | 1,200 | 1,380 |

*WATER QUALITY

Good Water Quality: Municipal water supply or well water from a clean aquifer with no sand, iron or manganese.

Average Water Quality: Wells with small amounts of sand (< 2 ppm) or clean surface water which includes lakes, ponds, reservoirs and canals.

Poor Water Quality: Well water from a poor quality aquifer (> 2 ppm/sand) or surface water in hot climates with increased biological growth and no chemical treatment which includes lakes, ponds, reservoirs and canals.

Very Poor Water Quality: Well water with greater than 10 ppm of sand including rivers, muddy canals, lakes and ponds with severe run off deposits and raw municipal wastewater.

Greater than 3 ppm Sand or Silt: May require a pre-filter such as a hydrocyclone.

ORDERING INFORMATION

| NUMBER OF FILTERS | MANIFOLD CONNECTION | MESH | MODEL NUMBER |
|-------------------|---------------------|------|------------------|
| 4 ANGLE | 6" | 80 | DFAAP04A-080ACHP |
| | | 120 | DFAAP04A-120ACHP |
| | | 140 | DFAAP04A-140ACHP |
| 3 TWIN | 10" | 80 | DFAAP03-080ACHP |
| | | 120 | DFAAP03-120ACHP |
| | | 140 | DFAAP03-140ACHP |
| 4 TWIN | 10" | 80 | DFAAP04-080ACHP |
| | | 120 | DFAAP04-120ACHP |
| | | 140 | DFAAP04-140ACHP |
| 5 TWIN | 10" | 80 | DFAAP05-080ACHP |
| | | 120 | DFAAP05-120ACHP |
| | | 140 | DFAAP05-140ACHP |
| 6 TWIN | 10" | 80 | DFAAP06-080ACHP |
| | | 120 | DFAAP06-120ACHP |
| | | 140 | DFAAP06-140ACHP |
| 7 TWIN | 12" | 80 | DFAAP07-080ACHP |
| | | 120 | DFAAP07-120ACHP |
| | | 140 | DFAAP07-140ACHP |
| 8 TWIN | 12" | 80 | DFAAP08-080ACHP |
| | | 120 | DFAAP08-120ACHP |
| | | 140 | DFAAP08-140ACHP |

AC Models include installed Backflush Controller for 110VAC power supply.

Solenoids are 24VAC - other voltages available by special order.

Backflush controllers are either 4 or 8 station depending on number of filters.

Maximum operating pressure - 140 psi.

SPECIFICATIONS

| | 4 UNIT ANGLE | 3 UNIT TWIN | 4 UNIT TWIN | 5 UNIT TWIN | 6 UNIT TWIN | 7 UNIT TWIN | 8 UNIT TWIN |
|---------------------------------------------------|--------------|-------------|-------------|-------------|-------------|-------------|-------------|
| HIGH PRESSURE MODEL MAX. OPERATING PRESSURE (psi) | 140 | 140 | 140 | 140 | 140 | 140 | 140 |
| MINIMUM BACKFLUSH PRESSURE (psi) | 30 | 30 | 30 | 30 | 30 | 30 | 30 |
| FILTRATION SURFACE AREA (sq. in.) | 1,625 | 2,435 | 3,245 | 4,055 | 4,865 | 5,675 | 6,485 |
| BACKFLUSH FLOW PER UNIT (GPM at 35 psi) | 95 | 190 | 190 | 190 | 190 | 190 | 190 |
| BACKFLUSH VOLUME PER FLUSH CYCLE (GPM) | 130 | 210 | 265 | 340 | 420 | 500 | 550 |
| INLET/OUTLET MANIFOLD CONNECTION (in.) | 6 FL | 10 FL | 10 FL | 10 FL | 10 FL | 12 FL | 12 FL |
| DRAIN MANIFOLD CONNECTION (in.) | 4 GR | 4 GR | 4 GR | 4 GR | 4 GR | 4 GR | 4 GR |
| MINIMUM ALLOWABLE pH | 5 | 5 | 5 | 5 | 5 | 5 | 5 |

MANIFOLD CONNECTIONS

FL = Flanged
GR = Grooved



SERIES 80 NYLON CONTROL VALVES

Improved Solenoid
Provides Longer
Wire Runs

APPLICATIONS

- Residential or commercial landscape irrigation applications
- For mild corrosive and mild acidity levels in the water
- For remote control, master valve and automated operations
- Reclaimed/reuse applications including municipally treated reclaimed water designated for irrigation

SPECIFICATIONS

- Recommended flow range:
 - ¾" - 0.01 to 26 GPM
 - 1" - 0.01 to 44 GPM
 - 1 ½" - 0.25 to 110 GPM
 - 2" - 0.25 to 176 GPM
- Minimum operating pressure: 7 psi
- Maximum operating pressure: 150 psi
- Water Temperature: up to 140° F
- 24VAC Solenoid standard ± 10% voltage
- Solenoid inrush current: 0.220A
- Solenoid holding current: 0.095A
- Optional Solenoids: 24VDC, 12VDC, 12VDC-latching and 120VAC

MATERIALS

- Body, bonnet, seat and diaphragm: Glass Reinforced Polyamide (GRP)
- Nuts, bolts and washers: Stainless Steel 304
- Spring: Stainless Steel AISI 302

FEATURES & BENEFITS

SIMPLE TO OPERATE AND MAINTAIN

Uniquely designed for simple in-line installation. Minimum maintenance, maximum dependability. Captured bolts make easy service for contractors – if needed.

ROBUST FLOW CONTROL STEM AND MANUAL OVERRIDE

Flow control stem allows manual control from full closure up to maximum capacity while solenoid manual override handle enables internal bleed to manually open the valve.

RELIABLE EVEN IN HARSH CONDITIONS

Durable, corrosion free materials. Clog-free labyrinth inlet for command water makes sure the valve is suitable for reclaimed water applications.

STABLE SOLENOID

Low sensitivity to dirt and voltage fluctuations. Compatible with most continuous current controllers. Exceptionally low inrush and holding current allow the largest wire run from valve to controller in the industry.

TIGHT SEALING VALVE WITH FULLY SUPPORTED DIAPHRAGM

The Series 80 valve is suitable for high pressure application where constant upstream pressure is supplied 24/7. Series 80 valves react quickly to opening and closing.

INTEGRAL STAINLESS STEEL EASYCLEAN® FILTER

For 1½" and 2" models only.

LOW FLOW CAPABILITY

¾" and 1" valves minimum flow 0.01 GPM.
1½" and 2" valves minimum flow 0.25 GPM.



1" GLOBE ELECTRIC CONTROL VALVE

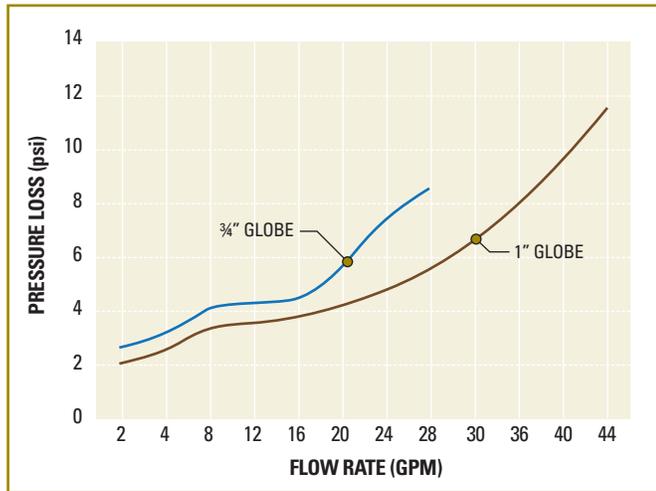


2" ANGLE ELECTRIC CONTROL VALVE

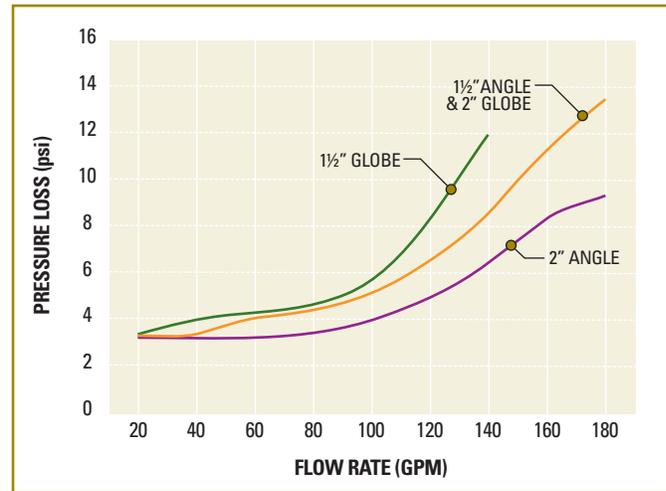
VALVES

SERIES 80 VALVES

3/4" & 1" MODELS FLOW RATE VS. PRESSURE LOSS



1 1/2" & 2" MODELS FLOW RATE VS. PRESSURE LOSS



3/4" & 1" MODELS FLOW RATE VS. PRESSURE LOSS

| FLOW (GPM) | PRESSURE LOSS (psi) | |
|------------|---------------------|----------|
| | 3/4" GLOBE | 1" GLOBE |
| 2 | 2.5 | 2 |
| 4 | 3 | 2.5 |
| 8 | 4 | 3.4 |
| 12 | 4.1 | 3.5 |
| 16 | 4.4 | 3.9 |
| 20 | 5.5 | 4.1 |
| 24 | 7.5 | 4.7 |
| 28 | 8.5 | 5.4 |
| 32 | - | 6.5 |
| 36 | - | 8 |
| 40 | - | 9.5 |
| 44 | - | 11.5 |

1 1/2" & 2" MODELS FLOW RATE VS. PRESSURE LOSS

| FLOW (GPM) | PRESSURE LOSS (psi) | | | |
|------------|---------------------|--------------|----------|----------|
| | 1 1/2" GLOBE | 1 1/2" ANGLE | 2" GLOBE | 2" ANGLE |
| 20 | 3.3 | 3.3 | 3.3 | 3.3 |
| 40 | 4.0 | 3.3 | 3.3 | 3.3 |
| 60 | 4.3 | 4.0 | 4.0 | 3.3 |
| 80 | 4.5 | 4.3 | 4.3 | 3.6 |
| 100 | 5.5 | 5.0 | 5.0 | 4.1 |
| 120 | 8.5 | 6.5 | 6.5 | 5.0 |
| 140 | 12.0 | 8.5 | 8.5 | 6.5 |
| 160 | - | - | 11.5 | 8.5 |
| 180 | - | - | 13.5 | 9.5 |

CONTROLLER TO VALVE MAXIMUM WIRE LENGTHS

| GAUGE | LENGTH |
|-------|--------|
| 12 | 6,800' |
| 14 | 4,300' |
| 16 | 2,700' |
| 18 | 1,700' |
| 20 | 1,000' |

ORDERING INFORMATION

| DESCRIPTION | SIZE | MODEL NUMBER |
|--------------------------------------|--------------|---------------|
| SERIES 80 VALVES WITH STANDARD 24VAC | 3/4" GLOBE | LVET.75GH2 |
| | 1" GLOBE | LVET1GH2 |
| | 1 1/2" GLOBE | LVET1.5GH2 |
| | 2" GLOBE | LVET2GH2 |
| | 1 1/2" ANGLE | LVET1.5GH2-AN |
| | 2" ANGLE | LVET2GH2-AN |



Durable
High Pressure
Valves

IRON AND BRONZE VALVES

APPLICATIONS

- Residential, institutional, commercial, municipal, golf
- Functions:
 - Electric (Master Valve)
 - Pressure Reducing
 - Pressure Sustaining
 - Quick Relief
 - Pump Control

SPECIFICATIONS

For Electric Valves:

- Volts: 24VAC standard \pm 10% voltage
- Optional: 24VDC, 12VDC, 12VDC-latching, 120VAC

MATERIALS

- Nuts, Bolts and Washers: Stainless Steel
- Body/Bonnet: Cast iron or bronze
- Spring: Stainless Steel
- Diaphragm assembly: Natural Rubber (EPDM and Nitril available on request)

FEATURES & BENEFITS

CAST IRON

Durable, high pressure valves up to 235 psi.

BRONZE - RESISTS CAVITATION

Where extreme flow velocities and high pressure differentials exist.

LOWEST FRICTION LOSS IN THE INDUSTRY

Unique design allows a straight flow pattern. The valve allows free passage in the fully open valve with minimal headloss at very high flows.

CONSTRUCTED OF MINIMAL PARTS

Structural simplicity and low maintenance.

EQUIPPED WITH DIRECT SEALING DIAPHRAGM

There are no shafts, bearings or seals to corrode and there is no wear and tear by dirty abrasive water or chemicals. The diaphragm is the only moving part.

SUPERB PRESSURE REGULATION

Valves can be used for regulating no flow to maximum flow with no need for additional throttling devices or bypass valves.



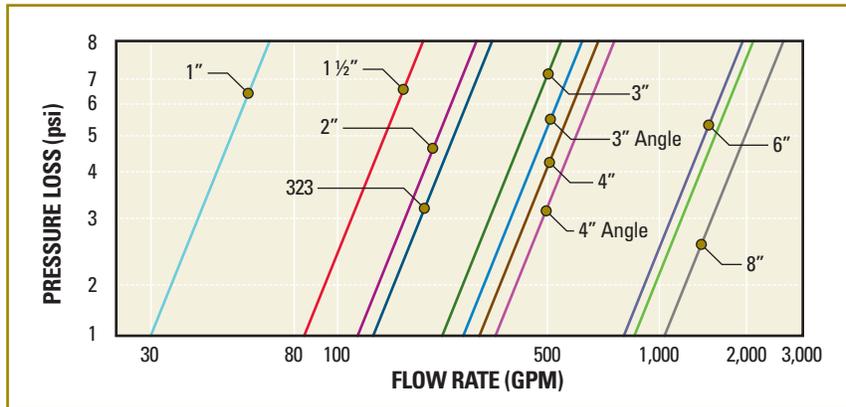
BRONZE THREADED VALVE
(QUICK RELIEF VALVE SHOWN)



CAST IRON FLANGED VALVE
(PRESSURE REDUCING ELECTRIC VALVE SHOWN)

IRON AND BRONZE VALVES

FLOW RATE VS. PRESSURE LOSS



Cv TABLE

| | 1" | 1 1/2" | 2" | 323 | 3" | 4" | 6" | 8" |
|-------------------------|----|--------|-----|-----|-----|-----|-----|-----|
| FLOW FACTOR (Cv) IN GPM | 20 | 75 | 110 | 117 | 200 | 260 | 700 | 930 |

HYDRAULIC SPECIFICATIONS

| | 1" | 1 1/2" | 2" | 323 | 3" | 4" | 6" | 8" |
|--------------------------------------------------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|
| MAXIMUM RECOMMENDED FLOW RATE CONTINUOUS VALVE (18 FEET PER SECOND - GPM) | 44 | 110 | 180 | 260 | 400 | 700 | 1,500 | 2,100 |
| NOMINAL RECOMMENDED FLOW RATE CONTINUOUS VALVE (8 FEET PER SECOND - GPM) | 22 | 50 | 80 | 120 | 176 | 330 | 700 | 960 |
| MAXIMUM RECOMMENDED FLOW RATE INTERMITTENT VALVE (49 FEET PER SECOND - GPM) | 118 | 300 | 485 | 485 | 1,080 | 1,915 | 4,200 | 5,770 |
| MINIMUM FLOW (GPM) | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| FLOW FACTOR (CV) | 20 | 75 | 110 | 117 | 200 | 260 | 700 | 930 |
| OPERATING PRESSURE RANGE HIGH PRESSURE DIAPHRAGM (PSI) | 17-230 | 17-230 | 21-230 | 21-230 | 21-230 | 17-230 | 21-230 | 10-230 |
| OPERATING PRESSURE RANGE LOW PRESSURE DIAPHRAGM (PSI) | 7-145 | 7-70 | 10-145 | 10-145 | 10-145 | 6-145 | 7-145 | 3-145 |

AVAILABLE MODELS

| CONNECTION | GLOBE THREADED | GLOBE THREADED | GLOBE FLANGED | GLOBE GROOVED | ANGLE THREADED | ANGLE THREADED | ANGLE FLANGED |
|-----------------|-------------------|-------------------|------------------|------------------|-------------------|-------------------|------------------|
| MATERIAL | CAST IRON | BRONZE | CAST IRON | CAST IRON | BRONZE | CAST IRON | CAST IRON |
| AVAILABLE SIZES | 1" | | ✓ | | | | |
| | 1 1/2" | ✓ | ✓ | | ✓ | ✓ | |
| | 2" | ✓ | ✓ | ✓ | ✓ | ✓ | |
| | 323 | ✓ | ✓ | | ✓ | ✓ | |
| | 3" | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | 4" | | | ✓ | ✓ | | ✓ |
| | 6" | | | ✓ | ✓ | | ✓ |

323 connection: 3" inlet, 2" body, 3" outlet

8" - 24" valves are available in cast iron flange configuration.

APPLICATIONS

- For commercial, institutional and sports field irrigation applications
- Ideal for retrofits
- Designed for high pressure, remote operated applications
- Water meter can communicate with irrigation controllers and central control units
- Valve can function as a remote master valve for automated operation
- Multiple pilot options: manual electric and manual electric pressure reducing

SPECIFICATIONS

- Sizes: 1 1/2", 2", 3", 4", 6" and 8"
- Maximum working pressure:
Manual Electric - 235 psi
Pressure Reducing
Manual Electric - 140 psi
- Body: Cast iron, polyester coated
- Valve Diaphragm: Reinforced natural rubber
- End Connections:
1 1/2" - Male Pipe Thread
2" - Female Pipe Thread
3", 4", 6" 8" - Flanged
- Flanges: Drilled according to ANSI specification
- Standards: EEC approval (class A)
- Installation of a continuous acting air vent before the Hydrometer is highly recommended for accurate flow readings

FEATURES & BENEFITS

GLOBE CONFIGURATION WITH BUILT-IN STRAIGHTENING VANE

Requires no straight pipe for installation - saving space.

± 2% ACCURACY ACROSS FLOW RANGES

No more false alarms.

RUGGED, HEAVY DUTY CONSTRUCTION

Cast Iron with corrosion resistant coating.

REGISTERS ARE STAINLESS STEEL/COMPOSITE ENCAPSULATED

Guaranteed against fogging due to moisture.

CONFIGURED WITH ANY COMBINATION OF PILOT CONTROL

Manual electric and pressure reducing manual electric. Normally open or normally closed.

DOUBLE-CHAMBERED VALVE

Provides quick acting and positive opening and closing.

SUB METERING

Meter dedicated to landscape irrigation water.



REED SWITCH (RS) REGISTER

The reed switch register is a dry contact or simple switch closure for communicating with control and monitoring equipment. Flows are totaled in U.S. Gallons based on the multiplication factors indicated on the dial face.



PHOTO DIODE HIGH FREQUENCY (PDH) REGISTER

A photo coupler sensor that provides a high frequency pulse output for communicating with control and monitoring equipment. Flows are totaled in U.S. Gallons based on the multiplication factors indicated on the dial face.

HYDROMETERS

FRICITION LOSS vs. PRESSURE LOSS (psi)

| | | FLOW RATE (GPM) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------|--------|-----------------|------|------|------|------|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|--|--|
| | | 1.8 | 4.4 | 5.3 | 14 | 20 | 21 | 53 | 55 | 79 | 95 | 97 | 125 | 150 | 198 | 220 | 250 | 300 | 357 | 380 | 400 | 500 | 700 | 860 | 900 | 950 | 1000 | 1250 | 1500 | | |
| SIZE | 1 1/2" | 0.01 | 0.04 | 0.1 | 0.4 | 0.8 | 0.8 | 5.3 | 5.7 | | | | | | | | | | | | | | | | | | | | | | |
| | 2" | | | 0.02 | 0.2 | 0.3 | 0.4 | 2.3 | 2.5 | 5.1 | 7.4 | 7.7 | | | | | | | | | | | | | | | | | | | |
| | 3" | | | | 0.02 | 0.05 | 0.1 | 0.3 | 0.4 | 0.7 | 1.1 | 1.1 | 1.8 | 2.7 | 4.5 | 5.7 | | | | | | | | | | | | | | | |
| | 4" | | | | | | 0.02 | 0.1 | 0.2 | 0.3 | 0.5 | 0.5 | 0.8 | 1.2 | 2.0 | 2.5 | 3.2 | 4.7 | 6.6 | 7.5 | | | | | | | | | | | |
| | 6" | | | | | | | 0.02 | 0.03 | 0.05 | 0.1 | 0.1 | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.7 | 1.1 | 1.2 | 1.3 | 2.1 | 4.1 | 6.1 | | | | | | | |
| | 8" | | | | | | | | | | 0.02 | 0.02 | 0.04 | 0.1 | 0.1 | 0.1 | 0.2 | 0.2 | 0.3 | 0.4 | 0.4 | 0.6 | 1.3 | 1.9 | 2.1 | 2.3 | 2.6 | 4.0 | 5.8 | | |

±2% Accuracy ±5% Accuracy

PERFORMANCE DATA

| SIZE | LOWEST FLOW | LOWEST FLOW | NOMINAL FLOW | MAXIMUM FLOW |
|--------|----------------------|----------------------|----------------------|----------------------|
| | WITHIN ± 5% ACCURACY | WITHIN ± 2% ACCURACY | WITHIN ± 2% ACCURACY | WITHIN ± 2% ACCURACY |
| 1 1/2" | 1.8 GPM | 4.4 GPM | 44 GPM | 55 GPM |
| 2" | 5.3 GPM | 20 GPM | 66 GPM | 95 GPM |
| 3" | 14 GPM | 53 GPM | 176 GPM | 220 GPM |
| 4" | 21 GPM | 79 GPM | 264 GPM | 380 GPM |
| 6" | 53 GPM | 198 GPM | 660 GPM | 860 GPM |
| 8" | 97 GPM | 357 GPM | 1,189 GPM | 1,500 GPM |

ORDERING INFORMATION

| ORDERING INFORMATION | | | | MODEL NUMBER | | | |
|----------------------|----------------------|------------------|-------------------|-----------------|-----------------------------------|--------------------------------------------------------------|---------------------------------------------------------------|
| METER SIZE | REGISTER OUTPUT TYPE | PULSE PER GALLON | GALLONS PER PULSE | MANUAL ELECTRIC | PRESSURE REDUCING MANUAL ELECTRIC | PRESSURE REDUCING MANUAL ELECTRIC HIGH PRESSURE (30-130 psi) | PRESSURE REDUCING MANUAL ELECTRIC HIGH PRESSURE (100-285 psi) |
| 1 1/2" | RS | 1 | 1 | LHM15TG1-MEL | LHM15TG1-PRMEL | LHM15TG1PREHR | LHM15TG1PREHB |
| | PDH | 187.900 | 0.0053 | LHM15TG0053-MEL | LHM15TG0053-PRMEL | LHM15TG0053PREHR | LHM15TG0053PREHB |
| 2" | RS | 1 | 1 | LHM2TG1-MEL | LHM2TG1-PRMEL | LHM2TG1PREHR | LHM2TG1PREHB |
| | PDH | 117.000 | 0.0085 | LHM2TG0085-MEL | LHM2TG0085-PRMEL | LHM2TG0085PREHR | LHM2TG0085PREHB |
| 3" | RS | 1 | 1 | LHM3FG1-MEL | LHM3FG1-PRMEL | LHM3FG1PREHR | LHM3FG1PREHB |
| | PDH | 48.710 | 0.0205 | LHM3FG0205-MEL | LHM3FG0205-PRMEL | LHM3FG0205PREHR | LHM3FG0205PREHB |
| 4" | RS | 1 | 1 | LHM4FG1-MEL | LHM4FG1-PRMEL | LHM4FG1PREHR | LHM4FG1PREHB |
| | PDH | 17.933 | 0.0566 | LHM4FG0566-MEL | LHM4FG0566-PRMEL | LHM4FG0566PREHR | LHM4FG0566PREHB |
| 6" | RS | 0.1 | 10 | LHM6FG10-MEL | LHM6FG10-PRMEL | LHM6FG10PREHR | LHM6FG10PREHB |
| | PDH | 5.747 | 0.1741 | LHM6FG1739-MEL | LHM6FG1739-PRMEL | LHM6FG1739PREHR | LHM6FG1739PREHB |
| 8" | RS | 0.1 | 10 | LHM8FG10-MEL | LHM8FG10-PRMEL | LHM8FG10PREHR | LHM8FG10PREHB |
| | PDH | 3.152 | 0.317 | LHM8FG317-MEL | LHM8FG317-PRMEL | LHM8FG317PREHR | LHM8FG317PREHB |

Netafim Hydrometers are standard in a manually closed configuration. To order Normally Open (NO) configurations add -NO to the end of the model number.

For example: When ordering a 8" Flanged Photo-Diode (PDH) Normally Open Hydrometer, use Model Number LHM8FG317-MELNO.

OCTAVE ULTRASONIC WATER METERS

Highly Accurate With
No Moving Parts

APPLICATIONS

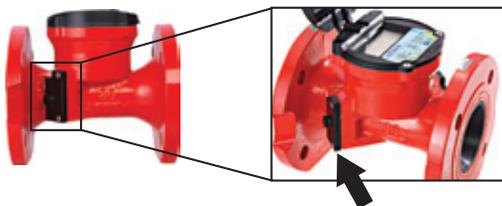
- Commercial applications
- Communicate with irrigation controllers and measures water usage for effective water management

SPECIFICATIONS

- Sizes: 2", 3", 4" and 6"
- Body: Epoxy-coated cast iron with flange inlet and outlet
- Flow Range: < 1 GPM to 1,600 GPM
- Working pressure: 175 psi (16 bar)
- Fluid Temperature Range: 32° to 122° F (0.1° to 50° C)
- Connection: Flanges ANSI ISO for AWWA connection standard
- Environmental Protection: IP-68, Ambient operation temperature for display: -13° to 131° F (-25° - 55° C)
- Display Units: Multi-line, programmable 9 digit LCD display
- Output (optional): Programmable single/dual open collector pulse output or externally powered 4-20 mA loop

HOW OCTAVE WORKS

The Octave's measurement method is based on ultrasonic, transit-time, dual-beam sensors that determines the length of time it takes an ultrasonic wave to travel the distance between the two sensors located in the meter's body. The sensors function as both sender and receiver, each one alternating these functions so that the ultrasonic wave travels both with and against the direction of the flow. Because the ultrasonic wave travels slower against the flow than with the flow, the time difference of the two waves allows the meter to determine the flow rate.



ULTRASONIC TRANSDUCERS
Double beam ultrasonic sensors

FEATURES & BENEFITS

ACCURATE FLOW DATA WITHIN ± 1.5%

Double-beam ultrasonic sensors provide highly accurate flow data and reliable operation.

NO IMPELLER OR MOVING PARTS IN THE FLOW PATH

Ensures unrestricted low pressure loss flows.

LONG TERM PERFORMANCE

Lithium batteries provide a 10 year life expectancy.

SEALED AND TAMPER PROOF IP68 REGISTER

Programmed to log and display both forward and reverse flow. Physically reversing the meter will not decrease the forward flow totalizer.

INSTANT INFORMATION READINGS

Flow and volume information, leak detection, flow direction, output mode, battery level, alarms and errors are viewable from a multi-readout screen.

UNIQUE SERIAL NUMBER AND ACCURACY CERTIFICATE

Each meter has its own unalterable bar-coded serial number and includes a certificate verifying flow accuracy.

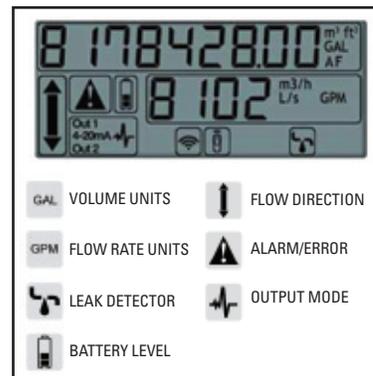
REDUCED MAINTENANCE

Requires less maintenance for wear-prone parts commonly found in other meters.



OCTAVE PROGRAMMING AND DIGITAL DISPLAY

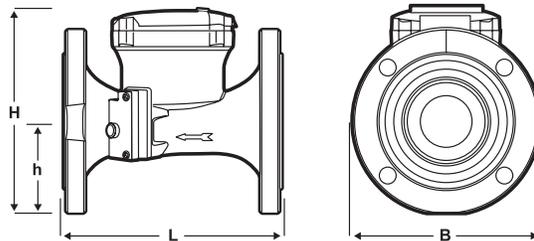
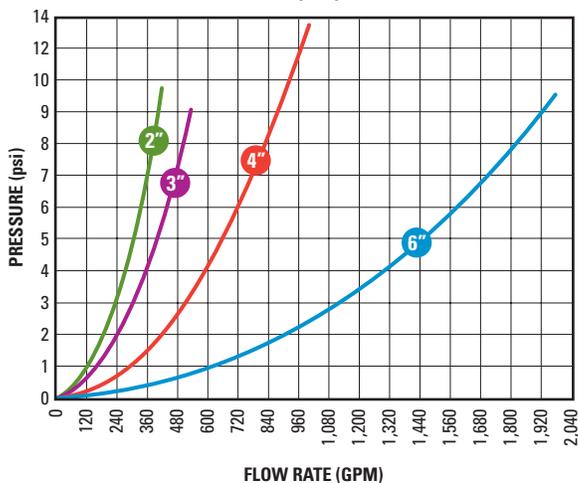
Multi-line digital LCD readout display provides immediate reporting and visual indicators for critical conditions. The 9 digit display is easy to read at a glance. Each Octave Meter will be pre-programmed before shipment for an instantaneous flow rate in Gallons per Minute (GPM) and Volume Totalizer Units (Gallons).



NOTE: Programming software is not available to the end user. Once the meter is programmed by the Netafim prior to shipment, it can only be reset by Netafim.

OCTAVE WATER METERS

HEADLOSS CURVE - 2", 3", 4" AND 6"



DIMENSIONS & WEIGHT

| SIZE | LENGTH (L) | WIDTH (B) | HEIGHT (H) | HEIGHT (h) | WEIGHT |
|------|------------|-----------|------------|------------|-----------|
| 2" | 7.9" | 6.5" | 7.5" | 1.6" | 19.8 LBS. |
| 3" | 8.9" | 7.9" | 8.3" | 3.5" | 28.7 LBS. |
| 4" | 9.8" | 8.7" | 8.8" | 4.1" | 33.1 LBS. |
| 6" | 11.8" | 11.2" | 11.1" | 5.5" | 70.5 LBS. |

PERFORMANCE DATA

| SIZE | STARTING FLOW (GPM) | EXTENDED LOW FLOW WITHIN ± 5% (GPM) | NOMINAL FLOW RANGE WITHIN ± 1.5% (GPM) | HEADLOSS MAX FLOW RATE (psi) |
|------|---------------------|-------------------------------------|----------------------------------------|------------------------------|
| 2" | 0.06 | 0.25 | 0.50 - 250 | 3.4 |
| 3" | 0.06 | 0.50 | 1 - 500 | 7.7 |
| 4" | 0.06 | 0.75 | 1.5 - 1,000 | 12.2 |
| 6" | 0.75 | 2.0 | 3 - 1,600 | 9.7 |

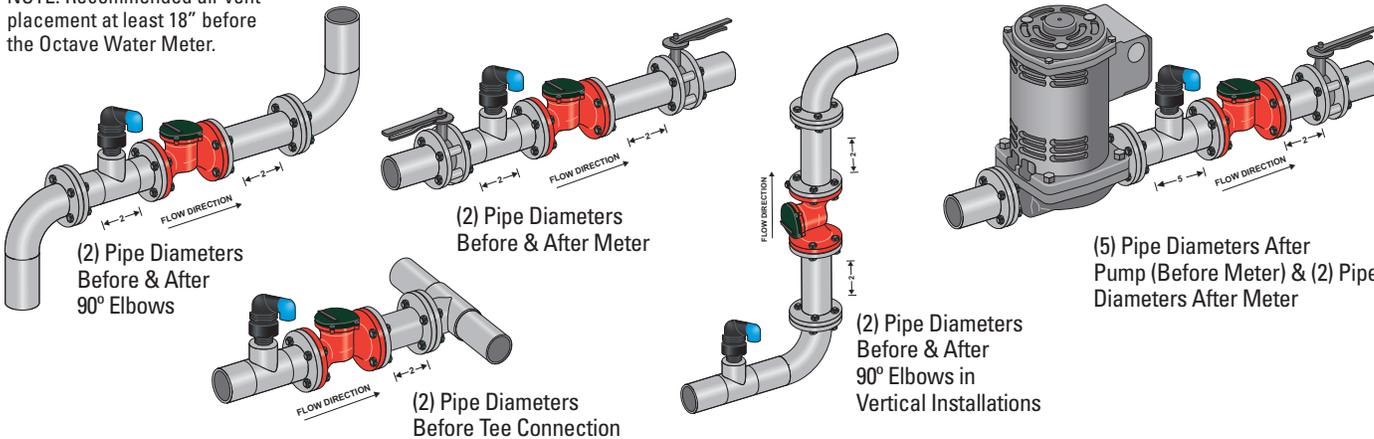


Unrestricted Flow Path

INSTALLATION EXAMPLES

RECOMMENDATIONS FOR ACHIEVING TOP PERFORMANCE

NOTE: Recommended air vent placement at least 18" before the Octave Water Meter.



ORDERING INFORMATION

LS360CT SIZE GAL OUTPUT

| SIZE | OUTPUT |
|---------|-------------------------------------|
| 2" = 02 | NO OUTPUT (METER DISPLAY ONLY) = NO |
| 3" = 03 | 0.01 GALLONS PER PULSE = 0.01 |
| 4" = 04 | 0.1 GALLONS PER PULSE = 0.1 |
| 6" = 06 | 1.0 GALLONS PER PULSE = 1.0 |
| | 10 GALLONS PER PULSE = 10 |
| | ANALOG OUTPUT 420mA = 420 |

ORDERING EXAMPLE:

LS360CT04GAL0.1

4" Octave Water Meter, Volume in Gallons, Flow Rate in Gallons Per Minute, Pulse Output 0.1 Gallons Per Pulse



With Optional Pulse Output



Most Accurate
in the Industry

WATER METERS

APPLICATIONS

- Use smaller sized meters as sub-meter for residential or commercial applications
- Communicate with irrigation controllers and measures water usage for effective water management

SPECIFICATIONS

- Sizes: 3/4" to 6"
- Maximum working pressure:
140 psi (3/4", 1" and 1 1/2")
230 psi (2" to 6")
- Maximum water liquid temperature:
122° F (3/4", 1" and 1 1/2")
131° F (2")
140° F (3" to 6")
- Available bodies: Metal (corrosion proof copper alloy) or Composite (plastic)
- Available with Reed Switch or Photo Diode Registers
- Installation of a continuous acting air vent before the Water Meter is highly recommended for accurate flow readings

FEATURES & BENEFITS

ONLY ONE MOVING PART - THE IMPELLER - IN CONTACT WITH THE WATER

For minimum wear and utmost reliability.

MAGNETIC DRIVEN SEALED REGISTERS ARE STAINLESS STEEL/COMPOSITE ENCAPSULATED

Guaranteed against fogging due to moisture.

ACCURATE OVER A WIDE RANGE OF FLOWS

For flexible and efficient water management.

INDUSTRY'S LONGEST WARRANTY

Three years on the metering components (register and metering assembly) and five years on the meter body.



3/4" and 1"
(PLASTIC BODY)



3/4", 1" and 1 1/2"
(METAL BODY)



2"



3", 4" and 6"

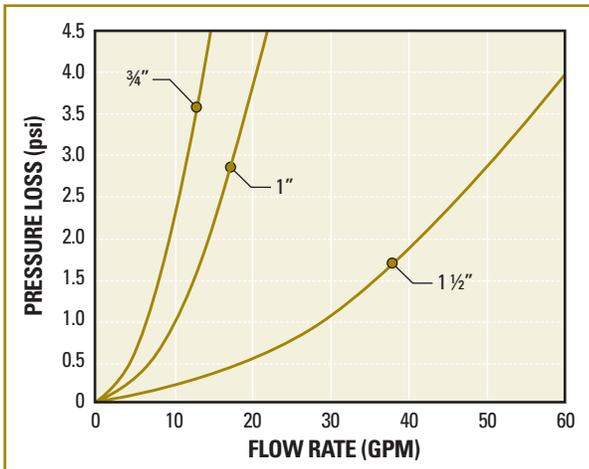
WATER METERS

WATER METERS

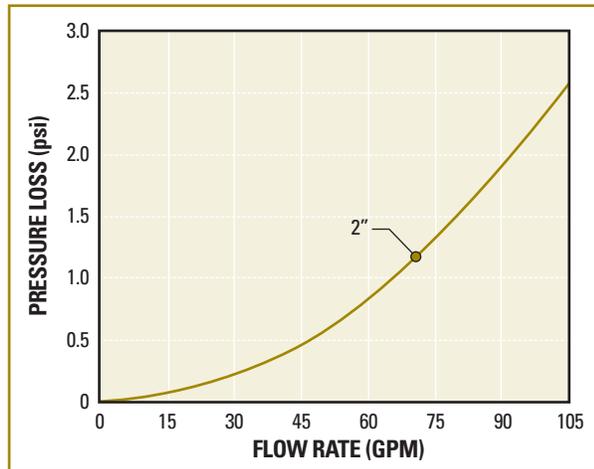
PERFORMANCE DATA

| | | LOWEST FLOW WITHIN ± 5% ACCURACY | LOWEST FLOW WITHIN ± 2% ACCURACY | NOMINAL FLOW WITHIN ± 2% ACCURACY | MAXIMUM FLOW WITHIN ± 2% ACCURACY |
|------|-----|----------------------------------------|----------------------------------------|-----------------------------------------|-----------------------------------------|
| SIZE | ¾" | 0.2 GPM | 0.9 GPM | 11 GPM | 14 GPM |
| | 1" | 0.3 GPM | 1.2 GPM | 15.4 GPM | 20 GPM |
| | 1½" | 0.9 GPM | 3.5 GPM | 44 GPM | 55 GPM |
| | 2" | 2.0 GPM | 8.8 GPM | 88 GPM | 110 GPM |
| | 3" | 2.0 GPM | 4 GPM | 528 GPM | 660 GPM |
| | 4" | 4.0 GPM | 6 GPM | 1,013 GPM | 1,266 GPM |
| | 6" | 11 GPM | 15 GPM | 1,145 GPM | 1,431 GPM |

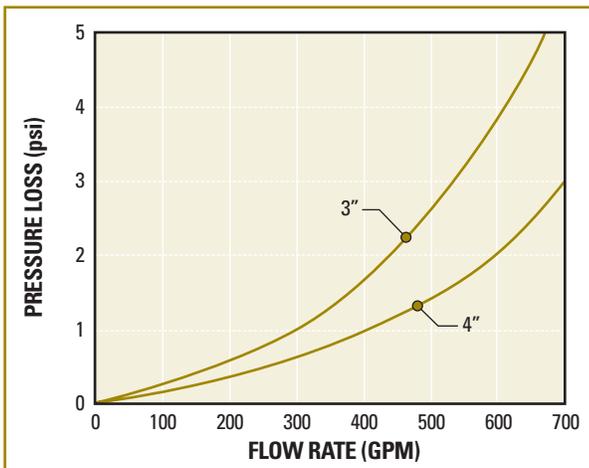
FLOW RATE VS. PRESSURE LOSS



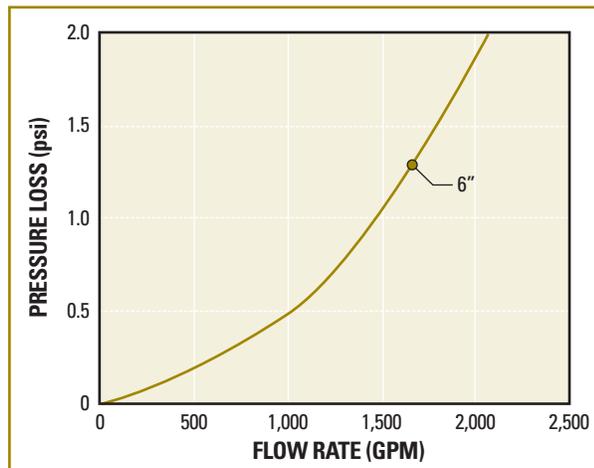
FLOW RATE VS. PRESSURE LOSS



FLOW RATE VS. PRESSURE LOSS



FLOW RATE VS. PRESSURE LOSS



WATER METERS



STANDARD REED SWITCH REGISTER

The reed switch register is a dry contact or simple switch closure for communicating with control and monitoring equipment. Flows are totaled in U.S. Gallons based on the multiplication factors indicated on the dial face.

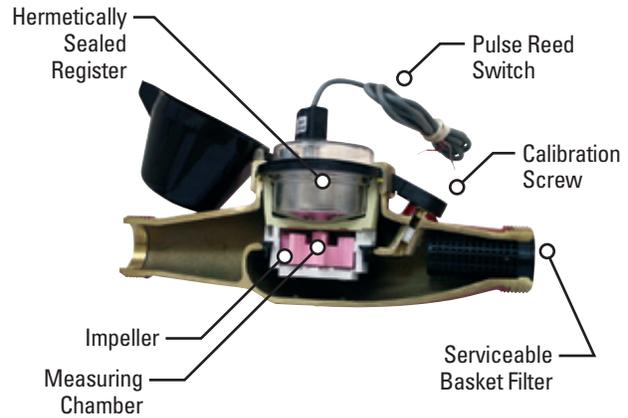


PHOTO DIODE REGISTER

A photo coupler sensor that provides pulse output for communicating with control and monitoring equipment. Flows are totaled in U.S. Gallons based on the multiplication factors indicated on the dial face.

ORDERING INFORMATION

| BODY MATERIAL | SIZE | REGISTER TYPE | GALLONS PER PULSE | MODEL NUMBER |
|---------------|------|---------------|-------------------|-------------------|
| PLASTIC | ¾" | REED SWITCH | 0.1 | WM-075-0.1-RS-P |
| PLASTIC | ¾" | REED SWITCH | 1.0 | WM-075-1.0-RS-P |
| PLASTIC | 1" | REED SWITCH | 1.0 | WM-100-1.0-RS-P |
| PLASTIC | ¾" | PHOTO DIODE | .0015 | WM-075-.0015-PD-P |
| PLASTIC | 1" | PHOTO DIODE | .0021 | WM-100-.0021-PD-P |
| METAL | ¾" | REED SWITCH | 0.1 | WM-075-0.1-RS-M |
| METAL | ¾" | REED SWITCH | 1.0 | WM-075-1.0-RS-M |
| METAL | 1" | REED SWITCH | 1.0 | WM-100-1.0-RS-M |
| METAL | 1 ½" | REED SWITCH | 1.0 | WM-150-1.0-RS |
| METAL | 2" | REED SWITCH | 10 | WM-200-10-RS |
| METAL | 3" | REED SWITCH | 10 | WMW-300-10-RS |
| METAL | 4" | REED SWITCH | 10 | WMW-400-10-RS |
| METAL | 6" | REED SWITCH | 100 | WMW-600-100-RS |
| METAL | ¾" | PHOTO DIODE | .0015 | WM-075-.0015-PD-M |
| METAL | 1" | PHOTO DIODE | .0021 | WM-100-.0021-PD-M |
| METAL | 1 ½" | PHOTO DIODE | .0074 | WM-150-.0074-PD |
| METAL | 2" | PHOTO DIODE | 1.0 | WM-200-1.0-PD |

WATER METERS

STRAIGHT PIPE INSTALLATION

REQUIRED FOR WATER METERS 2" AND LARGER

When water flows through a pipe, any transition through a fitting, elbow, or change in pipe size causes turbulence in the water. In order to eliminate water turbulence, some water meters require straight pipe before and after the water meter. Straight pipe installation refers to the length of straight pipe needed before (upstream of the water meter) and after (downstream of the water meter).

The ¾", 1" and 1½" Water Meters do not require straight pipe installation, but a 5 x diameter before and 2 x diameter straight pipe installation after the meter is recommended. (**Diameter = Meter Size**)

The 2" Water Meter requires straight pipe installation of 10 x diameter before and 5 x diameter straight pipe installation after the meter.

The 3", 4" and 6" Water Meters require straight pipe installation of 5 x diameter before and 2 x diameter straight pipe installation after the meter.

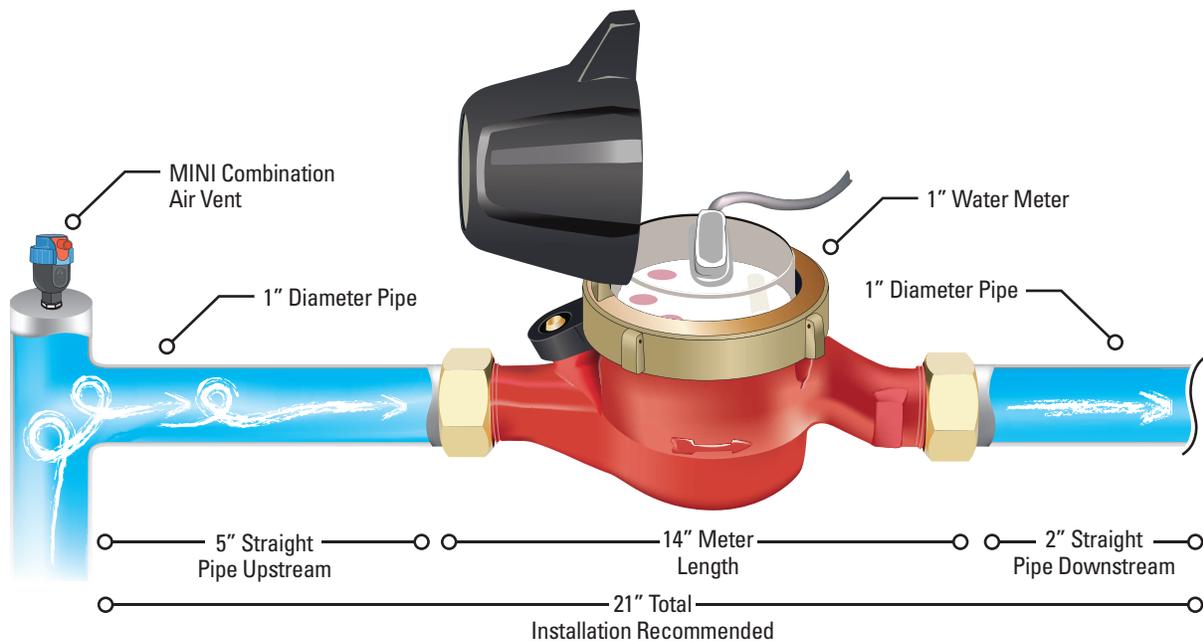
Continuous Acting Air Vents are used to remove air from the system for accurate metering. Proper air vent selection and placement within the system is critical.

CONFIGURING STRAIGHT PIPE INSTALLATION EXAMPLE BELOW:

- Water Meter:** 1"
- Upstream:** 5 x 1" diameter meter = 5" (5 x D)
5" of straight pipe upstream of the water meter
- Downstream:** 2 x 1" diameter meter = 2" (2 x D)
2" of straight pipe downstream of the water meter
- Meter Length:** 14"
- Total:** 21" total installation recommended

STRAIGHT PIPE INSTALLATION REQUIREMENTS (10 X D AND 5 X D - 2" SIZE) (5 X D AND 2 X D - 3", 4" AND 6" SIZE)

| | | UPSTREAM DISTANCE | DOWNSTREAM DISTANCE | METER LENGTH | TOTAL REQUIREMENT |
|------|----|-------------------|---------------------|--------------|-------------------|
| SIZE | 2" | 20" | 10" | 14" | 44" |
| | 3" | 15" | 6" | 9" | 30" |
| | 4" | 20" | 8" | 10" | 38" |
| | 6" | 30" | 12" | 12" | 54" |



NETAFIM LANDSCAPE CONTROLLER

Stand Alone Controller for
Converting Conventional Systems
to Remote Management

NLC-100S CONVENTIONAL

APPLICATIONS

- For commercial and residential applications
- For recreational applications such as sports fields, parks and arenas
- Remote management from any web-based computer
- Nurseries and greenhouses

SPECIFICATIONS

- Stations (Valves): 1 - 100*
- Electrical Input: 115VAC, 50VA
Electrical Output: 24VAC
- Maximum Simultaneous Active Valves: 6
- Master Valves: 1, 10 second stop delay
- Booster Pumps: 2, 10 second stop delay
- Built-in Lightning Protection
- Valve Output: 24VAC, 1.0 A per station maximum, 1.5 A total maximum
- Cabinet: Wall mounted NEMA 3 rated locking metal cabinet with internal Class 2 transformer
- Flow Sensing Capable

* Stations from 26-50 require NLCCAB20. Stations from 51-75 and 76-100 each require an NLCEXP.

FEATURES & BENEFITS

SIMPLE TO RETROFIT

Expressly designed to convert a conventional system to a remote management system with a wealth of controller capabilities.

TOTAL CYCLE MANAGEMENT

Totally integrated system utilizing a weather station, tipping rain bucket and up to 10 soil moisture sensors.

MANAGE REMOTELY

Control irrigation programs and review daily logs and schedules for multiple sites from any web-based computer (service contract required).

INSTANT TROUBLESHOOTING

Built-in monitors and alarms send automatic notifications pinpointing the exact nature of the problem (service contract required).



OPERATING FEATURES

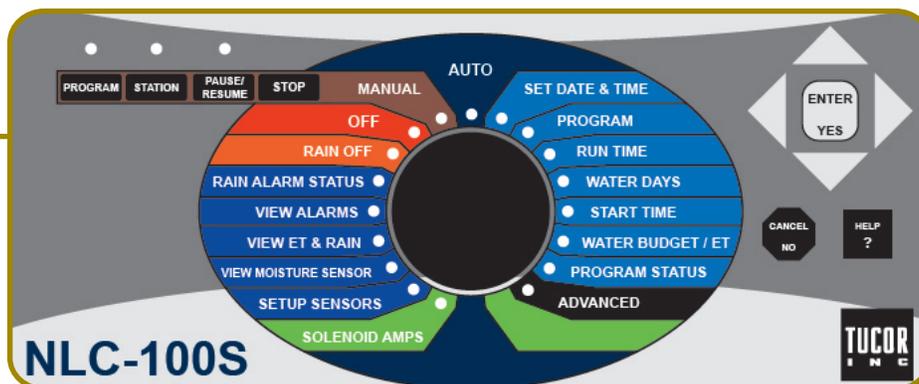
| | |
|---------------------|-------------------------------------------------------------------------------------------|
| PROGRAMS | 10 + 1 Test Programs |
| CONCURRENT PROGRAMS | 10 |
| START TIMES | 12 per Program, 1-99 repeats per start |
| CALENDAR | 14 days or Odd/Even |
| STATION RUN TIMES | 0-999 minutes in 1 second increments (<4 minutes) or 10 second increments (4-999 minutes) |
| WATER BUDGET | 0-250% at 1% increments |
| PROGRAM MODES | Active and Passive |
| START METHODS | Auto, Manual by Program, Manual by Station |
| DISPLAY | Monitors active programs, run times and alarms |

ADVANCED FEATURES

| | |
|--------------|-------------------------------------------------------------------|
| MIST MANAGER | Valve operations controllable in 1 second increments |
| FLOSTACK™ | Program stacking based on flow for up to 10 simultaneous programs |
| REALNET | Real-time, internet based water management via GSM or LAN |
| INTELLISET | Smart irrigation using a host of ET-based capabilities |
| FLOGUARD | Alarm and control option based on flow monitoring |

NLC-100S

NLC-100S CONVENTIONAL CONTROLLER FACE PLATE



REMOTE MANAGEMENT

- Via the internet when equipped with GSM or LAN
- Direct virtual screen control
- Real time web pages via Cycle Manager software
- Remote App for all smart phone and tablet platforms

CONSERVATION FEATURES

- Rain Sensor Terminals/Pulse, N/O, N/C
- Flow Sensor inputs at the Controller with:
 - Alarms: High, Unscheduled, % Deviation, Main Pump Failure with adjustable delay
 - Learn flow per station
- Moisture Sensors up to 10 per Controller
 - Monitoring by % volume and inches
 - Allow and inhibit per program
 - Automatically adjust ET based programs
- Multiple ET sources
 - Historic ET by city
 - Local on-site weather station
 - Server based data



HYDROMETER FLOW SENSOR

The perfect solution for retrofitting - contains both a master valve and flow sensor in one sturdy package.

- No straight pipe requirements upstream or downstream for installation in tight places.
- Real-time flow display based on pulses per gallon.
- Photo diode option for high frequency output, even at low flows. Powered by the controller or by a Sensor Decoder.
- Provides $\pm 2\%$ accuracy across a wide range of flows.
- Can also be used with NLC-100D, NLC-100S and NLC-3D Hybrid systems.

DIMENSIONS & WEIGHT

| | |
|---------------|-----|
| LENGTH (L) | 12" |
| DEPTH (D) | 6" |
| HEIGHT (H) | 12" |
| WEIGHT (LBS.) | 15 |

ORDERING MATRIX

OPTIONS

NLCSP - STATION COUNT - CABINET/PEDESTAL - COMMUNICATION - **NO** - OUTPUT

CONVENTIONAL PANEL

| STATION COUNT * |
|--------------------|
| 012 = 12 Stations |
| 018 = 18 Stations |
| 025 = 25 Stations |
| 037 = 37 Stations |
| 050 = 50 Stations |
| 075 = 75 Stations |
| 100 = 100 Stations |

* Order appropriate Cabinet size (C12 or C20) for Station Count

| CABINET/PEDESTAL |
|-----------------------------------------------|
| C12 = 12" x 12" x 6" Cabinet (Up to 25 zones) |
| C20 = 12" x 20" x 6" Cabinet (Over 25 zones) |
| PE1 = 2 Piece SS Pedestal |
| PE2 = 1 Piece Top Entry SS Lite Pedestal |
| PE3 = 1 Piece Top Entry SS HD Pedestal |
| NON = No Cabinet or Pedestal |

| COMMUNICATION |
|---------------|
| W = Cellular |
| L = LAN |
| N = None |

NOT HYBRID

| OUTPUT TERMINAL |
|---------------------------------------|
| Y = Heavy Duty Output Lightning Strip |
| N = No Output |

ORDERING EXAMPLE:

NLCSP012-C12-N-NO-N = Model Number **NLCSP012-C12NNON**
Netafim Landscape Controller NLC-100S, Conventional Panel, 12 Stations, 12" x 12" x 6" Cabinet, No Communication, Not Hybrid, No Output Terminal

NETAFIM LANDSCAPE CONTROLLER

Stand Alone Controller Includes Hybrid Technology with Master Valve and Sensor Inputs

NLC-100S HYBRID

APPLICATIONS

- Commercial and HOA applications with battery operated controllers
- Retrofit applications requiring flow sensors
- Applications that require the rezoning or expansion of existing systems

SPECIFICATIONS

CONTROLLER

- Stations (Valves): 12 - 100
- Electrical Input: 115VAC, 50VA
Electrical Output: 24VAC
- Maximum Simultaneous Active Valves: 6
- Master Valves: 1, 10 sec. stop delay
- Booster Pumps: 2, 10 sec. stop delay
- Built-in Lightning Protection
- Valve Output: 24VAC, 1.0 A per station maximum, 1.5 A total maximum
- Cabinet: Wall mounted NEMA 3 rated locking metal cabinet with internal Class 2 transformer

SPECIFICATIONS

HYBRID MODULE

- Stations (Valves): 6 or 24
Up to 48 with additional hybrid board
- Electrical Input: 24VAC sourced from current controller
- Includes (1) Master valve and (1) Flow sensor input
- Up to 3 stations simultaneously
- 2-Wire distances up to 8,000'
- Program Decoders at Hybrid controller or with the optional programmer
- Requirements:
 - Decoder for converted stations and Master valve
 - Sensor decoder for Flow sensor

FEATURES & BENEFITS

MASTER VALVE AND FLOW METER INPUTS

Add a master valve and flow meter to the system on top of the existing valve's common and control wires.

ADD MULTIPLE VALVES

Ability to add multiple valves to an existing system from any valve location.

CONVERT TO A 2-WIRE SYSTEM

Enjoy all the advantages of a 2-Wire decoder system with an existing controller.

MULTIPLE STATION INPUTS FOR MAXIMUM FLEXIBILITY

Ability to add multiple valves to an existing system from any valve location.

MANAGE REMOTELY

Control irrigation programs and review daily logs and schedules for multiple sites from any web-based computer (service contract required).

COMBINE MULTIPLE CONTROLLERS

Combining multiple controllers into one minimizes power drops and recurring server fees.



HYDROMETER FLOW SENSOR

The perfect solution for retrofitting - contains both a master valve and flow sensor in one sturdy package.

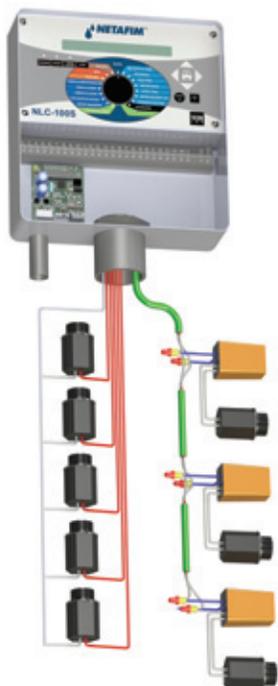
- No straight pipe requirements upstream or downstream for installation in tight places.
- Real-time flow display based on pulses per gallon.
- Photo diode option for high frequency output, even at low flows. Powered by the controller or by a Sensor Decoder.
- Provides +/- 2% accuracy across a wide range of flows.
- Also used with NLC-100S, NLC-100D and NLC-3D systems.

NLC-100S HYBRID

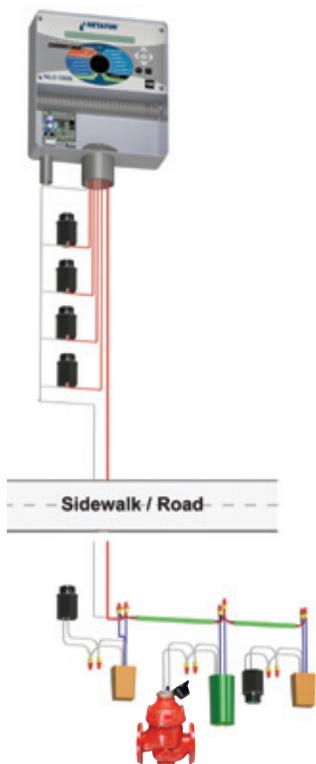
NLC-100S HYBRID CONTROLLER CONFIGURATIONS

The following illustrations show NLC-100S Hybrid controller configurations with the addition of a Master Valve and Flow Sensor, valves, and simple 2-Wire conversion.

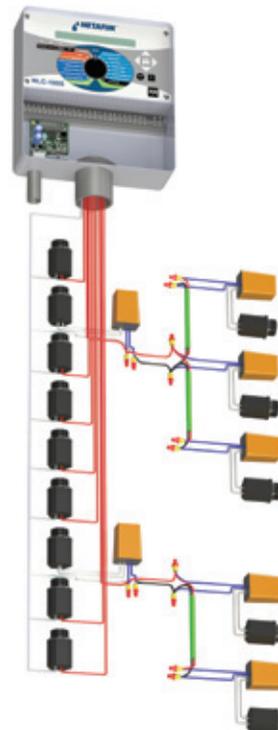
Simple conversion to a 2-Wire system



Adding 2-Wire, master valve and flow sensor using existing conventional wires



Conventional outputs with addition of valves by converting to a 2-Wire system



2-WIRE DISTANCES

| SIMULTANEOUS OPERATIONS | TW18/ 2AWG | TW16/ 2AWG | TW14/ 2AWG |
|-------------------------------------|---------------|---------------|---------------|
| 1 VALVE | 3,000 | 6,000 | 8,000 |
| 2 VALVES OR 1 VALVE + MASTER VALVE | 2,300 | 4,600 | 6,000 |
| 3 VALVES OR 2 VALVES + MASTER VALVE | 1,500 | 3,000 | 4,000 |

DIMENSIONS & WEIGHT

| | |
|---------------|-----|
| LENGTH (L) | 12" |
| DEPTH (D) | 6" |
| HEIGHT (H) | 12" |
| WEIGHT (LBS.) | 15 |

ORDERING MATRIX

OPTIONS

NLC SH - STATION COUNT - CABINET/PEDESTAL - COMMUNICATION - HYBRID OPTION - OUTPUT

CONVENTIONAL HYBRID PANEL

STATION COUNT *

| |
|---------------------------|
| 012 = 12 Stations |
| 018 = 18 Stations |
| 025 = 25 Stations |
| 037 = 37 Stations |
| 050 = 50 Stations |
| 075 = 75 Stations |
| 100 = 100 Stations |

* Order appropriate Cabinet size (C12 or C20) for Station Count

CABINET/PEDESTAL

| |
|------------------------------------------------------|
| C12 = 12" x 12" x 6" Cabinet (Up to 25 zones) |
| C20 = 12" x 20" x 6" Cabinet (Over 25 zones) |
| PE1 = 2 Piece SS Pedestal |
| PE2 = 1 Piece Top Entry SS Lite Pedestal |
| PE3 = 1 Piece Top Entry SS HD Pedestal |
| NON = No Cabinet or Pedestal |

COMMUNICATION

| |
|---------------------|
| W = Cellular |
| L = LAN |
| N = None |

HYBRID OPTIONS

| |
|----------------------------------------------|
| 06 = Up to 6 Valves, MV, Flow Sensor |
| 24 = Up to 24 Valves, MV, Flow Sensor |

OUTPUT TERMINAL

| |
|----------------------------------------------|
| Y = Heavy Duty Output Lightning Strip |
| N = No Output |

ORDERING EXAMPLE:

NLC SH012-C12-W-06-N = Model Number **NLC SH012-C12W06N**
Netafim Landscape Controller NLC-100S, Conventional with Hybrid Technology, 12 Stations, 12" x 12" x 6" Cabinet, Cellular, 6 Stations, No Output Terminal

NETAFIM LANDSCAPE CONTROLLER

Decoder Based 2-Wire Controller with Integrated Diagnostics and Flexibility

NLC-100D DECODER

APPLICATIONS

- For commercial and residential applications
- For recreational applications such as sports fields, parks and arenas
- Nurseries and greenhouses

SPECIFICATIONS

- Stations (Valves): 1 - 100
- Electrical Input: 115VAC, 50VA
Electrical Output: 24VAC
- Maximum Simultaneous Active Valves: 12
- Booster Pumps: 2 (1 per program)
- Built-in Lightning Protection
- Maximum Wire Lengths: *
16,300' with #14/2
10,200' with #16/2
- Cabinet: NEMA 3 rated locking metal cabinet with internal transformer
- Diagnostics:
Decoder Test - Pass/Fail
Short Test - Checks line condition
Line Survey - Displays 2-Wire voltage and current
- Flow Sensing Capable

* When running 2 valves simultaneously.

FEATURES & BENEFITS

PROGRAMMABLE LINE DECODER

Decoder is easily programmed by the user with specific station identifications connected anywhere along the 2-Wire path to turn on almost any 24VAC solenoid valve.

SUPPORTS 1 TO 100 VALVES

Operate up to 100 valves with one 2-Wire path, connecting the valves in a series.

INTEGRATED DIAGNOSTICS

Controller tests for decoder operation as well as 2-Wire path conditions.

MANAGE REMOTELY

Control irrigation programs and review daily logs and schedules for multiple sites from any web-based computer (service contract required).

INSTANT TROUBLESHOOTING

Built-in monitors and alarms send automatic notifications pinpointing the exact nature of the problem (service contract required).

EASY TO EXPAND

Adapts to your growing system by allowing the addition or modification of valves with no need for costly rewiring or upgrades.

ENERGY EFFICIENT

The 2-Wire cable carries both power and signal to control each valve using 1/10th the power of a conventional system.



OPERATING FEATURES

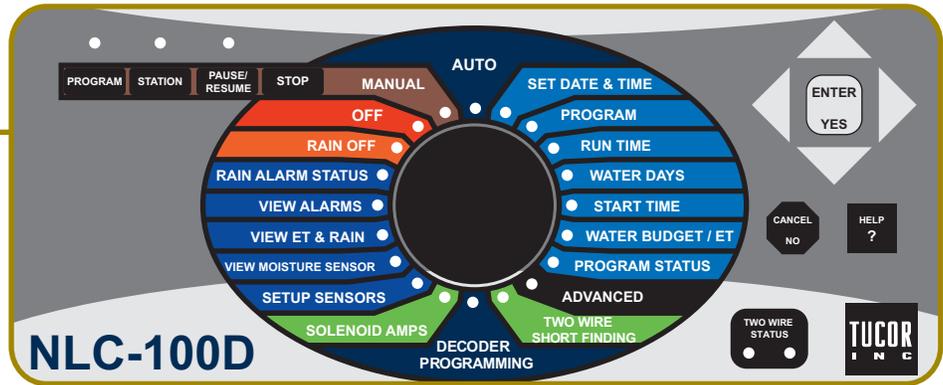
| | |
|---------------|--------------------------------------------------------------|
| PROGRAMS | 10 + 1 Test Programs, 10 Concurrent |
| START TIMES | 12 per Program |
| CALENDAR | 14 days or Odd/Even |
| STATION RUN | 0-999 minutes in 1 second increments |
| TIMES | (<4 minutes) or 10 second increments (4-999 minutes) |
| WATER BUDGET | 0-250% at 1% increments |
| PROGRAM MODES | Active and Passive |
| START METHODS | Auto, Manual by Program or Station |
| DISPLAY | Monitors active programs, run times, line conditions, alarms |
| DECODERS | Addressed and tested at controller |

ADVANCED FEATURES

| | |
|--------------|-------------------------------------------------------------------|
| MIST MANAGER | Valve operations controllable in 1 second increments |
| FLOSTACK™ | Program stacking based on flow for up to 10 simultaneous programs |
| REALNET | Real-time, internet based water management via GSM or LAN |
| INTELLISET | Smart irrigation using a host of ET-based capabilities |
| FLOGUARD | Alarm and control option based on flow monitoring |

NLC-100D DECODER

NLC-100D DECODER CONTROLLER FACE PLATE



DECODER SPECIFICATIONS

| | |
|-------------|--------------------|
| LEAD LENGTH | 11" |
| DIMENSIONS | 1.5" X 1.4" X 2.3" |

SURGE PROTECTOR SPECIFICATIONS

| | |
|---------------------------------------------------------------------------------------------------------------------------------------------------|------|
| NORMAL SPARK OVER VOLTAGE | 230V |
| MAX. SPARK OVER VOLTAGE | 450V |
| MAX. CURRENT | |
| | |
| Surge protector must be installed and grounded every 500' and at the end of the wire run. Resistance of the 2-Wire to ground must be 50Ω or less. | |

DIMENSIONS & WEIGHT

| | |
|---------------|-----|
| LENGTH (L) | 12" |
| DEPTH (D) | 6" |
| HEIGHT (H) | 12" |
| WEIGHT (LBS.) | 15 |

TUCOR WIRE SPECIFICATIONS

| | |
|---------------|--------------------------|
| INSULATION | POLYVINYLCHLORIDE |
| JACKET | POLYETHYLENE |
| SIZES | 12-16 AWG |
| COLORS | RED, GREEN, ORANGE, BLUE |
| SPOOL LENGTHS | 500', 1,000', 2,500' |

Some wire colors and spool lengths are special order.

TUCOR WIRE LENGTHS

| NUMBER OF SIMULTANEOUS PROGRAMS | VALVES EVENLY DISTRIBUTED ALONG 2-WIRE (FT.) | | |
|---------------------------------|----------------------------------------------|--------|--------|
| | AWG 18 | AWG 16 | AWG 14 |
| 1 | 7,000 | 11,000 | 17,800 |
| 2 | 6,400 | 10,200 | 16,300 |
| 3 | 5,500 | 8,800 | 14,100 |
| 4 | 4,900 | 7,800 | 12,500 |
| 5 | 4,400 | 7,000 | 11,200 |
| 6 | 4,000 | 6,300 | 10,100 |
| 7 | 3,600 | 5,800 | 9,200 |
| 8 | 3,300 | 5,300 | 8,500 |
| 9 | 3,100 | 4,900 | 7,800 |
| 10 | 2,800 | 4,600 | 7,300 |
| 10 + 1 MANUAL | 2,700 | 4,300 | 6,800 |
| 10 + 2 MANUAL | 2,500 | 4,000 | 6,400 |

DECODERS, SURGE PROTECTION AND WIRES

The decoder is easily programmed with a specific station ID, then connected anywhere along the 2-Wire path to enable valve activation. The decoder energizes almost any 24VAC solenoid and can be reprogrammed with a different ID when desired. Wire options:

- TUCOR WIRE - is the preferred means of connecting the field decoders to the controller. Tumor wire is designed expressly to ensure a secure, water-tight electrical pathway.



NOTE: Tumor wire is not supplied by Netafim.

- NETAFIM SINGLETNET CABLE - two low capacitance wires and a drain wire, 16 AWG, pre-packaged as a single cable inside a polyethylene sheath.

Field disruptions due to lightning are minimized by the use of the NLCSP100 surge protector which safely absorbs 2-Wire voltage surges adding substantial protection to the 2-Wire path.

HYDROMETER FLOW SENSOR

The perfect solution - contains both a master valve and flow sensor in one sturdy package.



ORDERING MATRIX

NLCDP - 100 - CABINET/PEDESTAL - COMMUNICATION - NO - N

DECODER STATION COUNT

| CABINET/PEDESTAL |
|------------------------------------------|
| C12 = 12" x 12" x 6" Cabinet |
| C20 = 12" x 20" x 6" Cabinet |
| PE1 = 2 Piece SS Pedestal |
| PE2 = 1 Piece Top Entry SS Lite Pedestal |
| PE3 = 1 Piece Top Entry SS HD Pedestal |
| NON = No Cabinet or Pedestal |

| COMMUNICATION |
|---------------|
| W = Cellular |
| L = LAN |
| N = None |

NOT HYBRID NO OUTPUT

ORDERING EXAMPLE:

NLCDP-100-C12-N-NON = Model Number **NLCDP100-C12NNON**

Netafim Landscape Controller NLC-100D, Decoder Controller, 100 Stations, 12" x 12" x 6" Cabinet, No Communication, Not Hybrid, No Output Terminal

NETAFIM LANDSCAPE CONTROLLER

2-Wire Interface Adapts to Any Conventional Controller Enabling System Expansion

NLC-3D HYBRID

APPLICATIONS

- Commercial, Residential, HOA and Sports Field applications with a conventional control system
- Retrofit applications requiring a flow sensor and/or master valve
- Applications that require the rezoning or expansion of existing systems

SPECIFICATIONS

- Stations (Valves): 6 or 24
48 maximum with additional parallel 3D
- Electrical Input: 24VAC sourced from current controller
- Each 3D interface includes (1) Master Valve and (1) Flow Sensor input
- Up to 3 stations simultaneously
- 2-Wire Distances up to 8,000'
- Status LEDs

FEATURES & BENEFITS

CONVERT TO A 2-WIRE DECODER SYSTEM

Combine a 2-Wire decoder with existing conventional wiring output, directly from the controller, for true hybrid applications.

ADD MULTIPLE VALVES

From any existing valve location, add multiple valves without having to install wires back to the controller.

TRUE 2-WIRE DECODER CONTROL

Take full advantage of increased wire distances, smaller wire sizes and added flexibility with this two wire interface.

ADD A MASTER VALVE OR FLOW SENSOR

Allows the addition of a master valve and a flow sensor without having to install wires back to the controller.



CONFIGURATIONS

| | |
|---------|---------------------------------------------------------------------------------------------------------|
| NLC3D24 | Supports up to 24 decoders plus (1) master valve and (1) flow sensor for 2-Wire decoder applications |
| NLC3D6 | Supports up to 6 decoders plus (1) master valve and (1) flow sensor for retrofit or repair applications |



HYDROMETER FLOW SENSOR

The perfect solution for retrofitting - contains both a master valve and flow sensor in one sturdy package.

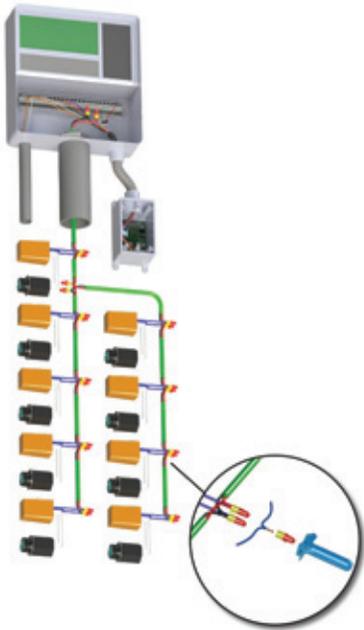
- No straight pipe requirements upstream or downstream for installation in tight places.
- Real-time flow display based on pulses per gallon.
- Photo diode option for high frequency output, even at low flows. Powered by the controller or a 3D decoder.
- Provides +/- 2% accuracy across a wide range of flows.
- Can also be used with NLC-100S, NLC-100S Hybrid and NLC-100D systems.

NLC-3D HYBRID

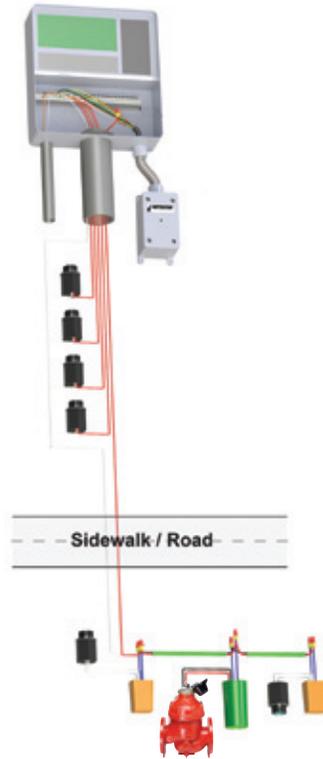
NLC-3D HYBRID INTERFACE CONFIGURATIONS

The following illustrations show a NLC-3D Hybrid interface with a conventional controller.

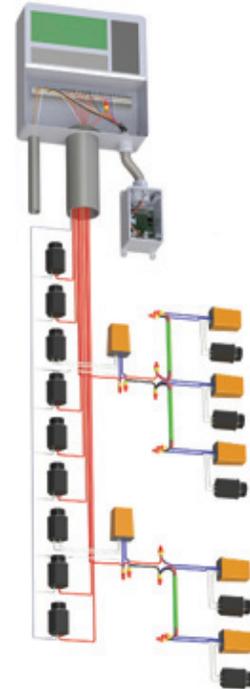
Simple conversion to a 2-Wire system



Adding 2-Wire, master valve and flow sensor using existing conventional wires



Conventional outputs with addition of valves by converting to a 2-Wire system



2-WIRE DISTANCES

| SIMULTANEOUS OPERATIONS | TW18/ 2AWG | TW16/ 2AWG | TW14/ 2AWG |
|----------------------------------------|---------------|---------------|---------------|
| 1 VALVE | 3,000 | 6,000 | 8,000 |
| 2 VALVES OR 1 VALVE + MASTER VALVE | 2,300 | 4,600 | 6,000 |
| 3 VALVES OR 2 VALVES + MASTER VALVE | 1,500 | 3,000 | 4,000 |

ORDERING INFORMATION

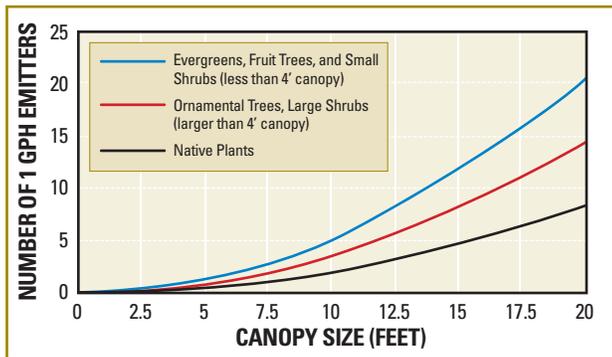
| MODEL NUMBER | DESCRIPTION |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------|
| NLC3D6 | 3D with 2-Wire output for up to 6 valves, flow sensor, master valve, NEMA 4X enclosure, flex conduit connection for hybrid function |
| NLC3D24 | 3D with 2-Wire output for up to 24 valves, flow sensor, master valve, NEMA 4X enclosure, flex conduit connection for hybrid function |
| NLC3DDLPCB | Add-on PCB with dynamic load feature for smart controllers with advanced valve diagnostics |
| NLC3DLD050 | Orange single valve line decoder for use with NLC3D6 and NLC3D24 |
| NLC3DSD100M | Sensor decoder modified for PDH register with power for LED |
| NLCLSP100 | Line surge protection |

POINT SOURCE DESIGN

IRRIGATING TREES, SHRUBS AND NATIVE PLANTS

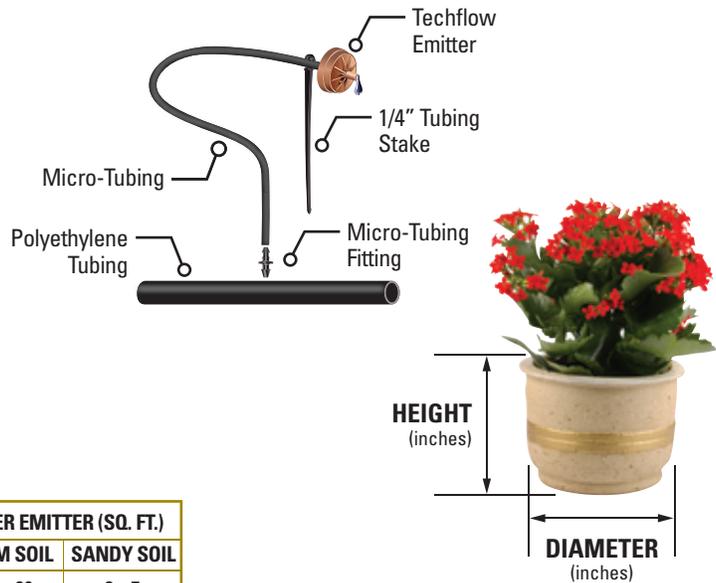
For trees, shrubs and native plants with wide and/or random spacing requirements, point source drip irrigation is the perfect alternative. In landscape areas that are sparsely planted, irrigating within the plant's canopy conserves water and inhibits weed growth in the areas with no plants. Depending on the plant's canopy size and soil type, the number of point source emitters can be easily determined.

SIMPLIFIED DRIP DESIGN GRAPH



IRRIGATING CONTAINERS

The correct watering of containers can be difficult when using a hose, sprinklers or sprays. Either not enough or too much water is applied; or the frequency of watering is inefficient to promote a healthy environment for the plant to thrive. By using a point source drip irrigation system, the emitter can easily be installed in each container and operated for the correct time and frequency to insure the correct amount of water is applied for healthy plant growth.



APPROXIMATE WETTED DIAMETER & WETTED AREA PER EMITTER (PER SOIL TYPE)

| EMITTER FLOW RATE | WETTED DIAMETER PER EMITTER (FT.) | | | WETTED AREA PER EMITTER (SQ. FT.) | | |
|-------------------|-----------------------------------|-----------|------------|-----------------------------------|-----------|------------|
| | CLAY SOIL | LOAM SOIL | SANDY SOIL | CLAY SOIL | LOAM SOIL | SANDY SOIL |
| 0.5 GPH | 5 - 7 | 3 - 5 | 2 - 3 | 20 - 38 | 7 - 20 | 3 - 7 |
| 1.0 GPH | 7 - 8 | 5 - 6 | 3 - 3.5 | 38 - 50 | 20 - 28 | 7 - 10 |
| 2.0 GPH | 8 - 9 | 6 - 7 | 3.5 - 4 | 50 - 64 | 28 - 38 | 10 - 13 |

Emitter flow rates have an impact on the soil's ability to absorb water. The lighter the shaded box indicates the more desirable flow rate given the soil selection.

$$\text{Container Size (gallons)} = \frac{\text{Surface Area (sq. in.)} \times \text{Height (inches)}}{231}$$

Surface Area = Diameter (m.) x .7854

$$\text{Number of Emitters per Plant} = \frac{\text{Plant Canopy (square feet)} \times 0.75}{\text{Wetted Area per Emitter (square feet)}}$$

For example:

- Tree with 16' canopy in a loam soil.
- Plant root zone = $(16')^2 \times 0.7854 = 256 \times 0.7854 = 201$ square feet.
- Number of 1.0 GPH emitters required = $201 \times .75/24 = 150.8/24 = 6.28 = 6 - 1.0$ GPH emitters.

IRRIGATION DURATION

| CLIMATE | RUN TIME |
|-------------|-----------|
| VERY COOL | 1.3 HOURS |
| COOL | 2.6 HOURS |
| MODERATE | 3.5 HOURS |
| HOT | 4.2 HOURS |
| HIGH DESERT | 5.1 HOURS |
| LOW DESERT | 5.9 HOURS |

CONTAINER IRRIGATION (FREQUENCY)

| CLIMATE | SANDY SOIL | LOAM SOIL | CLAY SOIL | POTTING SOIL |
|-------------|------------|-----------|-----------|--------------|
| VERY COOL | 2 DAYS | 3 DAYS | 8 DAYS | 2 DAYS |
| COOL | 1 ½ DAYS | 2 DAYS | 6 DAYS | DAILY |
| MODERATE | 1 ½ DAYS | 2 DAYS | 6 DAYS | DAILY |
| HOT | DAILY | 2 DAYS | 5 DAYS | DAILY |
| HIGH DESERT | DAILY | 1 ½ DAYS | 4 DAYS | DAILY |
| LOW DESERT | DAILY | DAILY | 3 DAYS | DAILY |

CONTAINER IRRIGATION (EMITTER FLOW RATE & RUN TIME)

| CONTAINER SIZE (GALLONS) | EMITTER FLOW (GPH) | SANDY SOIL (IN MIN.) | LOAM SOIL (IN MIN.) | CLAY SOIL (IN MIN.) | POTTING SOIL (IN MIN.) |
|--------------------------|--------------------|----------------------|---------------------|---------------------|------------------------|
| 1 | 0.5 | 3 | 5 | 11 | 2 |
| 2 | 0.5 | 6 | 10 | 20 | 4 |
| 5 | 1.0 | 9 | 15 | 30 | 6 |
| 15 | 1.0 | 25 | 40 | 90 | 18 |
| 25 | 1.0 | 40 | 75 | 150 | 35 |



POINT SOURCE EMITTERS

COMPARISON

POINT SOURCE EMITTERS COMPARISON CHART

| Emitter Flow Rate (GPH) | SELF-PIERCING EMITTERS | | | TECHFLOW EMITTERS | | | BD & WP EMITTERS | | |
|----------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| | See Page 61 | | | See Pages 62 | | | See Page 63 | | |
| | 0.5 | 1.0 | 2.0 | 0.5 | 1.0 | 2.0 | 0.5 | 1.0 | 2.0 |
| |  |  |  |  |  |  |  |  |  |
| APPLICATION | For Quick and Easy Installations Requiring No Tools | | | For Systems with a Wide Range of Pressure Variation | | | For Low Pressure or Gravity Fed Systems | | |
| TOOL REQUIRED FOR INSTALLATION? | No | No | No | Yes | Yes | Yes | Yes | Yes | Yes |
| PRESSURE COMPENSATION RANGE | 10.15 to 58 psi | 10.15 to 58 psi | 10.15 to 58 psi | 14.5 to 58 psi | 14.5 to 58 psi | 14.5 to 58 psi | No | No | No |
| MAXIMUM PRESSURE | 50 psi | 50 psi | 50 psi | 60 psi | 60 psi | 60 psi | 29 psi | 29 psi | 29 psi |
| INTERNAL CHECK VALVE | 1.74 psi, holds up to 3.9' of water | | | 2.2 psi, holds up to 5' of water | | | No | No | No |
| ANTI-SIPHON | Yes | Yes | Yes | Yes | Yes | Yes | No | No | No |
| SELF-CLEANING | Yes | Yes | Yes | Yes | Yes | Yes | No | No | No |
| BAG QUANTITY: 25 | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 100 | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | N/A |
| 250 | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| 1,000 | Yes | Yes | Yes | N/A | N/A | N/A | N/A | N/A | N/A |

SELF-PIERCING EMITTERS

With Check Valve

APPLICATIONS

- For use with blank polyethylene tubing, Techline® CV, Techline® DL and Techline® RW
- Install on-surface or subsurface
- Wide-spaced plantings
- Tree planting
- Hanging baskets
- Flower boxes
- Planters or pots

SPECIFICATIONS

- Flow rates: 0.5, 1.0 and 2.0 GPH
- Pressure compensation range: 10.15 to 58 psi
- Maximum pressure: 50 psi
- Uses 0.160" x 0.220" micro-tubing (Model EDTUBE - in black or white)
- Barb size: Inlet 0.160" - 0.170"
Outlet 0.160"
- Recommended minimum filtration: 120 mesh

FEATURES & BENEFITS

SELF-PIERCING BARB

Easy to install, no tools required. Optional insertion tool available.

1.74 psi INTERNAL CHECK VALVE

Helps prevent low emitter drainage holding back up to a 3.9' column of water. Can be used with Techline CV Dripline.

ANTI-SIPHON OPERATION

Prevents contaminants from being drawn into the emitter.

PRESSURE COMPENSATING

Delivers the same flow from 10.15 to 58 psi.

SELF-CLEANING ACTION

Exclusive TurboNet® flow path design regulates flow and provides continuous self-cleaning action during operation.



**BLUE
EMITTER**
0.5 GPH



**BLACK
EMITTER**
1.0 GPH

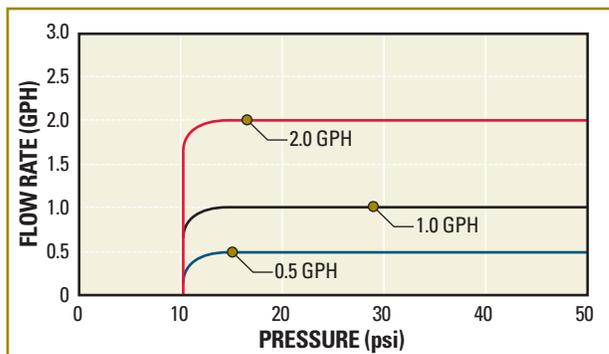


**RED
EMITTER**
2.0 GPH



INSERTION TOOL
Model SPDT

FLOW RATE VS. PRESSURE



ORDERING INFORMATION

| FLOW RATE | COLOR | BAG QUANTITY | MODEL NUMBER |
|-----------|-------|--------------|--------------|
| 0.5 GPH | BLUE | 25 | SPCV05-25 |
| | | 100 | SPCV05-100 |
| | | 250 | SPCV05-250 |
| | | 1,000 | SPCV05-1000 |
| 1.0 GPH | BLACK | 25 | SPCV10-25 |
| | | 100 | SPCV10-100 |
| | | 250 | SPCV10-250 |
| | | 1,000 | SPCV10-1000 |
| 2.0 GPH | RED | 25 | SPCV20-25 |
| | | 100 | SPCV20-100 |
| | | 250 | SPCV20-250 |
| | | 1,000 | SPCV20-1000 |

TECHFLOW EMITTERS

Pressure
Compensating
Emitters

APPLICATIONS

- For use with systems with a wide range of pressure variations (14.5 to 58 psi)
- Install on-surface or subsurface
- Wide range of plant spacings
- Hanging baskets, flower baskets, pots, interiorscapes

SPECIFICATIONS

- Flow rates: 0.5, 1.0 and 2.0 GPH
- Pressure compensation range: 14.5 to 58 psi
- Maximum pressure: 60 psi
- Uses 0.160" x 0.220" micro-tubing (Model EDTUBE - in black or white)
- Barb size: Inlet 0.160" - 0.170"
Outlet 0.160"
- Recommended minimum filtration: 120 mesh

FEATURES & BENEFITS

UNIQUE EMITTER DESIGN

Regulates flow and provides continuous self-cleaning action during operation.

2.2 psi INTERNAL CHECK VALVE

Helps prevent low emitter drainage by holding back up to a 5' column of water.

ANTI-SIPHON OPERATION

Prevents contaminates from being drawn into emitter.

COLOR-CODED EMITTER

Denotes flow rate.

CAN BE USED WITH TECHLINE CV DRIPLINE

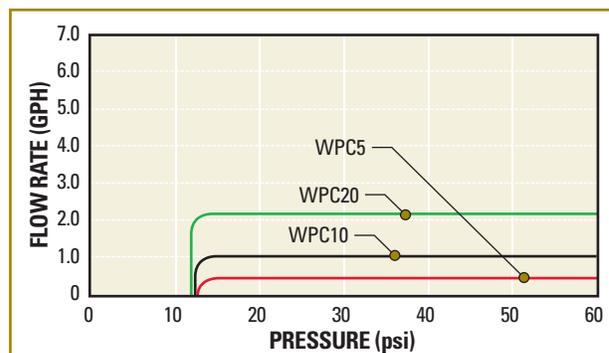
Without causing dripline drainage.



ORDERING INFORMATION

| FLOW RATE | COLOR | BAG QUANTITY | MODEL NUMBER |
|-----------------------------------|-------|--------------|--------------|
| BARB INLET X NIPPLE OUTLET | | | |
| 0.5 GPH | RED | 25 | WPC5 |
| | | 250 | WPC5-250 |
| 1.0 GPH | BLACK | 25 | WPC10 |
| | | 250 | WPC10-250 |
| 2.0 GPH | GREEN | 25 | WPC20 |
| | | 250 | WPC20-250 |
| BUG CAP | | | |
| - | - | 25 | WPBC |
| BARBED ADAPTER | | | |
| - | - | 25 | 11WPCON47-B |

FLOW RATE VS. PRESSURE



Non-Pressure
Compensating
Emitters

BD & WP EMITTERS

APPLICATIONS

- Use in piping networks with limited pressure variation
- Planters and pots
- Wide-spaced plantings

SPECIFICATIONS

- Flow rates: 0.5, 1.0 and 2.0 GPH
- BD and WP models use 0.160" x 0.220" micro-tubing (Model EDTUBE)
- Barb size: Inlet 0.160" - 0.170"
Outlet 0.160"
- Maximum pressure: 29 psi
- Recommended minimum filtration: 120 mesh

FEATURES & BENEFITS

WIDE TURBULENT FLOW PASSAGE

Resists clogging. Works well in low pressure applications.

BARB INLET

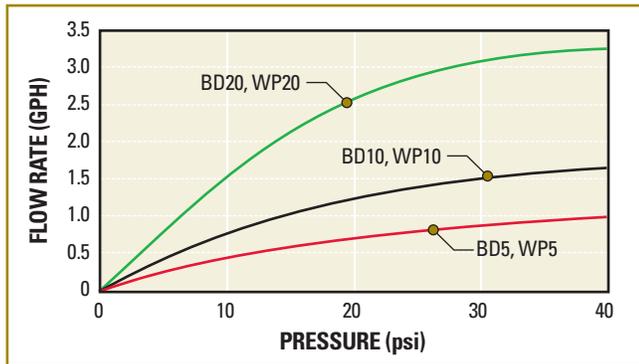
For easier installations.

COLOR-CODED EMITTER

Denotes flow rate.



FLOW RATE VS. PRESSURE



BD EMITTERS ORDERING INFORMATION

| FLOW RATE | COLOR | BAG QUANTITY | MODEL NUMBER |
|-----------|-------|--------------|--------------|
| 0.5 GPH | RED | 25 | BD5 |
| | | 250 | BD5-250 |
| 1.0 GPH | BLACK | 25 | BD10 |
| | | 250 | BD10-250 |
| 2.0 GPH | GREEN | 25 | BD20 |
| | | 250 | BD20-250 |

WP EMITTERS ORDERING INFORMATION

| FLOW RATE | COLOR | BAG QUANTITY | MODEL NUMBER |
|-----------|-------|--------------|--------------|
| 0.5 GPH | RED | 25 | WP5 |
| | | 250 | WP5-250 |
| 1.0 GPH | BLACK | 25 | WP10 |
| | | 250 | WP10-250 |
| 2.0 GPH | GREEN | 25 | WP20 |
| | | 250 | WP20-250 |

POLYETHYLENE TUBING

APPLICATIONS

- For use with point source drip emitters, micro-spray or micro-sprinklers for irrigating ground cover, trees and shrub beds
- Provides flexible and durable header or transition to dripline
- For on-surface or subsurface installations
- Positions on-line emission devices in hard to reach places

FEATURES & BENEFITS

SPEEDS INSTALLATION OF DRIP IRRIGATION SYSTEM

Allows for fast connections and easy layouts.

UV RESISTANT

Withstands heat, direct sun and harsh environments.

MANUFACTURED UNDER STRINGENT QUALITY CONTROLS

Assures highest quality as every coil undergoes a battery of over 30 quality checks.

MADE WITH THE FINEST LOW DENSITY POLYETHYLENE RESIN AVAILABLE

Available in black or white.



BLACK POLYETHYLENE
1,000' COIL



WHITE POLYETHYLENE
1,000' COIL

ORDERING INFORMATION

| DESCRIPTION | PRESSURE RATING (psi) | COIL LENGTH | MODEL NUMBER |
|---------------------------------------------|-----------------------|-------------|--------------|
| BLACK POLYETHYLENE TUBING | | | |
| 16MM O.D. (0.520" X 0.620", 0.050" WALL) | 70 | 250' | PE052062-25 |
| | | 500' | PE052062-05 |
| | | 1,000' | PE052062-10 |
| ½" (0.620" X 0.710", 0.045" WALL) | 52 | 500' | PE062071-05 |
| | | 1,000' | PE062071-10 |
| ½" (0.600" X 0.700", 0.050" WALL) | 61 | 250' | PE060070-25 |
| | | 500' | PE060070-05 |
| | | 1,000' | PE060070-10 |
| ¾" (0.820" X 0.940", 0.060" WALL) | 54 | 500' | PE082094-05 |
| | | 1,000' | PE082094-10 |
| 1" (1.060" X 1.200", 0.070" WALL) | 49 | 500' | PE106120-05 |
| WHITE POLYETHYLENE TUBING | | | |
| 16MM O.D. (0.520" X 0.620", 0.050" WALL) | 70 | 500' | PE052062-05W |
| | | 1,000' | PE052062-10W |
| ½" (0.600" X 0.700", 0.050" WALL) | 61 | 500' | PE060070-05W |
| | | 1,000' | PE060070-10W |
| ¾" (0.820" X 0.940", 0.060" WALL) | 54 | 500' | PE082094-05W |
| | | 1,000' | PE082094-10W |
| 1" (1.060" X 1.200", 0.070" WALL) | 49 | 500' | PE106120-05W |



Available in White & Black Polyethylene

MICRO-TUBING

APPLICATIONS

- For extending the drip emitter outlet/discharge close to a tree or shrub
- For use with point source drip emitters on trees, shrub beds, potted plants and hanging baskets

SPECIFICATIONS

- ¼" (4/6mm) EDTUBE Black: 0.160" ID, 0.220" OD, 0.030" wall 100' or 1,000' lengths
- ¼" (4/7mm) EDTUBE White: 0.156" ID, 0.264" OD, 0.054" wall 100' or 1,000' lengths

FEATURES & BENEFITS

UV AND ACID RESISTANT POLYETHYLENE RESIN MATERIALS

Withstands hot and cold weather better than vinyl. Provides excellent hold characteristics on point source drip emitter barbed outlets and fittings in any kind of weather.

MANUFACTURED UNDER STRINGENT QUALITY CONTROLS

Assures highest quality product as every coil undergoes a battery of tests and over 30 quality checks.

WIDE COMPATIBILITY

Compatible with all brands and models of point source emitters that accept ¼" (0.160" ID) micro-tubing.

WHITE PE TUBING IS REFLECTIVE AND OPAQUE

Prevents algae growth. Produces cooler water temperatures - enhancing plant growth.

FRICTION LOSS PER 100 FEET

| NOMINAL SIZE | | ¼" EDTUBE BLACK | | ¼" EDTUBE WHITE | |
|--------------|-------|-------------------------------------------|----------|-------------------------------------------|----------|
| FLOW RATE | | 0.160" I.D. 0.220" O.D. 0.030" WALL | | 0.156" I.D. 0.264" O.D. 0.054" WALL | |
| GPM | GPH | VELOCITY FPS | LOSS psi | VELOCITY FPS | LOSS psi |
| 0.01 | 0.50 | 0.13 | 0.08 | 0.14 | 0.09 |
| 0.02 | 1.00 | 0.27 | 0.27 | 0.28 | 0.31 |
| 0.03 | 2.00 | 0.53 | 0.92 | 0.56 | 1.04 |
| 0.05 | 3.00 | 0.80 | 1.87 | 0.84 | 2.11 |
| 0.07 | 4.00 | 1.06 | 3.09 | 1.12 | 3.49 |
| 0.08 | 5.00 | 1.33 | 4.57 | 1.40 | 5.16 |
| 0.10 | 6.00 | 1.60 | 6.29 | 1.68 | 7.10 |
| 0.12 | 7.00 | 1.86 | 8.24 | 1.96 | 9.29 |
| 0.13 | 8.00 | 2.13 | 10.40 | 2.24 | 11.74 |
| 0.15 | 9.00 | 2.39 | 12.79 | 2.52 | 14.43 |
| 0.17 | 10.00 | 2.66 | 15.38 | 2.80 | 17.35 |
| 0.20 | 12.00 | 3.19 | 21.15 | 3.36 | 23.87 |
| 0.23 | 14.00 | 3.72 | 27.70 | 3.92 | 31.26 |
| 0.27 | 16.00 | 4.26 | 35.00 | 4.48 | 39.49 |
| 0.30 | 18.00 | 4.79 | 43.01 | 5.04 | 48.53 |
| 0.33 | 20.00 | 5.32 | 51.72 | 5.60 | 58.36 |



ORDERING INFORMATION

| COIL LENGTH | MODEL NUMBER |
|--------------------------------|--------------|
| BLACK - 0.160" x 0.220" | |
| 100' | EDTUBE-01 |
| 1,000' | EDTUBE-10 |
| WHITE - 0.156" x 0.264" | |
| 100' | EDTUBE-01W |
| 1,000' | EDTUBE-10W |

POINT SOURCE COMPONENTS

MICRO-TUBE FITTINGS

APPLICATIONS

- Fits all models of 1/4" tubing with inside diameter of 0.160" or 0.156"

FEATURES & BENEFITS

BARBED FITTINGS

For secure fit and easy installation without clamps, glue or tools.

UV-RESISTANT

Withstands heat, direct sunlight and harsh chemicals.

WIDE COMPATIBILITY

Compatible with all brands and models of 1/4" micro-tubing.

FITTINGS



1/4" BARB TEE
(0.160")

Model EDTUBETEE



1/4" MICRO-VALVE
(0.160")

Model EDTUBEMVLV-B



**1/4" BARB
ADAPTER/COUPLER**
(0.160")

Model EDTUBEBA



1/4" TUBING STAKE

Model EDTUBESTK



1/4" / 3/8" GOOF PLUG
(0.160" / 0.230")

Model GOOFPLUG



**1/4" BARBED 8-WAY
x 1/2" MPT ADAPTER**
(0.160") for EDTUBE

Model EDTUBE8XMT

INSTALLATION TOOLS



**STEEL PUNCH
FOR 0.160" MICRO FITTINGS**

Model MTUBESPUN



**PLASTIC HANDLE PUNCH
FOR 0.160" MICRO FITTINGS**

Model MTUBEPPUN



**INSERTION TOOL
FOR SELF-PIERCING EMITTERS**

Model SPDT



DRIPLINE CALCULATIONS

FORMULA 1.1

Estimated Total Length of Dripline =

$$\frac{\text{Irrigated Area} \times 12}{\text{Minimum Recommended Lateral Spacing (inches)}}$$

In Which:

Estimated Total Length of Dripline = Total Footage of Dripline in a Zone

Irrigated Area = Total Area in Square Feet

Minimum Recommended Lateral (Row) Spacing = The minimum row spacing from the General Guidelines Chart in inches

FORMULA 1.2

Application Rate =

$$\frac{231.1 \times \text{Emitter Flow Rate (GPH)}}{\text{Dripline Row Spacing (inches)} \times \text{Emitter Spacing (inches)}}$$

In Which:

Application Rate is = Inches per Hour of Water Being Applied

Emitter Flow Rate = Gallons per Hour Flow of One Emitter

Emitter Spacing = Spacing in Inches of Emitters Inside Tubing

Dripline Row Spacing = Inches Between Techline Laterals (rows)

Note: 0.4, 0.6, and 0.9 GPH are nominal flow rates. Actual flow rates of 0.42, 0.61, and 0.92 GPH should be used in the calculations.

FORMULA 1.3

Number of Emitters in a Zone =

$$\frac{\text{Total Dripline} \times 12}{\text{Emitter Spacing (inches)}}$$

In Which:

Number of Emitters = Number of Emitters

Total Dripline = Length of All Dripline in a Zone in Feet

Emitter Spacing = Spacing in Inches of Emitters Inside Tubing

FORMULA 1.4

Flow Per Zone =

$$\frac{\text{Number of Emitters} \times \text{Emitter Flow Rate (GPH)}}{60}$$

In Which:

Flow Per Zone = Total Gallons per Minute

Number of Emitters = Number of Emitters

Emitter Flow Rate = Gallons per Hour of One Emitter

FORMULA 1.5

Estimated Total Zone Flow =

$$\left(\frac{\text{Irrigated Area} \times 144}{\text{Emitter Spacing (inches)} \times \text{Dripline Row Spacing (inches)}} \right) \times \text{Emitter Flow Rate (GPH)} \div 60$$

In Which:

Estimated Total Zone Flow = Gallons per Minute in Zone

Irrigated Area = Total Area in Square Feet

Emitter Spacing = Spacing in Inches of Emitters Inside Tubing

Dripline Row Spacing = Inches Between Techline Laterals (rows)

Emitter Flow Rate = Gallons per Hour of One Emitter

APPLICATION RATES

APPLICATION RATES 0.26 GPH EMITTER

| FLOW RATE (GPH) | EMITTER SPACING (IN.) | LATERAL SPACING (IN.) | APPLICATION RATE (IN./HR.) | TIME TO APPLY 1/4" (MIN.) |
|-----------------|-----------------------|-----------------------|----------------------------|---------------------------|
| 0.26 | 12 | 12 | 0.42 | 36 |
| 0.26 | 12 | 14 | 0.36 | 42 |
| 0.26 | 12 | 16 | 0.31 | 48 |
| 0.26 | 12 | 18 | 0.28 | 54 |
| 0.26 | 12 | 20 | 0.25 | 60 |
| 0.26 | 12 | 22 | 0.23 | 66 |
| 0.26 | 12 | 24 | 0.21 | 72 |
| 0.26 | 18 | 12 | 0.28 | 54 |
| 0.26 | 18 | 14 | 0.24 | 63 |
| 0.26 | 18 | 16 | 0.21 | 72 |
| 0.26 | 18 | 18 | 0.19 | 81 |
| 0.26 | 18 | 20 | 0.17 | 90 |
| 0.26 | 18 | 22 | 0.15 | 99 |
| 0.26 | 18 | 24 | 0.14 | 108 |
| 0.26 | 24 | 12 | 0.21 | 72 |
| 0.26 | 24 | 14 | 0.18 | 84 |
| 0.26 | 24 | 16 | 0.16 | 96 |
| 0.26 | 24 | 18 | 0.14 | 108 |
| 0.26 | 24 | 20 | 0.13 | 120 |
| 0.26 | 24 | 22 | 0.11 | 132 |
| 0.26 | 24 | 24 | 0.10 | 144 |

APPLICATION RATES 0.4 GPH EMITTER

| FLOW RATE (GPH) | EMITTER SPACING (IN.) | LATERAL SPACING (IN.) | APPLICATION RATE (IN./HR.) | TIME TO APPLY 1/4" (MIN.) |
|-----------------|-----------------------|-----------------------|----------------------------|---------------------------|
| 0.4 | 12 | 12 | 0.64 | 23 |
| 0.4 | 12 | 14 | 0.55 | 27 |
| 0.4 | 12 | 16 | 0.48 | 31 |
| 0.4 | 12 | 18 | 0.43 | 35 |
| 0.4 | 12 | 20 | 0.39 | 39 |
| 0.4 | 12 | 22 | 0.35 | 43 |
| 0.4 | 12 | 24 | 0.32 | 47 |
| 0.4 | 18 | 12 | 0.43 | 35 |
| 0.4 | 18 | 14 | 0.37 | 41 |
| 0.4 | 18 | 16 | 0.32 | 47 |
| 0.4 | 18 | 18 | 0.29 | 53 |
| 0.4 | 18 | 20 | 0.26 | 58 |
| 0.4 | 18 | 22 | 0.23 | 64 |
| 0.4 | 18 | 24 | 0.21 | 70 |
| 0.4 | 24 | 12 | 0.32 | 47 |
| 0.4 | 24 | 14 | 0.28 | 55 |
| 0.4 | 24 | 16 | 0.24 | 62 |
| 0.4 | 24 | 18 | 0.21 | 70 |
| 0.4 | 24 | 20 | 0.19 | 78 |
| 0.4 | 24 | 22 | 0.18 | 86 |
| 0.4 | 24 | 24 | 0.16 | 93 |

APPLICATION RATES 0.6 GPH EMITTER

| FLOW RATE (GPH) | EMITTER SPACING (IN.) | LATERAL SPACING (IN.) | APPLICATION RATE (IN./HR.) | TIME TO APPLY 1/4" (MIN.) |
|-----------------|-----------------------|-----------------------|----------------------------|---------------------------|
| 0.6 | 12 | 12 | 0.96 | 16 |
| 0.6 | 12 | 14 | 0.83 | 18 |
| 0.6 | 12 | 16 | 0.72 | 21 |
| 0.6 | 12 | 18 | 0.64 | 23 |
| 0.6 | 12 | 20 | 0.58 | 26 |
| 0.6 | 12 | 22 | 0.53 | 29 |
| 0.6 | 12 | 24 | 0.48 | 31 |
| 0.6 | 18 | 12 | 0.64 | 23 |
| 0.6 | 18 | 14 | 0.55 | 27 |
| 0.6 | 18 | 16 | 0.48 | 31 |
| 0.6 | 18 | 18 | 0.43 | 35 |
| 0.6 | 18 | 20 | 0.39 | 39 |
| 0.6 | 18 | 22 | 0.35 | 43 |
| 0.6 | 18 | 24 | 0.32 | 47 |
| 0.6 | 24 | 12 | 0.48 | 31 |
| 0.6 | 24 | 14 | 0.41 | 36 |
| 0.6 | 24 | 16 | 0.36 | 42 |
| 0.6 | 24 | 18 | 0.32 | 47 |
| 0.6 | 24 | 20 | 0.29 | 52 |
| 0.6 | 24 | 22 | 0.26 | 57 |
| 0.6 | 24 | 24 | 0.24 | 62 |

APPLICATION RATES 0.9 GPH EMITTER

| FLOW RATE (GPH) | EMITTER SPACING (IN.) | LATERAL SPACING (IN.) | APPLICATION RATE (IN./HR.) | TIME TO APPLY 1/4" (MIN.) |
|-----------------|-----------------------|-----------------------|----------------------------|---------------------------|
| 0.9 | 12 | 12 | 1.44 | 10 |
| 0.9 | 12 | 14 | 1.24 | 12 |
| 0.9 | 12 | 16 | 1.08 | 14 |
| 0.9 | 12 | 18 | 0.96 | 16 |
| 0.9 | 12 | 20 | 0.87 | 17 |
| 0.9 | 12 | 22 | 0.79 | 19 |
| 0.9 | 12 | 24 | 0.72 | 21 |
| 0.9 | 18 | 12 | 0.96 | 16 |
| 0.9 | 18 | 14 | 0.83 | 18 |
| 0.9 | 18 | 16 | 0.72 | 21 |
| 0.9 | 18 | 18 | 0.64 | 23 |
| 0.9 | 18 | 20 | 0.58 | 26 |
| 0.9 | 18 | 22 | 0.53 | 29 |
| 0.9 | 18 | 24 | 0.48 | 31 |
| 0.9 | 24 | 12 | 0.72 | 21 |
| 0.9 | 24 | 14 | 0.62 | 24 |
| 0.9 | 24 | 16 | 0.54 | 28 |
| 0.9 | 24 | 18 | 0.48 | 31 |
| 0.9 | 24 | 20 | 0.43 | 35 |
| 0.9 | 24 | 22 | 0.39 | 38 |
| 0.9 | 24 | 24 | 0.36 | 42 |

Application Rate = (231.1 x GPH) / (Emitter Spacing x Lateral Spacing)



Polyethylene Tubing

FRICITION LOSS

FRICITION LOSS CHARACTERISTICS POLYETHYLENE (PE) SDR PRESSURE RATED PIPE (2306, 3206, 3306) SDR 7, 9, 11.5, 15, C=150, Sizes ½" to 6", Flows 1 to 900 GPM

PSI LOSS OF 100 FEET OF PIPE (PSI PER 100 FEET)

| SIZE I.D. | | ½" 0.622" | | ¾" 0.824" | | 1" 1.049" | | 1 ¼" 1.380" | | 1 ½" 1.610" | | 2" 2.067" | | 2 ½" 2.469" | | 3" 3.068" | | 4" 4.026" | | 6" 6.065" | |
|-----------|----------|--------------|----------|--------------|----------|--------------|----------|--------------|----------|--------------|----------|--------------|----------|--------------|----------|--------------|----------|--------------|----------|--------------|----------|
| Flow GPM | Flow GPH | Velocity FPS | PSI Loss |
| 1 | 60 | 1.06 | 0.49 | 0.60 | 0.12 | 0.37 | 0.04 | 0.21 | 0.01 | 0.16 | 0.00 | 0.10 | 0.00 | 0.07 | 0.00 | 0.04 | 0.00 | 0.03 | 0.00 | 0.01 | 0.00 |
| 2 | 120 | 2.11 | 1.76 | 1.20 | 0.45 | 0.74 | 0.14 | 0.43 | 0.04 | 0.32 | 0.02 | 0.19 | 0.01 | 0.13 | 0.00 | 0.09 | 0.00 | 0.05 | 0.00 | 0.02 | 0.00 |
| 3 | 180 | 3.17 | 3.73 | 1.80 | 0.95 | 1.11 | 0.29 | 0.64 | 0.08 | 0.47 | 0.04 | 0.29 | 0.01 | 0.20 | 0.00 | 0.13 | 0.00 | 0.08 | 0.00 | 0.03 | 0.00 |
| 4 | 240 | 4.22 | 6.35 | 2.41 | 1.62 | 1.48 | 0.50 | 0.86 | 0.13 | 0.63 | 0.06 | 0.38 | 0.02 | 0.27 | 0.01 | 0.17 | 0.00 | 0.10 | 0.00 | 0.04 | 0.00 |
| 5 | 300 | 5.28 | 9.60 | 3.01 | 2.44 | 1.86 | 0.76 | 1.07 | 0.20 | 0.79 | 0.09 | 0.48 | 0.03 | 0.34 | 0.01 | 0.22 | 0.00 | 0.13 | 0.00 | 0.06 | 0.00 |
| 6 | 360 | 6.34 | 13.46 | 3.61 | 3.43 | 2.23 | 1.06 | 1.29 | 0.28 | 0.95 | 0.13 | 0.57 | 0.04 | 0.40 | 0.02 | 0.26 | 0.01 | 0.15 | 0.00 | 0.07 | 0.00 |
| 7 | 420 | 7.39 | 17.91 | 4.21 | 4.56 | 2.60 | 1.41 | 1.50 | 0.37 | 1.10 | 0.18 | 0.67 | 0.05 | 0.47 | 0.02 | 0.30 | 0.01 | 0.18 | 0.00 | 0.08 | 0.00 |
| 8 | 480 | 8.45 | 22.93 | 4.81 | 5.84 | 2.97 | 1.80 | 1.72 | 0.47 | 1.26 | 0.22 | 0.76 | 0.07 | 0.54 | 0.03 | 0.35 | 0.01 | 0.20 | 0.00 | 0.09 | 0.00 |
| 9 | 540 | 9.50 | 28.52 | 5.41 | 7.26 | 3.34 | 2.24 | 1.93 | 0.59 | 1.42 | 0.28 | 0.86 | 0.08 | 0.60 | 0.03 | 0.39 | 0.01 | 0.23 | 0.00 | 0.10 | 0.00 |
| 10 | 600 | 10.56 | 34.67 | 6.02 | 8.82 | 3.71 | 2.73 | 2.15 | 0.72 | 1.58 | 0.34 | 0.96 | 0.10 | 0.67 | 0.04 | 0.43 | 0.01 | 0.25 | 0.00 | 0.11 | 0.00 |
| 11 | 660 | 11.61 | 41.36 | 6.62 | 10.53 | 4.08 | 3.25 | 2.36 | 0.86 | 1.73 | 0.40 | 1.05 | 0.12 | 0.74 | 0.05 | 0.48 | 0.02 | 0.28 | 0.00 | 0.12 | 0.00 |
| 12 | 720 | 12.67 | 48.60 | 7.22 | 12.37 | 4.45 | 3.82 | 2.57 | 1.01 | 1.89 | 0.48 | 1.15 | 0.14 | 0.80 | 0.06 | 0.52 | 0.02 | 0.30 | 0.01 | 0.13 | 0.00 |
| 14 | 840 | | | 8.42 | 16.45 | 5.20 | 5.08 | 3.00 | 1.34 | 2.21 | 0.63 | 1.34 | 0.19 | 0.94 | 0.08 | 0.61 | 0.03 | 0.35 | 0.01 | 0.16 | 0.00 |
| 16 | 960 | | | 9.63 | 21.07 | 5.94 | 6.51 | 3.43 | 1.71 | 2.52 | 0.81 | 1.53 | 0.24 | 1.07 | 0.10 | 0.69 | 0.04 | 0.40 | 0.01 | 0.18 | 0.00 |
| 18 | 1,080 | | | 10.83 | 26.21 | 6.68 | 8.10 | 3.86 | 2.13 | 2.84 | 1.01 | 1.72 | 0.30 | 1.21 | 0.13 | 0.78 | 0.04 | 0.45 | 0.01 | 0.20 | 0.00 |
| 20 | 1,200 | | | 12.03 | 31.85 | 7.42 | 9.84 | 4.29 | 2.59 | 3.15 | 1.22 | 1.91 | 0.36 | 1.34 | 0.15 | 0.87 | 0.05 | 0.50 | 0.01 | 0.22 | 0.00 |
| 22 | 1,320 | | | 13.24 | 38.00 | 8.17 | 11.74 | 4.72 | 3.09 | 3.47 | 1.46 | 2.10 | 0.43 | 1.47 | 0.18 | 0.95 | 0.06 | 0.55 | 0.02 | 0.24 | 0.00 |
| 24 | 1,440 | | | | | 8.91 | 13.79 | 5.15 | 3.63 | 3.78 | 1.72 | 2.29 | 0.51 | 1.61 | 0.21 | 1.04 | 0.07 | 0.60 | 0.02 | 0.27 | 0.00 |
| 26 | 1,560 | | | | | 9.65 | 16.00 | 5.58 | 4.21 | 4.10 | 1.99 | 2.49 | 0.59 | 1.74 | 0.25 | 1.13 | 0.09 | 0.66 | 0.02 | 0.29 | 0.00 |
| 28 | 1,680 | | | | | 10.39 | 18.35 | 6.01 | 4.83 | 4.41 | 2.28 | 2.68 | 0.68 | 1.88 | 0.28 | 1.22 | 0.10 | 0.71 | 0.03 | 0.31 | 0.00 |
| 30 | 1,800 | | | | | 11.14 | 20.85 | 6.44 | 5.49 | 4.73 | 2.59 | 2.87 | 0.77 | 2.01 | 0.32 | 1.30 | 0.11 | 0.76 | 0.03 | 0.33 | 0.00 |
| 35 | 2,100 | | | | | 12.99 | 27.74 | 7.51 | 7.30 | 5.52 | 3.45 | 3.35 | 1.02 | 2.35 | 0.43 | 1.52 | 0.15 | 0.88 | 0.04 | 0.39 | 0.01 |
| 40 | 2,400 | | | | | | | 8.58 | 9.35 | 6.30 | 4.42 | 3.82 | 1.31 | 2.68 | 0.55 | 1.74 | 0.19 | 1.01 | 0.05 | 0.44 | 0.01 |
| 45 | 2,700 | | | | | | | 9.65 | 11.63 | 7.09 | 5.49 | 4.30 | 1.63 | 3.02 | 0.69 | 1.95 | 0.24 | 1.13 | 0.06 | 0.50 | 0.01 |
| 50 | 3,000 | | | | | | | 10.73 | 14.14 | 7.88 | 6.68 | 4.78 | 1.98 | 3.35 | 0.83 | 2.17 | 0.29 | 1.26 | 0.08 | 0.56 | 0.01 |
| 55 | 3,300 | | | | | | | 11.80 | 16.87 | 8.67 | 7.97 | 5.26 | 2.36 | 3.69 | 0.99 | 2.39 | 0.35 | 1.39 | 0.09 | 0.61 | 0.01 |
| 60 | 3,600 | | | | | | | 12.87 | 19.82 | 9.46 | 9.36 | 5.74 | 2.77 | 4.02 | 1.17 | 2.60 | 0.41 | 1.51 | 0.11 | 0.67 | 0.01 |
| 65 | 3,900 | | | | | | | 13.94 | 22.98 | 10.24 | 10.86 | 6.21 | 3.22 | 4.36 | 1.36 | 2.82 | 0.47 | 1.64 | 0.13 | 0.72 | 0.02 |
| 70 | 4,200 | | | | | | | | | 11.03 | 12.45 | 6.69 | 3.69 | 4.69 | 1.55 | 3.04 | 0.54 | 1.76 | 0.14 | 0.78 | 0.02 |
| 75 | 4,500 | | | | | | | | | 11.82 | 14.15 | 7.17 | 4.19 | 5.03 | 1.77 | 3.25 | 0.61 | 1.89 | 0.16 | 0.83 | 0.02 |
| 80 | 4,800 | | | | | | | | | 12.61 | 15.95 | 7.65 | 4.73 | 5.36 | 1.99 | 3.47 | 0.69 | 2.02 | 0.18 | 0.89 | 0.03 |
| 85 | 5,100 | | | | | | | | | 13.40 | 17.84 | 8.13 | 5.29 | 5.70 | 2.23 | 3.69 | 0.77 | 2.14 | 0.21 | 0.94 | 0.03 |
| 90 | 5,400 | | | | | | | | | | | 8.61 | 5.88 | 6.03 | 2.48 | 3.91 | 0.86 | 2.27 | 0.23 | 1.00 | 0.03 |
| 95 | 5,700 | | | | | | | | | | | 9.08 | 6.50 | 6.37 | 2.74 | 4.12 | 0.95 | 2.39 | 0.25 | 1.06 | 0.03 |
| 100 | 6,000 | | | | | | | | | | | 9.56 | 7.15 | 6.70 | 3.01 | 4.34 | 1.05 | 2.52 | 0.28 | 1.11 | 0.04 |
| 110 | 6,600 | | | | | | | | | | | 10.52 | 8.53 | 7.37 | 3.59 | 4.77 | 1.25 | 2.77 | 0.33 | 1.22 | 0.05 |
| 120 | 7,200 | | | | | | | | | | | 11.47 | 10.02 | 8.04 | 4.22 | 5.21 | 1.47 | 3.02 | 0.39 | 1.33 | 0.05 |
| 130 | 7,800 | | | | | | | | | | | 12.43 | 11.62 | 8.71 | 4.89 | 5.64 | 1.70 | 3.28 | 0.45 | 1.44 | 0.06 |
| 140 | 8,400 | | | | | | | | | | | 13.39 | 13.33 | 9.38 | 5.61 | 6.08 | 1.95 | 3.53 | 0.52 | 1.55 | 0.07 |
| 150 | 9,000 | | | | | | | | | | | | | 10.05 | 6.38 | 6.51 | 2.22 | 3.78 | 0.59 | 1.67 | 0.08 |
| 160 | 9,600 | | | | | | | | | | | | | 10.72 | 7.19 | 6.94 | 2.50 | 4.03 | 0.67 | 1.78 | 0.09 |
| 170 | 10,200 | | | | | | | | | | | | | 11.39 | 8.04 | 7.38 | 2.79 | 4.28 | 0.74 | 1.89 | 0.10 |
| 180 | 10,800 | | | | | | | | | | | | | 12.06 | 8.94 | 7.81 | 3.11 | 4.54 | 0.83 | 2.00 | 0.11 |
| 190 | 11,400 | | | | | | | | | | | | | 12.73 | 9.88 | 8.25 | 3.43 | 4.79 | 0.92 | 2.11 | 0.12 |
| 200 | 12,000 | | | | | | | | | | | | | 13.40 | 10.87 | 8.68 | 3.78 | 5.04 | 1.01 | 2.22 | 0.14 |
| 225 | 13,500 | | | | | | | | | | | | | | | 9.76 | 4.70 | 5.67 | 1.25 | 2.50 | 0.17 |
| 250 | 15,000 | | | | | | | | | | | | | | | 10.85 | 5.71 | 6.30 | 1.52 | 2.78 | 0.21 |
| 275 | 16,500 | | | | | | | | | | | | | | | 11.93 | 6.81 | 6.93 | 1.81 | 3.05 | 0.25 |
| 300 | 18,000 | | | | | | | | | | | | | | | 13.02 | 8.00 | 7.56 | 2.13 | 3.33 | 0.29 |
| 325 | 19,500 | | | | | | | | | | | | | | | | | 8.19 | 2.47 | 3.61 | 0.34 |
| 350 | 21,000 | | | | | | | | | | | | | | | | | 8.82 | 2.84 | 3.89 | 0.39 |
| 375 | 22,500 | | | | | | | | | | | | | | | | | 9.45 | 3.22 | 4.16 | 0.44 |
| 400 | 24,000 | | | | | | | | | | | | | | | | | 10.08 | 3.63 | 4.44 | 0.49 |
| 425 | 25,500 | | | | | | | | | | | | | | | | | 10.71 | 4.06 | 4.72 | 0.55 |
| 450 | 27,000 | | | | | | | | | | | | | | | | | 11.34 | 4.52 | 5.00 | 0.62 |
| 475 | 28,500 | | | | | | | | | | | | | | | | | 11.97 | 4.99 | 5.28 | 0.68 |
| 500 | 30,000 | | | | | | | | | | | | | | | | | 12.60 | 5.49 | 5.55 | 0.75 |
| 550 | 33,000 | | | | | | | | | | | | | | | | | 13.86 | 6.55 | 6.11 | 0.89 |
| 600 | 36,000 | | | | | | | | | | | | | | | | | | | 6.66 | 1.05 |
| 650 | 39,000 | | | | | | | | | | | | | | | | | | | 7.22 | 1.22 |
| 700 | 42,000 | | | | | | | | | | | | | | | | | | | 7.77 | 1.39 |
| 750 | 45,000 | | | | | | | | | | | | | | | | | | | 8.33 | 1.58 |
| 800 | 48,000 | | | | | | | | | | | | | | | | | | | 8.88 | 1.79 |
| 850 | 51,000 | | | | | | | | | | | | | | | | | | | 9.44 | 2.00 |
| 900 | 54,000 | | | | | | | | | | | | | | | | | | | 9.99 | 2.22 |

Note: Shaded areas of the chart indicate velocities over 5 Ft/Sec. Use with Caution.

Velocities are calculated using the general equation:
 $V = (0.4085 * (Q / d^2))$

Friction Losses are calculated using the Hazen-Williams Equation: $H_f = 0.2083 * (100 / C)^{1.852} * (Q^{1.852} / d^{4.866})$

V = FPS (feet per second)
 H_f = PSI/100 Ft. (pounds per square inch per 100 feet)
 C = 150
 Q = GPM (gallons per minute)
 d = ID (inside diameter)

DESIGN INFORMATION

FRICION LOSS Schedule 40 Pipe

FRICION LOSS CHARACTERISTICS PVC SCHEDULE 40 IPS PLASTIC PIPE (1120, 1220), C=150, Sizes 1/2" to 6", Flows 1 to 900 GPM

PSI LOSS OF 100 FEET OF PIPE (PSI PER 100 FEET)

| SIZE | | 1/2" | | 3/4" | | 1" | | 1 1/4" | | 1 1/2" | | 2" | | 2 1/2" | | 3" | | 4" | | 6" | |
|----------|----------|--------------|----------|--------------|----------|--------------|----------|--------------|----------|--------------|----------|--------------|----------|--------------|----------|--------------|----------|--------------|----------|--------------|----------|
| I.D. | | 0.622" | | 0.824" | | 1.049" | | 1.380" | | 1.610" | | 2.067" | | 2.469" | | 3.068" | | 4.026" | | 6.065" | |
| O.D. | | 0.840" | | 1.050" | | 1.315" | | 1.660" | | 1.900" | | 2.375" | | 2.875" | | 3.500" | | 4.500" | | 6.625" | |
| WALL | | 0.109" | | 0.113" | | 0.133" | | 0.140" | | 0.145" | | 0.154" | | 0.203" | | 0.216" | | 0.237" | | 0.280" | |
| Flow GPM | Flow GPH | Velocity FPS | PSI Loss |
| 1 | 60 | 1.06 | 0.43 | 0.60 | 0.11 | 0.37 | 0.03 | 0.21 | 0.01 | 0.16 | 0.00 | 0.10 | 0.00 | 0.07 | 0.00 | 0.04 | 0.00 | 0.03 | 0.00 | 0.01 | 0.00 |
| 2 | 120 | 2.11 | 1.55 | 1.20 | 0.39 | 0.74 | 0.12 | 0.43 | 0.03 | 0.32 | 0.02 | 0.19 | 0.00 | 0.13 | 0.00 | 0.09 | 0.00 | 0.05 | 0.00 | 0.02 | 0.00 |
| 3 | 180 | 3.17 | 3.28 | 1.80 | 0.84 | 1.11 | 0.26 | 0.64 | 0.07 | 0.47 | 0.03 | 0.29 | 0.01 | 0.20 | 0.00 | 0.13 | 0.00 | 0.08 | 0.00 | 0.03 | 0.00 |
| 4 | 240 | 4.22 | 5.59 | 2.41 | 1.42 | 1.48 | 0.44 | 0.86 | 0.12 | 0.63 | 0.05 | 0.38 | 0.02 | 0.27 | 0.01 | 0.17 | 0.00 | 0.10 | 0.00 | 0.04 | 0.00 |
| 5 | 300 | 5.28 | 8.45 | 3.01 | 2.15 | 1.86 | 0.66 | 1.07 | 0.17 | 0.79 | 0.08 | 0.48 | 0.02 | 0.34 | 0.01 | 0.22 | 0.00 | 0.13 | 0.00 | 0.06 | 0.00 |
| 6 | 360 | 6.34 | 11.85 | 3.61 | 3.02 | 2.23 | 0.93 | 1.29 | 0.25 | 0.95 | 0.12 | 0.57 | 0.03 | 0.40 | 0.01 | 0.26 | 0.01 | 0.15 | 0.00 | 0.07 | 0.00 |
| 7 | 420 | 7.39 | 15.76 | 4.21 | 4.01 | 2.60 | 1.24 | 1.50 | 0.33 | 1.10 | 0.15 | 0.67 | 0.05 | 0.47 | 0.02 | 0.30 | 0.01 | 0.18 | 0.00 | 0.08 | 0.00 |
| 8 | 480 | 8.45 | 20.18 | 4.81 | 5.14 | 2.97 | 1.59 | 1.72 | 0.42 | 1.26 | 0.20 | 0.76 | 0.06 | 0.54 | 0.02 | 0.35 | 0.01 | 0.20 | 0.00 | 0.09 | 0.00 |
| 9 | 540 | 9.50 | 25.10 | 5.41 | 6.39 | 3.34 | 1.97 | 1.93 | 0.52 | 1.42 | 0.25 | 0.86 | 0.07 | 0.60 | 0.03 | 0.39 | 0.01 | 0.23 | 0.00 | 0.10 | 0.00 |
| 10 | 600 | 10.56 | 30.51 | 6.02 | 7.77 | 3.71 | 2.40 | 2.15 | 0.63 | 1.58 | 0.30 | 0.96 | 0.09 | 0.67 | 0.04 | 0.43 | 0.01 | 0.25 | 0.00 | 0.11 | 0.00 |
| 11 | 660 | 11.61 | 36.40 | 6.62 | 9.26 | 4.08 | 2.86 | 2.36 | 0.75 | 1.73 | 0.36 | 1.05 | 0.11 | 0.74 | 0.04 | 0.48 | 0.02 | 0.28 | 0.00 | 0.12 | 0.00 |
| 12 | 720 | 12.67 | 42.77 | 7.22 | 10.88 | 4.45 | 3.36 | 2.57 | 0.89 | 1.89 | 0.42 | 1.15 | 0.12 | 0.80 | 0.05 | 0.52 | 0.02 | 0.30 | 0.00 | 0.13 | 0.00 |
| 14 | 840 | | | 8.42 | 14.48 | 5.20 | 4.47 | 3.00 | 1.18 | 2.21 | 0.56 | 1.34 | 0.16 | 0.94 | 0.07 | 0.61 | 0.02 | 0.35 | 0.01 | 0.16 | 0.00 |
| 16 | 960 | | | 9.63 | 18.54 | 5.94 | 5.73 | 3.43 | 1.51 | 2.52 | 0.71 | 1.53 | 0.21 | 1.07 | 0.09 | 0.69 | 0.03 | 0.40 | 0.01 | 0.18 | 0.00 |
| 18 | 1,080 | | | 10.83 | 23.06 | 6.68 | 7.12 | 3.86 | 1.88 | 2.84 | 0.89 | 1.72 | 0.26 | 1.21 | 0.11 | 0.78 | 0.04 | 0.45 | 0.01 | 0.20 | 0.00 |
| 20 | 1,200 | | | 12.03 | 28.03 | 7.42 | 8.66 | 4.29 | 2.28 | 3.15 | 1.08 | 1.91 | 0.32 | 1.34 | 0.13 | 0.87 | 0.05 | 0.50 | 0.01 | 0.22 | 0.00 |
| 22 | 1,320 | | | 13.24 | 33.44 | 8.17 | 10.33 | 4.72 | 2.72 | 3.47 | 1.28 | 2.10 | 0.38 | 1.47 | 0.16 | 0.95 | 0.06 | 0.55 | 0.01 | 0.24 | 0.00 |
| 24 | 1,440 | | | | | 8.91 | 12.14 | 5.15 | 3.20 | 3.78 | 1.51 | 2.29 | 0.45 | 1.61 | 0.19 | 1.04 | 0.07 | 0.60 | 0.02 | 0.27 | 0.00 |
| 26 | 1,560 | | | | | 9.65 | 14.08 | 5.58 | 3.71 | 4.10 | 1.75 | 2.49 | 0.52 | 1.74 | 0.22 | 1.13 | 0.08 | 0.66 | 0.02 | 0.29 | 0.00 |
| 28 | 1,680 | | | | | 10.39 | 16.15 | 6.01 | 4.25 | 4.41 | 2.01 | 2.68 | 0.60 | 1.88 | 0.25 | 1.22 | 0.09 | 0.71 | 0.02 | 0.31 | 0.00 |
| 30 | 1,800 | | | | | 11.14 | 18.35 | 6.44 | 4.83 | 4.73 | 2.28 | 2.87 | 0.68 | 2.01 | 0.28 | 1.30 | 0.10 | 0.76 | 0.03 | 0.33 | 0.00 |
| 35 | 2,100 | | | | | 12.99 | 24.41 | 7.51 | 6.43 | 5.52 | 3.04 | 3.35 | 0.90 | 2.35 | 0.38 | 1.52 | 0.13 | 0.88 | 0.04 | 0.39 | 0.00 |
| 40 | 2,400 | | | | | | | 8.58 | 8.23 | 6.30 | 3.89 | 3.82 | 1.15 | 2.68 | 0.49 | 1.74 | 0.17 | 1.01 | 0.04 | 0.44 | 0.01 |
| 45 | 2,700 | | | | | | | 9.65 | 10.24 | 7.09 | 4.83 | 4.30 | 1.43 | 3.02 | 0.60 | 1.95 | 0.21 | 1.13 | 0.06 | 0.50 | 0.01 |
| 50 | 3,000 | | | | | | | 10.73 | 12.44 | 7.88 | 5.88 | 4.78 | 1.74 | 3.35 | 0.73 | 2.17 | 0.25 | 1.26 | 0.07 | 0.56 | 0.01 |
| 55 | 3,300 | | | | | | | 11.80 | 14.84 | 8.67 | 7.01 | 5.26 | 2.08 | 3.69 | 0.88 | 2.39 | 0.30 | 1.39 | 0.08 | 0.61 | 0.01 |
| 60 | 3,600 | | | | | | | 12.87 | 17.44 | 9.46 | 8.24 | 5.74 | 2.44 | 4.02 | 1.03 | 2.60 | 0.36 | 1.51 | 0.10 | 0.67 | 0.01 |
| 65 | 3,900 | | | | | | | 13.94 | 20.23 | 10.24 | 9.55 | 6.21 | 2.83 | 4.36 | 1.19 | 2.82 | 0.41 | 1.64 | 0.11 | 0.72 | 0.02 |
| 70 | 4,200 | | | | | | | | | 11.03 | 10.96 | 6.69 | 3.25 | 4.69 | 1.37 | 3.04 | 0.48 | 1.76 | 0.13 | 0.78 | 0.02 |
| 75 | 4,500 | | | | | | | | | 11.82 | 12.45 | 7.17 | 3.69 | 5.03 | 1.55 | 3.25 | 0.54 | 1.89 | 0.14 | 0.83 | 0.02 |
| 80 | 4,800 | | | | | | | | | 12.61 | 14.03 | 7.65 | 4.16 | 5.36 | 1.75 | 3.47 | 0.61 | 2.02 | 0.16 | 0.89 | 0.02 |
| 85 | 5,100 | | | | | | | | | 13.40 | 15.70 | 8.13 | 4.65 | 5.70 | 1.96 | 3.69 | 0.68 | 2.14 | 0.18 | 0.94 | 0.02 |
| 90 | 5,400 | | | | | | | | | | | 8.61 | 5.17 | 6.03 | 2.18 | 3.91 | 0.76 | 2.27 | 0.20 | 1.00 | 0.03 |
| 95 | 5,700 | | | | | | | | | | | 9.08 | 5.72 | 6.37 | 2.41 | 4.12 | 0.84 | 2.39 | 0.22 | 1.06 | 0.03 |
| 100 | 6,000 | | | | | | | | | | | 9.56 | 6.29 | 6.70 | 2.65 | 4.34 | 0.92 | 2.52 | 0.25 | 1.11 | 0.03 |
| 110 | 6,600 | | | | | | | | | | | 10.52 | 7.50 | 7.37 | 3.16 | 4.77 | 1.10 | 2.77 | 0.29 | 1.22 | 0.04 |
| 120 | 7,200 | | | | | | | | | | | 11.47 | 8.82 | 8.04 | 3.71 | 5.21 | 1.29 | 3.02 | 0.34 | 1.33 | 0.05 |
| 130 | 7,800 | | | | | | | | | | | 12.43 | 10.22 | 8.71 | 4.31 | 5.64 | 1.50 | 3.28 | 0.40 | 1.44 | 0.05 |
| 140 | 8,400 | | | | | | | | | | | 13.39 | 11.73 | 9.38 | 4.94 | 6.08 | 1.72 | 3.53 | 0.46 | 1.55 | 0.06 |
| 150 | 9,000 | | | | | | | | | | | | | 10.05 | 5.61 | 6.51 | 1.95 | 3.78 | 0.52 | 1.67 | 0.07 |
| 160 | 9,600 | | | | | | | | | | | | | 10.72 | 6.33 | 6.94 | 2.20 | 4.03 | 0.59 | 1.78 | 0.08 |
| 170 | 10,200 | | | | | | | | | | | | | 11.39 | 7.08 | 7.38 | 2.46 | 4.28 | 0.66 | 1.89 | 0.09 |
| 180 | 10,800 | | | | | | | | | | | | | 12.06 | 7.87 | 7.81 | 2.73 | 4.54 | 0.73 | 2.00 | 0.10 |
| 190 | 11,400 | | | | | | | | | | | | | 12.73 | 8.70 | 8.25 | 3.02 | 4.79 | 0.81 | 2.11 | 0.11 |
| 200 | 12,000 | | | | | | | | | | | | | 13.40 | 9.56 | 8.68 | 3.32 | 5.04 | 0.89 | 2.22 | 0.12 |
| 225 | 13,500 | | | | | | | | | | | | | | | 9.76 | 4.13 | 5.67 | 1.10 | 2.50 | 0.15 |
| 250 | 15,000 | | | | | | | | | | | | | | | 10.85 | 5.02 | 6.30 | 1.34 | 2.78 | 0.18 |
| 275 | 16,500 | | | | | | | | | | | | | | | 11.93 | 5.99 | 6.93 | 1.60 | 3.05 | 0.22 |
| 300 | 18,000 | | | | | | | | | | | | | | | 13.02 | 7.04 | 7.56 | 1.88 | 3.33 | 0.26 |
| 325 | 19,500 | | | | | | | | | | | | | | | | | 8.19 | 2.18 | 3.61 | 0.30 |
| 350 | 21,000 | | | | | | | | | | | | | | | | | 8.82 | 2.50 | 3.89 | 0.34 |
| 375 | 22,500 | | | | | | | | | | | | | | | | | 9.45 | 2.84 | 4.16 | 0.39 |
| 400 | 24,000 | | | | | | | | | | | | | | | | | 10.08 | 3.20 | 4.44 | 0.44 |
| 425 | 25,500 | | | | | | | | | | | | | | | | | 10.71 | 3.58 | 4.72 | 0.49 |
| 450 | 27,000 | | | | | | | | | | | | | | | | | 11.34 | 3.98 | 5.00 | 0.54 |
| 475 | 28,500 | | | | | | | | | | | | | | | | | 11.97 | 4.40 | 5.28 | 0.60 |
| 500 | 30,000 | | | | | | | | | | | | | | | | | 12.60 | 4.83 | 5.55 | 0.66 |
| 550 | 33,000 | | | | | | | | | | | | | | | | | 13.86 | 5.77 | 6.11 | 0.79 |
| 600 | 36,000 | | | | | | | | | | | | | | | | | | | 6.66 | 0.92 |
| 650 | 39,000 | | | | | | | | | | | | | | | | | | | 7.22 | 1.07 |
| 700 | 42,000 | | | | | | | | | | | | | | | | | | | 7.77 | 1.23 |
| 750 | 45,000 | | | | | | | | | | | | | | | | | | | 8.33 | 1.39 |
| 800 | 48,000 | | | | | | | | | | | | | | | | | | | 8.88 | 1.57 |
| 850 | 51,000 | | | | | | | | | | | | | | | | | | | 9.44 | 1.76 |
| 900 | 54,000 | | | | | | | | | | | | | | | | | | | 9.99 | 1.95 |

Note: Shaded areas of the chart indicate velocities over 5 Ft/Sec. Use with Caution.

Velocities are calculated using the general equation:
 $V = (0.4085 * (Q / d^2))$

Friction Losses are calculated using the Hazen-Williams Equation: $H_f = 0.2083 * (100 / C)^{1.852} * (Q^{1.852} / d^{4.866})$

V = FPS (feet per second)
 H_f = PSI/100 Ft. (pounds per square inch per 100 feet)
 C = 150
 Q = GPM (gallons per minute)
 d = ID (inside diameter)



PVC Class 40

FRICITION LOSS

FRICITION LOSS CHARACTERISTICS PVC CLASS 200 IPS PLASTIC PIPE

(1120, 1220) SDR 21, C=150, Sizes 1/2" to 6", Flows 1 to 900 GPM

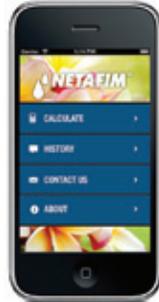
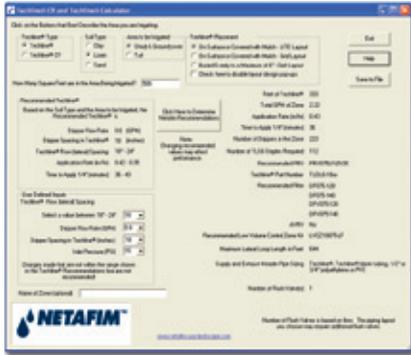
PSI LOSS OF 100 FEET OF PIPE (PSI PER 100 FEET)

| SIZE | | 1/2" (Class 315) | | 3/4" | | 1" | | 1 1/4" | | 1 1/2" | | 2" | | 2 1/2" | | 3" | | 4" | | 6" | | | |
|----------|----------|------------------|----------|--------------|----------|--------------|----------|--------------|----------|--------------|----------|--------------|----------|--------------|----------|--------------|----------|--------------|----------|--------------|----------|-------|------|
| I.D. | | 0.716" | | 0.930" | | 1.189" | | 1.502" | | 1.720" | | 2.149" | | 2.601" | | 3.166" | | 4.072" | | 5.993" | | | |
| O.D. | | 0.840" | | 1.050" | | 1.315" | | 1.660" | | 1.900" | | 2.375" | | 2.875" | | 3.500" | | 4.500" | | 6.625" | | | |
| WALL | | 0.062" | | 0.060" | | 0.063" | | 0.079" | | 0.090" | | 0.113" | | 0.137" | | 0.167" | | 0.214" | | 0.316" | | | |
| Flow GPM | Flow GPH | Velocity FPS | PSI Loss | Velocity FPS | PSI Loss | Velocity FPS | PSI Loss | Velocity FPS | PSI Loss | Velocity FPS | PSI Loss | Velocity FPS | PSI Loss | Velocity FPS | PSI Loss | Velocity FPS | PSI Loss | Velocity FPS | PSI Loss | Velocity FPS | PSI Loss | | |
| 1 | 60 | 0.80 | 0.22 | 0.47 | 0.06 | 0.29 | 0.02 | 0.18 | 0.01 | 0.14 | 0.00 | 0.09 | 0.00 | 0.06 | 0.00 | 0.04 | 0.00 | 0.02 | 0.00 | 0.01 | 0.00 | | |
| 2 | 120 | 1.59 | 0.78 | 0.94 | 0.22 | 0.58 | 0.07 | 0.36 | 0.02 | 0.28 | 0.01 | 0.18 | 0.00 | 0.12 | 0.00 | 0.08 | 0.00 | 0.05 | 0.00 | 0.02 | 0.00 | | |
| 3 | 180 | 2.39 | 1.65 | 1.42 | 0.46 | 0.87 | 0.14 | 0.54 | 0.04 | 0.41 | 0.02 | 0.27 | 0.01 | 0.18 | 0.00 | 0.12 | 0.00 | 0.07 | 0.00 | 0.03 | 0.00 | | |
| 4 | 240 | 3.19 | 2.82 | 1.89 | 0.79 | 1.16 | 0.24 | 0.72 | 0.08 | 0.55 | 0.04 | 0.35 | 0.01 | 0.24 | 0.01 | 0.16 | 0.00 | 0.10 | 0.00 | 0.05 | 0.00 | | |
| 5 | 300 | 3.98 | 4.26 | 2.36 | 1.19 | 1.44 | 0.36 | 0.91 | 0.12 | 0.69 | 0.06 | 0.44 | 0.02 | 0.30 | 0.01 | 0.20 | 0.00 | 0.12 | 0.00 | 0.06 | 0.00 | | |
| 6 | 360 | 4.78 | 5.97 | 2.83 | 1.67 | 1.73 | 0.51 | 1.09 | 0.16 | 0.83 | 0.08 | 0.53 | 0.03 | 0.36 | 0.01 | 0.24 | 0.00 | 0.15 | 0.00 | 0.07 | 0.00 | | |
| 7 | 420 | 5.58 | 7.95 | 3.31 | 2.23 | 2.02 | 0.67 | 1.27 | 0.22 | 0.97 | 0.11 | 0.62 | 0.04 | 0.42 | 0.01 | 0.29 | 0.01 | 0.17 | 0.00 | 0.08 | 0.00 | | |
| 8 | 480 | 6.37 | 10.18 | 3.78 | 2.85 | 2.31 | 0.86 | 1.45 | 0.28 | 1.10 | 0.14 | 0.71 | 0.05 | 0.48 | 0.02 | 0.33 | 0.01 | 0.20 | 0.00 | 0.09 | 0.00 | | |
| 9 | 540 | 7.17 | 12.66 | 4.25 | 3.55 | 2.60 | 1.07 | 1.63 | 0.34 | 1.24 | 0.18 | 0.80 | 0.06 | 0.54 | 0.02 | 0.37 | 0.01 | 0.22 | 0.00 | 0.10 | 0.00 | | |
| 10 | 600 | 7.97 | 15.38 | 4.72 | 4.31 | 2.89 | 1.30 | 1.81 | 0.42 | 1.38 | 0.22 | 0.88 | 0.07 | 0.60 | 0.03 | 0.41 | 0.01 | 0.25 | 0.00 | 0.11 | 0.00 | | |
| 11 | 660 | 8.77 | 18.35 | 5.20 | 5.14 | 3.18 | 1.56 | 1.99 | 0.50 | 1.52 | 0.26 | 0.97 | 0.09 | 0.66 | 0.03 | 0.45 | 0.01 | 0.27 | 0.00 | 0.13 | 0.00 | | |
| 12 | 720 | 9.56 | 21.56 | 5.67 | 6.04 | 3.47 | 1.83 | 2.17 | 0.59 | 1.66 | 0.30 | 1.06 | 0.10 | 0.72 | 0.04 | 0.49 | 0.02 | 0.30 | 0.00 | 0.14 | 0.00 | | |
| 14 | 840 | 11.16 | 28.69 | 6.61 | 8.04 | 4.05 | 2.43 | 2.54 | 0.78 | 1.93 | 0.40 | 1.24 | 0.14 | 0.85 | 0.05 | 0.57 | 0.02 | 0.34 | 0.01 | 0.16 | 0.00 | | |
| 16 | 960 | 12.75 | 36.73 | 7.56 | 10.29 | 4.62 | 3.11 | 2.90 | 1.00 | 2.21 | 0.52 | 1.42 | 0.17 | 0.97 | 0.07 | 0.65 | 0.03 | 0.39 | 0.01 | 0.18 | 0.00 | | |
| 18 | 1,080 | | | 8.50 | 12.80 | 5.20 | 3.87 | 3.26 | 1.24 | 2.49 | 0.64 | 1.59 | 0.22 | 1.09 | 0.09 | 0.73 | 0.03 | 0.44 | 0.01 | 0.20 | 0.00 | | |
| 20 | 1,200 | | | 9.45 | 15.56 | 5.78 | 4.71 | 3.62 | 1.51 | 2.76 | 0.78 | 1.77 | 0.26 | 1.21 | 0.10 | 0.82 | 0.04 | 0.49 | 0.01 | 0.23 | 0.00 | | |
| 22 | 1,320 | | | 10.39 | 18.56 | 6.36 | 5.62 | 3.98 | 1.80 | 3.04 | 0.93 | 1.95 | 0.32 | 1.33 | 0.12 | 0.90 | 0.05 | 0.54 | 0.01 | 0.25 | 0.00 | | |
| 24 | 1,440 | | | 11.34 | 21.81 | 6.93 | 6.60 | 4.35 | 2.12 | 3.31 | 1.09 | 2.12 | 0.37 | 1.45 | 0.15 | 0.98 | 0.06 | 0.59 | 0.02 | 0.27 | 0.00 | | |
| 26 | 1,560 | | | 12.28 | 25.29 | 7.51 | 7.65 | 4.71 | 2.45 | 3.59 | 1.27 | 2.30 | 0.43 | 1.57 | 0.17 | 1.06 | 0.07 | 0.64 | 0.02 | 0.30 | 0.00 | | |
| 28 | 1,680 | | | 13.22 | 29.01 | 8.09 | 8.78 | 5.07 | 2.82 | 3.87 | 1.46 | 2.48 | 0.49 | 1.69 | 0.19 | 1.14 | 0.07 | 0.69 | 0.02 | 0.32 | 0.00 | | |
| 30 | 1,800 | | | | | 8.67 | 9.97 | 5.43 | 3.20 | 4.14 | 1.65 | 2.65 | 0.56 | 1.81 | 0.22 | 1.22 | 0.08 | 0.74 | 0.02 | 0.34 | 0.00 | | |
| 35 | 2,100 | | | | | 10.11 | 13.27 | 6.34 | 4.26 | 4.83 | 2.20 | 3.10 | 0.74 | 2.11 | 0.29 | 1.43 | 0.11 | 0.86 | 0.03 | 0.40 | 0.01 | | |
| 40 | 2,400 | | | | | 11.56 | 16.99 | 7.24 | 5.45 | 5.52 | 2.82 | 3.54 | 0.95 | 2.42 | 0.38 | 1.63 | 0.14 | 0.99 | 0.04 | 0.45 | 0.01 | | |
| 45 | 2,700 | | | | | 13.00 | 21.13 | 8.15 | 6.78 | 6.21 | 3.51 | 3.98 | 1.19 | 2.72 | 0.47 | 1.83 | 0.18 | 1.11 | 0.05 | 0.51 | 0.01 | | |
| 50 | 3,000 | | | | | | | 9.05 | 8.24 | 6.90 | 4.26 | 4.42 | 1.44 | 3.02 | 0.57 | 2.04 | 0.22 | 1.23 | 0.06 | 0.57 | 0.01 | | |
| 55 | 3,300 | | | | | | | 9.96 | 9.83 | 7.59 | 5.08 | 4.86 | 1.72 | 3.32 | 0.68 | 2.24 | 0.26 | 1.35 | 0.08 | 0.63 | 0.01 | | |
| 60 | 3,600 | | | | | | | 10.86 | 11.55 | 8.28 | 5.97 | 5.31 | 2.02 | 3.62 | 0.80 | 2.45 | 0.31 | 1.48 | 0.09 | 0.68 | 0.01 | | |
| 65 | 3,900 | | | | | | | 11.77 | 13.39 | 8.98 | 6.93 | 5.75 | 2.34 | 3.92 | 0.93 | 2.65 | 0.36 | 1.60 | 0.10 | 0.74 | 0.02 | | |
| 70 | 4,200 | | | | | | | 12.68 | 15.36 | 9.67 | 7.95 | 6.19 | 2.69 | 4.23 | 1.06 | 2.85 | 0.41 | 1.72 | 0.12 | 0.80 | 0.02 | | |
| 75 | 4,500 | | | | | | | 13.58 | 17.46 | 10.36 | 9.03 | 6.63 | 3.05 | 4.53 | 1.21 | 3.06 | 0.46 | 1.85 | 0.14 | 0.85 | 0.02 | | |
| 80 | 4,800 | | | | | | | | | 11.05 | 10.17 | 7.08 | 3.44 | 4.83 | 1.36 | 3.26 | 0.52 | 1.97 | 0.15 | 0.91 | 0.02 | | |
| 85 | 5,100 | | | | | | | | | 11.74 | 11.38 | 7.52 | 3.85 | 5.13 | 1.52 | 3.46 | 0.58 | 2.09 | 0.17 | 0.97 | 0.03 | | |
| 90 | 5,400 | | | | | | | | | 12.43 | 12.65 | 7.96 | 4.28 | 5.43 | 1.69 | 3.67 | 0.65 | 2.22 | 0.19 | 1.02 | 0.03 | | |
| 95 | 5,700 | | | | | | | | | 13.12 | 13.99 | 8.40 | 4.73 | 5.74 | 1.87 | 3.87 | 0.72 | 2.34 | 0.21 | 1.08 | 0.03 | | |
| 100 | 6,000 | | | | | | | | | 13.81 | 15.38 | 8.85 | 5.20 | 6.04 | 2.06 | 4.08 | 0.79 | 2.46 | 0.23 | 1.14 | 0.04 | | |
| 110 | 6,600 | | | | | | | | | | | | | 9.73 | 6.21 | 6.64 | 2.45 | 4.48 | 0.94 | 2.71 | 0.28 | 1.25 | 0.04 |
| 120 | 7,200 | | | | | | | | | | | | | 10.61 | 7.30 | 7.25 | 2.88 | 4.89 | 1.11 | 2.96 | 0.33 | 1.36 | 0.05 |
| 130 | 7,800 | | | | | | | | | | | | | 11.50 | 8.46 | 7.85 | 3.34 | 5.30 | 1.28 | 3.20 | 0.38 | 1.48 | 0.06 |
| 140 | 8,400 | | | | | | | | | | | | | 12.38 | 9.71 | 8.45 | 3.83 | 5.71 | 1.47 | 3.45 | 0.43 | 1.59 | 0.07 |
| 150 | 9,000 | | | | | | | | | | | | | 13.27 | 11.03 | 9.06 | 4.36 | 6.11 | 1.67 | 3.70 | 0.49 | 1.71 | 0.08 |
| 160 | 9,600 | | | | | | | | | | | | | | | 9.66 | 4.91 | 6.52 | 1.89 | 3.94 | 0.55 | 1.82 | 0.08 |
| 170 | 10,200 | | | | | | | | | | | | | | | 10.27 | 5.49 | 6.93 | 2.11 | 4.19 | 0.62 | 1.93 | 0.09 |
| 180 | 10,800 | | | | | | | | | | | | | | | 10.87 | 6.11 | 7.34 | 2.35 | 4.43 | 0.69 | 2.05 | 0.11 |
| 190 | 11,400 | | | | | | | | | | | | | | | 11.47 | 6.75 | 7.74 | 2.59 | 4.68 | 0.76 | 2.16 | 0.12 |
| 200 | 12,000 | | | | | | | | | | | | | | | 12.08 | 7.42 | 8.15 | 2.85 | 4.93 | 0.84 | 2.27 | 0.13 |
| 225 | 13,500 | | | | | | | | | | | | | | | 13.59 | 9.23 | 9.17 | 3.55 | 5.54 | 1.04 | 2.56 | 0.16 |
| 250 | 15,000 | | | | | | | | | | | | | | | | | 10.19 | 4.31 | 6.16 | 1.27 | 2.84 | 0.19 |
| 275 | 16,500 | | | | | | | | | | | | | | | | | 11.21 | 5.14 | 6.77 | 1.51 | 3.13 | 0.23 |
| 300 | 18,000 | | | | | | | | | | | | | | | | | 12.23 | 6.04 | 7.39 | 1.78 | 3.41 | 0.27 |
| 325 | 19,500 | | | | | | | | | | | | | | | | | 13.25 | 7.01 | 8.01 | 2.06 | 3.70 | 0.31 |
| 350 | 21,000 | | | | | | | | | | | | | | | | | | | 8.62 | 2.36 | 3.98 | 0.36 |
| 375 | 22,500 | | | | | | | | | | | | | | | | | | | 9.24 | 2.68 | 4.27 | 0.41 |
| 400 | 24,000 | | | | | | | | | | | | | | | | | | | 9.85 | 3.03 | 4.55 | 0.46 |
| 425 | 25,500 | | | | | | | | | | | | | | | | | | | 10.47 | 3.38 | 4.83 | 0.52 |
| 450 | 27,000 | | | | | | | | | | | | | | | | | | | 11.09 | 3.76 | 5.12 | 0.57 |
| 475 | 28,500 | | | | | | | | | | | | | | | | | | | 11.70 | 4.16 | 5.40 | 0.63 |
| 500 | 30,000 | | | | | | | | | | | | | | | | | | | 12.32 | 4.57 | 5.69 | 0.70 |
| 550 | 33,000 | | | | | | | | | | | | | | | | | | | 13.55 | 5.46 | 6.26 | 0.83 |
| 600 | 36,000 | | | | | | | | | | | | | | | | | | | | | 6.82 | 0.98 |
| 650 | 39,000 | | | | | | | | | | | | | | | | | | | | | 7.39 | 1.13 |
| 700 | 42,000 | | | | | | | | | | | | | | | | | | | | | 7.96 | 1.30 |
| 750 | 45,000 | | | | | | | | | | | | | | | | | | | | | 8.53 | 1.48 |
| 800 | 48,000 | | | | | | | | | | | | | | | | | | | | | 9.10 | 1.67 |
| 850 | 51,000 | | | | | | | | | | | | | | | | | | | | | 9.67 | 1.86 |
| 900 | 54,000 | | | | | | | | | | | | | | | | | | | | | 10.24 | 2.07 |

Note: Shaded areas of the chart indicate velocities over 5 Ft/Sec. Use with Caution.
 Velocities are calculated using the general equation:
 $V = (0.4085 * (Q / d^2))$
 Friction Losses are calculated using the Hazen-Williams Equation: $H_f = 0.2083 * (100 / C)^{1.852} * (Q^{1.852} / d^{4.866})$
 V = FPS (feet per second)
 H_f = PSI/100 Ft. (pounds per square inch per 100 feet)
 C = 150
 Q = GPM (gallons per minute)
 d = ID (inside diameter)

DESIGN INFORMATION

WEB RESOURCES



DESIGN CALCULATOR

If you know the square footage of the area you want to irrigate, whether it is a garden or turfgrass, and what type of soil, the design calculator will provide the following information:

- Estimated amount of dripline (in feet)
- The range of inches apart the rows can be
- The distance between emitters
- The total number of emitters in the zone
- The flow of the zone in GPM
- The application rate of water in inches per hour based on the row spacing chosen
- The amount of time to apply 1/4" of water based on the row spacing chosen
- Compatible with PC and Mac systems

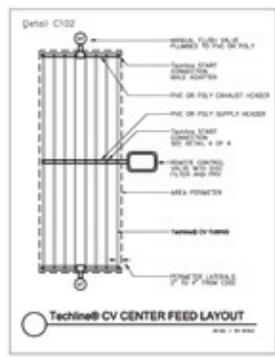
TECHNICAL SHEETS

All the technical information you need about a Netafim product. The technical sheets and brochures give you the complete details about our products in a format that is easy to download and share.

DESIGN GUIDES

Netafim Product Design Guides walk you through the design process step by step. Includes important information about best practices and our recommendations.

- Techline® CV
- Techline® DL
- Subsurface Design Guide



DESIGN DETAILS

Easy to download and use, our design details show line drawings of our products and their typical layouts in multiple file formats.



SOLUTIONS BY NETAFIM

Each Solution by Netafim highlights an actual installation of Netafim Landscape and Turf products. Learn how drip irrigation helped a corporate campus reduce water consumption over 70% or how a Colorado sports complex used subsurface drip irrigation to conserve water, minimize wind water loss and irrigate even when the fields were in use.

RESOURCES AT YOUR FINGERTIPS WWW.NETAFIMUSA.COM/LANDSCAPE



WARRANTY INFORMATION

BASIC MANUFACTURER'S LIMITED WARRANTY

Products sold and/or manufactured by Netafim Irrigation, Inc. (Netafim USA) are warranted to be free from original defects in material and workmanship for a period of one (1) year from the date of delivery.

LIMITED WARRANTY FOR EMITTERS

Netafim emitters (on-line and integral) are warranted to be free from original defects in materials and workmanship for a period of five (5) years from the date of shipment from Netafim.

LIMITED WARRANTY FOR DRIPLINES

Netafim warrants any polyethylene tubing and driplines (Techline® CV, Techline® DL, Techline® RW and Techline® EZ) sold to be free from environmental stress cracking for a period of seven (7) years from the date of original delivery.

LIMITED LIFETIME EXTENDED WARRANTY FOR TECHFILTERS®

Every Netafim Techfilter carries a 2-Year-to-Lifetime Warranty. Proper use and timely replacement of the cartridge will keep the Lifetime Extended Warranty in force.

LIMITED WARRANTY FOR FILTERS

Manual disc filters are warranted to be free from original defects in materials and workmanship for a period of one (1) year. Automatic disc filters are warranted to be free from original defects in materials and workmanship for a period of five (5) years. This warranty specifically excludes gaskets, diaphragms, o-rings and seals which are subject to the basic one (1) year warranty.

LIMITED WARRANTY FOR VALVES, WATER METERS AND HYDROMETERS

Valve, Water Meter and Hydrometer bodies are warranted to be free from original defects in materials and workmanship for a period of five (5) years. Water Meter and Hydrometer metering components (register and metering assembly) are warranted for three (3) years. Valve and Hydrometer diaphragms are warranted for two (2) years. This warranty specifically excludes pilots, pilot accessories, relays, solenoids, solenoid component/fittings, which are subject to the basic one (1) year warranty.

Octave Water Meters are warranted to be free from original defects in materials and workmanship for a period up to five (5) years. If the meter encounters a problem, Netafim USA will choose to cover the cost of repair or replacement based on a five (5) year pro-rated schedule as follows:

Year 0 through 2: 100% Year 2 through 3: 75%

Year 3 through 4: 50% Year 4 through 5: 25%

All Octave Water Meters must be installed with a Netafim branded Combination Air/Vacuum or Continuous Acting Air Vent to qualify for the five (5) year pro-rated product warranty.



NETAFIM USA
5470 E. HOME AVE.
FRESNO, CA 93727

(888) NETAFIM / (888) 638-2346

WWW.NETAFIMUSA.COM