# Product Catalog

**RESIDENTIAL & COMMERCIAL IRRIGATION** | *Built on Innovation®*

**VOLUME 38**

Hunter®


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Hunter®

# Advancing Irrigation Management
# THROUGH LEADERSHIP AND INNOVATION

The need for cutting-edge technology and support continues to expand across all segments of the irrigation industry. Labor is increasingly hard to find. Water conservation is a rising concern. Your customers are demanding bold irrigation management solutions that cut costs while ensuring healthy, green landscapes.

These evolving needs call for trusted product solutions and unwavering partnership from manufacturers. **At Hunter Industries, innovation and customer satisfaction are integral parts of who we are.** We build performance, reliability, and efficiency into every product that we manufacture, and we back our solutions with the best training and technical support in the industry.

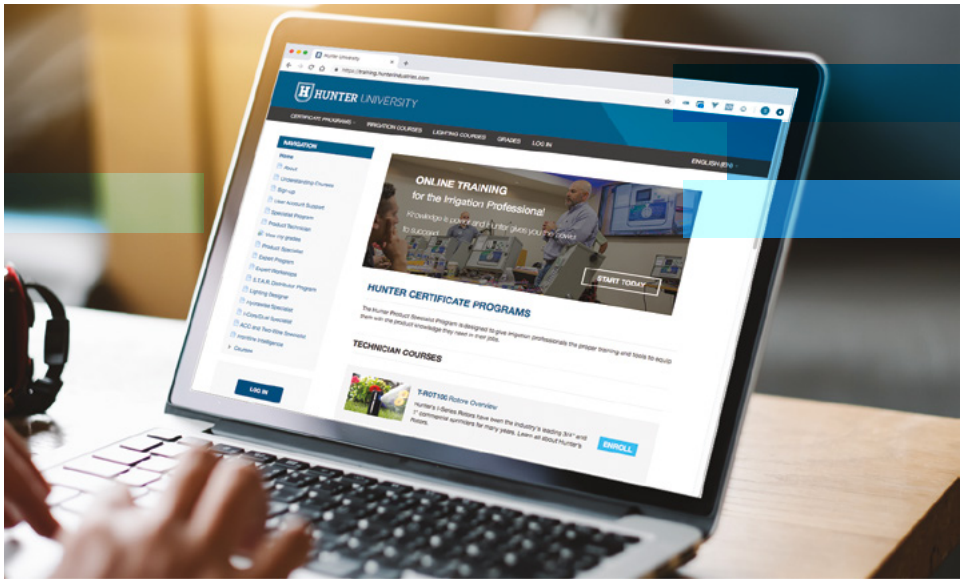
We are committed to advancing the boundaries of innovation wherever we do business. As we have for more than 38 years, we will always push ourselves to do better.

**Thank you for choosing Hunter Industries.** We're proud to stand with you to help solve your toughest irrigation challenges.


ROAM


PRO-C
Hunter


Hunter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World-Class Education, Tools, and Support

# FOR GREEN INDUSTRY PROFESSIONALS

From product knowledge to technical support, we offer a full suite of tools, services, and programs to help your business grow:

- Gain valuable product knowledge with comprehensive online irrigation and lighting training certificate programs through **Hunter University**.
- Customize solutions and send bids directly to your customers with the **SiteRec App**.
- Simplify your Hunter ordering and design process with the **My List** feature.
- Show customers their projected savings in real time with the **Water Savings Calculator**.
- Eliminate the guesswork before starting a project with the **Hunter Dripline Calculator**.
- Earn points for irrigation and lighting product purchases and redeem them for exciting prizes through the **Hunter Preferred Program**.

We also have technical guides, CAD legends and details, an expansive video library, and an array of other helpful tools and services. **Visit hunterindustries.com/contractors today to learn how we can help you build your business.**

**Follow us to stay on top of our latest product news, promotions, installation tips, and more!**

Hunter®

# HUNTER FAMILY
*of Companies*

Hunter®

**Founded in 1981, Hunter Industries is a family-owned, global manufacturer of best-in-class solutions** for residential, commercial, municipal, agricultural, and golf course irrigation systems, as well as the outdoor lighting industry. CEO Greg Hunter and his executive staff provide leadership for our entire company. Our core mission will always remain the same: to deliver valued products and services backed by unwavering customer support, grow the company conscientiously, and remain true to the culture that makes our employees proud to work at Hunter. **Learn more at hunterindustries.com.**

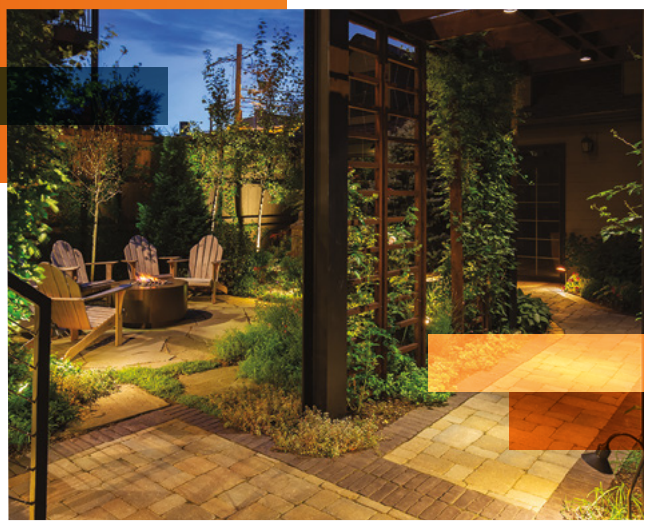
Hunter®
GOLF IRRIGATION

**Hunter has been on the leading edge of golf course irrigation for more than three decades.** We take pride in providing golf experts and professionals with the products, tools, and support they need to conceptualize, create, and manage world-class golf courses. **Learn more at hunterindustries.com/golf.**

## Senninger®

**Senninger Irrigation is a principal designer and manufacturer of premier irrigation solutions** for agricultural, horticultural, industrial, and wastewater applications. With over 50 years of experience in more than 50 countries worldwide, Senninger is one of the most trusted names in the agricultural irrigation industry. **Learn more at senninger.com.**

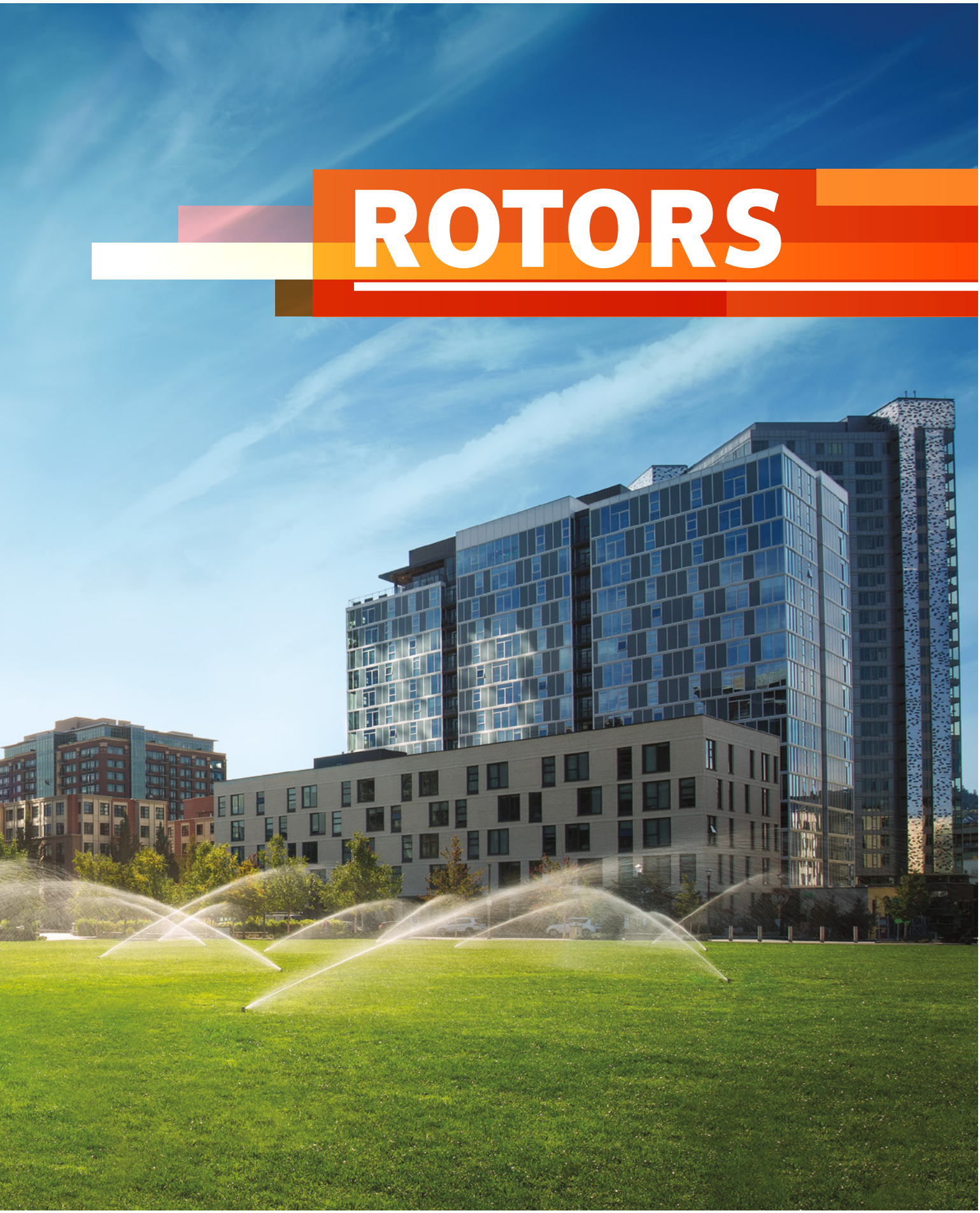
## FXLuminaire®



**FX Luminaire is an industry-leading manufacturer of landscape and architectural lighting solutions.** We focus on the advancement of LED technology and digital lighting control with smart home integration and zoning, dimming, and color generation capabilities. **Learn more at fxl.com.**

## LUMASCAPE

**Lumascape transforms architecture into performance art with precision-engineered lighting solutions.** Our global experts combine sophisticated design, advanced technologies, quality materials, and rigorous testing to manufacture comprehensive lighting systems that exceed expectations in a range of commercial and public-sector applications. **Learn more at lumascape.com.**


ROTORS

# ROTORS
# ADVANCED FEATURES

## RELIABLE STRENGTH & DURABILITY

### PRESSURE-REGULATED BODY

Reduce high incoming pressure to prevent misting and allow nozzles to operate at peak efficiency. Lower pressure produces larger water droplets that fight the effects of wind.

PGP Ultra Shrub and 4",
I-20 Shrub, 4" and 6"

### STAINLESS STEEL RISER

For unforgiving soil conditions, unpredictable climates, or heavy foot traffic, stainless steel is the best choice.

Standard on I-40, I-50, I-80
Optional on I-20 and I-25

### DRAIN CHECK VALVE

The drain check valve keeps lines from draining when the system is shut off. This saves water, reduces liability, and prolongs system life.

PGJ, PGP Ultra, I-20, I-25, I-40, I-50, I-80, I-90

## VALUE-ADDED OPTIONS

### OPPOSING NOZZLE 360° MODEL

The opposing nozzle design offers excellent water distribution. With primary and secondary nozzles on opposing sides of the turret, streams arc in opposite directions as the sprinkler rotates for outstanding midrange and close-in watering.

I-40, I-50, I-80, I-90

## EASY IN-THE-FIELD IDENTIFICATION

### OPTIONAL RECLAIMED WATER ID

Purple caps indicate where non-potable irrigation water is being used.

PGJ, PGP Ultra, I-20, I-25, I-40, I-50, I-80, I-90

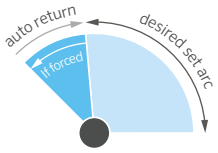
### COLOR-CODED NOZZLES

Nozzles are easier to differentiate in the field for simple installation and quick organization.

I-25, I-40, I-50, I-80, I-90

## EASY AS-NEEDED ADJUSTMENTS

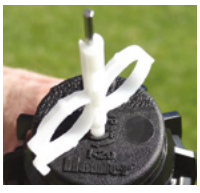
### AUTOMATIC ARC RETURN & NON-STRIPPABLE DRIVE




This patented feature returns the turret to the original arc regardless of where it is turned. The non-strippable drive mechanism is protected from damage, ensuring protection from vandalism.

PGP Ultra, I-20, I-25, I-40

### FLOSTOP® CONTROL



FloStop closes the flow of water from individual sprinkler heads while the system is running. This is ideal for changing nozzles or turning off specific heads during maintenance and construction.

I-20

### HEADED AND SLOTTED SETSCREW

Use a slotted screwdriver or the Hunter wrench for easier and simpler adjustments as needed.

PGJ, PGP Ultra, I-20

## ROTOR COMPARISON CHART

| QUICK SPECS | | PGJ | SRM | PGP-ADJ | PGP ULTRA | I-20 | I-25 | I-40 I-50 | I-40-ON I-50-ON | I-80 | I-90 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| INLET SIZE | | ½" | ½" | ¾" | ¾" | ¾" | 1" | 1" | 1" | 1½" | 1½" |
| RADIUS | ft. | 15' - 37' | 15' - 30' | 22' - 52' | 17' - 46' | 17' - 46' | 40' - 71' | 44' - 69' | 52' - 76' | 63' - 97' | 66' - 103' |
| FLOW | GPM | 0.64 - 5.3 | 0.42 - 3.4 | 0.5 - 14.1 | 0.36 - 14.8 | 0.36 - 14.8 | 3.8 - 31.5 | 7.6 - 29.5 | 13.0 - 33.7 | 20.2-58.5 | 29.5 - 83.8 |
| **FEATURES** | | | | | | | | | | | |
| RECOMMENDED PRESSURE RANGE | PSI | 30 - 50 | 30 - 50 | 25 - 70 | 25 - 70 | 25 - 70 | 40 - 100 | 40 - 100 | 40 - 100 | 50-100 | 80 - 120 |
| OPERATING PRESSURE RANGE | PSI | 20 - 100 | 20 - 100 | 20 - 100 | 20 - 100 | 20 - 100 | 40 - 100 | 40 - 100 | 40 - 100 | 50 - 100 | 80 - 120 |
| NOZZLE TRAJECTORY | | 15° | 15° | 25° | 25° | 25° | 25° | 25° | 25° | 22.5° | 22.5° |
| SPECIFIC NOZZLES | | --- | --- | --- | Optional | Optional | Pre-Installed | Pre-Installed | Pre-Installed | Pre-Installed | Pre-Installed |
| NOZZLE OPTIONS | | 8 | 6 | 27 | 34 | 34 | 11 | 6 | 6 | 7 | 16 |
| WARRANTY | | 2 Years | 1 Year | 2 Years | 5 Years | 5 Years | 5 Years | 5 Years | 5 Years | 5 Years | 5 Years |
| **ADVANCED FEATURES** | | | | | | | | | | | |
| LOW-ANGLE NOZZLE CHOICES | | | | ● | ● | ● | | | | | ● |
| AUTOMATIC ARC RETURN | | | | | ● | ● | ● | ● | | | |
| NON-STRIPPABLE DRIVE | | | | | ● | ● | ● | ● | | | |
| PART- AND FULL-CIRCLE IN ONE MODEL | | | | | ● | ● | ● | ● | | ● | |
| HEADED AND SLOTTED SETSCREW | | ● | | | ● | ● | | | | | |
| RECLAIMED WATER ID | | ● | | | ● | ● | ● | ● | ● | ● | ● |
| AVAILABLE SHORT RADIUS NOZZLES | | | | | ● | ● | | | | | |
| FLOSTOP® CONTROL | | | | | | ● | | | | | |
| OPPOSING NOZZLE | | | | | | | | | ● | ● | ● |
| STAINLESS STEEL RISER OPTION | | | | | | ● | ● | ● | ● | ● | |
| OPTIONAL PRESSURE-REGULATED BODY | | | | | ● | ● | | | | | |
| OPTIONAL OR FACTORY-INSTALLED DRAIN CHECK VALVE | | ● (7') | | | ● (7') | ● (7') | ● (10') | ● (15') | ● (15') | ● (5') | ● (9') |

# PGJ

*Radius:* **15' to 37'**
*Flow:* **0.64 to 5.3 GPM**

*The highly durable PGJ offers all the benefits of a large rotor in a compact, spray-sized package, with water-efficient nozzles and easy arc adjustment.*

## KEY BENEFITS

- Headed and slotted setscrew allows radius adjustment with a Hunter wrench or flat-blade screwdriver
- Adjustable arc from 40° to 360° to keep water in the appropriate areas
- Standard factory installed 2.0 nozzle speeds installation
- QuickCheck™ arc mechanism for fast arc adjustment

## OPERATING SPECIFICATIONS

- Nozzle choices: 8
- Radius: 15' to 37'
- Flow: 0.64 to 5.3 GPM
- Recommended pressure range: 30 to 50 PSI
- Operating pressure range: 20 to 100 PSI
- Precipitation rate: 0.6 in/hr approximately
- Nozzle trajectory: 14° approximately
- Warranty period: 2 years

## FACTORY-INSTALLED OPTIONS

- Drain check valve (up to 7' of elevation) excluding PGJ-00
- Reclaimed water ID

## USER-INSTALLED OPTIONS

- Drain check valve (up to 7' of elevation) excluding PGJ-00 (P/N 462078SP)
- HC-50F-50M Check valve (up to 32' of elevation) PGJ-00

**PGJ Reclaimed**
*Available as a factory-installed option on all models*

**PGJ-00**
Overall height: 7"
Exposed diameter: 1⅛"
Inlet size: ½"

**PGJ-04**
Overall height: 7⅛"
Pop-up height: 4"
Exposed diameter: 1⅛"
Inlet size: ½"

**PGJ-06**
Overall height: 9⅛"
Pop-up height: 6"
Exposed diameter: 1⅛"
Inlet size: ½"

**PGJ-12**
Overall height: 16⅜"
Pop-up height: 12"
Exposed diameter: 1⅛"
Inlet size: ½"

**PGJ – SPECIFICATION BUILDER:** ORDER 1 + 2 + 3

| 1 Model | 2 Standard Features | 3 Feature Options |
|---|---|---|
| **PGJ-00** = Shrub | Adjustable arc, 8 standard nozzles | **(blank)** = No option |
| **PGJ-04** = 4" pop-up | | **V** = Drain check valve |
| **PGJ-06** = 6" pop-up | | **R** = Drain check valve and reclaimed water ID |
| **PGJ-12** = 12" pop-up | | |

**Examples:**
**PGJ-04** = 4" pop-up, adjustable arc
**PGJ-06-V** = 6" pop-up, adjustable arc, with drain check valve
**PGJ-12-R** = 12" pop-up, adjustable arc, with drain check valve and reclaimed water ID

*Compatible with:*

***½" Swing Joints***
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***Hunter Flex SG***
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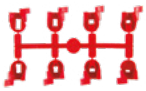
**PGJ RED NOZZLE PERFORMANCE DATA**

| Nozzle | Pressure PSI | Radius ft. | Flow GPM | Precip in/hr ■ | Precip in/hr ▲ |
|---|---|---|---|---|---|
| .75 ● Red | 30 | 15 | 0.64 | 0.55 | 0.63 |
| | **40** | **16** | **0.75** | **0.56** | **0.65** |
| | 50 | 17 | 0.85 | 0.57 | 0.65 |
| 1.0 ● Red | 30 | 18 | 0.85 | 0.51 | 0.58 |
| | **40** | **19** | **1.0** | **0.53** | **0.62** |
| | 50 | 19 | 1.1 | 0.59 | 0.68 |
| 1.5 ● Red | 30 | 21 | 1.3 | 0.57 | 0.66 |
| | **40** | **22** | **1.5** | **0.60** | **0.69** |
| | 50 | 22 | 1.7 | 0.68 | 0.78 |
| 2.0 ● Red | 30 | 24 | 1.7 | 0.57 | 0.66 |
| | **40** | **25** | **2.0** | **0.62** | **0.71** |
| | 50 | 25 | 2.3 | 0.71 | 0.82 |
| 2.5 ● Red | 30 | 27 | 2.2 | 0.58 | 0.67 |
| | **40** | **28** | **2.5** | **0.61** | **0.71** |
| | 50 | 28 | 2.8 | 0.69 | 0.79 |
| 3.0 ● Red | 30 | 30 | 2.5 | 0.53 | 0.62 |
| | **40** | **31** | **3.0** | **0.60** | **0.69** |
| | 50 | 31 | 3.4 | 0.68 | 0.79 |
| 4.0 ● Red | 30 | 33 | 3.7 | 0.65 | 0.76 |
| | **40** | **34** | **4.0** | **0.67** | **0.77** |
| | 50 | 34 | 4.3 | 0.72 | 0.83 |
| 5.0 ● Red | 30 | 36 | 4.7 | 0.70 | 0.81 |
| | **40** | **37** | **5.0** | **0.70** | **0.81** |
| | 50 | 37 | 5.3 | 0.75 | 0.86 |

**Bold** = Recommended pressure

**Note:**
All precipitation rates calculated for 180° operation. For the precipitation rate for a 360° sprinkler, divide by 2.

**PGJ NOZZLES**



# SRM

*Radius:* **15' to 30'**
*Flow:* **0.42 to 3.4 GPM**

*The SRM is an economical short-range rotor that offers a convenient and efficient alternative to spray heads.*

## KEY BENEFITS

- Adjustable arc from 40° to 360° to keep water in the appropriate areas
- Standard factory-installed 2.0 nozzle speeds installation
- Through-the-top arc adjustment for easy installation
- QuickCheck™ arc mechanism for fast arc adjustment

## OPERATING SPECIFICATIONS

- Nozzle choices: 6
- Radius: 15' to 30'
- Flow: 0.42 to 3.4 GPM
- Recommended pressure range: 30 to 50 PSI
- Operating pressure range: 20 to 100 PSI
- Precipitation rate: 0.6 in/hr approximately
- Nozzle trajectory: 14° approximately
- Warranty period: 2 years

## USER-INSTALLED OPTIONS

- Drain check valve (up to 7' of elevation) (P/N 462078SP)

**SRM**

| Model | Description |
|---|---|
| SRM-04 | 4" pop-up, adjustable arc, 6 standard nozzles |

**SRM NOZZLES**

SRM

**SRM-04**
Overall height: 6⅝"
Pop-up height: 4"
Exposed diameter: 1⅛"
Inlet size: ½"

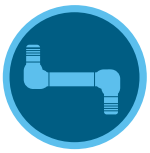
**SRM GREEN NOZZLE PERFORMANCE DATA**

| Nozzle | Pressure PSI | Radius ft. | Flow GPM | Precip in/hr ■ | Precip in/hr ▲ |
|---|---|---|---|---|---|
| .50 ● Dk. Green | 30 | 15 | 0.42 | 0.36 | 0.41 |
| | **40** | **16** | **0.50** | **0.38** | **0.43** |
| | 50 | 17 | 0.58 | 0.39 | 0.45 |
| .75 ● Dk. Green | 30 | 15 | 0.42 | 0.36 | 0.41 |
| | **40** | **16** | **0.50** | **0.38** | **0.43** |
| | 50 | 17 | 0.58 | 0.39 | 0.45 |
| 1.0 ● Dk. Green | 30 | 19 | 0.85 | 0.45 | 0.52 |
| | **40** | **20** | **1.0** | **0.48** | **0.56** |
| | 50 | 20 | 1.1 | 0.53 | 0.61 |
| 1.5 ● Dk. Green | 30 | 23 | 1.3 | 0.47 | 0.55 |
| | **40** | **24** | **1.5** | **0.50** | **0.58** |
| | 50 | 25 | 1.7 | 0.52 | 0.60 |
| 2.0 ● Dk. Green | 30 | 25 | 1.7 | 0.52 | 0.60 |
| | **40** | **26** | **2.0** | **0.57** | **0.66** |
| | 50 | 27 | 2.3 | 0.61 | 0.70 |
| 3.0 ● Dk. Green | 30 | 28 | 2.5 | 0.61 | 0.71 |
| | **40** | **30** | **3.0** | **0.64** | **0.74** |
| | 50 | 30 | 3.4 | 0.73 | 0.84 |

**Bold** = Recommended pressure

**Note:**
All precipitation rates calculated for 180° operation. For the precipitation rate for a 360° sprinkler, divide by 2.

*Compatible with:*



***½" Swing Joints***
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***Hunter Flex SG***
*Page 62*

# PGP®

*Radius:* **22' to 52'**
*Flow:* **0.5 to 14.1 GPM**

*As Hunter's original rotor, the PGP delivers unsurpassed reliability, durability, versatility, and value, keeping it the professional's choice year after year.*

## KEY BENEFITS

- Three types of nozzles available for various landscapes: standard red, standard blue, gray low-angle
- Adjustable arc from 40° to 360° to keep water in the appropriate areas
- Factory-installed rubber cover for safety
- Through-the-top arc adjustment for easy installation
- QuickCheck™ arc mechanism for fast arc adjustment

## OPERATING SPECIFICATIONS

- Nozzle choices: 27
- Radius: 22' to 52'
- Flow: 0.5 to 14.1 GPM
- Recommended pressure range: 25 to 70 PSI
- Operating pressure range: 20 to 100 PSI
- Precipitation rate: 0.4 in/hr approximately
- Nozzle trajectory: standard = 25°, low-angle = 13°
- Warranty period: 2 years

## FACTORY-INSTALLED OPTIONS

- Red #5–#8 nozzle; Blue #1.5–4.0

## USER-INSTALLED OPTIONS

- Drain check valve (up to 3' of elevation) (P/N 142300SP)

**PGP-ADJ**
Overall height: 7⅜"
Pop-up height: 4"
Exposed diameter: 1¾"
Inlet size: ¾"

**PGP-ADJ – SPECIFICATION BUILDER:** ORDER 1 + 2 + 3

| 1 Model | 2 Standard Features | 3 Feature Options |
|---|---|---|
| **PGP-ADJ-B** = 4" pop-up | Adjustable arc with blue nozzle rack | **1.5 to 4.0** = Factory-installed blue nozzle number |
| **PGP-ADJ** = 4" pop-up | Adjustable arc with red nozzle rack | **#5 to #8** = Factory-installed red nozzle number |

**Examples:**
**PGP-ADJ** = 4" pop-up, adjustable arc
**PGP-ADJ-B-3.0** = 4" pop-up, adjustable arc, and 3.0 blue nozzle
**PGP-ADJ-07** = 4" pop-up, adjustable arc, and #7 red nozzle

**PGP Red Standard Nozzle**

**PGP GRAY LOW-ANGLE NOZZLE PERFORMANCE DATA**

| Nozzle | Pressure PSI | Radius ft. | Flow GPM | Precip in/hr ■ | Precip in/hr ▲ |
|---|---|---|---|---|---|
| 4LA ● Gray | 30 | 22 | 1.4 | 0.56 | 0.64 |
| | 40 | 24 | 1.7 | 0.57 | 0.66 |
| | **50** | **26** | **1.8** | **0.51** | **0.59** |
| | 60 | 28 | 2.0 | 0.49 | 0.57 |
| 5LA ● Gray | 30 | 25 | 1.6 | 0.49 | 0.57 |
| | 40 | 27 | 1.9 | 0.50 | 0.58 |
| | **50** | **28** | **2.1** | **0.52** | **0.60** |
| | 60 | 30 | 2.3 | 0.49 | 0.57 |
| 6LA ● Gray | 30 | 27 | 2.1 | 0.55 | 0.64 |
| | 40 | 30 | 2.5 | 0.53 | 0.62 |
| | **50** | **33** | **2.8** | **0.49** | **0.57** |
| | 60 | 35 | 3.0 | 0.47 | 0.54 |
| 7LA ● Gray | 30 | 29 | 2.8 | 0.64 | 0.74 |
| | 40 | 32 | 3.1 | 0.58 | 0.67 |
| | **50** | **35** | **3.5** | **0.55** | **0.64** |
| | 60 | 37 | 3.8 | 0.53 | 0.62 |
| 8LA ● Gray | 30 | 31 | 3.4 | 0.68 | 0.79 |
| | 40 | 34 | 3.9 | 0.65 | 0.75 |
| | **50** | **37** | **4.4** | **0.62** | **0.71** |
| | 60 | 38 | 4.7 | 0.63 | 0.72 |
| 9LA ● Gray | 30 | 33 | 4.3 | 0.76 | 0.88 |
| | 40 | 37 | 5.0 | 0.70 | 0.81 |
| | **50** | **40** | **5.6** | **0.67** | **0.78** |
| | 60 | 42 | 6.1 | 0.67 | 0.77 |
| 10LA ● Gray | 40 | 38 | 6.5 | 0.87 | 1.00 |
| | 50 | 40 | 7.3 | 0.88 | 1.01 |
| | **60** | **42** | **8.0** | **0.87** | **1.01** |
| | 70 | 44 | 8.6 | 0.86 | 0.99 |

**Bold** = Recommended pressure

**Note:**
All precipitation rates calculated for 180° operation. For the precipitation rate for a 360° sprinkler, divide by 2.

## PGP® RED NOZZLE PERFORMANCE DATA

| Nozzle | Pressure PSI | Radius ft. | Flow GPM | Precip in/hr ■ | Precip in/hr ▲ |
|---|---|---|---|---|---|
| 1 ● Red | 30 | 28 | 0.5 | 0.12 | 0.14 |
| | 40 | 29 | 0.6 | 0.14 | 0.16 |
| | **50** | **29** | **0.7** | **0.16** | **0.19** |
| | 60 | 30 | 0.8 | 0.17 | 0.20 |
| 2 ● Red | 30 | 29 | 0.7 | 0.16 | 0.19 |
| | 40 | 30 | 0.8 | 0.17 | 0.20 |
| | **50** | **30** | **0.9** | **0.19** | **0.22** |
| | 60 | 31 | 1.0 | 0.20 | 0.23 |
| 3 ● Red | 30 | 30 | 0.9 | 0.19 | 0.22 |
| | 40 | 31 | 1.0 | 0.20 | 0.23 |
| | **50** | **31** | **1.2** | **0.24** | **0.28** |
| | 60 | 32 | 1.3 | 0.24 | 0.28 |
| 4 ● Red | 30 | 32 | 1.2 | 0.23 | 0.26 |
| | 40 | 33 | 1.4 | 0.25 | 0.29 |
| | **50** | **34** | **1.6** | **0.27** | **0.31** |
| | 60 | 34 | 1.8 | 0.30 | 0.35 |
| 5 ● Red | 30 | 32 | 1.6 | 0.30 | 0.35 |
| | 40 | 36 | 1.8 | 0.27 | 0.31 |
| | **50** | **38** | **2.0** | **0.27** | **0.31** |
| | 60 | 38 | 2.2 | 0.29 | 0.34 |
| 6 ● Red | 30 | 34 | 2.0 | 0.33 | 0.38 |
| | 40 | 36 | 2.4 | 0.36 | 0.41 |
| | **50** | **38** | **2.7** | **0.36** | **0.42** |
| | 60 | 38 | 2.9 | 0.39 | 0.45 |
| 7 ● Red | 30 | 34 | 2.6 | 0.43 | 0.50 |
| | 40 | 38 | 3.0 | 0.40 | 0.46 |
| | **50** | **40** | **3.4** | **0.41** | **0.47** |
| | 60 | 40 | 3.7 | 0.45 | 0.51 |
| 8 ● Red | 30 | 37 | 3.2 | 0.45 | 0.52 |
| | 40 | 39 | 3.7 | 0.47 | 0.54 |
| | **50** | **41** | **3.9** | **0.45** | **0.52** |
| | 60 | 42 | 4.6 | 0.50 | 0.58 |
| 9 ● Red | 30 | 38 | 3.6 | 0.48 | 0.55 |
| | 40 | 41 | 4.3 | 0.49 | 0.57 |
| | **50** | **44** | **5.2** | **0.52** | **0.60** |
| | 60 | 45 | 5.5 | 0.52 | 0.60 |
| 10 ● Red | 40 | 44 | 6.0 | 0.60 | 0.69 |
| | **50** | **46** | **6.8** | **0.62** | **0.71** |
| | 60 | 47 | 7.6 | 0.66 | 0.76 |
| | 70 | 49 | 8.2 | 0.66 | 0.76 |
| 11 ● Red | 40 | 46 | 8.0 | 0.73 | 0.84 |
| | **50** | **48** | **8.9** | **0.74** | **0.86** |
| | 60 | 50 | 9.8 | 0.75 | 0.87 |
| | 70 | 51 | 10.5 | 0.78 | 0.90 |
| 12 ● Red | 40 | 46 | 10.5 | 0.96 | 1.10 |
| | **50** | **48** | **11.9** | **0.99** | **1.15** |
| | 60 | 50 | 12.7 | 0.98 | 1.13 |
| | 70 | 52 | 14.1 | 1.00 | 1.16 |

**Bold** = Recommended pressure

**Note:**
All precipitation rates calculated for 180° operation. For the precipitation rate for a 360° sprinkler, divide by 2.

## PGP BLUE NOZZLE PERFORMANCE DATA

| Nozzle | Pressure PSI | Radius ft. | Flow GPM | Precip in/hr ■ | Precip in/hr ▲ |
|---|---|---|---|---|---|
| 1.5 ● Blue | 25 | 29 | 1.2 | 0.27 | 0.32 |
| | 35 | 31 | 1.4 | 0.28 | 0.32 |
| | **45** | **31** | **1.5** | **0.30** | **0.35** |
| | 55 | 32 | 1.8 | 0.34 | 0.39 |
| | 65 | 32 | 1.9 | 0.36 | 0.41 |
| 2.0 ● Blue | 25 | 33 | 1.4 | 0.25 | 0.29 |
| | 35 | 33 | 1.7 | 0.30 | 0.35 |
| | **45** | **34** | **2.0** | **0.33** | **0.38** |
| | 55 | 34 | 2.1 | 0.35 | 0.40 |
| | 65 | 32 | 2.3 | 0.43 | 0.50 |
| 2.5 ● Blue | 25 | 33 | 1.7 | 0.30 | 0.35 |
| | 35 | 35 | 2.1 | 0.33 | 0.38 |
| | **45** | **35** | **2.5** | **0.39** | **0.45** |
| | 55 | 35 | 2.6 | 0.41 | 0.47 |
| | 65 | 35 | 2.9 | 0.46 | 0.53 |
| 3.0 ● Blue | 25 | 35 | 2.2 | 0.35 | 0.40 |
| | 35 | 36 | 2.7 | 0.40 | 0.46 |
| | **45** | **38** | **3.0** | **0.40** | **0.46** |
| | 55 | 39 | 3.4 | 0.43 | 0.50 |
| | 65 | 39 | 3.7 | 0.47 | 0.54 |
| 4.0 ● Blue | 25 | 37 | 3.0 | 0.42 | 0.49 |
| | 35 | 39 | 3.5 | 0.44 | 0.51 |
| | **45** | **40** | **4.0** | **0.48** | **0.56** |
| | 55 | 41 | 4.5 | 0.52 | 0.60 |
| | 65 | 41 | 4.8 | 0.55 | 0.63 |
| 5.0 ● Blue | 25 | 37 | 3.7 | 0.52 | 0.60 |
| | 35 | 39 | 4.5 | 0.57 | 0.66 |
| | **45** | **42** | **5.0** | **0.55** | **0.63** |
| | 55 | 42 | 5.7 | 0.62 | 0.72 |
| | 65 | 42 | 6.2 | 0.68 | 0.78 |
| 6.0 ● Blue | 25 | 38 | 4.3 | 0.57 | 0.66 |
| | 35 | 40 | 5.6 | 0.67 | 0.78 |
| | **45** | **43** | **6.0** | **0.62** | **0.72** |
| | 55 | 44 | 6.7 | 0.67 | 0.77 |
| | 65 | 44 | 7.3 | 0.73 | 0.84 |
| 8.0 ● Blue | 25 | 37 | 6.0 | 0.84 | 0.97 |
| | 35 | 41 | 7.0 | 0.80 | 0.93 |
| | **45** | **44** | **8.0** | **0.80** | **0.92** |
| | 55 | 46 | 9.0 | 0.82 | 0.95 |
| | 65 | 46 | 9.8 | 0.89 | 1.03 |

## PGP NOZZLES

Red (P/N 130900)

Blue (P/N 665300)

Gray (P/N 233200)

**PGP-ADJ**

*Easy arc and radius adjustment*

# PGP® ULTRA

*Radius:* **17' to 47'**
*Flow:* **0.36 to 14.8 GPM**

*The PGP Ultra raises the bar for rotor technology with powerful features developed over three decades of research, customer feedback, and lab testing.*

## KEY BENEFITS

- Patented automatic arc return feature returns the turret back to the original arc pattern if vandalized; adjustable arc from 50° to 360°
- Non-strippable drive mechanism is protected from damage if turned in the opposite direction of travel
- Part- and full-circle in one model for flexibility across landscapes and reduced inventory
- Headed and slotted setscrew allows radius adjustment with a Hunter wrench or flat-blade screwdriver
- Flat-top nozzles allow fast, easy insertion
- QuickCheck™ arc mechanism for fast arc adjustment

## OPERATING SPECIFICATIONS

- Nozzle choices: 34
- Radius: 17' to 47'
- Flow: 0.36 to 14.8 GPM
- Recommended pressure range: 25 to 70 PSI
- Operating pressure range: 20 to 100 PSI
- Precipitation rate: 0.4 in/hr approximately
- Nozzle trajectory: standard = 25°, low-angle = 13°
- Nozzle racks: 1.5 to 8.0 blue, 2.0 to 4.5 low-angle gray, 0.50 to 3.0 black, 6.0 to 13.0 green, MPR-25, MPR-30, MPR-35
- Warranty period: 5 years

## FACTORY-INSTALLED OPTIONS

- Drain check valve (up to 10' of elevation)
- Reclaimed water ID
- Blue #1.5–4.0 nozzles

## USER-INSTALLED OPTIONS

- Drain check valve (up to 3' of elevation) PGP-04 only (P/N 142300SP)
- HSJ-0 prefabricated ¾" PVC swing joint

**PGP-00**
Overall height: 7½"
Exposed diameter: 1¾"
Inlet size: ¾"

**PGP-04**
Overall height: 7½"
Pop-up height: 4"
Exposed diameter: 1¾"
Inlet size: ¾"

**PGP-12**
Overall height: 17"
Pop-up height: 12"
Exposed diameter: 1¾"
Inlet size: ¾"

**PGP Ultra Reclaimed**
*Available as a factory-installed option on all models*

**PGP Ultra**
*Easy arc and radius adjustment*

**PGP-ULTRA – SPECIFICATION BUILDER:** ORDER 1 + 2 + 3 + 4

| 1 Model | 2 Standard Features | 3 Feature Options | 4 Nozzle Options |
|---|---|---|---|
| **PGP-00** = Shrub<br>**PGP-04** = 4" pop-up<br>**PGP-12** = 12" pop-up | Adjustable arc, plastic riser, 8 standard nozzles, and 4 low-angle nozzles | **(blank)** = No option<br>**CV** = Drain check valve<br>**CV-R** = Drain check valve and reclaimed water ID | **Blue 1.5–8.0**<br>**Gray low-angle**<br>**Black short-radius**<br>**Green high-flow**<br>**MPR-25-Q, T, H, F**<br>**MPR-30-Q, T, H, F**<br>**MPR-35-Q, T, H, F**<br>**1.5 to 4.0** = Only nozzles 1.5–4.0 can be factory-installed |

**Examples:**
**PGP-04** = 4" pop-up, adjustable arc
**PGP-04-2.5** = 4" pop-up, adjustable arc, and 2.5 nozzle
**PGP-12-CV-R-4.0** = 12" pop-up, adjustable arc, with drain check valve and reclaimed water ID, and 4.0 nozzle

# I-20

*Radius:* **17' to 46'**
*Flow:* **0.36 to 14.8 GPM**

*The I-20 is loaded with upgraded features such as FloStop control, check valves, and efficient nozzles that make it the perfect choice in a range of applications.*



## KEY BENEFITS

- Patented automatic arc return feature returns the turret back to the original arc pattern if vandalized; adjustable arc from 50° to 360°
- Non-strippable drive mechanism is protected from damage if turned in the opposite direction of travel
- Part- and full-circle in one model for flexibility across landscapes and reduced inventory
- Headed and slotted setscrew allows radius adjustment with a Hunter wrench or flat-blade screwdriver
- FloStop® closes the flow of water from individual sprinklers to change the nozzle or perform repairs
- Flat-top nozzles allow fast, easy insertion
- QuickCheck™ arc mechanism for fast arc adjustment
- Available stainless steel riser for extra durability
- Drain check valve prevents low-head drainage (up to 10' of elevation)

## OPERATING SPECIFICATIONS

- Nozzle choices: 34
- Radius: 17' to 47'
- Flow: 0.36 to 14.8 GPM
- Recommended pressure range: 25 to 70 PSI
- Operating pressure range: 20 to 100 PSI
- Precipitation rate: 0.4 in/hr approximately
- Nozzle trajectory: standard = 25°, low-angle = 13°
- Nozzle racks: 1.5 to 8.0 blue, 2.0 to 4.5 low-angle gray, 0.50 to 3.0 black, 6.0 to 13.0 green, MPR-25, MPR-30, MPR-35
- Warranty period: 5 years

## FACTORY-INSTALLED OPTIONS

- No drain check valve (NCV models)
- Reclaimed water ID
- Blue #1.5–4.0 nozzles

## USER-INSTALLED OPTIONS

- HSJ-0 prefabricated ¾" PVC swing joint

**I-20 (PLASTIC) – SPECIFICATION BUILDER:** ORDER 1 + 2 + 3 + 4

| 1 Model | 2 Standard Features | 3 Feature Options | 4 Nozzle Options |
|---|---|---|---|
| **I-20-00** = Shrub<br>**I-20-04** = 4" pop-up<br>**I-20-06** = 6" pop-up<br>**I-20-12** = 12" pop-up | Adjustable arc, plastic riser, check valve, 8 standard nozzles, and 4 low-angle nozzles | **(blank)** = No option<br>**NCV** = Without check valve *(only available on 4" model)*<br>**R** = Drain check valve and reclaimed water ID | **Blue 1.5–8.0**<br>**Gray low-angle**<br>**Black short-radius**<br>**Green high-flow**<br>**MPR-25-Q, T, H, F**<br>**MPR-30-Q, T, H, F**<br>**MPR-35-Q, T, H, F**<br>**1.5 to 4.0** = Only nozzles 1.5–4.0 can be factory-installed |

**I-20 (STAINLESS STEEL) – SPECIFICATION BUILDER:** ORDER 1 + 2 + 3 + 4

| 1 Model | 2 Standard Features | 3 Feature Options | 4 Nozzle Options |
|---|---|---|---|
| **I-20-04-SS** = 4" pop-up<br>**I-20-06-SS** = 6" pop-up | Adjustable arc, stainless steel riser, check valve, 8 standard nozzles, and 4 low-angle nozzles | **(blank)** = No option<br>**NCV** = Without check valve *(only available on 4" model)*<br>**R** = Drain check valve and reclaimed water ID | **Blue 1.5–8.0**<br>**Gray low-angle**<br>**Black short-radius**<br>**Green high-flow**<br>**MPR-25-Q, T, H, F**<br>**MPR-30-Q, T, H, F**<br>**MPR-35-Q, T, H, F**<br>**1.5 to 4.0** = Only nozzles 1.5–4.0 can be factory-installed |

**Example:**
**I-20-12-R-4.0** = 12" pop-up, adjustable arc, with reclaimed water ID, and 4.0 nozzle

**I-20-00**
Overall height: 7¾"
Exposed diameter: 1¾"
Inlet size: ¾"

**I-20-04**
Overall height: 7⅛"
Pop-up height: 4"
Exposed diameter: 1¾"
Inlet size: ¾"

**I-20-06**
Overall height: 9⅞"
Pop-up height: 6"
Exposed diameter: 1¾"
Inlet size: ¾"

**I-20-12**
Overall height: 17"
Pop-up height: 12"
Exposed diameter: 1¾"
Inlet size: ¾"

**I-20 Reclaimed**
*Available as a factory-installed option on all models*

# PGP® ULTRA & I-20 PRB

*Radius:* **17' to 46'**
*Flow:* **0.36 to 9.8 GPM**

*The PGP Ultra and I-20 PRB are built to thrive in applications where high water pressure could otherwise lead to inefficient nozzle operation.*

## KEY BENEFITS

- Pressure-regulated body (45 PSI) reduces high incoming pressure to increase nozzle efficiency
- Patented automatic arc return feature returns the turret back to the original arc pattern if vandalized; adjustable arc from 50° to 360°
- Non-strippable drive mechanism is protected from damage if turned in the opposite direction of travel
- Part- and full-circle in one model for flexibility across landscapes and reduced inventory
- Headed and slotted setscrew allows radius adjustment with a Hunter wrench or flat-blade screwdriver
- FloStop® closes the flow of water from individual sprinklers, to change the nozzle or perform repairs (I-20 only)
- Flat-top nozzles allow fast, easy insertion
- QuickCheck™ arc mechanism for fast arc adjustment
- Available stainless steel riser for extra durability
- Drain check valve prevents low-head drainage (up to 10' of elevation)

## OPERATING SPECIFICATIONS

- Nozzle choices: 30
- Radius: 17' to 46'
- Flow: 0.36 to 9.8 GPM
- Nozzle discharge pressure: 45 PSI
- Operating pressure range: 20 to 100 PSI
- Precipitation rate: 0.4 in/hr approximately
- Nozzle trajectory: standard = 25°, low-angle = 13°
- Nozzle racks: 1.5 to 8.0 blue, 2.0 to 4.5 low-angle gray, 0.50 to 3.0 black, MPR-25, MPR-30, MPR-35
- Warranty period: 5 years

## FACTORY-INSTALLED OPTIONS

- Reclaimed water ID
- Blue #1.5–4.0 nozzles

## USER-INSTALLED OPTIONS

- HSJ-0 prefabricated ¾" PVC swing joint

**PGP-ULTRA & I-20 PRB – SPECIFICATION BUILDER:** ORDER 1 + 2 + 3 + 4

| 1 Model | 2 Standard Features | 3 Feature Options | 4 Nozzle Options |
|---|---|---|---|
| **PGP-00-PRB** = Riser mount<br>**PGP-04-PRB** = 4" pop-up | Adjustable arc, plastic riser, pressure-regulated body, 8 standard nozzles, and 4 low-angle nozzles | **(blank)** = No option<br>**CV** = Drain check valve (PGP-04 only)<br>**CV-R** = Drain check valve and reclaimed water ID | **Blue 1.5–8.0** = Factory-installed nozzle number<br>**Gray low-angle**<br>**Black short-radius**<br>**MPR-25, 30, 35 - Q, T, H, F** |
| **I-20-00-PRB** = Shrub<br>**I-20-04-PRB** = 4" pop-up<br>**I-20-06-PRB** = 6" pop-up | Adjustable arc, plastic riser, pressure-regulated body, 8 standard nozzles, and 4 low-angle nozzles | **(blank)** = No option<br>**R** = Drain check valve and reclaimed water ID | **Blue 1.5–8.0** = Factory-installed nozzle number<br>**Gray low-angle**<br>**Black short-radius**<br>**MPR-25, 30, 35 - Q, T, H, F** |
| **I-20-04-SS-PRB** = 4" pop-up<br>**I-20-06-SS-PRB** = 6" pop-up | Adjustable arc, stainless steel riser, pressure-regulated body, 8 standard nozzles, and 4 low-angle nozzles | **(blank)** = No option<br>**R** = Drain check valve and reclaimed water ID | **Blue 1.5–8.0** = Factory-installed nozzle number<br>**Gray low-angle**<br>**Black short-radius**<br>**MPR-25, 30, 35 - Q, T, H, F** |

**Examples:**
**PGP-04-PRB** = 4" pop-up, adjustable arc, plastic riser with no factory installed-nozzle
**I-20-04-PRB-3.0-2.5** = 4" pop-up, adjustable arc, plastic riser with 3.0 nozzle
**I-20-06-SS-PRB-R-MPR-25H** = 6" pop-up, adjustable arc, stainless steel riser with MPR-25H

**PGP-00-PRB**
Overall height: 8⅝"
Exposed diameter: 1¼"
Inlet size: ¾"

**PGP-04-PRB**
Overall height: 8¼"
Pop-up height: 4"
Exposed diameter: 1¾"
Inlet size: ¾"

**I-20-00-PRB**
Overall height: 8⅝"
Exposed diameter: 1¼"
Inlet size: ¾"

**I-20-04-PRB**
Overall height: 8¼"
Pop-up height: 4"
Exposed diameter: 1¾"
Inlet size: ¾"

**I-20-06-PRB**
Overall height: 10⅝"
Pop-up height: 6"
Exposed diameter: 1¾"
Inlet size: ¾"

## PGP ULTRA / I-20 / PRB BLUE STANDARD NOZZLE PERFORMANCE DATA

| Nozzle | Pressure PSI | Radius ft. | Flow GPM | Precip in/hr ■ | Precip in/hr ▲ |
|---|---|---|---|---|---|
| 1.5 ● Blue | 25 | 29 | 1.2 | 0.27 | 0.32 |
| | 35 | 31 | 1.4 | 0.28 | 0.32 |
| | **45** | **31** | **1.5** | **0.30** | **0.35** |
| | 55 | 32 | 1.8 | 0.34 | 0.39 |
| | 65 | 32 | 1.9 | 0.36 | 0.41 |
| 2.0 ● Blue | 25 | 33 | 1.4 | 0.25 | 0.29 |
| | 35 | 33 | 1.7 | 0.30 | 0.35 |
| | **45** | **34** | **2.0** | **0.33** | **0.38** |
| | 55 | 34 | 2.1 | 0.35 | 0.40 |
| | 65 | 32 | 2.3 | 0.43 | 0.50 |
| 2.5 ● Blue | 25 | 33 | 1.7 | 0.30 | 0.35 |
| | 35 | 35 | 2.1 | 0.33 | 0.38 |
| | **45** | **35** | **2.5** | **0.39** | **0.45** |
| | 55 | 35 | 2.6 | 0.41 | 0.47 |
| | 65 | 35 | 2.9 | 0.46 | 0.53 |
| 3.0 ● Blue | 25 | 35 | 2.2 | 0.35 | 0.40 |
| | 35 | 36 | 2.7 | 0.40 | 0.46 |
| | **45** | **38** | **3.0** | **0.40** | **0.46** |
| | 55 | 39 | 3.4 | 0.43 | 0.50 |
| | 65 | 39 | 3.7 | 0.47 | 0.54 |
| 4.0 ● Blue | 25 | 37 | 3.0 | 0.42 | 0.49 |
| | 35 | 39 | 3.5 | 0.44 | 0.51 |
| | **45** | **40** | **4.0** | **0.48** | **0.56** |
| | 55 | 41 | 4.5 | 0.52 | 0.60 |
| | 65 | 41 | 4.8 | 0.55 | 0.63 |
| 5.0 ● Blue | 25 | 37 | 3.7 | 0.52 | 0.60 |
| | 35 | 39 | 4.5 | 0.57 | 0.66 |
| | **45** | **42** | **5.0** | **0.55** | **0.63** |
| | 55 | 42 | 5.7 | 0.62 | 0.72 |
| | 65 | 42 | 6.2 | 0.68 | 0.78 |
| 6.0 ● Blue | 25 | 38 | 4.3 | 0.57 | 0.66 |
| | 35 | 40 | 5.6 | 0.67 | 0.78 |
| | **45** | **43** | **6.0** | **0.62** | **0.72** |
| | 55 | 44 | 6.7 | 0.67 | 0.77 |
| | 65 | 44 | 7.3 | 0.73 | 0.84 |
| 8.0 ● Blue | 25 | 37 | 6.0 | 0.84 | 0.97 |
| | 35 | 41 | 7.0 | 0.80 | 0.93 |
| | **45** | **44** | **8.0** | **0.80** | **0.92** |
| | 55 | 46 | 9.0 | 0.82 | 0.95 |
| | 65 | 46 | 9.8 | 0.89 | 1.03 |

## PGP ULTRA / I-20 / PRB GRAY LOW-ANGLE NOZZLE PERFORMANCE DATA

| Nozzle | Pressure PSI | Radius ft. | Flow GPM | Precip in/hr ■ | Precip in/hr ▲ |
|---|---|---|---|---|---|
| 2.0 LA ● Gray | 30 | 25 | 1.6 | 0.49 | 0.57 |
| | 40 | 27 | 1.9 | 0.50 | 0.58 |
| | **50** | **28** | **2.1** | **0.52** | **0.60** |
| | 60 | 30 | 2.3 | 0.49 | 0.57 |
| 2.5 LA ● Gray | 30 | 27 | 2.1 | 0.55 | 0.64 |
| | 40 | 30 | 2.5 | 0.53 | 0.62 |
| | **50** | **33** | **2.8** | **0.49** | **0.57** |
| | 60 | 35 | 3.0 | 0.47 | 0.54 |
| 3.5 LA ● Gray | 30 | 29 | 2.8 | 0.64 | 0.74 |
| | 40 | 32 | 3.1 | 0.58 | 0.67 |
| | **50** | **35** | **3.5** | **0.55** | **0.64** |
| | 60 | 37 | 3.8 | 0.53 | 0.62 |
| 4.5 LA ● Gray | 30 | 29 | 3.4 | 0.78 | 0.90 |
| | 40 | 32 | 3.9 | 0.73 | 0.85 |
| | **50** | **35** | **4.4** | **0.69** | **0.80** |
| | 60 | 37 | 4.7 | 0.66 | 0.76 |

**Bold** = Recommended pressure

**Note:**
All precipitation rates calculated for 180° operation.
For the precipitation rate for a 360° sprinkler, divide by 2.

### Convenient Nozzle Rack

## PGP ULTRA / I-20 / PRB NOZZLES

Blue Standard / Gray Low-Angle (P/N 782900)

Flat-top nozzle for easy insertion coupled with a headed slotted adjustment screw for quick radius adjustment with a Hunter wrench or a flat-blade screwdriver.

*Flat-front nozzle allows easy alignment during installation.*

### I-20-04 with PRB Body

**Pressure Regulation**

*Continual operating pressure of 45 PSI*

**PR-075**

Overall height: 2¼"
Inlet/outlet size: ¾"
For use under all models ¾" inlet sprinklers, regulates to 45 PSI

## PGP ULTRA / I-20 GREEN HIGH-FLOW NOZZLE PERFORMANCE DATA

| Nozzle | Pressure PSI | Radius ft. | Flow GPM | Precip in/hr ■ | Precip in/hr ▲ |
|---|---|---|---|---|---|
| 10 ● Dk. Green | 40 | 42 | 8.4 | 0.92 | 1.06 |
| | 50 | 43 | 9.5 | 0.99 | 1.14 |
| | **60** | **45** | **10.5** | **1.00** | **1.15** |
| | 70 | 47 | 11.4 | 0.99 | 1.15 |
| 13 ● Dk. Green | 40 | 43 | 10.9 | 1.13 | 1.31 |
| | 50 | 44 | 12.3 | 1.22 | 1.41 |
| | **60** | **45** | **13.6** | **1.29** | **1.49** |
| | 70 | 47 | 14.8 | 1.29 | 1.49 |
| 6.0 LA ● Dk. Green | 30 | 31 | 4.2 | 0.84 | 0.97 |
| | 40 | 35 | 5.0 | 0.79 | 0.91 |
| | **50** | **37** | **5.8** | **0.82** | **0.94** |
| | 60 | 39 | 6.3 | 0.80 | 0.92 |
| 8.0 LA ● Dk. Green | 40 | 37 | 6.7 | 0.94 | 1.09 |
| | 50 | 39 | 7.7 | 0.97 | 1.13 |
| | **60** | **41** | **8.5** | **0.97** | **1.12** |
| | 70 | 41 | 9.2 | 1.05 | 1.22 |

I-20 with Blue Standard Nozzle

## PGP ULTRA / I-20 / PRB BLACK SHORT-RADIUS NOZZLE PERFORMANCE DATA (18'/25')

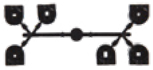
| Nozzle | Pressure PSI | Radius ft. | Flow GPM | Precip in/hr ■ | Precip in/hr ▲ |
|---|---|---|---|---|---|
| .50 SR ● Black | 30 | 17 | 0.36 | 0.24 | 0.28 |
| | 40 | 17 | 0.43 | 0.29 | 0.33 |
| | **50** | **18** | **0.50** | **0.30** | **0.34** |
| | 60 | 19 | 0.57 | 0.30 | 0.35 |
| 1.0 SR ● Black | 30 | 17 | 0.78 | 0.52 | 0.60 |
| | 40 | 17 | 0.90 | 0.60 | 0.69 |
| | **50** | **18** | **1.00** | **0.59** | **0.69** |
| | 60 | 19 | 1.10 | 0.59 | 0.68 |
| 2.0 SR ● Black | 30 | 17 | 1.40 | 0.93 | 1.08 |
| | 40 | 17 | 1.70 | 1.13 | 1.31 |
| | **50** | **18** | **2.00** | **1.19** | **1.37** |
| | 60 | 19 | 2.20 | 1.17 | 1.35 |
| .75 SR ● Black | 30 | 23 | 0.58 | 0.21 | 0.24 |
| | 40 | 24 | 0.68 | 0.23 | 0.26 |
| | **50** | **25** | **0.75** | **0.23** | **0.27** |
| | 60 | 26 | 0.83 | 0.24 | 0.27 |
| 1.5 SR ● Black | 30 | 23 | 1.10 | 0.40 | 0.46 |
| | 40 | 24 | 1.30 | 0.43 | 0.50 |
| | **50** | **25** | **1.50** | **0.46** | **0.53** |
| | 60 | 26 | 1.60 | 0.46 | 0.53 |
| 3.0 SR ● Black | 30 | 23 | 2.50 | 0.91 | 1.05 |
| | 40 | 24 | 2.70 | 0.90 | 1.04 |
| | **50** | **25** | **3.00** | **0.92** | **1.07** |
| | 60 | 26 | 3.10 | 0.88 | 1.02 |

**Bold** = Recommended pressure

**Note:**
All precipitation rates calculated for 180° operation. For the precipitation rate for a 360° sprinkler, divide by 2.

## PGP ULTRA / I-20 / PRB NOZZLES

Dk. Green High-Flow (P/N 444800)

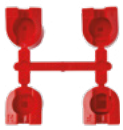


Black Short-Radius (P/N 466100)

## PGP® ULTRA / I-20 / PRB MPR-25 NOZZLE PERFORMANCE DATA

| Nozzle | Pressure PSI | Radius ft. | Flow GPM | Precip in/hr ■ | Precip in/hr ▲ |
|---|---|---|---|---|---|
| 90° | 25 | 23 | 0.74 | 0.54 | 0.62 |
| | 35 | 24 | 0.88 | 0.59 | 0.68 |
| | 45 | 25 | 1.00 | 0.62 | 0.71 |
| | 55 | 25 | 1.11 | 0.68 | 0.79 |
| | 65 | 25 | 1.21 | 0.75 | 0.86 |
| 120° | 25 | 23 | 1.00 | 0.55 | 0.63 |
| | 35 | 24 | 1.21 | 0.61 | 0.70 |
| | 45 | 25 | 1.38 | 0.64 | 0.74 |
| | 55 | 25 | 1.53 | 0.71 | 0.82 |
| | 65 | 25 | 1.67 | 0.77 | 0.89 |
| 180° | 25 | 23 | 1.44 | 0.52 | 0.61 |
| | 35 | 24 | 1.73 | 0.58 | 0.67 |
| | 45 | 25 | 1.98 | 0.61 | 0.70 |
| | 55 | 25 | 2.21 | 0.68 | 0.79 |
| | 65 | 25 | 2.41 | 0.74 | 0.86 |
| 360° | 25 | 23 | 2.78 | 0.51 | 0.58 |
| | 35 | 24 | 3.34 | 0.56 | 0.64 |
| | 45 | 25 | 3.82 | 0.59 | 0.68 |
| | 55 | 25 | 4.25 | 0.65 | 0.76 |
| | 65 | 25 | 4.63 | 0.71 | 0.82 |

**MPR-25 NOZZLE**



## PGP ULTRA / I-20 / PRB MPR-35 NOZZLE PERFORMANCE DATA

| Nozzle | Pressure PSI | Radius ft. | Flow GPM | Precip in/hr ■ | Precip in/hr ▲ |
|---|---|---|---|---|---|
| 90° | 25 | 32 | 1.40 | 0.53 | 0.61 |
| | 35 | 34 | 1.67 | 0.56 | 0.64 |
| | 45 | 35 | 1.92 | 0.60 | 0.70 |
| | 55 | 35 | 2.13 | 0.67 | 0.77 |
| | 65 | 35 | 2.31 | 0.73 | 0.84 |
| 120° | 25 | 32 | 1.77 | 0.50 | 0.58 |
| | 35 | 34 | 2.15 | 0.54 | 0.62 |
| | 45 | 35 | 2.46 | 0.58 | 0.67 |
| | 55 | 35 | 2.74 | 0.65 | 0.75 |
| | 65 | 35 | 2.99 | 0.70 | 0.81 |
| 180° | 25 | 32 | 2.75 | 0.52 | 0.60 |
| | 35 | 34 | 3.33 | 0.55 | 0.64 |
| | 45 | 35 | 3.81 | 0.60 | 0.69 |
| | 55 | 35 | 4.23 | 0.66 | 0.77 |
| | 65 | 35 | 4.62 | 0.73 | 0.84 |
| 360° | 25 | 32 | 5.36 | 0.50 | 0.58 |
| | 35 | 34 | 6.62 | 0.55 | 0.64 |
| | 45 | 35 | 7.58 | 0.60 | 0.69 |
| | 55 | 35 | 8.43 | 0.66 | 0.76 |
| | 65 | 35 | 9.18 | 0.72 | 0.83 |

**MPR-35 NOZZLE**

## PGP ULTRA / I-20 / PRB MPR-30 NOZZLE PERFORMANCE DATA

| Nozzle | Pressure PSI | Radius ft. | Flow GPM | Precip in/hr ■ | Precip in/hr ▲ |
|---|---|---|---|---|---|
| 90° | 25 | 29 | 1.03 | 0.47 | 0.54 |
| | 35 | 30 | 1.23 | 0.53 | 0.61 |
| | 45 | 30 | 1.40 | 0.60 | 0.69 |
| | 55 | 30 | 1.56 | 0.67 | 0.77 |
| | 65 | 30 | 1.69 | 0.72 | 0.83 |
| 120° | 25 | 29 | 1.34 | 0.46 | 0.53 |
| | 35 | 30 | 1.62 | 0.52 | 0.60 |
| | 45 | 30 | 1.85 | 0.59 | 0.69 |
| | 55 | 30 | 2.06 | 0.66 | 0.76 |
| | 65 | 30 | 2.24 | 0.72 | 0.83 |
| 180° | 25 | 29 | 2.15 | 0.49 | 0.57 |
| | 35 | 30 | 2.59 | 0.55 | 0.64 |
| | 45 | 30 | 2.96 | 0.63 | 0.73 |
| | 55 | 30 | 3.30 | 0.71 | 0.82 |
| | 65 | 30 | 3.60 | 0.77 | 0.89 |
| 360° | 25 | 29 | 4.24 | 0.49 | 0.56 |
| | 35 | 30 | 5.08 | 0.54 | 0.63 |
| | 45 | 30 | 5.78 | 0.62 | 0.71 |
| | 55 | 30 | 6.39 | 0.68 | 0.79 |
| | 65 | 30 | 6.92 | 0.74 | 0.85 |

**MPR-30 NOZZLE**

PGP-04 Ultra with MPR-30 Nozzle

# I-25

*Radius:* **37' to 71'**
*Flow:* **3.8 to 31.5 GPM**

*The reliable, durable, and versatile I-25 offers an expansive nozzle selection that makes it the perfect choice for large turf applications.*

## KEY BENEFITS

- Patented automatic arc return feature returns the turret back to the original arc pattern if vandalized; adjustable arc from 50° to 360°
- Non-strippable drive mechanism is protected from damage if turned in the opposite direction of travel
- Part- and full-circle in one model for installation flexibility and reduced inventory
- Color-coded nozzles make identification easy
- QuickCheck™ arc mechanism for fast arc adjustment
- Available stainless steel riser for extra durability
- Drain check valve prevents low-head drainage (up to 10' of elevation)

**I-25-04**
Overall height: 7⅞"
Pop-up height: 4"
Exposed diameter: 1¾"
Inlet size: 1"

## OPERATING SPECIFICATIONS

- Nozzle choices: 11
- Radius: 37' to 71'
- Flow: 3.8 to 31.5 GPM
- Recommended pressure range: 40 to 100 PSI
- Operating pressure range: 40 to 100 PSI
- Precipitation rates: 0.4 in/hr approximately
- Nozzle trajectory: standard = 25°
- Warranty period: 5 years

**I-25-06**
Overall height: 10¼"
Pop-up height: 6"
Exposed diameter: 1¾"
Inlet size: 1"

## FACTORY-INSTALLED OPTIONS

- Reclaimed water ID
- High-speed rotation

## USER-INSTALLED OPTIONS

- HSJ-1 prefabricated 1" PVC swing joint

**I-25 Reclaimed**
*Available as a factory-installed option on all models*

**I-25 High-Speed**
*Available as a factory-installed option on stainless steel models*

**I-25 (PLASTIC) - SPECIFICATION BUILDER:** ORDER 1 + 2 + 3 + 4

| 1 Model | 2 Standard Features | 3 Feature Options | 4 Nozzle Options |
|---|---|---|---|
| **I-25-04** = 4" pop-up<br>**I-25-06** = 6" pop-up | Adjustable arc, plastic riser, check valve, and 5 nozzles | **(blank)** = No option<br>**R** = Reclaimed water ID | **#4 to #28** = Factory-installed nozzle number |

**I-25 (STAINLESS STEEL) – SPECIFICATION BUILDER:** ORDER 1 + 2 + 3 + 4

| 1 Model | 2 Standard Features | 3 Feature Options | 4 Nozzle Options |
|---|---|---|---|
| **I-25-04-SS** = 4" pop-up<br>**I-25-06-SS** = 6" pop-up | Adjustable arc, stainless steel riser, check valve, and 5 nozzles | **(blank)** = No option<br>**R** = Reclaimed water ID<br>**HS** = High-speed<br>**HS-R** = High-speed and reclaimed water ID | **#4 to #28** = Factory-installed nozzle number |

**Examples:**
**I-25-04** = 4" pop-up, adjustable arc
**I-25-04-SS-R-18** = 4" pop-up, adjustable arc, stainless steel riser, reclaimed water ID, and #18 nozzle
**I-25-06-SS** = 6" pop-up, adjustable arc, stainless steel riser

## I-25 STANDARD NOZZLE PERFORMANCE DATA

| Nozzle | Pressure PSI | Radius ft. | Flow GPM | Precip in/hr ■ | Precip in/hr ▲ |
|---|---|---|---|---|---|
| 04 Yellow | 40 | 40 | 3.8 | 0.46 | 0.53 |
| | 50 | 41 | 4.3 | 0.49 | 0.57 |
| | 60 | 42 | 4.7 | 0.51 | 0.59 |
| | 70 | 43 | 5.1 | 0.53 | 0.61 |
| 07 Orange* | 40 | 45 | 6.6 | 0.63 | 0.72 |
| | 50 | 47 | 7.0 | 0.61 | 0.70 |
| | 60 | 48 | 7.5 | 0.63 | 0.72 |
| | 70 | 49 | 7.9 | 0.63 | 0.73 |
| 08 Lt. Brown | 40 | 47 | 7.7 | 0.67 | 0.77 |
| | 50 | 49 | 8.3 | 0.67 | 0.77 |
| | 60 | 50 | 9.2 | 0.71 | 0.82 |
| | 70 | 51 | 9.9 | 0.73 | 0.85 |
| 10 Lt. Green* | 50 | 51 | 10.1 | 0.75 | 0.86 |
| | 60 | 52 | 11.1 | 0.79 | 0.91 |
| | 70 | 53 | 12.1 | 0.83 | 0.96 |
| | 80 | 54 | 12.9 | 0.85 | 0.98 |
| 13 Lt. Blue | 50 | 53 | 11.2 | 0.77 | 0.89 |
| | 60 | 54 | 12.3 | 0.81 | 0.94 |
| | 70 | 55 | 13.3 | 0.85 | 0.98 |
| | 80 | 55 | 14.3 | 0.91 | 1.05 |
| 15 Gray* | 50 | 56 | 13.4 | 0.82 | 0.95 |
| | 60 | 57 | 14.3 | 0.85 | 0.98 |
| | 70 | 57 | 15.2 | 0.90 | 1.04 |
| | 80 | 58 | 16.4 | 0.94 | 1.08 |
| 18 Red | 50 | 58 | 14.5 | 0.83 | 0.96 |
| | 60 | 59 | 15.7 | 0.87 | 1.00 |
| | 70 | 62 | 16.9 | 0.85 | 0.98 |
| | 80 | 63 | 18.2 | 0.88 | 1.02 |
| 20 Dk. Brown* | 60 | 62 | 17.8 | 0.89 | 1.03 |
| | 70 | 63 | 19.2 | 0.93 | 1.08 |
| | 80 | 64 | 20.5 | 0.96 | 1.11 |
| | 90 | 65 | 21.8 | 0.99 | 1.15 |
| 23 Dk. Green | 60 | 64 | 21.9 | 1.03 | 1.19 |
| | 70 | 65 | 23.6 | 1.08 | 1.24 |
| | 80 | 66 | 25.6 | 1.13 | 1.31 |
| | 90 | 67 | 27.0 | 1.16 | 1.34 |
| 25 Dk. Blue* | 60 | 66 | 23.5 | 1.04 | 1.20 |
| | 70 | 68 | 25.5 | 1.06 | 1.23 |
| | 80 | 69 | 28.0 | 1.13 | 1.31 |
| | 90 | 70 | 29.5 | 1.16 | 1.34 |
| 28 Black | 70 | 68 | 26.9 | 1.12 | 1.29 |
| | 80 | 70 | 28.7 | 1.13 | 1.30 |
| | 90 | 71 | 30.6 | 1.17 | 1.35 |
| | 100 | 71 | 31.5 | 1.20 | 1.39 |

## I-25 HIGH-SPEED NOZZLE PERFORMANCE DATA

| Nozzle | Pressure PSI | Radius ft. | Flow GPM | Precip in/hr ■ | Precip in/hr ▲ |
|---|---|---|---|---|---|
| 04 Yellow | 40 | 37 | 3.8 | 0.53 | 0.62 |
| | 50 | 38 | 4.3 | 0.57 | 0.66 |
| | 60 | 38 | 4.7 | 0.63 | 0.72 |
| | 70 | 39 | 5.1 | 0.65 | 0.75 |
| 07 Orange* | 40 | 40 | 6.6 | 0.79 | 0.92 |
| | 50 | 41 | 7.0 | 0.80 | 0.93 |
| | 60 | 42 | 7.5 | 0.82 | 0.95 |
| | 70 | 44 | 7.9 | 0.79 | 0.91 |
| 08 Lt. Brown | 40 | 42 | 7.7 | 0.84 | 0.97 |
| | 50 | 43 | 8.3 | 0.86 | 1.00 |
| | 60 | 44 | 9.2 | 0.91 | 1.06 |
| | 70 | 45 | 9.9 | 0.94 | 1.09 |
| 10 Lt. Green* | 50 | 46 | 10.1 | 0.92 | 1.06 |
| | 60 | 48 | 11.1 | 0.93 | 1.07 |
| | 70 | 49 | 12.1 | 0.97 | 1.12 |
| | 80 | 50 | 12.9 | 0.99 | 1.15 |
| 13 Lt. Blue | 50 | 48 | 11.2 | 0.94 | 1.08 |
| | 60 | 49 | 12.3 | 0.99 | 1.14 |
| | 70 | 51 | 13.3 | 0.98 | 1.14 |
| | 80 | 51 | 14.3 | 1.06 | 1.22 |
| 15 Gray* | 50 | 49 | 13.4 | 1.07 | 1.24 |
| | 60 | 51 | 14.3 | 1.06 | 1.22 |
| | 70 | 53 | 15.2 | 1.04 | 1.20 |
| | 80 | 54 | 16.4 | 1.08 | 1.25 |
| 18 Red | 50 | 50 | 14.5 | 1.12 | 1.29 |
| | 60 | 53 | 15.7 | 1.08 | 1.24 |
| | 70 | 55 | 16.9 | 1.08 | 1.24 |
| | 80 | 57 | 18.2 | 1.08 | 1.25 |
| 20 Dk. Brown* | 60 | 53 | 17.8 | 1.22 | 1.41 |
| | 70 | 56 | 19.2 | 1.18 | 1.36 |
| | 80 | 58 | 20.5 | 1.17 | 1.35 |
| | 90 | 59 | 21.8 | 1.21 | 1.39 |
| 23 Dk. Green | 60 | 56 | 21.9 | 1.34 | 1.55 |
| | 70 | 58 | 23.6 | 1.35 | 1.56 |
| | 80 | 60 | 25.6 | 1.37 | 1.58 |
| | 90 | 61 | 27.0 | 1.40 | 1.61 |
| 25 Dk. Blue* | 60 | 58 | 23.5 | 1.34 | 1.55 |
| | 70 | 62 | 25.5 | 1.28 | 1.47 |
| | 80 | 64 | 28.0 | 1.32 | 1.52 |
| | 90 | 66 | 29.5 | 1.30 | 1.51 |
| 28 Black | 70 | 60 | 26.9 | 1.44 | 1.66 |
| | 80 | 62 | 28.7 | 1.44 | 1.66 |
| | 90 | 65 | 30.6 | 1.39 | 1.61 |
| | 100 | 67 | 31.5 | 1.35 | 1.56 |

* Five standard nozzles included with each sprinkler.

**Note:**
All precipitation rates calculated for 180° operation. For the precipitation rate for a 360° sprinkler, divide by 2.

## I-25 NOZZLE

Standard

# I-40

*Radius:* **44' to 76'**
*Flow:* **7.6 to 33.7 GPM**

*The I-40 rotor has a comprehensive list of upgraded features that make it the top choice for demanding, large turf projects.*

## KEY BENEFITS

- Patented automatic arc return feature returns the turret back to the original arc pattern if vandalized; adjustable arc from 50° to 360°
- Non-strippable drive mechanism is protected from damage if turned in the opposite direction of travel
- Part- and full-circle in one model for flexibility across landscapes and reduced inventory
- Color-coded nozzles make identification easy
- Available opposing nozzle model for even watering in full-circle applications (I-40-ON model)
- Drain check valve prevents low-head drainage (up to 15' of elevation)

**I-40-04**
Overall height: 7⅞"
Pop-up height: 4"
Exposed diameter: 2"
Inlet size: 1"

**I-40-06**
Overall height: 10¼"
Pop-up height: 6"
Exposed diameter: 2"
Inlet size: 1"

## OPERATING SPECIFICATIONS

- Nozzle choices: 12
- Radius I-40: 44' to 69'
- Radius I-40-ON: 52' to 76'
- Flow I-40: 7.6 to 29.5 GPM
- Flow I-40-ON: 13.0 to 33.7 GPM
- Recommended pressure range: 40 to 100 PSI
- Operating pressure range: 40 to 100 PSI
- Precipitation rate: 0.4 in/hr approximately
- Nozzle trajectory: standard = 25°
- Warranty period: 5 years

## FACTORY-INSTALLED OPTIONS

- Reclaimed water ID
- High-speed rotation

## USER-INSTALLED OPTIONS

- HSJ-1 prefabricated 1" PVC swing joint

**I-40 Reclaimed**
*Available as a factory-installed option on all models*

**I-40 High-Speed**
*Available as a factory-installed option on all models*

**I-40 – SPECIFICATION BUILDER:** ORDER 1 + 2 + 3 + 4

| 1 Model | 2 Standard Features | 3 Feature Options | 4 Nozzle Options |
|---|---|---|---|
| **I-40-04-SS** = 4" pop-up<br>**I-40-06-SS** = 6" pop-up | Adjustable arc, stainless steel riser, check valve, and 6 nozzles | **(blank)** = No option<br>**HS** = High-speed<br>**HS-R** = High-speed and reclaimed water ID<br>**R** = Reclaimed water ID | **#8 to #25** = Factory-installed nozzle number |

**I-40-ON – SPECIFICATION BUILDER:** ORDER 1 + 2 + 3 + 4

| 1 Opposing Nozzle Model | 2 Standard Features | 3 Feature Options | 4 Nozzle Options |
|---|---|---|---|
| **I-40-04-SS-ON** = 4" pop-up<br>**I-40-06-SS-ON** = 6" pop-up | Full-circle, opposing nozzle, stainless steel riser, check valve, and 6 nozzles | **(blank)** = No option<br>**ON** = Full-circle opposing nozzles<br>**ON-R** = Full-circle opposing nozzles and reclaimed water ID<br>**HS** = High-speed<br>**HS-R** = High-speed and reclaimed water ID<br>**R** = Reclaimed water ID | **#15 to #28** = Factory-installed nozzle number |

**Examples:**
**I-40-04-SS** = 4" pop-up, adjustable arc, stainless steel riser, with check valve
**I-40-04-SS-ON-R-23** = 4" pop-up, adjustable arc, stainless steel riser, with check valve, and reclaimed water ID and #23 nozzle
**I-40-06-SS-15** = 6" pop-up, adjustable arc, stainless steel riser, with check valve and #15 nozzle

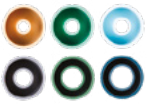
## I-40 NOZZLE PERFORMANCE DATA

| Nozzle | Pressure PSI | Radius ft | Flow GPM | Precip in/hr ■ | Precip in/hr ▲ |
|---|---|---|---|---|---|
| 08 (40) Lt. Brown | 40 | 44 | 7.6 | 0.76 | 0.87 |
| | 50 | 45 | 8.4 | 0.80 | 0.92 |
| | 60 | 46 | 9.2 | 0.84 | 0.97 |
| 10 (41) Lt. Green | 50 | 49 | 10.3 | 0.83 | 0.95 |
| | 60 | 50 | 11.3 | 0.87 | 1.00 |
| | 70 | 51 | 12.2 | 0.90 | 1.04 |
| | 80 | 51 | 13.0 | 0.96 | 1.11 |
| 13 (42) Lt. Blue | 50 | 50 | 11.1 | 0.85 | 0.99 |
| | 60 | 51 | 12.3 | 0.91 | 1.05 |
| | 70 | 52 | 13.3 | 0.95 | 1.08 |
| | 80 | 53 | 14.2 | 0.97 | 1.12 |
| 15 (43) Gray | 50 | 54 | 13.8 | 0.91 | 1.05 |
| | 60 | 55 | 15.7 | 1.00 | 1.15 |
| | 70 | 57 | 16.6 | 0.98 | 1.14 |
| | 80 | 59 | 18.3 | 1.01 | 1.17 |
| 23 (44) Dk. Green | 60 | 62 | 21.3 | 1.07 | 1.23 |
| | 70 | 64 | 23.0 | 1.08 | 1.25 |
| | 80 | 65 | 24.5 | 1.12 | 1.29 |
| | 90 | 66 | 25.9 | 1.14 | 1.32 |
| 25 (45) Dk. Blue | 60 | 66 | 23.9 | 1.06 | 1.22 |
| | 70 | 67 | 25.8 | 1.11 | 1.28 |
| | 80 | 68 | 27.7 | 1.15 | 1.33 |
| | 90 | 69 | 29.5 | 1.19 | 1.38 |

## I-40 HIGH-SPEED NOZZLE PERFORMANCE DATA

| Nozzle | Pressure PSI | Radius ft | Flow GPM | Precip in/hr ■ | Precip in/hr ▲ |
|---|---|---|---|---|---|
| 08 (40) Lt. Brown | 40 | 41 | 7.6 | 0.87 | 1.00 |
| | 50 | 41 | 8.4 | 0.96 | 1.11 |
| | 60 | 42 | 9.2 | 1.00 | 1.16 |
| 10 (41) Lt. Green | 50 | 45 | 10.3 | 0.98 | 1.13 |
| | 60 | 46 | 11.3 | 1.03 | 1.19 |
| | 70 | 47 | 12.2 | 1.06 | 1.23 |
| | 80 | 47 | 13.0 | 1.13 | 1.31 |
| 13 (42) Lt. Blue | 50 | 46 | 11.1 | 1.01 | 1.17 |
| | 60 | 47 | 12.3 | 1.07 | 1.24 |
| | 70 | 48 | 13.3 | 1.11 | 1.28 |
| | 80 | 49 | 14.2 | 1.14 | 1.31 |
| 15 (43) Gray | 50 | 51 | 13.8 | 1.02 | 1.18 |
| | 60 | 52 | 15.7 | 1.12 | 1.29 |
| | 70 | 53 | 16.6 | 1.14 | 1.31 |
| | 80 | 54 | 18.3 | 1.21 | 1.40 |
| 23 (44) Dk. Green | 60 | 58 | 21.3 | 1.22 | 1.41 |
| | 70 | 59 | 23.0 | 1.27 | 1.47 |
| | 80 | 60 | 24.5 | 1.31 | 1.51 |
| | 90 | 61 | 25.9 | 1.34 | 1.55 |
| 25 (45) Dk. Blue | 60 | 59 | 23.9 | 1.32 | 1.53 |
| | 70 | 61 | 25.8 | 1.33 | 1.54 |
| | 80 | 62 | 27.7 | 1.39 | 1.60 |
| | 90 | 63 | 29.5 | 1.43 | 1.65 |

## I-40 NOZZLES



Standard/High-Speed

I-40 Opposing Nozzle 360° Model

**I-40 Turf Cup Kit Option**
Available as a field-installed option on all models
P/N TURFCUPKITI40

## I-40 DUAL OPPOSING NOZZLE PERFORMANCE DATA

| Nozzle | Pressure PSI | Radius ft | Flow GPM | Precip in/hr ■ | Precip in/hr ▲ |
|---|---|---|---|---|---|
| 15 Gray | 50 | 52 | 13.0 | 0.46 | 0.53 |
| | 60 | 54 | 13.2 | 0.44 | 0.50 |
| | 70 | 56 | 14.4 | 0.44 | 0.51 |
| | 80 | 57 | 15.5 | 0.46 | 0.53 |
| 18 Red | 50 | 58 | 13.7 | 0.39 | 0.45 |
| | 60 | 59 | 15.2 | 0.42 | 0.49 |
| | 70 | 60 | 16.6 | 0.44 | 0.51 |
| | 80 | 62 | 17.8 | 0.45 | 0.51 |
| 20 Dk. Brown | 60 | 63 | 19.1 | 0.46 | 0.53 |
| | 70 | 64 | 20.9 | 0.49 | 0.57 |
| | 80 | 66 | 22.3 | 0.49 | 0.57 |
| | 90 | 66 | 23.9 | 0.53 | 0.61 |
| 23 Dk. Green | 60 | 65 | 20.4 | 0.46 | 0.54 |
| | 70 | 66 | 22.3 | 0.49 | 0.57 |
| | 80 | 67 | 24.0 | 0.51 | 0.59 |
| | 90 | 68 | 25.6 | 0.53 | 0.62 |
| 25 Dk. Blue* | 60 | 66 | 22.0 | 0.49 | 0.56 |
| | 70 | 68 | 24.0 | 0.50 | 0.58 |
| | 80 | 69 | 25.9 | 0.52 | 0.60 |
| | 90 | 70 | 27.2 | 0.53 | 0.62 |
| 28 Black | 70 | 70 | 28.9 | 0.57 | 0.66 |
| | 80 | 72 | 30.9 | 0.57 | 0.66 |
| | 90 | 74 | 32.9 | 0.58 | 0.67 |
| | 100 | 76 | 33.7 | 0.56 | 0.65 |

* Factory-installed nozzle

**Notes:**
All precipitation rates calculated for 180° operation.
For the precipitation rate for a 360° sprinkler, divide by 2.
Precipitation rates for the ON-Opposing Nozzle model are calculated at 360°.

## I-40 NOZZLES

Opposing

Front

Back

# I-50

*Radius:* **44' to 76'**
*Flow:* **7.6 to 33.7 GPM**

*The high-torque I-50 rotor is engineered to thrive in difficult water-quality conditions within large turf projects.*

## KEY BENEFITS

- Extra-strong, non-strippable, planetary gear drive mechanism is reliable and durable in harsh water conditions
- Tool-free, part- and full-circle arc adjustment mechanism makes fast, easy installation and reduces inventory (50° to 360°)
- Color-coded nozzles make identification easy
- QuickCheck™ arc mechanism for fast arc adjustment
- Stainless steel riser for extra durability
- Available opposing nozzle model for even watering in full-circle applications (I-50-ON model)
- Drain check valve prevents low-head drainage (up to 15' of elevation)

## OPERATING SPECIFICATIONS

- Nozzle choices: 12
- Radius I-50: 44' to 69'
- Radius I-50-ON: 52' to 76'
- Flow I-50: 7.6 to 29.5 GPM
- Flow I-50-ON: 13.0 to 33.7 GPM
- Recommended pressure range: 40 to 100 PSI
- Operating pressure range: 40 to 100 PSI
- Precipitation rate: 0.4 in/hr approximately
- Nozzle trajectory: standard = 25°
- Warranty period: 5 years

## FACTORY-INSTALLED OPTIONS

- Reclaimed water ID

## USER-INSTALLED OPTIONS

- HSJ-1 prefabricated 1" PVC swing joint

**I-50 Reclaimed**
*Available as a factory-installed option on all models*

**I-50-06-SS**
Overall height: 10¼"
Pop-up height: 6"
Exposed diameter: 2"
Inlet size: 1"

**I-50-06-SS-ON**
Overall height: 10¼"
Pop-up height: 6"
Exposed diameter: 2"
Inlet size: 1"

**I-50 Turf Cup Kit Option**
Available as a field-installed option on all models
P/N TURFCUPKITI40

**I-50 – SPECIFICATION BUILDER:** ORDER 1 + 2 + 3 + 4

| 1 Model | 2 Standard Features | 3 Feature Options | 4 Nozzle Options |
|---|---|---|---|
| **I-50-06-SS** = 6" pop-up | Adjustable arc, stainless steel riser, check valve, and 6 nozzles | **(blank)** = No option<br>**R** = Reclaimed water ID | **#8 to #25** = Factory-installed nozzle number |

**I-50-ON – SPECIFICATION BUILDER:** ORDER 1 + 2 + 3 + 4

| 1 Opposing Nozzle Model | 2 Standard Features | 3 Feature Options | 4 Nozzle Options |
|---|---|---|---|
| **I-50-06-SS-ON** = 6" pop-up | Full-circle, opposing nozzle, stainless steel riser, check valve, and 6 nozzles | **(blank)** = No option<br>**R** = Reclaimed water ID | **#15 to #28** = Factory-installed nozzle number |

**Examples:**
**I-50-06-SS** = 6" pop-up, adjustable arc, stainless steel riser, with check valve
**I-50-06-SS -ON-R-3** = 6" pop-up, adjustable arc, stainless steel riser, with check valve, reclaimed water ID, and #23 nozzle
**I-50-06-SS-15** = 6" pop-up, adjustable arc, stainless steel riser, with check valve and #15 nozzle

I-50 Opposing Nozzle 360° Model

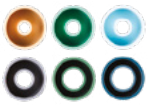
**Below-the -turret** arc adjustment

**Robust planetary gear drive** for extreme conditions

## I-50 NOZZLE PERFORMANCE DATA

| Nozzle | Pressure PSI | Radius ft | Flow GPM | Precip in/hr ■ | Precip in/hr ▲ |
|---|---|---|---|---|---|
| 8 (40) Lt. Brown | 40 | 44 | 7.6 | 0.76 | 0.87 |
| | 50 | 45 | 8.4 | 0.80 | 0.92 |
| | 60 | 46 | 9.2 | 0.84 | 0.97 |
| 10 (41) Lt. Green | 50 | 49 | 10.3 | 0.83 | 0.95 |
| | 60 | 50 | 11.3 | 0.87 | 1.00 |
| | 70 | 51 | 12.2 | 0.90 | 1.04 |
| | 80 | 51 | 13.0 | 0.96 | 1.11 |
| 13 (42) Lt. Blue | 50 | 50 | 11.1 | 0.85 | 0.99 |
| | 60 | 51 | 12.3 | 0.91 | 1.05 |
| | 70 | 52 | 13.3 | 0.95 | 1.08 |
| | 80 | 53 | 14.2 | 0.97 | 1.12 |
| 15 (43) Gray | 50 | 54 | 13.8 | 0.91 | 1.05 |
| | 60 | 55 | 15.7 | 1.00 | 1.15 |
| | 70 | 57 | 16.6 | 0.98 | 1.14 |
| | 80 | 59 | 18.3 | 1.01 | 1.17 |
| 23 (44) Dk. Green | 60 | 62 | 21.3 | 1.07 | 1.23 |
| | 70 | 64 | 23.0 | 1.08 | 1.25 |
| | 80 | 65 | 24.5 | 1.12 | 1.29 |
| | 90 | 66 | 25.9 | 1.14 | 1.32 |
| 25 (45) Dk. Blue | 60 | 66 | 23.9 | 1.06 | 1.22 |
| | 70 | 67 | 25.8 | 1.11 | 1.28 |
| | 80 | 68 | 27.7 | 1.15 | 1.33 |
| | 90 | 69 | 29.5 | 1.19 | 1.38 |

## I-50 NOZZLES



Standard

## I-50 DUAL OPPOSING NOZZLE PERFORMANCE DATA

| Nozzle | Pressure PSI | Radius ft | Flow GPM | Precip in/hr ■ | Precip in/hr ▲ |
|---|---|---|---|---|---|
| 15 Gray | 50 | 52 | 13.0 | 0.46 | 0.53 |
| | 60 | 54 | 13.2 | 0.44 | 0.50 |
| | 70 | 56 | 14.4 | 0.44 | 0.51 |
| | 80 | 57 | 15.5 | 0.46 | 0.53 |
| 18 Red | 50 | 58 | 13.7 | 0.39 | 0.45 |
| | 60 | 59 | 15.2 | 0.42 | 0.49 |
| | 70 | 60 | 16.6 | 0.44 | 0.51 |
| | 80 | 62 | 17.8 | 0.45 | 0.51 |
| 20 Dk. Brown | 60 | 63 | 19.1 | 0.46 | 0.53 |
| | 70 | 64 | 20.9 | 0.49 | 0.57 |
| | 80 | 66 | 22.3 | 0.49 | 0.57 |
| | 90 | 66 | 23.9 | 0.53 | 0.61 |
| 23 Dk. Green | 60 | 65 | 20.4 | 0.46 | 0.54 |
| | 70 | 66 | 22.3 | 0.49 | 0.57 |
| | 80 | 67 | 24.0 | 0.51 | 0.59 |
| | 90 | 68 | 25.6 | 0.53 | 0.62 |
| 25 Dk. Blue* | 60 | 66 | 22.0 | 0.49 | 0.56 |
| | 70 | 68 | 24.0 | 0.50 | 0.58 |
| | 80 | 69 | 25.9 | 0.52 | 0.60 |
| | 90 | 70 | 27.2 | 0.53 | 0.62 |
| 28 Black | 70 | 70 | 28.9 | 0.57 | 0.66 |
| | 80 | 72 | 30.9 | 0.57 | 0.66 |
| | 90 | 74 | 32.9 | 0.58 | 0.67 |
| | 100 | 76 | 33.7 | 0.56 | 0.65 |

**Notes:**
All precipitation rates calculated for 180° operation.
For the precipitation rate for a 360° sprinkler, divide by 2.
Precipitation rates for the ON-Opposing Nozzle model are calculated at 360°.

## I-50 NOZZLES

Opposing

Front

Back

# I-80

*Radius:* **63' to 97'**
*Flow:* **20.2 to 59.6 GPM**

*The highly versatile and efficient I-80 rotor is the first commercial sports turf rotor with no-dig Total-Top-Serviceability.*

## KEY BENEFITS

- Exclusive Total-Top-Service (TTS) design provides convenient no-dig servicing
- Exclusive PressurePort™ technology creates exceptional nozzle uniformity
- Forward-facing triple nozzles (I-80) or opposing triple nozzles (I-80-ON) create uniform nozzle profiles in part and full-circle applications
- QuickCheck™ arc mechanism (I-80) for fast arc adjustment and review of the arc setting
- QuickSet-360 arc mechanism (I-80) converts adjustable arc rotor to full-circle in an instant
- Part- and full-circle in one model provides flexible installation options and reduces inventory (I-80)
- Ratcheting stainless steel riser allows setting of right-side fixed arc alignment to the landscape without rotor disassembly
- Drain check valve prevents low-head drainage (up to 5' of elevation)

## OPERATING SPECIFICATIONS

- I-80
  - Standard 22.5° nozzle choices: 7
  - Radius: 65' to 94'
  - Flow: 20.2 to 59.6 GPM
  - Pressure range: 50 to 100 PSI
- Warranty Period: 5 years
- I-80-ON
  - Standard 22.5° nozzle choices: 7
  - Radius: 63' to 97'
  - Flow: 21.6 to 58.5 GPM
  - Pressure range: 65 to 100 PSI
- All I-80 rotors are pressure-rated at 150 PSI

## FACTORY-INSTALLED OPTIONS

- Exclusive ProTech TC™ turf cup option for an aesthetically clean and safe installation:
  - No-dig servicing of riser assembly
  - No-dig arc adjustments
  - Quick-release turf cup assembly
  - Threads in cup lock/retain the turf
- Reclaimed water ID

## USER-INSTALLED OPTIONS

- Rubber cover kit
- Turf cup kit
- HSJ prefabricated PVC swing joints

**I-80-00-SS Riser Mount**
**I-80-00-SS-ON Riser Mount**
Overall height: 9⅜"
Exposed diameter: 2¼"
Inlet size: 1½"

**I-80-04-SS Pop-Up**
**I-80-04-SS-ON Pop-Up**
Overall height: 9¾"
Pop-up height: 3¾"
Exposed diameter: 4⅜"
Inlet size: 1½"

**I-80-04-SS-TC Turf Cup**
**I-80-04-SS-ON-TC Turf Cup**
Overall height: 11½"
Pop-up height: 3¾"
Exposed diameter: 3½"
Inlet size: 1½"

**I-80 Turf Cup Kit**
P/N 959400SP

**I-80 Rubber Cover Kit**
P/N 959300SP

**I-80 – SPECIFICATION BUILDER:** ORDER 1 + 2 + 3 + 4

| 1 Model | 2 Standard Features | 3 Featured Options | 4 Nozzle Options |
|---|---|---|---|
| **I-80-00-SS** = Riser mount | Adjustable arc, stainless steel riser | **(blank)** = No option | **#23 to #53** = Factory-installed nozzle number, no nozzle pack |
| **I-80-04-SS** = 4" pop-up | Adjustable arc, stainless steel riser, check valve | **R** = Reclaimed water ID* | |
| **I-80-04-SS-TC** = 4" pop-up with turf cup | Adjustable arc, stainless steel riser, check valve, factory-installed turf cup | ** TC reclaimed ID not available* | |
| **I-80-00-SS-ON** = Riser mount | Full-circle, opposing nozzle, stainless steel riser | **(blank)** = No option | **#23 to #53** = Factory-installed nozzle number, no nozzle pack |
| **I-80-04-SS-ON** = 4" pop-up | Full-circle, opposing nozzle, stainless steel riser, check valve | **R** = Reclaimed water ID* | |
| **I-80-04-SS-ON-TC** = 4" pop-up with turf cup | Full-circle, opposing nozzle, stainless steel riser, check valve, factory-installed turf cup | ** TC reclaimed ID not available* | |

**Examples:**
**I-80-04-SS-25** = 4" pop-up, adjustable arc, stainless steel riser, check valve, and factory-installed #25 nozzle
**I-80-04-SS-ON-R-38** = 4" pop-up, stainless steel riser, check valve, opposing nozzle full-circle, reclaimed water ID, and factory-installed #38 nozzle
**I-80-04-SS-ON-TC-48** = 4" pop-up, stainless steel riser, check valve, opposing nozzle full-circle, factory-installed turf cup, and factory-installed #48 nozzle

## I-80-ON NOZZLE PERFORMANCE DATA*

| Nozzle Set | | | Pressure PSI | Radius ft. | Flow GPM | Precip in/hr ■ | Precip in/hr ▲ |
|---|---|---|---|---|---|---|---|
| ● Tan 803611 | 23 Green | ● Lt. Blue 315311 | 50 | 63 | 21.6 | 0.52 | 0.60 |
| | | | 60 | 65 | 23.0 | 0.52 | 0.61 |
| | | | 65 | 66 | 24.0 | 0.53 | 0.61 |
| | | | 70 | 67 | 24.9 | 0.53 | 0.62 |
| | | | 80 | 68 | 26.6 | 0.55 | 0.64 |
| ● Tan 803611 | 25 Blue | ● Lt. Blue 315311 | 65 | 71 | 28.6 | 0.55 | 0.63 |
| | | | 70 | 73 | 29.7 | 0.54 | 0.62 |
| | | | 80 | 74 | 31.7 | 0.56 | 0.64 |
| | | | 90 | 75 | 33.7 | 0.58 | 0.67 |
| | | | 100 | 77 | 35.8 | 0.58 | 0.67 |
| ● Tan 803611 | 33 Gray | ● Lt. Blue 315311 | 65 | 74 | 30.9 | 0.54 | 0.63 |
| | | | 70 | 75 | 32.0 | 0.55 | 0.63 |
| | | | 80 | 77 | 34.2 | 0.56 | 0.64 |
| | | | 90 | 79 | 36.2 | 0.56 | 0.64 |
| | | | 100 | 81 | 38.2 | 0.56 | 0.65 |
| ● Tan 803611 | 38 Red | ● Lt. Blue 315311 | 65 | 77 | 35.1 | 0.57 | 0.66 |
| | | | 70 | 79 | 36.6 | 0.56 | 0.65 |
| | | | 80 | 82 | 38.9 | 0.56 | 0.64 |
| | | | 90 | 84 | 41.3 | 0.56 | 0.65 |
| | | | 100 | 87 | 43.6 | 0.55 | 0.64 |
| ● Tan 803611 | 43 Dk. Brown | ● Lt. Blue 315311 | - | - | - | - | - |
| | | | 70 | 83 | 41.3 | 0.58 | 0.67 |
| | | | 80 | 85 | 43.6 | 0.58 | 0.67 |
| | | | 90 | 87 | 46.3 | 0.59 | 0.68 |
| | | | 100 | 89 | 48.8 | 0.59 | 0.68 |
| ● Tan 803611 | 48 Dk. Green | ● Lt. Blue 315311 | - | - | - | - | - |
| | | | 70 | 90 | 46.9 | 0.56 | 0.64 |
| | | | 80 | 92 | 48.9 | 0.56 | 0.64 |
| | | | 90 | 94 | 50.5 | 0.55 | 0.63 |
| | | | 100 | 96 | 53.5 | 0.56 | 0.65 |
| ● Tan 803611 | 53 Dk. Blue | ● Lt. Blue 315311 | - | - | - | - | - |
| | | | 70 | 91 | 49.8 | 0.58 | 0.67 |
| | | | 80 | 93 | 52.2 | 0.58 | 0.67 |
| | | | 90 | 95 | 55.5 | 0.59 | 0.68 |
| | | | 100 | 97 | 58.5 | 0.60 | 0.69 |

● = Nozzle plug P/N 315300 installed in the front side of the nozzle housing.

## I-80 NOZZLES

## I-80 NOZZLE PERFORMANCE DATA*

| Nozzle Set | | | Pressure PSI | Radius ft. | Flow GPM | Precip in/hr ■ | Precip in/hr ▲ |
|---|---|---|---|---|---|---|---|
| Orange 803603 ● | 23 Green | Lt. Green 315313 ● | 50 | 65 | 20.2 | 0.46 | 0.53 |
| | | | 60 | 66 | 22.1 | 0.49 | 0.56 |
| | | | 65 | 67 | 23.9 | 0.51 | 0.59 |
| | | | 70 | 67 | 24.2 | 0.52 | 0.60 |
| | | | 80 | 69 | 25.9 | 0.52 | 0.60 |
| Orange 803603 ● | 25 Blue | Lt. Green 315313 ● | 65 | 71 | 28.3 | 0.54 | 0.62 |
| | | | 70 | 72 | 29.3 | 0.54 | 0.63 |
| | | | 80 | 73 | 31.5 | 0.57 | 0.66 |
| | | | 90 | 74 | 33.4 | 0.59 | 0.68 |
| | | | 100 | 75 | 35.4 | 0.61 | 0.70 |
| Orange 803603 ● | 33 Gray | Lt. Green 315313 ● | 65 | 72 | 30.6 | 0.57 | 0.66 |
| | | | 70 | 73 | 31.6 | 0.57 | 0.66 |
| | | | 80 | 75 | 33.9 | 0.58 | 0.67 |
| | | | 90 | 77 | 35.8 | 0.58 | 0.67 |
| | | | 100 | 79 | 37.9 | 0.58 | 0.67 |
| Orange 803603 ● | 38 Red | Lt. Green 315313 ● | 65 | 76 | 34.9 | 0.58 | 0.67 |
| | | | 70 | 78 | 36.2 | 0.57 | 0.66 |
| | | | 80 | 80 | 39.1 | 0.59 | 0.68 |
| | | | 90 | 82 | 41.2 | 0.59 | 0.68 |
| | | | 100 | 84 | 43.5 | 0.59 | 0.69 |
| Orange 803603 ● | 43 Dk. Brown | Lt. Green 315313 ● | - | - | - | - | - |
| | | | 70 | 81 | 41.2 | 0.60 | 0.70 |
| | | | 80 | 83 | 43.5 | 0.61 | 0.70 |
| | | | 90 | 86 | 46.2 | 0.60 | 0.69 |
| | | | 100 | 89 | 48.7 | 0.59 | 0.68 |
| Orange 803603 ● | 48 Dk. Green | Lt. Green 315313 ● | - | - | - | - | - |
| | | | 70 | 83 | 46.3 | 0.65 | 0.75 |
| | | | 80 | 85 | 48.4 | 0.64 | 0.74 |
| | | | 90 | 89 | 51.7 | 0.63 | 0.73 |
| | | | 100 | 91 | 54.5 | 0.63 | 0.73 |
| Orange 803603 ● | 53 Dk. Blue | Lt. Green 315313 ● | - | - | - | - | - |
| | | | 70 | 87 | 50.7 | 0.64 | 0.74 |
| | | | 80 | 89 | 53.1 | 0.65 | 0.75 |
| | | | 90 | 92 | 56.4 | 0.64 | 0.74 |
| | | | 100 | 94 | 59.6 | 0.65 | 0.75 |

● = Nozzle plug P/N 315300 installed in the back side of the nozzle housing.

* Complies to ASAE standard. All precipitation rates calculated for 360° operation. All triangular rates are equilateral.

# I-90

*Radius:* **66' to 103'**
*Flow:* **29.5 to 83.8 GPM**

*The robust I-90 rotor is built for long-distance natural turf applications in large parks, open spaces, and sports fields.*

## KEY BENEFITS

- Exclusive PressurePort™ technology creates exceptional nozzle uniformity
- Forward-facing triple nozzles (I-90), opposing triple nozzles (I-90-ON) create uniform nozzle profiles in part- and full-circle applications
- QuickCheck™ arc mechanism for fast arc adjustment and review of the arc setting
- Part- and full-circle in one model provides flexible installation options and decreases inventory (I-90)
- Drain check valve prevents low-head drainage (up to 9' of elevation)

## OPERATING SPECIFICATIONS

- I-90 nozzle choices: 8
- Radius I-90 ADV: 66' to 97'
- Radius I-90 36V: 73' to 103'
- Flow I-90 ADV: 30.5 to 83.3 GPM
- Flow I-90 36V: 14.2 to 58.5 GPM
- Recommended pressure range: 80 to 120 PSI
- Operating pressure range: 80 to 150 PSI
- Precipitation rate: 0.75 in/hr approximately
- Warranty period: 5 years

## FACTORY-INSTALLED OPTIONS

- Reclaimed water ID

## USER-INSTALLED OPTIONS

- Rubber cover kit #234201
- Turf cup kit #467955
- HSJ prefabricated PVC 1½" swing joints

**I-90**
Overall height: ADV/36V: 11"
Pop-up height: 3"
Exposed diameter: 3½"
Inlet size: 1½"

**Turf Cup Kit**
P/N 467955

**Rubber Cover Kit**
P/N 234200; P/N 234201

**I-90 Reclaimed**
*Available as a factory-installed option on all models*

**I-90 – SPECIFICATION BUILDER:** ORDER 1 + 2 + 3 + 4

| 1 Model | 2 Standard Features | 3 Feature Options | 4 Nozzle Options |
|---|---|---|---|
| **I-90** = 3" pop-up | Plastic riser, check valve, and 8 nozzles | **ADV** = Adjustable arc<br>**ARV** = Adjustable arc and reclaimed water ID<br>**36V** = Full-circle, opposing nozzles<br>**3RV** = Full-circle, opposing nozzles, and reclaimed water ID | **#25 to #73** = Factory-installed nozzle number |

**Examples:**
**I-90-ADV** = 3" pop-up, adjustable arc
**I-90-36V-43** = 3" pop-up, full-circle, opposing nozzles, and #43 nozzle
**I-90-3RV-63** = 3" pop-up, full-circle, opposing nozzles, reclaimed water ID, and #63 nozzle

## I-90-ADV NOZZLE PERFORMANCE DATA

| Nozzle | Pressure PSI | Radius ft. | Flow GPM | Precip in/hr ■ | Precip in/hr ▲ |
|---|---|---|---|---|---|
| 25 Lt. Blue | 80 | 66 | 29.5 | 1.30 | 1.51 |
| | 90 | 67 | 31.5 | 1.35 | 1.56 |
| | 100 | 68 | 33.2 | 1.38 | 1.60 |
| | 110 | 69 | 35.6 | 1.44 | 1.66 |
| 33 Gray | 80 | 68 | 36.2 | 1.51 | 1.74 |
| | 90 | 69 | 38.2 | 1.54 | 1.78 |
| | 100 | 70 | 40.4 | 1.59 | 1.83 |
| | 110 | 71 | 42.6 | 1.63 | 1.88 |
| 38 Red | 80 | 72 | 40.6 | 1.51 | 1.74 |
| | 90 | 73 | 43.0 | 1.55 | 1.79 |
| | 100 | 75 | 45.4 | 1.55 | 1.79 |
| | 110 | 76 | 47.6 | 1.59 | 1.83 |
| 43 Dk. Brown | 80 | 74 | 46.1 | 1.62 | 1.87 |
| | 90 | 74 | 48.5 | 1.70 | 1.97 |
| | 100 | 75 | 50.7 | 1.74 | 2.00 |
| | 110 | 77 | 53.4 | 1.73 | 2.00 |
| 48 Dk. Green | 80 | 77 | 50.2 | 1.63 | 1.88 |
| | 90 | 79 | 52.6 | 1.62 | 1.87 |
| | 100 | 81 | 55.1 | 1.62 | 1.87 |
| | 110 | 82 | 57.5 | 1.65 | 1.90 |
| 53 Dk. Blue* | 80 | 81 | 54.9 | 1.61 | 1.86 |
| | 90 | 84 | 57.2 | 1.56 | 1.80 |
| | 100 | 86 | 59.5 | 1.55 | 1.79 |
| | 110 | 87 | 62.1 | 1.58 | 1.82 |
| | 120 | 88 | 64.4 | 1.60 | 1.85 |
| 63 Black | 80 | 86 | 62.3 | 1.62 | 1.87 |
| | 90 | 88 | 65.5 | 1.63 | 1.88 |
| | 100 | 90 | 69.0 | 1.64 | 1.89 |
| | 110 | 91 | 71.9 | 1.67 | 1.93 |
| | 120 | 92 | 74.7 | 1.70 | 1.96 |
| 73 Orange | 80 | 89 | 72.7 | 1.77 | 2.04 |
| | 90 | 91 | 75.4 | 1.75 | 2.02 |
| | 100 | 93 | 78.1 | 1.74 | 2.01 |
| | 110 | 95 | 80.9 | 1.73 | 1.99 |
| | 120 | 97 | 83.8 | 1.71 | 1.98 |

## I-90-36V NOZZLE PERFORMANCE DATA

| Nozzle | Pressure PSI | Radius ft. | Flow GPM | Precip in/hr ■ | Precip in/hr ▲ |
|---|---|---|---|---|---|
| 25 Lt. Blue | 80 | 73 | 30.5 | 0.55 | 0.64 |
| | 90 | 75 | 32.4 | 0.55 | 0.64 |
| | 100 | 76 | 34.3 | 0.57 | 0.66 |
| | 110 | 78 | 36.5 | 0.58 | 0.67 |
| 33 Gray | 80 | 77 | 36.3 | 0.59 | 0.68 |
| | 90 | 78 | 38.4 | 0.61 | 0.70 |
| | 100 | 80 | 40.6 | 0.61 | 0.71 |
| | 110 | 81 | 42.7 | 0.63 | 0.72 |
| 38 Red | 80 | 80 | 40.6 | 0.61 | 0.71 |
| | 90 | 82 | 42.9 | 0.61 | 0.71 |
| | 100 | 83 | 45.3 | 0.63 | 0.73 |
| | 110 | 85 | 47.7 | 0.64 | 0.73 |
| 43 Dk. Brown | 80 | 83 | 46.2 | 0.65 | 0.75 |
| | 90 | 84 | 48.6 | 0.66 | 0.77 |
| | 100 | 85 | 50.9 | 0.68 | 0.78 |
| | 110 | 86 | 53.4 | 0.69 | 0.80 |
| 48 Dk. Green | 80 | 86 | 49.6 | 0.65 | 0.75 |
| | 90 | 89 | 52.5 | 0.64 | 0.74 |
| | 100 | 90 | 54.8 | 0.65 | 0.75 |
| | 110 | 91 | 57.3 | 0.67 | 0.77 |
| 53 Dk. Blue* | 80 | 89 | 54.2 | 0.66 | 0.76 |
| | 90 | 90 | 56.7 | 0.67 | 0.78 |
| | 100 | 92 | 59.2 | 0.67 | 0.78 |
| | 110 | 93 | 61.7 | 0.69 | 0.79 |
| | 120 | 94 | 64.2 | 0.70 | 0.81 |
| 63 Black | 80 | 92 | 63.2 | 0.72 | 0.83 |
| | 90 | 94 | 65.9 | 0.72 | 0.83 |
| | 100 | 96 | 69.4 | 0.72 | 0.84 |
| | 110 | 97 | 72.0 | 0.74 | 0.85 |
| | 120 | 98 | 74.9 | 0.75 | 0.87 |
| 73 Orange | 80 | 96 | 72.1 | 0.75 | 0.87 |
| | 90 | 98 | 75.0 | 0.75 | 0.87 |
| | 100 | 99 | 77.8 | 0.76 | 0.88 |
| | 110 | 102 | 80.5 | 0.74 | 0.86 |
| | 120 | 103 | 83.3 | 0.76 | 0.87 |

* Factory-installed nozzle

**Notes:**
Precipitation rates for ADV models are calculated for 180° operation. Precipitation rates for 36V models are calculated for 360° operation. All triangular rates are equilateral. Complies to ASAE standard.

## I-90 NOZZLES

ADV & 36V

I-90

# SWING JOINTS

*With swivel ells on both ends, SJ Swing Joints easily adjust sprinklers to proper height and position in any configuration.*

## KEY BENEFITS

- Strength, longevity, and contamination resistance
  - Prefabricated PVC design with O-ring seals
- Configurations to meet every installation requirement
  - Available in all popular inlet and outlet configurations
  - Choose from 8", 12", or 18" lay arm lengths
  - Single top-out or triple top-out designs

**Swing Joints**
HSJ-0 = Model ¾"
HSJ-1 = Model 1"
HSJ-2 = Model 1¼"
HSJ-3 = Model 1½"


**HSJ SWING JOINT – SPECIFICATION BUILDER:** ORDER 1 + 2 + 3 + 4

| 1 Model | 2 Inlet Type (from pipe fitting) | 3 Outlet Type (to sprinkler inlet) | 4 Outlet Style | 5 Lay Length |
|---|---|---|---|---|
| **HSJ-0** = ¾" commercial swing joint<br>**HSJ-1** = 1" heavy-duty swing joint<br>**HSJ-2** = 1¼" heavy-duty swing joint<br>**HSJ-3** = 1½" heavy-duty swing joint | **2** = Spigot, short<br>  <br>**3** = Male NPT<br>  <br>**7** = Spigot, 4" long*<br>  <br>** Not available HSJ-0* | **2** = Male NPT<br>  | **2** = Single top-out<br>  <br>**4** = Triple top-out<br>  | **08** = 8" lay arm*<br><br>**12** = 12" lay arm<br><br>**18** = 18" lay arm<br><br>** HSJ-0 only* |

**Example:**
**HSJ-1-3-2-2-12** = HSJ 1" heavy-duty swing joint, 1" NPT inlet, 1" male NPT single top-out outlet, 12" lay arm length

# HUNTER CHECK VALVES

*Eliminate low-head drainage for both rotor and spray shrub systems with the adjustable Hunter Check Valve.*

## KEY BENEFITS

- Adjustment access through top of valve
- Adjusts to compensate for elevational changes up to 32'
- Variety of inlet and outlet options reduces need for additional fittings
- Meets schedule 80 specifications for durability under high pressure
- Pressure loss charts for HCV products on **page 198**

**HUNTER CHECK VALVES**

| Model | Description |
|---|---|
| HC-50F-50F | ½" female inlet x ½" female outlet |
| HC-50F-50M | ½" female inlet x ½" male outlet |
| HC-75F-75M | ¾" female inlet x ¾" male outlet |


**HCV Check Valve**
Overall height: 3"

# SNAPLOK COMBO KITS

*These kits are designed for applications that demand sturdy installation due to frequent quick coupler use.*

## KEY BENEFITS

- Versatile, cross-compatible, and heavy-duty quick coupler
- Highly effective solution for quick-coupler stabilization
- SnapLok™ design includes:
  - Heavy-duty PVC and brass outlet construction
  - Anti-rotation coupler locking feature
  - Accommodates both rebar and pipe stabilization
- Solves common quick-coupler stabilization and unthreading concerns
  - Unique SnapLok™ outlet with integrated brass thread outlet
- See the HSJ swing joints on **page 43**


**Quick Coupler with SnapLok**
*Equipped HSJ-1 swing joint*

**SNAPLOK COMBO KITS – SPECIFICATION BUILDER:** ORDER 1 + 2 + 3 + 4

| 1 Model | 2 Inlet Type (from pipe fitting) | 3 Outlet Type (to sprinkler inlet) | 4 Outlet Style | 5 Lay Length |
|---|---|---|---|---|
| **HSJ-1** = 1" heavy-duty swing joint | **3** = Male NPT  | **S** = Male 1" brass NPT SnapLok  **T** = Male ¾" brass NPT/BSP SnapLok  | **2** = Single top-out  | **12** = 12" lay arm  **18** = 18" lay arm  |

**Example:**
**HSJ-1-3-S-2-12** = HSJ 1" heavy-duty swing joint, 1" NPT inlet, 1" male brass outlet, single top-out, 12" lay arm length

*SnapLok is a trademark of LASCO Fittings Inc.*

# ST SYSTEM


SOUTHEASTERN UNIVERSITY
NUJAK
S-109
108

# STK-1 / STK-2

*Radius:* **103' to 120'**
*Flow:* **74.5 to 92.0 GPM**

*Top-quality ST System long-range rotors are dedicated to synthetic turf sports field irrigation.*

## KEY BENEFITS

- Arc setting: 40° to 360°
- QuickCheck™ arc mechanism
- Through-the-top arc adjustment
- Water-lubricated gear drive
- Factory-installed rubber logo cap
- Nozzle trajectory: 22.5°

## OPERATING SPECIFICATIONS

- Radius: 103' to 120'
- Flow: 74.5 to 92.0 GPM
- Operating pressure range: 100 to 120 PSI
- Precipitation rate: 1.25 in/hr approximately
- Warranty period: 5 years component part

## USER-INSTALLED OPTIONS

- Rubber Cover Kit ST-90: P/N 234200
- Rubber Cover Kit STG-900: P/N 473900

**ST-90***
Overall height: 11½"
Pop-up height: 3"
Diameter: 5½"
Inlet size: 1½" NPT

* Not for use with the ST Vault

**STG-900***
Overall height: 14"
Pop-up height: 3"
Diameter: 8"
Inlet size: 1½" Acme

* For use with the ST173026B Vault

| ST ROTOR | |
|---|---|
| **Model** | **Description** |
| ST-90-XX | 3" pop-up, jar top cap, adjustable arc, plastic riser, and NPT inlet threads, #73 or #83 pre-installed nozzle |
| STG-900-XX | 3" pop-up, top service, adjustable arc, plastic riser, and Acme inlet threads, #73 or #83 pre-installed nozzle |

## KIT CONFIGURATIONS

| STK-1 / STK-2 | | |
|---|---|---|
| **Kit Descriptions**<br>For specification ease and to ensure the correct product is installed, the ST System is available in the kit configurations below | **STK-1**<br>STG-900 Block System<br>(remotely located valve) | **STK-2**<br>STG-900 VAH System<br>(valve adjacent to head) |
| **ST Rotor:** Synthetic turf rotor without rubber cover kit | STG-900 | STG-900 |
| **ST Vault:** Vault with 3-piece polymer-concrete cover | ST-173026-B | ST-173026-B |
| **ST Swing Joint:** "VA" 2" PVC swing joint with 7 pivot points | ST-2008-VA | ST-2008-VA |
| **ST Valve and Fitting Kit** | — | ST-VBVF-K |
| **ST Adapter Elbow Fitting*** | 239800 | 239800 |
| **ST Rotor Adapter Fitting**** | 239300 | — |
| **Rubber Cover Kit:** STG-900 rubber cover kit | 473900 | 473900 |
| **Quick-Coupler Valve:** 1" inlet with 1¼" outlet for key | HQ-5RC | HQ-5RC |

**Notes:**
*ST Adapter Elbow Fitting connects ST-2008-VA swing joint to rotor adapter fitting (STK-1) also connects ST-VBVF-K to STG-900 rotor (STK-2)
**ST Rotor Adapter Fitting connects 239800 adapter elbow fitting to STG-900 rotor's Acme inlet (STK-1)

## ST-90 / STG-900 NOZZLE PERFORMANCE DATA

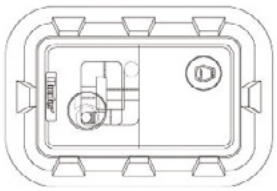
| Nozzle | Pressure PSI | Radius ft. | Flow GPM | Precip in/hr ■ | Precip in/hr ▲ |
|---|---|---|---|---|---|
| 73 ● Orange | 100 | 103 | 74.5 | 1.35 | 1.56 |
| | 110 | 109 | 77.0 | 1.25 | 1.44 |
| | 120 | 115 | 79.6 | 1.16 | 1.34 |
| 83 ● Tan | 100 | 112 | 84.2 | 1.29 | 1.49 |
| | 110 | 116 | 88.1 | 1.26 | 1.46 |
| | 120 | 120 | 92.0 | 1.23 | 1.42 |

**Notes:**
All precipitation rates calculated for 180° operation.
For precipitation rate of a 360° sprinkler, divide by 2.

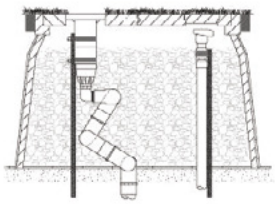
Requires minimum 100 PSI dynamic pressure supplied to swing joint inlet.

## INSTALLATION DETAILS

**STK-1**

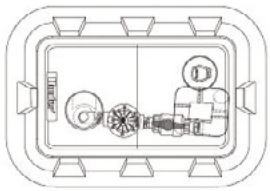


ON-FIELD SIDE

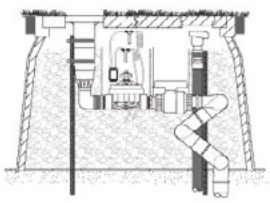


VIEW FROM ON-FIELD SIDE

**STK-2**



ON-FIELD SIDE



VIEW FROM ON-FIELD SIDE

**ST Rotor**

## ST SWING JOINTS

Multiaxis 315 PSI rated vertical alignment PVC swing joints with seven O-ring sealed pivot points allow the rotor to be perfectly placed within the ST Vault's cover set opening.

**ST2008VA: 2" for ST-90, STG-900**

**Inlet:** 2" female slip
**Outlet:** 1½" female Acme

**Adapter fitting 239300**
Connects 239800 elbow fitting to STG-900 Acme inlet rotor

**Adapter fitting 239302**
Connects 239800 elbow fitting to ST-90B BSP inlet rotor

## ST VALVE SETS

Heavy-duty control valves are configured to complement the ST Rotors and ST Vaults.

**STVBVFK: for STG-900 in STK-2 Kit**

**Valve:** 1½" NPT ICV
**Ball valve:** 315 PSI rated
**Inlet:** 1½" Acme
**Outlet:** 1½" Acme
**Low pressure loss design:** 9.8 PSI at 100 GPM
**Includes:** 1½" connection fittings

## ST VAULTS

Heavy-duty tapered fiberglass and polymer-concrete construction with pre-cast holes for rotor and quick-coupler valve.

**ST173026B for STG-900 includes 2" thick 3-piece PC cover set**

**Main cover:** 17" x 30"
**Overall height:** 26"
**Body weight:** 104 lbs.
**Total weight:** 161 lbs.
**Base pad:** 27" x 41"
**Quick access port:** 1


① Quick Coupler

All ST Vaults include convenient quick access ports. Quick couplers provide a convenient source of water for washing down spills and water-soluble paint. The integrated in-vault design eliminates the need for additional quick-coupler enclosures.

# ST-1600 / STK-6V

*Radius:* **107' to 165'**
*Flow:* **96.2 to 326.8 GPM**

*This ST System solution offers cleaning, cooling, and flushing capabilities to prepare synthetic sports fields for play.*

## KEY BENEFITS

- Nozzle choices: 6
- Standard nozzle: #20
- Nozzle range: #16 to #26
- Nozzle trajectory: 22.5°
- Isolated, grease-lubricated gear drive
- Factory-installed rubber logo cap (ST-1600B / ST-1600-HSB)
- Movable stops (left and right) arc adjustment
- Arc setting: 40° to non-reversing 360°
- Ratcheting nozzle turret
- Telescoping rubber infill barrier on riser
- Adjustable speed of rotation: 0 to 65 seconds (High-speed models, 180° at 120 PSI)
- Internal construction: brass, stainless steel, and ball bearings
- Optional infill barrier system (ST-1600B / ST-1600-HSB)
- Warranty period: 5 years component part

## OPERATING SPECIFICATIONS

- Radius: 107' to 165'
- Flow: 96.2 to 326.8 GPM
- Operating pressure range: 60 to 120 PSI
- Precipitation rate: 2.25 in/hr approximately

**ST-1600-HS-B (High-Speed)**
Overall height: 22½"
Pop-up height: 5"
Diameter: 14"
Inlet size: 2" BSP*

* Adapter to 2" NPT nipple not required. Use BSP t.o.e. nipple adapter P/N 241400 if desired.

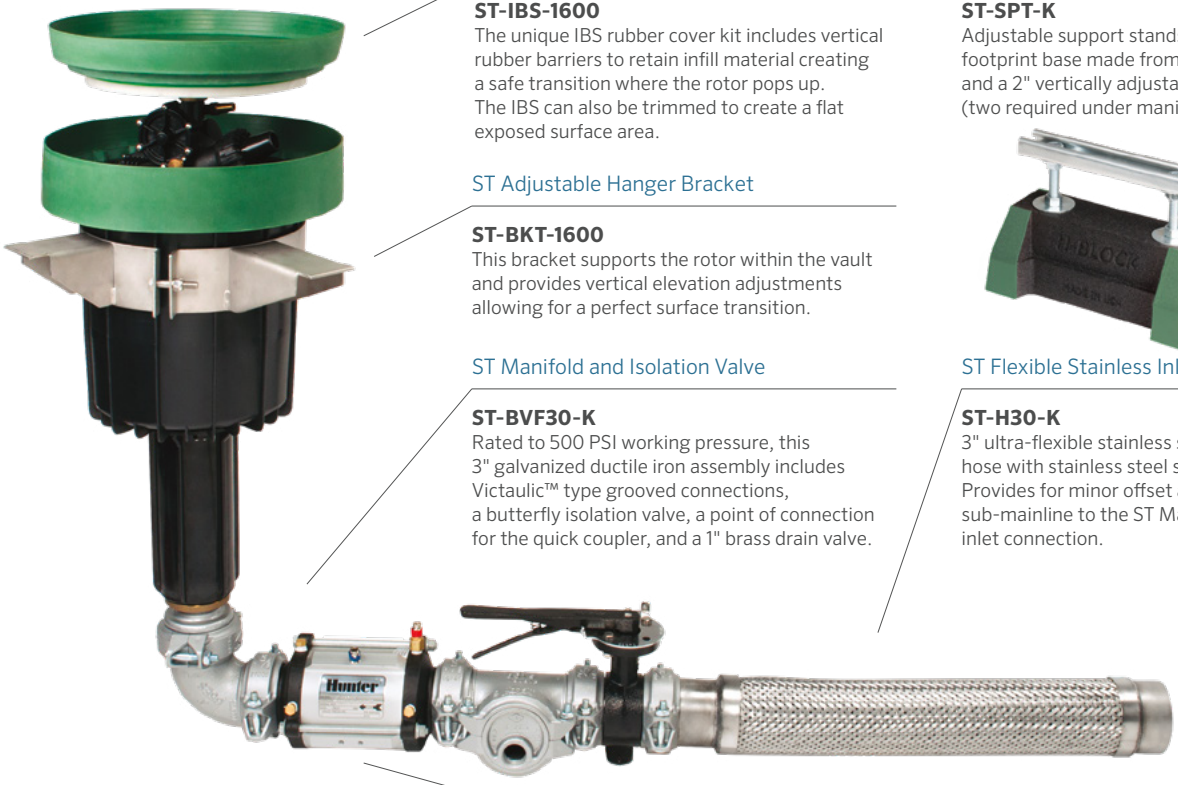
**BR (High-Speed)**
(Riser-Mounted Model)
Overall height: 8¾"
Diameter: 8¼"
Inlet size: 2" BSP*

* Adapter to 2" NPT nipple not required. Use BSP t.o.e. nipple adapter P/N 241400 if desired.

## KIT CONFIGURATIONS

| STK-6V | | |
|---|---|---|
| **Kit Description**<br>(Components are ordered individually) | **STK-6V-HSB-2P**<br>High-Speed Pop-Up<br>2" Plastic Valve | **STK-6V-HSB-3M**<br>High-Speed Pop-Up<br>3" Metal Valve |
| **ST Rotor:** Synthetic turf rotor | **ST-1600-HS-B** | **ST-1600-HS-B** |
| **ST Infill Barrier System:** Rubber cover kit | **ST-IBS-1600** | **ST-IBS-1600** |
| **ST Bracket:** Rotor hanger and elevation adjustment | **ST-BKT-1600** | **ST-BKT-1600** |
| **ST Vault:** 4-piece polymer-concrete cover set | **ST-243636-B** | **ST-243636-B** |
| **ST Manifold:** 3" fittings, isolation valve and drain valve | **ST-BVF30-K** | **ST-BVF30-K** |
| **ST Valve:** With remote on-off-auto selector | **ST-V20-KVP** | **ST-V30-KV** |
| **ST Variable Speed Valve:** Regulates opening speed | **ST-NDL-K** | **ST-NDL-K** |
| **ST Support:** Adjustable manifold support (2 required) | **ST-SPT-K** | **ST-SPT-K** |
| **ST Inlet Hose:** Flexible stainless steel alignment hose | **ST-H30-K** | **ST-H30-K** |
| **Quick-Coupler Valve:** 1" inlet, 1¼" outlet for key | **HQ-5RC** | **HQ-5RC** |

**ST1600 Tool**
P/N 517600SP
For gear drive installation and removal




### ST Infill Barrier System

**ST-IBS-1600**
The unique IBS rubber cover kit includes vertical rubber barriers to retain infill material creating a safe transition where the rotor pops up. The IBS can also be trimmed to create a flat exposed surface area.

### ST Adjustable Hanger Bracket

**ST-BKT-1600**
This bracket supports the rotor within the vault and provides vertical elevation adjustments allowing for a perfect surface transition.

### ST Manifold and Isolation Valve

**ST-BVF30-K**
Rated to 500 PSI working pressure, this 3" galvanized ductile iron assembly includes Victaulic™ type grooved connections, a butterfly isolation valve, a point of connection for the quick coupler, and a 1" brass drain valve.

### ST H-Block Manifold Supports

**ST-SPT-K**
Adjustable support stands include a large footprint base made from recycled tire rubber and a 2" vertically adjustable support rail (two required under manifold).



### ST Flexible Stainless Inlet Hose

**ST-H30-K**
3" ultra-flexible stainless steel corrugated hose with stainless steel support braiding. Provides for minor offset and alignment of sub-mainline to the ST Manifold's inlet connection.

### ST Low-Loss, Slow-Opening Valve (Plastic)

**For Flows Up to 200 GPM**


**ST-V20-KVP:** Heavy-duty plastic control valve
**Valve:** 2" grooved Vic type
**Opening speed:** ST-NDL-K regulates/slows speed
**Pressure loss:** Ultra-low (1.5 PSI at 200 GPM)
**Manual control:** Remote on-off-auto selector and solenoid (not shown)

### ST Low-Loss, Slow-Opening Valve (Metal)

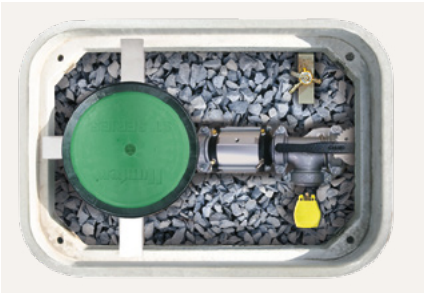
**ST-V30-KV:** Heavy-duty metal control valve
**Valve:** 3" grooved Vic type
**Opening speed:** ST-NDL-K regulates/slows speed
**Pressure loss:** Ultra-low (2.0 PSI at 325 GPM)
**Manual control:** Remote on-off-auto selector and solenoid (not shown)

## ST Rotors Have Many Uses

While ST Rotors are specifically designed for cleaning and cooling synthetic turf sports fields, they are also great for other applications such as pastures, horse arenas, dust control, and even casual natural turf areas.

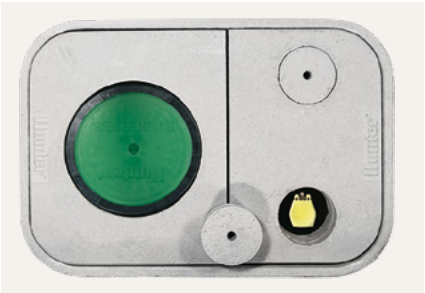
### INSIDE THE ST SYSTEM

Open access to all components for ease of ongoing maintenance



### FROM THE TOP

Smooth and safe surface area with quick-access ports



### SEAMLESS INTEGRATION

Blends in perfectly with the surrounding synthetic surface

*Victaulic is a trademark of Victaulic Company.*

## ST VAULTS

The heavy-duty tapered fiberglass and polymer-concrete construction includes pre-cast holes for the rotor, quick-coupler valve, and remote manifold assembly.

Quick couplers provide a convenient source of water for washing down spills and water-soluble paint. The integrated in-vault design eliminates the need for additional quick-coupler enclosures.

The ST-V30KV valve kit includes a remotely located on-off-auto selector and solenoid manifold assembly. These convenient features bring valve manual control functions and solenoid splice connections closer to the surface for easy access.

**ST-243636B:** Includes 3" thick 4-piece PC cover set

**Main cover:** 24" x 36"
**Overall height:** 36"
**Body weight:** 170 lbs.
**Total weight:** 320 lbs.
**Base pad:** 42" x 48"
**Quick-access ports:** 2

① Quick Coupler

② On-Off-Auto Selector


**ST-1600 Rotor in Action**

### ST-1600 SHORT-RADIUS NOZZLE KIT – P/N 959900 PERFORMANCE DATA

| Nozzle | Pressure PSI | Radius ft. | Flow GPM | Precip in/hr ■ | Precip in/hr ▲ |
|---|---|---|---|---|---|
| 8 | 45 | 67 | 23.3 | 1.00 | 1.15 |
| | 60 | 70 | 23.3 | 0.92 | 1.06 |
| | 70 | 72 | 25.5 | 0.95 | 1.09 |
| | 90 | 74 | 27.3 | 0.96 | 1.11 |
| | 100 | 76 | 29.2 | 0.97 | 1.12 |
| 10 | 45 | 74 | 32.4 | 1.14 | 1.32 |
| | 60 | 81 | 37.8 | 1.11 | 1.28 |
| | 70 | 84 | 42.5 | 1.16 | 1.34 |
| | 90 | 86 | 47.1 | 1.23 | 1.42 |
| | 100 | 88 | 51.0 | 1.27 | 1.46 |
| 12 | 45 | 84 | 46.2 | 1.26 | 1.46 |
| | 60 | 92 | 53.9 | 1.23 | 1.42 |
| | 70 | 94 | 60.5 | 1.32 | 1.52 |
| | 90 | 96 | 65.7 | 1.37 | 1.58 |
| | 100 | 98 | 71.8 | 1.44 | 1.66 |
| 14 | 45 | 91 | 60.7 | 1.41 | 1.63 |
| | 60 | 103 | 69.3 | 1.26 | 1.45 |
| | 70 | 105 | 78.2 | 1.37 | 1.58 |
| | 90 | 108 | 85.5 | 1.41 | 1.63 |
| | 100 | 110 | 92.5 | 1.47 | 1.70 |

### ST-1600 NOZZLE PERFORMANCE DATA*

| Nozzle | Pressure PSI | Radius ft. | Flow GPM | Precip in/hr ■ | Precip in/hr ▲ |
|---|---|---|---|---|---|
| 16 ● Black | 60 | 107 | 96.2 | 1.63 | 1.88 |
| | 70 | 115 | 107.3 | 1.57 | 1.81 |
| | 90 | 121 | 117.8 | 1.54 | 1.78 |
| | 100 | 128 | 127.3 | 1.50 | 1.73 |
| | 115 | 135 | 137.4 | 1.46 | 1.69 |
| 18 ● Black | 60 | 112 | 107.0 | 1.66 | 1.91 |
| | 70 | 121 | 119.4 | 1.56 | 1.80 |
| | 90 | 128 | 131.0 | 1.54 | 1.78 |
| | 100 | 133 | 141.3 | 1.54 | 1.78 |
| | 115 | 141 | 153.2 | 1.48 | 1.71 |
| 20 ● Black | 60 | 115 | 144.0 | 2.10 | 2.43 |
| | 70 | 128 | 160.9 | 1.89 | 2.18 |
| | 90 | 141 | 176.5 | 1.71 | 1.97 |
| | 100 | 144 | 190.5 | 1.76 | 2.03 |
| | 115 | 148 | 204.2 | 1.80 | 2.08 |
| 22 ● Black | 60 | 118 | 171.5 | 2.37 | 2.73 |
| | 70 | 130 | 191.8 | 2.20 | 2.54 |
| | 90 | 144 | 210.0 | 1.94 | 2.24 |
| | 100 | 151 | 226.9 | 1.84 | 2.12 |
| | 115 | 157 | 243.1 | 1.89 | 2.18 |
| 24 ● Black | 60 | 121 | 202.1 | 2.64 | 3.05 |
| | 70 | 133 | 225.9 | 2.46 | 2.84 |
| | 90 | 148 | 247.6 | 2.19 | 2.52 |
| | 100 | 156 | 267.4 | 2.12 | 2.45 |
| | 115 | 160 | 286.4 | 2.16 | 2.49 |
| 26 ● Black | 60 | 126 | 233.2 | 2.83 | 3.27 |
| | 70 | 136 | 260.4 | 2.71 | 3.13 |
| | 90 | 151 | 284.5 | 2.40 | 2.77 |
| | 100 | 160 | 307.0 | 2.31 | 2.67 |
| | 115 | 165 | 326.8 | 2.32 | 2.68 |

**Note:**
All precipitation rates calculated for 180° operation.
For precipitation rate of a 360° sprinkler, divide by 2.

* All radius measurements taken at standard rotation speeds. Slowing rotation to minimum rotation speed will add 10+ feet to radius.

# ST-1200BR

*Radius:* **67' to 115'**
*Flow:* **27.0 to 131.0 GPM**

*The cost-effective ST-1200BR is the ideal riser-mount solution for pastures, corrals, arenas, dust control, and wash-down watering.*

## KEY BENEFITS

- Nozzle choices: 5 (included)
- Standard nozzle: #12
- Nozzle range: #10 to #18
- Nozzle trajectory: 22.5°
- Isolated, grease-lubricated gear drive
- Nozzle barrels: short and long (included)
- Movable stops (left and right) arc adjustment
- Arc setting: 40° to non-reversing 360°
- Ratcheting nozzle turret

## OPERATING SPECIFICATIONS

- Radius: 67' to 115'
- Flow: 27.0 to 131.0 GPM

**ST-1200BR**
Overall height: 12"
Overall length: 12"
Overall width: 3¾"
Inlet size: 1½" NPT

**Included**
*Short and long barrels*

**ST-1200BR NOZZLE PERFORMANCE DATA**

| Nozzle | Pressure PSI | Radius ft. | Flow GPM | Precip in/hr ■ | Precip in/hr ▲ |
|---|---|---|---|---|---|
| 10 ● Black | 30 | 67 | 27.0 | 1.16 | 1.34 |
| | 45 | 75 | 32.8 | 1.12 | 1.30 |
| | 60 | 85 | 38.1 | 1.02 | 1.17 |
| | 75 | 90 | 43.5 | 1.03 | 1.19 |
| 12 ● Black | 30 | 68 | 33.6 | 1.40 | 1.62 |
| | 45 | 78 | 41.2 | 1.30 | 1.51 |
| | 60 | 88 | 47.6 | 1.18 | 1.37 |
| | 75 | 98 | 53.1 | 1.06 | 1.23 |
| 14 ● Black | 30 | 70 | 45.7 | 1.80 | 2.07 |
| | 45 | 86 | 56.0 | 1.46 | 1.68 |
| | 60 | 100 | 64.7 | 1.25 | 1.44 |
| | 75 | 110 | 72.5 | 1.15 | 1.33 |
| 16 ● Black | 30 | 72 | 59.5 | 2.21 | 2.55 |
| | 45 | 93 | 73.0 | 1.62 | 1.88 |
| | 60 | 103 | 84.3 | 1.53 | 1.77 |
| | 75 | 116 | 80.9 | 1.16 | 1.34 |
| 18 ● Black | 30 | 95 | 92.5 | 1.97 | 2.28 |
| | 45 | 104 | 107.0 | 1.90 | 2.20 |
| | 60 | 111 | 119.5 | 1.87 | 2.16 |
| | 75 | 115 | 131.0 | 1.91 | 2.20 |

# HIGH-FLOW SWING JOINTS

*These durable swing joints are easy to position and ensure correct rotor installation height.*

## KEY BENEFITS

- Heavy-duty, high-flow swing joints with O-ring seals
- HSJ-4 for high-flow I-90 and ST-90 rotors with 1½" inlets
- HSJ-5 for high-flow ST-1600B rotor with 2" inlet
- Available in popular inlet and outlet configurations

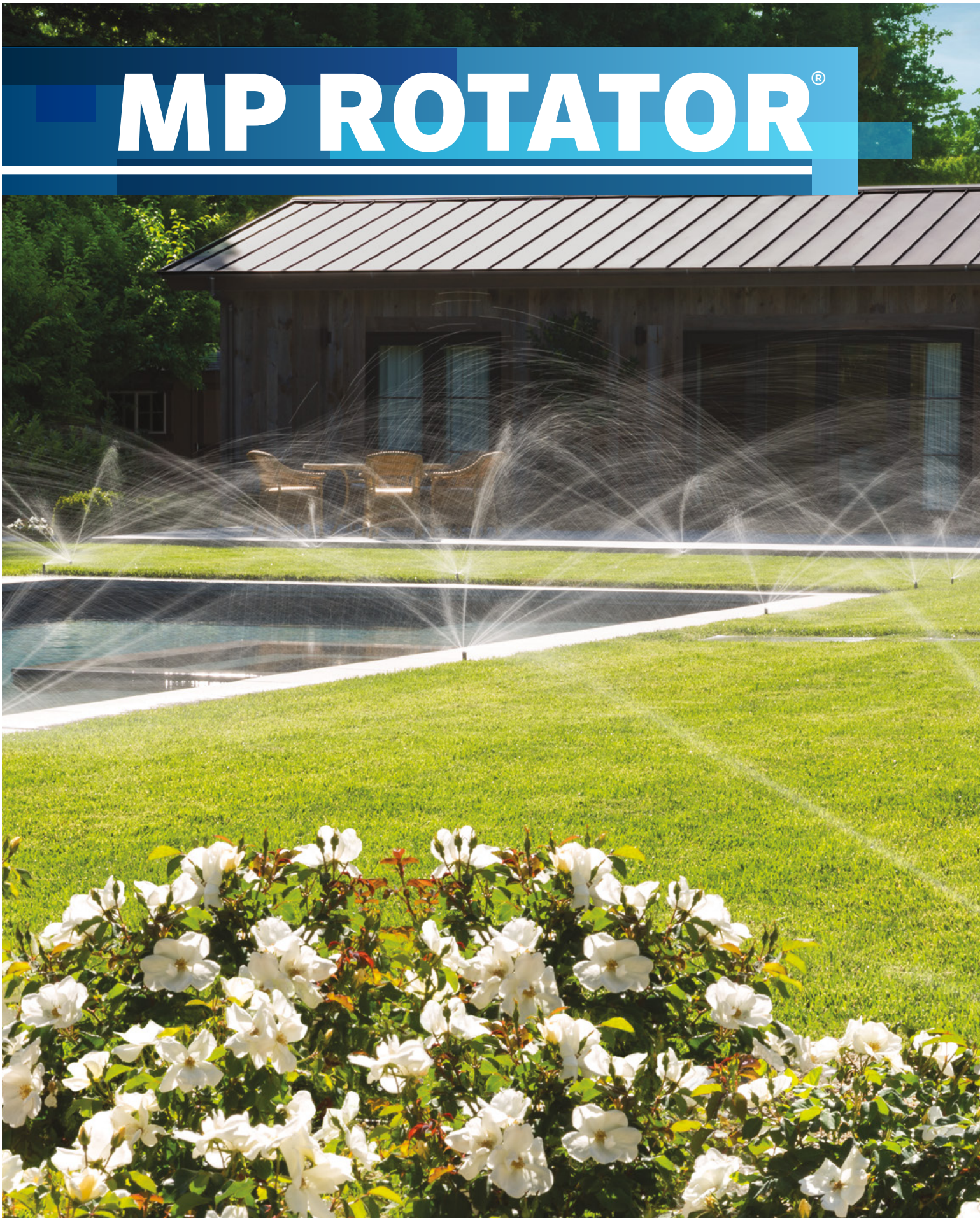
**High-Flow Swing Joints**
HSJ-4 = Model 2"
HSJ-5 = Model 3"

**HSJ HIGH-FLOW SWING JOINT – SPECIFICATION BUILDER:** ORDER 1 + 2 + 3 + 4

| 1 Model | 2 Inlet Type (from pipe fitting) | 3 Outlet Type (to sprinkler inlet) | 4 Outlet Style | 5 Lay Length |
|---|---|---|---|---|
| **HSJ-4** = 2" heavy-duty swing joint | **3** = 2" male NPT, horizontal side connection | **7** = 1½" male NPT | **2** = Single top-out | **12** = 12" lay arm |
| **HSJ-5** = 3" heavy-duty swing joint | **3** = 3" male NPT, horizontal side connection | **8** = 2" male NPT | **2** = Single top-out | **12** = 12" lay arm |

**Examples:**
**HSJ-4-37-212** = HSJ 2" heavy-duty swing joint, 2" male NPT horizontal side connection to piping, 1½" male NPT outlet to sprinkler, single top-out, and 12" lay arm
**HSJ-5-38-212** = HSJ 3" heavy-duty swing joint, 3" male NPT horizontal side connection to piping, 2" male NPT outlet to sprinkler, single top-out, and 12" lay arm

# MP ROTATOR®



# ADVANCED FEATURES

## AUTOMATIC MATCHED PRECIPITATION

MP Rotator nozzles adjust the flow rate through the nozzle as the radius and arc are changed, resulting in the same matched precipitation rate regardless of the nozzle setting.

## DOUBLE-POP FEATURE

MP Rotator nozzles pop up from their protected position only after the riser is fully extended, providing superior defense against dirt and debris.

## HIGH DISTRIBUTION UNIFORMITY

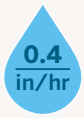
The multiple streams of the MP Rotator target all areas of the landscape evenly, resulting in superior uniformity over traditional spray nozzles and better wind resistance.

## LOW PRECIPITATION RATE

Since the majority of soils have a water infiltration rate of less than 1.0 in/hr, irrigating at a low precipitation rate is essential to reduce runoff and increase efficiency.

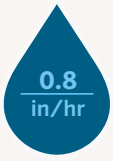
The Standard MP Rotator applies water at 0.4 in/hr, while the MP800 has a precipitation rate of 0.8 in/hr. Either choice will avoid runoff, save water, and prevent erosion.

**STANDARD**
MP Rotator




**8-35 ft.**
- Maximum water efficiency
- Slowest precipitation rate

**MP800**




**6-16 ft.**
- Small spaces
- Tight water windows

**MP STRIPS**

**5 ft. wide**
- Rectangular spaces
- Pair with either option

# MP ROTATOR®

*Radius:* **8' to 35'**

**0.4 in/hr**

*The MP Rotator nozzle is the most trusted high-efficiency solution on the market, offering up to 30% water savings over traditional spray nozzles.*

## KEY BENEFITS

- Low precipitation rate of approximately 0.4 in/hr — lowest in the industry
- Automatic matched precipitation for simplified irrigation design and flexibility
- Double-pop feature protects the nozzle from external debris
- High distribution uniformity for a healthy landscape with maximum water efficiency

## ADDITIONAL FEATURES

- Wind-resistant, multi-stream technology prevents misting
- Adjustable arc only when MP Rotator is running for vandal resistance
- Removable filter screen prevents nozzle from clogging
- Color-coded for easy identification

## OPERATING SPECIFICATIONS

- Radius reduction up to approximately 25% on all models
- Recommended operating pressure: 40 PSI
- Minimum radius setting achieved at 30 PSI
- Warranty period: 3 years

## OPTIONS

- Pair with Pro-Spray® PRS40 pop-up for pressure regulation to 40 PSI for nominal radius settings
- Pair with Pro-Spray PRS30 pop-up for pressure regulation to 30 PSI for minimum radius settings

### MP1000: 8' to 15' radius

**MP1000-90**
90° to 210°

**MP1000-210**
210° to 270°

**MP1000-360**
360°

### MP2000: 13' to 21' radius

**MP2000-90**
90° to 210°

**MP2000-210**
210° to 270°

**MP2000-360**
360°

### MP3000: 22' to 30' radius

**MP3000-90**
90° to 210°

**MP3000-210**
210° to 270°

**MP3000-360**
360°

### MP3500: 31' to 35' radius

**MP3500-90**
90° to 210°

**MP ROTATOR – SPECIFICATION BUILDER:** ORDER 1 + 2

| 1 Model | 2 Options |
|---|---|
| **MP1000-90** = 8' to 15' radius, adjustable from 90° to 210° | **(blank)** = No option |
| **MP1000-210** = 8' to 15' radius, adjustable from 210° to 270° | **HT** = Male threaded version *(Not available in 3500 and 1000-210)* |
| **MP1000-360** = 8' to 15' radius, 360° | |
| **MP2000-90** = 13' to 21' radius, adjustable from 90° to 210° | |
| **MP2000-210** = 13' to 21' radius, adjustable from 210° to 270° | |
| **MP2000-360** = 13' to 21' radius, 360° | |
| **MP3000-90** = 22' to 30' radius, adjustable from 90° to 210° | |
| **MP3000-210** = 22' to 30' radius, adjustable from 210° to 270° | |
| **MP3000-360** = 22' to 30' radius, 360° | |
| **MP3500-90** = 31' to 35' radius, adjustable from 90° to 210° | |
| **MPLCS-515** = Left corner strip, 5' x 15' | |
| **MPRCS-515** = Right corner strip, 5' x 15' | |
| **MPSS-530** = Side strip, 5' x 30' | |
| **MP-CORNER** = 8' to 15' radius, adjustable from 45° to 105° | |

## MP ROTATOR PERFORMANCE DATA

**MP1000**
Radius: 8' to 15'
Adjustable Arc and Full-Circle
- Maroon: 90° to 210°
- Lt. Blue: 210° to 270°
- Olive: 360°

**MP2000**
Radius: 13' to 21'
Adjustable Arc and Full-Circle
- Black: 90° to 210°
- Green: 210° to 270°
- Red: 360°

**MP3000**
Radius: 22' to 30'
Adjustable Arc and Full-Circle
- Blue: 90° to 210°
- Yellow: 210° to 270°
- Gray: 360°

| Arc | Pressure | MP1000 | | | | | MP2000 | | | | | MP3000 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PSI | Radius ft. | Flow GPM | Flow GPH | Precip in/hr ■ | Precip in/hr ▲ | Radius ft. | Flow GPM | Flow GPH | Precip in/hr ■ | Precip in/hr ▲ | Radius ft. | Flow GPM | Flow GPH | Precip in/hr ■ | Precip in/hr ▲ |
| 90° | 25 | -- | -- | -- | -- | -- | 17 | 0.34 | 20.4 | 0.45 | 0.52 | 25 | 0.71 | 42.6 | 0.44 | 0.51 |
| | 30 | 12 | 0.17 | 10.2 | 0.45 | 0.52 | 18 | 0.38 | 22.8 | 0.45 | 0.52 | 27 | 0.76 | 45.6 | 0.40 | 0.46 |
| | 35 | 13 | 0.19 | 11.4 | 0.43 | 0.50 | 19 | 0.40 | 24.0 | 0.43 | 0.49 | 28 | 0.82 | 49.2 | 0.40 | 0.46 |
| | **40** | **14** | **0.21** | **12.6** | **0.41** | **0.48** | **20** | **0.43** | **25.8** | **0.41** | **0.48** | **30** | **0.86** | **51.6** | **0.37** | **0.42** |
| | 45 | 14 | 0.23 | 13.8 | 0.45 | 0.52 | 21 | 0.46 | 27.6 | 0.40 | 0.46 | 30 | 0.90 | 54.0 | 0.39 | 0.44 |
| | 50 | 15 | 0.25 | 15.0 | 0.43 | 0.49 | 21 | 0.47 | 28.2 | 0.41 | 0.47 | 30 | 0.95 | 57.0 | 0.41 | 0.47 |
| | 55 | 15 | 0.27 | 16.2 | 0.46 | 0.53 | 21 | 0.48 | 28.8 | 0.42 | 0.48 | 30 | 1.01 | 60.6 | 0.43 | 0.50 |
| 180° | 25 | -- | -- | -- | -- | -- | 16 | 0.6 | 36.0 | 0.45 | 0.52 | 25 | 1.44 | 86.4 | 0.44 | 0.51 |
| | 30 | 12 | 0.34 | 20.4 | 0.45 | 0.52 | 17 | 0.64 | 38.4 | 0.43 | 0.49 | 27 | 1.58 | 94.8 | 0.42 | 0.48 |
| | 35 | 13 | 0.38 | 22.8 | 0.43 | 0.50 | 18 | 0.71 | 42.6 | 0.42 | 0.49 | 28 | 1.70 | 102.0 | 0.42 | 0.48 |
| | **40** | **14** | **0.42** | **25.2** | **0.41** | **0.48** | **19** | **0.77** | **46.2** | **0.41** | **0.47** | **30** | **1.82** | **109.2** | **0.39** | **0.45** |
| | 45 | 14 | 0.44 | 26.4 | 0.43 | 0.50 | 20 | 0.85 | 51.0 | 0.41 | 0.47 | 30 | 1.93 | 115.8 | 0.41 | 0.48 |
| | 50 | 15 | 0.50 | 30.0 | 0.43 | 0.49 | 21 | 0.91 | 54.6 | 0.40 | 0.46 | 30 | 2.04 | 122.4 | 0.44 | 0.50 |
| | 55 | 15 | 0.51 | 30.6 | 0.44 | 0.50 | 21 | 0.95 | 57.0 | 0.41 | 0.48 | 30 | 2.13 | 127.8 | 0.46 | 0.53 |
| 210° | 25 | -- | -- | -- | -- | -- | 16 | 0.72 | 43.2 | 0.46 | 0.54 | 25 | 1.68 | 100.8 | 0.44 | 0.51 |
| | 30 | 12 | 0.40 | 24.0 | 0.46 | 0.53 | 17 | 0.75 | 45.0 | 0.43 | 0.49 | 27 | 1.84 | 110.4 | 0.42 | 0.48 |
| | 35 | 13 | 0.45 | 27.0 | 0.44 | 0.51 | 18 | 0.81 | 48.6 | 0.41 | 0.48 | 28 | 1.99 | 119.4 | 0.42 | 0.48 |
| | **40** | **14** | **0.49** | **29.4** | **0.41** | **0.48** | **19** | **0.86** | **51.6** | **0.39** | **0.45** | **30** | **2.12** | **127.2** | **0.39** | **0.45** |
| | 45 | 14 | 0.51 | 30.6 | 0.43 | 0.50 | 20 | 0.91 | 54.6 | 0.38 | 0.43 | 30 | 2.25 | 135.0 | 0.41 | 0.48 |
| | 50 | 15 | 0.57 | 34.2 | 0.42 | 0.48 | 21 | 0.98 | 58.8 | 0.37 | 0.42 | 30 | 2.37 | 142.2 | 0.43 | 0.50 |
| | 55 | 15 | 0.59 | 35.4 | 0.43 | 0.50 | 21 | 1.01 | 60.6 | 0.38 | 0.44 | 30 | 2.49 | 149.4 | 0.46 | 0.53 |
| 270° | 25 | -- | -- | -- | -- | -- | 16 | 0.87 | 52.2 | 0.44 | 0.50 | 25 | 2.19 | 131.4 | 0.45 | 0.52 |
| | 30 | 12 | 0.48 | 28.8 | 0.43 | 0.49 | 17 | 0.95 | 57.0 | 0.42 | 0.49 | 27 | 2.37 | 142.2 | 0.42 | 0.48 |
| | 35 | 13 | 0.53 | 31.8 | 0.40 | 0.46 | 18 | 1.03 | 61.8 | 0.41 | 0.47 | 28 | 2.55 | 153.0 | 0.42 | 0.48 |
| | **40** | **14** | **0.63** | **37.8** | **0.41** | **0.48** | **19** | **1.10** | **66.0** | **0.39** | **0.45** | **30** | **2.73** | **163.8** | **0.39** | **0.45** |
| | 45 | 14 | 0.67 | 40.2 | 0.44 | 0.51 | 20 | 1.17 | 70.2 | 0.38 | 0.43 | 30 | 2.89 | 173.4 | 0.41 | 0.48 |
| | 50 | 15 | 0.72 | 43.2 | 0.41 | 0.47 | 21 | 1.23 | 73.8 | 0.36 | 0.41 | 30 | 3.06 | 183.6 | 0.44 | 0.50 |
| | 55 | 15 | 0.75 | 45.0 | 0.43 | 0.49 | 21 | 1.30 | 78.0 | 0.38 | 0.44 | 30 | 3.22 | 193.2 | 0.46 | 0.53 |
| 360° | 25 | -- | -- | -- | -- | -- | 16 | 1.20 | 72.0 | 0.45 | 0.52 | 25 | 2.88 | 172.8 | 0.44 | 0.51 |
| | 30 | 12 | 0.69 | 41.4 | 0.46 | 0.53 | 17 | 1.28 | 76.8 | 0.43 | 0.49 | 27 | 3.15 | 189.0 | 0.42 | 0.48 |
| | 35 | 13 | 0.77 | 46.2 | 0.44 | 0.51 | 18 | 1.37 | 82.2 | 0.41 | 0.47 | 28 | 3.40 | 204.0 | 0.42 | 0.48 |
| | **40** | **14** | **0.84** | **50.4** | **0.41** | **0.48** | **19** | **1.48** | **88.8** | **0.39** | **0.46** | **30** | **3.64** | **218.4** | **0.39** | **0.45** |
| | 45 | 14 | 0.88 | 52.8 | 0.43 | 0.50 | 20 | 1.57 | 94.2 | 0.38 | 0.44 | 30 | 3.86 | 231.6 | 0.41 | 0.48 |
| | 50 | 15 | 0.98 | 58.8 | 0.42 | 0.48 | 21 | 1.68 | 100.8 | 0.37 | 0.42 | 30 | 4.07 | 244.2 | 0.44 | 0.50 |
| | 55 | 15 | 1.01 | 60.6 | 0.43 | 0.50 | 21 | 1.74 | 104.4 | 0.38 | 0.44 | 30 | 4.27 | 256.2 | 0.46 | 0.53 |

**Bold =** Optimal pressure for the MP Rotator is 40 PSI. This can easily be achieved by using the MP Rotator with the Hunter Pro-Spray PRS40 pressure-regulated at 40 PSI.

**Works best with Pro-Spray PRS40**

*Compatible with:*

***Pro-Spray PRS40***
*Page 61*

## MP ROTATOR PERFORMANCE DATA

**MP3500**
Radius: 31' to 35'
Adjustable Arc
● Light Brown: 90°

| Arc | Pressure PSI | Radius ft. | Flow GPM | Flow GPH | Precip in/hr ■ | Precip in/hr ▲ |
|---|---|---|---|---|---|---|
| 90° | 25 | 33 | 1.04 | 62.4 | 0.37 | 0.42 |
| | 30 | 34 | 1.13 | 67.8 | 0.38 | 0.43 |
| | 35 | 34 | 1.21 | 72.6 | 0.40 | 0.47 |
| | **40** | **35** | **1.28** | **76.8** | **0.40** | **0.46** |
| | 45 | 35 | 1.38 | 82.8 | 0.43 | 0.50 |
| | 50 | 35 | 1.43 | 85.8 | 0.45 | 0.52 |
| | 55 | 35 | 1.50 | 90.0 | 0.47 | 0.54 |
| 180° | 25 | 33 | 2.21 | 132.6 | 0.39 | 0.45 |
| | 30 | 34 | 2.24 | 134.4 | 0.37 | 0.43 |
| | 35 | 34 | 2.65 | 159.0 | 0.44 | 0.51 |
| | **40** | **35** | **2.86** | **171.6** | **0.45** | **0.52** |
| | 45 | 35 | 3.10 | 186.0 | 0.49 | 0.56 |
| | 50 | 35 | 3.21 | 192.6 | 0.50 | 0.58 |
| | 55 | 35 | 3.28 | 196.8 | 0.52 | 0.60 |
| 210° | 25 | 33 | 2.59 | 155.4 | 0.39 | 0.45 |
| | 30 | 34 | 2.84 | 170.4 | 0.41 | 0.47 |
| | 35 | 34 | 3.08 | 184.8 | 0.44 | 0.51 |
| | **40** | **35** | **3.29** | **197.4** | **0.44** | **0.51** |
| | 45 | 35 | 3.54 | 212.4 | 0.48 | 0.55 |
| | 50 | 35 | 3.76 | 225.6 | 0.51 | 0.59 |
| | 55 | 35 | 3.94 | 236.4 | 0.53 | 0.61 |

MP3500

**Bold =** Optimal pressure for the MP Rotator is 40 PSI. This can easily be achieved by using the MP Rotator with the Pro-Spray PRS40, pressure-regulated spray body at 40 PSI.

## MP ROTATOR PERFORMANCE DATA

- ● **MPLCS-515:** Ivory, MP Left Corner Strip
- ● **MPRCS-515:** Copper, MP Right Corner Strip
- ● **MPSS-530:** Brown, MP Side Strip

| | Pressure PSI | Radius ft. | Flow GPM | Flow GPH |
|---|---|---|---|---|
| **MP Left Corner Strip** | 30 | 4 x 14 | 0.19 | 11.4 |
| | 35 | 5 x 15 | 0.21 | 12.6 |
| | **40** | **5 x 15** | **0.22** | **13.2** |
| | 45 | 5 x 15 | 0.23 | 13.8 |
| | 50 | 6 x 16 | 0.25 | 15.0 |
| | 55 | 6 x 16 | 0.26 | 15.6 |
| **MP Right Corner Strip** | 30 | 4 x 14 | 0.19 | 11.4 |
| | 35 | 5 x 15 | 0.21 | 12.6 |
| | **40** | **5 x 15** | **0.22** | **13.2** |
| | 45 | 5 x 15 | 0.23 | 13.8 |
| | 50 | 6 x 16 | 0.25 | 15.0 |
| | 55 | 6 x 16 | 0.26 | 15.6 |
| **MP Side Strip** | 30 | 4 x 28 | 0.38 | 22.8 |
| | 35 | 5 x 30 | 0.41 | 24.6 |
| | **40** | **5 x 30** | **0.44** | **26.4** |
| | 45 | 5 x 30 | 0.47 | 28.2 |
| | 50 | 6 x 32 | 0.49 | 29.4 |
| | 55 | 6 x 32 | 0.51 | 30.6 |

### MP Strips

**MPLCS-515**
Left Corner Strip
5' x 15'

**MPRCS-515**
Right Corner Strip
5' x 15'

**MPSS-530**
Side Strip
5' x 30'

**Bold** = Recommended pressure
Notes: To match the precipitation rate of Standard MP Rotator models, use single-row or triangular spacing. To match the MP800, use rectangular spacing.

See **page 183** for precipitation rate calculation.

## MP ROTATOR PERFORMANCE DATA

**MP Corner**
Radius: 8' to 15'
Adjustable Arc
● Turquoise: 45° to 105°

| Arc | Pressure PSI | Radius ft. | Flow GPM | Flow GPH |
|---|---|---|---|---|
| 45° | 25 | -- | -- | -- |
| | 30 | 12 | 0.17 | 10.2 |
| | 35 | 13 | 0.18 | 10.8 |
| | **40** | **14** | **0.19** | **11.4** |
| | 45 | 14 | 0.21 | 12.6 |
| | 50 | 14 | 0.22 | 13.2 |
| | 55 | 15 | 0.23 | 13.8 |
| 90° | 25 | 11 | 0.31 | 18.6 |
| | 30 | 12 | 0.34 | 20.4 |
| | 35 | 13 | 0.36 | 21.6 |
| | **40** | **14** | **0.39** | **23.4** |
| | 45 | 14 | 0.41 | 24.6 |
| | 50 | 15 | 0.43 | 25.8 |
| | 55 | 15 | 0.46 | 27.6 |
| 105° | 25 | 11 | 0.36 | 21.6 |
| | 30 | 12 | 0.39 | 23.4 |
| | 35 | 13 | 0.42 | 25.2 |
| | **40** | **14** | **0.45** | **27.0** |
| | 45 | 14 | 0.48 | 28.8 |
| | 50 | 15 | 0.51 | 30.6 |
| | 55 | 15 | 0.53 | 31.8 |

**Bold** = Recommended pressure

### MP Corner

**MP-CORNER**
Corner
8' to 15'

### Male Threaded

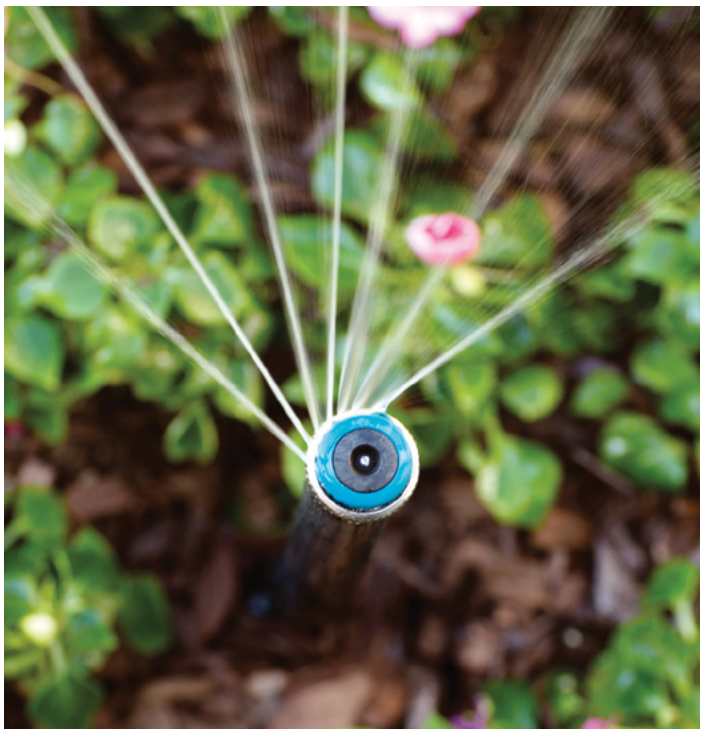
**MP-HT**
Male Threaded

### MP Accessories

**MPTOOL**
Adjusts all MP Rotator models

**MPSTICK**
Snaps onto any length of 1" PVC to allow standing adjustment. *PVC pipe not included.*

MP Corner



MP Tool for easy adjustments

# MP ROTATOR® 800

*Radius:* **6' to 16'**

0.8 in/hr

*The MP800 offers a higher precipitation rate perfect for small spaces and spray retrofits.*

## KEY BENEFITS

- Precipitation rate of approximately 0.8 in/hr for spray retrofit applications
- Automatic matched precipitation for simplified irrigation design and flexibility
- Double-pop feature protects the nozzle from external debris
- High distribution uniformity for a healthy landscape with maximum water efficiency

## ADDITIONAL FEATURES

- Wind-resistant, multi-stream technology prevents misting
- Adjustable arc only when MP Rotator nozzle is running for vandal resistance
- Removable filter screen prevents nozzle clogging
- Color-coded for easy identification

## OPERATING SPECIFICATIONS

- Radius reduction up to approximately 25% on all models
- Recommended operating pressure: 40 PSI
- Minimum radius setting achieved at 30 PSI
- Filtration recommended on dirty water applications
- Warranty period: 3 years

## OPTIONS

- Pair with Pro-Spray® PRS40 pop-up for pressure regulation to 40 PSI for nominal radius settings
- Pair with Pro-Spray PRS30 pop-up for pressure regulation to 30 PSI for minimum radius settings

### MP800SR: 6' to 12' radius

**MP800SR-90**
90° to 210°

**MP800SR-360**
360°

### MP815: 8' to 16' radius

**MP815-90**
90° to 210°

**MP815-210**
210° to 270°

**MP815-360**
360°

*Compatible with:*

***HY Filter***
*Page 152*

***PRS30 and PRS40***
*Page 60 and Page 61*

MP800SR-90

MP815-90

## MP ROTATOR PERFORMANCE DATA

### MP800SR

Radius: 6' to 12'
Adjustable Arc and Full-Circle
- Orange and Gray: 90° to 210°
- Lime Green and Gray: 360°

| | | MAX RADIUS | | | | | MIN RADIUS | |
|---|---|---|---|---|---|---|---|---|
| Arc | Pressure PSI | Radius ft. | Flow GPM | Flow GPH | Precip in/hr ■ | Precip in/hr ▲ | Radius ft. | Flow GPM |
| 90° | 30 | 8 | 0.17 | 9.6 | 0.90 | 1.04 | 6 | 0.13 |
| | 35 | 9 | 0.21 | 11.4 | 0.89 | 1.03 | 7 | 0.15 |
| | **40** | **10** | **0.23** | **13.8** | **0.83** | **0.96** | **8** | **0.16** |
| | 45 | 11 | 0.25 | 15.0 | 0.80 | 0.92 | 8 | 0.18 |
| | 50 | 11 | 0.27 | 16.2 | 0.79 | 0.92 | 9 | 0.19 |
| | 55 | 12 | 0.28 | 16.8 | 0.80 | 0.93 | 10 | 0.20 |
| 180° | 30 | 8 | 0.33 | 19.2 | 0.88 | 1.02 | 6 | 0.26 |
| | 35 | 9 | 0.38 | 22.2 | 0.85 | 0.99 | 7 | 0.29 |
| | **40** | **10** | **0.42** | **25.2** | **0.81** | **0.93** | **8** | **0.32** |
| | 45 | 11 | 0.46 | 27.6 | 0.77 | 0.88 | 8 | 0.36 |
| | 50 | 11 | 0.48 | 28.8 | 0.76 | 0.88 | 9 | 0.38 |
| | 55 | 12 | 0.50 | 30.0 | 0.73 | 0.84 | 10 | 0.40 |
| 210° | 30 | 8 | 0.35 | 22.2 | 0.80 | 0.93 | 6 | 0.30 |
| | 35 | 9 | 0.38 | 26.4 | 0.77 | 0.89 | 7 | 0.34 |
| | **40** | **10** | **0.43** | **29.4** | **0.81** | **0.91** | **8** | **0.37** |
| | 45 | 10 | 0.45 | 31.8 | 0.82 | 0.95 | 8 | 0.42 |
| | 50 | 11 | 0.49 | 33.6 | 0.73 | 0.85 | 9 | 0.44 |
| | 55 | 12 | 0.56 | 34.8 | 0.70 | 0.81 | 10 | 0.47 |
| 360° | 30 | 8 | 0.66 | 37.8 | 0.89 | 1.03 | 6 | 0.47 |
| | 35 | 9 | 0.71 | 42.0 | 0.80 | 0.92 | 7 | 0.52 |
| | **40** | **10** | **0.78** | **46.8** | **0.79** | **0.91** | **8** | **0.56** |
| | 45 | 10 | 0.85 | 51.0 | 0.78 | 0.90 | 8 | 0.59 |
| | 50 | 11 | 0.88 | 52.8 | 0.73 | 0.85 | 9 | 0.63 |
| | 55 | 12 | 0.98 | 58.8 | 0.70 | 0.81 | 10 | 0.70 |

**Bold** = Optimal pressure for the MP Rotator is 40 PSI. This can easily be achieved by using the MP Rotator with the Pro-Spray PRS40, pressure-regulated at 40 PSI.

## MP ROTATOR PERFORMANCE DATA

### MP815

Radius: 8' to 16'
Adjustable Arc and Full-Circle
- Maroon and Gray: 90° to 210°
- Lt. Blue and Gray: 210° to 270°
- Olive and Gray: 360°

| Arc | Pressure PSI | Radius ft. | Flow GPM | Flow GPH | Precip in/hr ■ | Precip in/hr ▲ |
|---|---|---|---|---|---|---|
| 90° | 30 | 14 | 0.42 | 25.2 | 0.83 | 0.95 |
| | 35 | 15 | 0.46 | 27.6 | 0.79 | 0.91 |
| | **40** | **15** | **0.49** | **29.4** | **0.84** | **0.97** |
| | 45 | 16 | 0.52 | 31.2 | 0.78 | 0.90 |
| | 50 | 16 | 0.55 | 33.0 | 0.83 | 0.96 |
| | 55 | 16 | 0.58 | 34.8 | 0.87 | 1.01 |
| 180° | 30 | 13 | 0.75 | 45.0 | 0.85 | 0.99 |
| | 35 | 14 | 0.86 | 51.6 | 0.84 | 0.98 |
| | **40** | **15** | **0.93** | **55.8** | **0.80** | **0.92** |
| | 45 | 15 | 0.96 | 57.6 | 0.82 | 0.95 |
| | 50 | 16 | 1.06 | 63.6 | 0.80 | 0.92 |
| | 55 | 16 | 1.11 | 66.6 | 0.83 | 0.96 |
| 210° | 30 | 13 | 0.88 | 52.8 | 0.86 | 0.99 |
| | 35 | 14 | 0.96 | 57.6 | 0.81 | 0.93 |
| | **40** | **15** | **1.10** | **66.0** | **0.81** | **0.93** |
| | 45 | 15 | 1.16 | 69.6 | 0.85 | 0.98 |
| | 50 | 16 | 1.24 | 74.4 | 0.80 | 0.92 |
| | 55 | 16 | 1.30 | 78.0 | 0.84 | 0.97 |
| 270° | 30 | 13 | 1.14 | 68.4 | 0.87 | 1.00 |
| | 35 | 14 | 1.24 | 74.4 | 0.81 | 0.94 |
| | **40** | **15** | **1.40** | **84.0** | **0.80** | **0.92** |
| | 45 | 15 | 1.47 | 88.2 | 0.84 | 0.97 |
| | 50 | 16 | 1.54 | 92.4 | 0.77 | 0.89 |
| | 55 | 16 | 1.61 | 96.6 | 0.81 | 0.93 |
| 360° | 30 | 13 | 1.52 | 91.2 | 0.87 | 1.00 |
| | 35 | 14 | 1.70 | 102.0 | 0.83 | 0.96 |
| | **40** | **15** | **1.87** | **112.2** | **0.80** | **0.92** |
| | 45 | 15 | 2.00 | 120.0 | 0.86 | 0.99 |
| | 50 | 16 | 2.13 | 127.8 | 0.80 | 0.92 |
| | 55 | 16 | 2.26 | 135.6 | 0.85 | 0.98 |

# SPRAYS & NOZZLES

# SPRAYS
# ADVANCED FEATURES

### CO-MOLDED WIPER SEAL

Molded with two types of chemical- and chlorine-resistant materials, this multi-function wiper seal reduces flow-by, allowing more heads on one zone, and prevents debris from entering the seal, reducing riser stick-ups.

### FLOGUARD™ TECHNOLOGY

In the event of a missing nozzle, FloGuard technology reduces the flow of water from the riser to a 0.5 GPM (10' tall) indicator stream, eliminating water waste and preventing landscape erosion while providing a visual indicator for repair.

### HEAVY-DUTY SPRING

The industry's strongest spring offers positive retraction under any conditions.

### CHECK VALVE

Optional field- or factory-installed check valves eliminate leaks and puddles at the lower heads, protecting landscapes from damage and erosion while reducing water waste.

### PRESSURE REGULATION

Pressure-regulated Pro-Spray pop-ups optimize the performance of the nozzle, reducing flow rates and preventing misting. The PRS30 (brown) regulates pressures to 30 PSI for spray nozzles. The PRS40 (gray) is designed for the efficient MP Rotator® nozzle at 40 PSI.

### INDUSTRY'S STRONGEST SPRAY BODY

The Pro-Spray line incorporates a heavy-duty ribbed body and durable cap engineered to withstand the harshest environments, including the rigors of foot traffic and the abuses of heavy machinery. In addition, the buttress thread design provides superior strength in cap-to-body gripping capacity, helping the head to withstand high inlet surge pressures.

**PRO-SPRAY**

**COMPETITOR**

### INNOVATIVE SEAL DESIGN

Pedestrian traffic, landscape equipment, temperature changes, and cycling pressures can cause body caps to loosen. The Pro-Spray cap can withstand more than one full 360° turn and remain sealed at any pressure, preventing excess runoff.

**Pro-Spray:** Seal remains intact
**Competitor:** Significant leaking at the body cap

## SPRAY BODY COMPARISON CHART

| QUICK SPECS | |  PS ULTRA |  PRO-SPRAY® |  PRS30 |  PRS40 |
|---|---|---|---|---|---|
| | | Good | Better | Best for Spray Nozzles | Best for MP Rotator® |
| POP-UP HEIGHT | in. | 2, 4, 6 | Shrub, 2, 3, 4, 6, 12 | Shrub, 4, 6, 12 | Shrub, 4, 6, 12 |
| PRESSURE-REGULATED | PSI | N/A | N/A | 30 | 40 |
| **FEATURES** | | | | | |
| PRE-INSTALLED NOZZLE | | 5SS, 8A, 10A, 12A, 15A, 17A | N/A | N/A | N/A |
| CAP COLOR | | Black | Black | Brown | Gray |
| CHECK VALVES | | Field-Installed | Field-Installed or Factory-Installed | Field-Installed or Factory-Installed | Factory-Installed |
| WARRANTY | | 2 Years | 5 Years | 5 Years | 5 Years |
| **ADVANCED FEATURES** | | | | | |
| BODY STYLE | | Slim Line | Rugged Body | Rugged Body | Rugged Body |
| SPRING | | Standard | Heavy-Duty | Heavy-Duty | Heavy-Duty |
| CO-MOLDED WIPER SEAL | | | ● | ● | ● |
| RECLAIMED CAP | | | ● | ● | ● |
| PRESSURE REGULATION | | | | ● | ● |
| FLOGUARD™ TECHNOLOGY | | | | ● | ● |
| **APPLICATIONS** | | | | | |
| TURFGRASS | | ● | ● | ● | ● |
| TURFGRASS: TALL MOWING HEIGHT | | ● | ● | ● | ● |
| SHRUBS: SPRINKLERS ON RISERS | | | ● | ● | ● |
| SHRUBS: TALL POP-UP SPRINKLERS | | | ● | ● | ● |
| RESIDENTIAL | | ● | ● | ● | ● |
| COMMERCIAL/MUNICIPALITIES | | | ● | ● | ● |
| HIGH-TRAFFIC AREAS | | | ● | ● | ● |
| RECLAIMED WATER | | | ● | ● | ● |

# PS ULTRA

*The PS Ultra is a compact, slim-line spray sprinkler with the option of pre-installed nozzles for faster installation.*



## KEY BENEFITS

- Enhanced cap for more durability, easier handling, and extended riser seal life
- Large inlet filter screen for increased debris resistance
- Check valve option eliminates low-head drainage
- Heavy-duty spring for consistent riser retraction

## ADDITIONAL FEATURES

- Directional flush plug design for cleaner installation
- Two-piece ratcheting riser
- 2" and 4" models can retrofit into older style PS models
- Compatible with all female-threaded nozzles

## OPERATING SPECIFICATIONS

- Operational pressure range: 20 to 70 PSI
- Warranty period: 2 years

## FACTORY-INSTALLED OPTIONS

- Flush plug (large filter screen not included)
- Nozzles 8A, 10A, 12A, 15A, 5' x 30' side strip
- Large inlet filter screen included in 4" and 6" pre-installed nozzle models

## USER-INSTALLED OPTIONS

- Check valve installs in filter screen for 4" and 6" models (up to 7' of elevation; P/N 462237SP)
- Large inlet filter screen (P/N 162900SP)
- Shutoff nozzle (P/N 916400SP)

**PSU-02**
Retracted height: 5"
Pop-up height: 2"
Exposed diameter: 1¼"
Inlet size: ½"

**PSU-04**
Retracted height: 7¼"
Pop-up height: 4"
Exposed diameter: 1¼"
Inlet size: ½"

**PSU-06**
Retracted height: 9½"
Pop-up height: 6"
Exposed diameter: 1¼"
Inlet size: ½"

**PS ULTRA – SPECIFICATION BUILDER:** ORDER 1 + 2 + 3 (OPTIONAL)

| 1 Model | 2 Nozzles | 3 Optional |
|---|---|---|
| **PSU-02** = 2" pop-up | **(blank)** = Flush plug, no large filter screen | **NFO** = Nozzle filter only *(available for 4" model only)*. Substitute standard installation of large inlet filter screen and receive unit with the nozzle filter only. |
| **PSU-04** = 4" pop-up | **8A** = 8' adjustable nozzle | |
| **PSU-06** = 6" pop-up | **10A** = 10' adjustable nozzle | |
| | **12A** = 12' adjustable nozzle | |
| | **15A** = 15' adjustable nozzle | |
| | **17A** = 17' adjustable nozzle | |
| | **5SS** = 5' x 30' side strip *(2" and 4" only)* | |

**Examples:**
**PSU-02 - 5SS** = 2" pop-up, with a 5' x 30' side strip
**PSU-06 - 10A** = 6" pop-up, with a 10' adjustable nozzle
**PSU-04** = 4" pop-up, with flush plug, large filter screen not included
**PSU-04 - 12A - NFO** = 4" pop-up, with a 12' adjustable nozzle, nozzle filter only

## PS ULTRA STANDARD NOZZLES PERFORMANCE DATA

| | | 8A ● Brown<br>8' radius<br>Adjustable from 0° to 360°<br>Trajectory: 0° | | | | 10A ● Red<br>10' radius<br>Adjustable from 0° to 360°<br>Trajectory: 15° | | | | 12A ● Green<br>12' radius<br>Adjustable from 0° to 360°<br>Trajectory: 28° | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Arc** | **Pressure** PSI | **Radius** ft. | **Flow** GPM | **Precip in/hr** ■ | ▲ | **Radius** ft. | **Flow** GPM | **Precip in/hr** ■ | ▲ | **Radius** ft. | **Flow** GPM | **Precip in/hr** ■ | ▲ |
| 45° | 20 | 7 | 0.18 | 2.83 | 3.27 | 9 | 0.20 | 1.90 | 2.20 | 11 | 0.25 | 1.59 | 1.84 |
| | 25 | 8 | 0.20 | 2.74 | 3.16 | 10 | 0.23 | 1.92 | 2.22 | 12 | 0.28 | 1.60 | 1.85 |
| | **30** | **8** | **0.22** | **2.65** | **3.06** | **10** | **0.25** | **1.93** | **2.22** | **12** | **0.32** | **1.68** | **1.95** |
| | 35 | 9 | 0.24 | 2.50 | 2.89 | 11 | 0.28 | 1.92 | 2.22 | 13 | 0.37 | 1.80 | 2.08 |
| | 40 | 9 | 0.25 | 2.38 | 2.74 | 11 | 0.30 | 1.88 | 2.17 | 13 | 0.42 | 1.91 | 2.21 |
| 90° | 20 | 7 | 0.36 | 2.83 | 3.27 | 9 | 0.40 | 1.90 | 2.20 | 11 | 0.50 | 1.59 | 1.84 |
| | 25 | 8 | 0.40 | 2.74 | 3.16 | 10 | 0.45 | 1.92 | 2.22 | 12 | 0.55 | 1.60 | 1.85 |
| | **30** | **8** | **0.44** | **2.65** | **3.06** | **10** | **0.50** | **1.93** | **2.22** | **12** | **0.63** | **1.68** | **1.95** |
| | 35 | 9 | 0.47 | 2.50 | 2.89 | 11 | 0.55 | 1.92 | 2.22 | 13 | 0.73 | 1.80 | 2.08 |
| | 40 | 9 | 0.50 | 2.38 | 2.74 | 11 | 0.59 | 1.88 | 2.17 | 13 | 0.84 | 1.91 | 2.21 |
| 120° | 20 | 7 | 0.48 | 2.83 | 3.27 | 9 | 0.53 | 1.90 | 2.20 | 11 | 0.67 | 1.59 | 1.84 |
| | 25 | 8 | 0.53 | 2.74 | 3.16 | 10 | 0.60 | 1.92 | 2.22 | 12 | 0.73 | 1.60 | 1.85 |
| | **30** | **8** | **0.59** | **2.65** | **3.06** | **10** | **0.67** | **1.93** | **2.22** | **12** | **0.84** | **1.68** | **1.95** |
| | 35 | 9 | 0.63 | 2.50 | 2.89 | 11 | 0.73 | 1.92 | 2.22 | 13 | 0.97 | 1.80 | 2.08 |
| | 40 | 9 | 0.67 | 2.38 | 2.74 | 11 | 0.79 | 1.88 | 2.17 | 13 | 1.12 | 1.91 | 2.21 |
| 180° | 20 | 7 | 0.72 | 2.83 | 3.27 | 9 | 0.80 | 1.90 | 2.20 | 11 | 1.00 | 1.59 | 1.84 |
| | 25 | 8 | 0.80 | 2.74 | 3.16 | 10 | 0.90 | 1.92 | 2.22 | 12 | 1.10 | 1.60 | 1.85 |
| | **30** | **8** | **0.88** | **2.65** | **3.06** | **10** | **1.00** | **1.93** | **2.22** | **12** | **1.26** | **1.68** | **1.95** |
| | 35 | 9 | 0.94 | 2.50 | 2.89 | 11 | 1.10 | 1.92 | 2.22 | 13 | 1.46 | 1.80 | 2.08 |
| | 40 | 9 | 1.00 | 2.38 | 2.74 | 11 | 1.18 | 1.88 | 2.17 | 13 | 1.68 | 1.91 | 2.21 |
| 240° | 20 | 7 | 0.96 | 2.83 | 3.27 | 9 | 1.07 | 1.90 | 2.20 | 11 | 1.33 | 1.59 | 1.84 |
| | 25 | 8 | 1.07 | 2.74 | 3.16 | 10 | 1.20 | 1.92 | 2.22 | 12 | 1.47 | 1.60 | 1.85 |
| | **30** | **8** | **1.17** | **2.65** | **3.06** | **10** | **1.33** | **1.93** | **2.22** | **12** | **1.68** | **1.68** | **1.95** |
| | 35 | 9 | 1.25 | 2.50 | 2.89 | 11 | 1.47 | 1.92 | 2.22 | 13 | 1.95 | 1.80 | 2.08 |
| | 40 | 9 | 1.33 | 2.38 | 2.74 | 11 | 1.57 | 1.88 | 2.17 | 13 | 2.24 | 1.91 | 2.21 |
| 270° | 20 | 7 | 1.08 | 2.83 | 3.27 | 9 | 1.20 | 1.90 | 2.20 | 11 | 1.50 | 1.59 | 1.84 |
| | 25 | 8 | 1.20 | 2.74 | 3.16 | 10 | 1.35 | 1.92 | 2.22 | 12 | 1.65 | 1.60 | 1.85 |
| | **30** | **8** | **1.32** | **2.65** | **3.06** | **10** | **1.50** | **1.93** | **2.22** | **12** | **1.89** | **1.68** | **1.95** |
| | 35 | 9 | 1.41 | 2.50 | 2.89 | 11 | 1.65 | 1.92 | 2.22 | 13 | 2.19 | 1.80 | 2.08 |
| | 40 | 9 | 1.50 | 2.38 | 2.74 | 11 | 1.77 | 1.88 | 2.17 | 13 | 2.52 | 1.91 | 2.21 |
| 360° | 20 | 7 | 1.44 | 2.83 | 3.27 | 9 | 1.60 | 1.90 | 2.20 | 11 | 2.00 | 1.59 | 1.84 |
| | 25 | 8 | 1.60 | 2.74 | 3.16 | 10 | 1.80 | 1.92 | 2.22 | 12 | 2.20 | 1.60 | 1.85 |
| | **30** | **8** | **1.76** | **2.65** | **3.06** | **10** | **2.00** | **1.93** | **2.22** | **12** | **2.52** | **1.68** | **1.95** |
| | 35 | 9 | 1.88 | 2.50 | 2.89 | 11 | 2.20 | 1.92 | 2.22 | 13 | 2.92 | 1.80 | 2.08 |
| | 40 | 9 | 2.00 | 2.38 | 2.74 | 11 | 2.36 | 1.88 | 2.17 | 13 | 3.36 | 1.91 | 2.21 |

**Bold** = Recommended pressure

## PS ULTRA STANDARD NOZZLES PERFORMANCE DATA

| | | 15A ● Black: 15' radius, Adjustable from 0° to 360°, Trajectory: 28° | | | | 17A ● Gray: 17' radius, Adjustable from 0° to 360°, Trajectory: 28° | | | |
|---|---|---|---|---|---|---|---|---|---|
| Arc | Pressure PSI | Radius ft. | Flow GPM | Precip in/hr ■ | Precip in/hr ▲ | Radius ft. | Flow GPM | Precip in/hr ■ | Precip in/hr ▲ |
| 45° | 20 | 14 | 0.39 | 1.51 | 1.75 | 16 | 0.49 | 1.46 | 1.68 |
| | 25 | 15 | 0.43 | 1.57 | 1.82 | 17 | 0.57 | 1.60 | 1.85 |
| | **30** | **15** | **0.47** | **1.59** | **1.84** | **17** | **0.58** | **1.53** | **1.77** |
| | 35 | 16 | 0.52 | 1.55 | 1.79 | 18 | 0.63 | 1.49 | 1.72 |
| | 40 | 17 | 0.57 | 1.60 | 1.85 | 19 | 0.69 | 1.55 | 1.79 |
| 90° | 20 | 14 | 0.77 | 1.51 | 1.75 | 16 | 0.97 | 1.46 | 1.68 |
| | 25 | 15 | 0.86 | 1.57 | 1.82 | 17 | 1.13 | 1.60 | 1.85 |
| | **30** | **15** | **0.93** | **1.59** | **1.84** | **17** | **1.15** | **1.53** | **1.77** |
| | 35 | 16 | 1.03 | 1.55 | 1.79 | 18 | 1.25 | 1.49 | 1.72 |
| | 40 | 17 | 1.13 | 1.60 | 1.85 | 19 | 1.38 | 1.55 | 1.79 |
| 120° | 20 | 14 | 1.03 | 1.51 | 1.75 | 16 | 1.29 | 1.46 | 1.68 |
| | 25 | 15 | 1.15 | 1.57 | 1.82 | 17 | 1.51 | 1.51 | 1.74 |
| | **30** | **15** | **1.24** | **1.59** | **1.84** | **17** | **1.53** | **1.53** | **1.77** |
| | 35 | 16 | 1.37 | 1.55 | 1.79 | 18 | 1.67 | 1.49 | 1.72 |
| | 40 | 17 | 1.51 | 1.60 | 1.85 | 19 | 1.84 | 1.47 | 1.70 |
| 180° | 20 | 14 | 1.54 | 1.51 | 1.75 | 16 | 1.94 | 1.46 | 1.68 |
| | 25 | 15 | 1.72 | 1.57 | 1.82 | 17 | 2.26 | 1.51 | 1.74 |
| | **30** | **15** | **1.86** | **1.59** | **1.84** | **17** | **2.30** | **1.53** | **1.77** |
| | 35 | 16 | 2.06 | 1.55 | 1.79 | 18 | 2.50 | 1.49 | 1.72 |
| | 40 | 17 | 2.26 | 1.60 | 1.85 | 19 | 2.76 | 1.47 | 1.70 |
| 240° | 20 | 14 | 2.05 | 1.51 | 1.75 | 16 | 2.59 | 1.46 | 1.68 |
| | 25 | 15 | 2.29 | 1.57 | 1.82 | 17 | 3.01 | 1.51 | 1.74 |
| | **30** | **15** | **2.48** | **1.59** | **1.84** | **17** | **3.07** | **1.53** | **1.77** |
| | 35 | 16 | 2.75 | 1.55 | 1.79 | 18 | 3.33 | 1.49 | 1.72 |
| | 40 | 17 | 3.01 | 1.60 | 1.85 | 19 | 3.68 | 1.47 | 1.70 |
| 270° | 20 | 14 | 2.31 | 1.51 | 1.75 | 16 | 2.91 | 1.46 | 1.68 |
| | 25 | 15 | 2.58 | 1.57 | 1.82 | 17 | 3.39 | 1.51 | 1.74 |
| | **30** | **15** | **2.79** | **1.59** | **1.84** | **17** | **3.45** | **1.53** | **1.77** |
| | 35 | 16 | 3.09 | 1.55 | 1.79 | 18 | 3.75 | 1.49 | 1.72 |
| | 40 | 17 | 3.39 | 1.60 | 1.85 | 19 | 4.14 | 1.47 | 1.70 |
| 360° | 20 | 14 | 3.08 | 1.51 | 1.75 | 16 | 3.88 | 1.46 | 1.68 |
| | 25 | 15 | 3.44 | 1.57 | 1.82 | 17 | 4.52 | 1.51 | 1.74 |
| | **30** | **15** | **3.72** | **1.59** | **1.84** | **17** | **4.60** | **1.53** | **1.77** |
| | 35 | 16 | 4.12 | 1.55 | 1.79 | 18 | 5.00 | 1.49 | 1.72 |
| | 40 | 17 | 4.52 | 1.60 | 1.85 | 19 | 5.52 | 1.47 | 1.70 |

**Bold** = Recommended pressure

## STRIP PATTERN NOZZLE PERFORMANCE DATA

| Model | Pressure PSI | Width x Length ft. | Flow GPM |
|---|---|---|---|
| SS-530 | 20 | 4 x 28 | 1.10 |
| | 25 | 5 x 30 | 1.20 |
| | **30** | **5 x 30** | **1.30** |
| | 35 | 5 x 30 | 1.40 |
| | 40 | 5 x 30 | 1.50 |

**Bold** = Recommended pressure

# PRO-SPRAY®

*Meet the strongest, most versatile spray body in the industry.*

## KEY BENEFITS

- Industry's strongest spray body for years of reliable performance
- Co-molded wiper seal made from chemical- and chlorine-resistant materials
- Innovative seal design prevents cap-to-body leaks, even with a loose cap
- Heavy-duty spring for consistent riser retraction
- Check valve option eliminates low-head drainage

## ADDITIONAL FEATURES

- Directional flush plug design for cleaner installation
- Interchangeable components for easier servicing, retrofits, and upgrades
- Compatible with all female-threaded nozzles

## OPERATING SPECIFICATIONS

- Operational pressure range: 15 to 100 PSI
- Warranty period: 5 years

## FACTORY-INSTALLED OPTIONS

- Check valve available for 4", 6", and 12" models (up to 10' of elevation)
- Reclaimed water ID cap

## USER-INSTALLED OPTIONS

- Drain check valve (up to 10' of elevation; P/N 437400SP)
- Reclaimed water ID cap (P/N 458520SP)
- Snap-on reclaimed cover (P/N PROS-RC-CAP-SP)
- Shutoff cap (P/N 213600SP)
- Shutoff nozzle (P/N 916400SP)

**Pro-Spray Reclaimed**

*Pro-Spray models include optional factory-installed purple reclaimed caps*

**PRO-SPRAY – SPECIFICATION BUILDER:** ORDER 1 + 2

| 1 Models | 2 Options |
|---|---|
| **PROS-00** = Shrub adapter | **(blank)** = No option |
| **PROS-02** = 2" pop-up | **CV** = Factory-installed drain check valve *(Pop-up models only)* |
| **PROS-03** = 3" pop-up | **R** = Factory-installed reclaimed body cap *(Shrub molded in purple)* |
| **PROS-04** = 4" pop-up | |
| **PROS-06** = 6" pop-up (no side inlet) | |
| **PROS-12** = 12" pop-up (no side inlet) | |

**PRO-SPRAY (SIDE INLET) MODELS**

| Model |
|---|
| **PROS-06-SI** = 6" pop-up with side inlet |
| **PROS-12-SI** = 12" pop-up with side inlet |

**Examples:**
**PROS-04** = 4" pop-up
**PROS-06-CV** = 6" pop-up, drain check valve
**PROS-12-CV-R** = 12" pop-up, drain check valve, reclaimed body cap

**PROS-00**
Retracted height: 1½"
Inlet size: ½"

**PROS-02**
Retracted height: 4"
Pop-up height: 2"
Exposed diameter: 2¼"
Inlet size: ½"

**PROS-03**
Retracted height: 5"
Pop-up height: 3"
Exposed diameter: 2¼"
Inlet size: ½"
Shutoff

**PROS-04**
Retracted height: 5⅞"
Pop-up height: 4"
Exposed diameter: 2¼"
Inlet size: ½"
Shutoff


[A] **PROS-06-SI**
[B] **PROS-06**
Retracted height: 8¾"
Pop-up height: 6"
Exposed diameter: 2¼"
Inlet size: ½"


[A] **PROS-12-SI**
[B] **PROS-12**
Retracted height: 16⅛"
Pop-up height: 12"
Exposed diameter: 2¼"
Inlet size: ½"

# PRS30

*To maintain consistent performance and reduce water waste, the PRS30 is pressure-regulated to an optimal pressure of 30 PSI.*

## KEY BENEFITS

- Industry's strongest spray body for years of reliable performance
- Pressure-regulated to 30 PSI for optimal nozzle performance
- Brown cap for easy field identification
- Co-molded wiper seal made from chemical- and chlorine-resistant materials
- Innovative seal design prevents cap-to-body leaks, even with a loose cap
- FloGuard technology option eliminates water waste in the event of a missing nozzle

## ADDITIONAL FEATURES

- Directional flush plug design for cleaner installation
- Interchangeable components for easier servicing, retrofits, and upgrades
- Heavy-duty spring for consistent riser retraction
- Check valve option eliminates low-head drainage
- Compatible with all female-threaded nozzles

## OPERATING SPECIFICATIONS

- Operational pressure range: 15 to 100 PSI
- Warranty period: 5 years

## FACTORY-INSTALLED OPTIONS

- Check valve available for 4", 6", and 12" models (up to 14' of elevation)
- Reclaimed water identification
- FloGuard technology available for check valve models

## USER-INSTALLED OPTIONS

- Check valve (up to 14' of elevation; P/N 437400SP)
- Reclaimed water ID cap (P/N 458560SP)
- Snap-on reclaimed cover (P/N PROS-RC-CAP-SP)
- Shutoff cap (P/N 213600SP)
- Shutoff nozzle (P/N 916400SP)

**PRS30 Reclaimed**
*PRS30 models include optional factory-installed purple reclaimed caps*

**PROS-00-PRS30**
Retracted height: 4½"
Inlet size: ½"

**PROS-04-PRS30**
Retracted height: 5⅞"
Pop-up height: 4"
Exposed diameter: 2¼"
Inlet size: ½"

**FloGuard Technology**


[A] **PROS-06-SI-PRS30**
[B] **PROS-06-PRS30**
Retracted height: 8¾"
Pop-up height: 6"
Exposed diameter: 2¼"
Inlet size: ½"


[A] **PROS-12-SI-PRS30**
[B] **PROS-12-PRS30**
Retracted height: 16⅛"
Pop-up height: 12"
Exposed diameter: 2¼"
Inlet size: ½"

**PRS30 – SPECIFICATION BUILDER:** ORDER 1 + 2 + 3

| 1 Model | 2 Feature Options | 3 Specialty Options |
|---|---|---|
| **PROS-00-PRS30** = 30 PSI regulated shrub adapter<br>**PROS-04-PRS30** = 30 PSI regulated 4" pop-up<br>**PROS-06-PRS30** = 30 PSI regulated 6" pop-up<br>**PROS-12-PRS30** = 30 PSI regulated 12" pop-up | **(blank)** = No option<br>**CV** = Factory-installed drain check valve *(Pop-up models only)* | **(blank)** = No option<br>**R** = Factory-installed reclaimed body cap<br>**F** = FloGuard technology<br>**F-R** = FloGuard technology with reclaimed body cap |

**PRS30 (SIDE INLET) MODELS**

| Model |
|---|
| **PROS-06-SI-PRS30** = 30 PSI regulated 6" pop-up with side inlet |
| **PROS-12-SI-PRS30** = 30 PSI regulated 12" pop-up with side inlet |

**Examples:**
**PROS-06-SI-PRS30** = 6" pop-up with side inlet regulated at 30 PSI
**PROS-06-PRS30-CV** = 6" pop-up regulated at 30 PSI, drain check valve
**PROS-12-PRS30-CV-F-R** = 12" pop-up regulated at 30 PSI, drain check valve, and FloGuard technology with reclaimed body cap

WaterSense Meets EPA Criteria Certified by ICC-ES

*Compatible with:*

***Pro Adjustable Nozzles***
*Page 63*
***Pro-Spray Fixed Arc Nozzles***
*Page 66*

# PRS40

*To optimize MP Rotator performance, the PRS40 is pressure-regulated to 40 PSI.*

## KEY BENEFITS

- Industry's strongest spray body for years of reliable performance
- Pressure-regulated to 40 PSI for the MP Rotator
- Gray cap for easy field identification
- Co-molded wiper seal made from chemical- and chlorine-resistant materials
- Innovative seal design prevents cap-to-body leaks, even with a loose cap
- FloGuard technology option eliminates water waste in the event of a missing nozzle

## ADDITIONAL FEATURES

- Directional flush plug design for cleaner installation
- Interchangeable components for easier servicing, retrofits, and upgrades
- Heavy-duty spring for consistent riser retraction
- Check valve comes standard (14' of elevation)

## OPERATING SPECIFICATIONS

- Operational pressure range: 15 to 100 PSI
- Warranty period: 5 years

## FACTORY-INSTALLED OPTIONS

- Reclaimed water identification
- FloGuard technology available for pop-up models

## USER-INSTALLED OPTIONS

- Reclaimed water ID cap (P/N 458562SP)
- Snap-on reclaimed cover (P/N PROS-RC-CAP-SP)
- Shutoff cap (P/N 213600SP)
- Shutoff nozzle (P/N 916400SP)

**PRS40 Reclaimed**

*PRS40 models include optional factory-installed purple reclaimed caps*

**FloGuard Technology**

**PROS-06-PRS40-CV**
Retracted height: 8¾"
Pop-up height: 6"
Exposed diameter: 2¼"
Inlet size: ½"

**PROS-12-PRS40-CV**
Retracted height: 16⅛"
Pop-up height: 12"
Exposed diameter: 2¼"
Inlet size: ½"

**PROS-00-PRS40**
Retracted height: 4½"
Inlet size: ½"

**PROS-04-PRS40-CV**
Retracted height: 5⅞"
Pop-up height: 4"
Exposed diameter: 2¼"
Inlet size: ½"

**PRS40 – SPECIFICATION BUILDER:** ORDER 1 + 2

| 1 Model | 2 Specialty Options |
|---|---|
| **PROS-00-PRS40** = 40 PSI regulated shrub adapter | **(blank)** = No option |
| **PROS-04-PRS40-CV** = 40 PSI regulated 4" pop-up with drain check valve | **R** = Factory-installed reclaimed body cap |
| **PROS-06-PRS40-CV** = 40 PSI regulated 6" pop-up with drain check valve | **F** = FloGuard technology |
| **PROS-12-PRS40-CV** = 40 PSI regulated 12" pop-up with drain check valve | **F-R** = FloGuard technology with reclaimed body cap |

**Examples:**
**PROS-04-PRS40-CV** = 4" pop-up regulated at 40 PSI, drain check valve
**PROS-06-PRS40-CV-F** = 6" pop-up regulated at 40 PSI, drain check valve, with FloGuard technology
**PROS-12-PRS40-CV-R** = 12" pop-up regulated at 40 PSI, drain check valve, reclaimed body cap

WaterSense Meets EPA Criteria Certified by ICC-ES

*Compatible with:*

***MP Rotator***
*Page 46 and Page 50*

# SPRAY ACCESSORIES

*Spray accessories provide flexibility for installation and maintenance of spray systems.*

## SJ SWING JOINTS

### Features
- Unique swivel ells on both ends for easy installation in any configuration
- Airtight connection points for long-term reliability

Pressure loss charts for SJ products on **page 198**

### Models
- SJ-506: ½" threaded x 6" length standard
- SJ-7506: ½" x ¾" threaded x 6" length
- SJ-706: ¾" threaded x 6" length
- SJ-512: ½" threaded x 12" length
- SJ-7512: ½" x ¾" threaded x 12" length
- SJ-712: ¾" threaded x 12" length

### Operating Specifications
- Pressure-rated to 150 PSI
- Warranty period: 2 years

**SJ Swing Joint**
6" and 12" links

## HUNTER SPIRAL BARB ELBOWS

### Features
- Compatible with FlexSG and other brands for a customized swing joint
- Acetal material for sharp barbs

### Models
- HSBE-050: ½" male NPT x spiral barb elbow
- HSBE-075: ¾" male NPT x spiral barb elbow
- HSBE TOOL: Insert tool

### Operating Specifications
- Operating pressure: Up to 80 PSI
- Warranty period: 2 years

**Spiral Barb Elbows**
P/N HSBE-TOOL, P/N HSBE-050, P/N HSBE-075

## FLEXSG TUBING

### Features
- Engineered to resist kinking
- Textured for easy grip
- Linear low-density polyethylene material
- Meets ASTM D2104, D2239, D2737

### Models
- FLEXSG: 100' roll
- FLEXSG-18: 18" pre-cut lengths

### Operating Specifications
- Operating pressure: up to 80 PSI
- Warranty period: 2 years

**FLEXSG Tubing**
100' and 18" pre-cut lengths
Inside diameter: 0.49"

## PRO-SPRAY SHUTOFF CAP

### Features
- Caps off the Pro-Spray for maintenance or drip conversions
- Maintains a clean look to the landscape

### Models
- 213600SP


**Pro-Spray Shutoff Cap**
213600SP

## SHUTOFF NOZZLE

### Features
- Easy shutoff for spray systems
- Allows heads to pop-up for easy visibility
- Use with Pro-Spray and PS Ultra models

### Models
- 916400SP

**Shutoff Nozzle**
916400SP

# PRO ADJUSTABLE NOZZLES

*Choose Pro Adjustable Nozzles for optimal landscape coverage in any setting.*

## KEY BENEFITS

- Adjustable from 0° to 360° for maximum design flexibility
- Easy-grip top for simple adjustment
- Strong edges for a defined pattern with better wind resistance
- Large water droplets minimize misting with better uniformity

## ADDITIONAL FEATURES

- Matched precipitation rate on each nozzle from 8A to 17A
- Even distribution results in better coverage
- Color-coded for easy field identification

## OPERATING SPECIFICATIONS

- Recommended operating pressure: 30 PSI
- Pair with Pro-Spray PRS30 pop-up for pressure regulation to 30 PSI
- Warranty period: 2 years

Pro Adjustable Nozzle

**4A**
Radius: 4'

**6A**
Radius: 6'

**8A**
Radius: 8'

**10A**
Radius: 10'

**12A**
Radius: 12'

**15A**
Radius: 15'

**17A**
Radius: 17'

## PRO ADJUSTABLE NOZZLES PERFORMANCE DATA




**4A** ● Lt. Green — 4' radius, Adjustable from 0° to 360°, Trajectory: 0°

**6A** ● Lt. Blue — 6' radius, Adjustable from 0° to 360°, Trajectory: 0°

**8A** ● Brown — 8' radius, Adjustable from 0° to 360°, Trajectory: 0°

**10A** ● Red — 10' radius, Adjustable from 0° to 360°, Trajectory: 15°

| Arc | Pressure PSI | 4A Radius ft. | 4A Flow GPM | 4A Precip in/hr ■ | 4A Precip in/hr ▲ | 6A Radius ft. | 6A Flow GPM | 6A Precip in/hr ■ | 6A Precip in/hr ▲ | 8A Radius ft. | 8A Flow GPM | 8A Precip in/hr ■ | 8A Precip in/hr ▲ | 10A Radius ft. | 10A Flow GPM | 10A Precip in/hr ■ | 10A Precip in/hr ▲ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 45° | 20 | 3 | 0.10 | 7.29 | 8.42 | 5 | 0.15 | 4.19 | 4.84 | 7 | 0.18 | 2.83 | 3.27 | 9 | 0.20 | 1.90 | 2.20 |
| | 25 | 3 | 0.11 | 7.12 | 8.22 | 5 | 0.17 | 4.36 | 5.03 | 8 | 0.20 | 2.74 | 3.16 | 10 | 0.23 | 1.92 | 2.22 |
| | **30** | **4** | **0.13** | **6.26** | **7.22** | **6** | **0.18** | **3.85** | **4.45** | **8** | **0.22** | **2.65** | **3.06** | **10** | **0.25** | **1.93** | **2.22** |
| | 35 | 4 | 0.14 | 6.11 | 7.06 | 6 | 0.18 | 3.55 | 4.10 | 9 | 0.24 | 2.50 | 2.89 | 11 | 0.28 | 1.92 | 2.22 |
| | 40 | 4 | 0.16 | 6.36 | 7.35 | 6 | 0.19 | 3.57 | 4.12 | 9 | 0.25 | 2.38 | 2.74 | 11 | 0.30 | 1.88 | 2.17 |
| 90° | 20 | 3 | 0.19 | 6.93 | 8.00 | 5 | 0.30 | 4.19 | 4.84 | 7 | 0.36 | 2.83 | 3.27 | 9 | 0.40 | 1.90 | 2.20 |
| | 25 | 3 | 0.20 | 6.47 | 7.47 | 5 | 0.34 | 4.49 | 5.18 | 8 | 0.40 | 2.74 | 3.16 | 10 | 0.45 | 1.92 | 2.22 |
| | **30** | **4** | **0.22** | **5.29** | **6.11** | **6** | **0.37** | **3.96** | **4.57** | **8** | **0.44** | **2.65** | **3.06** | **10** | **0.50** | **1.93** | **2.22** |
| | 35 | 4 | 0.24 | 5.24 | 6.05 | 6 | 0.38 | 3.75 | 4.32 | 9 | 0.47 | 2.50 | 2.89 | 11 | 0.55 | 1.92 | 2.22 |
| | 40 | 4 | 0.25 | 4.97 | 5.74 | 6 | 0.40 | 3.76 | 4.34 | 9 | 0.50 | 2.38 | 2.74 | 11 | 0.59 | 1.88 | 2.17 |
| 120° | 20 | 3 | 0.28 | 7.65 | 8.84 | 5 | 0.37 | 3.88 | 4.48 | 7 | 0.48 | 2.83 | 3.27 | 9 | 0.53 | 1.90 | 2.20 |
| | 25 | 3 | 0.30 | 7.28 | 8.40 | 5 | 0.38 | 3.76 | 4.35 | 8 | 0.53 | 2.74 | 3.16 | 10 | 0.60 | 1.92 | 2.22 |
| | **30** | **4** | **0.34** | **6.14** | **7.09** | **6** | **0.44** | **3.53** | **4.08** | **8** | **0.59** | **2.65** | **3.06** | **10** | **0.67** | **1.93** | **2.22** |
| | 35 | 4 | 0.36 | 5.81 | 6.71 | 6 | 0.46 | 3.40 | 3.93 | 9 | 0.63 | 2.50 | 2.89 | 11 | 0.73 | 1.92 | 2.22 |
| | 40 | 4 | 0.37 | 5.52 | 6.37 | 6 | 0.48 | 3.38 | 3.91 | 9 | 0.67 | 2.38 | 2.74 | 11 | 0.79 | 1.88 | 2.17 |
| 180° | 20 | 3 | 0.34 | 6.20 | 7.16 | 5 | 0.50 | 3.49 | 4.03 | 7 | 0.72 | 2.83 | 3.27 | 9 | 0.80 | 1.90 | 2.20 |
| | 25 | 3 | 0.38 | 6.15 | 7.10 | 5 | 0.54 | 3.56 | 4.12 | 8 | 0.80 | 2.74 | 3.16 | 10 | 0.90 | 1.92 | 2.22 |
| | **30** | **4** | **0.45** | **5.41** | **6.25** | **6** | **0.60** | **3.21** | **3.70** | **8** | **0.88** | **2.65** | **3.06** | **10** | **1.00** | **1.93** | **2.22** |
| | 35 | 4 | 0.46 | 5.02 | 5.80 | 6 | 0.64 | 3.15 | 3.64 | 9 | 0.94 | 2.50 | 2.89 | 11 | 1.10 | 1.92 | 2.22 |
| | 40 | 4 | 0.48 | 4.77 | 5.51 | 6 | 0.68 | 3.20 | 3.69 | 9 | 1.00 | 2.38 | 2.74 | 11 | 1.18 | 1.88 | 2.17 |
| 240° | 20 | 3 | 0.58 | 7.93 | 9.15 | 5 | 0.73 | 3.82 | 4.42 | 7 | 0.96 | 2.83 | 3.27 | 9 | 1.07 | 1.90 | 2.20 |
| | 25 | 3 | 0.62 | 7.52 | 8.68 | 5 | 0.78 | 3.86 | 4.46 | 8 | 1.07 | 2.74 | 3.16 | 10 | 1.20 | 1.92 | 2.22 |
| | **30** | **4** | **0.68** | **6.14** | **7.09** | **6** | **0.88** | **3.53** | **4.08** | **8** | **1.17** | **2.65** | **3.06** | **10** | **1.33** | **1.93** | **2.22** |
| | 35 | 4 | 0.74 | 6.06 | 6.99 | 6 | 0.92 | 3.40 | 3.93 | 9 | 1.25 | 2.50 | 2.89 | 11 | 1.47 | 1.92 | 2.22 |
| | 40 | 4 | 0.80 | 5.97 | 6.89 | 6 | 1.02 | 3.60 | 4.15 | 9 | 1.33 | 2.38 | 2.74 | 11 | 1.57 | 1.88 | 2.17 |
| 270° | 20 | 3 | 0.62 | 7.53 | 8.70 | 5 | 0.88 | 4.10 | 4.73 | 7 | 1.08 | 2.83 | 3.27 | 9 | 1.20 | 1.90 | 2.20 |
| | 25 | 3 | 0.66 | 7.12 | 8.22 | 5 | 0.98 | 4.31 | 4.98 | 8 | 1.20 | 2.74 | 3.16 | 10 | 1.35 | 1.92 | 2.22 |
| | **30** | **4** | **0.73** | **5.86** | **6.76** | **6** | **1.10** | **3.92** | **4.53** | **8** | **1.32** | **2.65** | **3.06** | **10** | **1.50** | **1.93** | **2.22** |
| | 35 | 4 | 0.78 | 5.67 | 6.55 | 6 | 1.15 | 3.78 | 4.36 | 9 | 1.41 | 2.50 | 2.89 | 11 | 1.65 | 1.92 | 2.22 |
| | 40 | 4 | 0.84 | 5.57 | 6.43 | 6 | 1.20 | 3.76 | 4.34 | 9 | 1.50 | 2.38 | 2.74 | 11 | 1.77 | 1.88 | 2.17 |
| 360° | 20 | 3 | 0.66 | 6.01 | 6.94 | 5 | 1.05 | 3.67 | 4.23 | 7 | 1.44 | 2.83 | 3.27 | 9 | 1.60 | 1.90 | 2.20 |
| | 25 | 3 | 0.72 | 5.82 | 6.72 | 5 | 1.10 | 3.63 | 4.19 | 8 | 1.60 | 2.74 | 3.16 | 10 | 1.80 | 1.92 | 2.22 |
| | **30** | **4** | **0.80** | **4.81** | **5.56** | **6** | **1.26** | **3.37** | **3.89** | **8** | **1.76** | **2.65** | **3.06** | **10** | **2.00** | **1.93** | **2.22** |
| | 35 | 4 | 0.86 | 4.69 | 5.42 | 6 | 1.30 | 3.20 | 3.70 | 9 | 1.88 | 2.50 | 2.89 | 11 | 2.20 | 1.92 | 2.22 |
| | 40 | 4 | 0.90 | 4.47 | 5.17 | 6 | 1.40 | 3.29 | 3.80 | 9 | 2.00 | 2.38 | 2.74 | 11 | 2.36 | 1.88 | 2.17 |

**Bold** = Recommended pressure
**Note:** The Pro-Spray PRS30's built-in pressure regulator controls output to a maximum of 30 PSI. Adjusting the radius reduction screw may be required to achieve catalog radius and flow.

## PRO ADJUSTABLE NOZZLES PERFORMANCE DATA



| | | 12A ● Green<br>12' radius<br>Adjustable from 0° to 360°<br>Trajectory: 28° | | | | 15A ● Black<br>15' radius<br>Adjustable from 0° to 360°<br>Trajectory: 28° | | | | 17A ● Gray<br>17' radius<br>Adjustable from 0° to 360°<br>Trajectory: 28° | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Arc | Pressure PSI | Radius ft. | Flow GPM | Precip in/hr ■ | Precip in/hr ▲ | Radius ft. | Flow GPM | Precip in/hr ■ | Precip in/hr ▲ | Radius ft. | Flow GPM | Precip in/hr ■ | Precip in/hr ▲ |
| 45° | 20 | 11 | 0.25 | 1.59 | 1.84 | 14 | 0.39 | 1.51 | 1.75 | 16 | 0.49 | 1.46 | 1.68 |
| | 25 | 12 | 0.28 | 1.60 | 1.85 | 15 | 0.43 | 1.57 | 1.82 | 17 | 0.57 | 1.60 | 1.85 |
| | **30** | **12** | **0.32** | **1.68** | **1.95** | **15** | **0.47** | **1.59** | **1.84** | **17** | **0.58** | **1.53** | **1.77** |
| | 35 | 13 | 0.37 | 1.80 | 2.08 | 16 | 0.52 | 1.55 | 1.79 | 18 | 0.63 | 1.49 | 1.72 |
| | 40 | 13 | 0.42 | 1.91 | 2.21 | 17 | 0.57 | 1.60 | 1.85 | 19 | 0.69 | 1.55 | 1.79 |
| 90° | 20 | 11 | 0.50 | 1.59 | 1.84 | 14 | 0.77 | 1.51 | 1.75 | 16 | 0.97 | 1.46 | 1.68 |
| | 25 | 12 | 0.55 | 1.60 | 1.85 | 15 | 0.86 | 1.57 | 1.82 | 17 | 1.13 | 1.60 | 1.85 |
| | **30** | **12** | **0.63** | **1.68** | **1.95** | **15** | **0.93** | **1.59** | **1.84** | **17** | **1.15** | **1.53** | **1.77** |
| | 35 | 13 | 0.73 | 1.80 | 2.08 | 16 | 1.03 | 1.55 | 1.79 | 18 | 1.25 | 1.49 | 1.72 |
| | 40 | 13 | 0.84 | 1.91 | 2.21 | 17 | 1.13 | 1.60 | 1.85 | 19 | 1.38 | 1.55 | 1.79 |
| 120° | 20 | 11 | 0.67 | 1.59 | 1.84 | 14 | 1.03 | 1.51 | 1.75 | 16 | 1.29 | 1.46 | 1.68 |
| | 25 | 12 | 0.73 | 1.60 | 1.85 | 15 | 1.15 | 1.57 | 1.82 | 17 | 1.51 | 1.51 | 1.74 |
| | **30** | **12** | **0.84** | **1.68** | **1.95** | **15** | **1.24** | **1.59** | **1.84** | **17** | **1.53** | **1.53** | **1.77** |
| | 35 | 13 | 0.97 | 1.80 | 2.08 | 16 | 1.37 | 1.55 | 1.79 | 18 | 1.67 | 1.49 | 1.72 |
| | 40 | 13 | 1.12 | 1.91 | 2.21 | 17 | 1.51 | 1.60 | 1.85 | 19 | 1.84 | 1.47 | 1.70 |
| 180° | 20 | 11 | 1.00 | 1.59 | 1.84 | 14 | 1.54 | 1.51 | 1.75 | 16 | 1.94 | 1.46 | 1.68 |
| | 25 | 12 | 1.10 | 1.60 | 1.85 | 15 | 1.72 | 1.57 | 1.82 | 17 | 2.26 | 1.51 | 1.74 |
| | **30** | **12** | **1.26** | **1.68** | **1.95** | **15** | **1.86** | **1.59** | **1.84** | **17** | **2.30** | **1.53** | **1.77** |
| | 35 | 13 | 1.46 | 1.80 | 2.08 | 16 | 2.06 | 1.55 | 1.79 | 18 | 2.50 | 1.49 | 1.72 |
| | 40 | 13 | 1.68 | 1.91 | 2.21 | 17 | 2.26 | 1.60 | 1.85 | 19 | 2.76 | 1.47 | 1.70 |
| 240° | 20 | 11 | 1.33 | 1.59 | 1.84 | 14 | 2.05 | 1.51 | 1.75 | 16 | 2.59 | 1.46 | 1.68 |
| | 25 | 12 | 1.47 | 1.60 | 1.85 | 15 | 2.29 | 1.57 | 1.82 | 17 | 3.01 | 1.51 | 1.74 |
| | **30** | **12** | **1.68** | **1.68** | **1.95** | **15** | **2.48** | **1.59** | **1.84** | **17** | **3.07** | **1.53** | **1.77** |
| | 35 | 13 | 1.95 | 1.80 | 2.08 | 16 | 2.75 | 1.55 | 1.79 | 18 | 3.33 | 1.49 | 1.72 |
| | 40 | 13 | 2.24 | 1.91 | 2.21 | 17 | 3.01 | 1.60 | 1.85 | 19 | 3.68 | 1.47 | 1.70 |
| 270° | 20 | 11 | 1.50 | 1.59 | 1.84 | 14 | 2.31 | 1.51 | 1.75 | 16 | 2.91 | 1.46 | 1.68 |
| | 25 | 12 | 1.65 | 1.60 | 1.85 | 15 | 2.58 | 1.57 | 1.82 | 17 | 3.39 | 1.51 | 1.74 |
| | **30** | **12** | **1.89** | **1.68** | **1.95** | **15** | **2.79** | **1.59** | **1.84** | **17** | **3.45** | **1.53** | **1.77** |
| | 35 | 13 | 2.19 | 1.80 | 2.08 | 16 | 3.09 | 1.55 | 1.79 | 18 | 3.75 | 1.49 | 1.72 |
| | 40 | 13 | 2.52 | 1.91 | 2.21 | 17 | 3.39 | 1.60 | 1.85 | 19 | 4.14 | 1.47 | 1.70 |
| 360° | 20 | 11 | 2.00 | 1.59 | 1.84 | 14 | 3.08 | 1.51 | 1.75 | 16 | 3.88 | 1.46 | 1.68 |
| | 25 | 12 | 2.20 | 1.60 | 1.85 | 15 | 3.44 | 1.57 | 1.82 | 17 | 4.52 | 1.51 | 1.74 |
| | **30** | **12** | **2.52** | **1.68** | **1.95** | **15** | **3.72** | **1.59** | **1.84** | **17** | **4.60** | **1.53** | **1.77** |
| | 35 | 13 | 2.92 | 1.80 | 2.08 | 16 | 4.12 | 1.55 | 1.79 | 18 | 5.00 | 1.49 | 1.72 |
| | 40 | 13 | 3.36 | 1.91 | 2.21 | 17 | 4.52 | 1.60 | 1.85 | 19 | 5.52 | 1.47 | 1.70 |

**Bold** = Recommended pressure
**Note:** The Pro-Spray PRS30's built-in pressure regulator controls output to a maximum of 30 PSI. Adjusting the radius reduction screw may be required to achieve catalog radius and flow.

# PRO-SPRAY® FIXED ARC NOZZLES

*Fixed Arc Nozzles are designed for high accuracy within a variety of landscape shapes and sizes.*



## KEY BENEFITS

- Clean edges for a defined pattern with better wind resistance
- Large water droplets minimize misting with better uniformity
- Sturdy construction ensures reliable performance
- Color-coded for easy field identification

## OPERATING SPECIFICATIONS

- Recommended operating pressure: 30 PSI
- Pair with Pro-Spray PRS30 pop-up for pressure regulation to 30 PSI
- Warranty period: 2 years

**PRO-SPRAY FIXED ARC NOZZLES**

| ARC | 5 | 8 | 10 | 12 | 15 | 17 |
|---|---|---|---|---|---|---|
| Q |  |  |  |  |  |  |
| T | Use 4A/6A Nozzle |  |  |  |  | Use 17A Nozzle |
| H |  |  |  |  |  |  |
| TT | Use 4A/6A Nozzle | Use 8A Nozzle | Use 10A Nozzle |  |  | Use 17A Nozzle |
| TQ | Use 4A/6A Nozzle | Use 8A Nozzle | Use 10A Nozzle |  |  | Use 17A Nozzle |
| F |  |  |  |  |  | Use 17A Nozzle |
| | (5') | (8') | (10') | (12') | (15') | (17') |

## PRO-SPRAY FIXED ARC NOZZLES PERFORMANCE DATA



**5** 5' radius
Fixed: ¼, ½, Full
● Blue Trajectory: 0°

**8** 8' radius
Fixed: ¼, ⅓, ½, Full
● Brown Trajectory: 0°

**10** 10' radius
Fixed: ¼, ⅓, ½, Full
● Red Trajectory: 15°

| Arc | Position | Pressure PSI | 5 Radius ft. | 5 Flow GPM | 5 Precip in/hr ■ | 5 Precip in/hr ▲ | 8 Radius ft. | 8 Flow GPM | 8 Precip in/hr ■ | 8 Precip in/hr ▲ | 10 Radius ft. | 10 Flow GPM | 10 Precip in/hr ■ | 10 Precip in/hr ▲ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 90° | Q | 20 | 4 | 0.09 | 2.25 | 2.60 | 7 | 0.20 | 1.54 | 1.78 | 9 | 0.34 | 1.63 | 1.88 |
| | | 25 | 4 | 0.11 | 2.54 | 2.94 | 8 | 0.22 | 1.33 | 1.53 | 10 | 0.39 | 1.48 | 1.71 |
| | | **30** | **5** | **0.12** | **1.80** | **2.08** | **8** | **0.24** | **1.46** | **1.69** | **10** | **0.42** | **1.63** | **1.89** |
| | | 35 | 6 | 0.13 | 1.36 | 1.57 | 9 | 0.26 | 1.25 | 1.45 | 11 | 0.46 | 1.47 | 1.69 |
| | | 40 | 6 | 0.14 | 1.46 | 1.69 | 9 | 0.28 | 1.34 | 1.55 | 11 | 0.49 | 1.57 | 1.82 |
| 120° | T | 20 | Use Hunter 4A or 6A Nozzle | | | | 7 | 0.26 | 1.54 | 1.78 | 9 | 0.46 | 1.63 | 1.88 |
| | | 25 | | | | | 8 | 0.29 | 1.33 | 1.53 | 10 | 0.51 | 1.48 | 1.71 |
| | | **30** | | | | | **8** | **0.32** | **1.46** | **1.69** | **10** | **0.57** | **1.63** | **1.89** |
| | | 35 | | | | | 9 | 0.35 | 1.25 | 1.45 | 11 | 0.61 | 1.47 | 1.69 |
| | | 40 | | | | | 9 | 0.38 | 1.34 | 1.55 | 11 | 0.66 | 1.57 | 1.82 |
| 180° | H | 20 | 4 | 0.19 | 2.25 | 2.60 | 7 | 0.38 | 1.49 | 1.72 | 9 | 0.70 | 1.67 | 1.92 |
| | | 25 | 4 | 0.21 | 2.54 | 2.94 | 8 | 0.43 | 1.28 | 1.48 | 10 | 0.79 | 1.53 | 1.76 |
| | | **30** | **5** | **0.23** | **1.80** | **2.08** | **8** | **0.47** | **1.41** | **1.63** | **10** | **0.88** | **1.69** | **1.95** |
| | | 35 | 6 | 0.25 | 1.36 | 1.57 | 9 | 0.51 | 1.21 | 1.39 | 11 | 0.95 | 1.52 | 1.75 |
| | | 40 | 6 | 0.27 | 1.46 | 1.69 | 9 | 0.54 | 1.29 | 1.49 | 11 | 1.03 | 1.63 | 1.89 |
| 240° | TT | 20 | Use Hunter 4A or 6A Nozzle | | | | Use Hunter 8A Nozzle | | | | Use Hunter 10A Nozzle | | | |
| | | 25 | | | | | | | | | | | | |
| | | **30** | | | | | | | | | | | | |
| | | 35 | | | | | | | | | | | | |
| | | 40 | | | | | | | | | | | | |
| 270° | TQ | 20 | Use Hunter 4A or 6A Nozzle | | | | Use Hunter 8A Nozzle | | | | Use Hunter 10A Nozzle | | | |
| | | 25 | | | | | | | | | | | | |
| | | **30** | | | | | | | | | | | | |
| | | 35 | | | | | | | | | | | | |
| | | 40 | | | | | | | | | | | | |
| 360° | F | 20 | 4 | 0.37 | 2.25 | 2.60 | 7 | 0.78 | 1.54 | 1.78 | 9 | 1.29 | 1.53 | 1.77 |
| | | 25 | 4 | 0.42 | 2.54 | 2.94 | 8 | 0.88 | 1.33 | 1.53 | 10 | 1.45 | 1.39 | 1.61 |
| | | **30** | **5** | **0.47** | **1.80** | **2.08** | **8** | **0.97** | **1.46** | **1.69** | **10** | **1.59** | **1.53** | **1.76** |
| | | 35 | 6 | 0.51 | 1.36 | 1.57 | 9 | 1.05 | 1.25 | 1.45 | 11 | 1.72 | 1.37 | 1.58 |
| | | 40 | 6 | 0.55 | 1.46 | 1.69 | 9 | 1.13 | 1.34 | 1.55 | 11 | 1.84 | 1.46 | 1.69 |

**Bold** = Recommended pressure

## PRO-SPRAY FIXED ARC NOZZLES PERFORMANCE DATA



**12** ● Green — 12' radius, Fixed: ¼, ⅓, ½, ⅔, ¾, Full, Trajectory: 28°

**15** ● Black — 15' radius, Fixed: ¼, ⅓, ½, ⅔, ¾, Full, Trajectory: 28°

**17** ● Gray — 17' radius, Fixed: ¼, ½, Trajectory: 28°

| Arc | Position | Pressure PSI | 12 Radius ft. | 12 Flow GPM | 12 Precip in/hr ■ | 12 Precip in/hr ▲ | 15 Radius ft. | 15 Flow GPM | 15 Precip in/hr ■ | 15 Precip in/hr ▲ | 17 Radius ft. | 17 Flow GPM | 17 Precip in/hr ■ | 17 Precip in/hr ▲ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 90° | Q | 20 | 11 | 0.54 | 1.71 | 1.98 | 14 | 0.78 | 1.53 | 1.77 | 16 | 0.93 | 1.40 | 1.61 |
| | | 25 | 12 | 0.61 | 1.62 | 1.87 | 15 | 0.88 | 1.51 | 1.74 | 17 | 1.05 | 1.39 | 1.61 |
| | | **30** | **12** | **0.67** | **1.78** | **2.06** | **15** | **0.97** | **1.67** | **1.92** | **17** | **1.15** | **1.54** | **1.77** |
| | | 35 | 13 | 0.72 | 1.65 | 1.90 | 16 | 1.06 | 1.59 | 1.84 | 18 | 1.25 | 1.49 | 1.72 |
| | | 40 | 13 | 0.78 | 1.77 | 2.04 | 17 | 1.14 | 1.52 | 1.75 | 19 | 1.34 | 1.43 | 1.65 |
| 120° | T | 20 | 11 | 0.72 | 1.71 | 1.98 | 14 | 1.04 | 1.53 | 1.77 | | | | |
| | | 25 | 12 | 0.81 | 1.62 | 1.87 | 15 | 1.17 | 1.51 | 1.74 | | | | |
| | | **30** | **12** | **0.89** | **1.78** | **2.06** | **15** | **1.30** | **1.67** | **1.92** | **Use Hunter 17A Nozzle** | | | |
| | | 35 | 13 | 0.97 | 1.65 | 1.90 | 16 | 1.41 | 1.59 | 1.84 | | | | |
| | | 40 | 13 | 1.04 | 1.77 | 2.04 | 17 | 1.52 | 1.52 | 1.75 | | | | |
| 180° | H | 20 | 11 | 1.05 | 1.67 | 1.93 | 14 | 1.51 | 1.48 | 1.71 | 16 | 1.91 | 1.43 | 1.66 |
| | | 25 | 12 | 1.18 | 1.58 | 1.83 | 15 | 1.69 | 1.45 | 1.67 | 17 | 2.15 | 1.43 | 1.65 |
| | | **30** | **12** | **1.30** | **1.74** | **2.01** | **15** | **1.86** | **1.59** | **1.84** | **17** | **2.37** | **1.58** | **1.82** |
| | | 35 | 13 | 1.42 | 1.61 | 1.86 | 16 | 2.02 | 1.52 | 1.75 | 18 | 2.57 | 1.53 | 1.76 |
| | | 40 | 13 | 1.52 | 1.73 | 2.00 | 17 | 2.16 | 1.44 | 1.66 | 19 | 2.76 | 1.47 | 1.70 |
| 240° | TT | 20 | 11 | 1.40 | 1.67 | 1.93 | 14 | 2.01 | 1.48 | 1.71 | | | | |
| | | 25 | 12 | 1.58 | 1.58 | 1.83 | 15 | 2.26 | 1.45 | 1.67 | | | | |
| | | **30** | **12** | **1.74** | **1.74** | **2.01** | **15** | **2.48** | **1.59** | **1.84** | **Use Hunter 17A Nozzle** | | | |
| | | 35 | 13 | 1.89 | 1.61 | 1.86 | 16 | 2.69 | 1.52 | 1.75 | | | | |
| | | 40 | 13 | 2.03 | 1.73 | 2.00 | 17 | 2.88 | 1.44 | 1.66 | | | | |
| 270° | TQ | 20 | 11 | 1.61 | 1.67 | 1.93 | 14 | 2.34 | 1.48 | 1.71 | | | | |
| | | 25 | 12 | 1.82 | 1.58 | 1.83 | 15 | 2.64 | 1.45 | 1.67 | | | | |
| | | **30** | **12** | **2.00** | **1.74** | **2.01** | **15** | **2.92** | **1.59** | **1.84** | **Use Hunter 17A Nozzle** | | | |
| | | 35 | 13 | 2.17 | 1.61 | 1.86 | 16 | 3.18 | 1.52 | 1.75 | | | | |
| | | 40 | 13 | 2.33 | 1.73 | 2.00 | 17 | 3.42 | 1.44 | 1.66 | | | | |
| 360° | F | 20 | 11 | 2.17 | 1.72 | 1.99 | 14 | 3.04 | 1.49 | 1.72 | | | | |
| | | 25 | 12 | 2.45 | 1.63 | 1.89 | 15 | 3.41 | 1.46 | 1.69 | | | | |
| | | **30** | **12** | **2.70** | **1.80** | **2.08** | **15** | **3.75** | **1.61** | **1.85** | **Use Hunter 17A Nozzle** | | | |
| | | 35 | 13 | 2.93 | 1.67 | 1.93 | 16 | 4.07 | 1.53 | 1.76 | | | | |
| | | 40 | 13 | 3.15 | 1.80 | 2.07 | 17 | 4.36 | 1.45 | 1.68 | | | | |

**Bold** = Recommended pressure

# SHORT-RADIUS MICRO SPRAY NOZZLES

*These highly accurate nozzles are perfect for small spaces and can support a robust micro spray system with Pro-Spray pop-ups.*

## KEY BENEFITS

- Low flow for controlled irrigation of tight spaces
- Meets micro spray requirement of 30 GPH max flow at 30 PSI
- Built to last for a robust overhead solution for small spaces

## OPERATING SPECIFICATIONS

- Recommended operating pressure: 30 PSI
- Pair with Pro-Spray PRS30 pop-up for pressure regulation to 30 PSI

### SHORT-RADIUS NOZZLES PERFORMANCE DATA

Lt. Brown

| Arc | Pressure PSI | Position | Radius ft. | Flow GPM | Flow GPH | *Precip in/hr |
|---|---|---|---|---|---|---|
| 90° | 20 | 2Q | 2 | 0.09 | 5.4 | 2.17 |
| | 25 | | 2 | 0.10 | 6.0 | 2.41 |
| | **30** | | **2** | **0.11** | **6.6** | **2.65** |
| | 35 | | 2 | 0.13 | 7.8 | 3.13 |
| | 40 | | 2 | 0.14 | 8.4 | 3.37 |
| 180° | 20 | 2H | 2 | 0.14 | 8.4 | 1.68 |
| | 25 | | 2 | 0.15 | 9.0 | 1.80 |
| | **30** | | **2** | **0.20** | **12.0** | **2.41** |
| | 35 | | 2 | 0.20 | 12.0 | 2.41 |
| | 40 | | 2 | 0.21 | 12.6 | 2.53 |

### SHORT-RADIUS NOZZLES PERFORMANCE DATA

Lt. Green

| Arc | Pressure PSI | Position | Radius ft. | Flow GPM | Flow GPH | *Precip in/hr |
|---|---|---|---|---|---|---|
| 90° | 20 | 4Q | 4 | 0.18 | 10.8 | 1.08 |
| | 25 | | 4 | 0.20 | 12.0 | 1.20 |
| | **30** | | **4** | **0.20** | **12.0** | **1.20** |
| | 35 | | 4 | 0.22 | 13.2 | 1.32 |
| | 40 | | 4 | 0.24 | 14.4 | 1.44 |
| 180° | 20 | 4H | 4 | 0.33 | 19.8 | 0.99 |
| | 25 | | 4 | 0.34 | 20.4 | 1.02 |
| | **30** | | **4** | **0.40** | **24.0** | **1.20** |
| | 35 | | 4 | 0.40 | 24.0 | 1.20 |
| | 40 | | 4 | 0.44 | 26.4 | 1.32 |

### SHORT-RADIUS NOZZLES PERFORMANCE DATA

Lt. Blue

| Arc | Pressure PSI | Position | Radius ft. | Flow GPM | Flow GPH | *Precip in/hr |
|---|---|---|---|---|---|---|
| 90° | 20 | 6Q | 6 | 0.22 | 13.2 | 0.59 |
| | 25 | | 6 | 0.24 | 14.4 | 0.64 |
| | **30** | | **6** | **0.30** | **18.0** | **0.80** |
| | 35 | | 6 | 0.30 | 18.0 | 0.80 |
| | 40 | | 6 | 0.30 | 18.0 | 0.80 |
| 180° | 20 | 6H | 6 | 0.40 | 24.0 | 0.53 |
| | 25 | | 6 | 0.44 | 26.4 | 0.59 |
| | **30** | | **6** | **0.50** | **30.0** | **0.67** |
| | 35 | | 6 | 0.52 | 31.2 | 0.70 |
| | 40 | | 6 | 0.54 | 32.4 | 0.72 |

**Bold** = Recommended pressure
*Precipitation rate shown without overlap

**2Q**
Radius: 2'

**2H**
Radius: 2'

**4Q**
Radius: 4'

**4H**
Radius: 4'

**6Q**
Radius: 6'

**6H**
Radius: 6'

Short-Radius Micro Spray Nozzle

# STRIP PATTERN NOZZLES

*Irrigate narrow turf and planter areas accurately with fixed arc strip nozzles.*



## KEY BENEFITS

- Designed for accurate coverage of strip areas
- Available in a variety of models for unique, rectangular spaces
- Built to last in harsh conditions

## OPERATING SPECIFICATIONS

- Recommended operating pressure: 30 PSI
- Pair with Pro-Spray PRS30 pop-up for pressure regulation to 30 PSI
- Warranty period: 2 years

**STRIP PATTERN NOZZLE PERFORMANCE DATA**

| Arc | Pressure PSI | Width x Length | Flow GPM |
|---|---|---|---|
| LCS-515 | 20 | 4' x 14' | 0.55 |
| | 25 | 5' x 15' | 0.60 |
| | **30** | **5' x 15'** | **0.65** |
| | 35 | 5' x 15' | 0.70 |
| | 40 | 5' x 15' | 0.75 |
| RCS-515 | 20 | 4' x 14' | 0.55 |
| | 25 | 5' x 15' | 0.60 |
| | **30** | **5' x 15'** | **0.65** |
| | 35 | 5' x 15' | 0.70 |
| | 40 | 5' x 15' | 0.75 |
| SS-530 | 20 | 4' x 28' | 1.10 |
| | 25 | 5' x 30' | 1.20 |
| | **30** | **5' x 30'** | **1.30** |
| | 35 | 5' x 30' | 1.40 |
| | 40 | 5' x 30' | 1.50 |
| SS-918 | 20 | 8' x 17' | 1.45 |
| | 25 | 9' x 18' | 1.58 |
| | **30** | **9' x 18'** | **1.72** |
| | 35 | 9' x 18' | 1.88 |
| | 40 | 9' x 18' | 2.08 |
| CS-530 | 20 | 4' x 28' | 1.10 |
| | 25 | 5' x 30' | 1.20 |
| | **30** | **5' x 30'** | **1.30** |
| | 35 | 5' x 30' | 1.40 |
| | 40 | 5' x 30' | 1.50 |
| ES-515 | 20 | 4' x 14' | 0.55 |
| | 25 | 5' x 15' | 0.60 |
| | **30** | **5' x 15'** | **0.65** |
| | 35 | 5' x 15' | 0.70 |
| | 40 | 5' x 15' | 0.75 |

**Bold** = Recommended pressure

**Left Corner Strip**
Rectangle: 5' x 15'

**Right Corner Strip**
Rectangle: 5' x 15'

**Side Strip**
Rectangle: 5' x 30'

**Side Strip**
Rectangle: 9' x 18'

**Center Strip**
Rectangle: 5' x 30'

**End Strip**
Rectangle: 5' x 15'

RCS-515

# STREAM NOZZLES

*Prevent runoff for slope, groundcover, and shrub applications with the low precipitation rate of these adjustable arc stream nozzles.*

## KEY BENEFITS

- Low application rate to avoid runoff
- Ideal for slopes, ground cover, and shrub applications
- Multiple streams provide even coverage
- Adjustable arc from 25° to 360° for design flexibility

## OPERATING SPECIFICATIONS

- Recommended operating pressure: 30 PSI
- Pair with Pro-Spray PRS30 pop-up for pressure regulation to 30 PSI
- Warranty period: 2 years

**S-8A**
7' to 9'

**S-16A**
15' to 18'

**MODEL S-8A STREAM SPRAY NOZZLE PERFORMANCE DATA**

| Arc S-8A | Pressure PSI | Radius ft. | Flow GPM | Precip in/hr ■ | Precip in/hr ▲ |
|---|---|---|---|---|---|
| 90° | 20 | 7 | 0.29 | 2.28 | 2.63 |
| | 25 | 8 | 0.32 | 1.93 | 2.22 |
| | **30** | **8** | **0.38** | **2.11** | **2.43** |
| | 35 | 8 | 0.41 | 2.29 | 2.64 |
| | 40 | 9 | 0.54 | 1.95 | 2.25 |
| 180° | 20 | 7 | 0.54 | 2.12 | 2.45 |
| | 25 | 8 | 0.57 | 1.71 | 1.98 |
| | **30** | **8** | **0.60** | **1.80** | **2.08** |
| | 35 | 8 | 0.63 | 1.89 | 2.19 |
| | 40 | 9 | 0.66 | 1.57 | 1.81 |
| 360° | 20 | 7 | 1.08 | 2.12 | 2.45 |
| | 25 | 8 | 1.11 | 1.67 | 1.93 |
| | **30** | **8** | **1.15** | **1.73** | **2.00** |
| | 35 | 8 | 1.18 | 1.77 | 2.05 |
| | 40 | 9 | 1.22 | 1.45 | 1.67 |

**Bold** = Recommended pressure

**MODEL S-16A STREAM SPRAY NOZZLE PERFORMANCE DATA**

| Arc S-16A | Pressure PSI | Radius ft. | Flow GPM | Precip in/hr ■ | Precip in/hr ▲ |
|---|---|---|---|---|---|
| 90° | 20 | 15 | 0.40 | 0.68 | 0.79 |
| | 25 | 16 | 0.46 | 0.69 | 0.80 |
| | **30** | **16** | **0.50** | **0.75** | **0.87** |
| | 35 | 17 | 0.54 | 0.72 | 0.83 |
| | 40 | 18 | 0.57 | 0.68 | 0.78 |
| 180° | 20 | 15 | 0.67 | 0.57 | 0.66 |
| | 25 | 16 | 0.80 | 0.60 | 0.69 |
| | **30** | **16** | **0.88** | **0.66** | **0.76** |
| | 35 | 17 | 0.97 | 0.65 | 0.75 |
| | 40 | 18 | 1.04 | 0.62 | 0.71 |
| 360° | 20 | 15 | 1.19 | 0.51 | 0.59 |
| | 25 | 16 | 1.46 | 0.55 | 0.63 |
| | **30** | **16** | **1.66** | **0.62** | **0.72** |
| | 35 | 17 | 1.82 | 0.61 | 0.70 |
| | 40 | 18 | 1.99 | 0.59 | 0.68 |

**Bold** = Recommended pressure

**S-8A**

# BUBBLER NOZZLES

*Deliver a consistent flow regardless of inlet pressure with pressure-compensating bubbler nozzles.*

## KEY BENEFITS

- Pressure-compensating for constant water flow at any pressure
- Designed for deep watering of planted areas
- Nozzle threaded for use with Pro-Spray
- Warranty period: 2 years

### MULTI-STREAM BUBBLER PERFORMANCE DATA

| Arc | Model | Flow GPM | Radius ft. |
|---|---|---|---|
| | MSBN-25Q | 0.25 | 1.0 |
| | MSBN-50Q | 0.50 | 1.5 |
| | MSBN-50H | 0.50 | 1.0 |
| | MSBN-10H | 1.00 | 1.5 |
| | MSBN-10F | 1.00 | 1.0 |
| | MSBN-20F | 2.00 | 1.5 |

**Notes:**
Typical spacing 2' to 4'. Flows shown for pressures between 15 and 70 PSI.


**MSBN Installed on PROS-04**

*Combining Hunter Bubbler Nozzles with the Pro-Spray provides the watering precision of pressure-compensating bubblers paired with the benefit of retracting the nozzle out of sight.*

Multi-Stream Bubbler

## MULTI-STREAM BUBBLER NOZZLES

**MSBN-25Q**
Flow: 0.25 GPM

**MSBN-50Q/50H**
Flow: 0.50 GPM

**MSBN-10H/10F**
Flow: 1.0 GPM

**MSBN-20F**
Flow: 2.0 GPM

### PCN PERFORMANCE DATA

| | Model | Flow GPM | Pattern Type |
|---|---|---|---|
| | 25 | 0.25 | Trickle |
| | 50 | 0.50 | Trickle |
| | 10 | 1.00 | Umbrella |
| | 20 | 2.00 | Umbrella |

**Notes:**
Typical spacing 2' to 4'. Flows shown for pressures between 15 and 70 PSI.

PCN

## PCN BUBBLER NOZZLES

**PCN-25**
Flow: 0.25 GPM

**PCN-50**
Flow: 0.50 GPM

**PCN-10**
Flow: 1.0 GPM

**PCN-20**
Flow: 2.0 GPM

### 5-CST-B BUBBLER NOZZLE PERFORMANCE DATA

| | Pressure (PSI) | Radius (ft.) | Flow (GPM) |
|---|---|---|---|
| | 20 | 5 | 0.30 |
| | 25 | 5 | 0.32 |
| | **30** | **5** | **0.38** |
| | 35 | 5 | 0.40 |
| | 40 | 5 | 0.42 |

5-CST-B

## DUAL-STREAM BUBBLER NOZZLE

**5-CST-B**

# BUBBLERS

*Ensure consistent flow regardless of pressure with above-ground, pressure-compensating bubblers.*

## KEY BENEFITS

- Pressure-compensating for constant water flow at any pressure
- Designed for deep watering of planted areas
- ½" threaded inlet for easy installation on a ½" riser
- Warranty period: 2 years

### PCB PERFORMANCE DATA

| | Model | Flow GPM | Pattern Type |
|---|---|---|---|
| ● | 25 | 0.25 | Trickle |
| | 50 | 0.50 | Trickle |
| | 10 | 1.00 | Umbrella |
| | 20 | 2.00 | Umbrella |

**Notes:**
Typical spacing 2' to 4'. Flows shown for pressures between 15 and 70 PSI.

PCB

## PRESSURE-COMPENSATING BUBBLERS

**PCB**

**PCB-R**

### AFB PERFORMANCE DATA

| | Model | Flow GPM | Pattern Type |
|---|---|---|---|
| ● | AFB | < 2.0 | Trickle/ Umbrella |

AFB

## ADJUSTABLE FLOOD BUBBLER

**AFB**


# VALVES

## VALVE COMPARISON CHART

| QUICK SPECS | 1" PGV & JAR-TOP | PGV | ICV | ICV FILTER SENTRY | IBV |
|---|---|---|---|---|---|
| SIZE | 1" | 1½", 2" | 1", 1½", 2", 3" | 1", 1½", 2", 3" | 1", 1½", 2", 3" |
| FLOW GPM | 0.2 to 40 | 20 to 150 | 0.1 to 300 | 0.1 to 300 | 0.1 to 300 |
| **FEATURES** | | | | | |
| CAPTIVE BONNET BOLTS | ● | ● | ● | ● | |
| EPDM DIAPHRAGM AND SEAT | | | Standard | Standard | Standard |
| WARRANTY | 2 Years | 2 Years | 5 Years | 5 Years | 5 Years |
| **ADVANCED FEATURES** | | | | | |
| FLOW CONTROL | Optional | ● | ● | ● | ● |
| FILTER SENTRY® | | | User-Installed | Factory-Installed | Factory-Installed |
| ACCU SYNC® CAPABLE | ● | ● | ● | ● | ● |
| RECLAIMED WATER ID HANDLE | User-Installed | User-Installed | User-Installed | User-Installed | |
| RECLAIMED WATER ID TAG | | | User-Installed | User-Installed | User-Installed |
| **APPLICATIONS** | | | | | |
| RESIDENTIAL | ● | ● | ● | | |
| COMMERCIAL | | ● | ● | ● | ● |
| POTABLE WATER | ● | ● | ● | ● | ● |
| RECLAIMED WATER | | | ● | ● | ● |
| SECONDARY WATER | | | | ● | ● |
| PRESSURE REGULATION | ● | ● | ● | ● | ● |
| HIGH-PRESSURE SYSTEMS | | | ● | ● | ● |
| LOW-PRESSURE SYSTEMS | ● | ● | ● | ● | ● |
| HIGH-TEMPERATURE LOCATIONS | | | ● | ● | ● |
| USE AS MASTER VALVE | | ● | ● | ● | ● |

## Advanced Features

### ACCU SYNC PRESSURE REGULATION

Available on:
PGV, ICV, IBV

Avoid sprinkler over-pressure conditions and gain significant water savings with Hunter's Accu Sync pressure regulator. This option is available in adjustable or fixed pressure models.

### FILTER SENTRY

For use with:
ICV, IBV

The Filter Sentry disc scours the filter clean twice during each valve cycle. Since it is attached to the diaphragm, the Filter Sentry feature can be easily added after a valve has been installed.


**All Hunter valves are 100% water-tested to ensure reliable operation once installed.** From residential to commercial applications, high pressure to low pressure, and clean water to dirty water, Hunter valves keep systems running flawlessly day in and day out.

# 1" PGV & PGV JAR-TOP

*These versatile and robust valves offer simple serviceability.*



## KEY BENEFITS

- External/internal manual bleed allows for quick and easy activation at the valve
- Double-beaded diaphragm seal design ensures leak-free performance
- Captive bonnet screws eliminate the possibility of lost parts during disassembly
- Triple-tool bonnet screws are compatible with standard or Phillips screwdrivers as well as a nut driver
- Jar-top models provide easy access without tools
- Encapsulated solenoid with captive plunger used on every Hunter valve provides hassle-free service
- Flow control maximizes efficiency and prolongs the life of the system

## USER-INSTALLED OPTIONS

- Accu Sync® pressure regulation at the valve*
- DC-latching solenoid for battery-powered controllers (P/N 458200)
- Solenoid conduit cover (P/N 464322)

## FACTORY-INSTALLED OPTIONS

- LS: Valve without solenoid
- DC: DC-latching solenoid for battery-powered controllers
- JT: Jar-top models

## OPERATING SPECIFICATIONS

- Flow: 0.2 to 40 GPM
- Recommended pressure range: 20 to 150 PSI
- Temperature rating: 150°F
- Warranty period: 2 years

## SOLENOID SPECIFICATIONS

- 24 VAC solenoid
  - 350 mA inrush, 190 mA holding, 60 Hz
  - 370 mA inrush, 210 mA holding, 50 Hz

* Accu Sync product information on **page 83**

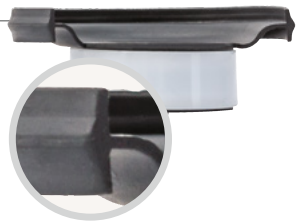
**PGV-100G**
Inlet diameter: 1"
Height: 5"
Length: 4½"
Width: 2½"

**PGV-101G**
Inlet diameter: 1"
Height: 5"
Length: 4½"
Width: 2½"

**PGV-100JT-G**
Inlet diameter: 1"
Height: 5½"
Length: 4½"
Width: 3¼"

**PGV-101JT-G**
Inlet diameter: 1"
Height: 5½"
Length: 4½"
Width: 3¼"

**Double-Beaded Diaphragm**



**Captive Bonnet Bolts**

## 1" PGV

| Model | Description |
|---|---|
| PGV-100A | 1" plastic angle valve, without flow control, female NPT inlet and outlet |
| PGV-100G | 1" plastic globe valve, without flow control, female NPT inlet and outlet |
| PGV-100G-S | 1" plastic globe valve, without flow control, slip inlet and outlet |
| PGV-100G-LS | 1" plastic globe valve, without flow control, female NPT inlet and outlet, no solenoid |
| PGV-100-MB | 1" plastic globe valve, without flow control, male NPT inlet, 1" outlet poly insert barb |
| PGV-100-MB125 | 1" plastic globe valve, without flow control, male NPT inlet, 1¼" outlet poly insert barb |
| PGV-100-MM | 1" plastic globe valve, without flow control, male NPT inlet and outlet |
| PGV-101A | 1" plastic angle valve, with flow control, female NPT inlet and outlet |
| PGV-101G | 1" plastic globe valve, with flow control, female NPTinlet and outlet |
| PGV-101G-S | 1" plastic globe valve, with flow control, slip inlet and outlet |
| PGV-101G-LS | 1" plastic globe valve, with flow control, female NPT inlet and outlet, no solenoid |
| PGV-101-MB | 1" plastic globe valve, with flow control, male NPT inlet, 1" outlet poly insert barb |
| PGV-101-MB125 | 1" plastic globe valve, with flow control, male NPT inlet, 1¼" outlet poly insert barb |
| PGV-101-MM | 1" plastic globe valve, with flow control, male NPT inlet and outlet |

## PGV JAR-TOP

| Model | Description |
|---|---|
| PGV-100JT-G | 1" plastic globe valve, jar-top bonnet, without flow control, female NPT inlet and outlet |
| PGV-100JT-G-LS | 1" plastic globe valve, jar-top bonnet, without flow control, female NPT inlet and outlet, no solenoid |
| PGV-100JT-GS | 1" plastic globe valve, jar-top bonnet, without flow control, female slip inlet and outlet |
| PGV-100JT-MB | 1" plastic globe valve, jar-top bonnet, without flow control, male NPT inlet, 1" outlet poly insert barb |
| PGV-100JT-MB075 | 1" plastic globe valve, jar-top bonnet, without flow control, male NPT inlet, ¾" outlet poly insert barb |
| PGV-100JT-MB125 | 1" plastic globe valve, jar-top bonnet, without flow control, male NPT inlet, 1¼" outlet poly insert barb |
| PGV-100JT-MM | 1" plastic globe valve, jar-top bonnet, without flow control, male NPT inlet and outlet |
| PGV-101JT-G | 1" plastic globe valve, jar-top bonnet, with flow control, female NPT inlet and outlet |
| PGV-101JT-G-LS | 1" plastic globe valve, jar-top bonnet, with flow control, female NPT inlet and outlet, no solenoid |
| PGV-101JT-GS | 1" plastic globe valve, jar-top bonnet, with flow control, female slip inlet and outlet |
| PGV-101JT-MB | 1" plastic globe valve, jar-top bonnet, with flow control, male NPT inlet, 1" outlet poly insert barb |
| PGV-101JT-MB075 | 1" plastic globe valve, jar-top bonnet, with flow control, male NPT inlet, ¾" outlet poly insert barb |
| PGV-101JT-MB125 | 1" plastic globe valve, jar-top bonnet, with flow control, male NPT inlet, 1¼" outlet poly insert barb |
| PGV-101JT-MM | 1" plastic globe valve, jar-top bonnet, with flow control, male NPT inlet and outlet |

## PGV PRESSURE LOSS IN PSI

| GPM | Globe | Angle | Male x Male | Male x Barb |
|---|---|---|---|---|
| 1 | 3 | 1 | 2 | 2 |
| 5 | 4 | 1 | 2 | 2 |
| 10 | 4 | 1 | 2 | 2 |
| 15 | 5 | 1 | 3 | 3 |
| 20 | 5 | 2 | 4 | 4 |
| 25 | 6 | 2 | 7 | 6 |
| 30 | 8 | 3 | 10 | 10 |
| 40 | 14 | 5 | 18 | 16 |

**PGV-100G Installed**

# PGV-ASV

*Gain simple and trouble-free operation without the need for a separate backflow preventer.*

## KEY BENEFITS

- External/internal manual bleed allows for quick and easy activation at the valve
- Double-beaded diaphragm seal design ensures leak-free performance
- Captive bonnet screws eliminate the possibility of lost parts during disassembly
- Triple-tool bonnet screws are compatible with standard or Phillips screwdrivers as well as a nut driver
- Removable anti-siphon cap for simple servicing
- Encapsulated solenoid with captive plunger used on every Hunter valve provides hassle-free service
- Flow control maximizes efficiency and prolongs the life of the system

## USER-INSTALLED OPTIONS

- Accu Sync® pressure regulation at the valve*
- DC-latching solenoid for battery-powered controllers

## FACTORY-INSTALLED OPTIONS

- LS: Valve without solenoid
- DC: DC-latching solenoid for battery-powered controllers

## OPERATING SPECIFICATIONS

- Flow: 0.2 to 40 GPM
- Recommended pressure range: 20 to 150 PSI
- Temperature rating: 150°F
- Warranty period: 2 years

* Accu Sync product information on **page 83**

**PGV-075-ASV**
Inlet diameter: ¾"
Height: 5½"
Length: 5¾"
Width: 2½"

**PGV-101-ASV**
Inlet diameter: 1"
Height: 5½"
Length: 6¼"
Width: 2½"

**Double-Beaded Diaphragm**

| PGV-ASV | |
|---|---|
| **Model** | **Description** |
| PGV-075-ASV | ¾" plastic anti-siphon electric valve, with flow control, NPT inlets |
| PGV-075-ASV-S | ¾" plastic anti-siphon electric valve, with flow control, slip inlets |
| PGV-075-ASV-LS | ¾" plastic anti-siphon electric valve, with flow control, NPT inlets, no solenoid |
| PGV-101-ASV | 1" plastic anti-siphon electric valve, with flow control, NPT inlets |
| PGV-101-ASV-S | 1" plastic anti-siphon electric valve, with flow control, slip inlets |
| PGV-101-ASV-LS | 1" plastic anti-siphon electric valve, with flow control, NPT inlets, no solenoid |

| PGV-ASV PRESSURE LOSS IN PSI | | |
|---|---|---|
| Flow (GPM) | ¾" | 1" |
| 1 | 1 | 1 |
| 5 | 2 | 2 |
| 10 | 2 | 2 |
| 15 | 3 | 3 |
| 20 | 6 | 6 |
| 25 | | 6 |
| 30 | | 9 |
| 35 | | 16 |
| 40 | | 20 |

# 1½" & 2" PGV

*These reliable valves provide long-lasting performance for larger systems.*

## KEY BENEFITS

- External/internal manual bleed allows for quick and easy activation at the valve
- Double-beaded diaphragm seal design ensures leak-free performance
- Captive bonnet screws eliminate the possibility of lost parts during disassembly
- Triple-tool bonnet screws are compatible with standard or Phillips screwdrivers as well as a nut driver
- Each valve available with globe or angle configuration for convenient placement
- Encapsulated solenoid with captive plunger used on every Hunter valve provides hassle-free service
- Flow control maximizes efficiency and prolongs the life of the system

## USER-INSTALLED OPTIONS

- Accu Sync® pressure regulation at the valve*
- DC-latching solenoid for battery-powered controllers (P/N 458200)
- Solenoid conduit cover (P/N 464322)
- Reclaimed flow control handle (P/N 607105)

## FACTORY-INSTALLED OPTIONS

- LS: Valve without solenoid
- DC: DC-latching solenoid for battery-powered controllers

## OPERATING SPECIFICATIONS

- Flow:
  - PGV-151: 20 to 120 GPM
  - PGV-201: 20 to 150 GPM
- Recommended pressure range: 20 to 150 PSI
- Temperature rating: 150°F
- Warranty period: 2 years

## SOLENOID SPECIFICATIONS

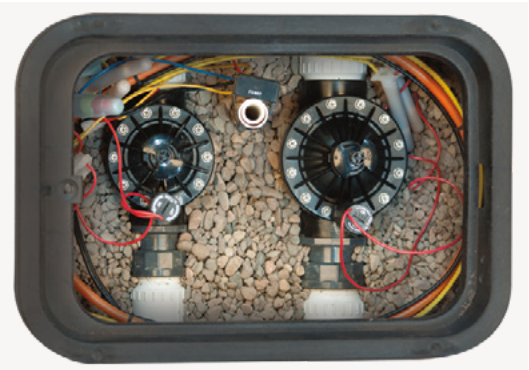
- 24 VAC solenoid
  - 350 mA inrush, 190 mA holding, 60 Hz
  - 370 mA inrush, 210 mA holding, 50 Hz

* Accu Sync product information on **page 83**

**PGV-151**
Inlet diameter: 1½"
Height: 7½"
Length: 5¾"
Width: 4½"

**PGV-201**
Inlet diameter: 2"
Height: 8"
Length: 6¾"
Width: 5¼"

**PGV Installed**



**PGV 1½" & 2"**

| Model | Description |
|---|---|
| PGV-151 | 1½" globe/angle valve with flow control |
| PGV-151-DC | 1½" globe/angle valve with DC-latching solenoid |
| PGV-151-LS | 1½" globe/angle valve less solenoid |
| PGV-201 | 2" globe/angle valve with flow control |
| PGV-201-DC | 2" globe/angle valve with DC-latching solenoid |
| PGV-201-LS | 2" globe/angle valve less solenoid |

**PGV PRESSURE LOSS IN PSI**

| Flow GPM | 1½" Globe | 1½" Angle | 2" Globe | 2" Angle |
|---|---|---|---|---|
| 20 | 3 | 3 | 1 | 1 |
| 30 | 3 | 3 | 1 | 2 |
| 35 | 3 | 3 | 2 | 2 |
| 40 | 3 | 3 | 2 | 2 |
| 50 | 4 | 3.5 | 1 | 1 |
| 60 | 5 | 4 | 2 | 2 |
| 80 | 5.5 | 4.5 | 3 | 2 |
| 100 | 9 | 8 | 5 | 3 |
| 120 | 11.5 | 10.5 | 6 | 5 |
| 135 | | | 8 | 7 |
| 150 | | | 10 | 9 |

# ICV

*This dependable valve works seamlessly with highly demanding systems.*

## KEY BENEFITS

- Optional Filter Sentry® scours the filter screen in dirty water conditions
- External/internal manual bleed allows for quick and easy activation at the valve
- Glass-filled nylon construction provides high pressure rating and reliability
- Double-beaded diaphragm seal design ensures leak-free performance
- Fabric-reinforced EPDM diaphragm and seat ensure greater performance in all water conditions
- Captive bonnet screws eliminate the possibility of lost parts during disassembly
- Triple-tool bonnet screws are compatible with standard or Phillips screwdrivers as well as a nut driver
- Encapsulated solenoid with captive plunger used on every Hunter valve provides hassle-free service
- Flow control maximizes efficiency and prolongs the life of the system

## USER-INSTALLED OPTIONS

- Accu Sync® pressure regulation at the valve
- DC-latching solenoid for battery-powered controllers (P/N 458200)
- Filter Sentry easily added to an installed valve*
- Solenoid conduit cover (P/N 464322)

## FACTORY-INSTALLED OPTIONS

- LS: Valve without solenoid
- DC: DC-latching solenoid for battery-powered controllers
- FS: Filter Sentry
- FS-R: Reclaimed option with Filter Sentry, purple control knob, and purple chlorine-resistant diaphragm

## OPERATING SPECIFICATIONS

- Flow:
  - ICV-101G: 0.1 to 40 GPM
  - ICV-151G: 0.1 to 150 GPM
  - ICV-201G: 0.1 to 200 GPM
  - ICV-301: 0.1 to 300 GPM
- Recommended pressure range: 20 to 220 PSI
- Temperature rating: 150°F
- Warranty period: 5 years

## SOLENOID SPECIFICATIONS

- 24 VAC solenoid
  - 350 mA inrush, 190 mA holding, 60 Hz
  - 370 mA inrush, 210 mA holding, 50 Hz

* Accu Sync product information on **page 83**

**ICV-101G**
Inlet diameter: 1"
Height: 5½"
Length: 4¾"
Width: 4"

**ICV-151G**
Inlet diameter: 1½"
Height: 7⅛"
Length: 6⅞"
Width: 5½"

**ICV-201G**
Inlet diameter: 2"
Height: 7⅛"
Length: 6⅞"
Width: 5½"

**ICV-301**
Inlet diameter: 3"
Height: 10¾"
Length: 9"
Width: 7⅜"

**ICV-R**
Inlet diameter: 1", 1½", 2", and 3"
Height: 7⅛"
Length: 6⅞"
Width: 5½"

**Double-Beaded Diaphragm**

**Filter Sentry**

## ICV

| Model | Description |
|---|---|
| ICV-101G | 1" globe valve with flow control |
| ICV-101G-FS | 1" globe valve with flow control, Filter Sentry |
| ICV-101G-DC | 1" globe valve with flow control, DC solenoid |
| ICV-101G-LS | 1" globe valve with flow-control-less solenoid |
| ICV-101G-FS-DC | 1" globe valve with flow control, Filter Sentry, DC solenoid |
| ICV-101G-FS-LS | 1" globe valve with flow control, Filter Sentry–less solenoid |
| ICV-101G-FS-R | Reclaimed 1" globe valve with flow control, Filter Sentry |
| ICV-151G | 1½" globe valve with flow control |
| ICV-151G-FS | 1½" globe valve with flow control, Filter Sentry |
| ICV-151G-DC | 1½" globe valve with flow control, DC solenoid |
| ICV-151G-FS-DC | 1½" globe valve with flow control, Filter Sentry, DC solenoid |
| ICV-151G-FS-R | Reclaimed 1½" globe valve with flow control, Filter Sentry |
| ICV-201G | 2" globe valve with flow control |
| ICV-201G-FS | 2" globe valve with flow control, Filter Sentry |
| ICV-201G-DC | 2" globe valve with flow control, DC solenoid |
| ICV-201G-LS | 2" globe valve with flow-control-less solenoid |
| ICV-201G-FS-DC | 2" globe valve with flow control, Filter Sentry, DC solenoid |
| ICV-201G-FS-LS | 2" globe valve with flow control, Filter Sentry–less solenoid |
| ICV-201G-FS-R | Reclaimed 2" globe valve with flow control, Filter Sentry |
| ICV301 | 3" globe/angle valve with flow control |
| ICV301-FS | 3" globe/angle valve with flow control, Filter Sentry |
| ICV301-DC | 3" globe/angle valve with flow control, DC solenoid |
| ICV301-FS-DC | 3" globe/angle valve with flow control, Filter Sentry, DC solenoid |
| ICV-301-FS-R | Reclaimed 3" globe/angle valve with flow control, Filter Sentry |

## ICV PRESSURE LOSS (AT OPTIMAL FLOWS) IN PSI

| Flow (GPM) | 1" Globe | 1½" Globe | 2" Globe | 3" Globe | 3" Angle |
|---|---|---|---|---|---|
| 0.1 | 2.0 | | | | |
| 0.5 | 2.0 | | | | |
| 1 | 2.0 | | | | |
| 5 | 2.5 | | | | |
| 10 | 3.0 | | | | |
| 15 | 3.0 | | | | |
| 20 | 3.0 | 1.5 | | | |
| 30 | 9.0 | 1.5 | | | |
| 40 | 20.0 | 1.7 | 0.8 | | |
| 50 | | 2.2 | 1.2 | | |
| 60 | | 3.0 | 1.7 | | |
| 75 | | 3.9 | 2.4 | | |
| 90 | | 5.5 | 3.2 | | |
| 100 | | 7.0 | 4.2 | | |
| 120 | | 10.9 | 6.5 | | |
| 135 | | 12.7 | 7.9 | | |
| 150 | | 16.2 | 9.8 | 2.5 | 1.9 |
| 175 | | | 13.3 | 3.0 | 2.4 |
| 200 | | | 17.7 | 4.1 | 3.3 |
| 225 | | | | 5.3 | 4.3 |
| 250 | | | | 6.7 | 5.5 |
| 275 | | | | 8.3 | 6.9 |
| 300 | | | | 10.1 | 8.5 |

**Double-Beaded Chlorine-Resistant Diaphragm**

**Filter Sentry**

**Captive Bonnet Bolts**

# IBV

*Built of solid brass, this valve can power through the fiercest irrigation conditions.*

## KEY BENEFITS

- Factory-installed Filter Sentry® scours the filter screen in dirty water conditions
- External/internal manual bleed allows for quick and easy activation at the valve
- Heavy-duty brass construction provides high pressure rating and reliability
- Double-beaded diaphragm seal design ensures leak-free performance
- Fabric-reinforced EPDM diaphragm and seat ensure greater performance in all water conditions
- Triple-tool bonnet screws are compatible with standard or Phillips screwdrivers as well as a nut driver
- Encapsulated solenoid with captive plunger used on every Hunter valve provides hassle-free service
- Flow control maximizes efficiency and prolongs the life of the system

## USER-INSTALLED OPTIONS

- Accu Sync® pressure regulation at the valve*
- DC-latching solenoid for battery-powered controllers (P/N 458200)
- Solenoid conduit cover (P/N 464322)

## FACTORY-INSTALLED OPTIONS

- DC: DC-latching solenoid for battery-powered controllers

## OPERATING SPECIFICATIONS

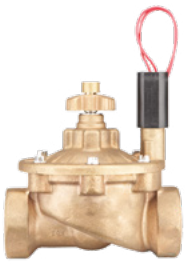
- Flow:
  - IBV-101G: 0.1 to 40 GPM
  - IBV-151G: 0.1 to 150 GPM
  - IBV-201G: 0.1 to 200 GPM
  - IBV-301G: 0.1 to 300 GPM
- Recommended pressure range: 20 to 220 PSI
- Temperature rating: 150°F
- Warranty period: 5 years

## SOLENOID SPECIFICATIONS

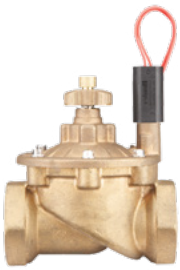
- 24 VAC solenoid
- 350 mA inrush, 190 mA holding, 60 Hz
- 370 mA inrush, 210 mA holding, 50 Hz

* Accu Sync product information on **page 83**

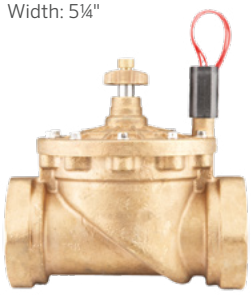
**IBV-101G-FS**
Inlet diameter: 1"
Height: 5¼"
Length: 4½"
Width: 3"



**IBV-151G-FS**
Inlet diameter: 1½"
Height: 6½"
Length: 6"
Width: 5¼"



**IBV-201G-FS**
Inlet diameter: 2"
Height: 7"
Length: 6"
Width: 5¼"



**IBV-301G-FS**
Inlet diameter: 3"
Height: 9"
Length: 8½"
Width: 7"


**IBV**

| Model | Description |
|---|---|
| IBV-101G-FS | 1" NPT brass globe valve, with flow control, with factory-installed Filter Sentry diaphragm |
| IBV-151G-FS | 1½" NPT brass globe valve, with flow control, with factory-installed Filter Sentry diaphragm |
| IBV-201G-FS | 2" NPT brass globe valve, with flow control, with factory-installed Filter Sentry diaphragm |
| IBV-301G-FS | 3" NPT brass globe valve, with flow control, with factory-installed Filter Sentry diaphragm |
| IBV-151G-FS-R | 1½" NPT brass globe valve with purple ID tag, Filter Sentry, and chlorine-resistant purple diaphragm |
| IBV-201G-FS-R | 2" NPT brass globe valve with purple ID tag, Filter Sentry, and chlorine-resistant purple diaphragm |

**IBV PRESSURE LOSS (AT OPTIMAL FLOWS) IN PSI**

| Flow GPM | 1" Globe | 1½" Globe | 2" Globe | 3" Globe |
|---|---|---|---|---|
| 0.1 | 2.0 | | | |
| 0.5 | 2.0 | | | |
| 1 | 2.0 | | | |
| 5 | 2.5 | | | |
| 10 | 3.0 | | | |
| 15 | 3.0 | | | |
| 20 | 3.0 | 1.5 | | |
| 30 | 4.0 | 1.5 | | |
| 40 | 7.0 | 1.7 | 0.8 | |
| 50 | | 2.2 | 1.2 | |
| 60 | | 3.0 | 1.7 | |
| 75 | | 3.9 | 2.4 | |
| 90 | | 5.5 | 3.2 | |
| 100 | | 7.0 | 4.2 | |
| 120 | | 10.9 | 6.5 | |
| 135 | | 12.7 | 7.9 | |
| 150 | | 16.2 | 9.8 | 2.5 |
| 175 | | | 13.3 | 3.0 |
| 200 | | | 17.7 | 4.1 |
| 225 | | | | 5.3 |
| 250 | | | | 6.7 |
| 275 | | | | 8.3 |
| 300 | | | | 10.1 |

**Note:**
Charts based on full-open flow-control position

# ACCU SYNC®

*Gain unparalleled pressure regulation for any Hunter valve.*

## OPERATING SPECIFICATIONS

- Regulation from 20 to 100 PSI
- Static pressure: 150 PSI
- Required dynamic pressure differential: 15 PSI
- Works with AC- and DC-latching solenoids
- Works with any Hunter valve
- Warranty period: 2 years

**ACCU SYNC VALVE RECOMMENDED FLOW RANGE**

| Valve | Flow GPM |
|---|---|
| PGV-100/101 | 5–40 |
| PGV-151 | 20–120 |
| PGV-201 | 40–150 |
| ICV-101 | 5–40 |
| ICV-151 | 20–150 |
| ICV-201 | 40–200 |
| ICV-301 | 150–300 |
| IBV-101 | 5–40 |
| IBV-151 | 20–150 |
| IBV-201 | 40–200 |
| IBV-301 | 150–300 |

**ACCU SYNC APPLICATIONS**

| | | |
|---|---|---|
| ● | **Adjustable 20–100 PSI** | For full customization, the adjustable Accu Sync can regulate pressure from 20 to 100 PSI |
| ● | **Fixed 30 PSI** | Ideal for spray systems |
| ● | **Fixed 40 PSI** | Ideal for MP Rotator® nozzles and large in-line drip systems |

## ADJUSTABLE

**AS-ADJ**
Height with solenoid: 3¼"

## ADAPTER

**SOLENOID ADAPTER**

## FIXED


**AS-30**
Height with solenoid: 3¼"


**AS-40**
Height with solenoid: 3¼"

**Installation**
*Accu Sync shown installed on ICV and PGV valves*

# QUICK COUPLERS

*The sturdy red brass and stainless steel construction of quick couplers strengthens any project.*

## KEY BENEFITS

- 100% interchangeable with major brands*
- Red brass and stainless steel construction
- Heavy-duty thermoplastic locking and non-locking covers
- Optional winged stabilization and Acme key connection
- Stainless steel lug on 1" and 1¼" keys
- Spring-loaded covers with stainless steel springs for positive closing and protection of valve's sealing components
- Warranty period: 5 years

**Quick Couplers**



**QUICK COUPLER, KEY, AND HOSE SWIVEL CHARTS**

| Model | Inlet Threads | Slots | Body | Color* | Locking | Key | Swivels |
|---|---|---|---|---|---|---|---|
| **HQ-3RC** | ¾" | 2 | 1-piece | Yellow | No | HK-33 | HS-0 |
| **HQ-33DRC** | ¾" | 2 | 2-piece | Yellow | No | HK-33 | HS-0 |
| **HQ-33DLRC** | ¾" | 2 | 2-piece | Yellow | Yes | HK-33 | HS-0 |
| **HQ-44RC** | 1" NPT | 1 | 2-piece | Yellow | No | HK-44 | HS-1 or HS-2 |
| **HQ-44LRC** | 1" NPT | 1 | 2-piece | Yellow | Yes | HK-44 | HS-1 or HS-2 |
| **HQ-44RC-AW** | 1" NPT | Acme | 2-piece wing** | Yellow | No | HK-44A | HS-1 or HS-2 |
| **HQ-44LRC-AW** | 1" NPT | Acme | 2-piece wing** | Yellow | Yes | HK-44A | HS-1 or HS-2 |
| **HQ-5RC** | 1" NPT | 1 | 1-piece | Yellow | No | HK-55 | HS-1 or HS-2 |
| **HQ-5LRC** | 1" NPT | 1 | 1-piece | Yellow | Yes | HK-55 | HS-1 or HS-2 |

**Notes:**
* All locking cover models are available with purple covers for reclaimed water applications.
** Anti-rotation stabilization wings.

HQ-3RC HQ-5RC HK-33

HQ-33DLRC HQ-44LRC HK-44

Non-locking Locking Reclaimed

HQ-44LRC HK-55

Key

### Reclaimed Water Option

*All locking models have an optional purple cover for sites using reclaimed water.*

## QUICK COUPLER – SPECIFICATION BUILDER: ORDER 1 + 2 + 3

| 1 Model | 2 Cover Options | 3 Additional Options |
|---|---|---|
| **HQ3** = ¾" inlet, 1-piece body, 2 slots | **RC** = Yellow rubber cover | **(blank)** = No option |
| **HQ5** = 1" inlet, 1-piece body, 1 slot | **LRC** = Yellow locking rubber cover | **AW** = Acme key with anti-rotation wings |
| **HQ33D** = ¾" inlet, 2-piece body, 2 slots | *(Not available for HQ3 body)* | *(Only available for HQ44 body)* |
| **HQ44** = 1" inlet, 2-piece body, 1 slot or Acme key socket | | **R** = Purple locking cover *(reclaimed water ID; only available for LRC models)* |

**Examples:**
**HQ3-RC** = HQ3 valve with rubber cover
**HQ44-LRC** = HQ44 valve with locking rubber cover
**HQ44-LRC-R** = HQ44 valve with locking rubber cover and reclaimed water ID
**HQ44-LRC-AW-R** = HQ44 valve, with locking rubber cover, Acme key socket with anti-rotation wings and reclaimed water ID

## KEYS

| Model | Compatible Valve | Compatible Swivel |
|---|---|---|
| HK33 = ¾" valve, ¾" key inlet | HQ3, HQ33 | HS0 |
| HK44 = 1" valve, 1" key inlet | HQ44 | HS1, HS2 |
| HK44A = 1" valve, Acme key inlet | HQ44AW | HS1, HS2 |
| HK55 = 1" valve, 1¼" key inlet | HQ5 | HS1, HS2 |

## HS HOSE SWIVELS

| Model | Compatible Key |
|---|---|
| HS0 = ¾" inlet, ¾" hose outlet | HK33 |
| HS1 = 1" inlet, ¾" hose outlet | HK44, HK44A, HK55 |
| HS2 = 1" inlet, 1" hose outlet | HK44, HK44A, HK55 |

## HQ PRESSURE LOSS IN PSI

| Flow (GPM) | HQ-3 | HQ-33 | HQ-44 | HQ-5 |
|---|---|---|---|---|
| 5 | 0.8 | 1.0 | | |
| 10 | 1.8 | 2.0 | | |
| 15 | 4.1 | 4.3 | 2.2 | |
| 20 | 7.2 | 7.6 | 4.4 | 1.0 |
| 30 | | | 11.5 | 3.0 |
| 40 | | | | 6.3 |
| 50 | | | | 9.2 |
| 60 | | | | 13.0 |
| 70 | | | | 19.8 |

HS0 HS1 HS2

# CONTROLLERS


HCC Wi-Fi
Hydrawise
Zones
Settings
Status
Hunter

# CONTROLLER
# SELECTION GUIDE



| Platform | AC-Powered Controllers |
|---|---|
| **STANDARD**<br>*Details on* ***page 90***<br>Dial-based controllers are standalone systems that offer water-saving features and convenient remote control operation for faster maintenance. | **X-Core®**<br>***Stations:*** *2, 4, 6, 8*<br>***page 92***<br>  <br>**X2™**<br>***Stations:*** *4, 6, 8, 14*<br>***page 93***<br>  <br>**Pro-C®**<br>***Stations:*** *4–16, 6, 12*<br>***page 94***<br>  <br>**I-Core®**<br>***Stations:*** *6–42 conventional, 1–48 with two-wire*<br>***page 95***<br>  |
| **HYDRAWISE®**<br>*Details on* ***page 98***<br>Hydrawise is simple to set up, easy to use, and packed with helpful features. Built-in system monitoring and a suite of powerful tools make saving water and managing multi-site municipal properties, community tracks, and commercial projects more convenient than ever before. | **HC**<br>***Stations:*** *6, 12*<br>***page 100***<br>  <br>**WAND for X2**<br>***Stations:*** *4, 6, 8, 14*<br>***page 101***<br>  <br>**HPC**<br>***Stations:*** *4–16*<br>***page 102***<br>  <br>**Pro-HC**<br>***Stations:*** *6, 12, 24*<br>***page 103***<br>  <br>**HCC**<br>***Stations:*** *8–54 conventional, 1–54 with two-wire*<br>***page 104***<br>  |
| **CENTRALUS™**<br>*Details on* ***page 108***<br>Gain cloud-based control and monitoring for ICC2 and ACC2 controllers with the mobile-friendly Centralus irrigation management platform. | **ICC2**<br>***Stations:*** *8–54 conventional, 1–54 with two-wire*<br>***page 109***<br>  <br>**ACC2**<br>***Stations:*** *12–54 conventional, 1–225 with two-wire*<br>***page 110***<br>  |

Use this guide to quickly compare Hunter controller power needs, station counts, and software platforms to ensure you choose the best controller for every installation.

| Platform | AC-Powered Controllers, Continued |
|---|---|
| **IMMS™ ONLINE**<br>*Details on* ***page 112***<br>Simplify central control of Hunter ACC controllers and accessories with the web- or server-based IMMS software package. | **ACC**<br>***Stations:*** *12–42 conventional, 1–99 with two-wire*<br>***page 114***  |

| Platform | Battery-Powered Controllers |
|---|---|
| **INDEPENDENT**<br>*Details on* ***page 116***<br>Battery-powered controllers allow automatic irrigation for power-restricted valve locations and areas where hardscape blocks the ability to run wire affordably. | **NODE**<br>***Stations:*** *1, 2, 4, 6*<br>***page 118***  <br>**XC Hybrid**<br>***Stations:*** *6, 12*<br>***page 120***  |
| **BLUETOOTH®**<br>*Details on* ***page 116***<br>Bluetooth enabled, battery-powered controllers have all the benefits of independent battery controllers with convenient, on-site wireless control from a smartphone. | **BTT**<br>***Zones:*** *1, 2*<br>***page 117***  <br>**NODE-BT**<br>***Stations:*** *1, 2, 4*<br>***page 119***  |

**Look for this icon** *to identify controllers with two-wire compatibility. Save wire and easily expand the system as needed after installation.*

# STANDARD CONTROLLERS

Standard controllers are self-contained irrigation systems designed for simple installation and programming. They offer locally measured weather monitoring capabilities for automatic schedule adjustments, the option of modular station flexibility, and convenient remote control operation for faster maintenance.



## STANDARD CONTROLLER COMPARISON CHART

| CONTROLLER MODELS | MAXIMUM STATIONS | SENSOR INPUTS | TWO-WIRE | REMOTE CONTROL | WEB ACCESS |
|---|---|---|---|---|---|
| X-CORE | 8 | 1 | None | ROAM, ROAM XL | None |
| X2 | 14 | 1 | None | ROAM, ROAM XL, Smartphone with Wi-Fi | Hydrawise, Wi-Fi |
| PRO-C | 16 | 1 | None | ROAM, ROAM XL | None |
| I-CORE | 42, 48 two-wire | 2 (Clik or Flow), 3 (Clik or Flow, in metal) | DUAL, 48 stations | ROAM, ROAM XL | None |

# X-CORE®

*This simple irrigation controller offers optional on-site smart ET watering adjustments and handheld remote operation.*

## KEY BENEFITS

- Number of stations:
  - 2, 4, 6, or 8 (fixed models)
- Solar Sync® accessory saves water based on local weather conditions
- Built-in key lock on outdoor models protects against vandalism
- 3 flexible programs with 4 start times each and up to 4-hour run times
- QuickCheck™ provides simple diagnostics of faulty field wiring
- Hide Programs setting shows 1 program and 1 start time for simplification
- Suspend irrigation up to 99 days during the off-season
- Short-circuit protection detects wiring faults and skips the station without system damage
- Easy Retrieve™ memory backs up the full irrigation schedule
- Delay Between Stations for slow-closing valves or pump recharge
- Cycle and Soak prevents water waste and runoff in areas with elevation changes or tight soils
- Seasonal adjustment for quicker schedule adjustments without changing run times

## OPERATING SPECIFICATIONS

- Transformer input: 120 VAC
- Transformer output (24 VAC): 1 A
- Station output (24 VAC): 0.56 A
- P/MV output (24 VAC): 0.28 A
- Sensor inputs: 1
- Approvals: Plastic IP54 (outdoor), UL, cUL, FCC, CE, RCM
- Warranty period: 2 years


**Plastic Indoor**
Height: 6½"
Width: 5¾"
Depth: 2"


**Plastic Outdoor**
Height: 8⅜"
Width: 7"
Depth: 3¾"

| X-CORE | |
|---|---|
| **Model** | **Description** |
| **XC-200i** | 2-station indoor controller, 120V wall adapter |
| **XC-400i** | 4-station indoor controller, 120V wall adapter |
| **XC-600i** | 6-station indoor controller, 120V wall adapter |
| **XC-800i** | 8-station indoor controller, 120V wall adapter |
| **XC-400** | 4-station outdoor controller, 120V transformer and plug with plastic cabinet |
| **XC-600** | 6-station outdoor controller, 120V transformer and plug with plastic cabinet |
| **XC-800** | 8-station outdoor controller, 120V transformer and plug with plastic cabinet |

*Compatible with:*

***Solar Sync Sensor***
*Page 136*

***ROAM Remote***
*Page 127*
***ROAM XL Remote***
*Page 128*

***Soil-Clik Sensor***
*Page 141*

look for WaterSense Meets EPA Criteria

**EPA WaterSense**
Add the WaterSense-labeled Solar Sync sensor to improve the water efficiency of this controller.

# X2™

*This online-capable controller features rapid schedule programming and advanced water-saving features.*

## KEY BENEFITS

- Number of stations:
  - 4, 6, 8, or 14 (fixed models)
- Wi-Fi capable controller automatically managed by Hydrawise® software
- Backlit display provides optimal visibility in any light
- 3 flexible programs with 4 start times each and up to 6-hour run times
- QuickCheck™ provides simple diagnostics of faulty field wiring
- Hide Programs option shows 1 program and 1 start time for simplification
- Suspend irrigation up to 99 days during the off-season
- Short-circuit protection detects wiring faults and skips the station without system damage
- Easy Retrieve™ memory backups the full irrigation schedule
- Delay Between Stations for slow-closing valves or pump recharge
- Cycle and Soak prevents water waste and runoff in areas with elevation changes or tight soils
- Seasonal adjustment for quicker schedule adjustments without changing run times

## WI-FI MODULE BENEFITS

- Provides rapid programming, online irrigation management, and controller status alerts
- Standard ABC programming with 6 programs and 6 start times or advanced schedules with 36 start times, and run times up to 24 hours
- Predictive Watering™ provides precise weather adjustments for maximum water savings
- Compatibility with Amazon Alexa™ and Control4® home automation
- See complete WAND Wi-Fi Module benefits and specifications on **page 101**

## OPERATING SPECIFICATIONS

- Transformer input: 120 VAC
- Transformer output (24 VAC): 1 A
- Station output (24 VAC): 0.56 A
- P/MV output (24 VAC): 0.28 A
- Sensor inputs: 1
- Approvals (controller): Plastic IP44, UL, cUL, FCC, CE, RCM
- Approvals (module): Wi-Fi b/g/n, Bluetooth 5.0, UL, cUL, FCC, CE, RCM
- Warranty period: 2 years


**X2**
Height: 9"
Width: 7½"
Depth: 3½"

**WAND** Wi-Fi Module
Height: ¾"
Width: 2⅛"
Depth: 2⅛"

| X2 | |
|---|---|
| **Model** | **Description** |
| **X2-400** | 4-station controller, 120V internal transformer and plug with plastic cabinet |
| **X2-600** | 6-station controller, 120V internal transformer and plug with plastic cabinet |
| **X2-800** | 8-station controller, 120V internal transformer and plug with plastic cabinet |
| **X2-1400** | 14-station controller, 120V internal transformer and plug with plastic cabinet |
| **WAND** | Wi-Fi module for Hydrawise water management software |

*Compatible with:*

***Hydrawise Software***
*Page 98*

***Rain-Clik Sensor***
*Page 134*

***ROAM Remote***
*Page 127*
***ROAM XL Remote***
*Page 128*

look for WaterSense Meets EPA Criteria

**EPA WaterSense**
Add the WaterSense-labeled WAND Wi-Fi module **(see page 101)** to improve the water efficiency of this controller.

# PRO-C®

*Simple programming and flexible station expansion make Pro-C the professional's choice for residential and light commercial systems.*

## KEY BENEFITS

- Number of stations:
  - Modular Pro-C capacity from 4 to 16
  - Fixed PCC with 6- and 12-station options
- 3 independent irrigation programs (4 start times each) allow for customized scheduling
- 6-hour maximum station run time provides flexibility for differing application amount
- 1 sensor input available for use with Solar Sync® or any Clik sensors
- 1 P/MV output for pump start relay and master valve activation
- Dedicated Solar Sync dial position provides logic for smart water savings
- Easy Retrieve™ memory allows for manual backup and retrieval of preferred settings and programming
- QuickCheck™ provides simple diagnostics of faulty field wiring
- 3 independent lighting programs available for simultaneous irrigation and lighting control

## OPERATING SPECIFICATIONS

- Transformer input: 120 VAC
- Transformer output (24 VAC): 1 A
- Station output (24 VAC): 0.56 A
- P/MV output (24 VAC): 0.28 A
- Approvals: UL, cUL, FCC, CE, RCM
- Warranty period: 2 years


**Plastic Indoor**
Height: 9"
Width: 10"
Depth: 4½"


**Plastic Outdoor**
Height: 9"
Width: 10"
Depth: 4½"

| PRO-C | |
|---|---|
| **Model** | **Description** |
| PCC-600i | Fixed 6-station, plastic indoor wall mount |
| PCC-600 | Fixed 6-station, plastic outdoor wall mount |
| PCC-1200i | Fixed 12-station, plastic indoor wall mount |
| PCC-1200 | Fixed 12-station, plastic outdoor wall mount |
| PC-400i | Modular 4-station base, plastic indoor wall mount |
| PC-400 | Modular 4-station base, plastic outdoor wall mount |

| PC-SERIES STATION EXPANSION | |
|---|---|
| **Modules** | **Description** |
| PCM-300 | 3-station plug-in module |
| PCM-900 | 9-station plug-in module (maximum, one per controller) |

*Compatible with:*

***Solar Sync Sensor***
*Page 136*

***ROAM Remote***
*Page 127*
***ROAM XL Remote***
*Page 128*

***PXSYNC Accessory***
*Visit fxl.com*

look for WaterSense Meets EPA Criteria

**EPA WaterSense**
Add the WaterSense-labeled Solar Sync sensor to improve the water efficiency of this controller.

# I-CORE®

*Flow monitoring and two-wire capabilities make I-Core an ideal fit for standalone midsize commercial and high-end residential projects.*

## KEY BENEFITS

- Number of stations:
  - Conventional: 6 to 30 (plastic), 6 to 42 (metal and pedestals)
  - With DUAL® decoder: up to 48
- 4 independent irrigation programs (8 start times each) allow for customized scheduling
- 12-hour maximum station run time provides flexibility for lower-flow zones
- Any 2 programs can operate simultaneously for more efficient watering
- Sensor inputs:
  - 2 (plastic)
  - 3 (metal and pedestals)
- 1 P/MV output for pump start relay and master valve activation
- Flow-monitoring capabilities provide real-time water usage data
- Programmable No Water Window prevents all irrigation for a specified time frame
- High-visibility, backlit display with 6 selectable languages

## OPERATING SPECIFICATIONS

- Transformer input: 120/230 VAC
- Transformer output (24 VAC): 1.4 A
- Station output (24 VAC): 0.56 A
- P/MV output (24 VAC): 0.28 A
- Approvals: Plastic Wall Mount IP44, Metal IP56, Plastic Pedestal IP34, NEMA 3R, UL, cUL, FCC, CE, RCM
- Warranty period: 5 years

**Plastic Wall Mount**
Height: 11"
Width: 13¼"
Depth: 6¼"

**Metal Wall Mount**
(gray or stainless steel)
Height: 12⅜"
Width: 15½"
Depth: 6½"

**Plastic Pedestal**
Height: 39"
Width: 24"
Depth: 17"

**Metal Pedestal**
(gray or stainless steel)
Height: 36"
Width: 15½"
Depth: 5"

| I-CORE | |
|---|---|
| **Model** | **Description** |
| IC-600-PL | Base 6-station controller, indoor/outdoor, plastic cabinet |
| IC-600-M | Base 6-station controller, indoor/outdoor, metal cabinet |
| IC-600-PP | Base 6-station controller, indoor/outdoor, plastic pedestal |
| IC-600-SS | Base 6-station controller, indoor/outdoor, stainless steel cabinet |
| ICM-600 | 6-station plug-in expansion module |
| ACC-PED | Metal pedestal, gray powder-coated, for use with I-Core and ACC metal controllers |
| PED-SS | Stainless steel pedestal for use with I-Core and ACC stainless steel controllers |

| DUAL | |
|---|---|
| **Model** | **Description** |
| DUAL48M | DUAL decoder output module, up to 48-stations maximum |
| DUAL-1 | DUAL 1-station decoder (includes 2 DBRY-6 connectors) |
| DUAL-2 | DUAL 2-station decoder (includes 2 DBRY-6 connectors) |
| DUAL-S | DUAL surge arrestor (includes 4 DBRY-6 connectors) |

*Compatible with:*

***Solar Sync Sensor***
*Page 136*

***DUAL Decoder***
*Page 125*

***Flow-Sync Sensor***
*Page 138*
***WFS Sensor***
*Page 139*

look for WaterSense Meets EPA Criteria

**EPA WaterSense**
Add the WaterSense-labeled Solar Sync sensor to improve the water efficiency of this controller.


# HYDRAWISE® CONTROLLERS

## HYDRAWISE CONTROLLER COMPARISON CHART

| CONTROLLER MODELS | MAXIMUM STATIONS | SENSOR INPUTS | TWO-WIRE | REMOTE CONTROL | WEB ACCESS | OUTDOOR LIGHTING CONTROL* |
|---|---|---|---|---|---|---|
| HC | 12 | 2 | None | Smartphone with Wi-Fi | Hydrawise, Wi-Fi | PXSYNC |
| WAND for X2 | 14 | 1 | None | ROAM, ROAM XL, Smartphone with Wi-Fi | Hydrawise, Wi-Fi | PXSYNC |
| HPC | 16 | 1 | None | ROAM, ROAM XL, Smartphone with Wi-Fi | Hydrawise, Wi-Fi | PXSYNC |
| PRO-HC | 24 | 2 | None | Smartphone with Wi-Fi | Hydrawise, Wi-Fi | PXSYNC |
| HCC | 54 | 2 | EZDS, 54 stations | ROAM, ROAM XL, Smartphone with Wi-Fi | Hydrawise, Wi-Fi | PXSYNC |

* To learn more about FX Luminaire lighting control solutions, **visit fxl.com**.


# HYDRAWISE® SOFTWARE

*The industry-best Hydrawise irrigation control platform allows for professional multi-site management and provides a range of helpful water-saving features for end users.*



## Save Water

### PREDICTIVE WATERING™

Predictive Watering uses past, current, and forecast weather data sourced from the internet to automatically adjust to local, real-time conditions and provide homeowners and end users with tremendous water savings.

### SET UP IRRIGATION BY PROGRAM OR ZONE

Configure schedules exactly how you like: by program or zone. If you like to create schedules by program, you can keep your management style.

### VIRTUAL SOLAR SYNC®

Virtual Solar Sync uses daily ET measurements from your selected weather stations to supplement the Predictive Watering adjustments on your controller, working to save even more water.

## Protect the Landscape

### SYSTEM MONITORING

Flow rate and valve monitoring alert you in the event of a problem, so you can quickly prevent landscape degradation before significant damage occurs.

### WEATHER MONITORING

Web-based climate monitoring automatically adjusts irrigation systems to local weather conditions, ensuring plants remain healthy — rain or shine.

## Save Time and Labor

### REMOTE MANAGEMENT

Make changes to a program and know the status of the controller and the irrigation plan without a site visit.

### STORE CUSTOMER PLANS AND DESIGNS

Attach irrigation system layouts to your customers' controllers for quick reference in the field. Never forget the location of the pipes or valve box again.

### ON-SITE REMOTE

Turn your smartphone into a remote control to make changes and check the irrigation system without visiting the controller.

## Build a Stronger Business

### BUILD A STRONGER BUSINESS

Add services, grow revenue, increase customer satisfaction, and rest assured that Hydrawise has your back as you expand your business.

### BUSINESS BRANDING

Gain instant recognition from your customers by including your business logo and details in your Hydrawise account.

### MULTI-SITE MANAGER

Manage many customers or multiple sites with our unique business tools:

- Summary of all controllers
- Map view of controllers
- List view of customers/sites
- Search for customers and controllers
- View all controller events and logs
- View all controller alerts
- Global control settings
  - Alerts
  - Watering Schedules
  - Start Times
  - Watering Triggers
- Quick select controllers
- Generate job sheets
- Manage subcontractors or regions

### BUSINESS ACCOUNT

Manage staff access with different levels of permission. Remove or add staff easily and quickly. Add and store files, irrigation plans, layouts, or other documents for access by your staff.

### MESSAGING

Receive messages from and send messages to customers and staff through the Hydrawise app.

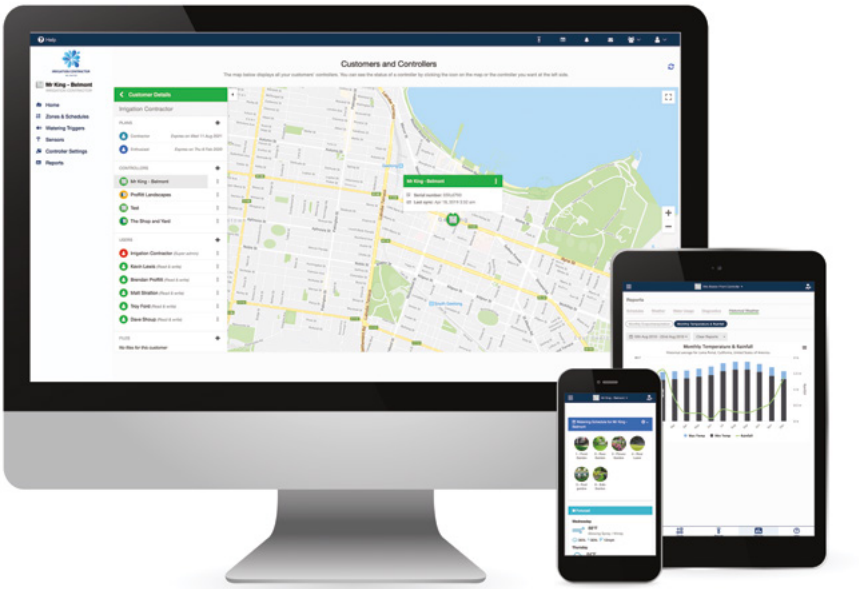
## Manage from Anywhere

### GLOBAL APP AND WEB ACCESS

Sit back and relax. With Hydrawise, everything you need is in the palm of your hand. Remote access allows you to view, manage, and monitor irrigation controllers from your smartphone, tablet, or computer at your convenience.

### SMART-HOME COMPATIBILITY

Hydrawise integrates seamlessly with several industry-leading smart-home solutions.




Access to Hydrawise software is free for all users worldwide. For advanced features, annual software plans are available for purchase. **To learn more, visit hydrawise.com.**

**EPA WaterSense Approved**
Recognized as a responsible water-saving tool by the U.S. Environmental Protection Agency


**HC Controller**
6- and 12-station count


**X2 Controller with WAND Module**
4-, 6-, 8-, and 14-station count


**HPC Controller**
4- to 16-station count


**Pro-HC Controller**
6-, 12-, and 24-station count


**HCC Controller**
8- to 54-station count, EZDS two-wire option

**HC Flow Meter**
Add an optional flow meter to receive flow alerts and monitor water consumption

*Not available for X2*

# HC

*Perfect for residential projects, the HC controller provides smart water savings and remote irrigation management capabilities.*

## KEY BENEFITS

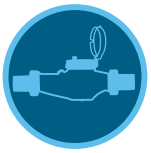
- Number of stations:
  - 6 or 12 (fixed indoor)
- Standard programming option allows for 6 independent irrigation programs and 6 start times per program
- Advanced programming option provides station-based programming with up to 6 total start times available
- 24-hour maximum station run time provides flexibility for low-flow zones
- 2 sensor inputs available for use with any Clik sensors and HC Flow Meter
- Station outputs can also be used to activate a pump start relay or master valve
- Wi-Fi enabled for quick connection to Hydrawise® software
- 2¾" full-color touchscreen display for simple programming at the control panel
- Built-in milliamp sensor for wire fault detection and alerts (12-station model only)

## OPERATING SPECIFICATIONS

- Transformer input: 120 VAC
- Transformer output (24 VAC): 1 A
- Station output (24 VAC): 0.56 A
- P/MV output (24 VAC): 0.28 A
- Approvals: UL, cUL, FCC, CE, RCM
- Warranty period: 2 years


**HC**
(plastic indoor)
Height: 6"
Width: 7"
Depth: 1¼"

*Compatible with:*



***HC Flow Meter***
*Page 137*

***Rain-Clik Sensor***
*Page 134*

***Soil-Clik Sensor***
*Page 141*

| HC | |
|---|---|
| **Model** | **Description** |
| HC-600i | Fixed 6-station, plastic indoor wall mount |
| HC-1200i | Fixed 12-station, plastic indoor wall mount |


**EPA WaterSense Approved**
Recognized as a responsible water-saving tool by the U.S. Environmental Protection Agency

# **WAND** FOR X2™

*This Wi-Fi upgrade option equips X2 controllers with remote management capabilities from anywhere with an internet connection.*

## KEY BENEFITS

- Simple plug-in Wi-Fi option for any X2 controller model for online irrigation management
- Standard programming option allows for 6 independent irrigation programs and 6 start times per program
- Advanced programming option provides station-based programming with up to 6 total start times available
- Increase water savings by adding Hydrawise to your X2 controller
- Fast Bluetooth Wi-Fi network setup, or SoftAP or WPS configuration
- See complete X2 controller key benefits and specifications on **page 93**

## OPERATING SPECIFICATIONS

- Approvals: Wi-Fi b/g/n, Bluetooth 5.0, UL, cUL, FCC, CE, RCM
- Warranty period: 2 years

**WAND** Wi-Fi Module
Height: ¾"
Width: 2⅛"
Depth: 2⅛"

**WAND Module installed in the X2 controller**

HYDRAWISE CONTROLLERS

**WAND WI-FI MODULE**

| Model | Description |
|---|---|
| WAND | Wi-Fi module for Hydrawise water management software |

WAND INSTALLATION

*Compatible with:*

***Rain-Clik Sensor***
*Page 134*

***ROAM Remote***
*Page 127*
***ROAM XL Remote***
*Page 128*

***Soil-Clik Sensor***
*Page 141*

**EPA WaterSense Approved**
Recognized as a responsible water-saving tool by the U.S. Environmental Protection Agency

# HPC

*Combine the modularity of the Pro-C® with Hydrawise® irrigation management software for a smart and flexible control solution.*

## KEY BENEFITS

- Number of stations:
  - Modular capacity from 4–16 stations permits simple system expansion
- Standard programming option allows for 6 independent irrigation programs and 6 start times per program
- Advanced programming option provides station-based programming with up to 6 total start times available
- 24-hour maximum station run time provides flexibility for low-flow zones
- 1 sensor input available for use with any Clik sensor or HC Flow Meter
- 1 P/MV output for pump start relay and master valve activation
- Wi-Fi enabled for quick connection to Hydrawise software
- 2¾" full-color touchscreen display for simple programming at the control panel
- Built-in milliamp sensor for wire fault detection and alerts

## OPERATING SPECIFICATIONS

- Transformer input: 120 VAC
- Transformer output (24 VAC): 1 A
- Station output (24 VAC): 0.56 A
- P/MV output (24 VAC): 0.28 A
- Approvals: Plastic IP44, UL, cUL, FCC, CE, RCM
- Warranty period: 2 years

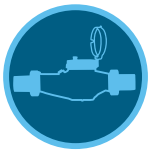

**HPC**
(plastic indoor/outdoor)
Height: 9"
Width: 10"
Depth: 4½"


**HPC Face Panel**

| HPC | |
|---|---|
| **Model** | **Description** |
| HPC-400 | 4-station base:<br>Domestic 120 VAC indoor/outdoor controller |
| HPC-FP | Hydrawise retrofit front panel for Pro-C controllers (March 2014 or newer models) |

| PC-SERIES STATION EXPANSION | |
|---|---|
| **Model** | **Description** |
| PCM-300 | 3-station plug-in module:<br>Use to increase station count from 4 to 7, 10, or 13 |
| PCM-900 | 9-station plug-in module:<br>Use to increase station count from 7 to 16 |

*Compatible with:*



***HC Flow Meter***
*Page 137*

***ROAM Remote***
*Page 127*
***ROAM XL Remote***
*Page 128*

***Rain-Clik Sensor***
*Page 134*


**EPA WaterSense Approved**
Recognized as a responsible water-saving tool by the U.S. Environmental Protection Agency

# PRO-HC

*Use this rugged, professional-grade Wi-Fi controller for residential and light commercial applications.*

## KEY BENEFITS

- Number of stations:
  - 6, 12, or 24
- Standard programming option allows for 6 independent irrigation programs and 6 start times per program
- Advanced programming option provides station-based programming with up to 6 total start times available
- 24-hour maximum station run time provides flexibility for low-flow zones
- 2 sensor inputs available for use with any Clik sensor and HC Flow Meter
- 1 P/MV output for pump start relay and master valve activation
- Wi-Fi enabled for quick connection to Hydrawise software
- 2¾" full-color touchscreen display for simple programming at the control panel
- Built-in milliamp sensor for wire fault detection and alerts

## OPERATING SPECIFICATIONS

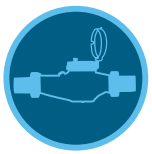
- Transformer input: 120 VAC
- Transformer output (24 VAC): 1 A
- Station output (24 VAC): 0.56 A
- P/MV output (24 VAC): 0.28 A
- Approvals: Plastic IP44 (outdoor), UL, cUL, FCC, CE, RCM
- Warranty period: 2 years

| PRO-HC | |
|---|---|
| **Model** | **Description** |
| **PHC-600i** | Fixed 6-station, plastic indoor wall mount |
| **PHC-600** | Fixed 6-station, plastic outdoor wall mount |
| **PHC-1200i** | Fixed 12-station, plastic indoor wall mount |
| **PHC-1200** | Fixed 12-station, plastic outdoor wall mount |
| **PHC-2400i** | Fixed 24-station, plastic indoor wall mount |
| **PHC-2400** | Fixed 24-station, plastic outdoor wall mount |


**Pro-HC**
(plastic indoor)
Height: 8¼"
Width: 9½"
Depth: 3½"


**Pro-HC**
(plastic outdoor)
Height: 9"
Width: 10"
Depth: 4"

*Compatible with:*



***HC Flow Meter***
*Page 137*

***Rain-Clik Sensor***
*Page 134*

***PXSYNC Accessory***
*Visit fxl.com*

**EPA WaterSense Approved**
Recognized as a responsible water-saving tool by the U.S. Environmental Protection Agency

# HCC

*Bring the power of Hydrawise® to residential, commercial, and public-sector projects with this affordable powerhouse.*

## KEY BENEFITS

- Number of stations:
  - Conventional: 8 to 38 (plastic), 8 to 54 (metal and pedestal)
  - With two-wire EZDS: up to 54 (all enclosure options)
- Standard programming option allows for 6 independent irrigation programs and 6 start times per program
- Advanced programming option provides station-based programming with up to 6 total start times available
- 24-hour maximum station run time provides flexibility for low-flow zones
- Any 2 programs or stations can operate simultaneously, providing more efficient watering
- 2 sensor inputs available for use with any Clik sensors and HC Flow Meter
- 1 P/MV output for pump start relay and master valve activation
- Wi-Fi enabled for quick connection to Hydrawise software
- 3¼" full-color touchscreen display for simple programming at the control panel
- Built-in milliamp sensor for wire fault detection and alerts

## OPERATING SPECIFICATIONS

- Transformer input: 120/230 VAC
- Transformer output (24 VAC): 1.4 A
- Station output (24 VAC): 0.56 A
- P/MV output (24 VAC): 0.56 A
- Approvals: Plastic Wall Mount IP44, NEMA 3R, Plastic Pedestal IP34, UL, cUL, FCC, CE, RCM
- Warranty period: 5 years

## USER-INSTALLED OPTIONS

- Rain-Clik for rain sensor shutdown see **page 134**


**Plastic**
Height: 12"
Width: 13¾"
Depth: 5"

**Metal**
(gray or stainless)
Height: 16"
Width: 13"
Depth: 5"

**Metal Pedestal**
(metal/stainless)
Height: 36"
Width: 11½"
Depth: 5"

**Plastic Pedestal**
Height: 39"
Width: 24"
Depth: 17"

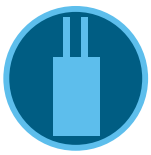
| HCC | |
|---|---|
| **Model** | **Description** |
| HCC-800-PL | 8-station base model, plastic outdoor, wall mount |
| HCC-800-M | 8-station base model, gray metal outdoor, wall mount |
| HCC-800-SS | 8-station base model, stainless steel, wall mount |
| HCC-800-PP | 8-station base model, plastic pedestal |
| HCC-FPUP | Retrofit upgrade kit for ICC and ICC2 |
| ICC-PED | Gray pedestal for metal wall mount cabinet |
| ICC-PED-SS | Stainless steel pedestal for stainless wall mount |
| ICC-PWB | Optional pedestal wiring board for metal pedestals |
| WIFI-EXT-KIT | Wi-Fi antenna extension kit |

| HCC SERIES STATION EXPANSION | |
|---|---|
| **Model** | **Description** |
| ICM-400 | 4-station plug-in module with enhanced surge protection |
| ICM-800 | 8-station plug-in module with enhanced surge protection |
| ICM-2200 | 22-station expansion module (maximum one per controller) |
| EZ-DM | 54-station decoder output module (one per controller) |
| EZ-1 | Single-station EZ decoder |

*Compatible with:*

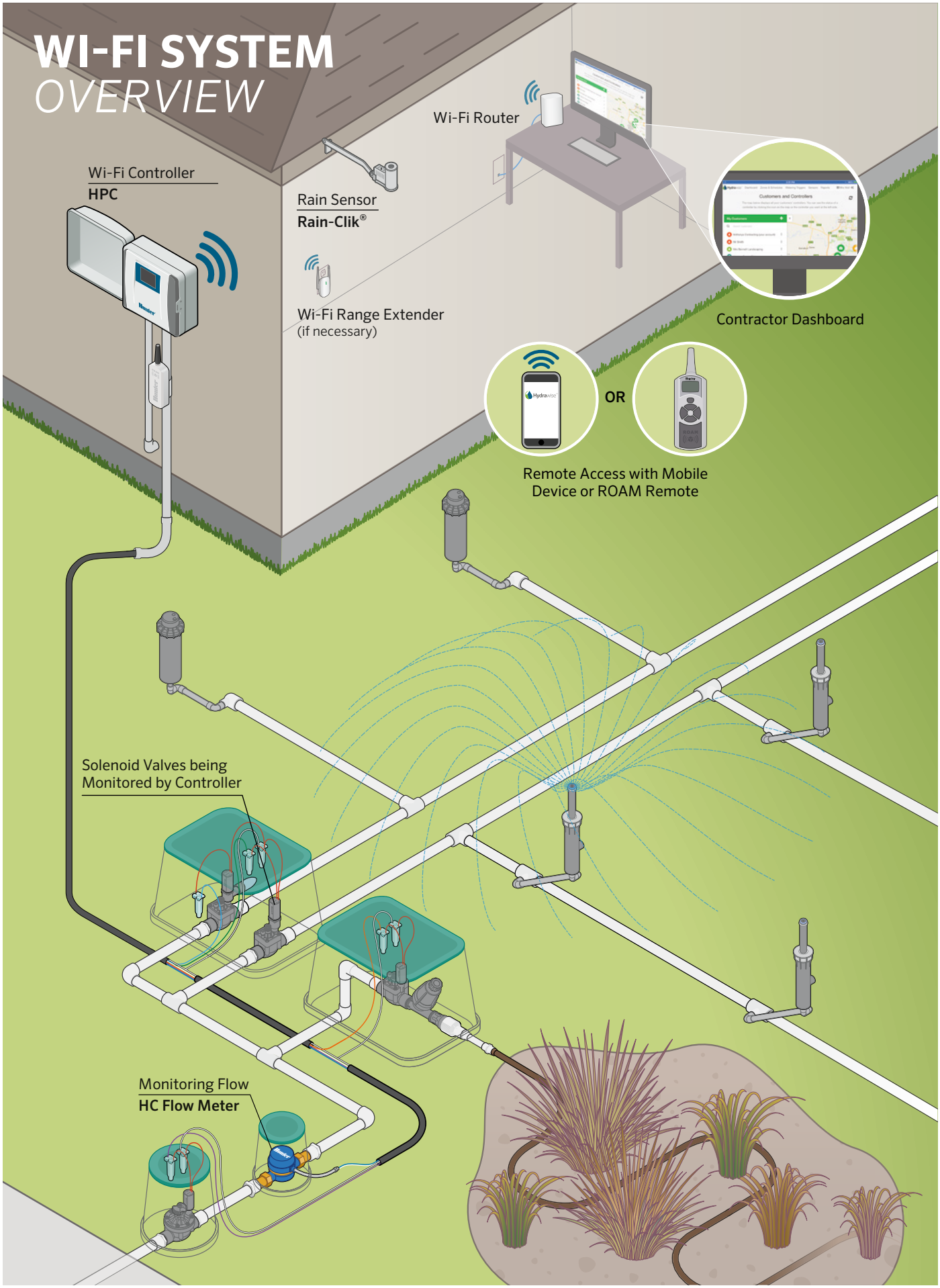
***HC Flow Meter***
*Page 137*

***ROAM Remote***
*Page 127*
***ROAM XL Remote***
*Page 128*

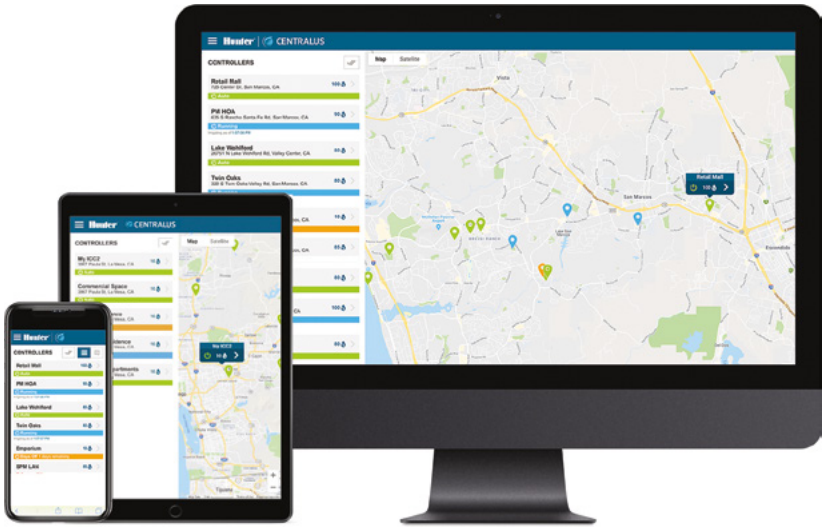


***EZ Decoder System***
*Page 124*


**EPA WaterSense Approved**
Recognized as a responsible water-saving tool by the U.S. Environmental Protection Agency


WI-FI SYSTEM
OVERVIEW
Wi-Fi Router
Wi-Fi Controller
HPC
Rain Sensor
Rain-Clik®
Wi-Fi Range Extender
(if necessary)
Contractor Dashboard
OR
Remote Access with Mobile
Device or ROAM Remote
Solenoid Valves being
Monitored by Controller
Monitoring Flow
HC Flow Meter


# CENTRALUS™ CONTROLLERS



**Centralus Software**
Enable ICC2 and ACC2 controllers with next-generation management technology.

### Mobile-Friendly

The mobile-friendly Centralus irrigation management platform provides highly secure, comprehensive cloud-based control and monitoring features. The connectivity allows you to view a controller's status, change settings, view forecasts, save water, and receive instant notification of important system alarms.

### User-Friendly

The addition of internet access brings dial-based ICC2 and ACC2 controllers seamlessly into the world of next-generation irrigation control. From the intuitive Centralus dashboard, it is now easier than ever before to add alarm monitoring, location information, remote operation, and scheduling to ICC2 and ACC2 controllers.

### Easy to Upgrade

To upgrade to Centralus control, add a simple Wi-Fi or LAN communication module to the controller:

- ICC2: Add WIFIKIT or LANKIT
- ACC2: Add A2C-WIFI or A2C-LAN

## CENTRALUS CONTROLLER COMPARISON CHART

| CONTROLLER MODELS | MAXIMUM STATIONS | SENSOR INPUTS | TWO-WIRE | REMOTE CONTROL | WEB ACCESS |
|---|---|---|---|---|---|
| ICC2 | 54 | 1 | EZDS, 54 stations | ROAM,<br>ROAM XL,<br>Smartphone with Wi-Fi | Centralus*:<br>Wi-Fi,<br>LAN |
| ACC2 | 54,<br>225 two-wire | 3 Clik,<br>6 Flow | ICD, 225 stations | ROAM,<br>ROAM XL,<br>Smartphone with Wi-Fi, | Centralus*:<br>Wi-Fi,<br>LAN |

**Cellular connections available in 2020.*

# CENTRALUS™ SOFTWARE

*Add cloud-based control and monitoring for ICC2 and ACC2 controllers with the mobile-friendly Centralus irrigation management platform.*

## KEY BENEFITS

- Browser-based programming and communication software
- Highly secure cloud access
- Map-based navigation and status
- Instant remote control from mobile device
- Flow monitoring and reporting
- Alarm reporting and detailed irrigation history reports
- Responsive web design configures for your device, allowing the same controls from your smartphone, tablet, or desktop
- Ethernet or Wi-Fi connectivity options
- Built-in Solar Sync® logic/Solar Sync Delay features for smart water savings
- Professional crewmember administration with multiple levels of access
- Organize maintenance teams and their controllers into management groups

## OPERATING SPECIFICATIONS

- Operates in most modern browsers (Internet Explorer® is no longer supported and may not display all screens correctly)
- Secure internet connection for web-hosted application

## USER-INSTALLED OPTIONS

- Solar Sync smart weather sensors, one per controller
- Flow sensors including Flow-Sync, WFS, and other approved equals
- Connected controllers are compatible with ROAM/ROAM XL license-free remote control (pre-wired controller connection)

## COMMUNICATION OPTIONS

- Ethernet with RJ-45 connection, low data requirements
- Wi-Fi 802.11 b/g/n, 2.4 GHz

**COMMUNICATIONS**

| Model | Description |
|---|---|
| WIFIKIT | ICC2 Wi-Fi connection |
| LANKIT | ICC2 LAN (Ethernet) connection |
| A2C-WIFI | ACC2 Wi-Fi connection |
| A2C-LAN | ACC2 LAN (Ethernet) connection |

**COMMUNICATIONS ACCESSORIES**

| Model | Description |
|---|---|
| WIFIEXTKIT | Antenna extension, conduit mount (up to 9' cable), use with A2C-WIFI only |

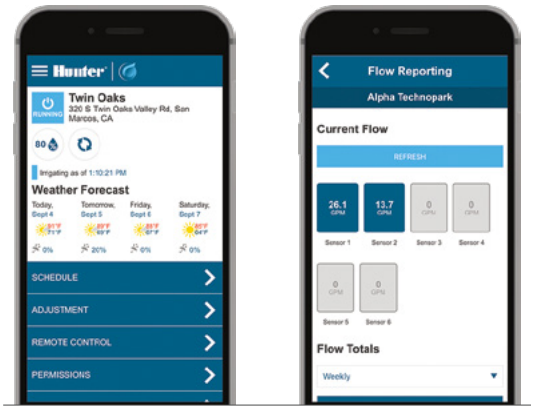
*Internet Explorer is a trademark of Microsoft Corporation.*

**WIFIKIT**
Height: 4¼"
Width: 2½" (installed)
Depth: 1⅜"

**LANKIT**
Height: 4¼"
Width: 2½" (installed)
Depth: 1⅜"

ACC2 COMMUNICATION MODULE INSTALLATION


**A2C-WIFI is installed behind the ACC2 facepack**




**Manage and monitor controllers from anywhere**

WIFIKIT INSTALLATION

# ICC2

*This reliable control system can run conventional, two-wire, or hybrid operations with the option to upgrade to Centralus™ cloud-based control.*

## KEY BENEFITS

- Number of stations:
  - Conventional: 8 to 38 (plastic), 8 to 54 (metal and pedestals)
  - With two-wire EZDS: up to 54 (all enclosure options)
- 4 independent irrigation programs (8 start times each) allow for customized scheduling
- 12-hour maximum station run time provides flexibility for low-flow zones
- Any 2 programs can operate simultaneously, providing more efficient watering
- 1 sensor input available for use with Solar Sync® or any Clik sensors
- 1 P/MV output for pump start relay and master valve activation
- Backward compatibility to original ICC controllers allows for quick updates to older systems
- Upgradeable to Centralus software for web-based central control options

## OPERATING SPECIFICATIONS

- Transformer input: 120/230 VAC
- Transformer output (24 VAC): 1.4 A
- Station output (24 VAC): 0.56 A
- P/MV output (24 VAC): 0.56 A
- Approvals: Wall Mounts IP44, Plastic Pedestal IP34, NEMA 3R, UL, cUL, FCC, CE, RCM
- Warranty period: 5 years

## USER-INSTALLED OPTIONS

- WIFIKIT or LANKIT communications for Centralus web-based control
- Compatible with Flow-Clik® sensor for catastrophic high-flow shutdown see **page 140**


**Plastic**
Height: 12"
Width: 13¾"
Depth: 5"

**Metal**
(gray or stainless steel)
Height: 16"
Width: 13"
Depth: 5"

**Metal Pedestal**
(gray or stainless steel)
Height: 36"
Width: 11½"
Depth: 5"


**Plastic Pedestal**
Height: 39"
Width: 24"
Depth: 17"

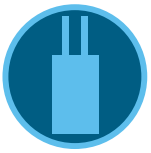
| ICC2 | |
|---|---|
| **Model** | **Description** |
| I2C-800-PL | 8-station base model, plastic outdoor wall mount |
| I2C-800-M | 8-station base model, gray metal outdoor, wall mount |
| I2C-800-SS | 8-station base model, stainless steel, wall mount |
| I2C-800-PP | 8-station base model, plastic pedestal |
| ICC-FPUP2 | ICC2 retrofit kit for original ICC controllers |
| ICC-PED | Gray pedestal for metal wall mount |
| ICC-PED-SS | Stainless steel pedestal for stainless wall mount |
| ICC-PWB | Optional pedestal wiring board for metal pedestals |

| ICC2 SERIES STATION EXPANSION | |
|---|---|
| **Model** | **Description** |
| ICM-400 | 4-station plug-in module with enhanced surge suppression |
| ICM-800 | 8-station plug-in module with enhanced surge suppression |
| ICM-2200 | 22-station expansion module (one per controller) |
| EZ-DM | 54-station decoder output module (one per controller) |
| EZ-1 | Single-station EZ decoder |

*Compatible with:*

***Solar Sync Sensor***
*Page 136*

***ROAM Remote***
*Page 127*
***ROAM XL Remote***
*Page 128*



***EZ Decoder System***
*Page 124*

look for WaterSense Meets EPA Criteria

**EPA WaterSense**
Add the WaterSense-labeled Solar Sync sensor to improve the water efficiency of this controller.

# ACC2

*The multi-flow monitoring and management capabilities of ACC2 make it the best choice for complex projects.*



## KEY BENEFITS

- Number of stations:
  - 12 to 225, for large projects
- Up to 6 flow sensor inputs and 6 P/MV outputs
- 32 automatic programs (10 start times each) for precise plant management
- Block function to group stations and consolidate large systems
- Built-in Solar Sync® logic for smart water savings
- Real-time flow monitoring detects and diagnoses leaks in up to 6 flow zones
- Flow management optimizes watering at safe velocities
- High-visibility, full-color display with reversible facepack
- Conditional Response "if/then" programming for active responses to sensor inputs
- User management password protection, with two levels of access
- Optional plug-in communications modules for cloud or network control
- Detailed alarm logs in plain language
- Extreme service lightning protection
- Easy Retrieve™ programming backup and restore
- Non-Water Windows to inhibit accidental irrigation

## OPERATING SPECIFICATIONS

- Transformer input: 120/230 VAC
- Maximum AC current draw: 120 VAC, 2 A/230 VAC, 1 A
- Transformer output: 24 VAC, ~3 A
- P/MV outputs (24 VAC): Up to 6; 3 included, 0.8 A each
- Sensor inputs: 3 Clik, 1 Solar Sync, and up to 6 Flow sensors (3 included)
- Approvals: Wall Mounts IP44, Plastic Pedestal IP34, NEMA 3R, UL, cUL, FCC, CE, RCM
- Warranty period: 5 years

## USER-INSTALLED OPTIONS

- ROAM/ROAM XL remote controls
- WSS-SEN or SOLAR-SYNC-SEN for automatic water savings
- Flow sensors (up to 6) including Flow-Sync, WFS, and other approved equals

**Metal Wall Mount**
(gray or stainless steel)
Height: 15⅞"
Width: 15"
Depth: 6⅘"

**Plastic Wall Mount**
Height: 16⅜"
Width: 16½"
Depth: 6⅝"

**Metal Pedestal**
(gray or stainless steel)
Height: 37"
Width: 15½"
Depth: 5"

**Plastic Pedestal**
Height: 39½"
Width: 23½"
Depth: 17"

*Compatible with:*

***Solar Sync Sensor***
*Page 136*

***Flow-Sync Sensor***
*Page 138*
***WFS Sensor***
*Page 139*

***ROAM Remote***
*Page 127*
***ROAM XL Remote***
*Page 128*


**EPA WaterSense Approved**
Add the WaterSense-labeled Solar Sync sensor to improve the water efficiency of this controller.

## ADDITIONAL SPECIFICATIONS BY MODEL

### ACC2 CONVENTIONAL

- Number of stations:
  - 12 to 54, for large projects
- Simultaneous station operation: Up to 14 solenoids
- Expands in 6-station increments
- Extreme service lightning protection, standard on all A2M-600 output modules
- Station outputs: 0.8 A each

### ACC2 DECODER

- Number of stations:
  - 75, 150, or 225, for large projects
- Simultaneous station operation: Up to 30 solenoids
- Operates Hunter's premium ICD decoders over ID wire:
  - Up to 10,000' (14 AWG wire)
  - Up to 15,000' (12 AWG wire)
- See complete ICD decoder key benefits and specifications on **page 123**
- Up to 3 two-wire paths per output module
- Diagnostics including decoder inventory, wire tracker, solenoid finder, and more

**ACC2 CONVENTIONAL MODELS**

| Model | Description |
|---|---|
| A2C-1200-M | 12-station base unit controller, expands to 54 stations, gray steel wall mount, outdoor |
| A2C-1200-P | 12-station base unit controller, expands to 54 stations, plastic outdoor wall mount |
| A2C-1200-SS | 12-station base unit controller, expands to 54 stations, stainless steel wall mount, outdoor |
| A2C-1200-PP | 12-station base unit controller, expands to 54 stations, plastic pedestal |
| A2M-600 | 6-station plug-in module for use with the A2C-1200 series controllers |

**ACC2 DECODER MODELS**

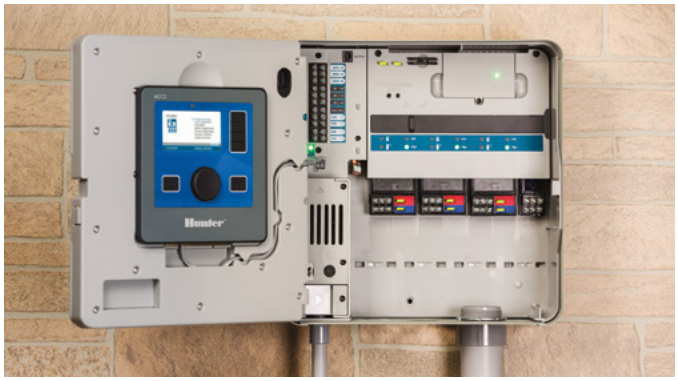
| Model | Description |
|---|---|
| A2C-75D-M | 75-station base model, gray metal outdoor, wall mount |
| A2C-75D-P | 75-station base model, plastic outdoor, wall mount |
| A2C-75D-SS | 75-station base model, stainless steel, wall mount |
| A2C-75D-PP | 75-station base model, plastic pedestal |
| A2C-D75 | 75-station decoder expansion module |

## ACC2 ACCESSORIES FOR ALL MODELS

**ACC2 ACCESSORIES**

| Model | Description |
|---|---|
| A2C-F3 | Optional flow meter expansion module (adds 3 inputs) |
| A2C-LEDKT | External status light shows controller status with door closed |
| A2C-WIFI | ACC2 Wi-Fi connection |
| A2C-LAN | ACC2 LAN (Ethernet) connection |
| ACC-PED | Gray pedestal for wall mount |
| PED-SS | Stainless steel pedestal for wall mount |

ACC2 – REVERSIBLE FACEPACK



# IMMS™ ONLINE

*Simplify central control of legacy Hunter ACC controllers and accessories with the web- or server-based IMMS software package.*

## KEY BENEFITS

- Browser-based programming and communication software
- Cloud access or user-hosted enterprise versions available
- Graphical user interface with customizable, map-based navigation
- Flow monitoring and reporting with Hunter ACC controllers
- Alarm reporting and detailed irrigation history reports
- Automatic SMS text notification of alarms to your mobile device
- Unique mobile view allows instant status updates and fast command functions
- Cell, Ethernet, UHF radio, and hardwire cable connectivity options
- APIs available for custom integration into management systems
- Built-in Solar Sync® logic/Solar Sync Delay features for smart water savings
- User administration with multiple levels of access

## OPERATING SPECIFICATIONS

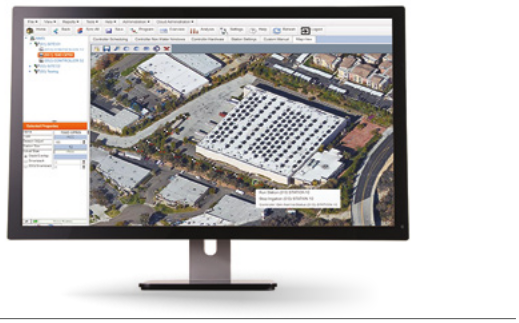
- Operates in most modern browsers (Internet Explorer® is no longer supported and may not display all screens correctly)
- Secure internet connection for web-hosted application

## USER-INSTALLED OPTIONS

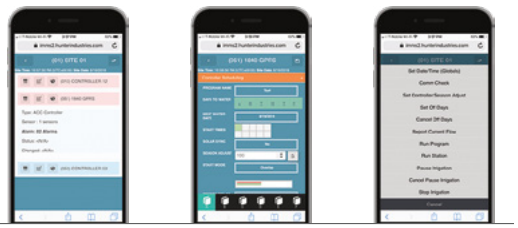
- Solar Sync Sensor smart weather sensors, one per controller
- Flow sensors including Flow-Sync, WFS, and other approved equals, one per controller
- ROAM/ROAM XL license-free remote control (pre-wired controller connection)

## COMMUNICATION OPTIONS

- Cellular (LTE or 3G, where applicable)
- Ethernet with RJ-45 connection, low data requirements
- Shared connections via UHF radio or hardwire cable
  - Radio, 450–470 MHz narrow band
  - Hardwire, 4–20 mA via 4-conductor, shielded GCBL cable



**Add a visual dimension to central control with background map graphics**



**Monitor and command IMMS-equipped controllers from your smartphone**

*Compatible with:*

*ACC Controller*
*Page 114*

*ROAM Remote*
*Page 127*
*ROAM XL Remote*
*Page 128*

*Solar Sync Sensor*
*Page 136*

*Internet Explorer is a trademark of Microsoft Corporation.*

**COMMUNICATION MODEL CHART**

| Model | | Description |
|---|---|---|
| ACC-P2P-LTE* | | Single-controller cell connection |
| ACC-COM-LTE* | | Multi-controller cell connection |
| ACC-COM-LAN | | Ethernet connection |
| ACC-COM-HWR | | Radio & hardwire connection, use with: |
| | RAD3 | UHF radio |
| | ACC-HWIM | Hardwire cable terminal & driver |

**Note:**
*Requires monthly cell service plan

**COMMUNICATION ACCESSORIES MODEL CHART**

| Model | Description |
|---|---|
| GCBL-XXX HARDWIRE CABLE | Add -100, -300, -500 for length in feet (30, 90, 150 m) |
| IMMS-ANT2 | Antenna for plastic pedestal lid |
| IMMS-ANT3 | Antenna for wall or pole mount |
| IMMS-ANTYAGI3 | High-efficiency directional antenna (pole mount) |
| RA-5M | High-gain omnidirectional base antenna (roof or pole mount) |
| APPBRKT2 | Comm module bracket for plastic pedestals |

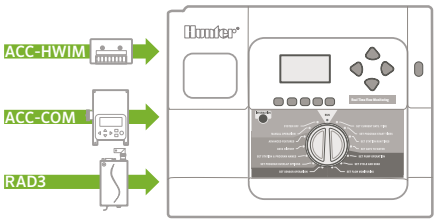
## IMMS SOFTWARE

| Model | Description |
|---|---|
| IMMS4CD | IMMS graphics central control software |

## COMMUNICATION OPTIONS FOR ACC INTERFACE

| Model | Purpose |
|---|---|
| **ACC-COM-HWR** = Hardwire/radio module* | Supports hardwire and radio communication options |
| **ACC-COM-LAN** = Ethernet module* | Supports TCP/IP in Ethernet networks in addition to hardwire and radio sharing with local controllers |
| **ACC-P2P-LTE** = Single controller cellular data module | Supports LTE data communications for a single controller |
| **ACC-COM-LTE** = LTE cellular data module* | Supports mobile data connection via GPRS phone in addition to hardwire and radio sharing with local controllers |

**Note:** * Also supports radio and hardwire




**ACC wall-mount communication components**

## USER-INSTALLED OPTIONS (SPECIFY SEPARATELY)

| Model | Description | Purpose |
|---|---|---|
| ACC-HWIM | Hardwire interface module required for hardwire connections | Provides surge-protected terminals for hardwired cable connections |
| RAD3 | UHF radio module (North America), 450–470 MHz | UHF radio module for wireless connections (license and antenna required and not included) |
| APPBRKT | Communication bracket for plastic pedestals | Holds comm modules and accessories in plastic pedestal (not required in wall mounts) |
| APPBRKT2 | Communication bracket for newer plastic pedestals (April 2017) | Holds comm modules and accessories in new-style plastic pedestal |

| Model | Description | Options | Purpose |
|---|---|---|---|
| IMMS-CCC | Hardwire central interface | None = 120 VAC (North America)<br>E = 230 VAC (Europe/ international power)<br>A = 230 VAC (Australia) | Hardwired central interface for connection to site via direct wire (GCBL cable), supplied with USB cable for connection to central computer, and plug-in transformer |
| GCBL* | 100 = 100'<br>300 = 300'<br>500 = 500' | | Cable for all IMMS hardwired communications |

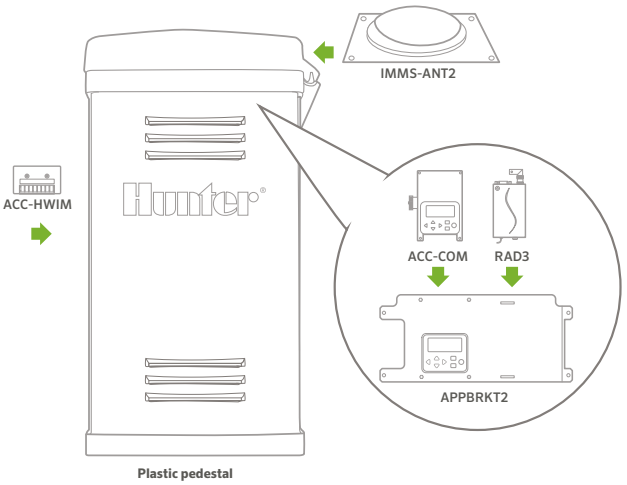
**Note:** * GCBL also available in 1,000' increments (up to 4,000')

## RADIO ANTENNA OPTIONS (SPECIFY SEPARATELY)

| Model | Description |
|---|---|
| IMMS-ANT2 | Omnidirectional antenna fits ACC plastic pedestal lid |
| IMMS-ANT3 | Omnidirectional antenna for wall or pole mount |
| IMMS-ANTYAGI3 | High-efficiency directional antenna for pole mount |
| RA5M | High-gain omnidirectional mast antenna for roof or pole mount |

look for WaterSense Meets EPA Criteria

**EPA WaterSense**
Add the WaterSense-labeled Solar Sync sensor to improve the water efficiency of this controller.




**ACC plastic pedestal communication components**

# ACC

*Powerful features and simple programming are hallmarks of this proven, flow-monitoring commercial controller.*

## KEY BENEFITS

- Number of stations:
  - 12 to 99, for large projects
- 6 automatic programs (10 start times each)
- SSGs (Simultaneous Station Groups) to consolidate large systems
- Built-in Solar Sync® logic for smart water savings
- Real-time flow monitoring detects and diagnoses leaks with optional flow sensor
- Detailed alarm logs in plain language
- Programmable Rain Delay after sensor shutdown
- Easy Retrieve™ programming backup and restore
- Non-Water Windows to inhibit accidental irrigation
- Cycle and Soak, Delay Between Stations

## OPERATING SPECIFICATIONS

- Transformer input: 120/230 VAC
- Maximum AC current draw: 120 VAC, 2A/230 VAC, 1 A
- Transformer output: 24 VAC, 4 A
- Station outputs: 0.56 A
- 2 P/MV outputs (24 VAC): 0.325 A each
- Simultaneous program operation: Up to 6 automatic programs
- Sensor inputs: 4 Clik, 1 Solar Sync, and 1 Flow sensor
- Approvals: Wall Mounts IP44, Plastic Pedestal IP34, NEMA 3R, UL, cUL, FCC, CE, RCM
- Warranty period: 5 years

## USER-INSTALLED OPTIONS

- Solar Sync smart weather sensor
- Flow sensor including Flow-Sync, WFS, and other approved equals
- ROAM/ROAM XL license-free remote control (pre-wired controller connection)
- Communication modules for IMMS™ central software on **page 112**

**Metal Enclosures**
(gray or stainless steel)
Height: 12½"
Width: 15½"
Depth: 6¼"

**Metal Pedestals**
(gray or stainless steel)
Height: 37"
Width: 15½"
Depth: 5"

**Plastic Pedestal**
Height: 39"
Width: 24"
Depth: 17"

*Compatible with:*

***Solar Sync Sensor***
*Page 136*

***ROAM Remote***
*Page 127*
***ROAM XL Remote***
*Page 128*

***Flow-Sync Sensor***
*Page 138*
***WFS Sensor***
*Page 139*

look for WaterSense Meets EPA Criteria

**EPA WaterSense**
Add the WaterSense-labeled Solar Sync sensor to improve the water efficiency of this controller.

## ADDITIONAL SPECIFICATIONS BY MODEL

**ACC-1200 CONVENTIONAL**

- Number of stations:
  - 12 to 42
- Modular expansion in 6-station increments
- Extreme service lightning protection, standard on all output modules

**ACC-99D DECODER**

- Number of stations:
  - 99 decoder stations
- Operates Hunter's premium ICD decoders over ID wire:
  - Up to 15,000' (12 AWG wire)
  - Up to 10,000' (14 AWG wire)
- Up to 6 two-wire paths for maximum flexibility
- 1-, 2-, 4-, and 6-station decoders plus ICD-SEN sensor input decoders
- See complete ICD decoder key benefits and specifications on **page 123**

**ACC-1200 CONVENTIONAL MODELS**

| Model | Description |
|---|---|
| A2C-1200-M | 12-station base unit controller, expands to 54 stations, gray steel wall mount, outdoor |
| A2C-1200-SS | 12-station base unit controller, expands to 54 stations, stainless steel wall mount, outdoor |
| A2C-1200-PP | 12-station base unit controller, expands to 54 stations, plastic pedestal |
| A2M-600 | 6-station plug-in module for use with the A2C-1200 series controllers |

**ACC-99D DECODER**

| Model | Description |
|---|---|
| ACC-99D | 2-wire decoder controller with 99-station capacity, metal cabinet |
| ACC-99D-SS | 2-wire decoder controller with 99-station capacity, stainless steel wall mount |
| ACC-99D-PP | 2-wire decoder controller with 99-station capacity, plastic pedestal |
| ADM-99 | Decoder output module |

## ACC ACCESSORIES FOR ALL MODELS

**ACC ACCESSORIES**

| Model | Description |
|---|---|
| ACC-PED | Gray pedestal for wall mount |
| PED-SS | Stainless steel pedestal for wall mount |

**ACC – CONTROL FOR COMMERCIAL PROJECTS**


# BATTERY-POWERED CONTROLLERS

## BATTERY-OPERATED CONTROLLER COMPARISON CHART

| CONTROLLER MODELS | MAXIMUM STATIONS | SENSOR INPUTS | REMOTE CONTROL | SOLAR |
|---|---|---|---|---|
| BTT | 2 | None | BTT Bluetooth App | None |
| NODE | 6 | 1 | None | SPNODE |
| NODE-BT | 4 | 2 | NODE-BT Bluetooth App | None |
| XC HYBRID | 12 | 1 | None | SPXCH, XCH-600-SSP, XCH-1200-SSP |

# BTT

*Take advantage of smartphone-controlled, above-ground irrigation for easier access to the hose tap.*

## KEY BENEFITS

- Number of zones:
  - 1 or 2
- Battery-operated tap timer with Bluetooth® control
- 1 smartphone manages an unlimited number of controllers
- 1-second to 24-hour run time with 4 start times for maximum programming flexibility
- Cycling mode repeats continuously within user-defined water windows, perfect for drip systems or germinating seeds
- Suspend irrigation up to 99 days during the off-season, perfect for seasonal markets
- Manual push-button operation for quick operation without a smartphone
- Automatic water shutoff after 1 hour prevents water waste
- Blinking LED low-battery alert indicates battery replacement
- Secure passcode protection prevents unauthorized schedule changes
- Alkaline batteries included for quicker installation

## OPERATING SPECIFICATIONS

- Two 1.5V AA alkaline batteries (included)
- BTT-100 flow rate: 5 to 17 GPM (60 to 1,000 GPH)
- BTT-200 flow rate: 4 to 15 GPM (48 to 900 GPH)
- Recommended pressure: 7 to 116 PSI
- Approvals: Plastic IPX6, Bluetooth 4.2 BLE, UL, cUL, FCC, CE, RCM
- Warranty period: 2 years

## APP SPECIFICATIONS

- iOS® 9.0 or above
- Android™ 4.4 or above
- Maximum communication distance: 32'

**BTT-100**
Inlet diameter: ¾"
Outlet diameter: ¾"
Height: 5"
Width: 4⁹⁄₁₀"
Depth: 2⅖"

**BTT-200**
Inlet diameter: ¾"
Outlet diameter: ¾"
Height: 6⅕"
Width: 5³⁄₁₀"
Depth: 3"

**BTT-LOC**
(optional)
Inlet diameter: ¾"
Outlet diameter:
16-18 mm dripline
Height: 2¾"
Width: 1¼"


**Pressure Regulator**
(optional)
Inlet diameter: ¾"
Outlet diameter: ¾"
Height: 3"
Width: 1½"

| BTT | |
|---|---|
| **Model** | **Description** |
| **BTT-100** | 1-zone Bluetooth Tap Timer, ¾" hose thread |
| **BTT-200** | 2-zone Bluetooth Tap Timer, ¾" hose thread |
| **BTT-LOC** | BTT adapter for 16-18 mm dripline |

| PRESSURE REGULATOR | |
|---|---|
| **Model** | **Description** |
| **PRLG203FH3MH** | 20 PSI pressure regulator, ¾" hose thread |
| **PRLG253FH3MH** | 25 PSI pressure regulator, ¾" hose thread |
| **PRLG303FH3MH** | 30 PSI pressure regulator, ¾" hose thread |
| **PRLG403FH3MH** | 40 PSI pressure regulator, ¾" hose thread |

BTT

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# NODE

*This battery-powered, waterproof controller offers automatic irrigation control for temporary irrigation and sites without electricity.*

## KEY BENEFITS

- Number of stations:
  - 1, 2, 4, or 6
- Battery-operated controller for automatic irrigation without AC power
- Battery-life indicator for battery replacement
- Waterproof enclosure seal protects against water ingress
- 3 flexible programs with 4 start times each and up to 6-hour run times
- Suspend irrigation up to 99 days during the off-season
- Easy Retrieve™ memory backs up the full irrigation schedule if ever changed
- Delay Between Stations for slow-closing valves or pump recharge
- Seasonal adjustment for quicker schedule adjustments without changing run times
- Solar panel provides maintenance-free operation
- Mounts to Hunter solenoids, pipes, flat surfaces, or inside the valve box

## OPERATING SPECIFICATIONS

- One or two 9V alkaline batteries or 1800 mAh solar panel with charging cell
- Operates DC-latching solenoids (P/N 458200)
- 100' maximum wire runs, 18 AWG wire only
- Station output: 9–11 VDC
- P/MV output: 9–11 VDC
- Sensor inputs: 1
- Approvals: IP68 , UL, cUL, FCC, CE, RCM
- Warranty period: 2 years

| NODE | |
|---|---|
| **Model** | **Description** |
| NODE-100 | Single-station battery controller and DC-latching solenoid |
| NODE-100-LS | Single-station battery controller |
| NODE-200 | 2-station battery controller |
| NODE-400 | 4-station battery controller |
| NODE-600 | 6-station battery controller |
| NODE-100-VALVE | Single-station battery controller with PGV-101G valve and DC-latching solenoid (NPT threads) |
| 458200 | DC-latching solenoid |


**NODE**
Diameter: 3½"
Height: 2½"


**SPXCH**
Solar panel kit (optional)
Height: 3¼"
Width: 3"
Depth: ⅝"

NODE


*Compatible with:*

***Mini-Clik Sensor***
*Page 135*

***Freeze-Clik Sensor***
*Page 142*

# NODE-BT

*Manage gardens, greenhouses, traffic medians, and temporary irrigation sites from a smartphone without opening the valve box.*

## KEY BENEFITS

- Number of stations:
  - 1, 2, or 4
- Bluetooth® battery-operated controller for automatic irrigation without AC power
- 1 smartphone manages an unlimited number of controllers
- Waterproof enclosure seal protects against water ingress
- Active station LEDs and battery-life LED indicator for battery replacement
- 3 programs with 8 start times each and 1 second to 12-hour run times
- Suspend irrigation up to 99 days during the off-season
- Manual push-button operation for quick operation without a smartphone
- Delay Between Stations for slow-closing valves or pump recharge
- Add soil moisture sensor for compliance with LEED projects and agricultural applications
- Cycle and Soak prevents water waste and runoff in areas with elevation changes or tight soils
- Monthly and global seasonal adjustment for quicker schedule adjustments without changing run times
- Secure passcode protection prevents unauthorized schedule changes
- Mounts to Hunter solenoids, pipes, flat surfaces, or inside the valve box

## OPERATING SPECIFICATIONS

- One or two 9V alkaline batteries
- Operates DC-latching solenoids (P/N 458200)
- 100' maximum wire runs, 18 AWG wire only
- Station output: 9–11 VDC
- P/MV output: 9–11 VDC
- Sensor inputs: 2
- Approvals: IP68, Bluetooth 5.0 BLE, UL, cUL, FCC, CE, RCM
- Warranty period: 2 years

## APP SPECIFICATIONS

- iOS® 9.0 or above
- Android™ 5.0 or above
- Maximum communication distance: 50'

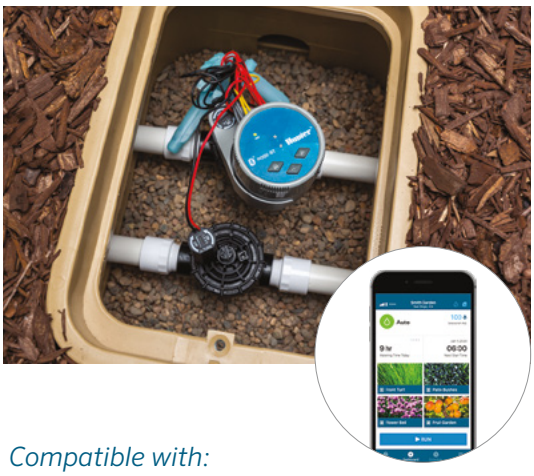
| NODE-BT | |
|---|---|
| **Model** | **Description** |
| NODE-BT-100 | Single-station Bluetooth battery controller and DC-latching solenoid |
| NODE-BT-100-LS | Single-station Bluetooth battery controller |
| NODE-BT-200 | 2-station Bluetooth battery controller |
| NODE-BT-400 | 4-station Bluetooth battery controller |
| NODE-BT-100-VALVE | Single-station Bluetooth battery controller with PGV-101G valve and DC-latching solenoid (NPT threads) |
| 458200 | DC-latching solenoid |
| SC-PROBE | Soil probe for moisture sensing |




**NODE-BT**
Diameter: 3½"
Height: 3"

**SC-PROBE** Soil Moisture Sensor Probe
Diameter: 1"
Height: 3¼"
Controller to probe: 100' maximum
18 AWG direct-burial wire

NODE-BT



*Compatible with:*

***Mini-Clik Sensor***
*Page 135*

***Freeze-Clik Sensor***
*Page 142*

# XC HYBRID

*Effectively manage landscapes where electricity is unavailable with this economical battery- or solar-powered controller.*

## KEY BENEFITS

- Number of stations:
  - 6 or 12
- 3 power options: ambient-light-compatible solar panel, battery, or AC power
- Battery-life indicator for battery replacement
- Stainless steel enclosure protects against vandalism
- 3 programs with 4 start times each and up to 4-hour run times
- Suspend irrigation up to 99 days during the off-season
- Easy Retrieve™ memory backs up the full irrigation schedule
- Delay Between Stations for slow-closing valves or pump recharge
- Seasonal adjustment for quicker schedule adjustments without changing run times
- Solar Panel provides maintenance-free operation
- Mounts to flat surfaces or steel posts

**Plastic**
Height: 8⅝"
Width: 7"
Depth: 3¾"

**Stainless Steel**
Height: 9¾"
Width: 7⅜"
Depth: 4¼"

**Stainless Steel Solar**
Height: 10¾"
Width: 7⅜"
Depth: 4¼"

**SPXCH**
Solar panel kit (optional)
Height: 3¼"
Width: 3"
Depth: ⅝"

**XCHSPOLE**
Pole-mounting kit (optional)
Height: 4'

**XCHSPB**
Mounting bracket and hardware only (optional)

## OPERATING SPECIFICATIONS

- Plastic model operates six 1.5V AA alkaline batteries
- Stainless steel model operated by six 1.5V C alkaline batteries
- Stainless steel solar model operates 1800 mAh solar panel with charging cell
- All models operate optional 24 VAC plug-in wall adapter (P/N 526500)
- Operates DC-latching solenoids (P/N 458200)
- Station output: 9-11 VDC
- P/MV output: 9-11 VDC
- Sensor inputs: 1
- Approvals: Plastic IP54, Stainless Steel IP24, UL, cUL, FCC, CE, RCM
- Warranty period: 2 years

| XC HYBRID | |
|---|---|
| **Model** | **Description** |
| **XCH-600** | 6-station battery controller |
| **XCH-600-SS** | 6-station battery controller, stainless steel |
| **XCH-600-SSP** | 6-station controller, stainless steel, with mounted solar panel |
| **XCH-1200** | 12-station battery controller |
| **XCH-1200-SS** | 12-station battery controller, stainless steel |
| **XCH-1200-SSP** | 12-station controller, stainless steel, with mounted solar panel |
| **458200** | DC-latching solenoid |
| **526500** | 120VAC/24V plug-in wall adapter |

| MAXIMUM WIRE RUNS | |
|---|---|
| **Wire Size** | **Max. Distance (ft.)** |
| 18 AWG | 550 |
| 16 AWG | 870 |
| 14 AWG | 1,380 |
| 12 AWG | 2,200 |

*Compatible with:*

***Mini-Clik Sensor***
*Page 135*

***Freeze-Clik Sensor***
*Page 142*

# SUSTAINABLE SOLAR AND BATTERY-OPERATED CONTROLLERS PROVIDE EFFICIENT AUTOMATIC IRRIGATION SOLUTIONS FOR TRAFFIC MEDIANS, GREEN ROOFS, AND SITES WITHOUT POWER.



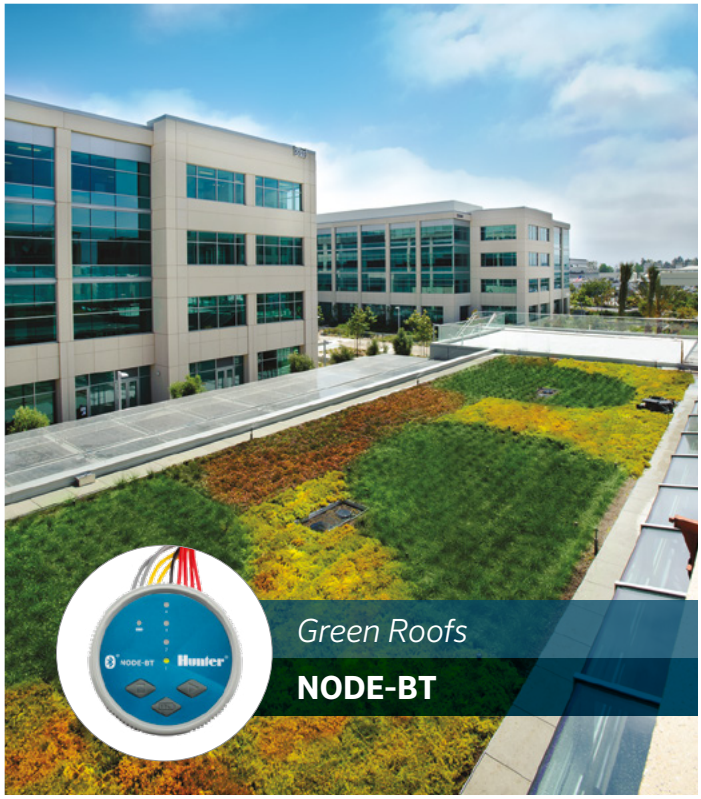

*Traffic Medians*

**XC HYBRID**



*Nurseries*

**BTT**





*Green Roofs*

**NODE-BT**


# CONTROLLER DECODERS & ACCESSORIES

## DBRY-6

*Use this approved waterproof connector for all ICD, DUAL®, and Pilot® wiring connections.*

### KEY BENEFITS

- Compatible with EZ decoder connections, but not required
- UL Listed for 600V direct burial
- Improved red-and-yellow wire nut, eliminating the need for two different sizes
- A snap-lock feature that secures the wire nut in the bottom of the light blue waterproof tube
- 3 wire exit cutouts in the strain relief cap, to ease wire routing
- Meets Directive 2006/95/EC and IEC standards EN61984:2009, EN60998-1:2004, and EN60998-2-4:2005

**Waterproof Wire Connectors**

| DBRY-6 MODULES | |
|---|---|
| **Model** | **Description** |
| DBRY100 | Bulk 100 connectors (100 tubes loose in box, plus inner box with 100 wire nuts) |
| DBRY2X25 | 25 x 2-packs (2 tubes and 2 wire nuts in a plastic bag, x 25 units) |

# ICD

*Hunter's premium two-wire decoders for long-distance, high-station-count ACC and ACC2 applications include two-way communications and integrated surge protection.*

## KEY BENEFITS

- ICD decoders are compatible with Hunter ACC-99D and ACC2 Decoder controllers
- 1-, 2-, 4-, and 6-station versions provide maximum flexibility
- Sensor decoders allow flow and Clik sensor monitoring via the two-wire paths
- Field-programmable decoders accept station numbers directly, and do not require entering serial numbers into the control panel
  - Decoders can be programmed before installation at the controller interface
  - Wireless programming with ICD-HP allows for decoder programming or re-programming after installation to the two-wire path
- Integrated surge protection eliminates the need for extra surge protection devices
- Color-coded wiring connections simplify installation
- Industrial-grade DBRY-6 waterproof connectors included for two-wire path splices

## OPERATING SPECIFICATIONS

- Maximum recommended distance, decoder to solenoid: 150'
- Maximum distance to decoder via two-wire path:
  - 14 AWG wire path: 10,000'
  - 12 AWG wire path: 15,000'
- Approvals: UL, cUL, FCC, CE, RCM
- Decoder rating: IP68 submersible
- Warranty period: 5 years

## USER-INSTALLED OPTIONS

- ICD-HP wireless handheld programmer, see **page 126**

**ICD-100, 200, ICD-SEN**
Height: 3½"
Width: 1½"
Depth: ¾"

**ICD-400, 600**
Height: 3½"
Width: 1¾"
Depth: 1½"

### DECODER MODULES

| Model | Description |
|---|---|
| ICD-100 | Single-station decoder with surge suppression and ground wire |
| ICD-200 | 2-station decoder with surge suppression and ground wire |
| ICD-400 | 4-station decoder with surge suppression and ground wire |
| ICD-600 | 6-station decoder with surge suppression and ground wire |
| ICD-SEN | 2-input sensor decoder with surge suppression and ground wire |

### ID WIRE MODEL GUIDE

| 14 AWG Decoder Cable | | 12 AWG Long-Range, Heavy-Duty Decoder Cable | |
|---|---|---|---|
| ID1GRY | Gray jacket | ID2GRY | Gray jacket |
| ID1PUR | Purple jacket | ID2PUR | Purple jacket |
| ID1YLW | Yellow jacket | ID2YLW | Yellow jacket |
| ID1ORG | Orange jacket | ID2ORG | Orange jacket |
| ID1BLU | Blue jacket | ID2BLU | Blue jacket |
| ID1TAN | Tan jacket | ID2TAN | Tan jacket |

### ID WIRE MAXIMUM WIRE RUNS

| ID 1 Wire | ID 2 Wire |
|---|---|
| 5,000' with I-Core®/DUAL® systems | 7,500' with I-Core/DUAL systems |
| 10,000' with ACC/ICD systems | 15,000' with ACC/ICD systems |

# EZ DECODER SYSTEM

*Bring two-wire technology to more projects than ever before with the revolutionary, low-cost, hassle-free EZ Decoder System for HCC and ICC2 controllers.*

## KEY BENEFITS

- Number of stations:
  - Up to 54, plus a master valve
- 2 two-wire paths to the field for flexible system design and installation
- No special wire or connectors required
- No special grounding or surge arrestors required in-line, saves time and money during installation
- Programmable decoders with no need to input individual serial numbers
- P/MV can activate via the two-wire path for distant master valves
- Permits hybrid operations of side-by-side conventional and decoder stations (maximum 54 stations) for added flexibility
- EZ-1 decoders have built-in status LED for positive diagnostics

## OPERATING SPECIFICATIONS

- Electrical output on two-wire path: 24 VAC, 50/60 Hz
- Wire paths possible over 3,000' (see wiring chart below)
- Each EZ-1 decoder has the capability to activate two standard 24 VAC solenoids
- Can operate any two decoders simultaneously for more efficient watering
- Approvals: UL, cUL, FCC, CE, RCM, Industry Canada
- EZ-1 decoders are IP68 rated, submersible
- Warranty period: 3 years

## USER-INSTALLED OPTIONS

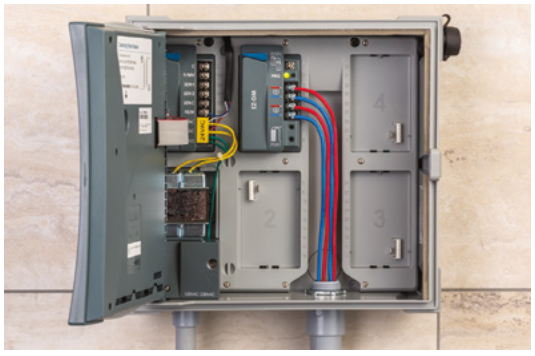
- Centralus™ with ICC2
- Hydrawise® with HCC
- ICV or PGV valves
- Pump start relays (PSR)


**Decoder Output Module**
Height: 4½"
Width: 2½"
Depth: 1⅝"


**Single-Station Decoder**
Height: 2⅞"
Width: 1⅝"
Depth: ⅝"

**EZ-1 single-station decoder with status LED**

**EZDM Installation**



| WIRING TABLE | | |
|---|---|---|
| American Wire Gauge | Distance, single solenoid (ft.) | Distance, 2 solenoids per output |
| 18 AWG | 908 | 454 |
| 16 AWG | 1,446 | 723 |
| 14 AWG | 2,292 | 1,146 |
| 12 AWG | 3,650 | 1,825 |

**Note**
Distances in the Wiring Table are calculated based on 60 Hz for American Wire Gauge, with a wire temperature of 120°F and a 10% safety factor.

| DECODER MODELS | |
|---|---|
| Model | Description |
| EZ-DM | Decoder output module for HCC and ICC2 controllers |
| EZ-1 | Single-station decoder with status LED |

*Compatible with:*

***HCC Controller***
*Page 104*

***ICC2 Controller***
*Page 109*

***ROAM Remote***
*Page 127*
***ROAM XL Remote***
*Page 128*

# DUAL®

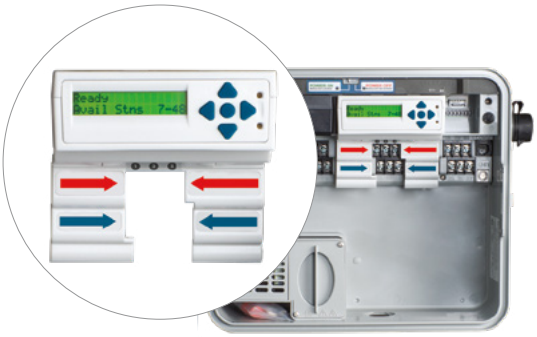
*Save materials and labor by adding this optional plug-in module to upgrade conventional I-Core® systems to two-wire control.*

## KEY BENEFITS

- DUAL48M output module enables up to 48 stations in any I-Core configuration
- 3 separate two-wire paths provide flexibility in system design and installation
- 1- and 2-station decoders for use with a variety of valve manifolds
- Field-programmable decoders do not require serial numbers
  - Decoders can be programmed before installation at the DUAL48M interface
  - Wireless programming with ICD-HP allows for decoder programming or re-programming after installation to the two-wire path
  - DUAL-S external surge protection module provides additional protection
- DUAL48M output module displays decoder programming, operation, and diagnostic information for assistance with maintenance and troubleshooting
- DUAL48M may be installed with conventional modules for hybrid operations
- Solenoid finder feature aids in locating decoders and valves in the field

## OPERATING SPECIFICATIONS

- Maximum recommended distance, decoder to solenoid: 100'
- Maximum distance to decoder via two-wire path:
  - 14 AWG wire path: 5,000'
  - 12 AWG wire path: 7,500'
- Approvals: UL, cUL, FCC, CE, RCM
- Decoder rating: IP68 submersible
- Warranty period: 5 years



**DUAL48M Decoder Output Module**
Height: 1⅜"
Width: 4⅜"
Depth: 4"

**DUAL Decoders**
Height: 3¾"
Width: 1⅝"
Depth: ⅞"

**Surge Arrestor**
Height: 2⅞"
Width: 1⅞"
Depth: 2"



**DUAL**

| Base Model | Plus | Description |
|---|---|---|
| IC-600-PL | DUAL48M | 48-station controller, indoor/outdoor, plastic cabinet |
| IC-600-M | DUAL48M | 48-station controller, indoor/outdoor, metal cabinet |
| IC-600-PP | DUAL48M | 48-station controller, indoor/outdoor, plastic pedestal |
| IC-600-SS | DUAL48M | 48-station controller, indoor/outdoor, stainless steel cabinet |

| DUAL Model | Description |
|---|---|
| DUAL48M | DUAL decoder output module, up to 48-station maximum |
| DUAL-1 | DUAL 1-station decoder (includes 2 DBRY-6 connectors) |
| DUAL-2 | DUAL 2-station decoder (includes 2 DBRY-6 connectors) |
| DUAL-S | DUAL surge arrestor (includes 4 DBRY-6 connectors) |

**ID WIRE MODEL GUIDE**

| 14 AWG Decoder Cable | | 12 AWG Long-Range, Heavy-Duty Decoder Cable | |
|---|---|---|---|
| ID1GRY | Gray jacket | ID2GRY | Gray jacket |
| ID1PUR | Purple jacket | ID2PUR | Purple jacket |
| ID1YLW | Yellow jacket | ID2YLW | Yellow jacket |
| ID1ORG | Orange jacket | ID2ORG | Orange jacket |
| ID1BLU | Blue jacket | ID2BLU | Blue jacket |
| ID1TAN | Tan jacket | ID2TAN | Tan jacket |

# ICD-HP

*Gain wireless, handheld programming and diagnostic capabilities for Hunter ICD and DUAL® decoders.*

## KEY BENEFITS

- Program or re-program decoder stations, whether new or installed*
- Program any station numbers in any order, or skip stations for future expansion
- Simplifies setup and diagnostics for sensor decoders
- Sensor test functions for Clik and Flow sensors, plus built-in multimeter
- Communicates with decoder through plastic case: wireless electromagnetic induction saves waterproof connectors
- Compatible with Hunter ICD, DUAL, and Pilot® series decoders
- USB powered for shop or office use; 4 AA batteries for field use
- All test leads and cables included in durable, foam-padded carrying case
- Turn decoder stations on and view solenoid status, current in milliamps, and more
- Waterproof programming cup
- Backlit adjustable display
- 6 operating languages

* **Note:** ICD-HP is not compatible with EZ-1 decoders

## ELECTRICAL SPECIFICATIONS

- Power input: 4 AA batteries, or standard USB connector (included)
- Communications: wireless induction, range 1"
- Fused test leads for unpowered decoder functions

## APPROVALS

- FCC, CE, C-tick

| ICD-HP | |
|---|---|
| **Model** | **Description** |
| ICD-HP | Wireless handheld decoder programmer, includes all test and power leads, programming cup, and rugged carrying case |


**ICD-HP**
Height: 8¼"
Width: 3⅞"
Depth: 2"

Packaged in an outdoor carrying case, this complete kit includes probes, induction cup, cable, USB power cable for bench use, and 4 AA batteries for fieldwork.

**ICD-HP**

# ROAM

*Enable convenient controller management from a distance with this handheld wireless remote.*

## KEY BENEFITS

- Compatibility with Hunter X-Core®, X2™, Pro-C®, HPC, ICC2, HCC, I-Core®, ACC, and ACC2 controllers provides remote operation for projects of any size
- Manually start individual stations or programs for quick maintenance checks and troubleshooting
- 128 programmable addresses available prevents cross-communication between multiple remotes within close proximity of each other
- Programmable run times from 1 to 90 minutes, which will not overwrite regular automatic programming
- Manual operation up to 240 stations provides flexibility for larger projects

## OPERATING SPECIFICATIONS

- Range: 1,000' from transmitter to receiver
- Transmitter power source: 4 x AAA batteries included
- Receiver power source: 24 VAC, 0.010 A
- System operating frequency: 433 MHz
- SmartPort® installation: maximum 50' from controller
- FCC and CE approved for use in the United States and internationally
- Warranty period: 2 years


**Transmitter and Receiver**
Height: 7"
Width: 2¼"
Depth: 1¼"

| ROAM | |
|---|---|
| **Model** | **Description** |
| ROAM-KIT | Transmitter, receiver, SmartPort wiring harness, and 4 AAA batteries |
| ROAM-TR | Transmitter unit and 4 AAA batteries included |
| ROAM-R | Receiver unit |

| OPTIONS (SPECIFY SEPARATELY) | |
|---|---|
| **Model** | **Description** |
| ROAM-WH | SmartPort wiring harness (length: 6') |
| ROAM-SCWH | Shielded SmartPort wiring harness (length: 25') |
| 258200 | Wall-mount bracket for SmartPort |

**SmartPort**
Hunter remotes require the installation of a SmartPort wiring harness. The SmartPort is a connector that is wired to the terminals on the controller, and allows quick connection to any Hunter receiver.

**Wall-Mount Bracket for SmartPort**
P/N 258200

# ROAM XL

*Add professional, license-free remote control to projects of any size with this long-range remote.*

## KEY BENEFITS

- Compatibility with Hunter X-Core®, X2™, Pro-C®, HPC, ICC2, HCC, I-Core®, ACC, and ACC2 controllers provides remote operation for a wide variety of landscapes
- Manually start individual stations or programs for quick maintenance checks and troubleshooting
- 128 programmable addresses available prevents cross-communication between multiple remotes within close proximity of each other
- Programmable run times from 1 to 90 minutes, which will not overwrite regular automatic programming
- Manual operation up to 240 stations provides flexibility for larger projects
- Rugged and water-resistant transmitter includes a large LCD display with simple push-button operation and a battery-life indicator

## OPERATING SPECIFICATIONS

- Range: 2 miles (line of sight) from transmitter to receiver
- Transmitter power source: 4 x AAA batteries included
- Receiver power source: 24 VAC, 0.010 A
- System operating frequency: 27 MHz
- SmartPort® installation: maximum 50' from controller
- FCC approved (not available in EU and some other countries, check local regulations)
- Warranty period: 3 years


**ROAM XL**
(without antenna)
Height: 6¼"
Width: 3"
Depth: 1¼"

| ROAM XL | |
|---|---|
| **Model** | **Description** |
| ROAMXL-KIT | Transmitter, receiver, SmartPort wiring harness, 4 AAA batteries and plastic carrying case included |
| ROAMXL-TR | Handheld transmitter and 4 AAA batteries included |
| ROAMXL-R | Receiver unit (SmartPort wiring harness included) |

| OPTIONS (SPECIFY SEPARATELY) | |
|---|---|
| **Model** | **Description** |
| 258200 | Wall-mount bracket for SmartPort |
| ROAMXL-CASE | Plastic carrying case |
| ROAM-WH | SmartPort wiring harness (length: 6') |
| ROAM-SCWH | Shielded SmartPort wiring harness (length: 25') |

**SmartPort**
Hunter remotes require the installation of a SmartPort wiring harness. The SmartPort is a connector that is wired to the terminals on the controller, and allows quick connection to any Hunter receiver.

**Wall-Mount Bracket for SmartPort**
P/N 258200

# PSR

*This reliable and economical pump start relay family is perfect for systems that require pump activation.*

## KEY BENEFITS

- A pump start relay family for a variety of voltage and power requirements.
- 24 VAC flying leads make connection to the controller quick and easy
- Suitable for conventional wiring or two-wire decoder activation, allows flexible installation options

## OPERATING SPECIFICATIONS

- Recommended installation: minimum 15' from irrigation controller; see chart on **page 199** for maximum distances
- Approvals: IP44, UL, CE, NEMA 3R rated
- Warranty period: 2 years

**Pump Start Relay**
Height: 6½"
Width: 7½"
Depth: 4½"

### PUMP START RELAY

| Model | Description |
|---|---|
| PSR-22 | Double-pole/single-throw pump start relay for 120 VAC pumps up to 2 hp or 230 VAC pumps up to 3 hp |
| PSR-52 | Double-pole/single-throw pump start relay for 120 VAC pumps up to 3 hp or 230 VAC pumps up to 7.5 hp |
| PSR-53 | Triple-pole/single-throw pump start relay for 120 VAC pumps up to 3 hp, 230 VAC pumps up to 7.5 hp, or 230 VAC pumps up to 10 hp (3-phase) |

### PUMP START RELAY ELECTRICAL SPECIFICATIONS

| Model | Single-Phase | | 3-Phase** | Max. Full Load | Max. Resistive | Coil VA | | | | Coil VA | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | HP at 120 VAC | HP at 230 VAC | HP at 230 VAC | AMPS | AMPS | INRUSH | | AMPS | | HOLDING | | AMPS | |
| | | | | | | 50 Hz | 60 Hz | 50 Hz | 60 Hz | 50 Hz | 60 Hz | 50 Hz | 60 Hz |
| PSR-22 | 2* | 3* | N/A | 30 | 40 | 33 | 30 | 1.38 | 1.25 | 8 | 6.5 | 0.33 | 0.27 |
| PSR-52 | 3 | 7.5 | N/A | 40 | 50 | 65 | 60 | 2.71 | 2.50 | 7.5 | 5 | 0.31 | 0.21 |
| PSR-53 | 3 | 7.5 | 10 | 40 | 50 | 65 | 60 | 2.71 | 2.50 | 7.5 | 5 | 0.31 | 0.21 |

**Note:** *Approximate power
** 3-phase power at 230 VAC is not commonly available in some international markets. Check local electrical codes for compatibility.

# PSRB

*For distant pump starts that require more power, choose the PSRB.*

## KEY BENEFITS

- Provides a solution for irrigation controller and pump start relay installations that have insufficient power to activate the pump
- Includes solid state relay and local 24 VAC transformer for simple PSR activation

## OPERATING SPECIFICATIONS

- Primary AC power input: 120/230 VAC
- Secondary AC power output: 24 VAC, 1.6 A
- Relay rating: Double-pole, double-throw solid state (10 A)
- Approvals: IP54, UL, CE, NEMA 3R rated
- Warranty period: 2 years

**PSRB Pump Start Relay Booster**
Height: 8⅝"
Width: 7"
Depth: 3¾"

### PUMP START RELAY BOOSTER

| Model | Description |
|---|---|
| PSRB | Use to boost controller output power available to operate larger pump start relays if necessary |

# SENSORS

# SENSOR AND CONTROLLER COMPATIBILITY CHART

| AC CONTROLLER MODELS | SENSOR INPUTS | RAIN | SMART WEATHER ADJUST | FLOW | HIGH-FLOW SHUTOFF |
|---|---|---|---|---|---|
| **X-CORE** page 92 | 1 | Mini-Clik, Rain-Clik | Solar Sync | None | Flow-Clik |
| **X2** page 93 | 1 | Mini-Clik, Rain-Clik | Hydrawise® Online | None | Flow-Clik |
| **PRO-C** page 94 | 1 | Mini-Clik, Rain-Clik | Solar Sync | None | Flow-Clik |
| **I-CORE** page 95 | 2 (Plastic), 3 (Metal and Pedestals) | Mini-Clik, Rain-Clik | Solar Sync | Flow-Sync, WFS, Other (K-Factor) | Built-in Real-Time Flow Monitoring |
| **HC** page 100 | 2 | Mini-Clik, Rain-Clik | Hydrawise Online | HC Flow Meter | Flow-Clik |
| **HPC** page 102 | 1 | Mini-Clik, Rain-Clik | Hydrawise Online | HC Flow Meter | Flow-Clik |
| **PRO-HC** page 103 | 2 | Mini-Clik, Rain-Clik | Hydrawise Online | HC Flow Meter | Flow-Clik |
| **HCC** page 104 | 2 | Mini-Clik, Rain-Clik | Hydrawise Online | HC Flow Meter | Flow-Clik |
| **ICC2** page 109 | 1 | Mini-Clik, Rain-Clik | Centralus online, Solar Sync | None | Flow-Clik |
| **ACC** page 114 | 4 Clik, 1 Flow | Mini-Clik, Rain-Clik | Solar Sync | Flow-Sync, WFS, Other (K-Factor) | Built-in Real-Time Flow Monitoring |
| **ACC2** page 110 | 1 Solar Sync, 3 Clik, 6 Flow | Mini-Clik, Rain-Clik | Centralus Online, Solar Sync | Flow-Sync, WFS, HC Flow Meter, Other (K-Factor or Scaled Pulse) | Built-in Real-Time Flow Monitoring |
| **BATTERY CONTROLLER MODELS** | | | | | |
| **NODE** page 118 | 1 | Mini-Clik, Rain-Clik | None | None | None |
| **NODE-BT** page 119 | 2 | Mini-Clik, Rain-Clik | None | None | None |
| **XC HYBRID** page 120 | 1 | Mini-Clik, Rain-Clik | None | None | None |

| SOIL MOISTURE | FREEZE | WIND |
|---|---|---|
| Soil-Clik | Freeze-Clik, WRF-Clik | Wind-Clik, MWS |
| Soil-Clik | Freeze-Clik, WRF-Clik, Online Forecast Option | Wind-Clik, MWS, Online Forecast Option |
| Soil-Clik | Freeze-Clik, WRF-Clik | Wind-Clik, MWS |
| Soil-Clik | Freeze-Clik, WRF-Clik | Wind-Clik, MWS |
| Soil-Clik | Freeze-Clik, WRF-Clik, Online Forecast Option | Wind-Clik, MWS Online Forecast Option |
| Soil-Clik | Freeze-Clik, WRF-Clik, Online Forecast Option | Wind-Clik, MWS, Online Forecast Option |
| Soil-Clik | Freeze-Clik, WRF-Clik, Online Forecast Option | Wind-Clik, MWS, Online Forecast Option |
| Soil-Clik | Freeze-Clik, WRF-Clik, Online Forecast Option | Wind-Clik, MWS, Online Forecast Option |
| Soil-Clik | Freeze-Clik, WRF-Clik, Online Forecast Option | Wind-Clik, MWS |
| Soil-Clik | Freeze-Clik, WRF-Clik | Wind-Clik, MWS |
| Soil-Clik | Freeze-Clik, WRF-Clik, Online Forecast Option | Wind-Clik, MWS |
| | | |
| None | Freeze-Clik | None |
| SC-Probe | Freeze-Clik | None |
| None | Freeze-Clik | None |

**Rain-Clik®**

**Mini-Clik®**

**Solar Sync®**

**HC Flow Meter**

**Flow-Sync®**

**WFS**

**Flow-Clik®**

**Soil-Clik®**

**Freeze-Clik®**

**Wind-Clik®**

**MWS**

# RAIN-CLIK®

*Sensor:* **Rain, Freeze**

*To prevent water waste, built-in Quick Response® technology instantly shuts down irrigation as soon as it starts raining.*

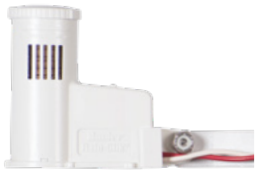
## KEY BENEFITS

- Instant Quick Response rain shutoff and freeze shutoff at 37°F
- Maintenance-free design with integrated battery for wireless models
- Adjustable vent ring allows for shorter or longer reset period
- Rugged polycarbonate housing and metal extension arm
- Includes gutter bracket and wall mount with wireless models
- Compatible with most normally open or normally closed irrigation controllers

## OPERATING SPECIFICATIONS

- Quick Response:
  - Time to turn off irrigation system: approximately 2 to 5 minutes for Quick Response
  - Time to reset Quick Response: approximately 4 hours under dry, sunny conditions
  - Time to reset when fully wet: approximately 3 days under dry, sunny conditions
- All models switch rating (24 VAC): 3 A
- Wired models include 25' of 20 AWG sheathed, two-conductor, UL-approved wire
- Wireless model operating frequency: 433 MHz
- Wireless model range is 800' line of sight from sensor to receiver
- Multiple wireless receivers can be operated from a single wireless sensor
- Approvals: UL, cUL, FCC, CE, RCM
- Warranty period: 5 years

| RAIN-CLIK | |
|---|---|
| **Model** | **Description** |
| RAIN-CLIK | Wired Rain-Clik sensor |
| RFC | Wired Rain/Freeze-Clik sensor |
| WR-CLIK | Wireless Rain-Clik sensor and receiver |
| WRF-CLIK | Wireless Rain/Freeze-Clik sensor and receiver |
| SGM | Optional gutter mount (included with WR-CLIK and WRF-CLIK) |
| WS-GUARD | Vandal-resistant wireless sensor guard for flat surfaces or pole mounting (order sensor separately) |
| WR-GUARD | Vandal-resistant wireless receiver guard for pedestal mounting (order receiver separately) |



**RAIN-CLIK/RFC**
(with mounting arm)
Height: 2½"
Length: 7"

**SGM**
Optional gutter mount
Height: ½"
Length: 3"

**WR-CLIK/WRF-CLIK**
(with mounting arm)
Height: 3"
Length: 8"


**Wireless Receiver**
(with mounting hardware)
Height: 3¼"
Length: 4"

**Wireless Sensor Guard**
(with mounting hardware)
Height: 2¾"
Length: 3¾"
Depth: 1¼"

**Wireless Receiver Guard**
(with mounting hardware)
Height: 5"
Length: 4"
Depth: 1¼"

# MINI-CLIK®

*Sensor:* **Rain**

*This sensor halts scheduled irrigation when it detects a preset level of rain has fallen to stop water waste.*

## KEY BENEFITS

- Shuts off sprinkler system automatically when it rains
- Adjustable from ⅛" to ¾" of rainfall
- Debris tolerant for reliable operation
- Mountable to gutters using (P/N SGM)
- Stainless steel guard with Mini-Clik sensor for commercial applications (P/N SG-MC)
- Compatible with most irrigation controllers

## OPERATING SPECIFICATIONS

- Switch rating (24 VAC): 5 A
- Includes 25' of 20 AWG sheathed, two-conductor, UL-approved wire
- Approvals: UL, cUL, FCC, CE, RCM
- Warranty period: 5 years

**MINI-CLIK**
Height: 2"
Length: 6"

**SG-MC**
Stainless steel sensor guard enclosure for Mini-Clik (includes Mini-Clik)
Height: 5½"
Length: 3"
Width: 4"

**SGM**
Optional gutter mount
Height: ½"
Length: 3"

| MINI-CLIK | |
|---|---|
| **Model** | **Description** |
| **MINI-CLIK** | Wired rain sensor |
| **MINI-CLIK-NO** | Wired rain sensor with normally open switch |
| **SG-MC** | Stainless steel sensor guard with Mini-Clik sensor |
| **SGM** | Optional gutter mount |

**MINI-CLIK INSTALLATION**

SENSORS

# SOLAR SYNC®

*Sensor:* **ET, Rain, Freeze**

*This sensor automatically adjusts controller run times daily based on local climate conditions to reduce water usage and improve plant health.*

## KEY BENEFITS

- Automatically adjusts irrigation duration based on weather conditions using on-site solar radiation and air temperature
- Quick Response® instant rain shutoff and freeze shutoff at 37°F
- Maintenance-free design with integrated battery for wireless models
- Adjustable vent ring allows for shorter or longer reset period
- Rugged polycarbonate housing and metal extension arm
- Includes gutter bracket and wall mount with wireless models
- Use with Hunter standard controllers, Centralus™ with ICC2 or ACC2, and IMMS™ online central control installations

## OPERATING SPECIFICATIONS

- Solar Sync:
  - Adjusts run times daily 3 minutes before midnight using the last 3 days of ET (evapotranspiration) data
- Quick Response:
  - Time to turn off irrigation system: approximately 2 to 5 minutes for Quick Response
  - Time to reset Quick Response: approximately 4 hours under dry, sunny conditions
  - Time to reset when fully wet: approximately 3 days under dry, sunny conditions
- All models switch rating (24 VAC): 3 A
- Wired models include 25' of 20 AWG sheathed, two-conductor, UL-approved wire
- Wireless model operating frequency: 433 MHz
- Wireless model range is 800' line of sight from sensor to receiver
- Multiple wireless receivers can be operated from a single wireless sensor
- Approvals: UL, cUL, FCC, CE, RCM
- Warranty period: 5 years

| SOLAR SYNC | |
|---|---|
| **Model** | **Description** |
| SOLAR-SYNC-SEN | Solar Sync sensor, wire, and gutter mount |
| WSS-SEN | Wireless Solar Sync sensor, receiver, and gutter mount |
| WS-GUARD | Vandal-resistant wireless sensor guard for flat surfaces or pole mounting (order sensor separately) |
| WR-GUARD | Vandal-resistant wireless receiver guard for pedestal mounting (order receiver separately) |

**Wired Solar Sync Sensor**
(with mounting arm)
Height: 3"
Width: 8½"
Depth: 1"

**Wireless Solar Sync Sensor**
Height: 4½"
Width: 8½"
Depth: 1"


**Wireless Solar Sync Receiver**
(with wall mounting kit)
Height: 5½"
Width: 1½"
Depth: 1½"


**Wireless Sensor Guard**
(with mounting hardware)
Height: 2¾"
Width: 3¾"
Depth: 1¼"


**Wireless Receiver Guard**
(with mounting arm)
Height: 5"
Width: 4"
Depth: 1¼"

**EPA WaterSense Approved**
Recognized as a responsible water-saving tool by the U.S. Environmental Protection Agency

# HC FLOW METER

*Sensor:* **Flow**

*Detect, monitor, and report critical flow zone data and total system flows with this robust and simple-to-install flow sensor.*

## KEY BENEFITS

- Compatible with HC, HPC, Pro-HC, and HCC
- Provides station-level flow totals
- Sends automatic alerts in the event of high-flow, low-flow, or unscheduled flow conditions
- Flow reports within Hydrawise software can display total system water use and individual station water use for accurate water budgeting and tracking
- Robust brass construction with union fittings for easy installation and removal for winterization
- Analog dial on the face of the meter displays daily flow totals and a leak detector

## OPERATING SPECIFICATIONS

- Scaled pulse output is pre-calibrated from the factory based on the size of the meter
- Meter must be hardwired to the controller via shielded, minimum 18 AWG wire, up to 1,000' from the controller
- Temperature range (water): up to 100°F
- Accuracy: ± 2% of reading at recommended flow
- Warranty period: 2 years

**HC-075-FLOW**
(¾" MNPT coupling)
Height: 3⅛"
Length: 9⅛"
Depth: 3⅛"
Weight: 2.1 lbs

**HC-100-FLOW**
(1" MNPT coupling)
Height: 3⅝"
Length: 10¼"
Depth: 3⅛"
Weight: 3.1 lbs

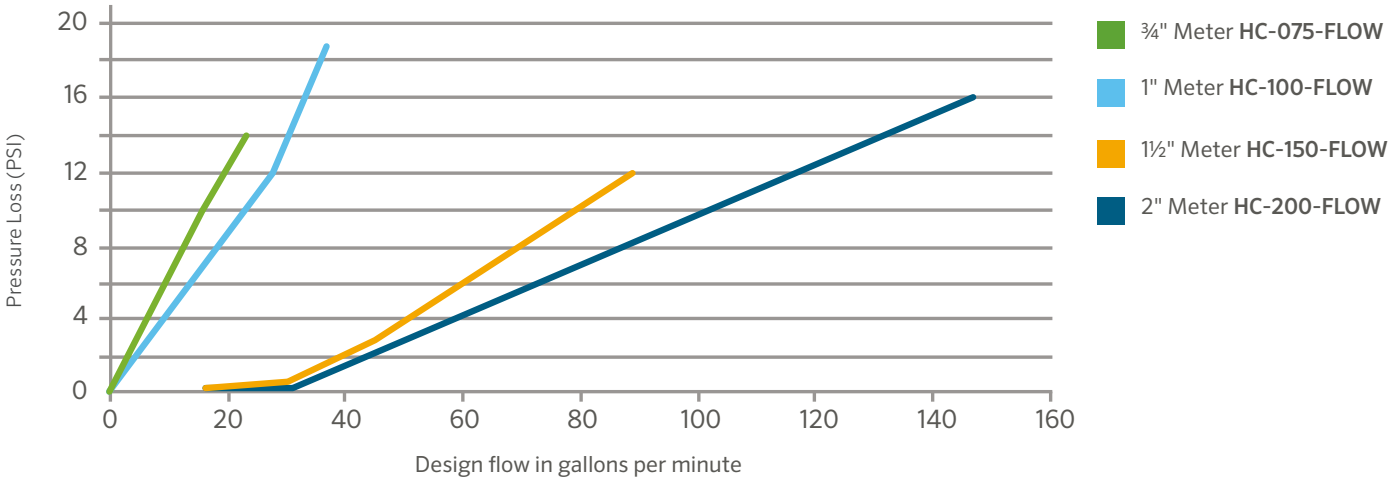
**HC-150-FLOW**
(1½" MNPT coupling)
Height: 6¼"
Length: 16⅞"
Depth: 4⅞"
Weight: 14.5 lbs

**HC-200-FLOW**
(2" MNPT coupling)
Height: 6¼"
Length: 17½"
Depth: 4⅞"
Weight: 16.3 lbs

**HC FLOW METER SPECIFICATIONS**

| | HC-075-FLOW (¾") | HC-100-FLOW (1") | HC-150-FLOW (1½") | HC-200-FLOW (2") |
|---|---|---|---|---|
| **Minimum flow (GPM)** | 0.22 | 0.3 | 0.88 | 1.98 |
| **Maximum recommended flow (GPM)** | 15 | 30 | 66 | 105 |
| **Maximum flow rate (GPM)** | 21 | 34 | 88 | 132 |
| **Dial reading (U.S. gal)** | 1 pulse per 0.1 U.S. gal | 1 pulse per 1 U.S. gal | 1 pulse per 1 U.S. gal | 1 pulse per 1 U.S. gal |

**HC FLOW METER** Pressure Loss Chart



# FLOW-SYNC®

*Sensor:* **Flow**

*This cost-effective flow sensor is designed for use with commercial controllers.*

## KEY BENEFITS

- Simple-insertion flow sensor for metering and reacting to real-time flow conditions
- Provides station-level flow monitoring for reaction to high- or low-flow conditions, helping to protect against flood damage and erosion
- Compatible with Hunter I-Core®, ACC, and ACC2 controllers, as well as ICD-SEN sensor decoders, for flexible installation in a variety of projects
- Easy connection up to 1,000' from controller or sensor decoder
- Sensor is pre-calibrated for K-factor and Offset based on pipe size, allowing for quick setup and programming within the controller

## OPERATING SPECIFICATIONS

- Recommended pressure range: 0 to 220 PSI
- Pressure loss: < 1 PSI
- Sensor wiring: 2 x direct burial, 18 AWG or greater, color-coded or marked for polarity, up to 1,000' from the controller
- Warranty period: 5 years

## USER-INSTALLED OPTIONS

- FCT tee fittings for pipe installation

**Impeller-type flow sensor, requires FCT fitting for pipe installation** (order separately)

**FLOW-SYNC**

| Model | Description |
|---|---|
| HFS | Hunter Flow-Sync sensor, use with I-Core, ACC, and ACC2 controllers, sensor requires FCT fitting for pipe installation. |

**REQUIRED USER-INSTALLED OPTION (SPECIFY SEPARATELY)**

| Model | Description |
|---|---|
| FCT-100 | 1" Schedule 40 sensor receptacle tee |
| FCT-150 | 1½" Schedule 40 sensor receptacle tee |
| FCT-158 | 1½" Schedule 80 sensor receptacle tee |
| FCT-200 | 2" Schedule 40 sensor receptacle tee |
| FCT-208 | 2" Schedule 80 sensor receptacle tee |
| FCT-300 | 3" Schedule 40 sensor receptacle tee |
| FCT-308 | 3" Schedule 80 sensor receptacle tee |
| FCT-400 | 4" Schedule 40 sensor receptacle tee |

**FLOW RANGE**

| Pipe Diameter | Operating Range (GPM) | |
|---|---|---|
| | Minimum | Suggested Maximum* |
| 1" | 2 | 17 |
| 1½" | 5 | 35 |
| 2" | 10 | 55 |
| 3" | 28 | 120 |
| 4" | 34 | 200 |

**Note:**

* Good design practice dictates the maximum flow not to exceed 5'/sec. Suggested maximum flow is based upon Class 200 IPS plastic pipe.

# WFS

*Sensor:* **Flow**

*Use this sensor to retrofit flow to existing systems that cross under asphalt, concrete, or other hardscapes.*

## KEY BENEFITS

- Wireless flow sensor saves time, materials, and labor
- Simple-insertion flow sensor for monitoring and reacting to real-time flow conditions
- Provides station-level flow monitoring for reaction to high- or low-flow conditions, helping to protect against waste and damage from leaks
- Compatible with Hunter I-Core®, ACC, and ACC2 controllers for flexible installation in a variety of projects
- Sensor is pre-calibrated for K-factor and Offset based on pipe size, allowing for quick setup and programming within the controller
- Multi-color LED on the receiver indicates proper communication to the transmitter, as well as remaining battery life

## OPERATING SPECIFICATIONS

- Maximum distance sensor to receiver: 500'
- Recommended pressure range: 0 to 220 PSI
- Pressure loss: < 1 PSI
- Approvals: FCC and CE approved
- Warranty period: 5 years

**WFS**



| WIRELESS FLOW SENSOR | |
|---|---|
| **Model** | **Description** |
| **WFS** | Wireless Flow Sensor Kit – Domestic 900 MHz |
| **WFS-T** | Wireless Flow Sensor Kit Transmitter Only – Domestic 900 MHz |
| **WFS-R** | Wireless Flow Sensor Kit Receiver Only – Domestic 900 MHz |
| **WFS-LITHBATT** | Wireless Flow Sensor Lithium Battery |
| **WFS-ALKBATT** | Wireless Flow Sensor Alkaline Battery with Cage |

| REQUIRED USER-INSTALLED OPTION (SPECIFY SEPARATELY) | |
|---|---|
| **Model** | **Description** |
| **FCT-100** | 1" Schedule 40 sensor (white) receptacle tee |
| **FCT-150** | 1½" Schedule 40 sensor (white) receptacle tee |
| **FCT-158** | 1½" Schedule 80 sensor (gray) receptacle tee |
| **FCT-200** | 2" Schedule 40 sensor (white) receptacle tee |
| **FCT-208** | 2" Schedule 80 sensor (gray) receptacle tee |
| **FCT-300** | 3" Schedule 40 sensor (white) receptacle tee |
| **FCT-308** | 3" Schedule 80 sensor (gray) receptacle tee |
| **FCT-400** | 4" Schedule 40 sensor (white) receptacle tee |

**FLOW RANGE**

| Pipe Diameter | Operating Range (GPM) | |
|---|---|---|
| | Minimum | Suggested Maximum* |
| 1" | 2 | 17 |
| 1½" | 5 | 35 |
| 2" | 10 | 55 |
| 3" | 28 | 120 |
| 4" | 34 | 200 |

**Note:**

* Good design practice dictates the maximum flow not to exceed 5'/sec. Suggested maximum flow is based upon Class 200 IPS plastic pipe.

# FLOW-CLIK®

*Sensor:* **Flow**

*Add high-flow shutoff capabilities to any irrigation controller with this simple, adjustable device.*

## KEY BENEFITS

- Automatically shuts down entire system if an overflow condition occurs, helping to protect against flood damage and erosion
- Single-button calibration to set highest flow rate
- User-adjustable timing and delay for sensor response
- Compatible with all Hunter AC-powered controllers for a variety of applications
- Multi-color LED indicates system status and if flow is within limits

## OPERATING SPECIFICATIONS

- Recommended pressure range: 0 to 220 PSI
- Current draw (24 VAC): 0.025 A
- Switching current: 2 A maximum
- Sensor wiring: 2 x direct burial, 18 AWG or greater, color-coded or marked for polarity, up to 1,000' from the interface module
- Programmable start up delay: 0 to 300 seconds (allows for system hydraulics to stabilize and prevents false flow readings)
- Programmable interrupt period: 5 to 60 minutes (or option to reset manually)
- Warranty period: 5 years

## USER-INSTALLED OPTIONS

- FCT fittings for 1" to 4" pipe diameters

**Flow-Clik sensor and module shown with required FCT fitting for pipe installation** (sold separately)

| FLOW-CLIK | |
|---|---|
| **Model** | **Description** |
| FLOW-CLIK | Standard kit for all 24 VAC controllers. *Includes sensor and interface module, sensor requires FCT for pipe installation.* |

| REQUIRED USER-INSTALLED OPTION (SPECIFY SEPARATELY) | |
|---|---|
| **Model** | **Description** |
| FCT-100 | 1" Schedule 40 sensor receptacle tee |
| FCT-150 | 1½" Schedule 40 sensor receptacle tee |
| FCT-158 | 1½" Schedule 80 sensor receptacle tee |
| FCT-200 | 2" Schedule 40 sensor receptacle tee |
| FCT-208 | 2" Schedule 80 sensor receptacle tee |
| FCT-300 | 3" Schedule 40 sensor receptacle tee |
| FCT-308 | 3" Schedule 80 sensor receptacle tee |
| FCT-400 | 4" Schedule 40 sensor receptacle tee |

| FLOW RANGE | | |
|---|---|---|
| **Pipe Diameter** | **Operating Range (GPM)** | |
| | Minimum | Suggested Maximum* |
| 1" | 2 | 17 |
| 1½" | 5 | 35 |
| 2" | 10 | 55 |
| 3" | 28 | 120 |
| 4" | 34 | 200 |

**Note:**

*Good design practice dictates the maximum flow not to exceed 5'/sec. Suggested maximum flow is based upon Class 200 IPS plastic pipe.

# SOIL-CLIK®

*Sensor:* **Soil Moisture**

*This sensor prevents water waste by measuring soil moisture and shutting off irrigation when a pre-set level is reached.*

## KEY BENEFITS

- View current soil moisture level and status at a glance
- One-touch override allows soil moisture bypass for special conditions
- Low-voltage outdoor enclosure powered by host controller
- Connect to sensor inputs, or use to interrupt common wires in virtually any 24 VAC irrigation system
- Use with Solar Sync® sensor for maximum water savings

## OPERATING SPECIFICATIONS

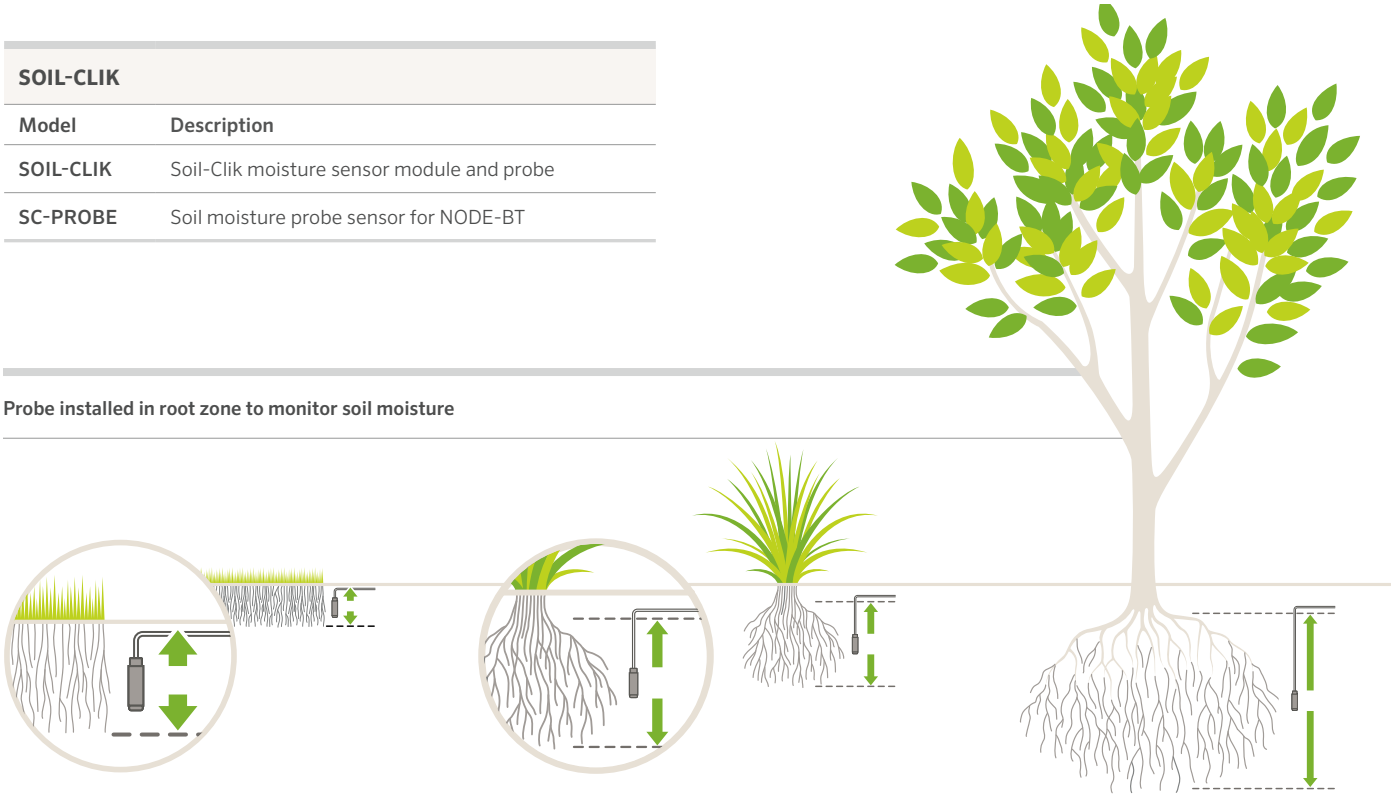
- Switch rating (24 VAC): 5 A
- Input power (24 VAC): 100 mA
- Output power: Normally closed dry-contact closure
- 6' maximum distance from Soil-Clik module to controller
- 1,000' maximum distance from Soil-Clik module to sensor probe for AC installations
- 100' maximum distance for NODE-BT installations
- Approvals: UL, cUL, FCC, CE, RCM
- Warranty period: 5 years

**Soil-Clik Module**
Height: 4½"
Width: 3½"
Depth: 1¼"
Power: 24 VAC, 100 mA max
Wire leads: 31½"


**Soil-Clik Probe**
Diameter: ⅘"
Height: 3¼"
Wire to probe: 1,000' max
18 AWG direct-burial wire
Wire leads: 31½"

| SOIL-CLIK | |
|---|---|
| **Model** | **Description** |
| SOIL-CLIK | Soil-Clik moisture sensor module and probe |
| SC-PROBE | Soil moisture probe sensor for NODE-BT |

**Probe installed in root zone to monitor soil moisture**



In turf applications, the probe should be placed in the root zone, approximately 6" deep (adjust for actual turf conditions).

For shrubs or trees, select a deeper depth that matches the root zone. For new plantings, choose a spot halfway down the root ball, adjacent to native soil.

# FREEZE-CLIK®

*Sensor:* **Freeze**

*Use this sensor to stop sprinklers from running during a freeze event and protect landscapes, walkways, and roadways from icy conditions.*

## KEY BENEFITS

- Automatically shuts off irrigation system when temperatures fall below 37°F
- Installs easily on automatic irrigation systems with no adjustments needed
- Use with other sensors to enhance overall efficiency of irrigation systems

*Note: Not intended for agricultural applications*

## OPERATING SPECIFICATIONS

- Switch rating (24 VAC): 5 A
- Includes 25' of 20 AWG sheathed, two-conductor, UL-approved wire
- Approvals: UL, cUL, FCC, CE, RCM
- Warranty period: 5 years

**FREEZE-CLIK**
Height: 2"
Length: 6"

| FREEZE-CLIK | |
|---|---|
| **Model** | **Description** |
| FREEZE-CLIK | Wired freeze sensor |

# WIND-CLIK®

*Sensor:* **Wind**

*This sensor keeps water coverage efficient and pedestrian paths and roadways safe by shutting down irrigation when wind speeds increase.*

## KEY BENEFITS

- Shuts off irrigation when winds are high
- Works well with fountains to eliminate overspray in windy conditions
- Installs easily on automatic irrigation systems with quick adjustments
- Compatible with most normally open or normally closed irrigation controllers

## OPERATING SPECIFICATIONS

- Switch rating (24 VAC): 5 A maximum
- Wind vane diameter: 5"
- Reset speed: 8 to 24 mph
- Includes 25' of 20 AWG sheathed, two-conductor, UL-approved wire
- Mounts: Slip fits over 2" PVC pipe or attaches to ½" conduit with adapter (included)
- Approvals: UL, cUL, FCC, CE, RCM
- Warranty period: 5 years

**WIND-CLIK**
Height: 4"
Wind vane diameter: 5"

| WIND-CLIK | |
|---|---|
| **Model** | **Description** |
| WIND-CLIK | Wired wind sensor |

# MWS

*Sensor:* **Wind, Rain, Freeze**

*This all-in-one wind, rain, and freeze sensor prevents water waste when any sensor triggers a stop to the system.*

## KEY BENEFITS

- Compact sensor with built-in wind, rain, and freeze sensors
- Installs easily on automatic irrigation systems with limited adjustment
- Set wind actuation speed shutdown from 12 to 35 mph
- Set system shutdown from ⅛" to ¾" of rainfall
- Automatically shuts off system when temperatures fall below 37°F
- Mounts: Slip fits over 2" PVC pipe or attaches to ½" conduit with adapter (included)

## OPERATING SPECIFICATIONS

- Switch rating (24 VAC): 5 A maximum
- Wind vane diameter: 5"
- Reset speed: 8 to 24 mph
- Includes 25' of 20 AWG sheathed, two-conductor, UL-approved wire
- Approvals: UL, cUL, FCC, CE, RCM
- Warranty period: 5 years

| MWS | |
|---|---|
| **Model** | **Description** |
| MWS | Weather station combines wind and rain sensors |
| MWS-FR | Weather station combines wind and rain sensors with a freeze sensor |

**MWS**
Height: 8"
Wind vane diameter: 5"

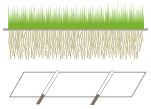
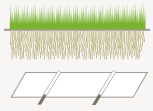
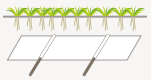
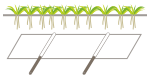
**MWS-FR**
Height: 8"
Wind vane diameter: 5"

# MICRO

# MICRO IRRIGATION SOLUTIONS

From ultra-durable Hunter Dripline to our innovative Root Zone Watering System, Hunter's micro irrigation solutions are designed to apply water efficiently and precisely where it's needed. Choose the combination of products best suited for your application and plant type using the chart below.

**COMMON MICRO APPLICATIONS GUIDE**

| APPLICATION | STANDARD DESIGN | ADVANCED DESIGN |
|---|---|---|
| TREES  | MLD, Emitters, Micro Sprays | HDL, Eco-Wrap, IH Risers, RZWS |
| MIXED PLANTINGS  | MLD, Micro Sprays, HDL, Single-Port Emitters | HDL-COP, Multi-Port Emitters, Eco-Wrap |
| SLOPED AREAS  | MLD, Micro Sprays, HDL-PC, HDL-R, Emitters, RZB | HDL-CV, Eco-Mat, Eco-Wrap, HDL-COP, IH Risers, RZWS |
| TURF  | HDL-COP | Eco-Wrap, Eco-Mat |
| SUBSURFACE  | HDL-COP | Eco-Wrap, Eco-Mat |
| SPARSE PLANTING  | Emitters, RZB | IH Risers |
| DENSE PLANTING  | Micro Sprays, HDL | HDL-COP, Eco-Wrap, Eco-Mat |
| GREEN ROOFS  | Eco-Mat | Eco-Mat |
| POTTED PLANTS  | Single-Port Emitters, Micro Sprays | MLD |
| RECLAIMED  | MLD, Micro Sprays, Emitters | HDL-R, IH Risers, RZWS |

# SOFT PIPE SYSTEMS

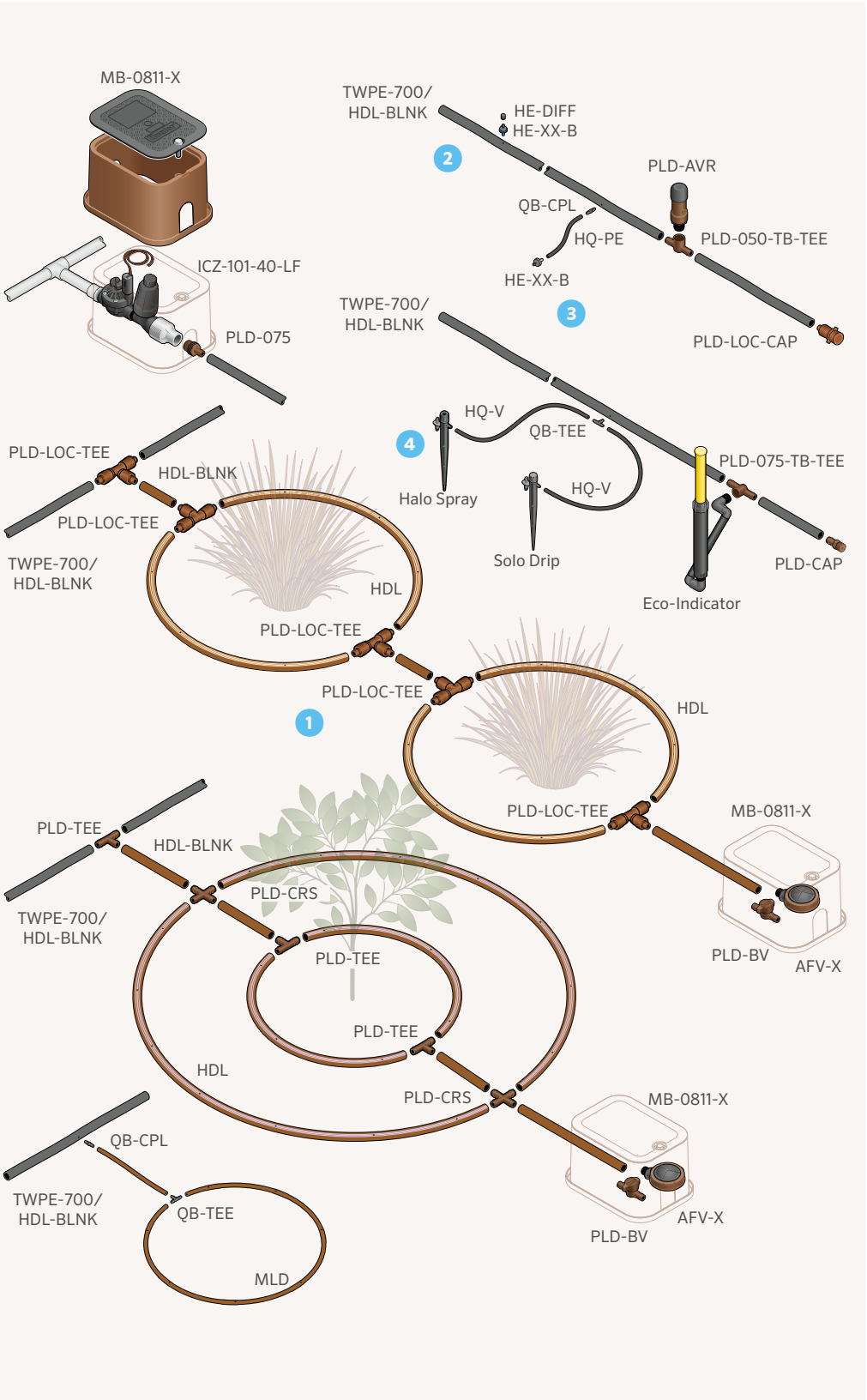
*Using soft pipe to distribute irrigation water is acceptable in both commercial and residential applications. Polyethylene tubing is used in place of PVC and may be 1", ¾", or ½". Hunter offers a full suite of products that are compatible with soft pipe systems.*

**1 Tree and Shrub Rings:**
- Convenient and efficient way to irrigate sparse plantings
- Use HDL or MLD to form the irrigation ring
- Connect with LOC fittings for faster installation

**2 ½" and ¼" Tubing:**
- Use ½" polyethylene (TWPE) to distribute water
- Use ¼" PE (HQPE) or vinyl (HQV) to connect to emitters and micro sprays

**3 Point-Source Emitters:**
- Barbed emitters insert directly into PE tubing or at the end of ¼" vinyl/PE
- Color-coded flows (0.5, 1.0, 2.0, 4.0, 6.0 GPH)

**4 Micro Spray Stakes:**
- Use when higher flows are needed (0–30 GPH)
- Throw water from 0-12'



# HARD PIPE SYSTEMS

*From multi-port emitters to micro sprays, Hunter offers a wide variety of products and accessories that are designed to complement hard pipe systems.*

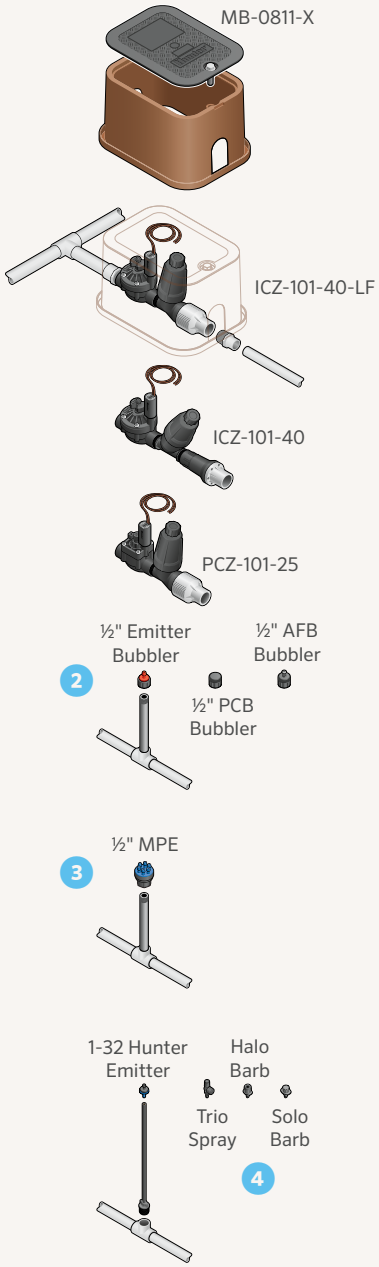
**1 IH Risers:**
- Ultra-durable point-to-point emitters
- Built-in check valve screen makes them great for slopes
- Wide variety of flows

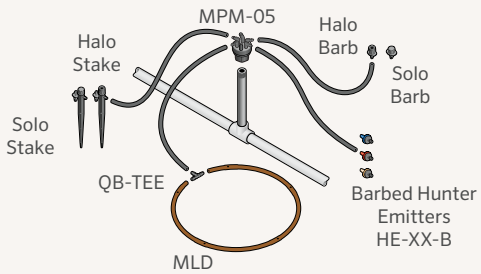
**2 Point-Source Emitters:**
- Color-coded flows (0.5, 1.0, 2.0, 4.0, 6.0 GPH)
- HEB (½" threaded emitter bubblers install directly onto ½" risers)
- HE-T (10-32 threaded emitters install onto rigid risers)

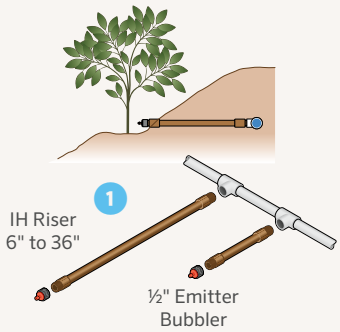
**3 Multi-Port Emitters:**
- Color-coded flows (0.5, 1.0, 2.0 GPH)
- Swivel barbs for directional flow
- Install directly onto ½" risers

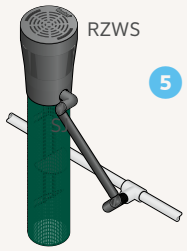
**4 Micro Sprays:**
- Ideal for higher flows (0-30 GPH)
- Diameter of throw from 0-12'
- Install directly onto rigid risers or on ¼" tubing

**5 Root Zone Watering System:**
- For deep root irrigating
- Allows oxygen to penetrate the soil
- Encourages healthier root growth




MICRO

# PCZ

*Make installations quick and easy with this robust, pre-assembled kit with stainless steel filtration and pressure regulation.*

## KEY BENEFITS

- Factory-assembled for quick and easy installation
- Valves 100% water-tested to ensure dependable operation
- Senninger regulator provides precise regulation to protect system from high pressure
- 150 mesh (100 microns) stainless steel screen for years of reliable filtration

## FACTORY-INSTALLED OPTIONS

- 25 or 40 PSI regulator

## USER-INSTALLED OPTIONS

- Reclaimed water ID handle for ACZ-075 and PCZ-101 (P/N 269205)

## PCZ-101

- 1" x ¾" inline valve
- Pressure regulation: 25 or 40 PSI
- Flow: 0.5 to 15 GPM (30 to 900 GPH)
- Operating pressure: 20 to 120 PSI
- Operating temperature: up to 120°F
- 150 mesh; 100 microns stainless steel screen

## SOLENOID OPERATING SPECIFICATIONS

- Heavy-duty solenoid: 24 VAC
  - 350 mA inrush current, 190 mA holding current, 60 Hz
  - 370 mA inrush current, 210 mA holding current, 50 Hz
- Warranty period: 2 years

**PCZ-101**
Height: 7"
Width: 3"
Length: 10"
1" inlet x ¾" outlet

**DRIP CONTROL ZONE KITS**

| Model | Description |
|---|---|
| **PCZ-101-25** | 1" PGV flow control valve with HFR-100-75 and 25 PSI regulator |
| **PCZ-101-40** | 1" PGV flow control valve with HFR-100-75 and 40 PSI regulator |

**PCZ AND ACZ CONTROL ZONE KITS: PRESSURE REQUIREMENTS BASED ON FLOW**

| System Flow | PCZ at 25 PSI outlet | ACZ at 25 PSI outlet | PCZ at 40 PSI outlet | ACZ at 40 PSI outlet |
|---|---|---|---|---|
| GPM | Dynamic Pressure* | Dynamic Pressure* | Dynamic Pressure** | Dynamic Pressure** |
| 0.5 | 34 | 25 | 41 | 41 |
| 1 | 34 | 26 | 42 | 43 |
| 5 | 34 | 28 | 45 | 47 |
| 10 | 37 | 30 | 52 | 52 |
| 15 | 41 | 32 | 59 | 55 |

*Minimum inlet pressure required to achieve 25 PSI on the outlet side
**Minimum inlet pressure required to achieve 40 PSI on the outlet side

# ACZ

*This sturdy, pre-assembled kit includes filtration and pressure regulation for above-ground installations with no additional backflow prevention.*

## ACZ-075

- ¾" x ¾" anti-siphon valve
- Pressure regulation: 25 or 40 PSI
- Flow: 0.5 to 15 GPM (30 to 900 GPH)
- Operating pressure: 20 to 120 PSI
- Operating temperature: up to 120°F
- 150 mesh; 100 microns stainless steel screen

## ACZ-101

- 1" x ¾" anti-siphon valve
- Pressure regulation: 25 or 40 PSI
- Flow: 0.5 to 15 GPM (30 to 900 GPH)
- Warranty period: 2 years
- Operating pressure: 20 to 120 PSI
- Operating temperature: up to 120°F
- 150 mesh; 100 microns stainless steel screen

**ACZ-075**
Height: 11½"
Width: 3"
Length: 12"
¾" inlet x ¾" outlet

**ACZ-101**
Height: 11½"
Width: 3"
Length: 12"
1" inlet x ¾" outlet

**DRIP CONTROL ZONE KITS**

| Model | Description |
|---|---|
| **ACZ-075-25** | ¾" PGV-ASV valve with HFR-100-075 and 25 PSI regulator |
| **ACZ-075-40** | ¾" PGV-ASV valve with HFR-100-075 and 40 PSI regulator |
| **ACZ-101-25** | 1" PGV-ASV valve with HFR-100-075 and 25 PSI regulator |
| **ACZ-101-40** | 1" PGV flow control valve with HFR-100-75 and 40 PSI regulator |

# 1" ICZ

*The most durable kit in the industry is offered in low-, medium-, and high-flow options for diverse system needs.*

## KEY BENEFITS

- Highest-quality components
- Factory-assembled to save installation time
- Filter Sentry® diaphragm screen cleaning system (on all models except ICZ-101-LF)
- Wide flow range to cover most micro irrigation applications
- Warranty period: 5 years

## FACTORY-INSTALLED OPTIONS

- 25 or 40 PSI regulator

## USER-INSTALLED OPTIONS

- Reclaimed water ID handle (P/N 561205)

## ICZ-101

- Factory-installed Filter Sentry
- Pressure regulation: 25 or 40 PSI
- Flow: 2 to 20 GPM (120 to 1,200 GPH)
- Operating pressure: 20 to 120 PSI
- Operating temperature: up to 120°F
- 150 mesh; 100 microns stainless steel screen
- 1" inlet and 1" outlet

## ICZ-101-LF

- Pressure regulation: 25 or 40 PSI
- Flow 0.5 to 15 GPM (30 to 900 GPH)
- Fits Multi-Purpose Box
- Operating pressure: 20 to 120 PSI
- Operating temperature: up to 120°F
- 150 mesh; 100 microns stainless steel screen
- 1" inlet and ¾" outlet

## ICZ-101-LF-R

- Pressure regulation: 25 or 40 PSI
- Flow 0.5 to 15 GPM (30 to 900 GPH)
- Fits Multi-Purpose Box
- Operating pressure: 20 to 120 PSI
- Operating temperature: up to 120°F
- 150 mesh; 100 microns stainless steel screen
- 1" inlet and ¾" outlet
- Reclaimed water ID tag, purple flow control knob, Filter Sentry, and purple chlorine-resistant diaphragm

## SOLENOID OPERATING SPECIFICATIONS

- Heavy-duty solenoid: 24 VAC
  - 350 mA inrush current, 190 mA holding current, 60 cycles
  - 370 mA inrush current, 210 mA holding current, 50 cycles
- Warranty period: 5 years

**ICZ-101**
Height: 6¾"
Width: 4"
Length: 14"
1" inlet x 1" outlet

**ICZ-101-LF**
Height: 7"
Width: 4"
Length: 10½"
1" inlet x ¾" outlet

**ICZ-101-LF-R**
Height: 7"
Width: 4"
Length: 10½"
1" inlet x ¾" outlet

**ICZ-101 KITS**

| GPM | Required Pressure for 25 PSI Outlet | Required Pressure for 40 PSI Outlet |
|---|---|---|
| 2 | 35 | 52 |
| 5 | 35 | 52 |
| 7 | 36 | 54 |
| 10 | 40 | 58 |
| 15 | 46 | 66 |
| 20 | 60 | 82 |

**ICZ-101 LOW-FLOW KITS**

| GPM | Required Pressure for 25 PSI Outlet | Required Pressure for 40 PSI Outlet |
|---|---|---|
| 0.5 | 35 | 41 |
| 1 | 35 | 43 |
| 5 | 36 | 47 |
| 10 | 37 | 52 |
| 15 | 40 | 55 |

Dynamic pressure required for designated outlet pressure

**DRIP CONTROL ZONE KITS – SPECIFICATION BUILDER:** ORDER 1 + 2

| 1 Model | 2 Options |
|---|---|
| **ICZ-101** = 1" ICV Filter Sentry globe valve with 1" HY100 filter and regulator | **25** = 25 PSI regulator |
| **ICZ-101-LF** = 1" ICV globe valve with 1" HFR-100-075 filter regulator | **40** = 40 PSI regulator |
| **ICZ-101-LF-R** = 1" ICV reclaimed valve with Filter Sentry and 1"x ¾" reclaimed Hunter Filter Regulator | |

**Example:**
**ICZ-101-40** = 1" ICV Filter Sentry globe valve with 1" HY100 filter and regulator, and 1" outlet 40 PSI regulator

# 1½" ICZ

*The toughest plastic valve available comes backed by glass-filled construction, a fabric-reinforced diaphragm, and a double-beaded diaphragm seal.*

## KEY BENEFITS

- Highest-quality components set Hunter kits apart
- Highest flow options in the industry
- Factory-assembled to save installation time
- Filter Sentry diaphragm screen cleaning system

## USER-INSTALLED OPTIONS

- Reclaimed water ID handle (P/N 561205)

## ICZ-151-XL

- Pressure regulation: 40 PSI
- Flow: 20 to 60 GPM
- Operating pressure: up to 120 PSI
- Operating temperature: up to 120°F
- 150 mesh; 100 micron stainless steel screen
- 1½" inlet x 2" outlet

## SOLENOID OPERATING SPECIFICATIONS

- Heavy-duty solenoid: 24 VAC
  - 350 mA inrush current, 190 mA holding current, 60 cycles
  - 370 mA inrush current, 210 mA holding current, 50 cycles
- Warranty period: 5 years
- Additional charts on **page 201**

**ICZ-151-XL**

Height: 12"
Width: 5½"
Length: 22½"
1½" inlet x single 2" outlet

| DRIP CONTROL ZONE KITS | |
|---|---|
| **Model** | **Description** |
| **ICZ-151-40-XL** | 1½" ICV globe valve with 1½" filter and single 2" regulator |

| ICZ-151-40-XL | |
|---|---|
| **GPM** | **Required Pressure for 40 PSI Outlet** |
| 20 | 46 |
| 30 | 50 |
| 40 | 54 |
| 50 | 63 |
| 60 | 75 |
| 70 | 82 |

*For inlet pressures below 60 PSI, pressure regulation may not be required*

# FILTER REGULATORS

*This all-in-one choice features a state-of-the-art Senninger regulator and a stainless steel filter screen.*

## KEY BENEFITS

- HFR-075 (Hunter filter regulator)
  - Compact, all-in-one filter and regulator minimize required valve box space
  - Senninger regulator provides precise regulation to protect system from high pressure
  - 150 mesh (100 microns) stainless steel screen for years of reliable filtration
  - Wide flow range covers most drip applications
- HY-075 (Hunter Y-filter)
  - 150 mesh (100 microns) stainless steel screen for years of reliable filtration
  - Wide flow range covers most drip applications
- Warranty period: 2 years

**HUNTER FILTER REGULATORS**

| Model | Description |
|---|---|
| **HFR-075-25** | ¾" inlet x ¾" outlet, regulated at 25 PSI |
| **HFR-075-40** | ¾" inlet x ¾" outlet, regulated at 40 PSI |
| **HFR-100-075-25** | 1" inlet x ¾" outlet, regulated at 25 PSI |
| **HFR-100-075-25-R** | 1" inlet x ¾" outlet, regulated at 25 PSI, reclaimed |
| **HFR-100-075-40** | 1" inlet x ¾" outlet, regulated at 40 PSI |
| **HFR-100-075-40-R** | 1" inlet x ¾" outlet, regulated at 40 PSI, reclaimed |
| **133801** | Reclaimed filter bonnet |

**HFR-075-25**
**HFR-075-40**
Height: 7"
Width: 2¾"
Length: 6¼"
¾" inlet x ¾" outlet

**HFR-100-075-25**
**HFR-100-075-40**
Height: 7"
Width: 2¾"
Length: 6¼"
1" inlet x ¾"outlet

**HFR-100-075-25-R**
**HFR-100-075-40-R**
Height: 7"
Width: 2¾"
Length: 6¼"
1" inlet x ¾"outlet

# FILTERS

*For added durability, these simple yet rugged filters come standard with a stainless steel screen.*

## ¾" AND 1" FILTER KEY BENEFITS

- Standard size of 150 mesh to collect debris and prevent system from clogging
- High-quality stainless steel screen
- Polypropylene body
- Operating pressure: up to 120 PSI

## 1½" AND 2" FILTER KEY BENEFITS

- Glass-filled polypropylene for added strength and durability
- Operating pressure: up to 150 PSI
- Standard stainless steel screen with 150 mesh
- Large filtration screen provides longer life in between cleanings
- Optional screens of 80 and 120 mesh
- Disc filter available (125 microns)
- Warranty period: 2 years

**HUNTER Y-FILTERS AND SCREENS**

| Size | Model | Description |
|---|---|---|
| ¾" and 1" | HY-075 | ¾" inlet/outlet |
| | HY-100-075 | 1" inlet x ¾" outlet |
| | HY-100 | 1" inlet/outlet |
| | HY-100-R | 1" inlet/outlet, with reclaimed bonnet |
| 1½" | HY-151 | 1½" inlet/outlet |
| | HY-151-D | 1½" disc filter with 125 micron (120 mesh) |
| | HY151SCREEN150 | 150 mesh screen for 1½" filter |
| | HY151SCREEN120 | 120 mesh screen for 1½" filter |
| | HY151SCREEN080 | 80 mesh screen for 1½" filter |
| | HY151DISC120 | 120 mesh disc for 1½" filter |
| 2" | HY-201 | 2" inlet/outlet |
| | HY-201-D | 2" disc filter 125 micron (120 mesh) |
| | HY201SCREEN150 | 150 mesh screen for 2" filter |
| | HY201SCREEN120 | 120 mesh screen for 2" filter |
| | HY201SCREEN080 | 80 mesh screen for 2" filter |
| | HY201DISC120 | 120 mesh disc for 2" filter |

**HY-075, HY-100, HY-100-075**
Height: 6"
Width: 3"
Length: 5"

**HY-075, HY-100, HY-100-075**
Height: 6"
Width: 3"
Length: 5"

**HY-151**
Height: 9"
Width: 5"
Length: 9"

**HY-201**
Height: 12"
Width: 6¾"
Length: 11½"

MICRO

# SENNINGER® PRESSURE REGULATORS

*Choose the most consistent and reliable pressure regulators in the industry.*

## KEY BENEFITS

- Maintains consistent preset outlet pressure preventing damage to system components
- 100% water-tested to ensure accuracy and dependable operation
- Install above or below ground for project design convenience
- Tamper-proof construction provides reliability and long life

## OPERATING SPECIFICATIONS

- PRL (¾"):
  - Flow range: 0.5 to 8.0 GPM
  - Maximum inlet pressure*: 100 to 120 PSI
- PRLV (¾", 1"):
  - Flow range: 0.5 to 18 GPM
  - Maximum inlet pressure: 125 PSI
- PRM-MF (¾", 1"):
  - Flow range: 2 to 20 GPM
  - Maximum inlet pressure*: 100 to 130 PSI
- Warranty period: 2 years

*Maximum recommended inlet pressure should not exceed 80 PSI above nominal model pressure

**PRL (¾")**

| Model | Pressure | Inlet | Outlet |
|---|---|---|---|
| PRL203F3F | 20 PSI | ¾" FPT | ¾" FPT |
| PRL253F3F | 25 PSI | ¾" FPT | ¾" FPT |
| PRL303F3F | 30 PSI | ¾" FPT | ¾" FPT |
| PRL353F3F | 35 PSI | ¾" FPT | ¾" FPT |
| PRL403F3F | 40 PSI | ¾" FPT | ¾" FPT |

**PRLV (¾")**

| Model | Pressure | Inlet | Outlet |
|---|---|---|---|
| PRLV20MF3F3FV | 20 PSI | ¾" FPT | ¾" FPT |
| PRLV30MF3F3FV | 30 PSI | ¾" FPT | ¾" FPT |
| PRLV40MF3F3FV | 40 PSI | ¾" FPT | ¾" FPT |

**PRLV (1")**

| Model | Pressure | Inlet | Outlet |
|---|---|---|---|
| PRLV40MF4F4FV | 40 PSI | 1" FPT | 1" FPT |
| PRLV50MF4F4FV | 50 PSI | 1" FPT | 1" FPT |
| PRLV60MF4F4FV | 60 PSI | 1"FPT | 1" FPT |

**PMR-MF (¾")**

| Model | Pressure | Inlet | Outlet |
|---|---|---|---|
| PMR20MF3F3FV | 20 PSI | ¾" FPT | ¾" FPT |
| PMR25MF3F3FV | 25 PSI | ¾" FPT | ¾" FPT |
| PMR30MF3F3FV | 30 PSI | ¾" FPT | ¾" FPT |
| PMR35MF3F3FV | 35 PSI | ¾" FPT | ¾" FPT |
| PMR40MF3F3FV | 40 PSI | ¾" FPT | ¾" FPT |
| PMR50MF3F3FV | 50 PSI | ¾" FPT | ¾" FPT |

**PMR-MF (1")**

| Model | Pressure | Inlet | Outlet |
|---|---|---|---|
| PMR20MF4F4FV | 20 PSI | 1" FPT | 1" FPT |
| PMR25MF4F4FV | 25 PSI | 1" FPT | 1" FPT |
| PMR30MF4F4FV | 30 PSI | 1" FPT | 1" FPT |
| PMR35MF4F4FV | 35 PSI | 1" FPT | 1" FPT |
| PMR40MF4F4FV | 40 PSI | 1" FPT | 1" FPT |

**PRL - Pressure-Regulating**
**Low-Flow**
Width: 1 9⁄10"
Length: 4½"
¾" FPT inlet x ¾" outlet FPT


**PRLV - Pressure-Regulating Limit Valve**
**Wide-Range Flow**
Width: 2½"
Length: 5⅘"
¾" FPT inlet x ¾" outlet FPT

**PMR-MF - Pressure-Master Regulator**
**Medium-Flow**
Width: 2½"
Length: 5⅕" (¾" model), 5⅘" (1" model)
1" FPT inlet x 1" outlet

*The pressure regulator will maintain the predetermined operating pressure provided that the inlet pressure is at least 5 PSI above the expected outlet pressure, but not exceeding the maximum operating pressure.*

# SENNINGER® PRESSURE REGULATORS

*Top-performing Senninger regulators are the best in the industry.*

## KEY BENEFITS

- Each regulator maintains a constant preset outlet pressure based on its flow/inlet pressure.
- 100% water-tested for accuracy
- Very low hysteresis and friction loss helps maintain accurate regulation
- Can be installed above or below ground
- Patented tamper-proof design
- No external metal parts for excellent corrosion resistance

## OPERATING SPECIFICATIONS

- PRLG (¾"):
  - Flow range: 0.5 to 7.0 GPM
  - Maximum inlet pressure*: 100 to 120 PSI
- PRU:
  - Flow range: 20 to 100 GPM
  - Maximum inlet pressure: 120 PSI
- Warranty period: 2 years

*Maximum recommended inlet pressure should not exceed 80 PSI above nominal model pressure



| PRLG (¾" HOSE THREAD) | | | |
|---|---|---|---|
| **Model** | **Pressure** | **Inlet** | **Outlet** |
| **PRLG203FH3MH** | 20 PSI | ¾" FHT | ¾" MHT |
| **PRLG253FH3MH** | 25 PSI | ¾" FHT | ¾" MHT |
| **PRLG303FH3MH** | 30 PSI | ¾" FHT | ¾" MHT |
| **PRLG403FH3MH** | 40 PSI | ¾" FHT | ¾" MHT |

| PRU-40 | | | |
|---|---|---|---|
| **Model** | **Pressure** | **Inlet** | **Outlet** |
| **PRU-40** | 40 PSI | 2" FPT | 2" FPT |


**PRLG - Pressure Regulator**
**Landscape Grade**
Width: 1⅜"
Length: 3⅛"
¾" FHT inlet x ¾" MHT outlet


**PRU - Pressure Regulator Ultra**
Width: 4½"
Length: 9"
2" FPT inlet x 2" FPT outlet

*The pressure regulator will maintain the predetermined operating pressure provided that the inlet pressure is at least 5 PSI above the expected outlet pressure, but not exceeding the maximum operating pressure.*

# DRIPLINE SYSTEMS

*Ultra-durable Hunter Dripline (HDL) is easy to install and provides maximum longevity in the field. HDL works efficiently and effectively to use as little water as possible and keep plants thriving.*

1. The dripline grid is a common installation practice either at grade or subsurface. Establishing consistent laterals in dense plantings provides a quick and simple approach to irrigating a planted area.

2. Arranging the dripline through a series of plants is an accepted and reliable method of irrigation. Ensure the dripline has emission points near or around each plant.

**A Multi-Purpose Box:**
- 10" x 7" opening
- Five color options for lids

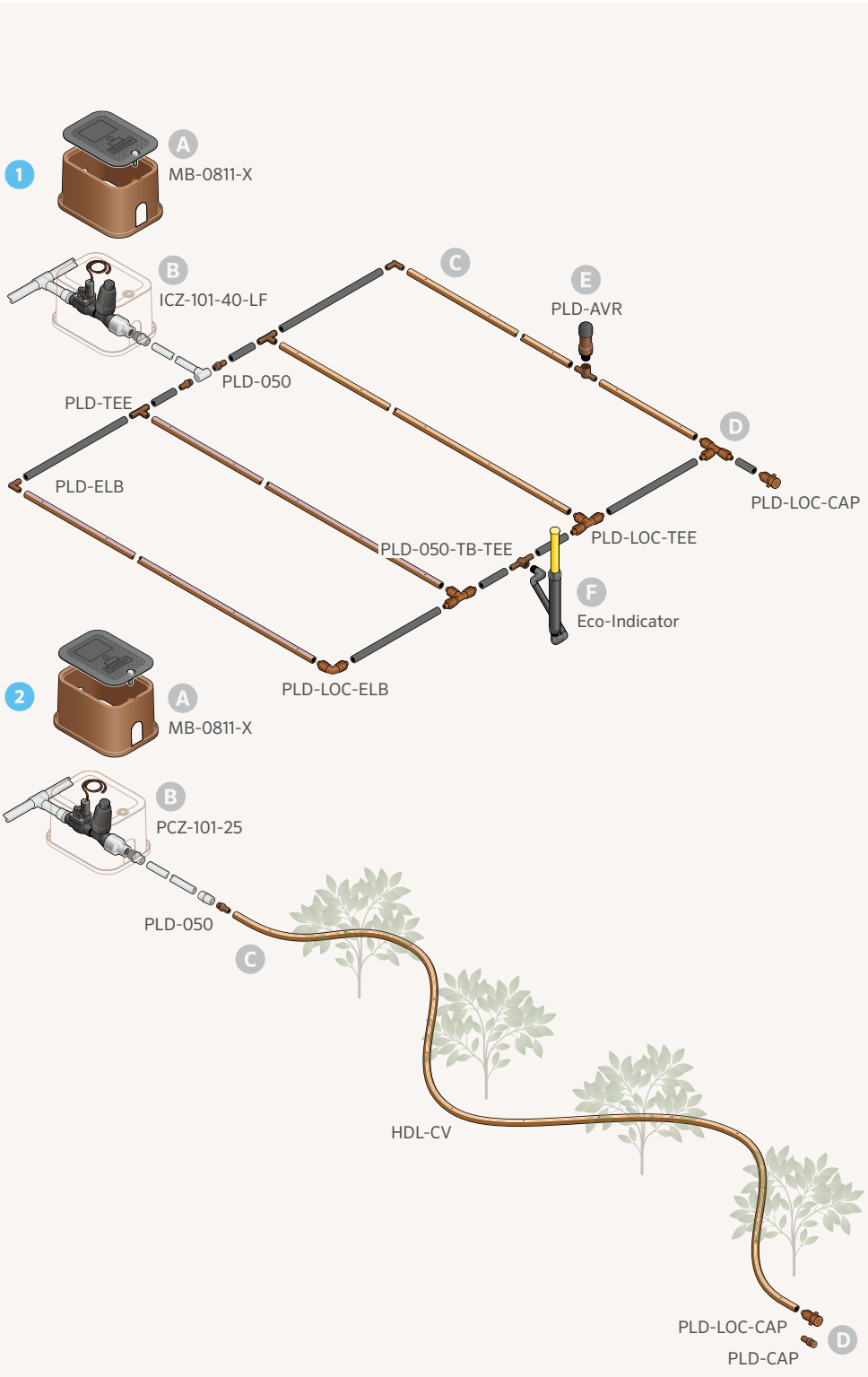
**B Control Zone Kit:**
- Factory-assembled for quick and easy installation
- Low-, medium-, and high-flow kits

**C HDL:**
- All versions are pressure-compensating
- Colored stripes indicate flow
- Stretch-wrapped coils make installation simple and clean
- Four dripline options to choose from: HDL-CV, HDL-PC, HDL-R, HDL-CO

**D Fittings:**
- Double-barb holds fittings tight
- LOC fittings can be reused

**E Air/Vacuum Relief Valve:**
- Helps prevent water hammer and tubing collapse
- Use at high point(s) in zone

**F Eco-Indicator:**
- Pops up at 12 PSI and shows system is running
- Reveals when system pressure drops too low



# HDL-CV

*Increase drip system efficiency with pressure compensation, flow indication stripes, and a 6' check height.*

## KEY BENEFITS

- Pressure-compensating emitters for consistent flow and uniform coverage
- Non-draining check valve (CV) prevents low-point pooling and allows all emitters to open/close at the same time for greater system efficiency
- Check height of 6' minimizes system drainage and runoff
- Anti-siphon feature prevents debris from entering emitter at system shutdown
- Color-coded stripes provide easy identification of flow
- UV resistance facilitates product longevity
- Stretch-wrapped coils stay intact and make installation quick and easy
- Superior grit tolerance provided by proprietary emitter design with multiple inlet filters, a wide turbulent labyrinth, and a full-size outlet pool

## PRODUCT SPECIFICATIONS

- Available flow rates: 0.4, 0.6, 0.9 GPH
- Available emitter spacing: 12", 18", 24"
- Tubing dimensions: 0.660" x 0.560" (outside/inside diameter)
- Available without emitter (HDL-BLNK)

## OPERATING SPECIFICATIONS

- Operating range: 15 to 60 PSI
- Minimum filtration: 120 mesh (125 microns)
- Warranty period: 5 years (plus 2 additional years for environmental stress cracking)

**HDL-CV**

**Coil with Stretch Wrap**

**HDL-CV – SPECIFICATION BUILDER:** ORDER 1 + 2 + 3 + 4

| 1 Model | 2 Spacing | 3 Length | 4 Options |
|---|---|---|---|
| **HDL-04** = 0.4 GPH flow | **12** = 12" | **100** = 100' | **CV** = Pressure-compensating with check valve |
| **HDL-06** = 0.6 GPH flow | **18** = 18" | **250** = 250' | |
| **HDL-09** = 0.9 GPH flow | **24** = 24" | **500** = 500' | |
| | | **1K** = 1,000' | |

**Example:**
**HDL-06-12-250-CV** = 0.6 GPH, 12" emitter spacing, 250' coil with check valve

**HDL-BLNK – SPECIFICATION BUILDER:** ORDER 1 + 2 + 3

| 1 Model | 2 Length | | 3 Options |
|---|---|---|---|
| **HDL-BLNK** = No emitters | **100** = 100' | **500** = 500' | **(BLANK)**= Brown |
| | **250** = 250' | **1K** = 1,000' | **R** = Purple stripes |

**Examples:**
**HDL-BLNK-250** = No emitters, 500' coil with purple stripes
**HDL-BLNK-500-R** = No emitters, 250' coil

**HUNTER DRIPLINE COLOR CODE**

| STRIPE COLOR | TUBING COLOR |
|---|---|
| ● 0.9 GPH - Black | ● HDL-CV - Dark brown tubing, pressure-compensating with check valve |
| ○ 0.6 GPH - Gray | |
| ○ 0.4 GPH - Tan | |

## MAXIMUM RUN LENGTHS

**HDL-CV – 0.4 GPH**

| Pressure (PSI) | Emitter Spacing (in.) 12 | 18 | 24 |
|---|---|---|---|
| 15 | 205 | 289 | 367 |
| 20 | 289 | 404 | 513 |
| 25 | 339 | 479 | 604 |
| 30 | 380 | 535 | 679 |
| 40 | 438 | 623 | 788 |
| 50 | 489 | 691 | 872 |
| 60 | 529 | 747 | 947 |

**HDL-CV – 0.6 GPH**

| Pressure (PSI) | Emitter Spacing (in.) 12 | 18 | 24 |
|---|---|---|---|
| 15 | 171 | 239 | 304 |
| 20 | 239 | 336 | 426 |
| 25 | 280 | 398 | 501 |
| 30 | 314 | 441 | 560 |
| 40 | 363 | 516 | 653 |
| 50 | 404 | 570 | 722 |
| 60 | 438 | 619 | 784 |

**HDL-CV – 1.0 GPH**

| Pressure (PSI) | Emitter Spacing (in.) 12 | 18 | 24 |
|---|---|---|---|
| 15 | 117 | 164 | 211 |
| 20 | 164 | 233 | 292 |
| 25 | 192 | 273 | 348 |
| 30 | 217 | 307 | 389 |
| 40 | 251 | 355 | 451 |
| 50 | 280 | 395 | 501 |
| 60 | 302 | 429 | 541 |

# HDL-PC & HDL-R

*Maximize drip system longevity with robust material construction and pressure compensation for standard and reclaimed applications.*

## KEY BENEFITS

- Pressure-compensating emitters for consistent flow and uniform coverage
- Check height of 6' minimizes system drainage and runoff
- Color-coded stripes provide easy identification of flow
- UV Resistant facilitates product longevity
- Stretch-wrapped coils stay intact and make installation quick and easy
- Superior grit tolerance provided by proprietary emitter design with multiple inlet filters, a wide turbulent labyrinth and a full-size outlet pool
- Reclaimed product (HDL-R) identified by purple stripes assists in visual identification when using non-potable water

## PRODUCT SPECIFICATIONS

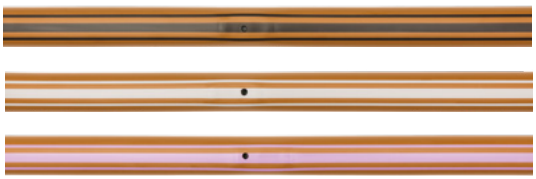
- Available flow rates: 0.6, 0.9 GPH
- Available emitter spacing: 12", 18", 24"
- Tubing dimensions: 0.660" x 0.560" (outside/inside diameter)

## OPERATING SPECIFICATIONS

- Operating range: 10 to 60 PSI
- Minimum filtration: 120 mesh (125 microns)
- Warranty period: 5 years (plus 2 additional years for environmental stress cracking)

**HDL-PC**

**HDL-R** (Reclaimed)



**HDL – SPECIFICATION BUILDER:** ORDER 1 + 2 + 3 + 4

| 1 Model | 2 Spacing | 3 Length | 4 Options |
|---|---|---|---|
| **HDL-06** = 0.6 GPH flow | **12** = 12" | **100** = 100' | **PC** = Pressure-compensating |
| **HDL-09** = 0.9 GPH flow | **18** = 18" | **250** = 250' | **R** = Reclaimed |
| | **24** = 24" | **500** = 500' | |
| | | **1K** = 1,000' | |

**Example:**
**HDL-09-12-1K-PC** = 0.9 GPH, 12" emitter spacing, 1,000" coil with PC emitter
Note: Two HDL-PC products are available in 100' coils: HDL-06-12-100-PC and HDL-09-12-100-PC

**HUNTER DRIPLINE COLOR CODE**

| STRIPE COLOR | TUBING COLOR |
|---|---|
| 0.9 GPH - Black | HDL-PC - Light brown tubing pressure-compensating |
| 0.6 GPH - Gray | HDL-R - Light brown with purple stripe - pressure-compensating reclaimed |
| Reclaimed - Purple | |

## MAXIMUM RUN LENGTHS

**HDL-PC/R – 0.4 GPH**

| Pressure (PSI) | Emitter Spacing (in.) 12 | 18 | 24 |
|---|---|---|---|
| 10 | 205 | 285 | 361 |
| 15 | 285 | 404 | 511 |
| 20 | 339 | 475 | 604 |
| 25 | 380 | 532 | 675 |
| 30 | 411 | 582 | 735 |
| 40 | 463 | 657 | 831 |
| 50 | 507 | 719 | 912 |
| 60 | 548 | 772 | 981 |

**HDL-PC/R – 0.6 GPH**

| Pressure (PSI) | Emitter Spacing (in.) 12 | 18 | 24 |
|---|---|---|---|
| 10 | 168 | 236 | 298 |
| 15 | 236 | 333 | 423 |
| 20 | 280 | 395 | 501 |
| 25 | 314 | 441 | 560 |
| 30 | 339 | 482 | 610 |
| 40 | 385 | 545 | 688 |
| 50 | 419 | 594 | 753 |
| 60 | 451 | 638 | 810 |

**HDL-PC/R – 0.9 GPH**

| Pressure (PSI) | Emitter Spacing (in.) 12 | 18 | 24 |
|---|---|---|---|
| 10 | 114 | 164 | 208 |
| 15 | 164 | 233 | 292 |
| 20 | 192 | 273 | 348 |
| 25 | 214 | 304 | 385 |
| 30 | 236 | 333 | 419 |
| 40 | 267 | 376 | 479 |
| 50 | 292 | 414 | 523 |
| 60 | 314 | 441 | 560 |

# HDL-COP

*Minimize the risk of root intrusion by adding copper to industry-leading Hunter Dripline.*

## KEY BENEFITS

- Copper oxide in the emitter provides root intrusion resistance
- Copper will not leach into soil
- Slow-draining check valve (CV) emitters prevent low-point pooling and boost system efficiency
- Pressure-compensating emitters provide consistent flow over the entire lateral length
- Anti-siphon feature prevents debris from entering emitter
- Color-coded stripes provide easy identification of flow
- UV resistance facilitates product longevity
- Stretch-wrapped coils stay intact and make installation quick and easy
- Multiple inlet filters in the emitter and a wide turbulent labyrinth provide superior grit tolerance
- Full-sized emitter outlet pool and raised wall inhibit debris and roots from entering the emitter

**HDL-CV**

**Coil with Stretch Wrap**

## PRODUCT SPECIFICATIONS

- Available flow rates: 0.6, 0.9 GPH
- Available emitter spacing: 12"
- Tubing dimensions: 0.660" x 0.560" (outside/inside diameter)

## OPERATING SPECIFICATIONS

- Operating range: 15 to 60 PSI
- Minimum filtration: 120 mesh (125 microns)
- Warranty period: 5 years (plus 2 additional years for environmental stress cracking)

## AVAILABLE MODELS

- HDL-09-12-250-COP
- HDL-09-12-1K-COP
- HDL-06-12-250-COP
- HDL-06-12-1K-COP

## MAXIMUM RUN LENGTHS

**HDL-COP – 0.6 GPH**

| Pressure (PSI) | Emitter Spacing (in.) 12 |
|---|---|
| 15 | 171 |
| 20 | 239 |
| 25 | 280 |
| 30 | 314 |
| 35 | 339 |
| 40 | 363 |
| 45 | 385 |
| 50 | 404 |
| 55 | 419 |
| 60 | 438 |

**HDL-COP – 0.9 GPH**

| Pressure (PSI) | Emitter Spacing (in.) 12 |
|---|---|
| 15 | 117 |
| 20 | 164 |
| 25 | 192 |
| 30 | 217 |
| 35 | 236 |
| 40 | 251 |
| 45 | 267 |
| 50 | 280 |
| 55 | 292 |
| 60 | 302 |

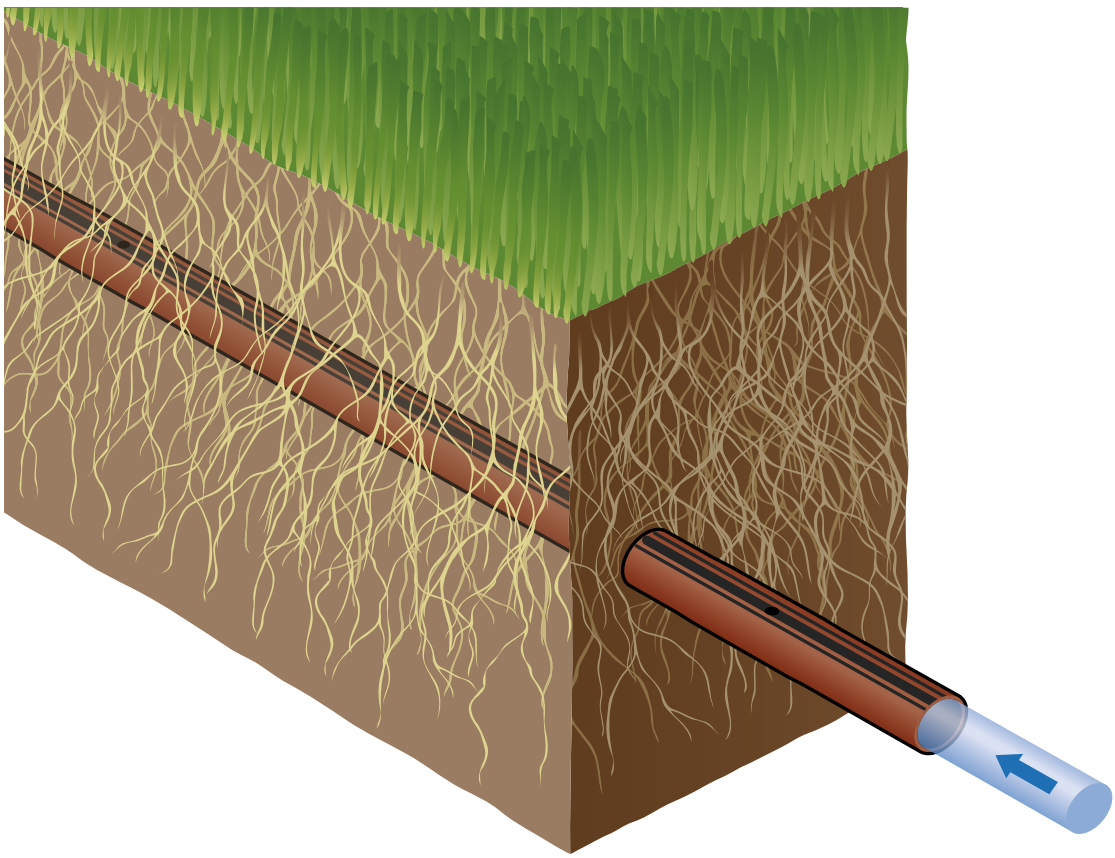
# HDL-COP

## HOW IT WORKS

Hunter Dripline is known for having an industry-leading emitter with a high level of grit tolerance, accurate flows, and very high burst ratings. This robust emitter is now provided with the added protection of copper, which has been scientifically proven to inhibit root growth. HDL-COP is designed with copper particles infused directly into the emitter. These benefits are long-lasting and provide an effective, nontoxic, and noncorrosive method for aiding in the prevention of root intrusion.

## HOW TO IRRIGATE SUBSURFACE

Effective subsurface irrigation requires a different technique than overhead irrigation. Shorter cycles and more frequent watering will assist in maintaining proper soil moisture, oxygenation of the soil, and the prevention of root intrusion. For more information, visit *hunterindustries.com/sites/default/files/subsurfaceguidelineshdl.pdf*



# LOC FITTINGS

*LOC fittings are compatible with any nominal ½" tubing and dripline for quicker installs and easy repairs.*

## KEY BENEFITS

- Glass-filled polypropylene for added durability
- Thread lock connection method provides a secure connection while still allowing flexibility for service and system changes

## PRODUCT SPECIFICATIONS

- Use with HDL, TWPE, or other 16/17/18 mm dripline or tubing
- For installations with PLD-IAC/PLD-IAE grommets, use an 11⁄16" spade drill bit to cut into the PVC

## OPERATING SPECIFICATIONS

- Operating pressure range: up to 145 PSI
- Warranty period: 2 years

## FITTINGS

**PLD-LOC 075**
¾" male pipe thread x LOC

**PLD-LOC 050**
½" male pipe Tread x LOC

**PLD-LOC CAP**
End cap x LOC

**PLD-LOC ELB**
Locking elbow

**PLD-LOC CPL**
Locking coupler

**PLD-LOC FHS**
¾" female hose swivel x LOC

**PLD-LOC TEE**
Locking tee



# 17 MM BARB FITTINGS

*Acetal construction holds vinyl and PE tubing for an ideal low-cost choice when installing dripline.*

## KEY BENEFITS

- Acetal material provides a secure connection
- Dual barb removes the need for clamps

## PRODUCT SPECIFICATIONS

- Use with HDL or other 17 mm dripline
- For installations with PLD-IAC/PLD-IAE grommets, use an 11⁄16" spade drill bit to cut into the PVC

## OPERATING SPECIFICATIONS

- Operating pressure range: up to 100 PSI
- Warranty period: 1 year

## FITTINGS

**PLD-050**
½" MPT x 17 mm barb

**PLD-ELB**
17 mm barb elbow

**PLD-075**
¾" MPT x 17 mm barb

**PLD-CPL**
17 mm barb coupling

**PLD-CAP**
17 mm barb x ½" MPT with cap

**PLD-075-TB-TEE**
17 mm barb tee x ¾" thread

**PLD-BV**
17 mm barb Shut-off valve

**PLD-TEE**
17 mm barb tee

**PLD-050-TB-TEE**
½" FPT x 17 mm barb tee

**PLD-IAC**
(with grommet) Insert adapter x 17 mm coupling

**PLD-IAE**
(with grommet) Insert adapter x 17 mm elbow

**PLD-CRS**
17 mm barb cross

**PLD-075-TB-ELB**
¾" FPT x 17 mm barb elbow

# SUBSURFACE SYSTEMS

*Subsurface drip irrigation systems can be extremely effective at saving water and encouraging root growth. Hunter is the only manufacturer to offer three tiers of top-quality subsurface irrigation solutions: HDL-COP dripline, Eco-Wrap fleece-wrapped dripline, and Eco-Mat specialized fleece mat.*

**1** **Eco-Mat** offers 30% greater efficiency than any other bare subsurface dripline product. It installs under the soil like a blanket of water, ready for the roots to absorb what they need.

**2** **Eco-Wrap** provides resistance to root intrusion while enhancing the capillary action and efficiency of the system. Eco-Wrap combines the quality of HDL with the wicking properties of polyethylene fleece.

**A** **Entry Manifold:**
- PVC (for stability) or polyethylene
- Assemble with either 17 mm or LOC fittings

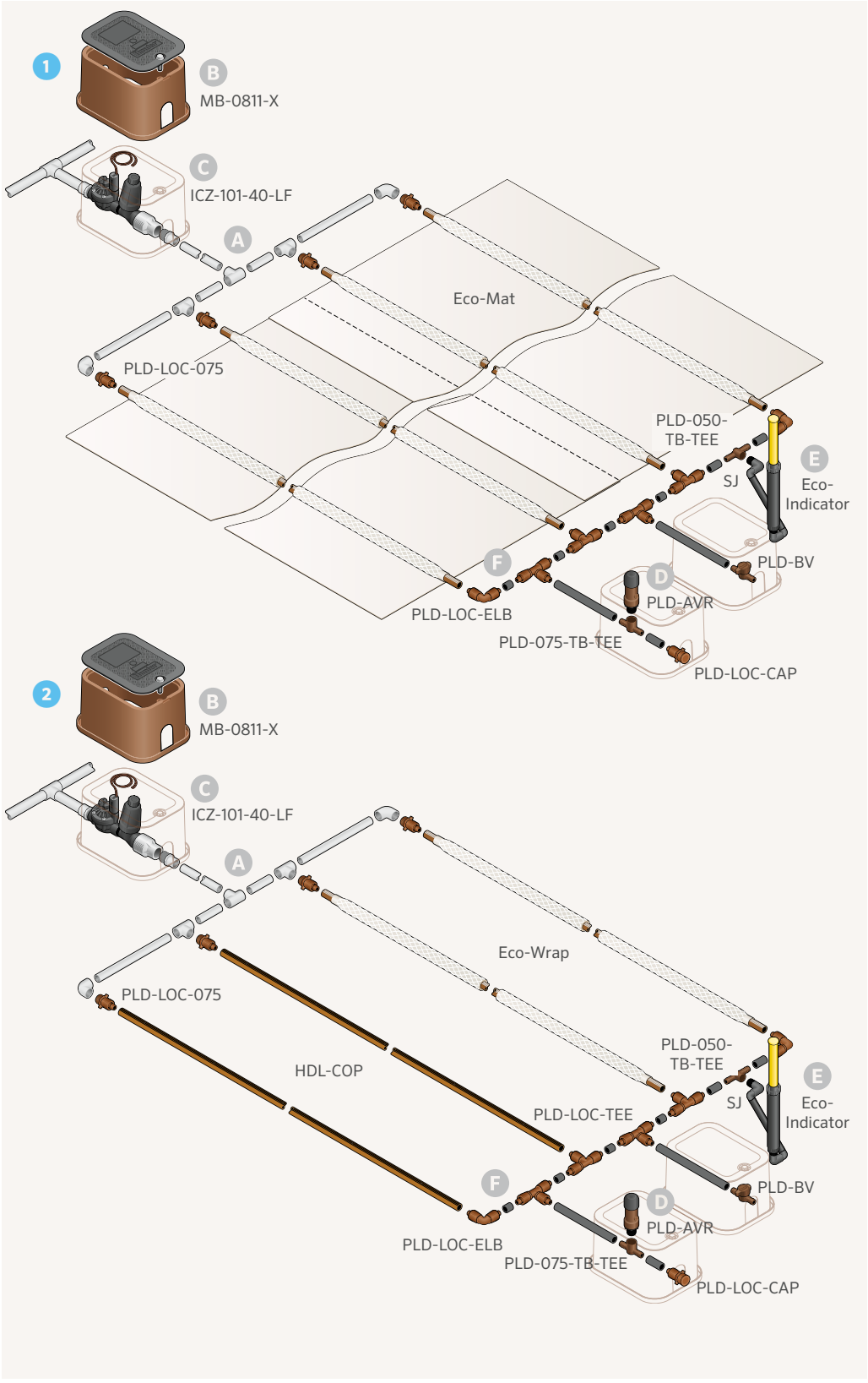
**B** **Multi-Purpose Box:**
- 10" x 7" opening
- Five color options for lids

**C** **Control Zone Kit:**
- Factory-assembled for quick and easy installation
- Low-, medium-, and high-flow kits

**D** **Air/Vacuum Relief Valve:**
- Helps prevent water hammer and tubing collapse
- Use at high point(s) in zone

**E** **Eco-Indicator:**
- Pops up at 12 PSI and shows system is running
- Reveals when system pressure drops too low

**F** **Fittings:**
- Double-barb holds fittings tight
- LOC fittings can be reused



# ECO-MAT®

*Irrigate plants below the root zone for maximum efficiency with a combination of fleece-wrapped dripline and fleece blanket.*

## KEY BENEFITS

- Anti-siphon feature and fleece wrap protect against debris and root intrusion
- Saves 20–40% more water than standard products due to superior capillary movement of water to the entire root zone, promoting healthier root growth
- Non-draining, pressure-compensating emitters open/close simultaneously, maximizing efficiency
- Check height of 6' minimizes system drainage and runoff

## OPERATING SPECIFICATIONS

- Operating range: 15 to 50 PSI
- Minimum filtration: 120 mesh; 125 microns
- Compatible with LOC and 17 mm insert barb fittings
- Air relief recommended for sloping conditions greater than 6'
- Recommended installation depth: turf (4" to 6"); other (4" to 14")
- May use in conjunction with Eco-Wrap
- Warranty period: 5 years (plus 2 additional years for environmental stress cracking)

## PRODUCT SPECIFICATIONS

- Flow rate: 0.6 GPH; 0.83 in/hr
- Emitter spacing: 12"
- Lateral row spacing: 14"
- Product width: 32"
- Roll length: mini roll = 100'; standard roll = 295'
- Tubing dimensions: 0.660" x 0.560" (outside/inside diameter)
- Water-holding capacity: 0.5 gallons
- Approximate coverage per roll: mini roll = 250 ft²; Standard roll = 830 ft²
- Example calculation based on area 40' x 80':

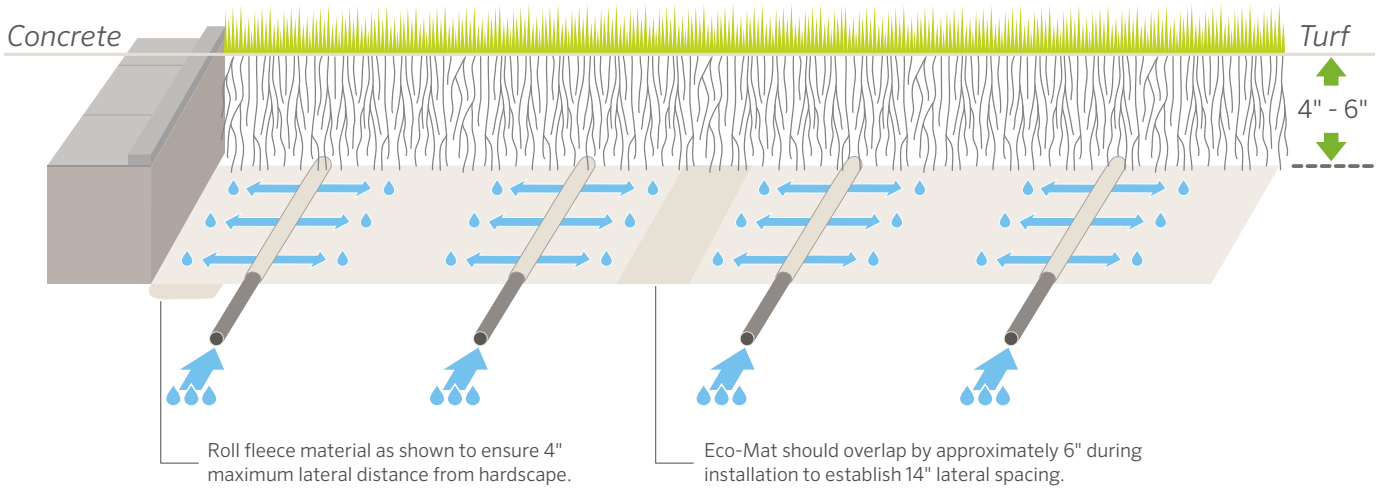
$$\text{Roll Qty.} = \frac{\text{Irrigated landscape area}}{\text{Area of roll coverage}} = \frac{3{,}200\ \text{ft}^2}{830\ \text{ft}^2} = 3.8 \text{ (round up to 4 rolls)}$$

Eco-Mat Installed

*Compatible with:*

***Soil-Clik***
*Page 141*

***Eco-Indicator***
*Page 164*



# ECO-WRAP®

*Irrigate more efficiently than blank dripline with fleece-wrapped dripline.*

## KEY BENEFITS

- Perfect for narrow areas that are difficult to irrigate with standard methods
- Anti-siphon feature and fleece wrap protect against debris and root intrusion
- Saves 20–40% more water than standard products due to superior capillary movement of water to the entire root zone, promoting healthier root growth
- Non-draining, pressure-compensating emitters open/close simultaneously, maximizing efficiency
- Check height of 6' minimizes system drainage and runoff

## OPERATING SPECIFICATIONS

- Flow rate: 0.6 GPH
- Emitter spacing: 12"
- Tubing dimensions: 0.660" x 0.560" (outside/inside diameter)
- Roll length: 250'
- Accepts 17 mm barb or LOC fittings
- Warranty period: 5 years (plus 2 additional years for environmental stress cracking)

## PRODUCT SPECIFICATIONS

- Operating range: 15 to 50 PSI
- Minimum filtration: 120 mesh; 125 microns
- Air relief recommended for sloping conditions greater than 6'
- Recommended installation depth: turf (4" to 6"); other (4" to 8")
- Compatible with Eco-Mat

**MAXIMUM RUN LENGTH FOR ECO-MAT AND ECO-WRAP**

| Pressure (PSI) | Length (ft.) |
|---|---|
| 15 | 171 |
| 20 | 239 |
| 25 | 280 |
| 30 | 314 |
| 40 | 363 |
| 50 | 404 |
| 60 | 438 |

**Eco-Wrap**

*For maximum run lengths, reference the Maximum Run Length Chart on page 156. Use 0.6 GPH for flow and 12" emitter spacing.*

**Eco-Wrap Installed**

*Compatible with:*

***Soil-Clik***
*Page 141*

***Eco-Indicator***
*Page 164*

# SUPPLY TUBING

*UV-resistant polyethylene makes this 0.700" x 0.600" solution a useful addition to drip systems.*

## KEY BENEFITS

- Thick wall and UV resistance provide durability and longevity
- Kink resistance for added flexibility and quicker installation

## PRODUCT SPECIFICATIONS

- 0.700" x 0.600" (outside x inside diameter)

## OPERATING SPECIFICATIONS

- Operating pressure range: up to 80 PSI
- Warranty period: 2 years
- Warranty period: 2 years

**½" PE Tubing**

**½" PE TUBING – SPECIFICATION BUILDER:** ORDER 1 + 2 + 3

| 1 Model | 2 Tubing Diameter | 3 Length |
|---|---|---|
| **TWPE** = Thick-walled polyethylene tubing | **700** = 0.700" outside diameter | **100** = 100'<br>**250** = 250'<br>**500** = 500'<br>**1K** = 1,000' |

**Example:**
**TWPE-700-250** = ½" polyethylene tubing in a 250' roll



# ECO-INDICATOR

*Confirm system operation and adequate pressure with this handy visual tool.*

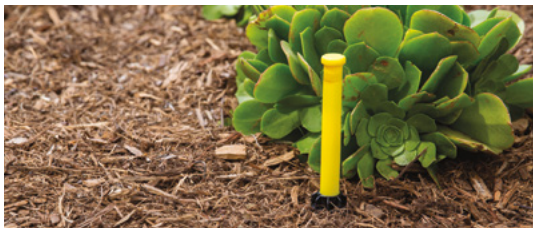
## KEY BENEFITS

- Visible yellow stem indicates when system is in operation
- Stem pops up when pressure exceeds 12 PSI and assists in confirming low pressures if not raised

## OPERATING SPECIFICATIONS

- Operating pressure: up to 80 PSI
- Indication of system operation: above 12 PSI
- Warranty period: 2 years

**Eco-Indicator Installed**



**ECO-ID**

*Pair with Eco-Mat® and Eco-Wrap® subsurface systems.*

# MLD

*Use this ¼" dripline solution for tight spaces and raised planters.*

## KEY BENEFITS

- Superior flexibility makes MLD an excellent choice for small spaces and raised containers
- Properly irrigates without being intrusive to the landscape

## PRODUCT SPECIFICATIONS

- Colors: brown or black polyethylene
- Emitter spacing: 6" or 12"
- Coil sizes: 100' or 250'
- 0.250" x 0.175" (outside/inside diameters)
- Use with ¼" barb fittings

## OPERATING SPECIFICATIONS

- Pressure range: 10–40 PSI
- Minimum filtration: 150 mesh; 120 microns
- Maximum run lengths: 6" spacing = 15'; 12" spacing = 30'
- Warranty period: 2 years

**MLD**

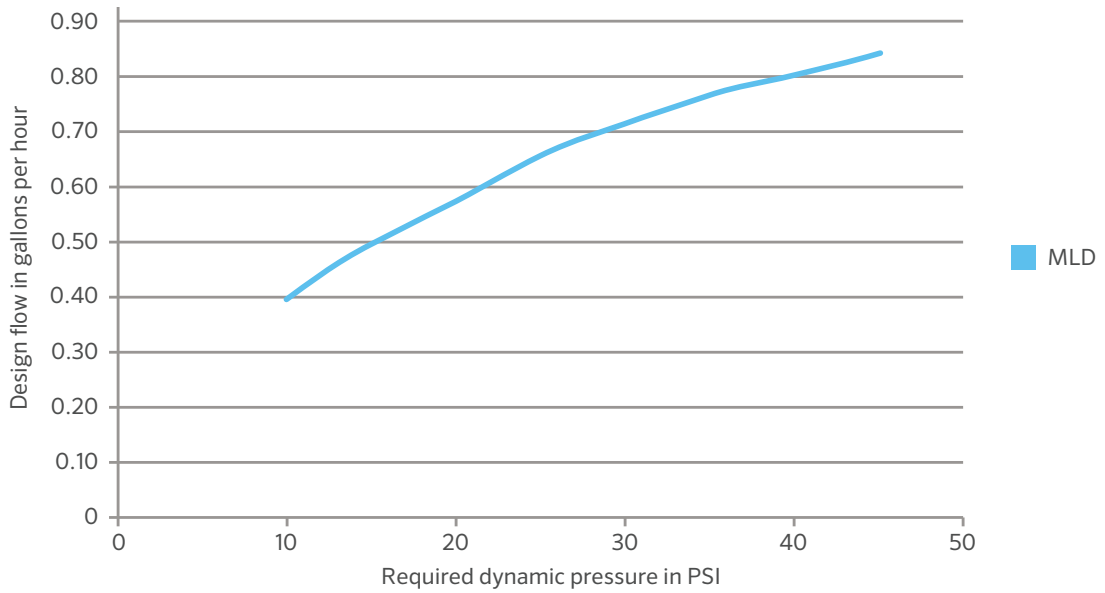
**MLD Installed**

**MLD – SPECIFICATION BUILDER:** ORDER 1 + 2 + 3 + 4

| 1 Model | 2 Spacing | 3 Length | 4 Options |
|---|---|---|---|
| **MLD-05** | **06** = 6"<br>**12** = 12" | **100** = 100'<br>**250** = 250' | **BL** = Black<br>**(blank)** = Brown |

**Example:**
**MLD-05-12-250** = 0.5 GPH mini landscape dripline with 12" spacing in a 250' roll, brown

**MLD FLOW CHART**



# DISTRIBUTION TUBING

*Add stability and flexibility when using point-source emitters or micro sprays.*

## KEY BENEFITS

- High quality vinyl or polyethylene securely connects to acetal ¼" fittings
- Vinyl is more flexible, but it softens in high heat and should be used in cooler climates
- Polyethylene performs well in warmer climates

## PRODUCT SPECIFICATIONS

- Material: polyethylene or vinyl
- Coil sizes: 100', 250', and 1,000'

## OPERATING SPECIFICATIONS

- Operating pressure range: up to 60 PSI
- Warranty period: 2 years

**¼" Tubing**

**¼" TUBING – SPECIFICATION BUILDER:** ORDER 1 + 2 + 3

| 1 Model | 2 Tubing Diameter | 3 Length |
|---|---|---|
| **HQPE** = Polyethylene tubing<br>**HQV** = Vinyl tubing | **250** = 0.250" outside diameter | **100** = 100'<br>**250** = 250'<br>**1K** = 1,000' |

**Example:**
**HQPE-250-1K** = ¼" polyethylene tubing in a 1,000' roll

# ¼" BARBED FITTINGS

*Ensure a superior hold with robust acetal construction.*

## KEY BENEFITS

- Acetal material provides a secure connection
- Goof plug lays flat to help prevent leaking

## PRODUCT SPECIFICATIONS

- Fits Hunter MLD and distribution tubings

## OPERATING SPECIFICATIONS

- Pressure range: up to 60 PSI
- Warranty period: 1 year

**QB-TEE**
¼" barb tee

**QB-ELB**
¼" barb elbow

**QB-CPL**
¼" barb coupling

**QB-CRS**
¼" barb cross

**GP-025**
Goof plug

**¼" Barb Fittings:**

*Use with MLD or any vinyl or polyethylene ¼" tubing, UV-stabilized materials, and durable single barb connection.*

# IH RISERS

*Simplify point-to-point irrigation with vandal-resistant, heavy-duty IH Risers.*

## KEY BENEFITS

- Heavy-duty, military-grade, vandal-resistant design
- Made of flexible PVC for durability
- Brown components blend in with landscape
- Accepts any ½" FPT emitter
- Ideal for slopes
- Pre-assembly reduces labor by up to 50%
- At-grade or below-grade installation
- Available in multiple lengths for easy assembly
- Pre-assembled with ½" MPT adapter and specified emitter with check valve
- Available as components for custom assemblies
- Check valve holds back 12' of head

## OPERATING SPECIFICATIONS

- Maximum flow: 7 GPM
- Maximum pressure: 60 PSI
- Warranty period: 2 years

## RECOMMENDED GLUES FOR FLEXIBLE PVC

- IPS® Weld-On®:
  - P-68™ primer (recommended for PVC fittings only)
  - P-70™ primer (may be used but P-68 is suggested)
  - 795™ Flex PVC cement
- Christy's®:
  - Purple Primer® or Red Hot Clear Primer® (fittings only)
  - Flex Pro PVC pipe cement
  - Red Hot Blue Glue® (not specialized for flexible PVC)

**IH Risers with Emitters – SPECIFICATION BUILDER:** ORDER 1 + 2 + 3

| 1 Riser Length | 2 Flow with Check Valve Screen | 3 Fitting Options |
|---|---|---|
| **IH-06** = 6" riser | **05-CV** = 0.5 GPH | **(blank)** = Brown |
| **IH-12** = 12" riser | **10-CV** = 1.0 GPH | **R** = Reclaimed (purple fitting) |
| **IH-18** = 18" riser | **20-CV** = 2.0 GPH | |
| **IH-24** = 24" riser | **40-CV** = 4.0 GPH | |
| **IH-36** = 36" riser | **60-CV** = 6.0 GPH | |

**Example:**
**IH-12-10-CV** = 12" irrigation hose riser with 1.0 GPH emitter with brown fittings

**IH RISER COMPONENTS SOLD SEPARATELY**

| Model | Description |
|---|---|
| SCREEN-CV | Filter screen with 12' check valve |
| IH-FIT-3850 | ⅜" x ½" MPT IH fitting |
| IH-FIT-3850-R | ⅜" x ½" MPT IH fitting (reclaimed) |
| IH-250 | 250' length of 12" flexible PVC irrigation hose |
| IPS-050-250 | 250' length of ½" IPS |

IPS, Weld-On, P-68, P-70, and 795 are trademarks of IPS Corporation. Christy's, Purple Primer, Red Hot Clear Primer, and Red Hot Blue Glue are trademarks of T. Christy Enterprises.

**IH RISERS**

**SCREEN-CV**
Filter screen with 12' check valve.

**IH-FIT-3850**
⅜" x ½" MPT
IH fitting

**IH-FIT-3850-R**
⅜" x ½" MPT
IH fitting
(reclaimed)

**IPS-050-250**

**IH-250**

Flexible PVC for creating headers or custom risers

# POINT-SOURCE EMITTERS

*Ensure accurate irrigation for mixed and sparse plantings with a wide range of flow rates.*

## KEY BENEFITS

- Pressure-compensating for consistent and reliable flow
- Color-coded by flow for easy identification in the field
- Earth-tone colors blend in well with the surrounding environment
- Three inlet variations: ¼" barb, 10-32 thread, ½" FPT
- Coined edges for easy grip
- Self-piercing barb
- Optional diffuser cap
- Self-flushing diaphragm

## OPERATING SPECIFICATIONS

- Recommended pressure range: 20 to 50 PSI
- Minimum filtration: 150 mesh; 100 microns
- Warranty period: 2 years

**½" FEMALE THREAD (BROWN BASE)**

| | Model | Inlet Type | Flow (GPH) |
|---|---|---|---|
| Blue | HEB-05-BR | ½" female thread | 0.5 |
| Black | HEB-10-BR | ½" female thread | 1.0 |
| Red | HEB-20-BR | ½" female thread | 2.0 |
| Tan | HEB-40-BR | ½" female thread | 4.0 |
| Orange | HEB-60-BR | ½" female thread | 6.0 |

**EMITTER MODEL CHART**

| | Model | Inlet Type | Flow (GPH) |
|---|---|---|---|
| Blue | HE-050-B | Self-piercing barb | 0.5 |
| Black | HE-10-B | Self-piercing barb | 1.0 |
| Red | HE-20-B | Self-piercing barb | 2.0 |
| Tan | HE-40-B | Self-piercing barb | 4.0 |
| Orange | HE-60-B | Self-piercing barb | 6.0 |
| Blue | HE-050-T | 10-32 thread | 0.5 |
| Black | HE-10-T | 10-32 thread | 1.0 |
| Red | HE-20-T | 10-32 thread | 2.0 |
| Tan | HE-40-T | 10-32 thread | 4.0 |
| Orange | HE-60-T | 10-32 thread | 6.0 |
| Blue | HEB-05 | ½" female thread | 0.5 |
| Black | HEB-10 | ½" female thread | 1.0 |
| Red | HEB-20 | ½" female thread | 2.0 |
| Tan | HEB-40 | ½" female thread | 4.0 |
| Orange | HEB-60 | ½" female thread | 6.0 |

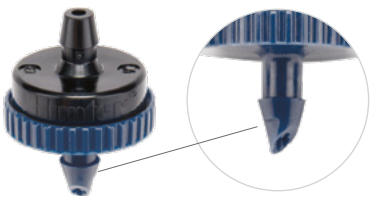
**Hunter Emitter Multi-Tool**
P/N HEMT
(Punches pilot holes and pellets, inserts and removes emitters, cuts tubing)

**Pocket Punch**
P/N POCKETPUNCH
(Punches, inserts, and removes emitters)

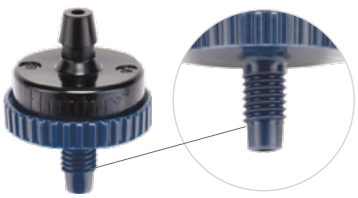
**DIFFUSER CAP**
(HE-DIFF)
Use for flows higher than 2 GPH to diffuse the water and prevent erosion.

**½" FEMALE THREAD**
Brown base matches IH Risers and blends into landscaping

**Inlet Options**



① Self-piercing barb



② 10-32 thread

③ ½" female thread

# MULTI-PORT EMITTERS

*Use these emitters to irrigate groups of plants effectively from one source.*

## KEY BENEFITS

- Six pressure-compensating emitter ports provide consistent and reliable flow
- Color-coded by flow for easy identification
- Earth-tone colors blend in with surrounding landscape
- Swivel elbows assist in placing water directly to plant
- MPM (Multi-Port Manifold) provides unrestricted flow for each outlet

## PRODUCT SPECIFICATIONS

- Available in ½" FNPT
- Available flows: 0.5, 1.0, 2.0 GPH
- PVC cap plugs port when not being used

## OPERATING SPECIFICATIONS

- Pressure range: 10 to 50 PSI
- Minimum filtration: 150 mesh
- Warranty period: 2 years

**MULTI-PORT EMITTER MODEL CHART**

| | Model | Flow (GPH) |
|---|---|---|
| Blue | MPE-05 | 0.5 |
| Black | MPE-10 | 1.0 |
| Red | MPE-20 | 2.0 |
| Gray | MPM-050 | N/A |

**Multi-Port Emitter**

**Multi-Port Manifold**
(MPM-050)
Unrestricted flow through outlets as indicated by gray color. Use with ¼" distribution tubing and a barbed emitter at the end (available in ½" FPT). Allows water to be directed to as many as six different locations.

**Emitter Caps**
(MPE-CAPS)
Plug unused ¼" barbed emitter outlets. Use with Hunter Multi-Port Emitters.

# MICRO SPRAYS

*Apply water accurately for small-area coverage.*

## SOLO-DRIP

- Eight streams of water for thorough coverage
- Adjustable cap for flow and radius adjustment

**SOLO-DRIP PERFORMANCE DATA**

| Pressure PSI | Flow GPH | Throw Diameter ft. |
|---|---|---|
| 15 | 0–11 | 0–1.5 |
| 20 | 0–12.5 | 0–1.9 |
| 30 | 0–15.7 | 0–2.7 |

**Note:** Adjustable to maximum (approximately 20 clicks)

## HALO-SPRAY

- Adjustable umbrella of water
- Adjustable cap for flow and radius adjustment

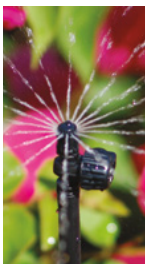
**HALO-SPRAY PERFORMANCE DATA**

| Pressure PSI | Flow GPH | Throw Diameter ft. |
|---|---|---|
| 15 | 0–14 | 0–5.8 |
| 20 | 0–16 | 0–7.7 |
| 30 | 0–20 | 0–11.5 |

**Note:** Adjustable to maximum (approximately 14 clicks)

## TRIO-SPRAY

- Full-, half-, and quarter-circle configurations
- Adjustable cap for flow and radius adjustment



**TRIO-SPRAY PERFORMANCE DATA**

| Pressure PSI | Flow GPH | Spray Pattern ft. Diameter in Throw 360° x 18 Hole | Radius of Throw 180° | Radius of Throw 90° |
|---|---|---|---|---|
| 10 | 0–16.7 | 0–17 | 0–7 | 0–6 |
| 15 | 0–20.3 | 0–19 | 0–8 | 0–7 |
| 20 | 0–23.4 | 0–20 | 0–9 | 0–8 |
| 25 | 0–26.1 | 0–22 | 0–10 | 0–9 |
| 30 | 0–28.6 | 0–23 | 0–11 | 0–10 |

**SD-T**



**HS-T**



**TS-T-F**

**SD-B**

**HS-B**

**TS-T-H**

**SD-B-STK**
Height: 6"

**HS-B-STK**
Height: 6"

**TS-T-Q**

B = Barbed, F = Full, H = Half, Q = Quarter, STK = Stake, T = Threaded

*For a more robust overhead micro spray system, pair Short-Radius Micro Spray Nozzles with Pro-Spray sprinklers:*

***Short-Radius Micro Spray Nozzles***
*Page 69*

# RIGID RISERS

*These risers maintain their stiffness even when used with micro sprays, making them a perfect choice for high-throw applications.*

## KEY BENEFITS

- For rugged system designs
- Accepts 10-32 threaded components
- Perfect for annual flower beds and planters
- Inlet configurations: ½" FPT, ¼" barb, or blank
- HDPE construction

## OPERATING SPECIFICATIONS

- Warranty period: 1 year

**RIGID RISER MODEL CHART**

| Model | Description |
|---|---|
| RR12 | 12" rigid riser |
| RR12-T | 12" rigid riser with ½" threaded base |
| RR12-B | 12" rigid riser with ¼" barb base |
| RR18 | 18" rigid riser |
| RR18-T | 18" rigid riser with ½" threaded base |
| RR18-B | 18" rigid riser with ¼" barb base |

**Rigid Riser**
Available in 12" and 18" inlet options

# MULTI-PURPOSE BOX

*This sturdy box is just the right size to provide protection and easy access to essential irrigation components.*

## KEY BENEFITS

- Small footprint in a sturdy, durable box
- Five color offerings blend in with any environment
- Overlapping lid prevents debris from entering box
- Knock-out bolt hole
- UV-protected, non-slip lid

## PRODUCT SPECIFICATIONS

- Fits small control zone kits and other assorted components
- Durable HDPE construction
- ⅜" bolt included with every box
- Warranty period: 2 years

| MULTI-PURPOSE BOX | |
|---|---|
| **Model** | **Description** |
| **MB-0811** | Multi-purpose box with standard brown lid |
| **MB-0811-G** | Multi-purpose box with green lid |
| **MB-0811-T** | Multi-purpose box with tan lid |
| **MB-0811-R** | Multi-purpose box with purple lid |
| **MB-0811-B** | Multi-purpose box with black lid |
| **MB-BOX** | Multi-purpose box (box only) |
| **MB-LID** | Multi-purpose box (lid only), brown |
| **MB-LID-G** | Multi-purpose box (lid only), green |
| **MB-LID-T** | Multi-purpose box (lid only), tan |
| **MB-LID-R** | Multi-purpose box (lid only), purple |
| **MB-LID-B** | Multi-purpose box (lid only), black |

**Multi-Purpose Box**
Top
Width: 7½"
Length: 10½"

Bottom
Width: 8½"
Length: 11½"

Height: 8"

**MB-LID-B**

**MB-LID-G**

**MB-LID**

**MB-LID-R**

**MB-LID-T**

**Multi-Purpose Box Installed**

# AIR/VACUUM RELIEF VALVE

*Prevent water hammer and system collapse by discharging air during startup and allowing air to enter during shutdown.*

## KEY BENEFITS

- Releases air pockets without premature closure
- Leak-free closure after release
- Helps prevent system collapse through vacuum relief

## PRODUCT SPECIFICATIONS

- UV-protected and corrosion-resistant material

## OPERATING SPECIFICATIONS

- Pressure range: up to 80 PSI
- Warranty period: 2 years

**AVR-075**
Height: 5"
Width: 2"
Inlet: ¾" MPT

**PLD-AVR**
½" Air/vacuum relief valve

**Air/Vacuum Relief Valve Installed**

# AUTOMATIC FLUSH VALVE

*Keep laterals clean by automatically flushing water, air, and debris at each system startup.*

## KEY BENEFITS

- Flushes debris automatically at every system startup
- Reversible diaphragm to coordinate with low or high flow
- Lateral placement provides better grit tolerance

## PRODUCT SPECIFICATIONS

- Removable top for diaphragm maintenance

## OPERATING SPECIFICATIONS

- Pressure range: up to 60 PSI
- Low-flow diaphragm side: 2 to 5 GPM
- High-flow diaphragm side: 5 to 12 GPM
- Warranty period: 1 year

**AFV-B**
Automatic flush valve with 17 mm barb connection

**AFV-T**
Automatic flush valve with ½" MPT connection

**Automatic Flush Valve Installed**

# RZWS

*Deliver water across all levels of the root zone for high-efficiency subsurface irrigation of trees and shrubs.*

## KEY BENEFITS

- Patented StrataRoot™ baffles divert water to all levels of the root zone while adding strength to the unit
- Durable locking cap for vandal resistance
- Pressure-compensating bubbler for accurate water flow
- Built-in Hunter Swing Joint for direct installation to ½" PVC fitting
- Pre-assembled for fast installation

## OPERATING SPECIFICATIONS

- Bubbler flow rates: 0.25 or 0.50 GPM
- Recommended pressure range: 15 to 70 PSI
- Warranty period: 2 years

## FACTORY-INSTALLED OPTIONS

- Check valve (HCV)
- Locking reclaimed water purple cap

## USER-INSTALLED OPTIONS

- Fabric sleeve to prevent soil intrusion in sandy areas for 18" and 36" models (P/N RZWS-SLEEVE)
- Replacement cap for 18" and 36" models (P/N 913300SP)
- Locking reclaimed purple cap for 18" and 36" models (P/N 913301SP)
- Reclaimed water purple cap for 10" model (P/N RZWS10-RCC)

**ROOT ZONE WATERING SYSTEM – SPECIFICATION BUILDER:** Order 1 + 2 + 3

| 1 Model | 2 Bubbler Flow Rate | 3 Options |
|---|---|---|
| **RZWS-10** = 10" Root Zone Watering System | **25** = 0.25 GPM | **(blank)** = No option |
| **RZWS-18** = 18" Root Zone Watering System | **50** = 0.50 GPM | **CV** = Check valve |
| **RZWS-36** = 36" Root Zone Watering System | **(blank)** = No bubbler or swing joint | **R** = Reclaimed cap |
| | | **CV-R** = Check valve with reclaimed cap |

**Examples:**
**RZWS-10-50-CV** = 10" Root Zone Watering System at 0.50 GPM, with check valve
**RZWS-36-25-CV-R** = 36" Root Zone Watering System at 0.25 GPM, with check valve and reclaimed cap

**RZWS-10**
Diameter: 2"
Length: 10"

**RZWS-18**
Tube diameter: 3"
Cap diameter: 4¾"
Length: 18"

**RZWS-36**
Tube diameter: 3"
Diameter: 4¾"
Length: 36"

**Reclaimed models available (Add -R to model number)**

**ADDITIONAL OPTION (SPECIFY SEPARATELY)**

**RZWS-SLEEVE** = Field-installed sleeve made from filter fabric

# RZB

*This accessory for small trees and shrubs assists in delivering water to roots.*

## KEY BENEFITS

- Solid mesh tube with perforated top to complement overhead or drip irrigation systems
- Allows oxygen and natural precipitation to reach the root zone
- Easy installation that directs overhead and drip irrigation to the root zone
- Warranty period: 1 year

**RZB**
Diameter: 2"
Length: 9"

# RECLAIMED

# EMBRACE THE POWER OF PURPLE

*with our complete line of reclaimed water products*

## ROTORS

**PGJ**

- **PGJ-00-R**
- **PGJ-04-R**
- **PGJ-06-R**
- **PGJ-12-R**

**PGP ULTRA**

- **PGP-00-CV-R**
- **PGP-00-CV-R-PRB**
- **PGP-04-CV-R**
- **PGP-04-CV-R-PRB**
- **PGP-12-CV-R**

**I-20**

- **I-20-00-R**
- **I-20-00-R-PRB**
- **I-20-04-R**
- **I-20-04-SS-R**
- **I-20-04-R-PRB**
- **I-20-04-SS-R-PRB**
- **I-20-06-R**
- **I-20-06-SS-R**
- **I-20-06-R-PRB**
- **I-20-06-SS-R-PRB**
- **I-20-12-R**

**I-25**

- **I-25-04-R**
- **I-25-04-SS-R**
- **I-25-06-R**
- **I-25-06-SS-R**

**I-40**

- **I-40-04-SS-R**
- **I-40-04-SS-ON-R**
- **I-40-06-SS-R**
- **I-40-06-SS-ON-R**

**I-50**

- **I-50-06-SS-R**
- **I-50-06-SS-ON-R**

**Rotors** Key

**00** - Shrub
**04** - 4" pop-up
**06** - 6" pop-up
**12** - 12" pop-up
**CV** - Check valve
**SS** - Stainless steel
**ON** - Opposing nozzles
**PRB** - Pressure-regulated body
**ARV** - Adjustable arc
**3RV** - Full-circle

## ROTORS

**I-80**

- **I-80-00-SS-R**
- **I-80-04-SS-R**
- **I-80-00-SS-ON-R**
- **I-80-04-SS-ON-R**

**I-90**

- **I-90-ARV**
- **I-90-3RV**

## SPRAYS

**PRO-SPRAY**

- **PROS-00-R**
- **PROS-04-CV-R**
- **PROS-06-CV-R**
- **PROS-12-CV-R**
- **PROS-RC-CAP-SP** (snap-on)
- **458520SP** = ID cap (threaded)

**PRO-SPRAY PRS30**

- **PROS-00-PRS30-R**
- **PROS-04-PRS30-CV-R**
- **PROS-06-PRS30-CV-R**
- **PROS-12-PRS30-CV-R**
- **458560** = ID cap

**PRO-SPRAY PRS40**

- **PROS-00-PRS40-R**
- **PROS-04-PRS40-CV-R**
- **PROS-06-PRS40-CV-R**
- **PROS-12-PRS40-CV-R**
- **458562** = ID cap

**Sprays** Key

**00** - Shrub
**04** - 4" pop-up
**06** - 6" pop-up
**12** - 12" pop-up
**CV** - Check valve

# BUBBLERS

### BUBBLERS

**PCB-25-R**

**PCB-50-R**

**PCB-10-R**

**PCB-20-R**

**Bubblers** Key

**25** - 0.25 GPM
**50** - 0.50 GPM
**10** - 1.00 GPM
**20** - 2.00 GPM

# VALVES

### ICV

**ICV-101G-FS-R**

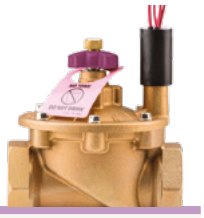
**ICV-151G-FS-R**

**ICV-201G-FS-R**

**ICV-301-FS-R**

**561205** = ICV-101-201 series ID handle

**515005** = ICV-301 series ID handle



### IBV

**IBV-101G-FS-R**

**IBV-151G-FS-R**

**IBV-201G-FS-R**

**IBV-301G-FS-R**


### QUICK COUPLER

**HQ-33DLRC-R**

**HQ-44LRC-R**

**HQ-44LRC-AW-R**

**HQ-5LRC-R**

### DRIP CONTROL ZONE KITS

**ICZ-101-25-LF-R**

**ICZ-101-40-LF-R**

**HFR-100-075-25-R** = Filter with 25 PSI regulator only

**HFR-100-075-40-R** = Filter with 40 PSI regulator only

**Valves** Key

**FS** - Filter Sentry®
**LRC** - Locking rubber cover
**RC** - Rubber cover
**AW** - Acme key with anti-rotation wheels

*** Note:** IBV purple tags are user-installed options.

**Quick Coupler** Key

**LRC** - Locking rubber cover
**RC** - Rubber cover
**AW** - Acme key with anti-rotation wheels

# MICRO

### IH RISERS

**IH-RISER-XX-R**

**IH-XX-YY-CV-R**

**IH-FIT-3850-R**

### RZWS

**RZWS-10-R**
**RZWS-10-25-R**
**RZWS-10-50-R**
**RZWS-10-25-CV-R**
**RZWS-10-50-CV-R**
**RZWS-18-R**
**RZWS-18-25-R**
**RZWS-18-50-R**
**RZWS-18-25-CV-R**
**RZWS-18-50-CV-R**

**RZWS-36-R**
**RZWS-36-25-R**
**RZWS-36-50-R**
**RZWS-36-25-CV-R**
**RZWS-36-50-CV-R**

**913301SP** (purple cap for 18" and 36" )

**RZWS10-RCC** (purple cap for 10")

### HDL

**HDL-06-12-250-R**
**HDL-06-12-500-R**
**HDL-06-12-1K-R**
**HDL-06-18-250-R**
**HDL-06-18-500-R**
**HDL-06-18-1K-R**
**HDL-06-24-250-R**
**HDL-06-24-1K-R**
**HDL-09-12-250-R**
**HDL-09-12-500-R**

**HDL-09-12-1K-R**
**HDL-09-18-250-R**
**HDL-09-18-500-R**
**HDL-09-18-1K-R**
**HDL-09-24-250-R**
**HDL-09-24-250-R**
**HDL-09-24-1K-R**
**HDL-BLNK-250-R**
**HDL-BLNK-500-R**
**HDL-BLNK-1K-R**

### MULTI-PURPOSE BOX

**MB-0811-R**

**MB-LID-R** (lid only)

**Micro** Key

**IH Risers**
**12** - 12" riser
**18** - 18" riser
**24** - 24" riser
**XX** - Riser length (06, 12, 18, 24, 36) inches
**YY** - Emitter flow (0.5, 1.0, 2.0, 4.0, 6.0) GPH
**CV** - Check valve (standard)

**RZWS**
**10** - 10" length
**18** - 18" length
**36** - 36" length
**25** - 0.25 GPM
**50** - 0.50 GPM
**CV** - Check valve

**HDL**
**BLNK** - No emitter
**HDL-04** - 0.4 GPH
**HDL-06** - 0.6 GPH
**HDL-09** - 0.9 GPH
**12** - 12" spacing
**18** - 18" spacing
**24** - 24" spacing
**250** - 250' length
**500** - 500' length
**1K** - 1,000' length

RECLAIMED


# TOOLS

# SPOTSHOT HOSE-END NOZZLE

## MODELS

- ¾" hose thread inlet – P/N 160700
- 1" hose thread inlet – P/N 160705

## KEY BENEFITS

- Variable nozzle stream choices:
  - Fan: Broad, light stream for turf hot spots
  - Soak: Medium stream for dust-control areas
  - Jet: Tight, focused stream for power washing

## OPERATING SPECIFICATIONS

- Flow – 35 GPM at 80 PSI*

* Not recommended for residential use with regulated, low-pressure, or low-flow conditions

**SpotShot Hose-End Nozzle**
¾" P/N 160700SP
1" P/N 160705SP

**Pitot Gauge**
P/N 280100SP
Used to check operating pressure of rotor sprinklers

**MP Gauge Assembly**
P/N MPGAUGE
Used to check operating pressure on spray body sprinklers

**Hand Pump**
P/N 217500SP
Used to remove water from flooded areas during service and installation

**Nozzle Insertion Collar**
P/N 123200SP

**Hunter Wrench**
P/N 172000SP

**"T" Handle Tool**
P/N 319100SP

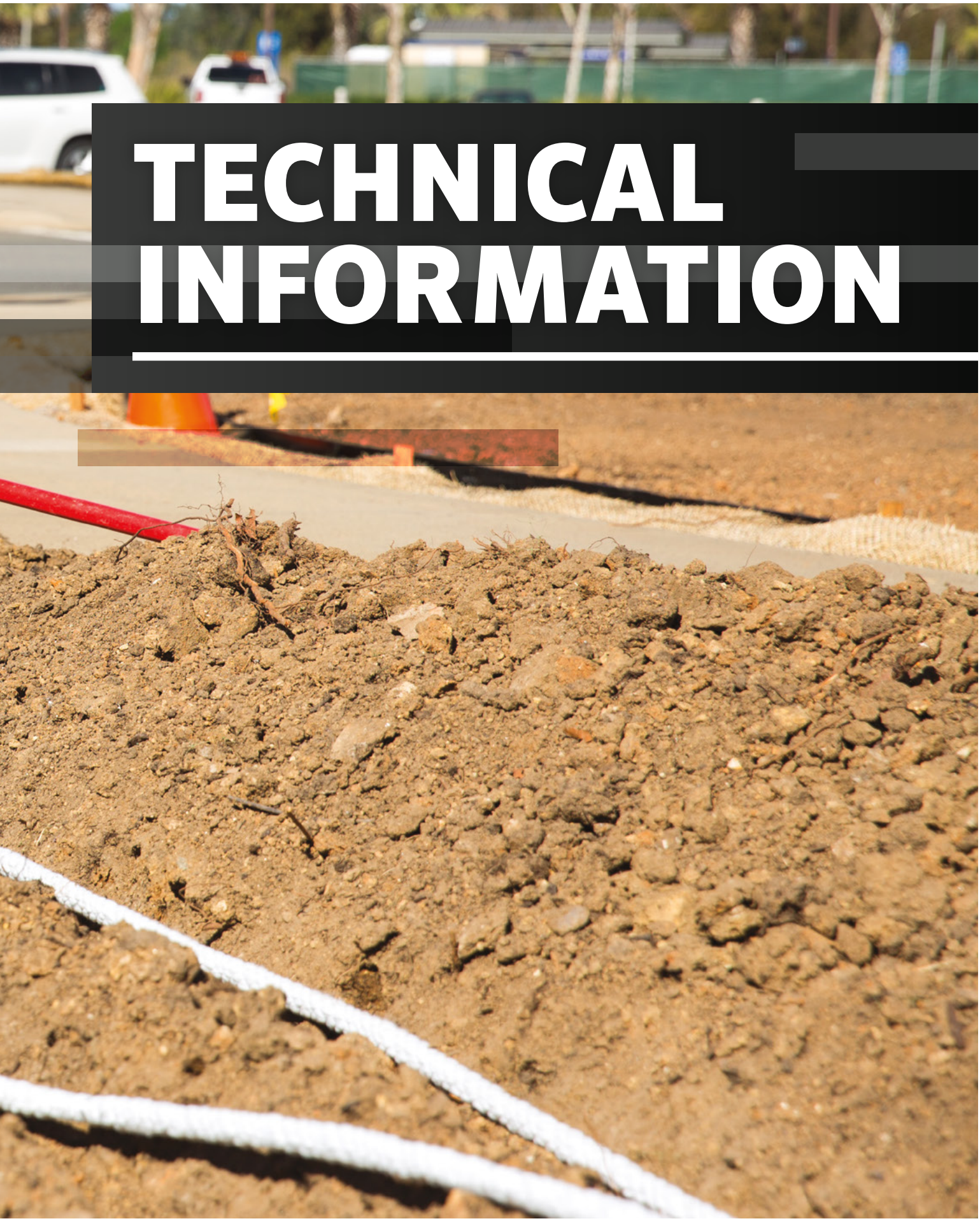
**Nozzle Removal/ Installation Tool**
P/N 803700
I-80, G85B, G885 Short and Mid-Range Nozzles

**I-80 Turf Cup Tool**
P/N 991300SP
Arc Adjustment, Riser Hold-up, Turf Cup Remove/Install

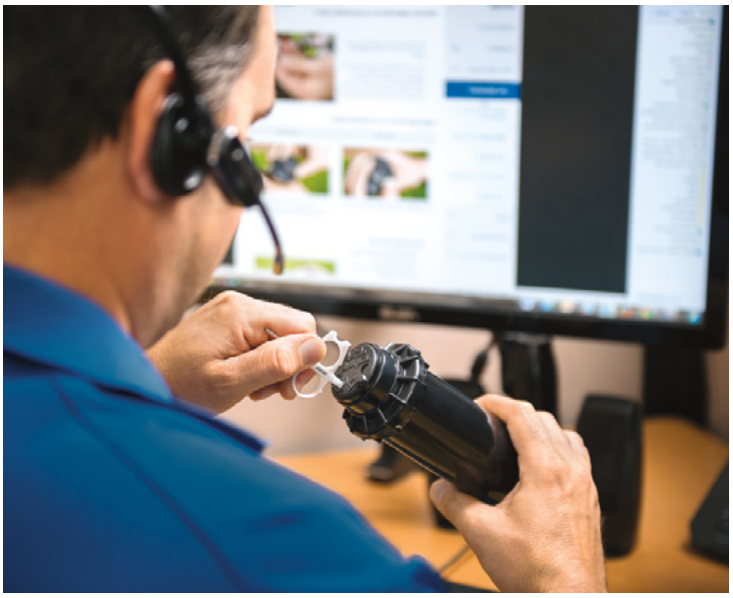
**I-80 Body Plug**
P/N 996500SP

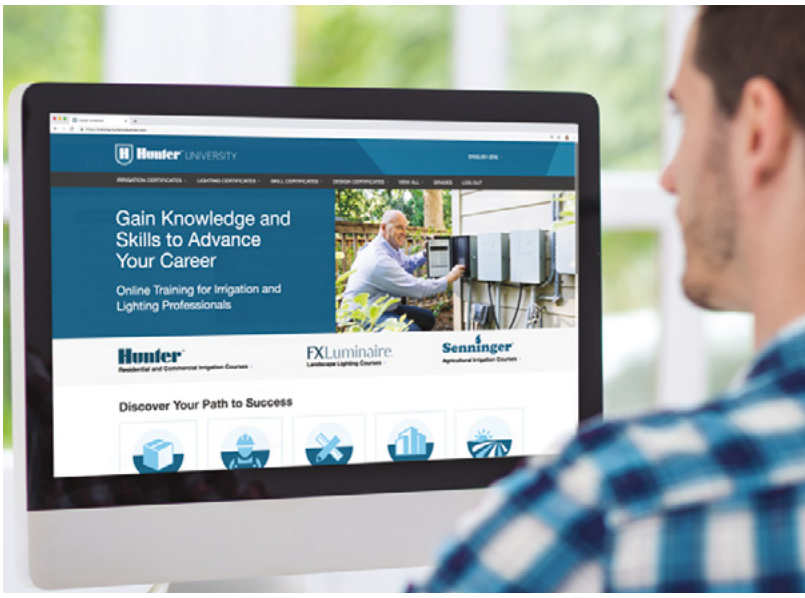
**Snap Ring Tool**
P/N 984400SP
I-80 Installation Removal


LOS ANGELES



# TECHNICAL INFORMATION



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**Email:** huntertechnical.support@hunterindustries.com

**After Hours:** Leave us a voice message and someone from our team will return your call the next business day.

## *Online Product Information*

**Visit our Support Library for instructional videos, owner's manuals, installation details, articles, and more:**

- hunterindustries.com/support
- support.hydrawise.com/hc/en-us

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# PRECIPITATION RATES

In this section, the "Sprinkler Spacing Method–Any Arc and Any Spacing" equation is used to calculate precipitation rates. The first set of equations with the ■ shows the precipitation rate for the sprinklers when they are laid out in a square pattern. The next set with the ▲ shows the precipitation rate for the sprinklers laid out in an equilateral triangular spacing pattern. This is the "Sprinkler Spacing Method–Equilateral Triangular Spacing" equation.

## WHAT IS "PRECIPITATION RATE"?

If someone said they were caught in a rainstorm that dropped one inch of water in an hour, you would have some idea of how "hard" or "heavily" the rain came down. A rainstorm that covers an area with one inch of water in one hour has a "precipitation rate" of one inch per hour (1 in/hr or 25 mm/hr). Similarly, the precipitation rate is the "speed" at which a sprinkler or an irrigation system applies water.

## MATCHED PRECIPITATION RATES

A zone or system in which all the heads have similar precipitation rates is said to have "matched precipitation rates." Systems that have matched precipitation rates reduce wet and dry spots and minimize run times, which reduces water consumption and lowers costs. Knowing that sprinkler spacing, flow rates, and arcs of coverage affect precipitation rates, a general guideline is: as the spray arc doubles, so should the flow.

90° Arc = 1 GPM
(0.23 $m^3$/hr; 3.8 l/min)

180° Arc = 2 GPM
(0.45 $m^3$/hr; 7.6 l/min)

360° Arc = 4 GPM
(0.91 $m^3$/hr; 15.1 l/min)

The flow rate of half-circle heads must be two times the flow rate of the quarter-circle heads, and the full-circle heads must have two times the flow rate of the half-circle heads. In the illustration, the same amount of water is applied to each quarter circle area and precipitation is therefore matched.

### CALCULATING PRECIPITATION RATES

Depending upon the construction of the irrigation system, the precipitation rate may be calculated by either a Sprinkler Spacing or a Total Area method.

**Sprinkler Spacing Method (■)**
The precipitation rate should be calculated for each individual zone. If all sprinkler heads on the zone have the same spacing, flow rate, and arc of coverage, use one of the following formulas:

**Any Arc and Any Spacing (■):**

$$\text{P.R. (in/hr)} = \frac{\text{Flow Rate (GPM) for any Arc x 34,650}}{\text{Degrees of Arc x Head Spacing (ft.) x Row Spacing (ft.)}}$$

$$\text{P.R. (mm/hr)} = \frac{\text{Flow Rate } (m^3/hr) \text{ for any Arc x 360,000}}{\text{Degrees of Arc x Head Spacing (m) x Row Spacing (m)}}$$

$$\text{P.R. (mm/hr)} = \frac{\text{Flow Rate (l/min) for any Arc x 21,600}}{\text{Degrees of Arc x Head Spacing (m) x Row Spacing (m)}}$$

**Sprinkler Spacing Method (▲)**
The precipitation rate should be calculated for each individual zone. If all sprinkler heads on the zone have the same spacing, flow rate, and arc of coverage, use one of the following formulas:

**Equilateral Triangular Spacing (▲):**

$$\text{P.R. (in/hr)} = \frac{\text{Flow Rate (GPM) for any Arc x 34,650}}{\text{Degrees of Arc x (Head Spacing)}^2 \text{ x 0.866}}$$

$$\text{P.R. (mm/hr)} = \frac{\text{Flow Rate } (m^3/hr) \text{ for any Arc x 360,000}}{\text{Degrees of Arc x (Head Spacing)}^2 \text{ x 0.866}}$$

$$\text{P.R. (mm/hr)} = \frac{\text{Flow Rate (l/min) for any Arc x 21,600}}{\text{Degrees of Arc x (Head Spacing)}^2 \text{ x 0.866}}$$

**Total Area Method**
The precipitation rate for a "system" is the average precipitation rate of all sprinklers in an area, regardless of the spacing, flow rate, or arc for each head. The Total Area Method calculates all the flows of all of the heads in any given area.

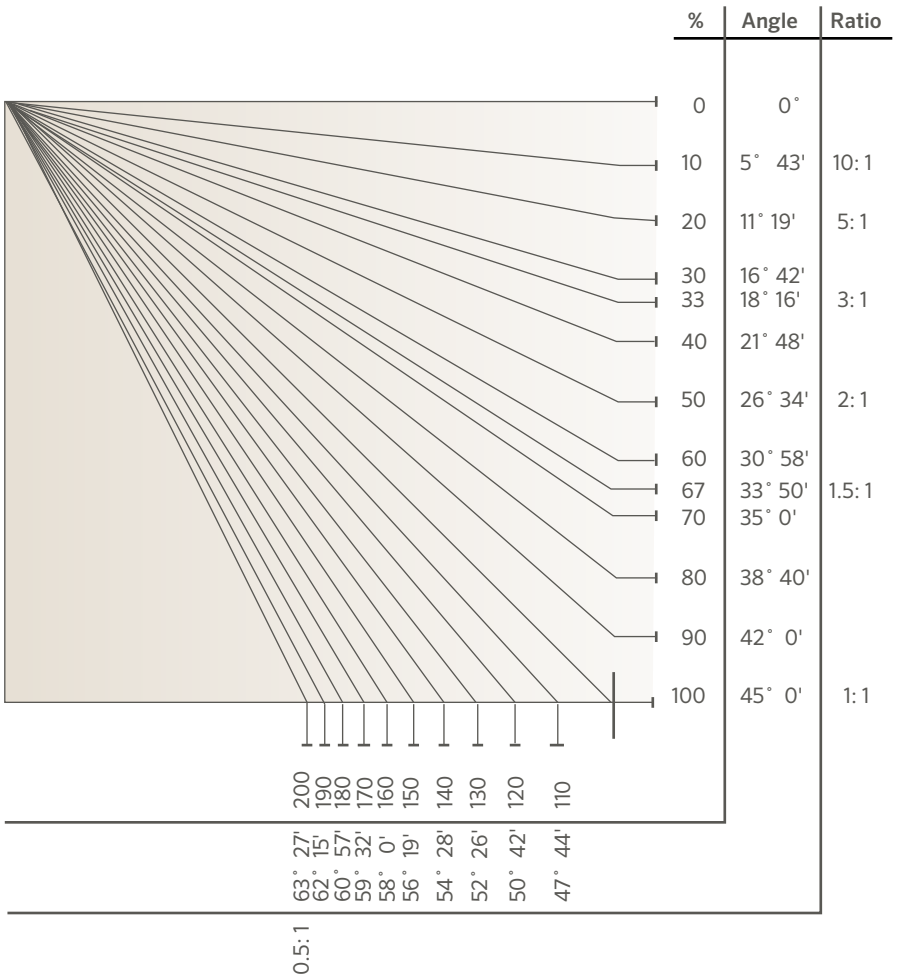
$$\text{P.R. (in/hr)} = \frac{\text{Flow (GPM) x 96.25}}{\text{Total Area (ft.)}}$$

$$\text{P.R. (mm/hr)} = \frac{\text{Flow } (m^3/hr) \text{ x 1,000}}{\text{Total Area } (m^2)}$$

$$\text{P.R. (mm/hr)} = \frac{\text{Flow (l/min) x 60}}{\text{Total Area } (m^2)}$$

# SLOPE EQUIVALENTS/IRRIGATION

## PERCENT, ANGLE, RATIO




## SLOPE IRRIGATION: Maximum precipitation rates for slopes in in/hr

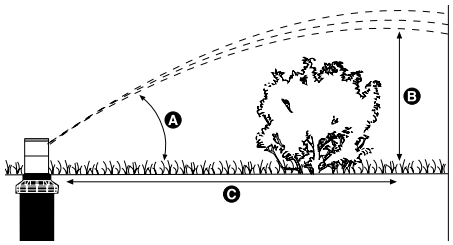
| Soil Texture | 0 to 5% Slope | | 5 to 8% Slope | | 8 to 12% Slope | | 12%+ Slope | |
|---|---|---|---|---|---|---|---|---|
| | Cover | Bare | Cover | Bare | Cover | Bare | Cover | Bare |
| Coarse sandy soils | 2.0 | 2.0 | 2.0 | 1.5 | 1.5 | 1.0 | 1.0 | 0.5 |
| Coarse sandy soils over compact subsoils | 1.75 | 1.5 | 1.25 | 1.0 | 1.0 | 0.75 | 0.75 | 0.4 |
| Light sandy loams uniform | 1.75 | 1.0 | 1.25 | 0.8 | 1.0 | 0.6 | 0.75 | 0.4 |
| Light sandy loams over compact subsoils | 1.25 | 0.75 | 1.0 | 0.5 | 0.75 | 0.4 | 0.5 | 0.3 |
| Uniform silt loams | 1.0 | 0.5 | 0.8 | 0.4 | 0.6 | 0.3 | 0.4 | 0.2 |
| Silt loams over compact subsoil | 0.6 | 0.3 | 0.5 | 0.25 | 0.4 | 0.15 | 0.3 | 0.1 |
| Heavy clay or clay loam | 0.2 | 0.15 | 0.15 | 0.10 | 0.12 | 0.08 | 0.1 | 0.06 |

**Notes:**

The maximum precipitation values listed below are those suggested by the United States Department of Agriculture. The values are average and may vary with respect to actual soil and groundcover conditions.

# HEIGHT OF SPRAY

The trajectory and spray height of the water stream leaving a sprinkler nozzle is important information when designing and installing irrigation systems.




These rotor nozzle trajectory charts are designed to help determine how close a sprinkler can be placed to an object such as a fence or hedge without obstructing the spray pattern. All information shown is at optimum operating pressures.

**HUNTER NOZZLE HEIGHT AND TRAJECTORY CHART**

| Model | Nozzle No. | Pressure (PSI) | Degrees of Trajectory | Max Height of Spray | Distance from Head to Maximum Height (ft.) |
|---|---|---|---|---|---|
| MP ROTATOR® | 800SR | 40 | 18 | 18" | Varies |
| | 815 | 40 | 15 | 12" | Varies |
| | 1000 | 40 | 20 | 20" | Varies |
| | 2000 | 40 | 26 | 45" | Varies |
| | 3000 | 40 | 26 | 79" | Varies |
| | 3500 | 40 | 26 | 79" | Varies |
| | Corner | 40 | 14 | 14" | Varies |
| | Side Strip | 40 | 16 | 19" | Varies |
| | Left Strip | 40 | 16 | 18" | Varies |
| PGJ | 0.75 | 40 | 10 | 2' | 4 |
| | 1.0 | 40 | 10 | 2' | 8 |
| | 1.5 | 40 | 10 | 3' | 12 |
| | 2.0 | 40 | 15 | 5' | 16 |
| | 2.5 | 40 | 12 | 5' | 20 |
| | 3.0 | 40 | 15 | 5' | 20 |
| | 4.0 | 40 | 15 | 5' | 22 |
| | 5.0 | 40 | 15 | 6' | 24 |
| PGP® RED NOZZLES | 1 | 50 | 26 | 7' | 22 |
| | 2 | 50 | 26 | 7' | 22 |
| | 3 | 50 | 26 | 8' | 23 |
| | 4 | 50 | 26 | 8' | 23 |
| | 5 | 50 | 27 | 9' | 26 |
| | 6 | 50 | 27 | 10' | 28 |
| | 7 | 50 | 26 | 11' | 30 |
| | 8 | 50 | 26 | 11' | 30 |
| | 9 | 50 | 27 | 12' | 32 |
| | 10 | 60 | 25 | 13' | 32 |
| | 11 | 60 | 25 | 13' | 38 |
| | 12 | 60 | 25 | 13' | 40 |
| PGP LOW-ANGLE GRAY NOZZLES | 4 | 50 | 15 | 5' | 22 |
| | 5 | 50 | 15 | 4' | 22 |
| | 6 | 50 | 14 | 4' | 22 |
| | 7 | 50 | 14 | 4' | 22 |
| | 8 | 50 | 14 | 5' | 24 |
| | 9 | 50 | 15 | 5' | 26 |
| | 10 | 60 | 15 | 6' | 30 |
| PGP BLUE NOZZLES | 1.5 | 45 | 25 | 8' | 23 |
| | 2.0 | 45 | 25 | 8' | 23 |
| | 2.5 | 45 | 25 | 9' | 26 |
| | 3.0 | 45 | 25 | 10' | 28 |
| | 4.0 | 45 | 25 | 11' | 30 |
| | 5.0 | 45 | 25 | 11' | 30 |
| | 6.0 | 55 | 25 | 12' | 32 |
| | 8.0 | 55 | 25 | 13' | 32 |
| PGP ULTRA/I-20 DARK BLUE NOZZLES | 1.0 | 50 | 26 | 8' | 23 |
| | 1.5 | 50 | 26 | 8' | 23 |
| | 2.0 | 50 | 27 | 9' | 26 |
| | 3.0 | 50 | 27 | 10' | 28 |
| | 3.5 | 50 | 26 | 11' | 30 |
| | 4.0 | 50 | 26 | 11' | 30 |
| | 6.0 | 50 | 27 | 12' | 32 |
| | 8.0 | 60 | 25 | 13' | 32 |
| PGP ULTRA/I-20 BLUE NOZZLES | 1.5 | 45 | 25 | 8' | 23 |
| | 2.0 | 45 | 25 | 8' | 23 |
| | 2.5 | 45 | 25 | 9' | 26 |
| | 3.0 | 45 | 25 | 10' | 28 |
| | 4.0 | 45 | 25 | 11' | 30 |
| | 5.0 | 45 | 25 | 11' | 30 |
| | 6.0 | 55 | 25 | 12' | 32 |
| | 8.0 | 55 | 25 | 13' | 32 |

# HEIGHT OF SPRAY

**HUNTER NOZZLE HEIGHT AND TRAJECTORY CHART**

| Model | Nozzle No. | Pressure (PSI) | Degrees of Trajectory | Max Height of Spray | Distance from Head to Maximum Height (ft.) |
|---|---|---|---|---|---|
| PGP® Ultra/I-20 Low-Angle Gray Nozzles | 2.0LA | 50 | 13 | 5 | 22 |
| | 2.5LA | 50 | 13 | 4 | 22 |
| | 3.5LA | 50 | 13 | 4 | 22 |
| | 4.5LA | 50 | 13 | 4 | 22 |
| PGP Ultra/I-20 Short- Radius Black Nozzles | 0.5 | 50 | 15 | 5 | 8 |
| | 1.0 | 50 | 14 | 6 | 9 |
| | 2.0 | 50 | 3 | 1 | 6 |
| PGP Ultra/I-20 Short-Radius Black Nozzles | 0.75 | 50 | 22 | 7 | 13 |
| | 1.5 | 50 | 18 | 7 | 13 |
| | 3.0 | 50 | 8 | 1 | 6 |
| PGP Ultra/I-20 MPR-25 Red Nozzles | Q - 90 | 45 | 22 | 3 | 15 |
| | T - 120 | 45 | 21 | 4 | 14 |
| | H - 180 | 45 | 24 | 4 | 14 |
| | F - 360 | 45 | 22 | 4 | 10 |
| PGP Ultra/I-20 MPR-30 Lt. Green Nozzles | Q - 90 | 45 | 28 | 5 | 18 |
| | T - 120 | 45 | 14 | 3 | 17 |
| | H - 180 | 45 | 16 | 4 | 16 |
| | F - 360 | 45 | 18 | 2 | 13 |
| PGP Ultra/I-20 MPR-35 Tan Nozzles | Q - 90 | 45 | 28 | 6 | 19 |
| | T - 120 | 45 | 28 | 6 | 18 |
| | H - 180 | 45 | 16 | 4 | 17 |
| | F - 360 | 45 | 14 | 3 | 12 |
| I-25 | 4 | 50 | 25 | 9 | 22 |
| | 5 | 50 | 25 | 11 | 28 |
| | 7 | 50 | 25 | 10 | 28 |
| | 8 | 50 | 25 | 11 | 28 |
| | 10 | 60 | 25 | 12 | 30 |
| | 13 | 60 | 25 | 13 | 31 |
| | 15 | 60 | 25 | 12 | 31 |
| | 18 | 60 | 25 | 15 | 34 |
| | 20 | 70 | 25 | 15 | 35 |
| | 23 | 70 | 25 | 16 | 38 |
| | 25 | 70 | 25 | 16 | 38 |
| | 28 | 70 | 25 | 17 | 40 |
| I-40/I-50 Adjustable | 8 | 50 | 25 | 12 | 32 |
| | 10 | 60 | 25 | 14 | 32 |
| | 13 | 60 | 25 | 14 | 34 |
| | 15 | 60 | 25 | 15 | 42 |
| | 23 | 70 | 25 | 17 | 46 |
| | 25 | 70 | 25 | 17 | 48 |
| I-40/I-50-ON | 15 | 50 | 25 | 15 | 42 |
| | 18 | 60 | 25 | 16 | 43 |
| | 20 | 60 | 25 | 17 | 45 |
| | 23 | 60 | 25 | 17 | 46 |
| | 25 | 70 | 25 | 17 | 48 |
| | 28 | 70 | 25 | 17 | 50 |

# HEIGHT OF SPRAY

**HUNTER NOZZLE HEIGHT AND TRAJECTORY CHART**

| Model | Nozzle No. | Pressure (PSI) | Degrees of Trajectory | Max Height of Spray | Distance from Head to Maximum Height (ft.) |
|---|---|---|---|---|---|
| I-80 & I-90 ADV | 15 | 80 | 22.5 | 12 | 30 |
| | 18 | 80 | 22.5 | 13 | 32 |
| | 20 | 80 | 22.5 | 14 | 34 |
| | 23 | 80 | 22.5 | 14 | 37 |
| | 25 | 80 | 22.5 | 15 | 40 |
| | 33 | 80 | 22.5 | 15 | 42 |
| | 38 | 80 | 22.5 | 16 | 48 |
| | 43 | 80 | 22.5 | 16 | 48 |
| | 48 | 80 | 22.5 | 17 | 54 |
| | 53 | 80 | 22.5 | 17 | 56 |
| | 63 | 80 | 22.5 | 18 | 64 |
| | 73 | 80 | 22.5 | 19 | 68 |
| I-80-ON & I-90 36V Low-Angle | 15 | 80 | 22.5 | 12 | 32 |
| | 18 | 80 | 22.5 | 13 | 34 |
| | 20 | 80 | 22.5 | 14 | 38 |
| | 23 | 80 | 22.5 | 14 | 41 |
| | 25 | 80 | 22.5 | 15 | 46 |
| | 33 | 80 | 22.5 | 15 | 46 |
| | 38 | 80 | 22.5 | 16 | 50 |
| | 43 | 80 | 22.5 | 16 | 54 |
| | 48 | 80 | 22.5 | 17 | 56 |
| | 53 | 80 | 22.5 | 17 | 58 |
| | 63 | 80 | 22.5 | 18 | 62 |
| | 73 | 80 | 22.5 | 19 | 68 |
| I-80 & I-90 ADV Low-Angle | 15 | 80 | 22.5 | 6 | 28 |
| | 18 | 80 | 22.5 | 7 | 30 |
| | 20 | 80 | 22.5 | 7 | 32 |
| | 23 | 80 | 22.5 | 7 | 34 |
| | 25 | 80 | 22.5 | 8 | 36 |
| | 33 | 80 | 22.5 | 8 | 38 |
| | 38 | 80 | 22.5 | 9 | 40 |
| | 43 | 80 | 22.5 | 9 | 41 |
| | 48 | 80 | 22.5 | 10 | 43 |
| | 53 | 80 | 22.5 | 11 | 45 |
| | 63 | 80 | 22.5 | 12 | 48 |
| | 73 | 80 | 22.5 | 13 | 52 |
| I-80-ON & I-90 36V | 15 | 80 | 22.5 | 6 | 28 |
| | 18 | 80 | 22.5 | 7 | 30 |
| | 20 | 80 | 22.5 | 7 | 32 |
| | 23 | 80 | 22.5 | 7 | 34 |
| | 25 | 80 | 22.5 | 8 | 36 |
| | 33 | 80 | 22.5 | 8 | 38 |
| | 38 | 80 | 22.5 | 9 | 40 |
| | 43 | 80 | 22.5 | 9 | 41 |
| | 48 | 80 | 22.5 | 10 | 43 |
| | 53 | 80 | 22.5 | 11 | 45 |
| | 63 | 80 | 22.5 | 12 | 48 |
| | 73 | 80 | 22.5 | 13 | 52 |

# CONVERSION FACTORS

**CONVERSION FACTORS**

| To Convert | From | To | Multiply By |
|---|---|---|---|
| **Area** | acres | foot$^2$ | 43560 |
| | acres | meter$^2$ | 4046.8 |
| | meter$^2$ | foot$^2$ | 10.764 |
| | foot$^2$ | inch$^2$ | 144 |
| | inch$^2$ | centimeter$^2$ | 6.452 |
| | hectares | meter$^2$ | 10000 |
| | hectares | acres | 2.471 |
| **Power** | kilowatts | horsepower | 1.341 |
| **Flow** | foot$^3$/minute | meter$^3$/second | 0.0004719 |
| | foot$^3$/second | meter$^3$/second | 0.02832 |
| | yards$^3$/minute | meter$^3$/second | 0.01274 |
| | gallon/minute | meter$^3$/hour | 0.22716 |
| | gallon/minute | liter/minute | 3.7854 |
| | gallon/minute | liter/second | 0.06309 |
| | meter$^3$/hour | liter/minute | 16.645 |
| | meter$^3$/hour | liter/second | 0.2774 |
| | liter/minute | liter/second | 60 |
| **Length** | foot | inch | 12 |
| | inch | centimeter | 2.54 |
| | foot | meter | 0.30481 |
| | kilometer | miles | 0.6214 |
| | miles | foot | 5280 |
| | miles | meter | 1609.34 |
| | millimeter | inch | 0.03937 |
| **Pressure** | PSI | kilopascals | 6.89476 |
| | PSI | bar | 0.068948 |
| | bar | kilopascals | 100 |
| | PSI | feet of head | 2.31 |
| **Velocity** | feet/second | meter/second | 0.3048 |
| **Volume** | feet$^3$ | gallon | 7.481 |
| | feet$^3$ | liter | 28.32 |
| | meter$^3$ | feet$^3$ | 35.31 |
| | meter$^3$ | yard$^3$ | 1.3087 |
| | yard$^3$ | feet$^3$ | 27 |
| | yard$^3$ | gallon | 202 |
| | acres/feet | foot$^3$ | 43,560 |
| | gallon | meter$^3$ | 0.003785 |
| | gallon | liter | 3.785 |
| | imperial gallon | gallon | 1.833 |

# FRICTION LOSS CHARTS

**WATER METER PRESSURE LOSS CHART: Typical Pressure Loss (PSI)**

| Flow (GPM) | ⅝" | ¾" | 1" | 1½" | 2" | 3" | 4" | Flow (GPM) |
|---|---|---|---|---|---|---|---|---|
| 1 | 0.2 | 0.1 | | | | | | 1 |
| 2 | 0.3 | 0.2 | | | | | | 2 |
| 3 | 0.4 | 0.3 | | | | | | 3 |
| 4 | 0.6 | 0.5 | 0.1 | | | | | 4 |
| 5 | 0.9 | 0.6 | 0.2 | | | | | 5 |
| 6 | 1.3 | 0.7 | 0.3 | | | | | 6 |
| 7 | 1.8 | 0.8 | 0.4 | | | | | 7 |
| 8 | 2.3 | 1.0 | 0.5 | | | | | 8 |
| 9 | 3.0 | 1.3 | 0.6 | | | | | 9 |
| 10 | 3.7 | 1.6 | 0.7 | | | | | 10 |
| 11 | 4.4 | 1.9 | 0.8 | | | | | 11 |
| 12 | 5.1 | 2.2 | 0.9 | | | | | 12 |
| 13 | 6.1 | 2.6 | 1.0 | | | | | 13 |
| 14 | 7.2 | 3.1 | 1.1 | | | | | 14 |
| 15 | 8.3 | 3.6 | 1.2 | | | | | 15 |
| 16 | 9.4 | 4.1 | 1.4 | 0.4 | | | | 16 |
| 17 | 10.7 | 4.6 | 1.6 | 0.5 | | | | 17 |
| 18 | 12.0 | 5.2 | 1.8 | 0.6 | | | | 18 |
| 19 | 13.4 | 5.8 | 2.0 | 0.7 | | | | 19 |
| 20 | 15.0 | 6.5 | 2.2 | 0.8 | | | | 20 |
| 22 | | 7.9 | 2.8 | 1.0 | | | | 22 |
| 24 | | 9.5 | 3.4 | 1.2 | | | | 24 |
| 26 | | 11.2 | 4.0 | 1.4 | | | | 26 |
| 28 | | 13.0 | 4.6 | 1.6 | | | | 28 |
| 30 | | 15.0 | 5.3 | 1.8 | 0.7 | | | 30 |
| 32 | | | 6.0 | 2.1 | 0.8 | | | 32 |
| 34 | | | 6.9 | 2.4 | 0.9 | | | 34 |
| 36 | | | 7.8 | 2.7 | 1.0 | | | 36 |
| 38 | | | 8.7 | 3.0 | 1.2 | | | 38 |
| 40 | | | 9.6 | 3.3 | 1.3 | | | 40 |
| 42 | | | 10.6 | 3.6 | 1.4 | | | 42 |
| 44 | | | 11.7 | 3.9 | 1.5 | | | 44 |
| 46 | | | 12.8 | 4.2 | 1.6 | | | 46 |
| 48 | | | 13.9 | 4.5 | 1.7 | | | 48 |
| 50 | | | 15.0 | 4.9 | 1.9 | | | 50 |
| 52 | | | | 5.3 | 2.1 | | | 52 |
| 54 | | | | 5.7 | 2.2 | | | 54 |
| 56 | | | | 6.2 | 2.3 | | | 56 |
| 58 | | | | 6.7 | 2.5 | | | 58 |
| 60 | | | | 7.2 | 2.7 | 1.0 | | 60 |
| 65 | | | | 8.3 | 3.2 | 1.1 | | 65 |
| 70 | | | | 9.8 | 3.7 | 1.3 | | 70 |
| 75 | | | | 11.3 | 4.3 | 1.5 | | 75 |
| 80 | | | | 12.8 | 4.9 | 1.6 | 0.7 | 80 |
| 90 | | | | 16.1 | 6.2 | 2.0 | 0.8 | 90 |
| 100 | | | | 20.0 | 7.8 | 2.5 | 0.9 | 100 |
| 110 | | | | | 9.5 | 2.9 | 1.0 | 110 |
| 120 | | | | | 11.3 | 3.4 | 1.2 | 120 |
| 130 | | | | | 13.0 | 3.9 | 1.4 | 130 |
| 140 | | | | | 15.1 | 4.5 | 1.6 | 140 |
| 150 | | | | | 17.3 | 5.1 | 1.8 | 150 |
| 160 | | | | | 20.0 | 5.8 | 2.1 | 160 |
| 170 | | | | | | 6.5 | 2.4 | 170 |
| 180 | | | | | | 7.2 | 2.7 | 180 |
| 190 | | | | | | 8.0 | 3.0 | 190 |
| 200 | | | | | | 9.0 | 3.2 | 200 |
| 220 | | | | | | 11.0 | 3.9 | 220 |
| 240 | | | | | | 13.0 | 4.7 | 240 |
| 260 | | | | | | 15.0 | 5.5 | 260 |
| 280 | | | | | | 17.3 | 6.3 | 280 |
| 300 | | | | | | 20.0 | 7.2 | 300 |
| 350 | | | | | | | 10.0 | 350 |
| 400 | | | | | | | 13.0 | 400 |
| 450 | | | | | | | 16.2 | 450 |
| 500 | | | | | | | 20.0 | 500 |
| **75% of max meter capacity** | **15 GPM** | **22.5 GPM** | **37.5 GPM** | **75 GPM** | **120 GPM** | **225 GPM** | **375 GPM** | **75% of max meter capacity** |

**Notes:** Shaded areas represent velocities over 5 fps. Use with caution when water hammer is a concern.

# FRICTION LOSS CHARTS - TYPE K COPPER TUBING

ASTM B88 C = 140 • PSI loss per 100 ft. of pipe

| Nominal Size | ½" | | ⅝" | | ¾" | | 1" | | 1¼" | | 1½" | | 2" | | 2½" | | 3" | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pipe ID | 0.527 | | 0.652 | | 0.745 | | 0.995 | | 1.245 | | 1.481 | | 1.959 | | 2.435 | | 2.907 | |
| Pipe OD | 0.625 | | 0.750 | | 0.875 | | 1.125 | | 1.375 | | 1.625 | | 2.125 | | 2.625 | | 3.125 | |
| Avg. Wall | 0.049 | | 0.049 | | 0.065 | | 0.065 | | 0.065 | | 0.072 | | 0.083 | | 0.095 | | 0.109 | |
| Flow (GPM) | 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 | 1.47 | 1.09 | 0.96 | 0.39 | 0.74 | 0.20 | 0.41 | 0.05 | 0.26 | 0.02 | | | | | | | | |
| 2 | 2.94 | 3.94 | 1.92 | 1.40 | 1.47 | 0.73 | 0.82 | 0.18 | 0.53 | 0.06 | | | | | | | | |
| 3 | 4.41 | 8.35 | 2.88 | 2.97 | 2.21 | 1.55 | 1.24 | 0.38 | 0.79 | 0.13 | | | | | | | | |
| 4 | 5.88 | 14.23 | 3.84 | 5.05 | 2.94 | 2.64 | 1.65 | 0.65 | 1.05 | 0.22 | | | | | | | | |
| 5 | 7.35 | 21.51 | 4.80 | 7.64 | 3.68 | 3.99 | 2.06 | 0.98 | 1.32 | 0.33 | | | | | | | | |
| 6 | 8.81 | 30.15 | 5.76 | 10.70 | 4.41 | 5.59 | 2.47 | 1.37 | 1.58 | 0.46 | 1.12 | 0.20 | | | | | | |
| 7 | 10.28 | 40.12 | 6.72 | 14.24 | 5.15 | 7.44 | 2.88 | 1.82 | 1.84 | 0.61 | 1.30 | 0.26 | | | | | | |
| 8 | 11.75 | 51.37 | 7.68 | 18.24 | 5.88 | 9.53 | 3.30 | 2.33 | 2.11 | 0.78 | 1.49 | 0.34 | | | | | | |
| 9 | 13.22 | 63.90 | 8.64 | 22.68 | 6.62 | 11.85 | 3.71 | 2.90 | 2.37 | 0.97 | 1.67 | 0.42 | | | | | | |
| 10 | 14.69 | 77.66 | 9.60 | 27.57 | 7.35 | 14.41 | 4.12 | 3.52 | 2.63 | 1.18 | 1.86 | 0.51 | | | | | | |
| 12 | | | 11.52 | 38.64 | 8.82 | 20.20 | 4.95 | 4.94 | 3.16 | 1.66 | 2.23 | 0.71 | 1.28 | 0.18 | | | | |
| 14 | | | 13.44 | 51.41 | 10.29 | 26.87 | 5.77 | 6.57 | 3.69 | 2.21 | 2.60 | 0.95 | 1.49 | 0.24 | | | | |
| 16 | | | 15.36 | 65.83 | 11.76 | 34.41 | 6.59 | 8.42 | 4.21 | 2.83 | 2.98 | 1.22 | 1.70 | 0.31 | | | | |
| 18 | | | 17.28 | 81.88 | 13.23 | 42.80 | 7.42 | 10.47 | 4.74 | 3.52 | 3.35 | 1.51 | 1.91 | 0.39 | | | | |
| 20 | | | | | 14.70 | 52.02 | 8.24 | 12.72 | 5.26 | 4.28 | 3.72 | 1.84 | 2.13 | 0.47 | | | | |
| 22 | | | | | 16.17 | 62.06 | 9.07 | 15.18 | 5.79 | 5.10 | 4.09 | 2.19 | 2.34 | 0.56 | 1.51 | 0.19 | 1.06 | 0.08 |
| 24 | | | | | 17.64 | 72.91 | 9.89 | 17.84 | 6.32 | 5.99 | 4.46 | 2.58 | 2.55 | 0.66 | 1.65 | 0.23 | 1.16 | 0.10 |
| 26 | | | | | | | 10.71 | 20.69 | 6.84 | 6.95 | 4.84 | 2.99 | 2.76 | 0.77 | 1.79 | 0.27 | 1.26 | 0.11 |
| 28 | | | | | | | 11.54 | 23.73 | 7.37 | 7.97 | 5.21 | 3.43 | 2.98 | 0.88 | 1.93 | 0.30 | 1.35 | 0.13 |
| 30 | | | | | | | 12.36 | 26.96 | 7.90 | 9.06 | 5.58 | 3.89 | 3.19 | 1.00 | 2.06 | 0.35 | 1.45 | 0.15 |
| 32 | | | | | | | 13.19 | 30.39 | 8.42 | 10.21 | 5.95 | 4.39 | 3.40 | 1.12 | 2.20 | 0.39 | 1.54 | 0.16 |
| 34 | | | | | | | 14.01 | 34.00 | 8.95 | 11.42 | 6.32 | 4.91 | 3.61 | 1.26 | 2.34 | 0.44 | 1.64 | 0.18 |
| 36 | | | | | | | 14.84 | 37.79 | 9.48 | 12.70 | 6.70 | 5.46 | 3.83 | 1.40 | 2.48 | 0.49 | 1.74 | 0.20 |
| 38 | | | | | | | 15.66 | 41.77 | 10.00 | 14.04 | 7.07 | 6.03 | 4.04 | 1.55 | 2.61 | 0.54 | 1.83 | 0.23 |
| 40 | | | | | | | 16.48 | 45.94 | 10.53 | 15.43 | 7.44 | 6.63 | 4.25 | 1.70 | 2.75 | 0.59 | 1.93 | 0.25 |
| 42 | | | | | | | 17.31 | 50.28 | 11.06 | 16.89 | 7.81 | 7.26 | 4.47 | 1.86 | 2.89 | 0.65 | 2.03 | 0.27 |
| 44 | | | | | | | | | 11.58 | 18.41 | 8.18 | 7.91 | 4.68 | 2.03 | 3.03 | 0.70 | 2.12 | 0.30 |
| 46 | | | | | | | | | 12.11 | 19.99 | 8.56 | 8.59 | 4.89 | 2.20 | 3.17 | 0.76 | 2.22 | 0.32 |
| 48 | | | | | | | | | 12.63 | 21.63 | 8.93 | 9.30 | 5.10 | 2.38 | 3.30 | 0.83 | 2.32 | 0.35 |
| 50 | | | | | | | | | 13.16 | 23.33 | 9.30 | 10.03 | 5.32 | 2.57 | 3.44 | 0.89 | 2.41 | 0.38 |
| 55 | | | | | | | | | 14.48 | 27.84 | 10.23 | 11.96 | 5.85 | 3.07 | 3.78 | 1.06 | 2.66 | 0.45 |
| 60 | | | | | | | | | 15.79 | 32.70 | 11.16 | 14.05 | 6.38 | 3.60 | 4.13 | 1.25 | 2.90 | 0.53 |
| 65 | | | | | | | | | 17.11 | 37.93 | 12.09 | 16.30 | 6.91 | 4.18 | 4.47 | 1.45 | 3.14 | 0.61 |
| 70 | | | | | | | | | 18.43 | 43.51 | 13.02 | 18.70 | 7.44 | 4.79 | 4.82 | 1.66 | 3.38 | 0.70 |
| 75 | | | | | | | | | | | 13.95 | 21.24 | 7.97 | 5.45 | 5.16 | 1.89 | 3.62 | 0.80 |
| 80 | | | | | | | | | | | 14.88 | 23.94 | 8.51 | 6.14 | 5.50 | 2.13 | 3.86 | 0.90 |
| 85 | | | | | | | | | | | 15.81 | 26.79 | 9.04 | 6.87 | 5.85 | 2.38 | 4.10 | 1.01 |
| 90 | | | | | | | | | | | 16.74 | 29.78 | 9.57 | 7.63 | 6.19 | 2.65 | 4.35 | 1.12 |
| 95 | | | | | | | | | | | 17.67 | 32.91 | 10.10 | 8.44 | 6.54 | 2.93 | 4.59 | 1.24 |
| 100 | | | | | | | | | | | 18.60 | 36.19 | 10.63 | 9.28 | 6.88 | 3.22 | 4.83 | 1.36 |
| 110 | | | | | | | | | | | | | 11.69 | 11.07 | 7.57 | 3.84 | 5.31 | 1.62 |
| 120 | | | | | | | | | | | | | 12.76 | 13.01 | 8.26 | 4.51 | 5.79 | 1.91 |
| 130 | | | | | | | | | | | | | 13.82 | 15.08 | 8.95 | 5.23 | 6.28 | 2.21 |
| 140 | | | | | | | | | | | | | 14.88 | 17.30 | 9.63 | 6.00 | 6.76 | 2.54 |
| 150 | | | | | | | | | | | | | 15.95 | 19.66 | 10.32 | 6.82 | 7.24 | 2.88 |
| 160 | | | | | | | | | | | | | 17.01 | 22.16 | 11.01 | 7.69 | 7.72 | 3.25 |
| 170 | | | | | | | | | | | | | 18.07 | 24.79 | 11.70 | 8.60 | 8.21 | 3.63 |
| 180 | | | | | | | | | | | | | | | 12.39 | 9.56 | 8.69 | 4.04 |
| 190 | | | | | | | | | | | | | | | 13.07 | 10.57 | 9.17 | 4.46 |
| 200 | | | | | | | | | | | | | | | 13.76 | 11.62 | 9.66 | 4.91 |
| 220 | | | | | | | | | | | | | | | 15.14 | 13.87 | 10.62 | 5.86 |
| 240 | | | | | | | | | | | | | | | 16.51 | 16.29 | 11.59 | 6.88 |
| 260 | | | | | | | | | | | | | | | 17.89 | 18.90 | 12.55 | 7.98 |
| 280 | | | | | | | | | | | | | | | 19.27 | 21.68 | 13.52 | 9.15 |
| 300 | | | | | | | | | | | | | | | | | 14.48 | 10.40 |
| 320 | | | | | | | | | | | | | | | | | 15.45 | 11.72 |
| 340 | | | | | | | | | | | | | | | | | 16.42 | 13.11 |
| 360 | | | | | | | | | | | | | | | | | 17.38 | 14.58 |
| 380 | | | | | | | | | | | | | | | | | 18.35 | 16.11 |
| 400 | | | | | | | | | | | | | | | | | | |
| 420 | | | | | | | | | | | | | | | | | | |
| 440 | | | | | | | | | | | | | | | | | | |
| 460 | | | | | | | | | | | | | | | | | | |
| 480 | | | | | | | | | | | | | | | | | | |
| 500 | | | | | | | | | | | | | | | | | | |

**Notes:** Shaded areas represent velocities over 7 fps. Use with caution when water hammer is a concern.

# FRICTION LOSS CHARTS - TYPE L COPPER TUBING

ASTM B88 C = 140 • PSI loss per 100 ft. of pipe

| Nominal Size | ½" | | ⅝" | | ¾" | | 1" | | 1¼" | | 1½" | | 2" | | 2½" | | 3" | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pipe ID | 0.545 | | 0.666 | | 0.785 | | 1.025 | | 1.265 | | 1.505 | | 1.985 | | 2.465 | | 2.945 | |
| Pipe OD | 0.625 | | 0.750 | | 0.875 | | 1.125 | | 1.375 | | 1.625 | | 2.125 | | 2.625 | | 3.125 | |
| Avg. Wall | 0.040 | | 0.042 | | 0.045 | | 0.050 | | 0.055 | | 0.060 | | 0.070 | | 0.080 | | 0.090 | |
| Flow (GPM) | 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 | 1.37 | 0.93 | 0.92 | 0.35 | 0.66 | 0.16 | 0.39 | 0.04 | 0.25 | 0.02 | | | | | | | | |
| 2 | 2.75 | 3.35 | 1.84 | 1.26 | 1.32 | 0.57 | 0.78 | 0.15 | 0.51 | 0.06 | | | | | | | | |
| 3 | 4.12 | 7.09 | 2.76 | 2.67 | 1.99 | 1.20 | 1.17 | 0.33 | 0.76 | 0.12 | | | | | | | | |
| 4 | 5.49 | 12.09 | 3.68 | 4.56 | 2.65 | 2.05 | 1.55 | 0.56 | 1.02 | 0.20 | | | | | | | | |
| 5 | 6.87 | 18.27 | 4.60 | 6.89 | 3.31 | 3.09 | 1.94 | 0.85 | 1.27 | 0.30 | | | | | | | | |
| 6 | 8.24 | 25.61 | 5.52 | 9.65 | 3.97 | 4.34 | 2.33 | 1.18 | 1.53 | 0.43 | 1.08 | 0.18 | | | | | | |
| 7 | 9.62 | 34.07 | 6.44 | 12.84 | 4.63 | 5.77 | 2.72 | 1.58 | 1.78 | 0.57 | 1.26 | 0.24 | | | | | | |
| 8 | 10.99 | 43.63 | 7.36 | 16.45 | 5.30 | 7.39 | 3.11 | 2.02 | 2.04 | 0.72 | 1.44 | 0.31 | | | | | | |
| 9 | 12.36 | 54.26 | 8.28 | 20.45 | 5.96 | 9.19 | 3.50 | 2.51 | 2.29 | 0.90 | 1.62 | 0.39 | | | | | | |
| 10 | 13.74 | 65.95 | 9.20 | 24.86 | 6.62 | 11.17 | 3.88 | 3.05 | 2.55 | 1.10 | 1.80 | 0.47 | | | | | | |
| 12 | | | 11.04 | 34.85 | 7.95 | 15.66 | 4.66 | 4.28 | 3.06 | 1.54 | 2.16 | 0.66 | 1.24 | 0.17 | | | | |
| 14 | | | 12.88 | 46.36 | 9.27 | 20.83 | 5.44 | 5.69 | 3.57 | 2.04 | 2.52 | 0.88 | 1.45 | 0.23 | | | | |
| 16 | | | 14.72 | 59.37 | 10.59 | 26.68 | 6.21 | 7.28 | 4.08 | 2.62 | 2.88 | 1.12 | 1.66 | 0.29 | | | | |
| 18 | | | 16.56 | 73.84 | 11.92 | 33.18 | 6.99 | 9.06 | 4.59 | 3.25 | 3.24 | 1.40 | 1.86 | 0.36 | | | | |
| 20 | | | | | 13.24 | 40.33 | 7.77 | 11.01 | 5.10 | 3.96 | 3.60 | 1.70 | 2.07 | 0.44 | | | | |
| 22 | | | | | 14.57 | 48.11 | 8.54 | 13.14 | 5.61 | 4.72 | 3.96 | 2.03 | 2.28 | 0.53 | 1.48 | 0.18 | 1.03 | 0.08 |
| 24 | | | | | 15.89 | 56.53 | 9.32 | 15.44 | 6.12 | 5.55 | 4.32 | 2.38 | 2.49 | 0.62 | 1.61 | 0.22 | 1.13 | 0.09 |
| 26 | | | | | | | 10.10 | 17.90 | 6.63 | 6.43 | 4.68 | 2.76 | 2.69 | 0.72 | 1.75 | 0.25 | 1.22 | 0.11 |
| 28 | | | | | | | 10.87 | 20.54 | 7.14 | 7.38 | 5.04 | 3.17 | 2.90 | 0.82 | 1.88 | 0.29 | 1.32 | 0.12 |
| 30 | | | | | | | 11.65 | 23.33 | 7.65 | 8.38 | 5.40 | 3.60 | 3.11 | 0.94 | 2.01 | 0.33 | 1.41 | 0.14 |
| 32 | | | | | | | 12.43 | 26.30 | 8.16 | 9.45 | 5.76 | 4.06 | 3.31 | 1.05 | 2.15 | 0.37 | 1.51 | 0.15 |
| 34 | | | | | | | 13.20 | 29.42 | 8.67 | 10.57 | 6.12 | 4.54 | 3.52 | 1.18 | 2.28 | 0.41 | 1.60 | 0.17 |
| 36 | | | | | | | 13.98 | 32.71 | 9.18 | 11.75 | 6.48 | 5.05 | 3.73 | 1.31 | 2.42 | 0.46 | 1.69 | 0.19 |
| 38 | | | | | | | 14.76 | 36.15 | 9.69 | 12.99 | 6.84 | 5.58 | 3.93 | 1.45 | 2.55 | 0.51 | 1.79 | 0.21 |
| 40 | | | | | | | 15.53 | 39.75 | 10.20 | 14.28 | 7.21 | 6.13 | 4.14 | 1.59 | 2.69 | 0.56 | 1.88 | 0.23 |
| 42 | | | | | | | 16.31 | 43.51 | 10.71 | 15.63 | 7.57 | 6.71 | 4.35 | 1.75 | 2.82 | 0.61 | 1.98 | 0.26 |
| 44 | | | | | | | | | 11.22 | 17.04 | 7.93 | 7.32 | 4.56 | 1.90 | 2.95 | 0.66 | 2.07 | 0.28 |
| 46 | | | | | | | | | 11.73 | 18.50 | 8.29 | 7.94 | 4.76 | 2.07 | 3.09 | 0.72 | 2.16 | 0.30 |
| 48 | | | | | | | | | 12.24 | 20.02 | 8.65 | 8.60 | 4.97 | 2.24 | 3.22 | 0.78 | 2.26 | 0.33 |
| 50 | | | | | | | | | 12.75 | 21.59 | 9.01 | 9.27 | 5.18 | 2.41 | 3.36 | 0.84 | 2.35 | 0.35 |
| 55 | | | | | | | | | 14.02 | 25.76 | 9.91 | 11.06 | 5.70 | 2.88 | 3.69 | 1.00 | 2.59 | 0.42 |
| 60 | | | | | | | | | 15.30 | 30.26 | 10.81 | 13.00 | 6.21 | 3.38 | 4.03 | 1.18 | 2.82 | 0.50 |
| 65 | | | | | | | | | 16.57 | 35.10 | 11.71 | 15.07 | 6.73 | 3.92 | 4.36 | 1.37 | 3.06 | 0.57 |
| 70 | | | | | | | | | 17.85 | 40.26 | 12.61 | 17.29 | 7.25 | 4.50 | 4.70 | 1.57 | 3.29 | 0.66 |
| 75 | | | | | | | | | | | 13.51 | 19.65 | 7.77 | 5.11 | 5.04 | 1.78 | 3.53 | 0.75 |
| 80 | | | | | | | | | | | 14.41 | 22.14 | 8.28 | 5.76 | 5.37 | 2.01 | 3.76 | 0.84 |
| 85 | | | | | | | | | | | 15.31 | 24.77 | 8.80 | 6.44 | 5.71 | 2.25 | 4.00 | 0.94 |
| 90 | | | | | | | | | | | 16.21 | 27.54 | 9.32 | 7.16 | 6.04 | 2.50 | 4.23 | 1.05 |
| 95 | | | | | | | | | | | 17.11 | 30.44 | 9.84 | 7.91 | 6.38 | 2.76 | 4.47 | 1.16 |
| 100 | | | | | | | | | | | 18.01 | 33.47 | 10.35 | 8.70 | 6.71 | 3.03 | 4.70 | 1.28 |
| 110 | | | | | | | | | | | | | 11.39 | 10.38 | 7.39 | 3.62 | 5.17 | 1.52 |
| 120 | | | | | | | | | | | | | 12.43 | 12.20 | 8.06 | 4.25 | 5.65 | 1.79 |
| 130 | | | | | | | | | | | | | 13.46 | 14.15 | 8.73 | 4.93 | 6.12 | 2.07 |
| 140 | | | | | | | | | | | | | 14.50 | 16.23 | 9.40 | 5.66 | 6.59 | 2.38 |
| 150 | | | | | | | | | | | | | 15.53 | 18.44 | 10.07 | 6.43 | 7.06 | 2.70 |
| 160 | | | | | | | | | | | | | 16.57 | 20.78 | 10.74 | 7.24 | 7.53 | 3.05 |
| 170 | | | | | | | | | | | | | 17.60 | 23.25 | 11.41 | 8.11 | 8.00 | 3.41 |
| 180 | | | | | | | | | | | | | | | 12.09 | 9.01 | 8.47 | 3.79 |
| 190 | | | | | | | | | | | | | | | 12.76 | 9.96 | 8.94 | 4.19 |
| 200 | | | | | | | | | | | | | | | 13.43 | 10.95 | 9.41 | 4.61 |
| 220 | | | | | | | | | | | | | | | 14.77 | 13.07 | 10.35 | 5.50 |
| 240 | | | | | | | | | | | | | | | 16.12 | 15.35 | 11.29 | 6.46 |
| 260 | | | | | | | | | | | | | | | 17.46 | 17.80 | 12.23 | 7.49 |
| 280 | | | | | | | | | | | | | | | 18.80 | 20.42 | 13.17 | 8.59 |
| 300 | | | | | | | | | | | | | | | | | 14.11 | 9.76 |
| 320 | | | | | | | | | | | | | | | | | 15.05 | 11.00 |
| 340 | | | | | | | | | | | | | | | | | 15.99 | 12.31 |
| 360 | | | | | | | | | | | | | | | | | 16.94 | 13.69 |
| 380 | | | | | | | | | | | | | | | | | 17.88 | 15.13 |
| 400 | | | | | | | | | | | | | | | | | | |
| 420 | | | | | | | | | | | | | | | | | | |
| 440 | | | | | | | | | | | | | | | | | | |
| 460 | | | | | | | | | | | | | | | | | | |
| 480 | | | | | | | | | | | | | | | | | | |
| 500 | | | | | | | | | | | | | | | | | | |

**Notes:** Shaded areas represent velocities over 7 fps. Use with caution when water hammer is a concern.

# FRICTION LOSS CHARTS - SCHEDULE 40 STEEL

ASTM B53 C = 100 • PSI loss per 100 ft. of pipe

| Nominal Size | ½" | | ¾" | | 1" | | 1¼" | | 1½" | | 2" | | 2½" | | 3" | | 4" | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pipe ID | 0.622 | | 0.824 | | 1.049 | | 1.38 | | 1.610 | | 2.067 | | 2.469 | | 3.068 | | 4.026 | |
| PIpe OD | 0.842 | | 1.050 | | 1.315 | | 1.660 | | 1.900 | | 2.375 | | 2.875 | | 3.500 | | 4.500 | |
| Avg. Wall | 0.110 | | 0.113 | | 0.133 | | 0.140 | | 0.145 | | 0.154 | | 0.203 | | 0.216 | | 0.237 | |
| Flow (GPM) | 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 | 1.05 | 0.91 | 0.60 | 0.23 | 0.37 | 0.07 | 0.21 | 0.02 | 0.16 | 0.01 | | | | | | | | |
| 2 | 2.11 | 3.28 | 1.20 | 0.84 | 0.74 | 0.26 | 0.43 | 0.07 | 0.31 | 0.03 | | | | | | | | |
| 3 | 3.16 | 6.95 | 1.80 | 1.77 | 1.11 | 0.55 | 0.64 | 0.14 | 0.47 | 0.07 | | | | | | | | |
| 4 | 4.22 | 11.85 | 2.40 | 3.02 | 1.48 | 0.93 | 0.86 | 0.25 | 0.63 | 0.12 | | | | | | | | |
| 5 | 5.27 | 17.91 | 3.00 | 4.56 | 1.85 | 1.41 | 1.07 | 0.37 | 0.79 | 0.18 | | | | | | | | |
| 6 | 6.33 | 25.10 | 3.61 | 6.39 | 2.22 | 1.97 | 1.29 | 0.52 | 0.94 | 0.25 | 0.57 | 0.07 | | | | | | |
| 7 | 7.38 | 33.40 | 4.21 | 8.50 | 2.60 | 2.63 | 1.50 | 0.69 | 1.10 | 0.33 | 0.67 | 0.10 | | | | | | |
| 8 | 8.44 | 42.77 | 4.81 | 10.88 | 2.97 | 3.36 | 1.71 | 0.89 | 1.26 | 0.42 | 0.76 | 0.12 | | | | | | |
| 9 | 9.49 | 53.19 | 5.41 | 13.54 | 3.34 | 4.18 | 1.93 | 1.10 | 1.42 | 0.52 | 0.86 | 0.15 | | | | | | |
| 10 | 10.55 | 64.65 | 6.01 | 16.45 | 3.71 | 5.08 | 2.14 | 1.34 | 1.57 | 0.63 | 0.95 | 0.19 | | | | | | |
| 12 | 12.65 | 90.62 | 7.21 | 23.06 | 4.45 | 7.12 | 2.57 | 1.88 | 1.89 | 0.89 | 1.15 | 0.26 | 0.80 | 0.11 | | | | |
| 14 | | | 8.41 | 30.68 | 5.19 | 9.48 | 3.00 | 2.50 | 2.20 | 1.18 | 1.34 | 0.35 | 0.94 | 0.15 | | | | |
| 16 | | | 9.61 | 39.29 | 5.93 | 12.14 | 3.43 | 3.20 | 2.52 | 1.51 | 1.53 | 0.45 | 1.07 | 0.19 | | | | |
| 18 | | | 10.82 | 48.87 | 6.67 | 15.10 | 3.86 | 3.97 | 2.83 | 1.88 | 1.72 | 0.56 | 1.20 | 0.23 | | | | |
| 20 | | | 12.02 | 59.40 | 7.42 | 18.35 | 4.28 | 4.83 | 3.15 | 2.28 | 1.91 | 0.68 | 1.34 | 0.28 | | | | |
| 22 | | | 13.22 | 70.87 | 8.16 | 21.89 | 4.71 | 5.76 | 3.46 | 2.72 | 2.10 | 0.81 | 1.47 | 0.34 | 0.95 | 0.12 | 0.55 | 0.03 |
| 24 | | | | | 8.90 | 25.72 | 5.14 | 6.77 | 3.78 | 3.20 | 2.29 | 0.95 | 1.61 | 0.40 | 1.04 | 0.14 | 0.60 | 0.04 |
| 26 | | | | | 9.64 | 29.83 | 5.57 | 7.85 | 4.09 | 3.71 | 2.48 | 1.10 | 1.74 | 0.46 | 1.13 | 0.16 | 0.65 | 0.04 |
| 28 | | | | | 10.38 | 34.22 | 6.00 | 9.01 | 4.41 | 4.25 | 2.67 | 1.26 | 1.87 | 0.53 | 1.21 | 0.18 | 0.70 | 0.05 |
| 30 | | | | | 11.12 | 38.88 | 6.43 | 10.24 | 4.72 | 4.83 | 2.86 | 1.43 | 2.01 | 0.60 | 1.30 | 0.21 | 0.76 | 0.06 |
| 32 | | | | | 11.86 | 43.81 | 6.86 | 11.54 | 5.04 | 5.45 | 3.06 | 1.62 | 2.14 | 0.68 | 1.39 | 0.24 | 0.81 | 0.06 |
| 34 | | | | | 12.61 | 49.02 | 7.28 | 12.91 | 5.35 | 6.10 | 3.25 | 1.81 | 2.28 | 0.76 | 1.47 | 0.26 | 0.86 | 0.07 |
| 36 | | | | | 13.35 | 54.49 | 7.71 | 14.35 | 5.67 | 6.78 | 3.44 | 2.01 | 2.41 | 0.85 | 1.56 | 0.29 | 0.91 | 0.08 |
| 38 | | | | | | | 8.14 | 15.86 | 5.98 | 7.49 | 3.63 | 2.22 | 2.54 | 0.94 | 1.65 | 0.33 | 0.96 | 0.09 |
| 40 | | | | | | | 8.57 | 17.44 | 6.30 | 8.24 | 3.82 | 2.44 | 2.68 | 1.03 | 1.73 | 0.36 | 1.01 | 0.10 |
| 42 | | | | | | | 9.00 | 19.09 | 6.61 | 9.02 | 4.01 | 2.67 | 2.81 | 1.13 | 1.82 | 0.39 | 1.06 | 0.10 |
| 44 | | | | | | | 9.43 | 20.81 | 6.93 | 9.83 | 4.20 | 2.91 | 2.94 | 1.23 | 1.91 | 0.43 | 1.11 | 0.11 |
| 46 | | | | | | | 9.86 | 22.59 | 7.24 | 10.67 | 4.39 | 3.16 | 3.08 | 1.33 | 1.99 | 0.46 | 1.16 | 0.12 |
| 48 | | | | | | | 10.28 | 24.44 | 7.56 | 11.55 | 4.58 | 3.42 | 3.21 | 1.44 | 2.08 | 0.50 | 1.21 | 0.13 |
| 50 | | | | | | | 10.71 | 26.36 | 7.87 | 12.45 | 4.77 | 3.69 | 3.35 | 1.55 | 2.17 | 0.54 | 1.26 | 0.14 |
| 55 | | | | | | | 11.78 | 31.45 | 8.66 | 14.86 | 5.25 | 4.40 | 3.68 | 1.85 | 2.38 | 0.64 | 1.38 | 0.17 |
| 60 | | | | | | | 12.85 | 36.95 | 9.44 | 17.45 | 5.73 | 5.17 | 4.02 | 2.18 | 2.60 | 0.76 | 1.51 | 0.20 |
| 65 | | | | | | | 13.93 | 42.86 | 10.23 | 20.24 | 6.21 | 6.00 | 4.35 | 2.53 | 2.82 | 0.88 | 1.64 | 0.23 |
| 70 | | | | | | | | | 11.02 | 23.22 | 6.68 | 6.88 | 4.69 | 2.90 | 3.03 | 1.01 | 1.76 | 0.27 |
| 75 | | | | | | | | | 11.81 | 26.39 | 7.16 | 7.82 | 5.02 | 3.29 | 3.25 | 1.14 | 1.89 | 0.31 |
| 80 | | | | | | | | | 12.59 | 29.74 | 7.64 | 8.82 | 5.35 | 3.71 | 3.47 | 1.29 | 2.01 | 0.34 |
| 85 | | | | | | | | | 13.38 | 33.27 | 8.12 | 9.86 | 5.69 | 4.15 | 3.68 | 1.44 | 2.14 | 0.38 |
| 90 | | | | | | | | | | | 8.59 | 10.96 | 6.02 | 4.62 | 3.90 | 1.60 | 2.27 | 0.43 |
| 95 | | | | | | | | | | | 9.07 | 12.12 | 6.36 | 5.10 | 4.12 | 1.77 | 2.39 | 0.47 |
| 100 | | | | | | | | | | | 9.55 | 13.33 | 6.69 | 5.61 | 4.33 | 1.95 | 2.52 | 0.52 |
| 110 | | | | | | | | | | | 10.50 | 15.90 | 7.36 | 6.70 | 4.77 | 2.33 | 2.77 | 0.62 |
| 120 | | | | | | | | | | | 11.46 | 18.68 | 8.03 | 7.87 | 5.20 | 2.73 | 3.02 | 0.73 |
| 130 | | | | | | | | | | | 12.41 | 21.66 | 8.70 | 9.12 | 5.63 | 3.17 | 3.27 | 0.85 |
| 140 | | | | | | | | | | | 13.37 | 24.85 | 9.37 | 10.47 | 6.07 | 3.64 | 3.52 | 0.97 |
| 150 | | | | | | | | | | | | | 10.04 | 11.89 | 6.50 | 4.13 | 3.78 | 1.10 |
| 160 | | | | | | | | | | | | | 10.71 | 13.40 | 6.94 | 4.66 | 4.03 | 1.24 |
| 170 | | | | | | | | | | | | | 11.38 | 15.00 | 7.37 | 5.21 | 4.28 | 1.39 |
| 180 | | | | | | | | | | | | | 12.05 | 16.67 | 7.80 | 5.79 | 4.53 | 1.54 |
| 190 | | | | | | | | | | | | | 12.72 | 18.43 | 8.24 | 6.40 | 4.78 | 1.71 |
| 200 | | | | | | | | | | | | | 13.39 | 20.26 | 8.67 | 7.04 | 5.03 | 1.88 |
| 220 | | | | | | | | | | | | | | | 9.54 | 8.40 | 5.54 | 2.24 |
| 240 | | | | | | | | | | | | | | | 10.40 | 9.87 | 6.04 | 2.63 |
| 260 | | | | | | | | | | | | | | | 11.27 | 11.45 | 6.54 | 3.05 |
| 280 | | | | | | | | | | | | | | | 12.14 | 13.13 | 7.05 | 3.50 |
| 300 | | | | | | | | | | | | | | | 13.00 | 14.92 | 7.55 | 3.98 |
| 320 | | | | | | | | | | | | | | | 13.87 | 16.81 | 8.05 | 4.48 |
| 340 | | | | | | | | | | | | | | | | | 8.56 | 5.01 |
| 360 | | | | | | | | | | | | | | | | | 9.06 | 5.57 |
| 380 | | | | | | | | | | | | | | | | | 9.57 | 6.16 |
| 400 | | | | | | | | | | | | | | | | | 10.07 | 6.77 |
| 420 | | | | | | | | | | | | | | | | | 10.57 | 7.42 |
| 440 | | | | | | | | | | | | | | | | | 11.08 | 8.08 |
| 460 | | | | | | | | | | | | | | | | | 11.58 | 8.78 |
| 480 | | | | | | | | | | | | | | | | | 12.08 | 9.50 |
| 500 | | | | | | | | | | | | | | | | | 12.59 | 10.24 |

**Notes:** Shaded areas represent velocities over 7 fps. Use with caution when water hammer is a concern.

# FRICTION LOSS CHARTS - CLASS 160 PVC IPS PLASTIC PIPE

**ASTM D2241 (1120, 1220) SDR 26 C = 150 • PSI loss per 100 ft. of pipe**

| Nominal Size | ½" | | ¾" | | 1" | | 1¼" | | 1½" | | 2" | | 2½" | | 3" | | 4" | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Avg. ID | 0.696 | | 0.910 | | 1.175 | | 1.512 | | 1.734 | | 2.173 | | 2.635 | | 3.21 | | 4.134 | |
| Pipe OD | 0.840 | | 1.050 | | 1.315 | | 1.660 | | 1.900 | | 2.375 | | 2.875 | | 3.500 | | 4.500 | |
| Avg. Wall | 0.072 | | 0.070 | | 0.070 | | 0.074 | | 0.083 | | 0.101 | | 0.120 | | 0.145 | | 0.183 | |
| Min. Wall | 0.062 | | 0.060 | | 0.060 | | 0.064 | | 0.073 | | 0.091 | | 0.110 | | 0.135 | | 0.173 | |
| Flow (GPM) | 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 | 0.84 | 0.25 | 0.49 | 0.07 | 0.30 | 0.02 | 0.18 | 0.01 | 0.14 | 0.00 | | | | | | | | |
| 2 | 1.68 | 0.90 | 0.99 | 0.24 | 0.59 | 0.07 | 0.36 | 0.02 | 0.27 | 0.01 | 0.17 | 0.00 | | | | | | |
| 3 | 2.53 | 1.90 | 1.48 | 0.52 | 0.89 | 0.15 | 0.54 | 0.04 | 0.41 | 0.02 | 0.26 | 0.01 | | | | | | |
| 4 | 3.37 | 3.24 | 1.97 | 0.88 | 1.18 | 0.25 | 0.71 | 0.07 | 0.54 | 0.04 | 0.35 | 0.01 | 0.24 | 0.00 | | | | |
| 5 | 4.21 | 4.89 | 2.46 | 1.33 | 1.48 | 0.38 | 0.89 | 0.11 | 0.68 | 0.06 | 0.43 | 0.02 | 0.29 | 0.01 | | | | |
| 6 | 5.05 | 6.86 | 2.96 | 1.86 | 1.77 | 0.54 | 1.07 | 0.16 | 0.81 | 0.08 | 0.52 | 0.03 | 0.35 | 0.01 | 0.24 | 0.00 | | |
| 7 | 5.90 | 9.12 | 3.45 | 2.47 | 2.07 | 0.71 | 1.25 | 0.21 | 0.95 | 0.11 | 0.60 | 0.04 | 0.41 | 0.01 | 0.28 | 0.01 | | |
| 8 | 6.74 | 11.68 | 3.94 | 3.17 | 2.36 | 0.91 | 1.43 | 0.27 | 1.09 | 0.14 | 0.69 | 0.05 | 0.47 | 0.02 | 0.32 | 0.01 | | |
| 9 | 7.58 | 14.53 | 4.43 | 3.94 | 2.66 | 1.14 | 1.61 | 0.33 | 1.22 | 0.17 | 0.78 | 0.06 | 0.53 | 0.02 | 0.36 | 0.01 | | |
| 10 | 8.42 | 17.66 | 4.93 | 4.79 | 2.96 | 1.38 | 1.78 | 0.40 | 1.36 | 0.21 | 0.86 | 0.07 | 0.59 | 0.03 | 0.40 | 0.01 | | |
| 12 | 10.11 | 24.75 | 5.91 | 6.71 | 3.55 | 1.94 | 2.14 | 0.57 | 1.63 | 0.29 | 1.04 | 0.10 | 0.71 | 0.04 | 0.48 | 0.01 | | |
| 14 | 11.79 | 32.93 | 6.90 | 8.93 | 4.14 | 2.58 | 2.50 | 0.76 | 1.90 | 0.39 | 1.21 | 0.13 | 0.82 | 0.05 | 0.55 | 0.02 | | |
| 16 | 13.48 | 42.16 | 7.88 | 11.44 | 4.73 | 3.30 | 2.86 | 0.97 | 2.17 | 0.50 | 1.38 | 0.17 | 0.94 | 0.06 | 0.63 | 0.02 | 0.38 | 0.01 |
| 18 | 15.16 | 52.44 | 8.87 | 14.23 | 5.32 | 4.10 | 3.21 | 1.20 | 2.44 | 0.62 | 1.56 | 0.21 | 1.06 | 0.08 | 0.71 | 0.03 | 0.43 | 0.01 |
| 20 | | | 9.85 | 17.29 | 5.91 | 4.99 | 3.57 | 1.46 | 2.71 | 0.75 | 1.73 | 0.25 | 1.18 | 0.10 | 0.79 | 0.04 | 0.48 | 0.01 |
| 22 | | | 10.84 | 20.63 | 6.50 | 5.95 | 3.93 | 1.74 | 2.99 | 0.90 | 1.90 | 0.30 | 1.29 | 0.12 | 0.87 | 0.04 | 0.53 | 0.01 |
| 24 | | | 11.82 | 24.24 | 7.09 | 6.99 | 4.28 | 2.05 | 3.26 | 1.05 | 2.07 | 0.35 | 1.41 | 0.14 | 0.95 | 0.05 | 0.57 | 0.02 |
| 26 | | | 12.81 | 28.11 | 7.68 | 8.11 | 4.64 | 2.38 | 3.53 | 1.22 | 2.25 | 0.41 | 1.53 | 0.16 | 1.03 | 0.06 | 0.62 | 0.02 |
| 28 | | | 13.80 | 32.25 | 8.27 | 9.30 | 5.00 | 2.73 | 3.80 | 1.40 | 2.42 | 0.47 | 1.65 | 0.18 | 1.11 | 0.07 | 0.67 | 0.02 |
| 30 | | | 14.78 | 36.64 | 8.87 | 10.57 | 5.35 | 3.10 | 4.07 | 1.59 | 2.59 | 0.53 | 1.76 | 0.21 | 1.19 | 0.08 | 0.72 | 0.02 |
| 32 | | | | | 9.46 | 11.91 | 5.71 | 3.49 | 4.34 | 1.79 | 2.76 | 0.60 | 1.88 | 0.23 | 1.27 | 0.09 | 0.76 | 0.03 |
| 34 | | | | | 10.05 | 13.32 | 6.07 | 3.91 | 4.61 | 2.01 | 2.94 | 0.67 | 2.00 | 0.26 | 1.35 | 0.10 | 0.81 | 0.03 |
| 36 | | | | | 10.64 | 14.81 | 6.42 | 4.34 | 4.88 | 2.23 | 3.11 | 0.74 | 2.12 | 0.29 | 1.43 | 0.11 | 0.86 | 0.03 |
| 38 | | | | | 11.23 | 16.37 | 6.78 | 4.80 | 5.16 | 2.46 | 3.28 | 0.82 | 2.23 | 0.32 | 1.50 | 0.12 | 0.91 | 0.04 |
| 40 | | | | | 11.82 | 18.00 | 7.14 | 5.28 | 5.43 | 2.71 | 3.46 | 0.90 | 2.35 | 0.35 | 1.58 | 0.14 | 0.95 | 0.04 |
| 42 | | | | | 12.41 | 19.70 | 7.50 | 5.78 | 5.70 | 2.97 | 3.63 | 0.99 | 2.47 | 0.39 | 1.66 | 0.15 | 1.00 | 0.04 |
| 44 | | | | | 13.00 | 21.47 | 7.85 | 6.30 | 5.97 | 3.23 | 3.80 | 1.08 | 2.59 | 0.42 | 1.74 | 0.16 | 1.05 | 0.05 |
| 46 | | | | | 13.59 | 23.32 | 8.21 | 6.84 | 6.24 | 3.51 | 3.97 | 1.17 | 2.70 | 0.46 | 1.82 | 0.18 | 1.10 | 0.05 |
| 48 | | | | | 14.18 | 25.23 | 8.57 | 7.40 | 6.51 | 3.80 | 4.15 | 1.27 | 2.82 | 0.50 | 1.90 | 0.19 | 1.15 | 0.06 |
| 50 | | | | | 14.78 | 27.21 | 8.92 | 7.98 | 6.78 | 4.10 | 4.32 | 1.37 | 2.94 | 0.53 | 1.98 | 0.20 | 1.19 | 0.06 |
| 55 | | | | | | | 9.82 | 9.52 | 7.46 | 4.89 | 4.75 | 1.63 | 3.23 | 0.64 | 2.18 | 0.24 | 1.31 | 0.07 |
| 60 | | | | | | | 10.71 | 11.18 | 8.14 | 5.74 | 5.18 | 1.91 | 3.53 | 0.75 | 2.38 | 0.29 | 1.43 | 0.08 |
| 65 | | | | | | | 11.60 | 12.97 | 8.82 | 6.66 | 5.62 | 2.22 | 3.82 | 0.87 | 2.57 | 0.33 | 1.55 | 0.10 |
| 70 | | | | | | | 12.49 | 14.88 | 9.50 | 7.64 | 6.05 | 2.55 | 4.11 | 1.00 | 2.77 | 0.38 | 1.67 | 0.11 |
| 75 | | | | | | | 13.38 | 16.90 | 10.18 | 8.68 | 6.48 | 2.89 | 4.41 | 1.13 | 2.97 | 0.43 | 1.79 | 0.13 |
| 80 | | | | | | | 14.28 | 19.05 | 10.86 | 9.78 | 6.91 | 3.26 | 4.70 | 1.28 | 3.17 | 0.49 | 1.91 | 0.14 |
| 85 | | | | | | | | | 11.53 | 10.94 | 7.34 | 3.65 | 4.99 | 1.43 | 3.37 | 0.55 | 2.03 | 0.16 |
| 90 | | | | | | | | | 12.21 | 12.16 | 7.78 | 4.06 | 5.29 | 1.59 | 3.56 | 0.61 | 2.15 | 0.18 |
| 95 | | | | | | | | | 12.89 | 13.45 | 8.21 | 4.48 | 5.58 | 1.76 | 3.76 | 0.67 | 2.27 | 0.20 |
| 100 | | | | | | | | | 13.57 | 14.79 | 8.64 | 4.93 | 5.88 | 1.93 | 3.96 | 0.74 | 2.39 | 0.22 |
| 110 | | | | | | | | | 14.93 | 17.64 | 9.50 | 5.88 | 6.46 | 2.30 | 4.36 | 0.88 | 2.63 | 0.26 |
| 120 | | | | | | | | | | | 10.37 | 6.91 | 7.05 | 2.71 | 4.75 | 1.04 | 2.86 | 0.30 |
| 130 | | | | | | | | | | | 11.23 | 8.02 | 7.64 | 3.14 | 5.15 | 1.20 | 3.10 | 0.35 |
| 140 | | | | | | | | | | | 12.10 | 9.20 | 8.23 | 3.60 | 5.54 | 1.38 | 3.34 | 0.40 |
| 150 | | | | | | | | | | | 12.96 | 10.45 | 8.81 | 4.09 | 5.94 | 1.57 | 3.58 | 0.46 |
| 160 | | | | | | | | | | | 13.82 | 11.77 | 9.40 | 4.61 | 6.34 | 1.76 | 3.82 | 0.52 |
| 170 | | | | | | | | | | | 14.69 | 13.17 | 9.99 | 5.16 | 6.73 | 1.97 | 4.06 | 0.58 |
| 180 | | | | | | | | | | | | | 10.58 | 5.73 | 7.13 | 2.19 | 4.30 | 0.64 |
| 190 | | | | | | | | | | | | | 11.16 | 6.34 | 7.52 | 2.42 | 4.54 | 0.71 |
| 200 | | | | | | | | | | | | | 11.75 | 6.97 | 7.92 | 2.67 | 4.77 | 0.78 |
| 220 | | | | | | | | | | | | | 12.93 | 8.31 | 8.71 | 3.18 | 5.25 | 0.93 |
| 240 | | | | | | | | | | | | | 14.10 | 9.77 | 9.50 | 3.74 | 5.73 | 1.09 |
| 260 | | | | | | | | | | | | | | | 10.29 | 4.33 | 6.21 | 1.27 |
| 280 | | | | | | | | | | | | | | | 11.09 | 4.97 | 6.68 | 1.45 |
| 300 | | | | | | | | | | | | | | | 11.88 | 5.65 | 7.16 | 1.65 |
| 320 | | | | | | | | | | | | | | | 12.67 | 6.37 | 7.64 | 1.86 |
| 340 | | | | | | | | | | | | | | | 13.46 | 7.12 | 8.12 | 2.08 |
| 360 | | | | | | | | | | | | | | | 14.25 | 7.92 | 8.59 | 2.31 |
| 380 | | | | | | | | | | | | | | | | | 9.07 | 2.56 |
| 400 | | | | | | | | | | | | | | | | | 9.55 | 2.81 |
| 420 | | | | | | | | | | | | | | | | | 10.03 | 3.08 |
| 440 | | | | | | | | | | | | | | | | | 10.50 | 3.35 |
| 460 | | | | | | | | | | | | | | | | | 10.98 | 3.64 |
| 480 | | | | | | | | | | | | | | | | | 11.46 | 3.94 |
| 500 | | | | | | | | | | | | | | | | | 11.94 | 4.25 |

**Notes:** Shaded areas represent velocities over 5 fps. Use with caution when water hammer is a concern.

# FRICTION LOSS CHARTS - CLASS 200 PVC IPS PLASTIC PIPE

ASTM D2241 (1120, 1220) SDR 21 C = 150 • PSI loss per 100 ft. of pipe

| Nominal Size | Class 315: ½" | | ¾" | | 1" | | 1¼" | | 1½" | | 2" | | 2½" | | 3" | | 4" | | 6" | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Avg. ID | 0.696 | | 0.910 | | 1.169 | | 1.482 | | 1.700 | | 2.129 | | 2.581 | | 3.146 | | 4.046 | | 5.955 | |
| Pipe OD | 0.840 | | 1.050 | | 1.315 | | 1.660 | | 1.900 | | 2.375 | | 2.875 | | 3.500 | | 4.500 | | 6.625 | |
| Avg. Wall | 0.072 | | 0.070 | | 0.073 | | 0.089 | | 0.100 | | 0.123 | | 0.147 | | 0.177 | | 0.227 | | 0.335 | |
| Min. Wall | 0.062 | | 0.060 | | 0.063 | | 0.079 | | 0.090 | | 0.113 | | 0.137 | | 0.167 | | 0.214 | | 0.316 | |
| Flow (GPM) | 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 | 0.84 | 0.25 | 0.49 | 0.07 | 0.30 | 0.02 | 0.19 | 0.01 | 0.14 | 0.00 | | | | | | | | | | |
| 2 | 1.68 | 0.90 | 0.99 | 0.24 | 0.60 | 0.07 | 0.37 | 0.02 | 0.28 | 0.01 | 0.18 | 0.00 | | | | | | | | |
| 3 | 2.53 | 1.90 | 1.48 | 0.52 | 0.90 | 0.15 | 0.56 | 0.05 | 0.42 | 0.02 | 0.27 | 0.01 | | | | | | | | |
| 4 | 3.37 | 3.24 | 1.97 | 0.88 | 1.19 | 0.26 | 0.74 | 0.08 | 0.56 | 0.04 | 0.36 | 0.01 | 0.24 | 0.01 | | | | | | |
| 5 | 4.21 | 4.89 | 2.46 | 1.33 | 1.49 | 0.39 | 0.93 | 0.12 | 0.71 | 0.06 | 0.45 | 0.02 | 0.31 | 0.01 | | | | | | |
| 6 | 5.05 | 6.86 | 2.96 | 1.86 | 1.79 | 0.55 | 1.11 | 0.17 | 0.85 | 0.09 | 0.54 | 0.03 | 0.37 | 0.01 | 0.25 | 0.00 | | | | |
| 7 | 5.90 | 9.12 | 3.45 | 2.47 | 2.09 | 0.73 | 1.30 | 0.23 | 0.99 | 0.12 | 0.63 | 0.04 | 0.43 | 0.02 | 0.29 | 0.01 | | | | |
| 8 | 6.74 | 11.68 | 3.94 | 3.17 | 2.39 | 0.94 | 1.49 | 0.30 | 1.13 | 0.15 | 0.72 | 0.05 | 0.49 | 0.02 | 0.33 | 0.01 | | | | |
| 9 | 7.58 | 14.53 | 4.43 | 3.94 | 2.69 | 1.17 | 1.67 | 0.37 | 1.27 | 0.19 | 0.81 | 0.06 | 0.55 | 0.02 | 0.37 | 0.01 | | | | |
| 10 | 8.42 | 17.66 | 4.93 | 4.79 | 2.99 | 1.42 | 1.86 | 0.45 | 1.41 | 0.23 | 0.90 | 0.08 | 0.61 | 0.03 | 0.41 | 0.01 | | | | |
| 12 | 10.11 | 24.75 | 5.91 | 6.71 | 3.58 | 1.98 | 2.23 | 0.63 | 1.69 | 0.32 | 1.08 | 0.11 | 0.73 | 0.04 | 0.49 | 0.02 | | | | |
| 14 | 11.79 | 32.93 | 6.90 | 8.93 | 4.18 | 2.64 | 2.60 | 0.83 | 1.98 | 0.43 | 1.26 | 0.14 | 0.86 | 0.06 | 0.58 | 0.02 | | | | |
| 16 | 13.48 | 42.16 | 7.88 | 11.44 | 4.78 | 3.38 | 2.97 | 1.07 | 2.26 | 0.55 | 1.44 | 0.18 | 0.98 | 0.07 | 0.66 | 0.03 | 0.40 | 0.01 | | |
| 18 | 15.16 | 52.44 | 8.87 | 14.23 | 5.37 | 4.21 | 3.34 | 1.33 | 2.54 | 0.68 | 1.62 | 0.23 | 1.10 | 0.09 | 0.74 | 0.03 | 0.45 | 0.01 | | |
| 20 | | | 9.85 | 17.29 | 5.97 | 5.11 | 3.72 | 1.61 | 2.82 | 0.83 | 1.80 | 0.28 | 1.22 | 0.11 | 0.82 | 0.04 | 0.50 | 0.01 | | |
| 22 | | | 10.84 | 20.63 | 6.57 | 6.10 | 4.09 | 1.92 | 3.11 | 0.99 | 1.98 | 0.33 | 1.35 | 0.13 | 0.91 | 0.05 | 0.55 | 0.01 | | |
| 24 | | | 11.82 | 24.24 | 7.17 | 7.17 | 4.46 | 2.26 | 3.39 | 1.16 | 2.16 | 0.39 | 1.47 | 0.15 | 0.99 | 0.06 | 0.60 | 0.02 | | |
| 26 | | | 12.81 | 28.11 | 7.76 | 8.31 | 4.83 | 2.62 | 3.67 | 1.34 | 2.34 | 0.45 | 1.59 | 0.18 | 1.07 | 0.07 | 0.65 | 0.02 | | |
| 28 | | | 13.80 | 32.25 | 8.36 | 9.53 | 5.20 | 3.01 | 3.95 | 1.54 | 2.52 | 0.52 | 1.71 | 0.20 | 1.15 | 0.08 | 0.70 | 0.02 | | |
| 30 | | | 14.78 | 36.64 | 8.96 | 10.83 | 5.57 | 3.41 | 4.24 | 1.75 | 2.70 | 0.59 | 1.84 | 0.23 | 1.24 | 0.09 | 0.75 | 0.03 | | |
| 32 | | | | | 9.55 | 12.21 | 5.94 | 3.85 | 4.52 | 1.97 | 2.88 | 0.66 | 1.96 | 0.26 | 1.32 | 0.10 | 0.80 | 0.03 | 0.37 | 0.00 |
| 34 | | | | | 10.15 | 13.66 | 6.32 | 4.31 | 4.80 | 2.21 | 3.06 | 0.74 | 2.08 | 0.29 | 1.40 | 0.11 | 0.85 | 0.03 | 0.39 | 0.00 |
| 36 | | | | | 10.75 | 15.18 | 6.69 | 4.79 | 5.08 | 2.45 | 3.24 | 0.82 | 2.20 | 0.32 | 1.48 | 0.12 | 0.90 | 0.04 | 0.41 | 0.01 |
| 38 | | | | | 11.35 | 16.78 | 7.06 | 5.29 | 5.36 | 2.71 | 3.42 | 0.91 | 2.33 | 0.36 | 1.57 | 0.14 | 0.95 | 0.04 | 0.44 | 0.01 |
| 40 | | | | | 11.94 | 18.45 | 7.43 | 5.82 | 5.65 | 2.98 | 3.60 | 1.00 | 2.45 | 0.39 | 1.65 | 0.15 | 1.00 | 0.04 | 0.46 | 0.01 |
| 42 | | | | | 12.54 | 20.20 | 7.80 | 6.37 | 5.93 | 3.27 | 3.78 | 1.09 | 2.57 | 0.43 | 1.73 | 0.16 | 1.05 | 0.05 | 0.48 | 0.01 |
| 44 | | | | | 13.14 | 22.02 | 8.17 | 6.94 | 6.21 | 3.56 | 3.96 | 1.19 | 2.69 | 0.47 | 1.81 | 0.18 | 1.10 | 0.05 | 0.51 | 0.01 |
| 46 | | | | | 13.73 | 23.91 | 8.55 | 7.54 | 6.49 | 3.86 | 4.14 | 1.29 | 2.82 | 0.51 | 1.90 | 0.19 | 1.15 | 0.06 | 0.53 | 0.01 |
| 48 | | | | | 14.33 | 25.87 | 8.92 | 8.15 | 6.78 | 4.18 | 4.32 | 1.40 | 2.94 | 0.55 | 1.98 | 0.21 | 1.20 | 0.06 | 0.55 | 0.01 |
| 50 | | | | | 14.93 | 27.90 | 9.29 | 8.79 | 7.06 | 4.51 | 4.50 | 1.51 | 3.06 | 0.59 | 2.06 | 0.23 | 1.25 | 0.07 | 0.58 | 0.01 |
| 55 | | | | | | | 10.22 | 10.49 | 7.76 | 5.38 | 4.95 | 1.80 | 3.37 | 0.71 | 2.27 | 0.27 | 1.37 | 0.08 | 0.63 | 0.01 |
| 60 | | | | | | | 11.15 | 12.33 | 8.47 | 6.32 | 5.40 | 2.11 | 3.67 | 0.83 | 2.47 | 0.32 | 1.50 | 0.09 | 0.69 | 0.01 |
| 65 | | | | | | | 12.07 | 14.30 | 9.18 | 7.33 | 5.85 | 2.45 | 3.98 | 0.96 | 2.68 | 0.37 | 1.62 | 0.11 | 0.75 | 0.02 |
| 70 | | | | | | | 13.00 | 16.40 | 9.88 | 8.41 | 6.30 | 2.81 | 4.29 | 1.10 | 2.89 | 0.42 | 1.74 | 0.12 | 0.81 | 0.02 |
| 75 | | | | | | | 13.93 | 18.63 | 10.59 | 9.56 | 6.75 | 3.20 | 4.59 | 1.25 | 3.09 | 0.48 | 1.87 | 0.14 | 0.86 | 0.02 |
| 80 | | | | | | | 14.86 | 21.00 | 11.29 | 10.77 | 7.20 | 3.60 | 4.90 | 1.41 | 3.30 | 0.54 | 1.99 | 0.16 | 0.92 | 0.02 |
| 85 | | | | | | | | | 12.00 | 12.05 | 7.65 | 4.03 | 5.21 | 1.58 | 3.50 | 0.60 | 2.12 | 0.18 | 0.98 | 0.03 |
| 90 | | | | | | | | | 12.71 | 13.40 | 8.10 | 4.48 | 5.51 | 1.76 | 3.71 | 0.67 | 2.24 | 0.20 | 1.04 | 0.03 |
| 95 | | | | | | | | | 13.41 | 14.81 | 8.55 | 4.95 | 5.82 | 1.94 | 3.92 | 0.74 | 2.37 | 0.22 | 1.09 | 0.03 |
| 100 | | | | | | | | | 14.12 | 16.28 | 9.00 | 5.45 | 6.12 | 2.13 | 4.12 | 0.81 | 2.49 | 0.24 | 1.15 | 0.04 |
| 110 | | | | | | | | | | | 9.90 | 6.50 | 6.74 | 2.55 | 4.53 | 0.97 | 2.74 | 0.29 | 1.27 | 0.04 |
| 120 | | | | | | | | | | | 10.80 | 7.63 | 7.35 | 2.99 | 4.95 | 1.14 | 2.99 | 0.34 | 1.38 | 0.05 |
| 130 | | | | | | | | | | | 11.70 | 8.85 | 7.96 | 3.47 | 5.36 | 1.32 | 3.24 | 0.39 | 1.50 | 0.06 |
| 140 | | | | | | | | | | | 12.60 | 10.16 | 8.57 | 3.98 | 5.77 | 1.52 | 3.49 | 0.45 | 1.61 | 0.07 |
| 150 | | | | | | | | | | | 13.50 | 11.54 | 9.19 | 4.52 | 6.18 | 1.73 | 3.74 | 0.51 | 1.73 | 0.08 |
| 160 | | | | | | | | | | | 14.40 | 13.01 | 9.80 | 5.10 | 6.60 | 1.95 | 3.99 | 0.57 | 1.84 | 0.09 |
| 170 | | | | | | | | | | | | | 10.41 | 5.70 | 7.01 | 2.18 | 4.24 | 0.64 | 1.96 | 0.10 |
| 180 | | | | | | | | | | | | | 11.02 | 6.34 | 7.42 | 2.42 | 4.49 | 0.71 | 2.07 | 0.11 |
| 190 | | | | | | | | | | | | | 11.64 | 7.01 | 7.83 | 2.67 | 4.74 | 0.79 | 2.19 | 0.12 |
| 200 | | | | | | | | | | | | | 12.25 | 7.71 | 8.24 | 2.94 | 4.98 | 0.86 | 2.30 | 0.13 |
| 220 | | | | | | | | | | | | | 13.47 | 9.19 | 9.07 | 3.51 | 5.48 | 1.03 | 2.53 | 0.16 |
| 240 | | | | | | | | | | | | | 14.70 | 10.80 | 9.89 | 4.12 | 5.98 | 1.21 | 2.76 | 0.18 |
| 260 | | | | | | | | | | | | | | | 10.72 | 4.78 | 6.48 | 1.41 | 2.99 | 0.21 |
| 280 | | | | | | | | | | | | | | | 11.54 | 5.48 | 6.98 | 1.61 | 3.22 | 0.25 |
| 300 | | | | | | | | | | | | | | | 12.37 | 6.23 | 7.48 | 1.83 | 3.45 | 0.28 |
| 320 | | | | | | | | | | | | | | | 13.19 | 7.02 | 7.98 | 2.06 | 3.68 | 0.31 |
| 340 | | | | | | | | | | | | | | | 14.02 | 7.86 | 8.47 | 2.31 | 3.91 | 0.35 |
| 360 | | | | | | | | | | | | | | | 14.84 | 8.73 | 8.97 | 2.57 | 4.14 | 0.39 |
| 380 | | | | | | | | | | | | | | | | | 9.47 | 2.84 | 4.37 | 0.43 |
| 400 | | | | | | | | | | | | | | | | | 9.97 | 3.12 | 4.60 | 0.48 |
| 420 | | | | | | | | | | | | | | | | | 10.47 | 3.42 | 4.83 | 0.52 |
| 440 | | | | | | | | | | | | | | | | | 10.97 | 3.72 | 5.06 | 0.57 |
| 460 | | | | | | | | | | | | | | | | | 11.46 | 4.04 | 5.29 | 0.62 |
| 480 | | | | | | | | | | | | | | | | | 11.96 | 4.37 | 5.52 | 0.67 |
| 500 | | | | | | | | | | | | | | | | | 12.46 | 4.72 | 5.75 | 0.72 |

**Notes:** Shaded areas represent velocities over 5 fps. Use with caution when water hammer is a concern.

# FRICTION LOSS CHARTS - CLASS 315 PVC IPS PLASTIC PIPE

ASTM D2241 (1120, 1220) SDR 13.5 C = 150 • PSI loss per 100 ft. of pipe

| Nominal Size | ½" | | ¾" | | 1" | | 1¼" | | 1½" | | 2" | | 2½" | | 3" | | 4" | | 6" | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Avg. ID | 0.696 | | 0.874 | | 1.101 | | 1.394 | | 1.598 | | 1.983 | | 2.423 | | 2.948 | | 3.794 | | 5.583 | |
| Pipe OD | 0.840 | | 1.050 | | 1.315 | | 1.660 | | 1.900 | | 2.375 | | 2.875 | | 3.500 | | 4.500 | | 6.625 | |
| Avg. Wall | 0.072 | | 0.088 | | 0.107 | | 0.133 | | 0.151 | | 0.196 | | 0.226 | | 0.274 | | 0.353 | | 0.521 | |
| Min. Wall | 0.062 | | 0.078 | | 0.097 | | 0.123 | | 0.141 | | 0.176 | | 0.213 | | 0.259 | | 0.333 | | 0.491 | |
| Flow (GPM) | 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 | 0.84 | 0.25 | 0.53 | 0.08 | 0.34 | 0.03 | 0.21 | 0.01 | 0.16 | 0.00 | | | | | | | | | | |
| 2 | 1.68 | 0.90 | 1.07 | 0.30 | 0.67 | 0.10 | 0.42 | 0.03 | 0.32 | 0.02 | 0.21 | 0.01 | | | | | | | | |
| 3 | 2.53 | 1.90 | 1.60 | 0.63 | 1.01 | 0.20 | 0.63 | 0.06 | 0.48 | 0.03 | 0.31 | 0.01 | | | | | | | | |
| 4 | 3.37 | 3.24 | 2.14 | 1.07 | 1.35 | 0.35 | 0.84 | 0.11 | 0.64 | 0.06 | 0.42 | 0.02 | 0.28 | 0.01 | | | | | | |
| 5 | 4.21 | 4.89 | 2.67 | 1.61 | 1.68 | 0.53 | 1.05 | 0.17 | 0.80 | 0.09 | 0.52 | 0.03 | 0.35 | 0.01 | | | | | | |
| 6 | 5.05 | 6.86 | 3.20 | 2.26 | 2.02 | 0.74 | 1.26 | 0.23 | 0.96 | 0.12 | 0.62 | 0.04 | 0.42 | 0.02 | 0.28 | 0.01 | | | | |
| 7 | 5.90 | 9.12 | 3.74 | 3.01 | 2.36 | 0.98 | 1.47 | 0.31 | 1.12 | 0.16 | 0.73 | 0.06 | 0.49 | 0.02 | 0.33 | 0.01 | | | | |
| 8 | 6.74 | 11.68 | 4.27 | 3.86 | 2.69 | 1.25 | 1.68 | 0.40 | 1.28 | 0.20 | 0.83 | 0.07 | 0.56 | 0.03 | 0.38 | 0.01 | | | | |
| 9 | 7.58 | 14.53 | 4.81 | 4.80 | 3.03 | 1.56 | 1.89 | 0.49 | 1.44 | 0.25 | 0.93 | 0.09 | 0.63 | 0.03 | 0.42 | 0.01 | | | | |
| 10 | 8.42 | 17.66 | 5.34 | 5.83 | 3.37 | 1.90 | 2.10 | 0.60 | 1.60 | 0.31 | 1.04 | 0.11 | 0.69 | 0.04 | 0.47 | 0.02 | | | | |
| 12 | 10.11 | 24.75 | 6.41 | 8.17 | 4.04 | 2.66 | 2.52 | 0.84 | 1.92 | 0.43 | 1.25 | 0.15 | 0.83 | 0.06 | 0.56 | 0.02 | | | | |
| 14 | 11.79 | 32.93 | 7.48 | 10.87 | 4.71 | 3.53 | 2.94 | 1.12 | 2.24 | 0.58 | 1.45 | 0.20 | 0.97 | 0.08 | 0.66 | 0.03 | | | | |
| 16 | 13.48 | 42.16 | 8.55 | 13.92 | 5.39 | 4.53 | 3.36 | 1.44 | 2.56 | 0.74 | 1.66 | 0.26 | 1.11 | 0.10 | 0.75 | 0.04 | 0.45 | 0.01 | | |
| 18 | 15.16 | 52.44 | 9.61 | 17.32 | 6.06 | 5.63 | 3.78 | 1.79 | 2.88 | 0.92 | 1.87 | 0.32 | 1.25 | 0.12 | 0.85 | 0.05 | 0.51 | 0.01 | | |
| 20 | | | 10.68 | 21.05 | 6.73 | 6.84 | 4.20 | 2.17 | 3.20 | 1.12 | 2.08 | 0.39 | 1.39 | 0.15 | 0.94 | 0.06 | 0.57 | 0.02 | | |
| 22 | | | 11.75 | 25.11 | 7.40 | 8.16 | 4.62 | 2.59 | 3.52 | 1.33 | 2.28 | 0.47 | 1.53 | 0.18 | 1.03 | 0.07 | 0.62 | 0.02 | | |
| 24 | | | 12.82 | 29.50 | 8.08 | 9.59 | 5.04 | 3.04 | 3.83 | 1.57 | 2.49 | 0.55 | 1.67 | 0.21 | 1.13 | 0.08 | 0.68 | 0.02 | | |
| 26 | | | 13.89 | 34.21 | 8.75 | 11.12 | 5.46 | 3.53 | 4.15 | 1.82 | 2.70 | 0.64 | 1.81 | 0.24 | 1.22 | 0.09 | 0.74 | 0.03 | | |
| 28 | | | 14.96 | 39.25 | 9.42 | 12.76 | 5.88 | 4.05 | 4.47 | 2.08 | 2.91 | 0.73 | 1.95 | 0.27 | 1.31 | 0.11 | 0.79 | 0.03 | | |
| 30 | | | 16.02 | 44.60 | 10.10 | 14.50 | 6.30 | 4.60 | 4.79 | 2.37 | 3.11 | 0.83 | 2.08 | 0.31 | 1.41 | 0.12 | 0.85 | 0.04 | | |
| 32 | | | | | 10.77 | 16.34 | 6.72 | 5.18 | 5.11 | 2.67 | 3.32 | 0.93 | 2.22 | 0.35 | 1.50 | 0.14 | 0.91 | 0.04 | 0.42 | 0.01 |
| 34 | | | | | 11.44 | 18.28 | 7.14 | 5.80 | 5.43 | 2.98 | 3.53 | 1.04 | 2.36 | 0.39 | 1.60 | 0.15 | 0.96 | 0.04 | 0.45 | 0.01 |
| 36 | | | | | 12.12 | 20.32 | 7.56 | 6.45 | 5.75 | 3.32 | 3.74 | 1.16 | 2.50 | 0.44 | 1.69 | 0.17 | 1.02 | 0.05 | 0.47 | 0.01 |
| 38 | | | | | 12.79 | 22.46 | 7.98 | 7.13 | 6.07 | 3.67 | 3.94 | 1.28 | 2.64 | 0.48 | 1.78 | 0.19 | 1.08 | 0.05 | 0.50 | 0.01 |
| 40 | | | | | 13.46 | 24.70 | 8.40 | 7.84 | 6.39 | 4.03 | 4.15 | 1.41 | 2.78 | 0.53 | 1.88 | 0.20 | 1.13 | 0.06 | 0.52 | 0.01 |
| 42 | | | | | 14.14 | 27.04 | 8.82 | 8.58 | 6.71 | 4.41 | 4.36 | 1.54 | 2.92 | 0.58 | 1.97 | 0.22 | 1.19 | 0.07 | 0.55 | 0.01 |
| 44 | | | | | 14.81 | 29.47 | 9.24 | 9.35 | 7.03 | 4.81 | 4.57 | 1.68 | 3.06 | 0.63 | 2.07 | 0.24 | 1.25 | 0.07 | 0.58 | 0.01 |
| 46 | | | | | 15.48 | 32.00 | 9.66 | 10.15 | 7.35 | 5.22 | 4.77 | 1.83 | 3.20 | 0.69 | 2.16 | 0.27 | 1.30 | 0.08 | 0.60 | 0.01 |
| 48 | | | | | 16.16 | 34.62 | 10.08 | 10.98 | 7.67 | 5.65 | 4.98 | 1.98 | 3.34 | 0.75 | 2.25 | 0.29 | 1.36 | 0.08 | 0.63 | 0.01 |
| 50 | | | | | 16.83 | 37.34 | 10.50 | 11.85 | 7.99 | 6.09 | 5.19 | 2.13 | 3.47 | 0.80 | 2.35 | 0.31 | 1.42 | 0.09 | 0.65 | 0.01 |
| 55 | | | | | | | 11.55 | 14.13 | 8.79 | 7.27 | 5.71 | 2.54 | 3.82 | 0.96 | 2.58 | 0.37 | 1.56 | 0.11 | 0.72 | 0.02 |
| 60 | | | | | | | 12.60 | 16.60 | 9.59 | 8.54 | 6.23 | 2.99 | 4.17 | 1.13 | 2.82 | 0.43 | 1.70 | 0.13 | 0.79 | 0.02 |
| 65 | | | | | | | 13.65 | 19.26 | 10.39 | 9.91 | 6.74 | 3.47 | 4.52 | 1.31 | 3.05 | 0.50 | 1.84 | 0.15 | 0.85 | 0.02 |
| 70 | | | | | | | 14.70 | 22.09 | 11.18 | 11.37 | 7.26 | 3.98 | 4.86 | 1.50 | 3.29 | 0.58 | 1.98 | 0.17 | 0.92 | 0.03 |
| 75 | | | | | | | 15.75 | 25.10 | 11.98 | 12.91 | 7.78 | 4.52 | 5.21 | 1.70 | 3.52 | 0.66 | 2.13 | 0.19 | 0.98 | 0.03 |
| 80 | | | | | | | 16.80 | 28.29 | 12.78 | 14.55 | 8.30 | 5.09 | 5.56 | 1.92 | 3.76 | 0.74 | 2.27 | 0.22 | 1.05 | 0.03 |
| 85 | | | | | | | | | 13.58 | 16.28 | 8.82 | 5.70 | 5.91 | 2.15 | 3.99 | 0.83 | 2.41 | 0.24 | 1.11 | 0.04 |
| 90 | | | | | | | | | 14.38 | 18.10 | 9.34 | 6.33 | 6.25 | 2.39 | 4.23 | 0.92 | 2.55 | 0.27 | 1.18 | 0.04 |
| 95 | | | | | | | | | 15.18 | 20.01 | 9.86 | 7.00 | 6.60 | 2.64 | 4.46 | 1.02 | 2.69 | 0.30 | 1.24 | 0.05 |
| 100 | | | | | | | | | 15.98 | 22.00 | 10.38 | 7.70 | 6.95 | 2.90 | 4.69 | 1.12 | 2.83 | 0.33 | 1.31 | 0.05 |
| 110 | | | | | | | | | | | 11.41 | 9.18 | 7.64 | 3.46 | 5.16 | 1.33 | 3.12 | 0.39 | 1.44 | 0.06 |
| 120 | | | | | | | | | | | 12.45 | 10.79 | 8.34 | 4.07 | 5.63 | 1.57 | 3.40 | 0.46 | 1.57 | 0.07 |
| 130 | | | | | | | | | | | 13.49 | 12.51 | 9.03 | 4.72 | 6.10 | 1.82 | 3.68 | 0.53 | 1.70 | 0.08 |
| 140 | | | | | | | | | | | 14.53 | 14.35 | 9.73 | 5.41 | 6.57 | 2.08 | 3.97 | 0.61 | 1.83 | 0.09 |
| 150 | | | | | | | | | | | 15.56 | 16.31 | 10.42 | 6.15 | 7.04 | 2.37 | 4.25 | 0.69 | 1.96 | 0.11 |
| 160 | | | | | | | | | | | 16.60 | 18.38 | 11.12 | 6.93 | 7.51 | 2.67 | 4.54 | 0.78 | 2.09 | 0.12 |
| 170 | | | | | | | | | | | | | 11.81 | 7.76 | 7.98 | 2.99 | 4.82 | 0.87 | 2.23 | 0.13 |
| 180 | | | | | | | | | | | | | 12.51 | 8.62 | 8.45 | 3.32 | 5.10 | 0.97 | 2.36 | 0.15 |
| 190 | | | | | | | | | | | | | 13.20 | 9.53 | 8.92 | 3.67 | 5.39 | 1.08 | 2.49 | 0.16 |
| 200 | | | | | | | | | | | | | 13.90 | 10.48 | 9.39 | 4.03 | 5.67 | 1.18 | 2.62 | 0.18 |
| 220 | | | | | | | | | | | | | 15.29 | 12.50 | 10.33 | 4.81 | 6.24 | 1.41 | 2.88 | 0.22 |
| 240 | | | | | | | | | | | | | 16.68 | 14.69 | 11.27 | 5.66 | 6.80 | 1.66 | 3.14 | 0.25 |
| 260 | | | | | | | | | | | | | | | 12.21 | 6.56 | 7.37 | 1.92 | 3.40 | 0.29 |
| 280 | | | | | | | | | | | | | | | 13.15 | 7.52 | 7.94 | 2.20 | 3.67 | 0.34 |
| 300 | | | | | | | | | | | | | | | 14.08 | 8.55 | 8.50 | 2.50 | 3.93 | 0.38 |
| 320 | | | | | | | | | | | | | | | 15.02 | 9.64 | 9.07 | 2.82 | 4.19 | 0.43 |
| 340 | | | | | | | | | | | | | | | 15.96 | 10.78 | 9.64 | 3.16 | 4.45 | 0.48 |
| 360 | | | | | | | | | | | | | | | 16.90 | 11.98 | 10.20 | 3.51 | 4.71 | 0.54 |
| 380 | | | | | | | | | | | | | | | | | 10.77 | 3.88 | 4.97 | 0.59 |
| 400 | | | | | | | | | | | | | | | | | 11.34 | 4.27 | 5.24 | 0.65 |
| 420 | | | | | | | | | | | | | | | | | 11.90 | 4.67 | 5.50 | 0.71 |
| 440 | | | | | | | | | | | | | | | | | 12.47 | 5.09 | 5.76 | 0.78 |
| 460 | | | | | | | | | | | | | | | | | 13.04 | 5.53 | 6.02 | 0.84 |
| 480 | | | | | | | | | | | | | | | | | 13.61 | 5.98 | 6.28 | 0.91 |
| 500 | | | | | | | | | | | | | | | | | 14.17 | 6.45 | 6.54 | 0.98 |

**Notes:** Shaded areas represent velocities over 5 fps. Use with caution when water hammer is a concern.

# FRICTION LOSS CHARTS - SCHEDULE 40 PVC IPS PLASTIC PIPE

ASTM D1785 (1120, 1220) C = 150 • PSI loss per 100 ft. of pipe

| Nominal Size | ½" | | ¾" | | 1" | | 1¼" | | 1½" | | 2" | | 2½" | | 3" | | 4" | | 5" | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Avg. ID | 0.602 | | 0.804 | | 1.029 | | 1.360 | | 1.590 | | 2.047 | | 2.445 | | 3.042 | | 3.998 | | 6.031 | |
| Pipe OD | 0.840 | | 1.050 | | 1.315 | | 1.660 | | 1.900 | | 2.375 | | 2.875 | | 3.500 | | 4.500 | | 6.625 | |
| Avg. Wall | 0.119 | | 0.123 | | 0.143 | | 0.150 | | 0.155 | | 0.164 | | 0.215 | | 0.229 | | 0.251 | | 0.297 | |
| Min. Wall | 0.109 | | 0.113 | | 0.133 | | 0.140 | | 0.145 | | 0.154 | | 0.203 | | 0.216 | | 0.237 | | 0.280 | |
| Flow (GPM) | 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 | 1.13 | 0.50 | 0.63 | 0.12 | 0.39 | 0.04 | 0.22 | 0.01 | 0.16 | 0.00 | | | | | | | | | | |
| 2 | 2.25 | 1.82 | 1.26 | 0.44 | 0.77 | 0.13 | 0.44 | 0.03 | 0.32 | 0.02 | 0.19 | 0.00 | | | | | | | | |
| 3 | 3.38 | 3.85 | 1.89 | 0.94 | 1.16 | 0.28 | 0.66 | 0.07 | 0.48 | 0.03 | 0.29 | 0.01 | | | | | | | | |
| 4 | 4.50 | 6.55 | 2.52 | 1.60 | 1.54 | 0.48 | 0.88 | 0.12 | 0.65 | 0.06 | 0.39 | 0.02 | 0.27 | 0.01 | | | | | | |
| 5 | 5.63 | 9.91 | 3.16 | 2.42 | 1.93 | 0.73 | 1.10 | 0.19 | 0.81 | 0.09 | 0.49 | 0.03 | 0.34 | 0.01 | | | | | | |
| 6 | 6.75 | 13.89 | 3.79 | 3.40 | 2.31 | 1.02 | 1.32 | 0.26 | 0.97 | 0.12 | 0.58 | 0.04 | 0.41 | 0.02 | 0.26 | 0.01 | | | | |
| 7 | 7.88 | 18.48 | 4.42 | 4.52 | 2.70 | 1.36 | 1.54 | 0.35 | 1.13 | 0.16 | 0.68 | 0.05 | 0.48 | 0.02 | 0.31 | 0.01 | | | | |
| 8 | 9.01 | 23.66 | 5.05 | 5.79 | 3.08 | 1.74 | 1.76 | 0.45 | 1.29 | 0.21 | 0.78 | 0.06 | 0.55 | 0.03 | 0.35 | 0.01 | | | | |
| 9 | 10.13 | 29.43 | 5.68 | 7.20 | 3.47 | 2.17 | 1.99 | 0.56 | 1.45 | 0.26 | 0.88 | 0.08 | 0.61 | 0.03 | 0.40 | 0.01 | | | | |
| 10 | 11.26 | 35.77 | 6.31 | 8.75 | 3.85 | 2.63 | 2.21 | 0.68 | 1.61 | 0.32 | 0.97 | 0.09 | 0.68 | 0.04 | 0.44 | 0.01 | | | | |
| 12 | 13.51 | 50.14 | 7.57 | 12.27 | 4.62 | 3.69 | 2.65 | 0.95 | 1.94 | 0.44 | 1.17 | 0.13 | 0.82 | 0.05 | 0.53 | 0.02 | | | | |
| 14 | 15.76 | 66.71 | 8.84 | 16.32 | 5.39 | 4.91 | 3.09 | 1.26 | 2.26 | 0.59 | 1.36 | 0.17 | 0.96 | 0.07 | 0.62 | 0.03 | | | | |
| 16 | 18.01 | 85.42 | 10.10 | 20.90 | 6.17 | 6.29 | 3.53 | 1.62 | 2.58 | 0.76 | 1.56 | 0.22 | 1.09 | 0.09 | 0.71 | 0.03 | 0.41 | 0.01 | | |
| 18 | 20.26 | 106.24 | 11.36 | 25.99 | 6.94 | 7.82 | 3.97 | 2.01 | 2.90 | 0.94 | 1.75 | 0.28 | 1.23 | 0.12 | 0.79 | 0.04 | 0.46 | 0.01 | | |
| 20 | | | 12.62 | 31.59 | 7.71 | 9.51 | 4.41 | 2.45 | 3.23 | 1.14 | 1.95 | 0.33 | 1.36 | 0.14 | 0.88 | 0.05 | 0.51 | 0.01 | | |
| 22 | | | 13.89 | 37.69 | 8.48 | 11.35 | 4.85 | 2.92 | 3.55 | 1.37 | 2.14 | 0.40 | 1.50 | 0.17 | 0.97 | 0.06 | 0.56 | 0.02 | | |
| 24 | | | 15.15 | 44.28 | 9.25 | 13.33 | 5.29 | 3.43 | 3.87 | 1.60 | 2.34 | 0.47 | 1.64 | 0.20 | 1.06 | 0.07 | 0.61 | 0.02 | | |
| 26 | | | 16.41 | 51.36 | 10.02 | 15.46 | 5.74 | 3.98 | 4.20 | 1.86 | 2.53 | 0.54 | 1.77 | 0.23 | 1.15 | 0.08 | 0.66 | 0.02 | | |
| 28 | | | 17.67 | 58.91 | 10.79 | 17.73 | 6.18 | 4.56 | 4.52 | 2.13 | 2.73 | 0.62 | 1.91 | 0.26 | 1.23 | 0.09 | 0.71 | 0.02 | | |
| 30 | | | 18.94 | 66.94 | 11.56 | 20.15 | 6.62 | 5.19 | 4.84 | 2.42 | 2.92 | 0.71 | 2.05 | 0.30 | 1.32 | 0.10 | 0.77 | 0.03 | | |
| 32 | | | | | 12.33 | 22.71 | 7.06 | 5.85 | 5.16 | 2.73 | 3.12 | 0.80 | 2.18 | 0.34 | 1.41 | 0.12 | 0.82 | 0.03 | 0.36 | 0.00 |
| 34 | | | | | 13.10 | 25.41 | 7.50 | 6.54 | 5.49 | 3.06 | 3.31 | 0.89 | 2.32 | 0.38 | 1.50 | 0.13 | 0.87 | 0.03 | 0.38 | 0.00 |
| 36 | | | | | 13.87 | 28.24 | 7.94 | 7.27 | 5.81 | 3.40 | 3.51 | 0.99 | 2.46 | 0.42 | 1.59 | 0.14 | 0.92 | 0.04 | 0.40 | 0.01 |
| 38 | | | | | 14.64 | 31.22 | 8.38 | 8.04 | 6.13 | 3.76 | 3.70 | 1.10 | 2.59 | 0.46 | 1.68 | 0.16 | 0.97 | 0.04 | 0.43 | 0.01 |
| 40 | | | | | 15.41 | 34.33 | 8.82 | 8.84 | 6.46 | 4.13 | 3.89 | 1.21 | 2.73 | 0.51 | 1.76 | 0.18 | 1.02 | 0.05 | 0.45 | 0.01 |
| 42 | | | | | 16.18 | 37.58 | 9.26 | 9.67 | 6.78 | 4.52 | 4.09 | 1.32 | 2.87 | 0.56 | 1.85 | 0.19 | 1.07 | 0.05 | 0.47 | 0.01 |
| 44 | | | | | 16.95 | 40.96 | 9.71 | 10.54 | 7.10 | 4.93 | 4.28 | 1.44 | 3.00 | 0.61 | 1.94 | 0.21 | 1.12 | 0.06 | 0.49 | 0.01 |
| 46 | | | | | 17.73 | 44.47 | 10.15 | 11.45 | 7.42 | 5.35 | 4.48 | 1.57 | 3.14 | 0.66 | 2.03 | 0.23 | 1.17 | 0.06 | 0.52 | 0.01 |
| 48 | | | | | 18.50 | 48.12 | 10.59 | 12.39 | 7.75 | 5.79 | 4.67 | 1.69 | 3.28 | 0.71 | 2.12 | 0.25 | 1.23 | 0.07 | 0.54 | 0.01 |
| 50 | | | | | 19.27 | 51.90 | 11.03 | 13.36 | 8.07 | 6.25 | 4.87 | 1.83 | 3.41 | 0.77 | 2.20 | 0.27 | 1.28 | 0.07 | 0.56 | 0.01 |
| 55 | | | | | | | 12.13 | 15.94 | 8.88 | 7.45 | 5.36 | 2.18 | 3.75 | 0.92 | 2.42 | 0.32 | 1.40 | 0.08 | 0.62 | 0.01 |
| 60 | | | | | | | 13.24 | 18.72 | 9.68 | 8.75 | 5.84 | 2.56 | 4.09 | 1.08 | 2.65 | 0.37 | 1.53 | 0.10 | 0.67 | 0.01 |
| 65 | | | | | | | 14.34 | 21.72 | 10.49 | 10.15 | 6.33 | 2.97 | 4.44 | 1.25 | 2.87 | 0.43 | 1.66 | 0.11 | 0.73 | 0.02 |
| 70 | | | | | | | 15.44 | 24.91 | 11.30 | 11.65 | 6.82 | 3.41 | 4.78 | 1.43 | 3.09 | 0.50 | 1.79 | 0.13 | 0.79 | 0.02 |
| 75 | | | | | | | 16.54 | 28.31 | 12.10 | 13.23 | 7.30 | 3.87 | 5.12 | 1.63 | 3.31 | 0.56 | 1.91 | 0.15 | 0.84 | 0.02 |
| 80 | | | | | | | 17.65 | 31.90 | 12.91 | 14.91 | 7.79 | 4.36 | 5.46 | 1.84 | 3.53 | 0.63 | 2.04 | 0.17 | 0.90 | 0.02 |
| 85 | | | | | | | | | 13.72 | 16.69 | 8.28 | 4.88 | 5.80 | 2.06 | 3.75 | 0.71 | 2.17 | 0.19 | 0.95 | 0.03 |
| 90 | | | | | | | | | 14.52 | 18.55 | 8.76 | 5.43 | 6.14 | 2.29 | 3.97 | 0.79 | 2.30 | 0.21 | 1.01 | 0.03 |
| 95 | | | | | | | | | 15.33 | 20.50 | 9.25 | 6.00 | 6.48 | 2.53 | 4.19 | 0.87 | 2.42 | 0.23 | 1.07 | 0.03 |
| 100 | | | | | | | | | 16.14 | 22.55 | 9.74 | 6.59 | 6.82 | 2.78 | 4.41 | 0.96 | 2.55 | 0.25 | 1.12 | 0.03 |
| 110 | | | | | | | | | | | 10.71 | 7.87 | 7.51 | 3.31 | 4.85 | 1.14 | 2.81 | 0.30 | 1.23 | 0.04 |
| 120 | | | | | | | | | | | 11.68 | 9.24 | 8.19 | 3.89 | 5.29 | 1.34 | 3.06 | 0.36 | 1.35 | 0.05 |
| 130 | | | | | | | | | | | 12.66 | 10.72 | 8.87 | 4.52 | 5.73 | 1.56 | 3.32 | 0.41 | 1.46 | 0.06 |
| 140 | | | | | | | | | | | 13.63 | 12.30 | 9.55 | 5.18 | 6.17 | 1.79 | 3.57 | 0.47 | 1.57 | 0.06 |
| 150 | | | | | | | | | | | 14.61 | 13.97 | 10.24 | 5.89 | 6.61 | 2.03 | 3.83 | 0.54 | 1.68 | 0.07 |
| 160 | | | | | | | | | | | 15.58 | 15.75 | 10.92 | 6.63 | 7.05 | 2.29 | 4.08 | 0.61 | 1.79 | 0.08 |
| 170 | | | | | | | | | | | | | 11.60 | 7.42 | 7.50 | 2.56 | 4.34 | 0.68 | 1.91 | 0.09 |
| 180 | | | | | | | | | | | | | 12.28 | 8.25 | 7.94 | 2.85 | 4.59 | 0.75 | 2.02 | 0.10 |
| 190 | | | | | | | | | | | | | 12.97 | 9.12 | 8.38 | 3.15 | 4.85 | 0.83 | 2.13 | 0.11 |
| 200 | | | | | | | | | | | | | 13.65 | 10.03 | 8.82 | 3.46 | 5.11 | 0.92 | 2.24 | 0.12 |
| 220 | | | | | | | | | | | | | 15.01 | 11.96 | 9.70 | 4.13 | 5.62 | 1.09 | 2.47 | 0.15 |
| 240 | | | | | | | | | | | | | 16.38 | 14.06 | 10.58 | 4.85 | 6.13 | 1.28 | 2.69 | 0.17 |
| 260 | | | | | | | | | | | | | | | 11.46 | 5.63 | 6.64 | 1.49 | 2.92 | 0.20 |
| 280 | | | | | | | | | | | | | | | 12.35 | 6.46 | 7.15 | 1.71 | 3.14 | 0.23 |
| 300 | | | | | | | | | | | | | | | 13.23 | 7.34 | 7.66 | 1.94 | 3.37 | 0.26 |
| 320 | | | | | | | | | | | | | | | 14.11 | 8.27 | 8.17 | 2.19 | 3.59 | 0.30 |
| 340 | | | | | | | | | | | | | | | 14.99 | 9.25 | 8.68 | 2.45 | 3.81 | 0.33 |
| 360 | | | | | | | | | | | | | | | 15.87 | 10.29 | 9.19 | 2.72 | 4.04 | 0.37 |
| 380 | | | | | | | | | | | | | | | | | 9.70 | 3.01 | 4.26 | 0.41 |
| 400 | | | | | | | | | | | | | | | | | 10.21 | 3.31 | 4.49 | 0.45 |
| 420 | | | | | | | | | | | | | | | | | 10.72 | 3.62 | 4.71 | 0.49 |
| 440 | | | | | | | | | | | | | | | | | 11.23 | 3.95 | 4.94 | 0.53 |
| 460 | | | | | | | | | | | | | | | | | 11.74 | 4.28 | 5.16 | 0.58 |
| 480 | | | | | | | | | | | | | | | | | 12.25 | 4.64 | 5.38 | 0.63 |
| 500 | | | | | | | | | | | | | | | | | 12.76 | 5.00 | 5.61 | 0.68 |

**Notes:** Shaded areas represent velocities over 5 fps. Use with caution when water hammer is a concern.

# FRICTION LOSS CHARTS - POLYETHYLENE PLASTIC PIPE ID CONTROLLED

PE 3408 ASTM D2239 C = 140 • PSI loss per 100 ft. of pipe

| Nominal Size / Avg. ID | ½" 0.622 | | ¾" 0.824 | | 1" 1.049 | | 1¼" 1.380 | | 1½" 1.610 | | 2" 2.067 | | 2½" 2.469 | | 3" 3.068 | | 4" 4.026 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Flow (GPM) | 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 | 1.05 | 0.49 | 0.60 | 0.12 | 0.37 | 0.04 | 0.21 | 0.01 | 0.16 | 0.00 | | | | | | | | |
| 2 | 2.11 | 1.76 | 1.20 | 0.45 | 0.74 | 0.14 | 0.43 | 0.04 | 0.31 | 0.02 | 0.19 | 0.01 | | | | | | |
| 3 | 3.16 | 3.73 | 1.80 | 0.95 | 1.11 | 0.29 | 0.64 | 0.08 | 0.47 | 0.04 | 0.29 | 0.01 | | | | | | |
| 4 | 4.22 | 6.35 | 2.40 | 1.62 | 1.48 | 0.50 | 0.86 | 0.13 | 0.63 | 0.06 | 0.38 | 0.02 | 0.27 | 0.01 | | | | |
| 5 | 5.27 | 9.60 | 3.00 | 2.44 | 1.85 | 0.76 | 1.07 | 0.20 | 0.79 | 0.09 | 0.48 | 0.03 | 0.33 | 0.01 | | | | |
| 6 | 6.33 | 13.46 | 3.61 | 3.43 | 2.22 | 1.06 | 1.29 | 0.28 | 0.94 | 0.13 | 0.57 | 0.04 | 0.40 | 0.02 | 0.26 | 0.01 | | |
| 7 | 7.38 | 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 | | |
| 8 | 8.44 | 22.93 | 4.81 | 5.84 | 2.97 | 1.80 | 1.71 | 0.47 | 1.26 | 0.22 | 0.76 | 0.07 | 0.54 | 0.03 | 0.35 | 0.01 | | |
| 9 | 9.49 | 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 | | |
| 10 | 10.55 | 34.67 | 6.01 | 8.82 | 3.71 | 2.73 | 2.14 | 0.72 | 1.57 | 0.34 | 0.95 | 0.10 | 0.67 | 0.04 | 0.43 | 0.01 | | |
| 12 | | | 7.21 | 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 | | |
| 14 | | | 8.41 | 16.45 | 5.19 | 5.08 | 3.00 | 1.34 | 2.20 | 0.63 | 1.34 | 0.19 | 0.94 | 0.08 | 0.61 | 0.03 | | |
| 16 | | | 9.61 | 21.07 | 5.93 | 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 |
| 18 | | | 10.82 | 26.21 | 6.67 | 8.10 | 3.86 | 2.13 | 2.83 | 1.01 | 1.72 | 0.30 | 1.20 | 0.13 | 0.78 | 0.04 | 0.45 | 0.01 |
| 20 | | | 12.02 | 31.85 | 7.42 | 9.84 | 4.28 | 2.59 | 3.15 | 1.22 | 1.91 | 0.36 | 1.34 | 0.15 | 0.87 | 0.05 | 0.50 | 0.01 |
| 22 | | | | | 8.16 | 11.74 | 4.71 | 3.09 | 3.46 | 1.46 | 2.10 | 0.43 | 1.47 | 0.18 | 0.95 | 0.06 | 0.55 | 0.02 |
| 24 | | | | | 8.90 | 13.79 | 5.14 | 3.63 | 3.78 | 1.72 | 2.29 | 0.51 | 1.61 | 0.21 | 1.04 | 0.07 | 0.60 | 0.02 |
| 26 | | | | | 9.64 | 16.00 | 5.57 | 4.21 | 4.09 | 1.99 | 2.48 | 0.59 | 1.74 | 0.25 | 1.13 | 0.09 | 0.65 | 0.02 |
| 28 | | | | | 10.38 | 18.35 | 6.00 | 4.83 | 4.41 | 2.28 | 2.67 | 0.68 | 1.87 | 0.28 | 1.21 | 0.10 | 0.70 | 0.03 |
| 30 | | | | | 11.12 | 20.85 | 6.43 | 5.49 | 4.72 | 2.59 | 2.86 | 0.77 | 2.01 | 0.32 | 1.30 | 0.11 | 0.76 | 0.03 |
| 32 | | | | | 11.86 | 23.50 | 6.86 | 6.19 | 5.04 | 2.92 | 3.06 | 0.87 | 2.14 | 0.36 | 1.39 | 0.13 | 0.81 | 0.03 |
| 34 | | | | | 12.61 | 26.29 | 7.28 | 6.92 | 5.35 | 3.27 | 3.25 | 0.97 | 2.28 | 0.41 | 1.47 | 0.14 | 0.86 | 0.04 |
| 36 | | | | | | | 7.71 | 7.69 | 5.67 | 3.63 | 3.44 | 1.08 | 2.41 | 0.45 | 1.56 | 0.16 | 0.91 | 0.04 |
| 38 | | | | | | | 8.14 | 8.50 | 5.98 | 4.02 | 3.63 | 1.19 | 2.54 | 0.50 | 1.65 | 0.17 | 0.96 | 0.05 |
| 40 | | | | | | | 8.57 | 9.35 | 6.30 | 4.42 | 3.82 | 1.31 | 2.68 | 0.55 | 1.73 | 0.19 | 1.01 | 0.05 |
| 42 | | | | | | | 9.00 | 10.24 | 6.61 | 4.83 | 4.01 | 1.43 | 2.81 | 0.60 | 1.82 | 0.21 | 1.06 | 0.06 |
| 44 | | | | | | | 9.43 | 11.16 | 6.93 | 5.27 | 4.20 | 1.56 | 2.94 | 0.66 | 1.91 | 0.23 | 1.11 | 0.06 |
| 46 | | | | | | | 9.86 | 12.12 | 7.24 | 5.72 | 4.39 | 1.70 | 3.08 | 0.71 | 1.99 | 0.25 | 1.16 | 0.07 |
| 48 | | | | | | | 10.28 | 13.11 | 7.56 | 6.19 | 4.58 | 1.84 | 3.21 | 0.77 | 2.08 | 0.27 | 1.21 | 0.07 |
| 50 | | | | | | | 10.71 | 14.14 | 7.87 | 6.68 | 4.77 | 1.98 | 3.35 | 0.83 | 2.17 | 0.29 | 1.26 | 0.08 |
| 55 | | | | | | | 11.78 | 16.87 | 8.66 | 7.97 | 5.25 | 2.36 | 3.68 | 0.99 | 2.38 | 0.35 | 1.38 | 0.09 |
| 60 | | | | | | | 12.85 | 19.82 | 9.44 | 9.36 | 5.73 | 2.77 | 4.02 | 1.17 | 2.60 | 0.41 | 1.51 | 0.11 |
| 65 | | | | | | | | | 10.23 | 10.86 | 6.21 | 3.22 | 4.35 | 1.36 | 2.82 | 0.47 | 1.64 | 0.13 |
| 70 | | | | | | | | | 11.02 | 12.45 | 6.68 | 3.69 | 4.69 | 1.55 | 3.03 | 0.54 | 1.76 | 0.14 |
| 75 | | | | | | | | | 11.81 | 14.15 | 7.16 | 4.19 | 5.02 | 1.77 | 3.25 | 0.61 | 1.89 | 0.16 |
| 80 | | | | | | | | | 12.59 | 15.95 | 7.64 | 4.73 | 5.35 | 1.99 | 3.47 | 0.69 | 2.01 | 0.18 |
| 85 | | | | | | | | | 13.38 | 17.84 | 8.12 | 5.29 | 5.69 | 2.23 | 3.68 | 0.77 | 2.14 | 0.21 |
| 90 | | | | | | | | | | | 8.59 | 5.88 | 6.02 | 2.48 | 3.90 | 0.86 | 2.27 | 0.23 |
| 95 | | | | | | | | | | | 9.07 | 6.50 | 6.36 | 2.74 | 4.12 | 0.95 | 2.39 | 0.25 |
| 100 | | | | | | | | | | | 9.55 | 7.15 | 6.69 | 3.01 | 4.33 | 1.05 | 2.52 | 0.28 |
| 110 | | | | | | | | | | | 10.50 | 8.53 | 7.36 | 3.59 | 4.77 | 1.25 | 2.77 | 0.33 |
| 120 | | | | | | | | | | | 11.46 | 10.02 | 8.03 | 4.22 | 5.20 | 1.47 | 3.02 | 0.39 |
| 130 | | | | | | | | | | | 12.41 | 11.62 | 8.70 | 4.89 | 5.63 | 1.70 | 3.27 | 0.45 |
| 140 | | | | | | | | | | | 13.37 | 13.33 | 9.37 | 5.61 | 6.07 | 1.95 | 3.52 | 0.52 |
| 150 | | | | | | | | | | | | | 10.04 | 6.38 | 6.50 | 2.22 | 3.78 | 0.59 |
| 160 | | | | | | | | | | | | | 10.71 | 7.19 | 6.94 | 2.50 | 4.03 | 0.67 |
| 170 | | | | | | | | | | | | | 11.38 | 8.04 | 7.37 | 2.79 | 4.28 | 0.74 |
| 180 | | | | | | | | | | | | | 12.05 | 8.94 | 7.80 | 3.11 | 4.53 | 0.83 |
| 190 | | | | | | | | | | | | | 12.72 | 9.88 | 8.24 | 3.43 | 4.78 | 0.92 |
| 200 | | | | | | | | | | | | | 13.39 | 10.87 | 8.67 | 3.78 | 5.03 | 1.01 |
| 220 | | | | | | | | | | | | | | | 9.54 | 4.50 | 5.54 | 1.20 |
| 240 | | | | | | | | | | | | | | | 10.40 | 5.29 | 6.04 | 1.41 |
| 260 | | | | | | | | | | | | | | | 11.27 | 6.14 | 6.54 | 1.64 |
| 280 | | | | | | | | | | | | | | | 12.14 | 7.04 | 7.05 | 1.88 |
| 300 | | | | | | | | | | | | | | | 13.00 | 8.00 | 7.55 | 2.13 |
| 320 | | | | | | | | | | | | | | | 13.87 | 9.02 | 8.05 | 2.40 |
| 340 | | | | | | | | | | | | | | | | | 8.56 | 2.69 |
| 360 | | | | | | | | | | | | | | | | | 9.06 | 2.99 |
| 380 | | | | | | | | | | | | | | | | | 9.57 | 3.30 |
| 400 | | | | | | | | | | | | | | | | | 10.07 | 3.63 |
| 420 | | | | | | | | | | | | | | | | | 10.57 | 3.98 |
| 440 | | | | | | | | | | | | | | | | | 11.08 | 4.33 |
| 460 | | | | | | | | | | | | | | | | | 11.58 | 4.71 |
| 480 | | | | | | | | | | | | | | | | | 12.08 | 5.09 |
| 500 | | | | | | | | | | | | | | | | | 12.59 | 5.49 |

**Notes:** Shaded areas represent velocities over 5 fps. Use with caution when water hammer is a concern.

# FRICTION LOSS CHARTS

## TABLE OF APPROXIMATE PRESSURE LOSSES FOR PIPE FITTINGS

| Steel Fitting Type | ½" | ¾" | 1" | 1¼" | 1½" | 2" | 2½" | 3" | 4" | 6" | 8" |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Coupling | 0.6 | 0.8 | 1 | 1.2 | 1.5 | 2 | 2.5 | 3 | 4 | 6 | 8 |
| Run of St. Tee | 1 | 1 | 1.5 | 2 | 2 | 2.5 | 3 | 4 | 5 | 7 | 10 |
| Tee, Side Outlet | 3 | 4.5 | 5 | 7 | 9 | 11 | 13 | 16 | 20 | 31 | 42 |
| Tee, Run Reduced ½" | 1.5 | 2.5 | 3 | 4 | 5 | 6 | 7 | 8 | 12 | 16 | 20 |
| Elbow, 90° | 1.5 | 2.5 | 3 | 4 | 5 | 6 | 7 | 8 | 12 | 16 | 20 |
| Elbow, 45° | 0.75 | 1 | 1.3 | 1.7 | 2 | 2.5 | 3 | 3.5 | 5 | 7.5 | 10 |
| Corporation Stop | 9 | 9 | 9 | 9 | 9 | 9 | | | | | |
| Curb Stop | 6 | 6 | 7 | 7 | 8 | 8 | | | | | |

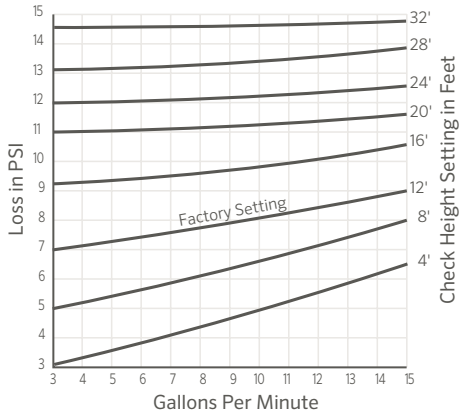
| Plastic IPS or Copper Fitting Type | ½" | ¾" | 1" | 1¼" | 1½" | 2" | 2½" | 3" | 4" | 6" | 8" |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Coupling | 1.5 | 2.5 | 3.0 | 3.0 | 4.0 | 6.0 | 7.0 | 8.0 | 11.0 | 18.0 | 24.0 |
| Run of St. Tee | 2.5 | 3.0 | 4.0 | 5.0 | 6.0 | 8.0 | 9.0 | 11.0 | 15.0 | 21.0 | 28.0 |
| Tee, Side Outlet | 7.0 | 9.0 | 12.0 | 15.0 | 18.0 | 24.0 | 30.0 | 36.0 | 45.0 | 70.0 | 90.0 |
| Tee, Run Reduced ½" | 3.5 | 4.5 | 6.0 | 8.0 | 9.0 | 11.0 | 14.0 | 17.0 | 24.0 | 34.0 | 45.0 |
| Elbow, 90° | 3.5 | 4.5 | 6.0 | 8.0 | 9.0 | 11.0 | 14.0 | 17.0 | 24.0 | 34.0 | 45.0 |
| Elbow, 34° | 1.5 | 2.0 | 3.0 | 3.5 | 4.0 | 5.0 | 7.0 | 8.0 | 10.0 | 16.0 | 20.0 |

To use this chart, multiply the approximate "equivalent feet of pipe" value by the proper pipe pressure loss per 100 ft. rating, then divide by 100. The result is the fitting loss in PSI.

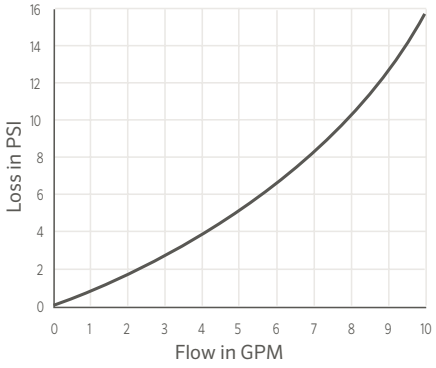
**Note:**
It is recommended that the charts above only be used when the manufacturer's recommended pressure loss values are not available.

## ACCESSORY PRESSURE LOSS CHARTS

### HCV PRESSURE LOSS CHART




### SWING JOINT FRICTION LOSS



# WIRE DATA

| STANDARD ANNEALED COPPER AT 68°F (20°C) | | | | | | |
|---|---|---|---|---|---|---|
| **American Wire Gauge** | **Common Metric Equivalent** ($mm^2$) | **Diameter** (mils) | **Diameter** (mm) | **Cross-Sectional Area** ($mm^2$) | **Resistance** (Per mft ohms) | **Resistance** (Per km ohms) |
| 1 | 50 | 289.3 | 7.348 | 42.4 | 0.924 | 0.407 |
| 2 | 35 | 257.6 | 6.543 | 33.6 | 0.156 | 0.513 |
| 3 | | 229.4 | 5.827 | 26.7 | 0.197 | 0.647 |
| 4 | 25 | 204.3 | 5.189 | 21.1 | 0.249 | 0.815 |
| 5 | | 181.9 | 4.62 | 16.8 | 0.313 | 1.028 |
| 6 | 16 | 162 | 4.115 | 13.3 | 0.395 | 1.297 |
| 7 | | 144.3 | 3.665 | 10.6 | 0.498 | 1.634 |
| 8 | 10 | 128.5 | 3.264 | 8.36 | 0.628 | 2.061 |
| 9 | | 114.4 | 2.906 | 6.63 | 0.793 | 2.6 |
| 10 | 6 | 101.9 | 2.588 | 5.26 | 0.999 | 3.277 |
| 11 | | 90.7 | 2.3 | 4.17 | 1.26 | 4.14 |
| 12 | 4 | 80.8 | 2.05 | 3.31 | 1.59 | 5.21 |
| 13 | | 72 | 1.83 | 2.63 | 2 | 6.56 |
| 14 | 2.5 | 64.1 | 1.63 | 1.63 | 2.52 | 8.28 |
| 15 | | 57.1 | 1.45 | 1.65 | 3.18 | 10.4 |
| 16 | 1.5 | 50.8 | 1.29 | 1.31 | 4.02 | 13.2 |
| 17 | | 45.3 | 1.15 | 1.04 | 5.05 | 16.6 |
| 18 | 0.75 | 40.3 | 1.02 | 0.82 | 6.39 | 21 |
| 19 | | 35.9 | 0.912 | 0.65 | 8.05 | 26.4 |
| 20 | 0.5 | 32 | 0.813 | 0.52 | 10.1 | 33.2 |

## PSR WIRE DATA

| MAXIMUM WIRE LENGTH, ONE WAY | | | | | | |
|---|---|---|---|---|---|---|
| **Model** | **18 AWG** | **16 AWG** | **14 AWG** | **12 AWG** | **10 AWG** | **8 AWG** |
| **PSR-22** | 243 ft. | 386 ft. | 616 ft. | 976 ft. | 1551 ft. | 2463 ft. |
| **PSR-52** | 134 ft. | 214 ft. | 341 ft. | 540 ft. | 859 ft. | 1365 ft. |
| **PSR-53** | 134 ft. | 214 ft. | 341 ft. | 540 ft. | 859 ft. | 1365 ft. |

# WIRE SIZING

## REQUIRED INFORMATION

1) Actual one-way length of wire between the controllers and the power source or the controllers and valves

2) Allowable voltage loss along the wire circuit

3) Accumulative current flowing through the wire section being sized in amperes

## RESISTANCE IS CALCULATED USING THIS FORMULA:

$$R = \frac{1000 \times AVL}{2L \times I}$$

R = Maximum allowable resistance of wire in ohms per 1,000'

AVL = Allowable voltage loss

L = Wire length (one way)

I = Inrush current

AVL for controller power wire sizing is calculated by subtracting the minimum operating voltage required by the controller from the minimum available voltage at the power source.

AVL for valve wire sizing is calculated by subtracting minimum solenoid operating voltage from controller output voltage. This number will vary depending on the manufacturer and in some cases with line pressure.

## VALVE WIRE SIZING EXAMPLE

Given: The distance from the controller to the valve is 1,800'. The controller output is 24 V. The valve has a minimum operating voltage of 20 V and an inrush current of 370 mA (0.37 A).

$$R = \frac{1{,}000 \times 4}{2\,(1{,}800) \times 0.37}$$

$$R = \frac{4{,}000}{1{,}332}$$

$$R = 3.00 \text{ ohms/1,000 ft.}$$

So, wire resistance cannot exceed 3.00 ohms per 1,000'. Now go to table #1 and select the proper wire size. Since 18 gauge wire has more resistance than 3.00 ohms per 1,000', choose 14 gauge wire.

Table 2 is a quick reference and is set up to provide maximum wire runs given the information at the bottom of the table.

**TABLE 1 - RESISTANCE OF COPPER WIRE**

| Wire Size (AWG) | Resistance at 20° C (68° F) (ohms per 1,000') |
|---|---|
| 18 | 6.39 |
| 16 | 4.02 |
| 14 | 2.52 |
| 12 | 1.59 |
| 10 | 1 |
| 8 | 0.63 |
| 6 | 0.4 |
| 4 | 0.25 |

**TABLE 2 - VALVE WIRE SIZING**

| Ground Wire | Control Wire | | | | | | |
|---|---|---|---|---|---|---|---|
| | 18 | 16 | 14 | 12 | 10 | 8 | 6 |
| 18 | 850 | 1040 | 1210 | 1350 | 1460 | 1540 | 1590 |
| 16 | 1040 | 1340 | 1650 | 1920 | 2150 | 2330 | 2440 |
| 14 | 1210 | 1650 | 2150 | 2630 | 3080 | 3450 | 3700 |
| 12 | 1350 | 1920 | 2630 | 3390 | 4170 | 4880 | 5400 |
| 10 | 1460 | 2150 | 3080 | 4170 | 5400 | 6670 | 7690 |
| 8 | 1540 | 2330 | 3450 | 4880 | 6670 | 8700 | 10530 |
| 6 | 1590 | 2440 | 3700 | 5400 | 7690 | 10530 | 13330 |

**Notes:**

Maximum one-way distance in feet between controller and valve heavy-duty solenoid: 24 VAC, 350 mA inrush current, 190 mA holding current, 60 Hz; 370 mA inrush current, 210 mA holding current, 50 Hz.

Table 2 is for a single active solenoid. With two solenoids operating simultaneously on the same wires, the wire distances should be halved.

# ADDITIONAL DATA

## WIRE SIZE REFERENCE CHART

| Wire Size (AWG) | ½ | ¾ | 1 | 1¼ | 1½ | 2 | 2½ | 3 | 3½ | 4 | 5 | 6 | Wire Size (AWG) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 18 | 6 | 12 | 20 | 35 | 49 | 80 | 110 | 175 | | | | | 18 |
| 16 | 5 | 10 | 16 | 30 | 42 | 67 | 97 | 150 | | | | | 16 |
| 14 | 4 | 6 | 10 | 18 | 25 | 40 | 56 | 88 | 120 | 150 | | | 14 |
| 12 | 3 | 5 | 7 | 15 | 20 | 33 | 50 | 75 | 102 | 130 | 205 | | 12 |
| 10 | 1 | 3 | 6 | 13 | 16 | 27 | 40 | 63 | 85 | 110 | 170 | | 10 |
| 8 | 1 | 2 | 4 | 6 | 9 | 16 | 25 | 35 | 50 | 65 | 105 | 150 | 8 |
| 6 | 1 | 1 | 3 | 3 | 5 | 10 | 15 | 22 | 32 | 40 | 63 | 92 | 6 |
| 4 | | 1 | 1 | 2 | 4 | 7 | 10 | 16 | 24 | 30 | 48 | 70 | 4 |
| 2 | | 1 | 1 | 2 | 2 | 5 | 9 | 12 | 18 | 22 | 36 | 54 | 2 |
| 0 | | | 1 | 1 | 2 | 3 | 5 | 8 | 12 | 15 | 24 | 36 | 0 |
| 00 | | | 1 | 1 | 1 | 2 | 4 | 7 | 10 | 14 | 21 | 31 | 00 |
| 000 | | | | 1 | 1 | 2 | 3 | 6 | 8 | 11 | 18 | 26 | 000 |
| 0000 | | | | 1 | 1 | 1 | 2 | 5 | 7 | 10 | 15 | 22 | 0000 |

**Notes:**
Approximate number of wires to be installed in conduit or tubing.
Maximum number of wires in conduit or sleeving.

## ESTIMATING PIPE SIZE

| Nominal Pipe Size | Approximate String Length in Inches | | |
|---|---|---|---|
| | Copper Pipe | Galvanized (Sch. 40 Steel) | PVC Pipe |
| ½" | 2" | 2⅝" | 2⅝" |
| ⅝" | 2⅜" | | |
| ¾" | 2¾" | 3⅝16" | 3⅝16" |
| 1" | 3½" | 4⅛" | 4⅛" |
| 1¼" | 4⅝16" | 5⅜16" | 5⅜16" |
| 1½" | 5⅛" | 6" | 6" |
| 2" | 6¾" | 7⅞16" | 7⅞16" |

**Notes:**
To determine the nominal size of a pipe, wrap a string around the pipe and compare its length to the chart above.

## CLIMATE ETp TABLE

| Climate* | Inches Daily |
|---|---|
| Cool Humid | 0.10 to 0.15 |
| Cool Dry | 0.15 to 0.20 |
| Warm Humid | 0.15 to 0.20 |
| Warm Dry | 0.20 to 0.25 |
| Hot Humid | 0.20 to 0.30 |
| Hot Dry | 0.30 to 0.45 |

**Notes:**
* Cool = under 70˚F as an average midsummer high
* Warm = between 70˚ and 90˚F as midsummer highs
* Hot = over 90˚F
* Humid = over 50% as average midsummer relative humidity (dry = under 50%)

# STATEMENT OF WARRANTY

## Hunter Residential and Commercial Irrigation

Hunter Industries Incorporated ("Hunter") warrants the following products to be free of defects in materials or workmanship under normal use in landscape irrigation applications for the specified period of time outlined below from the original date of manufacture:

| | | | | |
|---|---|---|---|---|
| **ONE YEAR** | **ROTORS** | SRM | **MICRO** | Micro Sprays, PLD Fittings, Rigid Risers, Air Relief Valves, RZB |
| **TWO YEARS** | **ROTORS** | PGP®-ADJ, PGJ, HCV | **CONTROLLERS** | BTT, HC, HPC, NODE, NODE-BT, Pro-C Families, Pro-HC, PSR, ROAM, X2, XC Hybrid, X-Core, and WAND |
| | **SPRAYS** | PS Ultra Family, SJ, FLEXsg, HSBE Family | **SENSORS** | HC Flow Meter |
| | **NOZZLES** | Spray Nozzles, PCN, PCB, AFB, MSBN | **MICRO** | ACZ, Accu Sync, PCZ, RZWS, Point Source Emitters, Tubing, Multi-Port Emitters, IH Risers, MLD, Eco-Indicator, Multi-Purpose Box, Senninger Regulators, PLD-LOC Fittings |
| | **VALVES** | PGV Family | **TOOLS** | SpotShot |
| **THREE YEARS** | **CONTROLLERS** | ROAM XL, EZ Decoder System | **MP ROTATOR** | All |
| **FIVE YEARS** | **ROTORS** | PGP Ultra, I-20, I-25, I-40, I-50, I-80, and I-90 Families | **CENTRAL** | IMMS Central Control Products, A2CNWRK, LANKIT, WIFIKIT |
| | **SPRAYS** | Pro-Spray, Pro-Spray PRS30, and Pro-Spray PRS40 Families | **SENSORS** | Clik Sensors, Flow-Sync, MWS, Solar Sync, Wireless Flow Sensor |
| | **VALVES** | HQ, ICV, IBV | **MICRO** | ICZ, HDL, HDL-COP**, Eco-Mat, Eco-Wrap |
| | **CONTROLLERS** | ACC/ACC2 Families, HCC, ICC2, ICD Decoders, ICD-HP, and I-Core/DUAL Families | | |

## Hunter Golf and ST System Irrigation Component* Warranty Products

Hunter will unconditionally repair, replace, or repurchase, at its sole discretion, any defective component* assemblies contained within the Golf and ST products listed below by category, returned freight prepaid, from the date of manufacture within a period of:

| | | |
|---|---|---|
| **ONE YEAR** | **GOLF CONTROLLERS** | Pilot Command Center Software, Pilot-FC, Pilot-FI, Pilot Hub |
| **THREE YEARS** | **GOLF ROTORS** | TTS-800 Series, G-800 Series, G-900 Series, B-Series, RT Series |
| | **GOLF DECODERS** | Pilot 100, Pilot 200, Pilot 400, Pilot 600 |
| **FIVE YEARS** | **GOLF ROTORS** | The golf rotor component warranty is extended to 5 years with a one-for-one purchase of an HSJ Swing Joint from an authorized Hunter Golf distributor. |
| | **SWING JOINTS** | HSJ-0, HSJ-1, HSJ-2, HSJ-3 |
| | **ST ROTORS** | ST-90, STG-900, ST-1200, ST-1600 |
| | **ST ACCESSORIES** | All model "numbers" starting with "ST" |
| | **COMPUTER, PRINTERS & ACCESSORIES, MAINTENANCE RADIO & BATTERY** | Equipment manufacturer's warranty (no Hunter warranty) |

* Warranty covers repair, replacement, or repurchase of individual defective component assemblies contained within the product. Returns of complete finished goods are not allowed under warranty without prior approval from the Hunter Product Manager.

If used for agricultural applications, Hunter limits the warranty for its spray, rotator, and rotor products to a period of one (1) year from the original date of manufacture. This agriculture limitation supersedes all other warranties expressed or implied. **While the use of copper does not completely remove the chance of root intrusion, it has been shown to assist in its prevention when coupled with proper irrigation scheduling.

Hunter® | *Built on Innovation®*

*Statement of Warranty, Continued*

If a defect in a Hunter product is discovered during the applicable warranty period, Hunter will repair or replace, at its option, the product or the defective part. This warranty does not extend to repairs, adjustments, or replacement of a Hunter product or part that results from misuse, negligence, alteration, modification, tampering, or improper installation and/or maintenance of the product. This warranty extends only to the original installer of the Hunter product. If a defect arises in a Hunter product during the warranty period, contact your local Hunter Authorized Distributor.

Hunter's warranty applies only to products installed as specified and used as intended for irrigation purposes. Hunter's warranty shall be limited to defects in materials and workmanship during the warranty period, and shall not extend to situations in which the product was subjected to improper design, installation, operation, maintenance, application, abuse, improper electrical current, grounding, service other than by Hunter authorized agents, operating conditions other than that for which it was designed, or in systems using water containing corrosive chemicals, electrolytes, sand, dirt, silt, rust, or agents that otherwise attack and degrade plastics. Hunter's warranty does not cover component failures caused by lightning strikes, electrical power surges, or unconditioned power supplies. If products are repurchased, the price to Distributor for such products in effect at the time of return will apply.

Hunter's obligation to repair, replace, or repurchase its products or product components as set forth above is the sole and exclusive warranty extended by Hunter. There are no other warranties, expressed or implied, including warranties of merchantability and warranties of fitness for a particular purpose. Hunter will not be liable to a distributor or to any other party in strict liability, tort, contract, or any other manner for any damages caused or claimed to be caused as a result of any design of or defect in Hunter's products, or for any special, incidental, or consequential damages of any nature.

Where applicable, Hunter's statement of warranty complies with local directives.

**If you have any questions concerning the warranty or its application, please email HunterTechnical.Support@hunterindustries.com.**

## ASAE CERTIFICATION STATEMENT

Hunter Industries Incorporated certifies that pressure, flow rate, and radius data for these products were determined and listed in accordance with ASAE Standard S398.1, Procedure for Sprinkler Testing and Performance Reporting, and are representative of performance of production sprinklers at the time of publication. Actual product performance may differ from the published specifications due to normal manufacturing variations and sample selection. All other specifications are solely the recommendation of Hunter Industries Incorporated.

Helping our customers succeed is what drives us. While our passion for innovation and engineering is built into everything we do, it is our commitment to exceptional support that we hope will keep you in the Hunter family of customers for years to come.

Gregory R. Hunter, CEO of Hunter Industries

Gene Smith, President, Landscape Irrigation and Outdoor Lighting

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