

# Drip Irrigation in the Municipal Landscape

Dino Viale- Area Sales Manager, Northern California (510) 365-5186



# Netafim



- **Started in Israel in 1965**
- **Global company focusing on the Agricultural, Landscape, Mining, Greenhouse and Wastewater Industries.**
- **USA corporate office, Manufacturing plant and Distribution center in Fresno, CA.**
- **Smart Drip Irrigation is what we do.**
- **[www.netafimusa.com](http://www.netafimusa.com)**

# **Why Drip Irrigation?**

**90-95% Efficient Watering**

**Why Drip? No run-off, reduced evaporation, no over spray or hardscape damage.**

**A Dripline system will save from 30% - 70% of the water of a sprinkler system.**

**AB 1881: New Model Water Efficient Landscape Ordinance**

# Why Drip Irrigation?

## AB1881

- **“Overhead irrigation shall not be permitted within 24 inches of any non-permeable surface.”**
- **Only use sub-surface or low volume irrigation in planting areas less than 10 feet wide.**



# Why Drip Irrigation?



# Product Overview

- **Techline CV, DL, RW, Bioline, & EZ**
- **Emitter Evolution – 31<sup>st</sup> version**
- **Designing a system**
- **Choosing the right Techline**
- **Valves, Filters, Pressure Regulators**
- **Hydrometers**
- **Netafim Controllers**

# Techline Options

## TLCV

- Check valve version opens at 15psi.
- Made with minimum 30% recycled plastic.

## TLDL

- Emitters open at lower pressure - 2psi. Pressure compensates at 7psi.
- Needs an ARV ( Air Relief Valve ) , AFV (Automatic Flush Valve )
- Lower cost product.

## TLRW

- Reclaimed (recycled) water use.
- Same as TLDL with purple stripes.
- New – TLRWP Dripline – solid purple dripline for reclaimed water.

## Bioline

- Grey Water re-use: emitter treated with silver iodide to prevent slime build up on the emitter

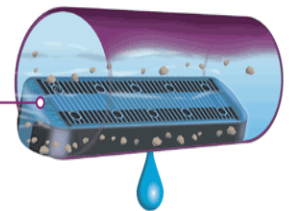
## TLEZ

- 6" spacing available
- 12mm / 3/8"



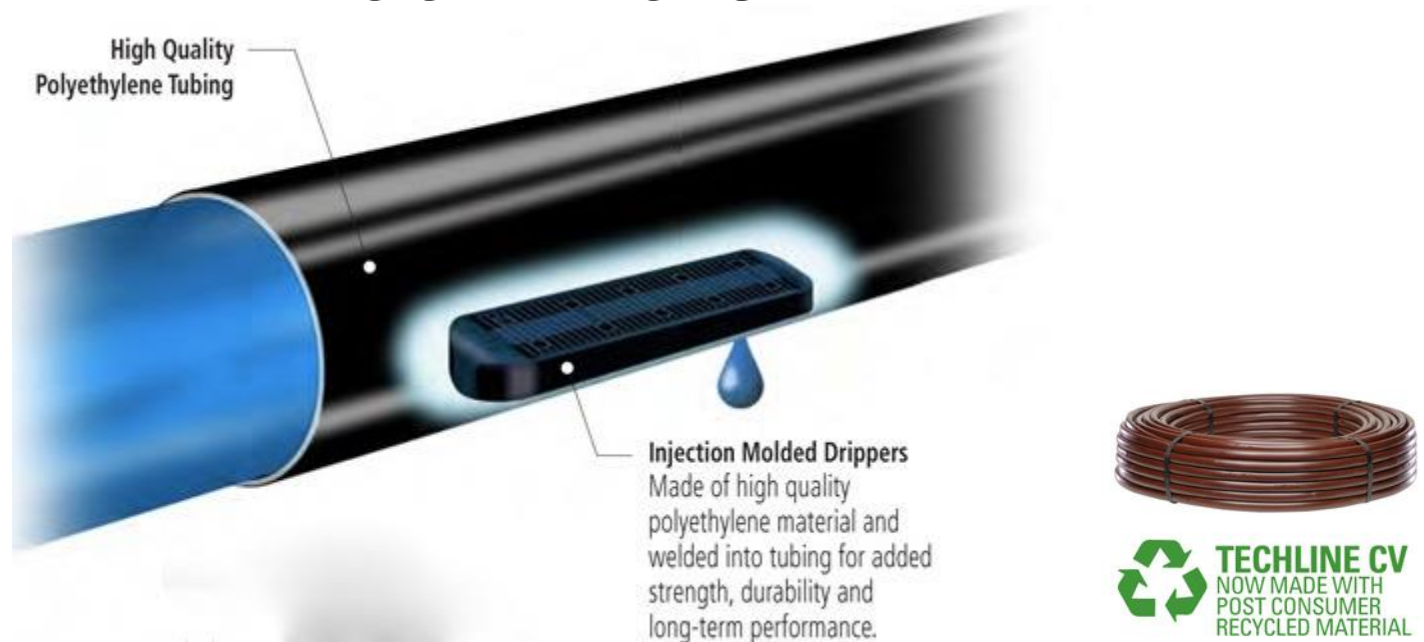
**CROSS SECTION  
OF BIOLINE  
DRIPPERLINE**

Bioline dripper inlets  
are positioned in the  
center of flow where  
water is the cleanest





# Techline CV

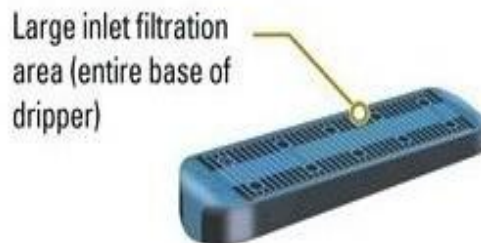


- **Flexible UV resistant tubing withstands heat and direct sun. Adapts to any planting area shape - tubing curves at a 7" radius. For on-surface or sub-surface installations.**
- **Contains 30% recycled material and qualifies for use on LEED projects.**



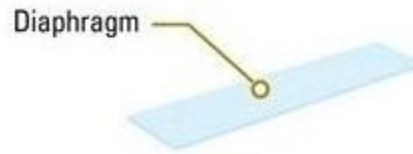
# Bottom View Of Dripper

EXPLODED VIEW OF TECHLINE CV DRIPPER



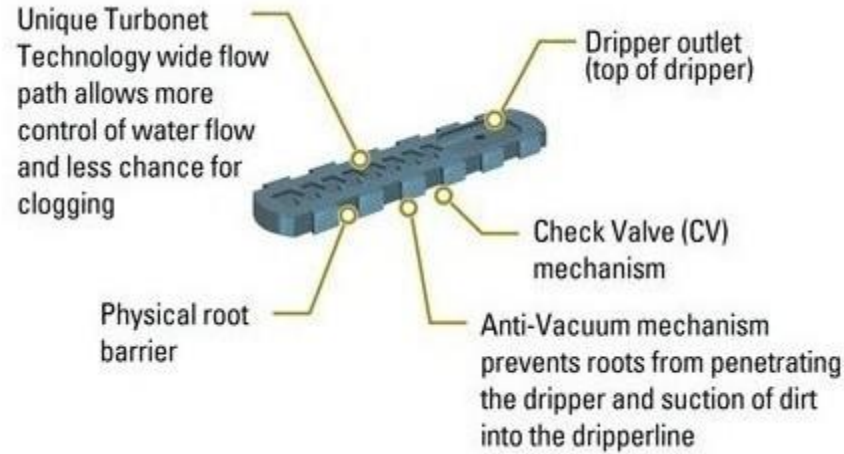
- **Extremely large filtration area preventing penetration of dirt particles into dripper.**
- **Pressure compensates at 14.5-58 PSI**
- **Check valve feature at 14.5 PSI**
- **Check valve retains 4.5ft of water on an elevation change**

# Diaphragm



- **Chemical Resistant- Chlorine**
- **Injected Molded**
- **Self Adjusting ( Movement in the Diaphragm maintains constant pressure differential within water passage-Resulting in a uniform flow rate under a wide pressure range )**

# Turbonet Technology



- **Industry's Widest flow path.**
- **Turbonet Technology improves our dripper performance maximizing flow path area.**
- **Large flow path area allows contaminants to pass easily through the emitter.**
- **Constant self flushing emitter-only one in industry.**

# Top Of Dripper



- **Unique Emitter Design with Physical Root Barrier**  
Emitter resists root intrusion without chemical reliance.
- **Anti-Vacuum mechanism prevents roots from penetrating the emitter and suction of dirt into the dripline.**

# Choosing the right Techline CV

## General Guidelines

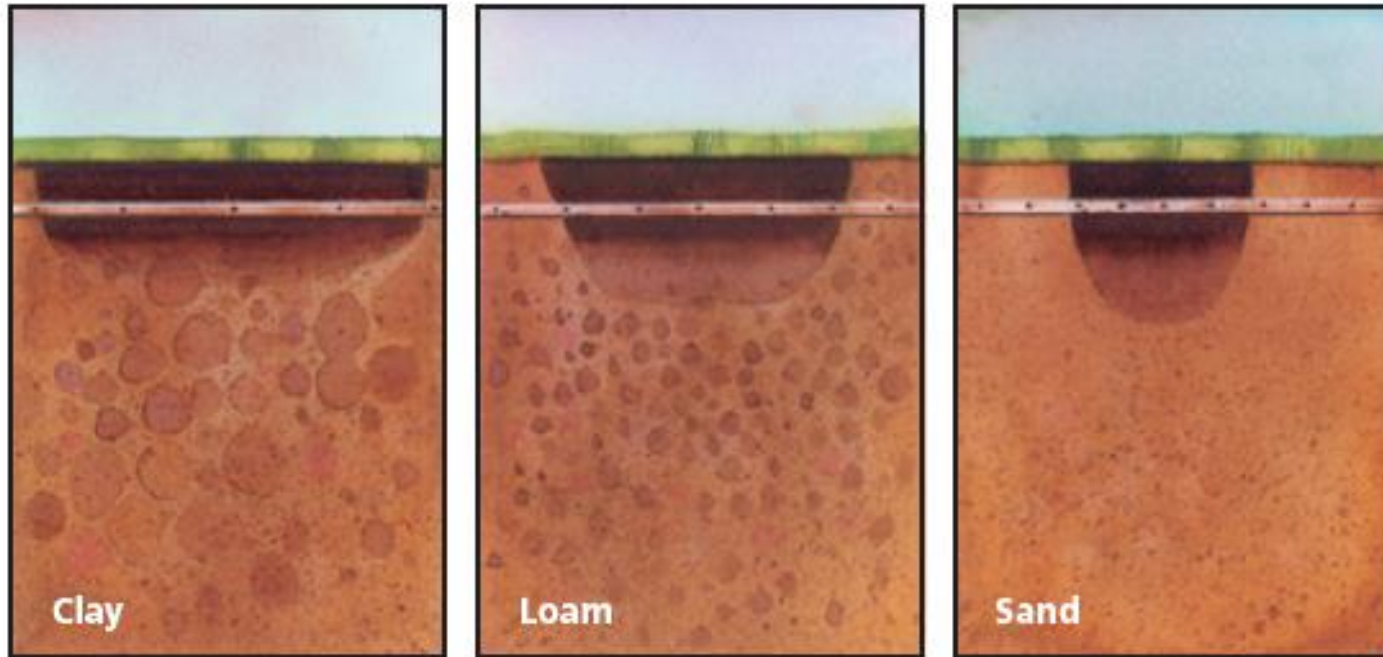
- **Choosing the Proper Emitter GPH**
- **Emitter Spacing**
- **Row Spacing**
- **Application/Precipitation Rate**
- **Watering time to apply a 1/4" of water**

# Choosing the Right Techline CV

## General Guidelines

- **What are you watering?**
- **Shrubs**
- **Turf**
- **What are your soil types?**
- **Clay**
- **Loam**
- **Sand**

# Relative Movement of Water through Soil



Inline Drip	0.26 GPH	0.4 GPH	0.6 GPH
Spray	1.3 GPM	1.3 GPM	1.3 GPM
Inline Drip	0.19 IN/HR	0.29 IN/HR	0.72 IN/HR
Spray	2.01 IN/HR	2.01 IN/HR	2.01 IN/HR



# DESIGN

## CATALOG, Techline CV

GENERAL GUIDELINES	TURF												SHRUB & GROUND COVER											
	CLAY SOIL			LOAM SOIL			SANDY SOIL			SANDY SOIL			CLAY SOIL			LOAM SOIL			SANDY SOIL			SANDY 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 1/4" 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.

# Max Length of Laterals

## Techline CV

### MAXIMUM LENGTH OF A SINGLE LATERAL (FEET)

DRIPPER SPACING		12"				18"				24"	
DRIPPER 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	335	247	194	148	475	348	275	209	348	266
	25 psi	420	308	243	184	592	435	344	262	436	332
	35 psi	528	388	305	232	748	550	434	329	550	419
	45 psi	605	444	350	266	857	630	497	378	632	481

# Flow per 100 Feet, Techline CV

## 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"	26.40	0.44	42.00	0.70	61.00	1.02	92.50	1.54
18"	17.58	0.29	28.00	0.47	40.67	0.68	61.67	1.03
24"	Not Standard		Not Standard		30.50	0.51	46.25	0.77

# Friction Loss Chart – Proper Sizing of Headers

## GPM

**0-5 GPM**

**5.1-8 GPM**

**8.1-12 GPM**

**12.1-20 GPM**

**20.1-32 GPM**

## Pipe Size Sch.40

**1/2" PVC or TLCV**

**3/4" PVC or Poly**

**1" PVC**

**1 1/4" PVC**

**1 1/2" PVC**

- 5 feet per second velocity flow

# LAYOUTS: Planter or Turf > 5 GPM

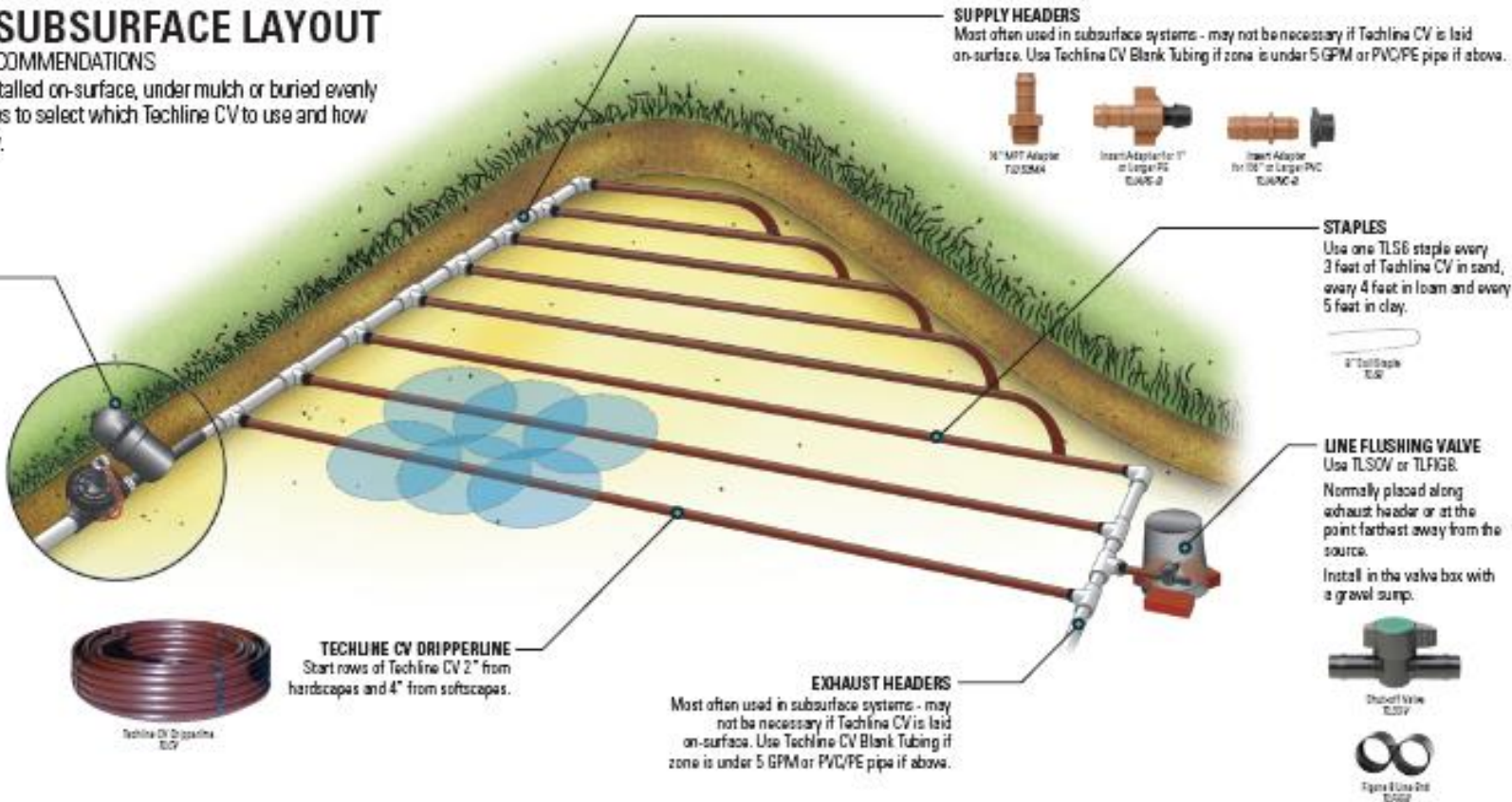
## SURFACE/SUBSURFACE LAYOUT

### LAYOUT TIPS AND RECOMMENDATIONS

Techline CV can be installed on-surface, under mulch or buried evenly up to 6". Use guidelines to select which Techline CV to use and how much to apply properly.

### LOW VOLUME CONTROL ZONE KIT

For easy installation of a valve, disc filter and pressure regulator valve (PRV) use Netafim's Low Volume Control Zone Kit. Two models are available with a pre-assembled 1" valve, 3/4" disc filter.  
Low Flow (0.25 - 4.4 GPM)  
LVCZ10075-LF  
High Flow (4.5 - 17.6 GPM)  
LVCZ10075-HF



# LAYOUTS: Planter or Turf < 5 GPM

## LITE LAYOUT

### LAYOUT TIPS AND RECOMMENDATIONS

Techline CV can be installed on-surface, under mulch or subsurface buried evenly up to 6". Use guidelines to select which Techline CV to use and how much to apply properly.

**MULCH OR DECOMPOSED GRANITE**  
Add weed barrier as needed.

**LOW VOLUME CONTROL ZONE KIT**  
For easy installation of a valve, disc filter and pressure regulator valve (PRV) use Netafim's Low Volume Control Zone Kit in a standard 12" Valve Box. Four models are available with a pre-assembled with 1" Control Valve, 3/4" Disc Filter and High/Low Flow Pressure Regulator.  
**Low Flow** (0.25 - 4.4 GPM)  
LVCZ10075-LF  
LVCZ10075-LF (No Control Valve)  
**High Flow** (4.5 - 17.6 GPM)  
LVCZ10075-HF  
LVCV10075-HF (No Control Valve)

**SUPPLY LATERAL**  
Use Techline CV Blank Tubing if zone is under 5 GPM or PVC/PE pipe if over 5 GPM.

**TECHLINE CV DRIPPERLINE**  
Start rows of Techline CV 2" from hardscapes and 4" from softscapes.



**LINE FLUSHING VALVE**  
Use TLSOV or TLFIG8.  
Normally placed along exhaust header or at the point farthest away from the control zone kit.  
Install in the valve box with a gravel sump.



**STAPLES**  
Use one TLS6 staple every 3 feet of Techline CV in sand, every 4 feet in loam and every 5 feet in clay.



# Valves

- Residential or commercial applications
  - For Mild Corrosive or Mild Acidity levels
  - For remote control master valve and automated operations
  - Reclaim/Reuse applications including municipality treated reclaimed water designated for irrigation
- 
- Recommended flow range:
  - $\frac{3}{4}$ " - 0.01 to 26 GPM
  - 1" - 0.01 to 44 GPM
  - 1  $\frac{1}{2}$ " - 0.25 to 110 GPM
  - 2" - 0.25 to 176 GPM





# Regulators

- 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
- Maximum pressure: 145 psi
- Other models available up to 175 GPM



## ORDERING INFORMATION

DESCRIPTION	psi	GPM	MODEL NUMBER	ITEM NUMBER
LOW FLOW INLINE 3/4" FPT INLET X FPT OUTLET	15	0.25 to 4.4	PRV075LF15V2K	00135-000480
	20		PRV075LF20V2K	00135-000490
	25		PRV075LF25V2K	00135-000500
	35		PRV075LF35V2K	00135-000510
	42		PRV075LF42V2K	00135-000520
HIGH FLOW 3/4" FPT INLET X MPT OUTLET	15	4.5 to 17.6	PRV075HF15V2K	00135-000430
	20		PRV075HF20V2K	00135-000440
	25		PRV075HF25V2K	00135-000450
	35		PRV075HF35V2K	00135-000460
	45		PRV075HF45V2K	00135-000470
1 1/2" MPT X MPT	15	11 to 35	PRV15015V2K	00135-000530
	20		PRV15020V2K	00135-000540
	25		PRV15025V2K	00135-000550
	35		PRV15035V2K	00135-000560
	45		PRV15045V2K	00135-000570
REPLACEMENT PRESSURE REGULATING MODULE	15		PRVU15V2K	00135-000595
	20		PRVU20V2K	00135-000600
	25		PRVU25V2K	00135-000610
	35		PRVU35V2K	00135-000620
	45		PRVU45V2K	00135-000630

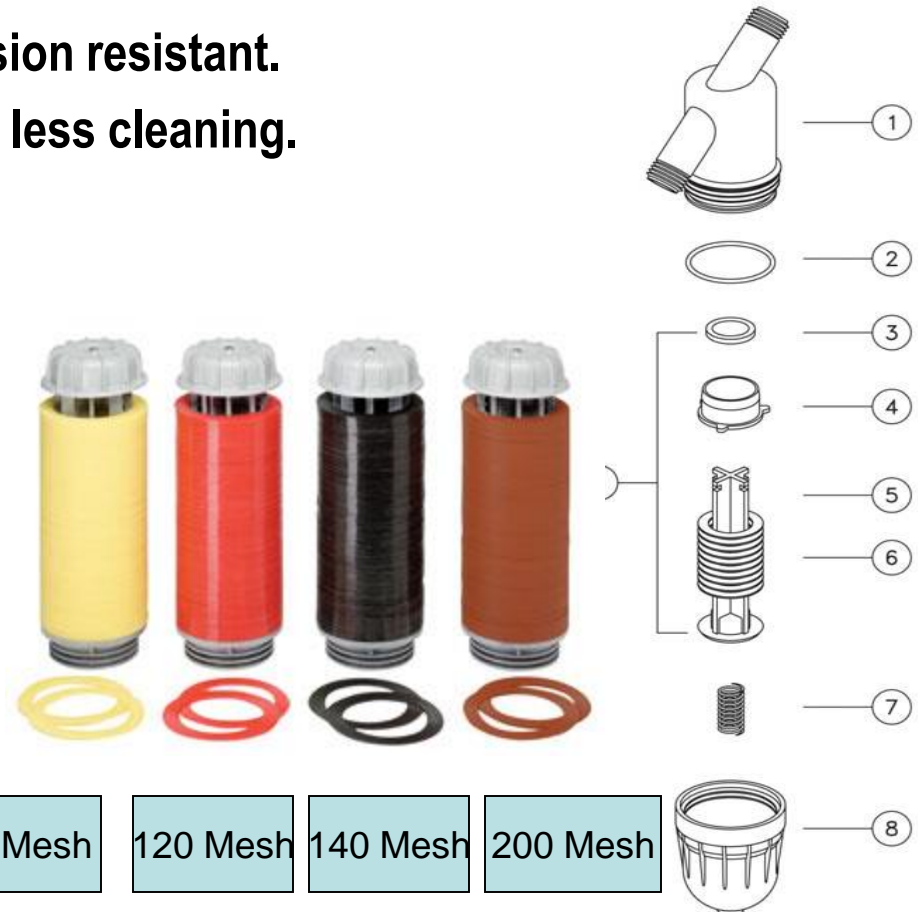
For larger Pressure Regulators (above 35 GPM), call Customer Service at (888) NETAFIM.

FPT = Female Pipe Thread  
MPT = Male Pipe Thread

# Filtration

- **Disc filter - collects debris along the depth of the discs, not just at the surface like screen filters.**
- **100% thermoplastic discs are corrosion resistant.**
- **Extra large filtration capacity means less cleaning.**
- **Maximum pressure: 140 psi**

Disc filters sizes:  
¾" up to 17 GPM  
1" up to 26 GPM  
1 ½" up to 35 GPM  
1 ½" Long up to 52 GPM  
2" up to 120 GPM



# Drip Zone Kit's

.25 to 4.4 GPM



.25 to 4.4GPM



4.5 to 17 GPM



4.5 to 17.6GPM



11 to 35 GPM



11 to 35GPM



# LAYOUTS: Planter or Turf < 4 GPM

## LITE LAYOUT

### LAYOUT TIPS AND RECOMMENDATIONS

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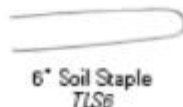
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Normally placed along exhaust header or at the point farthest away from the control zone kit.  
Install in the valve box with a gravel sump.



**STAPLES**  
Use one TLS6 staple every 3 feet of Techline CV in sand, every 4 feet in loam and every 5 feet in clay.





# HOTCHKINS MEMORIAL-Planter Bed



# LIBRARY: Planter Bed





# LIBRARY: After





# Subsurface with TLCV



# RESIDENTIAL: Turf





# RESIDENTIAL: After



# LAYOUTS: Planter or Turf > 5 GPM

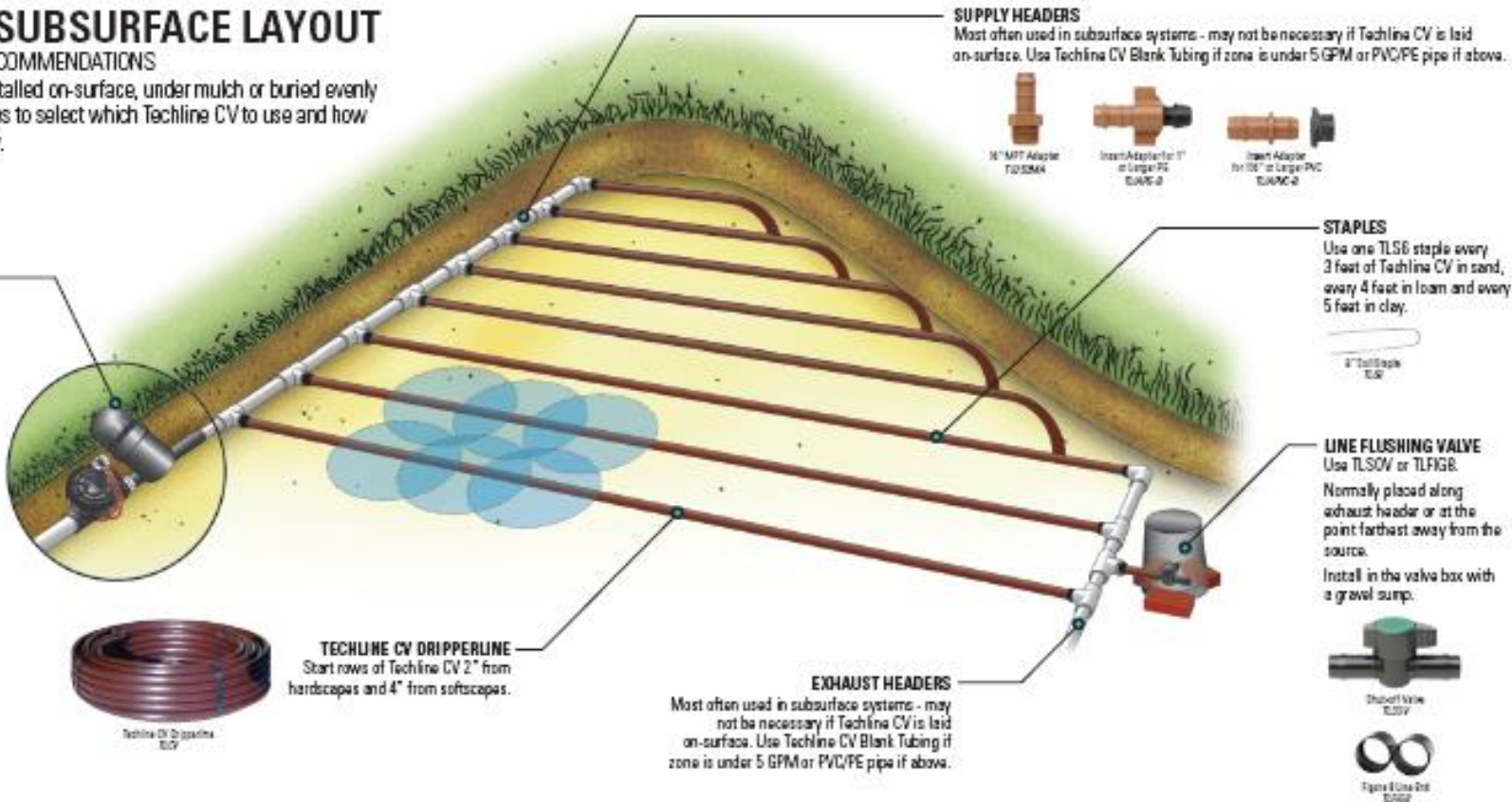
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Low Flow (0.25 - 4.4 GPM)  
LVCZ10075-LF  
High Flow (4.5 - 17.6 GPM)  
LVCZ10075-HF



### SUPPLY HEADERS

Most often used in subsurface systems - may not be necessary if Techline CV is laid on-surface. Use Techline CV Blank Tubing if zone is under 5 GPM or PVC/PE pipe if above.



### STAPLES

Use one TLS6 staple every 3 feet of Techline CV in sand, every 4 feet in loam and every 5 feet in clay.



### LINE FLUSHING VALVE

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



### EXHAUST HEADERS

Most often used in subsurface systems - may not be necessary if Techline CV is laid on-surface. Use Techline CV Blank Tubing if zone is under 5 GPM or PVC/PE pipe if above.



# AMPHITHEATER: Before





# AMPHITHEATER: After



# Subsurface Commercial

- 2011



- 2012





# Slope General Guidelines

- **Add 25% extra spacing at bottom 1/3 (toe) of slope.**
- **Proper check valve placement.**
- **Multiple start times on controller to help with run-off.**



# DESIGN

## CD

**Techline® CV and Techline® Calculator**

Click on the Buttons that Best Describe the Area you are Irrigating:

**Techline® Type**  
☐ Techline®  
☒ Techline® CV

**Soil Type**  
☐ Clay  
☒ Loam  
☐ Sand

**Area to be Irrigated**  
☒ Shrub & Groundcover  
☐ Turf

**Techline® CV Placement**  
☐ On Surface or Covered with Mulch - LITE Layout  
☒ On Surface or Covered with Mulch - Grid Layout  
☐ Buried Evenly to a Maximum of 6" - Grid Layout  
☐ Check here to disable layout design pop-ups

How Many Square Feet are in the Area Being Irrigated?

**Recommended Techline® CV**  
Based on the Soil Type and the Area to be Irrigated, the Recommended Techline® CV is:

Dripper Flow Rate	0.4 (GPH)
Dripper Spacing in Techline® CV	18 (inches)
Techline® CV Row (lateral) Spacing	18" - 24"
Application Rate (in/hr)	0.29 - 0.21
Time to Apply 1/4" (minutes)	52 - 71

**User Defined Inputs**  
Techline® CV Row (lateral) Spacing  
Select a value between 18" - 24"

Dripper Flow Rate (GPH)

Dripper Spacing in Techline® CV (inches)

Inlet Pressure (PSI)

Changes made that are not within the range shown in the Techline® CV Recommendations box are not recommended!


Name of Zone (optional)

**Click Here to Determine Netafim Recommendations**

Note:  
Changing recommended values may effect performance.

Feet of Techline® CV	1000
Total GPM of Zone	4.44
Application Rate (in/hr)	0.29
Time to Apply 1/4" (minutes)	53
Number of Drippers in the Zone	667
Number of TLS6 Staples Required	334
Recommended PRV	PRV075HF45V2K
Techline® CV Part Number	TLCV4-18xx
Recommended Filter	DF075-120 DF075-140 DFV075-120 DFV075-140
AVRV	No
Recommended Low Volume Control Zone Kit	LVCZ10075-HF
Maximum Length of a Lateral in Feet	579
Supply and Exhaust Header Pipe Sizing	Techline® CV, Techline® CV blank tubing, 1/2" or 3/4" polyethylene or PVC
Number of Flush Valve(s)	To maintain the integrity of the Techline® CV Check Valve feature, use a TLSOV or TLFIG8 in lieu of automatic line flushing valves
Number of Flush Valves is based on flow. The piping layout you choose may require additional flush valves.	

**Exit**  
**Help**  
**Save to File**

 **NETAFIM™**

[www.netafim-usa-landscape.com](http://www.netafim-usa-landscape.com)

# Hydrometer Features & Benefits

- Globe Configuration With Built-In Straightening Vane  
Requires no straight pipe installation - saving space.
- $\pm 2\%$  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.
- Sub Metering Meter dedicated to landscape  
irrigation water.



# Hydrometer Features & Benefits

- 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.

## FRICTION 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 ½"	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

		LOWEST FLOW WITHIN ± 5% ACCURACY	LOWEST FLOW WITHIN ± 2% ACCURACY	NOMINAL FLOW WITHIN ± 2% ACCURACY	MAXIMUM FLOW WITHIN ± 2% ACCURACY
SIZE	1 ½"	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





# NETAFIM LANDSCAPE CONTROLLER

**NLC-100S Conventional**  
Stand Alone Controller for Converting  
Conventional Systems to Remote Management

## 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: 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 NLCEXT1.



## 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





# NETAFIM LANDSCAPE CONTROLLER

**NLC-100S Hybrid**  
Stand-Alone Controller with Hybrid Technology  
for Master Valve and Sensor Inputs

## 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): 1 - 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): 24  
48 with additional parallel hybrid
- Electrical Input: 24VAC sourced from current controller
- Includes (1) Master valve and (1) Flow sensor input
- Up to 3 stations simultaneously
- Two-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 TWO WIRE SYSTEM

Enjoy all the advantages of a two-wire decoder system with an existing controller.

### MULTIPLE STATION INPUTS

Allows 24 station inputs and up to 48 total with an additional hybrid installed in parallel.

### 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.
- Can also be used with NLC-100S and NLC-100D systems.



# NETAFIM LANDSCAPE CONTROLLER

**NLC-100D Decoder**  
Decoder based Two-Wire Controller with Integrated Diagnostics and Flexibility

## 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 like a string of lights.

### 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 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 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
ROSTACK*	Program stacking based on flow for up to 10 simultaneous programs
REALNET	Real-time, Internet based water management via GSM or LAN
INTELLESET	Smart irrigation using a host of ET-based capabilities
FLOWGUARD	Alarm and control option based on flow monitoring



# TOTAL CYCLE MANAGEMENT

- **Calculate ET rates using real time weather data.**
- **Validate your irrigation schedule with soil moisture sensors.**

# Thank You

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