



Intelligence

Information

Irrigation

## PRODUCTS & TECHNICAL INFORMATION

CONTROLLERS

SATELLITES

CENTRAL CONTROLS

ROTORS

SPRAYS

IMPACTS

VALVES

SENSORS

[www.SignatureControlSystems.com](http://www.SignatureControlSystems.com)

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## Signature Control Systems

**has maintained a continuous presence in the golf and turf irrigation industry since our beginnings in 1907.**

**From manufacturing spray-heads to large golf rotors and residential controllers to today's most sophisticated irrigation control systems, we hope that you find this catalog demonstrative of what Signature can provide for your irrigation system.**

## OVERVIEW

Signature Control Systems, Inc. can trace its roots in the irrigation industry to humble beginnings over 100 years ago. Since then, Signature has been dedicated to providing the highest-quality products and services in the landscape and irrigation industry.

Signature is an industry leader in the design and manufacture of turf management systems including intelligent irrigation controllers, site management software, irrigation valves, gear-drive rotors & spray-head products. Thus providing landscape managers, golf course superintendents, as well as property managers', direct control of their irrigation system, water and energy resources.

To achieve these goals Signature continues to invest in research and development of new products, product line expansion and manufacturing facilities. We continue to increase our manufacturing capacity of our products in our own factory in the USA and are proud to bring to market a full basket of Professional Irrigation products servicing all industry segments and end users of irrigation products. Whether Installer, Designer, Distributor or end User you will find Signature can meet and exceed your irrigation requirements.

In recent years, we have successfully staked a claim as an innovative creator of central control systems that range from the basic to the most complex. Today we have expanded controller ranges and with imminent water management legislation you will find Signature's own intellectual property is well positioned to meet and exceed this legislation. Further and when appropriate, we have and continue to invest in acquisitions that increase our product breadth and depth. As a result of several acquisitions, Signature is now a full line manufacturer and supplier to the Irrigation Industry with products that will cover any installation requirement. We are sure that you will be familiar with many of the products you see listed in our catalog and invite you to look at them with the new understanding that Signature will be supplying the Irrigation Industry for many years to come with innovative solutions.



**Brian J. Smith**  
President and CEO

## BACKGROUND

You may think that Signature is a fairly new name in the irrigation industry... we are not. We can trace our roots in the irrigation industry to 1907 when we started out as the Thompson Manufacturing Co.

Through a series of strategic acquisitions and manufacturing expansion initiatives, Signature provides a complete array of products and via our channel partners, distributes a complete line of irrigation equipment: battery operated controllers, residential and commercial controllers, golf satellite controllers, central control systems, gear drive rotors, spray head sprinklers, impact sprinklers, control valves, quick coupling valves and moisture sensors.

Signature is known as a nimble company that can adapt to the changing economies of the world or regional market influences, and is a company driven by several guiding lights that keep us on track to achieve our most important goal—satisfying our customer.

To that end we are market driven, we listen to our customers and make sure any product or service we deliver meets their needs, not just ours.

Signature's designs are highly respected in the industry and with the emergence of our new design concepts and products, Signature will certainly play a major role in the future of the irrigation industry.

## MAJOR PRODUCT LINES:

Some of the names you may recognize:

**Constellation® Galaxy™ & eConstellation®**

Commercial irrigation satellite control systems

**EZ Pro™**

Wall Mount residential & commercial style controllers

**Aurora® & eAurora®**

Golf course irrigation satellite control systems

**SoloRain®**

Battery operated controllers "No Power ... No Problem"®

The Aurora®, Constellation®, and Galaxy™ range of irrigation products are industry recognized as the latest technology in cost effective irrigation. In addition, Signature has a comprehensive range of commercial and large turf rotors and valves.

Signature provides management systems in hardwire, radio and telephone configurations including weather station equipment. All Signature Control Systems products are compatible for both domestic and international markets.



CONTROLLERS



BATTERY OPERATED CONTROLLERS

APPLICATIONS	SoloRain®				
	8010	8014	8014SR	8017	8017N
Residential Applications	✓	✓	✓	✓	✓
Commercial Applications	✓	✓	✓	✓	✓
Sports Turf Applications	✓	✓	✓	✓	✓
Golf Course Applications	✓	✓	✓	✓	✓
Retrofit Older Systems	✓	✓	✓	✓	✓
Isolated Locations Without Power	✓	✓	✓	✓	✓
FEATURES					
Single Zone	✓	✓	✓	✓	✓
Multi Zone					
Programs	1	6	6	6	6
Network Ready					✓
9V Alkaline Battery	✓				
3.6V Lithium Battery		✓	✓	✓	✓
1.5 AA battery (x2)					
Sensor Ready			✓		✓

APPLICATIONS	SoloRain®				
	8018	8018S	8020	8028	8030
Residential Applications	✓	✓	✓	✓	✓
Commercial Applications	✓	✓	✓	✓	✓
Sports Turf Applications	✓	✓	✓	✓	✓
Golf Course Applications	✓	✓	✓	✓	✓
Retrofit Older Systems	✓	✓	✓	✓	✓
Isolated Locations Without Power	✓	✓	✓	✓	✓
FEATURES					
Single Zone					✓
Multi Zone	6	6	6	6	
Programs	+	+	3	+	16
Network Ready	✓	✓		✓	
9V Alkaline Battery			✓		✓
3.6V Lithium Battery				✓	
1.5 AA battery (x2)	✓	✓	✓	✓	
Sensor Ready	✓	✓	✓	✓	



## PRODUCT OVERVIEW

### BATTERY OPERATED CONTROLLERS

#### SoloRain® 8010



- Single zone valve mounted battery operated controller.
- Single Program
- Operates on one replaceable 9 volt battery for over one year depending on usage.
- Waterproof design tested to IP68, 6ft (1,8m)
- Installs directly on all Signature Turf valves and can be fitted to many other valves through the use of adapters.
- Includes three dials for easy programming and flexible programming features.
- 8010 can be purchased mounted on a 7900 series valve (8012).

#### SoloRain® 8014



- Single zone valve mounted battery operated controller.
- 6 Programs
- Operates on one replaceable 3.6 volt lithium battery for several years depending on usage.
- Waterproof design tested to IP68, 6ft (1,8m)
- Valve adaptors are available for the majority of competitor valve types.
- Compatible with all Signature valves and can be purchased already mounted to the valve.
- Smart logic provides for current savings giving batteries longer life spans.

#### SoloRain® 8014-SR



- Single zone valve mounted battery operated controller.
- 6 Programs
- Operates on one replaceable 3.6 volt lithium battery for several years depending on usage.
- Waterproof design tested to IP68, 6ft (1,8m)
- Valve adaptors are available for the majority of competitor valve types.
- Sensor ready for connection to any normally closed, rain, soil moisture, freeze or wind sensors.
- Compatible with all Signature valves and can be purchased already mounted to the valve.

#### SoloRain® 8020



- Multi-zone, valve box mounted, battery operated controller. Available in zones.
- 3 Programs
- Operates on two AA batteries for several years depending on usage.
- Waterproof design tested to IP68, 6ft (1,8m)
- Installs directly on all Signature Turf valves and can be fitted to many other valves through the use of adapters.
- Can have up to 250 ft (76 m) of 18 AWG direct burial wire between the 8020 series controller and the DC solenoid.
- All models accommodate normally closed rain, freeze or event sensors.

#### SoloRain® 8017/8017-N



- Single zone valve mounted battery operated controller.
- 6 Programs
- Operates on one replaceable 3.6 volt lithium battery for several years depending on usage.
- Easy access twist-off battery compartment cover.
- Waterproof design tested to IP68, 6ft (1,8m)
- Valve adaptors are available for the majority of competitor valve types.
- Sensor ready for connection to any normally closed, rain, soil moisture, freeze or wind sensors.
- Compatible with all Signature valves and can be purchased already mounted to the valve.
- Upgradable to Web accessed central control via 8018 when used with any Signature Share compatible controllers.

#### SoloRain® 8018-S



- Operates on two AA batteries for several years depending on usage; solar optional.
- Waterproof design tested to IP68, 6ft (1,8m)
- Sensor ready for connection to any normally closed, rain, soil moisture, freeze or wind sensors.
- Integrated short-haul data radio to communicate to any access point controllers compatible with the Signature Share platform.
- Upgradable to Web accessed central control via 8017-N, 8014-SR when used with any Signature Share compatible controllers.
- Operates Signature 8014-SR actuators, 8017-N actuators.
- Acts as a gateway for 1, 2, 4, or 6 remotely located zones.
- Integrated low-profile antenna allows for vandal resistant installation; remote located antenna available as an option.

#### SoloRain® 8028-S



- Multi-zone, valve box mounted, battery operated controller. Available in zones.
- Available in 4-zones.
- 3 Programs
- Operates on two AA batteries for several years depending on usage; solar optional.
- Waterproof design tested to IP68, 6ft (1,8m)
- Sensor ready for connection to any normally closed, rain, soil moisture, freeze or wind sensors.
- Can have up to 250 ft (76 m) of 18 AWG direct burial wires between the controller and the 8020-DC solenoid.
- Integrated short-haul data radio to communicate to any access point controllers compatible with the Signature Share platform.
- Upgradable to Web accessed central control via any Signature Share compatible controllers.

#### SoloRain® 8030



- Single zone, remote programmable, valve mounted battery operated controller.
- 16 Programs
- Operates on one replaceable 9 volt battery for over one year depending on usage.
- Waterproof design tested to IP68, 6ft (1,8m)
- Programming is accomplished through the 8071 handheld programmer which can be used on unlimited 8030 actuators. The built in memory in the 8071 allows storage of up to 36 different programs.
- Installs directly on to all Signature Turf valves and can be fitted to many other valves through the use of adapters.
- 8030 can be purchased mounted on a 7900 series valve (8032).

## BATTERY OPERATED CONTROLLERS

### SoloRain®

#### 8010

Programmable Actuator

#### 8012

Programmable Actuator with 7901 Valve



### SPECIFICATIONS

#### DIMENSIONS (H X W X D)

4 1/2" (11,5 cm) x 2 3/4" (7 cm) x 1 3/4" (4,5 cm)

#### ELECTRICAL:

One 9V Alkaline Battery (not included)



### VALVE COMPATIBILITY CHART

#### 8010/8030/8090DC Adapter Kit #77440:

**SIGNATURE** 9001,9003,9002,9011,9013,9012,  
7901,7916,7911,7917,9501,9501FC,  
9502,9515NC,9520NC,9515BC,9520BC,

#### Adapter Kit #77422:

<b>TORO:</b> 252 (1.5" - 2"), 220	<b>BERMAD</b> 1"
<b>IRRITROL:</b> 2400, 2600, 2500, 2700, 311, 2623, 300, 700, 100, 216, 623DPR	<b>DOROT</b> 1" <b>GALCON</b> 1"
<b>K-RAIN</b> 7001, 7200	<b>GRISWOLD</b> 1"

#### Adapter Kit #77423:

**TORO:** EZ FLOW, TPV

#### Adapter Kit #77424:

**RAIN BIRD:**  
DV, DVF, ASVF, JTV, JTVF, PGA, PEB, PESB, GBR, EFB, BPE, BPES

#### Used without and adapter kit:

**HIT:** 100, 200, 300, 500, 800, 8400

### FEATURES

#### SoloRain® 8010 Series:

- FITS ALL SIGNATURE® TURF VALVES
- Compatible with most valves via adapters
- Single program stand-alone unit includes three dials for easy programming
- Waterproof design in both the programmable actuator and the battery compartment - IP68 tested
- Solenoid and battery compartment are compact and made of durable nylon with protective cover included
- Operates on a single 9 volt Energizer® alkaline battery for one year depending on usage (not included)
- Latching solenoid design uses minimal battery consumption
- Resistant to the hazards of lightning and power surges commonly seen in AC systems
- Programmable clock for real time operation
- Automatic watering up to two times per day
- Watering times from 1-2 minute to 5 1/2 hours
- Manual ON and OFF

### SoloRain®

#### 8014

DuraLife® Valve Actuator

#### 8014SR

DuraLife® Valve Actuator with Sensor Ready

#### 8013E

DuraLife® Valve Actuator with 1" (25,4 mm) 9003 valve

#### 8015 (8015E)

DuraLife® Valve Actuator with 1" (25,4 mm) 7901/7916 valve

#### 8016E

DuraLife® Valve Actuator with 1" (25,4 mm) 9501 valve



### SPECIFICATIONS

#### DIMENSIONS (H X W X D)

8014, 8014SR: 5 1/2" (14 cm) x 3 1/2" (9 cm)

8013E: 7 3/8" (18,8 cm) x 5" (12,7 cm) x 3" (7,6 cm)

8015, 8015E: 7 1/2" (19 cm) x 4" (10,2 cm) x 3 1/2" (8,9 cm)

8016E: 8 1/8" (20,6 cm) x 5 1/2" (14 cm) x 3 1/2" (9 cm)

#### ELECTRICAL:

Factory installed 3.6 V Lithium Battery



### FEATURES

#### SoloRain®

#### 8014/8013E/8015/8016E Series:

- FITS ALL SIGNATURE® TURF VALVES
- Long life factory installed lithium battery\*. Actual battery life will depend on the number of cycles run per year, valve size, operating pressure, and temperature. The battery is replaceable and is available as a service part.
- LCD displays clock and programming
- Timed manual ON and OFF
- Length of watering time: 1 minute to 12 hours
- Six watering programs available per day
- Mist Cycle available on all 6 programs
- Days of the week, Odd/Even, and Interval scheduling
- Rain Delay is programmable from 1 to 99 days
- Leap year compatible-automatically includes Feb. 29th every four years
- Waterproof design tested

#### 8014SR

- Two wires on the "SR" version allows any normally open/normally closed sensor to be hooked up to it (switch has to be closed for the 8014 to operate). Sensors can be up to 25 ft (7,5 m) away.

### VALVE COMPATIBILITY CHART

#### SoloRain® 8014 and 8020 DC ADAPTERS\* Model 77467

**ALL HARDIE/IRRITROL VALVES**  
**NELSON TURF:**  
7937, 7987, 7938, 7988, 7904, 7914, 7925, 7927,  
7928, 7937, 7938, 7987, 7988,  
**TORO:** EZ FLOW, TPV  
**K-RAIN:** 7001, 7200, 7200

#### Model 77468

**RAINBIRD:**  
PEB, DV, DVF, ASVF, EFB, GB, PGA, PESB, BPE, BPES

#### Model 77481

**WEATHERMATIC:**  
ALL WEATHERMATIC VALVES

#### Model 77516

**HUNTER:**  
ALL HUNTER VALVES

#### Model 77526

**TORO:**  
252 (1.5" - 2"), 220

\* Sold separately. No adapter required on the following Signature Valves:  
7901, 7911, 7916, 7917, 9001, 9002, 9003, 9011, 9012, 9013, 9501,  
9501FC, 9502, 9515BC, 9515NC, 9520BC, 9520NC.  
This is a partial list; please contact Signature for further details.

\* Battery life will vary depending on environmental conditions.  
Test results have shown 2 - 3 years of battery life



## BATTERY OPERATED CONTROLLERS

## SoloRain®

## 8017

Duralife Valve Actuator with Bayonet cap

## 8017-N

Duralife Valve Actuator with Bayonet cap &amp; Network Capable



## FEATURES

SoloRain®  
8017

- FITS ALL SIGNATURE® TURF VALVES
- Long life factory installed lithium battery. Actual battery life will depend on the number of cycles run per year, valve size, operating pressure, and temperature. The battery is replaceable and is available as a service part.
- LCD displays clock and programming
- Timed manual ON and OFF
- Length of watering time: 1 minute to 12 hours
- Six watering programs available per day
- Mist Cycle available on all 6 programs
- Days of the week, Odd/Even, and Interval scheduling
- Rain Delay is programmable from 1 to 99 days
- Leap year compatible-automatically includes Feb. 29th every four years
- Waterproof design tested to IP68, 6ft (1.8m)

## 8017-N

- Two wires on the "N" version allow for any normally closed sensor to be hooked to it. Sensors can be up to 25ft (7.5 m) away.
- The "N" version is Network ready and when used with an 8018-S, can be networked with any Signature Share compatible central controlled controller/s.

## SPECIFICATIONS

## DIMENSIONS (H X W X D)

8017, 8017N: 5 1/2" (14 cm) x 3 1/2" (9 cm)

## ELECTRICAL:

Factory installed 3.6V lithium battery



## VALVE COMPATIBILITY CHART

SoloRain® 8014 and 8020 DC ADAPTERS\*  
Model 77467

ALL HARDIE/IRRITROL VALVES  
NELSON TURF:  
7937, 7987, 7938, 7988, 7904, 7914, 7925, 7927,  
7928, 7937, 7938, 7987, 7988,  
TORO: EZ FLOW, TPV  
K-RAIN: 7001, 7200, 7200

## Model 77468

RAINBIRD:  
PEB, DV, DVF, ASVF, EFB, GB, PGA, PESB, BPE, BPES

## Model 77481

WEATHERMATIC:  
ALL WEATHERMATIC VALVES

## Model 77516

HUNTER:  
ALL HUNTER VALVES

## Model 77526

TORO:  
252 (1.5" -2"), 220

\* Sold separately. No adapter required on the following Signature Valves:  
7901, 7911, 7916, 7917, 9001, 9002, 9003, 9011, 9012, 9013, 9501,  
9501FC, 9502, 9515BC, 9515NC, 9520BC, 9520NC.  
This is a partial list; please contact Signature for further details.

\* Battery Life will vary depending on environmental conditions and usage. Test results have shown 2-3 years of battery life.

## SoloRain®

## 8018-S

Network DSS Gateway Radio



## FEATURES

- Integrated short-haul data radio connects to access point controllers compatible with the Signature Share platform.
- Operates Signature 8014-SR actuators, 8017-N actuators.
- Smart circuitry allows for two AA batteries to operate for several years depending on usage.
- Acts as a gateway for 1, 2, 4, or 6 remotely located zones.
- Waterproof design tested to IP68, 6ft (1.8m)

## SPECIFICATIONS

## DIMENSIONS (H X W X D)

4 1/4" (10.8 cm) x 3 1/4" (8.25 cm)

## ELECTRICAL:

Two AA Alkaline Batteries (not included)

## SoloRain®

## 8028-S

Valve Actuator &amp; integrated Network DSS Gateway Radio

## 8020DC

Latching Solenoid

## 8090DC

9vdc Latching Solenoid 3/4" - 20 threads.



## FEATURES

- Integrated short-haul data radio connects to access point controllers compatible with the Signature Share platform.
- Operates Signature 8020-DC solenoids
- Smart circuitry allows for two AA batteries to operate for several years depending on usage.
- Acts as a gateway for 1, 2, 4, or 6 remotely located zones
- Can have up to 250 ft (76 m) of 18 AWG direct burial wire between the solenoid and 8017-N actuators
- Waterproof design tested to IP68, 6ft (1.8m)
- Compatible to use with several competitors DC-solenoid/valve combinations.

## SPECIFICATIONS

## DIMENSIONS (H X W X D)

4 1/4" (10.8 cm) x 3 1/4" (8.25 cm)

## ELECTRICAL:

Two AA alkaline batteries (not included)

## VALVE COMPATIBILITY CHART

8010/8030/8090DC  
Adapter Kit #77440:

SIGNATURE 9001, 9003, 9002, 9011, 9013, 9012,  
7901, 7916, 7917, 9001, 9002, 9003, 9011, 9012, 9013, 9501,  
9502, 9515NC, 9520NC, 9515BC, 9520BC,

## Adapter Kit #77422:

TORO: 252 (1.5" -2"), 220  
IRRITROL: 2400, 2600, 2500, 2700,  
311, 2623, 300, 700, 100,  
216, 623DPR  
K-RAIN: 7001, 7200

## Adapter Kit #77423:

TORO: EZ FLOW, TPV

## Adapter Kit #77424:

RAIN BIRD:  
DVF, ASVF, TVT, TVF, PGA, PEB, PESB, GBR, EFB, BPE, BPES

Used without and adapter kit:  
HIT: 100, 200, 300, 500, 800, 8400

SoloRain® 8014 and 8020 DC ADAPTERS\*  
Model 77467

ALL HARDIE/IRRITROL VALVES  
NELSON TURF:  
7937, 7987, 7938, 7988, 7904, 7914, 7925, 7927,  
7928, 7937, 7938, 7987, 7988,  
TORO: EZ FLOW, TPV  
K-RAIN: 7001, 7200, 7200

## Model 77468

RAINBIRD:  
PEB, DV, DVF, ASVF, EFB, GB, PGA, PESB, BPE, BPES

## Model 77481

WEATHERMATIC:  
ALL WEATHERMATIC VALVES

## Model 77516

HUNTER:  
ALL HUNTER VALVES

## Model 77526

TORO:  
252 (1.5" -2"), 220

\* Sold separately. No adapter required on the following Signature Valves:  
7901, 7911, 7916, 7917, 9001, 9002, 9003, 9011, 9012, 9013, 9501,  
9501FC, 9502, 9515BC, 9515NC, 9520BC, 9520NC.  
This is a partial list; please contact Signature for further details.

\* Battery life will vary depending on environmental conditions.  
Test results have shown 2 - 3 years of battery life

## BATTERY OPERATED CONTROLLERS

SoloRain®  
Controllers**8024C**

4 zone controller only

**8020DC**Latching Solenoid  
(12 vdc 7/8 24 threads)**8090DC**Latching Solenoid  
(9vdc 3/4" -20 threads)

## Accessories

**8020P**

8020 Series Mounting Plate

**8020S**

8020 Series Mounting Stake

**8020GC**

8020 Series Waterproof Connectors



## SPECIFICATIONS

## DIMENSIONS (H X W X D)

4 1/4" (10,8 cm) x 3 1/4" (8,25 cm)

## ELECTRICAL:

Two AA Alkaline Batteries (not included)



## VALVE COMPATIBILITY CHART

8010/8030/8090DC Adapter Kit #77440:	
SIGNATURE 9001,9003,9002,9011,9013,9012, 7901,7916,7911,7917,9501,9501FC, 9502,9515NC,9520NC, 9515BC,9520BC,	
Adapter Kit #77422:	
TORO: 252 (1.5" 2"),220	BERMAD 1"
IRRITROL: 2400,2600,2500,2700, 311,2623,300,700,100, 216,623DPR	DOROT 1" GALCON 1"
K-RAIN 7001,7200	GRISWOLD 1"
Adapter Kit #77423:	
TORO: EZ FLOW,TPV	
Adapter Kit #77424:	
RAIN BIRD: DV,DVF,ASVF,JTV,JTVF,PGA,PEB,PESB,GBR,EFB,BPE,BPES	
Used without and adapter kit:	
HIT: 100,200,300,500,800,8400	

SoloRain® 8014 and 8020 DC ADAPTERS\*  
Model 77467ALL HARDIE/IRRITROL VALVES  
NELSON TURF:  
7937, 7987, 7938, 7988, 7904, 7914, 7925, 7927,  
7928, 7937, 7938, 7987, 7988,  
TORO: EZ FLOW,TPV  
K-RAIN: 7001, 7200, 7200

## Model 77468

RAINBIRD:  
PEB, DV, DVF, ASVF, EFB, GB, PGA, PESB, BPE, BPES

## Model 77481

WEATHERMATIC:  
ALL WEATHERMATIC VALVES

## Model 77516

HUNTER:  
ALL HUNTER VALVES

## Model 77526

TORO:  
252 (1.5" -2"), 220\* Sold separately. No adapter required on the following Signature Valves:  
7901, 7911, 7916, 7917, 9001, 9002, 9003, 9011, 9012, 9013, 9501,  
9501FC, 9502, 9515BC, 9515NC, 9520BC, 9520NC.  
This is a partial list; please contact Signature for further details.\* Battery life will vary depending on environmental conditions.  
Test results have shown 2 - 3 years of battery life

## FEATURES

## SoloRain® 8020 Series:

- FITS ALL SIGNATURE® TURF VALVES
- Available from 1-6 zones
- Three start times per program (9 total start times)
- Three independent programs
- Length of programmable watering time (1 min to 3hr 59min per zone)
- Four scheduling options to suit the need of plant material or to comply with watering restrictions (days of the week, 1-30 day interval, true odd/even)
- Leap year compatible (automatically includes February 29th)
- 0-200% Water budget programming
- Three test cycles (manual open, cycle, and 3min test)
- Color coded label, wires make wiring /zone identification quick and easy!
- Can have up to 250 ft (76 m) of 18 AWG direct burial wire between the solenoid and the 8020 Series Controller (Must use Waterproof design connectors for splice or your warranty is void) waterproof design tested to IP68, 6ft (1,8m).
- Long life battery\*
- Operates RainBird® & Hunter® DC latching Solenoids (makes for an easy controller replacement)

## SoloRain®

**8030**

Remote Programmable Actuator

**8032 (8033)**Remote Programmable Actuator with  
1" (25,4 mm) 7901/7916 valve**8071**

Programmer Plus console

*Note: Versions in parenthesis feature  
BSP threading for international use***8030****8032**

## FEATURES

## SoloRain® 8030 Series:

- FITS ALL SIGNATURE® TURF VALVES
- Compatible with most valves via adapters
- Solenoid and battery compartment are compact and made of durable nylon construction
- Programming interface through cord connection to the model 8071 Programmer control console
- Waterproof design in both the programmable actuator and the battery compartment - IP68 tested
- Latching solenoid design uses minimal battery consumption

## SoloRain® 8071:

- Independent programming of an unlimited number of 8030 series actuators
- Up to 16 irrigation start times per actuator
- 14-day programming calendar
- Built-in memory allows storage of up to 36 different irrigation programs
- Downloadable transfer of programs individually or to a group of actuators
- Memory is retained for 2 minutes during battery change
- Four line LCD display for easy menu guided programming
- User can choose between five languages for operation

## SPECIFICATIONS

## DIMENSIONS (H X W X D)

8030: 4 1/2" (11,5 cm) x 2 3/4" (7 cm) x 1 3/4" (4,5 cm)  
8032: 7" (17,8 cm) x 4 3/4" (12 cm) x 2 3/4" (7 cm)  
8071: 9 7/8" (25,1 cm) x 5 1/4" (13,3 cm) x 1 1/4" (3,2 cm)

## ELECTRICAL:

One 9V Alkaline Battery (not included)

## VALVE COMPATIBILITY CHART

8010/8030/8090DC (3/4" - 20 Threads 9vdc)  
Adapter Kit #77440:SIGNATURE 9001,9003,9002,9011,9013,9012,  
7901,7916,7911,7917,9501,9501FC,  
9502,9515NC,9520NC, 9515BC,9520BC,

## Adapter Kit #77422:

TORO: 252 (1.5" 2"),220	BERMAD 1"
IRRITROL: 2400,2600,2500,2700, 311,2623,300,700,100, 216,623DPR	DOROT 1" GALCON 1"
K-RAIN 7001,7200	GRISWOLD 1"

## Adapter Kit #77423:

TORO: EZ FLOW,TPV

## Adapter Kit #77424:

RAIN BIRD:  
DV,DVF,ASVF,JTV,JTVF,PGA,PEB,PESB,GBR,EFB,BPE,BPES

## Used without and adapter kit:

HIT: 100,200,300,500,800,8400

- Easy to program with large LCD display and simplified four rubber button keypad with audio "beep" response
- Impact-resistant plastic housing
- Operates on one 9 volt alkaline battery
- Programmable 12 or 24-hour clock with synchronizing function
- Watering times from one minute to 24 hours in one minute increments
- Manual START and STOP function
- Program review
- Rain ON/OFF capability





TURF CONTROLLERS

	EZ Indoor 8100	EZ Pro™ Jr. Indoor 8200	EZ CONNECT 8250	EZ CONNECT DC 8255S
APPLICATIONS				
Residential	✓	✓	✓	✓
Commercial/Municipal		✓	✓	✓
Sports Turf Applications	✓	✓	✓	✓
Indoor	✓	✓	✓	✓
Outdoor				
Pedestal Mount Optional				✓
Web-Based [Optional Add-On]				
Central Control			✓	✓
FEATURES				
Programs	2	3	+	+
Zones	4, 6	4, 6, 9	12+	6

	EZ CONNECT DC 8255W	EZ Pro™ Jr. 8300	EZ Pro™ 8600
APPLICATIONS			
Residential	✓	✓	✓
Commercial/Municipal	✓	✓	✓
Sports Turf Applications	✓	✓	✓
Indoor	✓	✓	✓
Outdoor		✓	✓
Pedestal Mount Optional	✓		✓
Web-Based [Optional Add-On]			✓
Central Control	✓		
FEATURES			
Programs	+	3	3
Zones	6	4, 6, 9&12	8, 12, 16, 20 & 24

## PRODUCT OVERVIEW CONTROLLERS

### EZ Indoor 8100



- Dual program, multiple start times and schedule options.
- Capable of 6 hours of run time per zone.
- Available in 4 and 6 zones.
- Simple to budget water by program
- A single long life lithium battery stores programs even without power connected and keeps the correct time and date for up to one year.
- Resettable fuse for short circuit zone protection.
- External transformer.
- Rain sensor compatible with use of a normally closed sensor.
- Smart Water Port™ for future upgrades

### EZ Pro™ Jr. 8200



- Three programs, multiple start times and schedule options. The 8200 series is capable of 5 hours 59 minutes of run time per zone.
- Available in 4, 6 and 9 zones.
- 1.0 amp self resetting fuse for short circuit zone protection.
- The 8200 series comes in an indoor plastic cabinet with an external transformer.
- This series is packed with many advanced water management features such as global water budgeting, water budgeting by month, event days and a built in sensor input.

### EZ Pro™ Jr. 8300



- Three programs, multiple start times and schedule options. The 8300 series is capable of 5 hours 59 minutes of run time per zone.
- Available in 4, 6, 9, and 12 zones.
- Lithium battery backup stores programs without AC power or AA batteries.
- 1.0 amp self resetting fuse for short circuit zone protection.
- The 8300 series comes in an indoor / outdoor weather resistant plastic cabinet with an internal transformer.
- This series is packed with many advanced water management features such as global water budgeting, water budgeting by month, event days and a built in sensor input.

### EZ Pro™ 8600



- Three programs, multiple start times and schedule options. The 8600 series is capable of 9 hours 59 minutes of run time per zone.
- Available in 8, 12, 16, 20, and 24 zones.
- Nonvolatile memory stores programs without AC power or AA batteries.
- 1.0 amp self resetting fuse for short circuit zone protection.
- The 8600 series comes in an indoor / outdoor weather resistant plastic cabinet with an internal transformer.
- This series is packed with many advanced water management features such as global water budgeting, water budgeting by month and a built in sensor input.
- Central control ready. Just install the EZ Pro™ Live communications module and control your controller from anywhere in the world using EZProLive.com.

### EZ Pro™ Jr. 8250-W



- Signature Share web based ET controller
- 12-zone expandable with additional output modules.
- Indoor modular controller.
- 24VAC output to control in irrigation solenoid valves.
- 1 amp self resetting fuse for short circuit zone protection
- Ethernet connectivity; connects directly to internet via local area network.
- No need for complicated wi-fi setup; uses power line adaptors to connect remotely located controllers to internet [adaptors sold separately]
- No complex keypad or display; simple operation via Smart Phones or web based iOS applications.
- Integrates to other Signature products to expand the control network, making it ideal for remote control of other DC or battery operated valves or controllers.
- Two built in expansion ports for; station modules, lighting relay modules, N/O or N/C pump start modules, 2-wire decoder module, or smart sensors.
- Multiple Programs via web interface
- Operates on 110/220/240VAC plug in transformer power.
- Splash proof enclosure.
- Sensor ready for connection to any normally closed, rain, soil moisture, freeze or wind sensors.

### EZ Pro™ Jr. 8255-W



- Signature Share web based ET controller
- 6-zone 12VDC output.
- Indoor modular controller.
- 1 amp self resetting fuse for short circuit zone protection
- Compatible to Signature Share platform as well as remotely controlled via iOS devices or SmartPhones.
- Signature Share web based ET controller.
- Connects directly to Signature Share cellular network out of the box.
- Integrates to other Signature products to expand the control network, making it ideal for remote control of other DC or battery operated valves or controllers.
- Immediately connects to Signature's Share platform of products, out of the box.
- No complex keypad or display; simple operation via Smart Phones or web based iOS applications.
- Two open/close sensor ports.
- Data port for smart sensors
- Operates on 110/220/240VAC plug in transformer power.
- Splash proof enclosure.

### EZ Pro™ Jr. 8255-S



- Signature Share web based ET controller
- 6-zone 12VDC output.
- Indoor modular controller.
- 1 amp self resetting fuse for short circuit zone protection
- Compatible to Signature Share platform as well as remotely controlled via iOS devices or SmartPhones.
- Signature Share web based ET controller.
- Connects directly to Signature Share cellular network out of the box.
- Integrates to other Signature products to expand the control network, making it ideal for remote control of other DC or battery operated valves or controllers.
- Integrated short-haul data radio to communicate to any access point controllers compatible with the Signature Share platform.
- No complex keypad or display; simple operation via Smart Phones or web based iOS applications.
- Two open/close sensor ports.
- Data port for smart sensors
- Operates on 110/220/240VAC plug in transformer power.



## CONTROLLERS

### EZ Indoor

**8124\***

4 zone

**8126\***

6 zone

\* A country code is required after model number:

**'AU'** - Australia

**'ES'** - Spain

**'FR'** - France

**'IT'** - Italy

**'PT'** - Portugal

**'US'** - English



### SPECIFICATIONS

#### DIMENSIONS (H X W X D)

5 3/4" (14,6 cm) x 4 1/2" (11,5 cm) x 1 1/2" (3,8 cm)

#### Cabinet:

Durable plastic- indoor controller

#### # of zones:

4, 6

#### ELECTRICAL:

##### US & Canada Models

INPUT: 120V AC, 60 Hz

OUTPUT: 24V AC, .50 Amp

##### International Models

INPUT: 230V AC, 50 Hz

OUTPUT: 24V AC, .50 Amp

FCC Part 15 Class B compliant



### FEATURES

- Stacking start times
- Two independent programs
- Three start times per program
- Simple to budget water by program
- Smart Water Port™ for future upgrades
- True calendar clock (Leap year compatible)
- Scheduling options:  
Odd/Even  
Interval, 1-30 days  
7-day Calendar
- Zone run times from one minute to 6 hours
- Long life Lithium battery keep correct time and date for up to 1 year
- Resettable fuse for short circuit zone protection
- Manual test with manual advance feature
- Rain sensor compatible

### EZ Pro™ Jr.

**8204 (8274\*)**

4 zone

**8206(8276\*)**

6 zone

**8209 (8279\*)**

9 zone

\* A country code is required after model number:

**'AU'** - Australia

**'ES'** - Spain

**'FR'** - France

**'IT'** - Italy

**'PT'** - Portugal

**'US'** - English



### SPECIFICATIONS

#### DIMENSIONS (H X W X D)

7" (17,8 cm) x 5 5/8" (14,3 cm) x 2" (5,1 cm)

#### Cabinet:

Durable Plastic- indoor controller

#### # of zones:

4, 6, 9

#### ELECTRICAL:

##### 8204 to 8209:

INPUT: 120V AC, 60 Hz

OUTPUT: 24V AC, .83 Amp

##### 8274 to 8289:

INPUT: 230V AC, 50 Hz

OUTPUT: 24V AC, .83 Amp

Two Energizer® AA alkaline batteries (not included)

FCC Part 15 Class B compliant



### FEATURES

- Stacking start times
- Three independent programs
- Three start times per program
- True calendar clock (Leap year compatible)
- Scheduling options: Odd/Even; Interval 1-30 days; 7-day Calendar; Event Day
- Zone run times from one minute to 5 hours 59 minutes
- Programmable delay between zones, 1 second to 30 minutes
- Quick push button rain sensor bypass
- Cycle test, Manual test with manual advance
- Two AA alkaline batteries keep correct time and date for 5 years
- Input and output surge protection
- 1.0 amp self resetting polyswitch for short-circuit zone protection

### WATER MANAGEMENT FEATURES

- Event days per program - Blocks any day from irrigating
- Water budget option reduces or increases watering 0 to 200 percent
- Advanced water budget to set water budget for each month of the year, per program 0 to 200 percent

## CONTROLLERS

### EZ Pro™ Jr.

**8250**  
Ethernet Based Residential Controller

### Accessories

**Sensor Expansion Module**  
**2-Wire Decoder Module**  
**N.O. Relay Module**  
**Station Expansion Module**



### SPECIFICATIONS

#### DIMENSIONS (H X W X D)

7" (17,8 cm) x 5<sup>5</sup>/<sub>8</sub>" (14,3 cm) x 2" (5,1 cm)

#### Cabinet:

Durable Plastic- indoor controller

#### # OF ZONES:

12 (expandable)

#### ELECTRICAL:

8250-W USA & Canada

INPUT: 120V AC, 60 hz

OUTPUT: 24V AC, .83 Amp

8250-W International

INPUT: 230V AC, 50 hz

OUTPUT: 24V AC, .83 Amp

FCC Part 15 Class B compliant



### FEATURES

- Stacking start times
- Three independent programs
- Twenty-four events per program
- True calendar clock (Leap year compatible)
- Scheduling options: Odd/Even; Interval 1-30 days; 7-day Calendar; Event Day; 12-month calendar
- Zone run times from one minute to eleven hours 59 minutes
- Cycle test, Manual test with manual advance
- Input and output surge protection
- 1.0 amp self resetting polyswitch for short-circuit zone protection
- Two sensor inputs: Moisture sensor; Flow sensor; Temperature sensor; Wind sensor
- Two expansion ports
- No need for complicated wi-fi setup; uses power line adaptors to connect remotely located controllers to internet [adaptors sold separately]
- Remote access via the Web

### WATER MANAGEMENT FEATURES

- Event days per program - Blocks any day from irrigating
- Water budget option reduces or increases watering 0 to 200 percent
- Advanced water budget to set water budget for each month of the year; per program 0 to 200 percent
- Can be used on any Signature Share compatible network and web based software.
- Conventional time based watering scheduling as well as Smart Watering and ET-based scheduling capabilities.
- No complex keypad or display; simple operation via Smart Phones or web based iOS applications

### EZ Pro™ Jr.

**8255W**  
Cellular Based Residential / Commercial Controller

**8255S**  
Cellular Based Residential / Commercial Controller with Access Point Data Modem



### SPECIFICATIONS

#### DIMENSIONS (H X W X D)

7" (17,8 cm) x 5<sup>5</sup>/<sub>8</sub>" (14,3 cm) x 2" (5,1 cm)

#### Cabinet:

Durable Plastic- indoor controller

#### # OF ZONES:

12 (expandable)

#### ELECTRICAL:

8255-W / 8255-S USA & Canada

INPUT: 120V AC, 60 hz

OUTPUT: 24V DC, .50 Amp

8255-W / 8255-S International

INPUT: 230V AC, 50 hz

OUTPUT: 24V DC, .50 Amp

FCC Part 15 Class B compliant



### FEATURES

- Signature Share web based ET controller
- 6-zone 12VDC output.
- Indoor modular controller.
- 1 amp self resetting fuse for short circuit zone protection
- Compatible to Signature Share platform as well as remotely controlled via iOS devices or SmartPhones.
- Signature Share web based ET controller.
- Connects directly to Signature Share cellular network out of the box.
- Integrates to other Signature products to expand the control network, making it ideal for remote control of other DC or battery operated valves or controllers.
- Integrated short-haul data radio to communicate to any access point controllers compatible with the Signature Share platform.
- Upgradable to Web accessed central control via 8017-N, 8014-SR when used with any Signature Share compatible controllers.
- Integrated data modem allows for immediate connection to Signature's Share platform of products, out of the box.
- No complex keypad or display; simple operation via Smart Phones or web based iOS applications.
- Two open/close sensor ports.
- Data port for smart sensors
- Operates on 110/220/240VAC plug in transformer power.

### WATER MANAGEMENT FEATURES

- Event days per program - Blocks any day from irrigating
- Water budget option reduces or increases watering 0 to 200 percent
- Advanced water budget to set water budget for each month of the year; per program 0 to 200 percent
- Can be used on any Signature Share compatible network and web based software.
- Conventional time based watering scheduling as well as Smart Watering and ET-based scheduling capabilities.
- No complex keypad or display; simple operation via Smart Phones or web based iOS applications.



## CONTROLLERS

### EZ Pro™ Jr.

**8304 (8374\*)**

4 zone

**8306 (8376\*)**

6 zone

**8309 (8379\*)**

9 zone

**8312 (8382\*)**

12 zone

\* A country code is required  
after model number:

**'AU'** - Australia

**'ES'** - Spain

**'FR'** - France

**'IT'** - Italy

**'PT'** - Portugal

**'US'** - English



### SPECIFICATIONS

#### DIMENSIONS (H X W X D)

8" (20,3 cm) x 10" (25,4 cm) x 4" (10 cm)

#### Cabinet:

Weather resistant plastic

#### # of zones:

4, 6, 9, 12

#### ELECTRICAL:

**8304 to 8312:**

INPUT: 120V AC, 60 Hz

OUTPUT: 24V AC, .83 Amp

**8374 to 8382:**

INPUT: 230V AC, 50 Hz

OUTPUT: 24V AC, .83 Amp

Two Energizer® AA alkaline batteries  
(not included)

FCC Part 15 Class B compliant



### WATER MANAGEMENT FEATURES

- Event days per program - Blocks any day from irrigating
- Water budget option reduces or increases watering 0 to 200 percent
- Advanced water budget to set water budget for each month of the year; per program 0 to 200 percent

### FEATURES

- Lithium battery back-up stores programs without AC power or AA batteries
- Stacking start times
- Three independent programs
- Three start times per program
- True calendar clock (Leap year compatible)
- Scheduling options: Odd/Even; Interval 1-30 days; 7-day Calendar; Event Day
- Zone run times from one minute to 5 hours 59 minutes
- Programmable delay between zones, 1 second to 30 minutes
- Quick push button rain sensor bypass
- Cycle test, Manual test with manual advance
- Two AA alkaline batteries keep correct time and date for 5 years
- Input and output surge protection
- 1.0 amp self resetting polyswitch for short-circuit zone protection

### EZ Pro™

**8608 (8678\*)**

8 zone

**8612 (8682\*)**

12 zone

**8616 (8686\*)**

16 zone

**8620 (8690\*)**

20 zone

**8624 (8694\*)**

24 zone

\* A country code is required  
after model number:

**'AU'** - Australia

**'ES'** - Spain

**'FR'** - France

**'IT'** - Italy

**'PT'** - Portugal

**'US'** - English



### SPECIFICATIONS

#### DIMENSIONS (H X W X D)

9" (22,9 cm) x 12" (30,5 cm) x 5" (12,5 cm)

#### Cabinet:

Weather resistant plastic

#### # of zones:

8, 12, 16, 20, 24

#### ELECTRICAL:

**8608 to 8624:**

INPUT: 120V AC, 60 Hz

OUTPUT: 24V AC, 1.25 Amp

**8678 to 8694:**

INPUT: 230V AC, 50 Hz

OUTPUT: 24V AC, 1.25 Amp

Two Energizer® AA alkaline batteries (not included)  
FCC Part 15, Sub Part C, 15.247

UL, COL and CE Listed:

FCC Part 15 Class B compliant



### FEATURES

- Non-volatile memory stores programs without AC power or batteries
- Two AA batteries keep correct time for one year
- Stacking start times
- Pump start programmable by zone
- Programmable Rain Delay to 99 days
- Three independent programs
- Four start times per program
- Three scheduling options to suit the needs of plant material or to comply with watering restrictions (7 day calendar, 1-30 day interval, true odd/even)
- Leap year compatible
- Water budget option reduces or increases watering 0-200 percent
- Advanced water budget to set water budget for each month of the year
- Three test cycles (Manual test with manual advance feature, Cycle test, 3-minute test)
- Programmable run times from one minute to 9 hours 59 minutes
- Poly-fuse self resetting circuit protection



COMMERCIAL SATELLITE CONTROLLERS

Partial Features List	TURF CONTROLLERS SATELLITES (24VAC) GALAXY™ CONSTELLATION®		DECODER CONTROLLERS SATELLITES (2-Wire) GALAXY™ CONSTELLATION®	
<b>APPLICATIONS</b>				
Commercial	✓	✓	✓	✓
Municipal	✓	✓	✓	✓
Sports turf	✓	✓	✓	✓
<b>ENCLOSURE TYPE</b>				
Wall Mount	✓	✓	✓	✓
Plastic Pedestal	✓	✓	✓	✓
Stainless Steel	✓	✓	✓	✓
<b>NETWORK COMMUNICATION</b>				
Stand-Alone Controller	✓	✓	✓	✓
Peer-to-Peer Communication		✓		✓
Local Sensors	✓	✓	✓	✓
Network Sensing		✓		✓
<b>CENTRAL CONTROL UPGRADEABLE</b>				
Constellation Desktop		✓		✓
eConstellation	✓	✓	✓	✓
Share™ Network	✓	✓	✓	✓
<b>OTHER</b>				
Uses Decoder Modules	✓	✓	✓	✓
Uses Valve Modules	✓	✓	✓	✓
Hybrid of Output	✓	✓	✓	✓

ROLLERS



## PRODUCT OVERVIEW

### COMMERCIAL SATELLITE CONTROLLER FAMILY

#### Galaxy



- The **Galaxy™** Satellite Controller delivers the ultimate in power at an affordable price.
- Galaxy is designed to operate as a stand-alone controller or as a satellite in a central controlled system.
- Galaxy is easy to operate with flexible configuration and communication options.
- Galaxy firmware can be upgraded in the field to a fully configured Constellation® version allowing the user full access to our patented Peer-to-Peer networking features.
- Available in several languages.
- All controllers are intelligent and smart; meaning, they don't need constant contact with central computers or expensive software packages to operate.
- Available in both 24VAC or 2-wire configurations or a hybrid of both.
- Ability to communicate over the internet and via SmartPhone technology with Signature mobile software.

#### Galaxy-RT



- The **Galaxy-RT™** Satellite Controller operates exclusively in a central controlled environment.
- Immediately connects to Signature's Share platform of products, out of the box.
- Remote control via iOS devices such as iPhones™ & iPads™.
- Ability to control via the internet from anywhere without requiring expensive local communications infrastructure.
- Ease of installation makes the Galaxy-RT the choice of Contractors.
- Control standard solenoids via 24VAC wiring or 2-wire decoder configurations.

#### Constellation



- The Constellation® Satellite Controller delivers the ultimate in power, ease and value.
- Constellation is designed to function as a stand-alone controller or as a satellite in a network with or without a central computer.
- No need to have software to operate; intelligent processors store data and operate independently of the network.
- Available in several languages.
- Remote control of stations located in remotely located Constellation controllers from anywhere on the Signature network, via Signature's peer-to-peer technology.
- Each Constellation Satellite Controller is like having a central computer in the field for unprecedented control and unparalleled value.
- Constellation is easy to operate with flexible configuration and communication options.
- Fits every commercial application—from parks, sports complexes, and business parks—to cemeteries, theme parks, HOAs.
- Suitable for hybrid applications where two-wire systems and traditional wired systems coincide.
- Expansion made easy with a modular output design.

### DECODER CONTROLLER FAMILY

#### Galaxy-RT Solar



- The **Galaxy-RT™** Solar Powered Satellite Controller operates exclusively from solar power.
- Immediately connects to Signature's Share platform of products, out of the box.
- Remote control via iOS devices such as iPhones™ & iPads™.
- Operates 12VDC solenoids and ideal for areas with no AC-Power.
- No complex keypad or display; simple operation via Smart Phones or web based iOS applications.
- Integrates to other Signature products to expand the control network, making it ideal for remote control of other DC or battery operated valves or controllers.

#### Constellation Interface Unit



- The Constellation® Interface Unit is the interface between the Constellation Desktop Software and the Constellation controllers in the field.
- All controllers are intelligent and smart; meaning, they don't need constant contact with central computers or expensive software packages to operate.
- Not just an interface, but also a controller; can operate standard wired 24VAC solenoids or 2-wire decoders operating 24VAC solenoids.
- Available in several languages.
- Remote control of stations located in remotely located Constellation controllers from anywhere on the Signature network, via Signature's peer-to-peer technology.
- Perfect for sites that are under construction or the As-Built design is incomplete; program the site via the Interface Unit and once the design is loaded on the desktop, upload all the programs from the field and you are ready.
- Constellation is easy to operate with flexible configuration and communication options.

#### Field Decoders & In-Line Surge Protection



- User-defined programmable addresses make it easy to setup and install without any complex equipment.
- User-defined station loading within the controllers allow for compensation for lengthy cable runs or additional decoder installations.
- By using the decoder programmer, change decoder addresses in the field, with ease.
- Field decoders are directly compatible to Signature Share platform as well as remotely controlled via iOS devices or SmartPhones.
- Each decoder modulator includes 125-individually programmable stations and each controller; is expandable to 250-stations with a single expansion module.
- Ease of installation has made decoders more popular around the world; together with the ease of future expansion by simple splice, install & go.
- Fully encapsulated electronic components making the decoders ready for direct burial.
- Pre-coded addressing eliminates confusion associated with switch-based addressing.

# COMMERCIAL SATELLITE CONTROLLERS

## Galaxy

## Constellation

## Galaxy Decoder

## Constellation Decoder



Wall Mount Enclosure



Plastic Pedestal Enclosure

## FEATURES

Constellation® Satellite Controller  
Stand-alone controller or network satellite  
for commercial sites

### NETWORK

Patented true two-way communication (peer to peer) allows a Constellation Satellite Controller to operate as a stand-alone controller or as part of a satellite network with or without a central computer

- Sensor inputs allow satellites to monitor, store and share data from multiple sensors across a network
- Hardwire, telephone, ethernet and radio communications can be used on the same network
- Cell phones and handheld radios can be used as remotes
- Backward and forward compatible
- Network can be monitored and controlled at any satellite through our patented Peer to Peer communications, through a central computer with our desktop software, through the internet with our eConstellation service, or all of the above
- Hardwire ready configuration allows for quick and inexpensive installation of our patented Peer to Peer communication between satellites

### SATELLITE CONTROLLER

- Multilingual user interface
- Enable and disable commands with delay timer
- User-selectable, 12-hour or 24-hour clock format
- Semi-automatic, manual and delayed manual station control
- Global, controller/satellite, program water budgeting from 0-999%
- Open, Overload and short-circuit protection
- User-selectable Water Budget or ET-adjusted control for each irrigation schedule/program
- Master valves (2 N/C and 2 N/O) and local and remote pump capabilities and pump start
- Accommodates up to two sensors and shares an additional 4 sensors across a network
- Flow monitoring and reporting of over-flow or under-flow conditions
- Generates alarms, flow and status reports which can be transmitted to a user defined-location and/or stored in the local alarm log

- Pedestal units can be configured for 96 traditional stations, or 250 decoder addresses (6 valve modules max. within a pedestal)
- Wallmount units can be configured for 48 traditional stations, or 250 decoder addresses (3 valve modules max. within a wall mount)
- Manages 128 fully independent, customized schedules/programs
- Each schedule/program has 8 start times and can accommodate up to 48 events; stations can be run in any sequence and you have the capability to run the same station multiple times within the same schedule/program, each with a different run time if needed
- Programs can be linked to start when another program ends—from any satellite on the network
- Each schedule/program has a completely independent watering calendar which can be All Months, Months, Weeks, Odd/Even or interval up to 99 days
- Virtually unlimited flexibility for specific cycle scheduling/programming
- Multiple repeats and pauses within a schedule/program
- Suitable for hybrid applications where two-wire systems and traditional wired systems coincide

### NETWORK COMMUNICATIONS OPTIONS

- Hardwire (Standard)
- Digital Spread Spectrum Radio (License Free) [900 MHz and 2.4 GHz]
- Ethernet Modem

### REMOTE COMMUNICATIONS OPTIONS

- Handheld Maintenance Radio [VHF]
- Landline Telephone
- Cellular Phone (CDMA and GSM)
- Ethernet Modem

#### Note:

Other options available — options vary by location; check with your local distributor

### Summary Features List

#### COMMUNICATION FEATURES

Peer-to-Peer Communication

#### PROGRAMMING FEATURES

Number of Zones (Wall Mount)	8-48	8-48	8-48
Number of Zones (Pedestal)	8-96	8-96	8-96
Remote Master Valve / Pump Starts			Y
Master Valve / Pump Starts	1 N/O	1 N/O	2 N/O, 2 N/C
Number of Independent Programs Per Controller	32	32	128
Start Times per Program	8	8	8
Multiple Start Types per Program	✓	✓	✓
Events per Program	48	48	48
Real Time Flow Sensing	✓	✓	✓

#### SENSOR FEATURES

Local Sensors per Satellite	2	2	2
Remote Sensors per Satellite			✓
Sharing of Sensor Data - from Interface Unit	✓	✓	✓
Sharing of Sensor Data - from any Satellite			✓
Number of Sensor Logs	7	7	90

## SATELLITES OPTIONS

### LOW POWER TYPE

**CD-111LP:** Low Power Field Decoder; 1- address, 1-solenoid

**CD-121LP:** Low Power Field Decoder; 2- addresses, 1-solenoid per address

### STANDARD DECODER TYPE

**CD-112:** Field Decoder; 1- address, up to 2-solenoid per address

**CD-122:** Field Decoder; 2- addresses, up to 2-solenoids per address

**CD-111:** Field Decoder; 1- address, 1-solenoid

**CD-132:** Field Decoder; 3- addresses, up to 2-solenoids per address

**CD-142:** Field Decoder; 4- addresses, up to 2-solenoids per address

### SATELLITES (24VAC)

### SATELLITES (2-Wire)

#### COMMUNICATION FEATURES

Peer-to-Peer Communication

#### PROGRAMMING FEATURES

Number of Zones (Wall Mount)	8-48	8-48	8-48
Number of Zones (Pedestal)	8-96	8-96	8-96
Remote Master Valve / Pump Starts			Y
Master Valve / Pump Starts	1 N/O	1 N/O	2 N/O, 2 N/C
Number of Independent Programs Per Controller	32	32	128
Start Times per Program	8	8	8
Multiple Start Types per Program	✓	✓	✓
Events per Program	48	48	48
Real Time Flow Sensing	✓	✓	✓

#### SENSOR FEATURES

Local Sensors per Satellite	2	2	2
Remote Sensors per Satellite			✓
Sharing of Sensor Data - from Interface Unit	✓	✓	✓
Sharing of Sensor Data - from any Satellite			✓
Number of Sensor Logs	7	7	90

## OPTIONS

**ACDECI:** 125-Zone Decoder Modulator Board

**ACVLVI:** Valve Module Standrad Surge Protection

**ADPROG:** Decoder Field Programmer

**TWSPK:** Decoder Surge Protection Kit





COMMERCIAL SATELLITE CONTROLLERS

Galaxy-RT Solar

Galaxy Solar Powered &  
Remote Access Point Controller



SPECIFICATIONS

DIMENSIONS (H X W X D)

Plastic Wall Mount

18" (46 cm) x 14" (36 cm) x 4 1/4" (36 cm)

FEATURES

Galaxy-RT Solar

- Signature Share web based ET controller
- Operates on Solar power.
- 6-zone 12VDC output.
- Outdoor Enclosure, Pole mounted system.
- Web based modular controller.
- 1 amp self resetting fuse for short circuit zone protection
- Compatible to Signature Share platform as well as remotely controlled via iOS devices or SmartPhones.
- Signature Share web based ET controller.
- Connects directly to Signature Share cellular network, via Signature proprietary design data modem, right out of the box.
- Integrates to other Signature products to expand the control network, making it ideal for remote control of other DC or battery operated valves or controllers.
- Immediately connects to Signature's Share platform of products, out of the box.
- No complex keypad or display; simple operation via Smart Phones or web based iOS applications.
- Two open/close sensor ports.
- Data port for smart sensors
- Integrated short-haul data radio to communicate to any access point controllers compatible with the Signature Share platform.
- Connect to 8017-N , 8018-S and 8028-S actuators for expanded remote control of far to reach zones..

NETWORK

- Patented true two-way communication (peer to peer) allows a Galaxy™ Solar Controller to operate as a stand-alone controller or as part of a satellite network with or without a central computer
- Sensor inputs allow satellites to monitor, store and share data from multiple sensors across a network
- Cell phones can be used as remotes
- Backward and forward compatible

SATELLITE CONTROLLER

- Multilingual user interface
- Enable and disable commands with delay timer
- User-selectable, 12-hour or 24-hour clock format
- Semi-automatic, manual and delayed manual station control
- Global, controller/satellite, program water budgeting from 0-999%
- Open, Overload and short-circuit protection
- User-selectable Water Budget or ET-adjusted control for each irrigation schedule/program
- Master valves (2 N/C and 2 N/O) and local and remote pump capabilities and pump start
- Accommodates up to two sensors and shares an additional 4 sensors across a network
- Flow monitoring and reporting of over-flow or under-flow conditions
- Generates alarms, flow and status reports which can be transmitted to a user defined location and/or stored in the local alarm log
- Manages multiple independent, customized schedules/programs
- Each schedule/program has 8 start times and can accommodate up to 48 events; stations can be run in any sequence and you have the capability to run the same station multiple times within the same schedule/program, each with a different run time if needed
- Programs can be linked to start when another program ends—from any satellite on the network
- Each schedule/program has a completely independent watering calendar which can be All Months, Months, Weeks, Odd/Even or interval up to 99 days
- Virtually unlimited flexibility for specific cycle scheduling/programming
- Multiple repeats and pauses within a schedule/program

REMOTE COMMUNICATIONS OPTIONS

- Cellular Phone (CDMA and GSM)
- Smart Phones or web based iOS applications

GOLF SATELLITE CONTROLLERS

Summary Features List	TURF CONTROLLERS SATELLITES (24VAC) Aurora LT™ Aurora RT™ Aurora®			DECODER CONTROLLERS SATELLITES (2-Wire) Aurora LT™ Aurora RT™ Aurora®		
APPLICATIONS						
Commercial	✓	✓	✓	✓	✓	✓
Municipal	✓	✓	✓	✓	✓	✓
Sports turf	✓	✓	✓	✓		
ENCLOSURE TYPE						
Wall Mount	✓		✓	✓		✓
Plastic Pedestal	✓	✓	✓	✓	✓	
Stainless Steel	✓		✓	✓		✓
NETWORK COMMUNICATION						
Stand-Alone Controller	✓		✓	✓		✓
Peer-to-Peer Communication			✓			✓
Hybrid Communication	✓		✓	✓		✓
Wireless Communication		✓			✓	
Local Sensors	✓	✓	✓	✓	✓	✓
Network Sensing			✓			✓
CENTRAL CONTROL UPGRADEABLE						
Aurora Desktop	✓		✓	✓		✓
eAurora	✓		✓	✓		✓
Share™ Network	✓	✓	✓	✓	✓	✓
OTHER						
Uses Decoder Modules	✓	✓	✓	✓	✓	✓
Uses Valve Modules	✓	✓	✓	✓	✓	✓

GOLF SATELLITE CONTROLLERS

AuroraLT

Aurora

AuroraLT  
Decoder

Aurora  
Decoder

AuroraRT



Wall Mount Enclosure



Plastic Pedestal Enclosure

FEATURES

Aurora® Satellite Controller  
Stand-alone controller or network satellite  
for commercial sites

NETWORK

Patented true two-way communication (peer to peer) allows a Aurora® Satellite Controller to operate as a stand-alone controller or as part of a satellite network with or without a central computer

- Sensor inputs allow satellites to monitor, store and share data from multiple sensors across a network
- Hardwire, telephone, ethernet and radio communications can be used on the same network
- Cell phones and handheld radios can be used as remotes
- Backward and forward compatible
- Network can be monitored and controlled at any satellite through our patented Peer to Peer communications, through a central computer with our desktop software, through the internet with our eAurora service, or all of the above
- Hardwire ready configuration allows for quick and inexpensive installation of our patented Peer to Peer communication between satellites

SATELLITE CONTROLLER

- Multilingual user interface
- Enable and disable commands with delay timer
- User-selectable, 12-hour or 24-hour dock format
- Semi-automatic, manual and delayed manual station control
- Global, controller/satellite, program water budgeting from 0-999%
- Open, Overload and short-circuit protection
- User-selectable Water Budget or ET-adjusted control for each irrigation schedule/program
- Master valves (2 N/C and 2 N/O) and local and remote pump capabilities and pump start
- Accommodates up to two sensors and shares an additional 4 sensors across a network
- Flow monitoring and reporting of over-flow or under-flow conditions
- Generates alarms, flow and status reports which can be transmitted to a user defined-location and/or stored in the local alarm log

- Pedestal units can be configured for 96 traditional stations, or 250 decoder addresses (6 valve modules max. within a pedestal)
- Wallmount units can be configured for 48 traditional stations, or 250 decoder addresses (3 valve modules max. within a wall mount)
- Manages 128 fully independent, customized schedules/programs
- Each schedule/program has 8 start times and can accommodate up to 48 events; stations can be run in any sequence and you have the capability to run the same station multiple times within the same schedule/program, each with a different run time if needed
- Programs can be linked to start when another program ends—from any satellite on the network
- Each schedule/program has a completely independent watering calendar which can be All Months, Months, Weeks, Odd/Even or interval up to 99 days
- Virtually unlimited flexibility for specific cycle scheduling/programming
- Multiple repeats and pauses within a schedule/program
- Suitable for hybrid applications where two-wire systems and traditional wired systems coincide

NETWORK  
COMMUNICATIONS OPTIONS

- Hardwire (Standard)
- Digital Spread Spectrum Radio (License Free) [900 MHz and 2.4 GHz]
- Ethernet Modem

REMOTE  
COMMUNICATIONS OPTIONS

- Handheld Maintenance Radio [VHF]
- Landline Telephone
- Cellular Phone (CDMA and GSM)
- Ethernet Modem

**Note:**  
Other options available — options vary by location; check with your local distributor

Summary Features List

COMMUNICATION FEATURES

Peer-to-Peer Communication

PROGRAMMING FEATURES

Number of Zones (Wall Mount)

Number of Zones (Pedestal)

Remote Master Valve / Pump Starts

Master Valve / Pump Starts

Number of Independent  
Programs Per Controller

Start Times per Program

Multiple Start Types per Program

Events per Program

Real Time Flow Sensing

SENSOR FEATURES

Local Sensors per Satellite

Remote Sensors per Satellite

Sharing of Sensor Data -  
from Interface Unit

Sharing of Sensor Data -  
from any Satellite

Number of Sensor Logs

SATELLITES (24VAC)

AURORA LT™ AURORA RT™ AURORA®

8-48 8-48 8-48

8-96 8-96 8-96

Y

1 N/O 1 N/O 2 N/O, 2 N/C

32 32 128

8 8 8

✓ ✓ ✓

48 48 48

✓ ✓ ✓

2 2 2

✓ ✓ ✓

✓ ✓ ✓

7 7 90

SATELLITES (2-Wire)

AURORA LT™ AURORA RT™ AURORA®

✓

250 250 250

250 250 250

✓

1 N/O 1 N/O 2 N/O, 2 N/C

32 32 128

8 8 8

✓ ✓ ✓

48 48 48

✓ ✓ ✓

2 2 2

✓ ✓ ✓

7 7 90

SATELLITES OPTIONS

LOW POWER TYPE

**AD-111LP:** Low Power Field Decoder;  
1- address, 1-solenoid

**AD-121LP:** Low Power Field Decoder;  
2- addresses, 1-solenoid per address

STANDARD DECODER TYPE

**AD-112:** Field Decoder;  
1- address, up to 2-solenoid per address

**AD-122:** Field Decoder;  
2- addresses, up to 2-solenoids per address

**AD-111:** Field Decoder;  
1- address, 1-solenoid

**AD-132:** Field Decoder;  
3- addresses, up to 2-solenoids per address

**AD-142:** Field Decoder;  
4- addresses, up to 2-solenoids per address

OPTIONS

**ACDECI:** 125-Zone Decoder Modulator Board

**ACVLVI:** Valve Module Standrad Surge Protection

**ADPROG:** Decoder Field Programmer

**TWSPK:** Decoder Surge Protection Kit





## SATELLITE CONTROLLERS OPTIONS

## ENCLOSURE OPTIONS

## Plastic Pedestal:

- Black Granite, Green Granite, Gray Granite, Tan

## Wall Mount:

- Large (Indoor/Outdoor Mount), Gray Only

## Heavy-Duty Stainless Steel:

- Top Opening or Front Opening

## SENSOR OPTIONS

Accepts both Pulse (standard) and 4-20mA (optional equipment required) sensors

## Pulse Sensors:

- ET Gauge
- Tipping Rain Bucket
- Rain Switch
- Flow Meter
- Frost /Temperature
- Any On/Off or Active/Non-Active

## 4-20mA Sensors:

- Soil Temperature
- Soil Moisture
- Flow
- Pressure

## VALVE MODULE OPTIONS

A style = 16 station (small terminals)  
B style = 8 station (large terminals)  
C style = 16 station  
(large terminals, pedestals only)  
D style = 125 address decoder

## ELECTRICAL

## Input Power

- 110/117 VAC, 60 Hz or 220/240 VAC, 50 Hz
- 0.20 amps @ 115 VAC, 60 Hz (no load)
- 0.80 amps @ 115 VAC, 60 Hz (max. load)

## Station Output Power

- 24 VAC (120 VA) total
- Station draw: max. 3 solenoids per station,
- 14 stations simultaneously (max. 3.2 amps)

## DIMENSIONS (H X W X D)

## Metal Wall Mount

- 18" (46 cm) x 14" (36 cm) x 4 1/4" (36 cm)

## Plastic Pedestal

- 45" (114 cm) x 16" (41 cm) x 11 5/8" (30 cm)



Plastic Pedestal Color Options

Heavy-Duty  
Stainless Steel Pedestal  
(Top Opening Style)Plastic Pedestal front view  
with 32 stations  
(2 C modules x 16 stations per module = 32)Plastic Pedestal back view  
(showing the field wiring connections)

## HOW TO ORDER

## CONTROLLER PART NUMBER GRID:

CON S PE B I A P 016 H 0

**Product Line:**  
AUR = Aurora Full Version Firmware  
ALT = AuroraLT Lite Version Firmware  
AUT = AuroraRT  
GRT = GalaxyRT  
CON = Constellation Full Version Firmware  
GAL = Galaxy Lite Version Firmware

**Product Brand:**  
S = Signature Control Systems  
R = RT

**Controller Enclosure:**  
PE = Plastic Pedestal  
LW = Large Wall Mount  
SW = Small Wall Mount  
HT = Heavy Duty Stainless Steel Top Entry  
HF = Heavy Duty Stainless Steel Front Entry

**Enclosure Color:**  
B = Black Plastic  
G = Green Plastic  
Y = Gray Plastic or Wall Mount  
T = Tan Plastic

**Transformer Power:**  
1 = 110v  
2 = 220v  
S = solar

**Valve Module Type:**  
A = 16 Station Valve Module (Small Terminals)  
B = 8 Station Valve Module (Large Terminals)  
C = 16 Station Valve Module (Large Terminals - Pedestals Only)  
D = 125 Address Decoder Module  
O = None

**Valve Module Surge Protection:**  
P = Premium Surge Protection  
S = Standard Surge Protection

**Valve Module Station Count:**  
006 = 6-Stations  
008 = 8-Stations  
016 = 16-Stations  
024 = 24-Stations  
032 = 32 Stations  
040 = 40 Stations  
048 = 48 Stations  
056 = 56 Stations  
064 = 64 Stations  
072 = 72 Stations  
080 = 80 Stations  
088 = 88 Stations  
096 = 96-Stations

**Decoder Option:**  
125 = 1-Module  
225 = Dual 125 Plat-form  
250 = 2-Modules

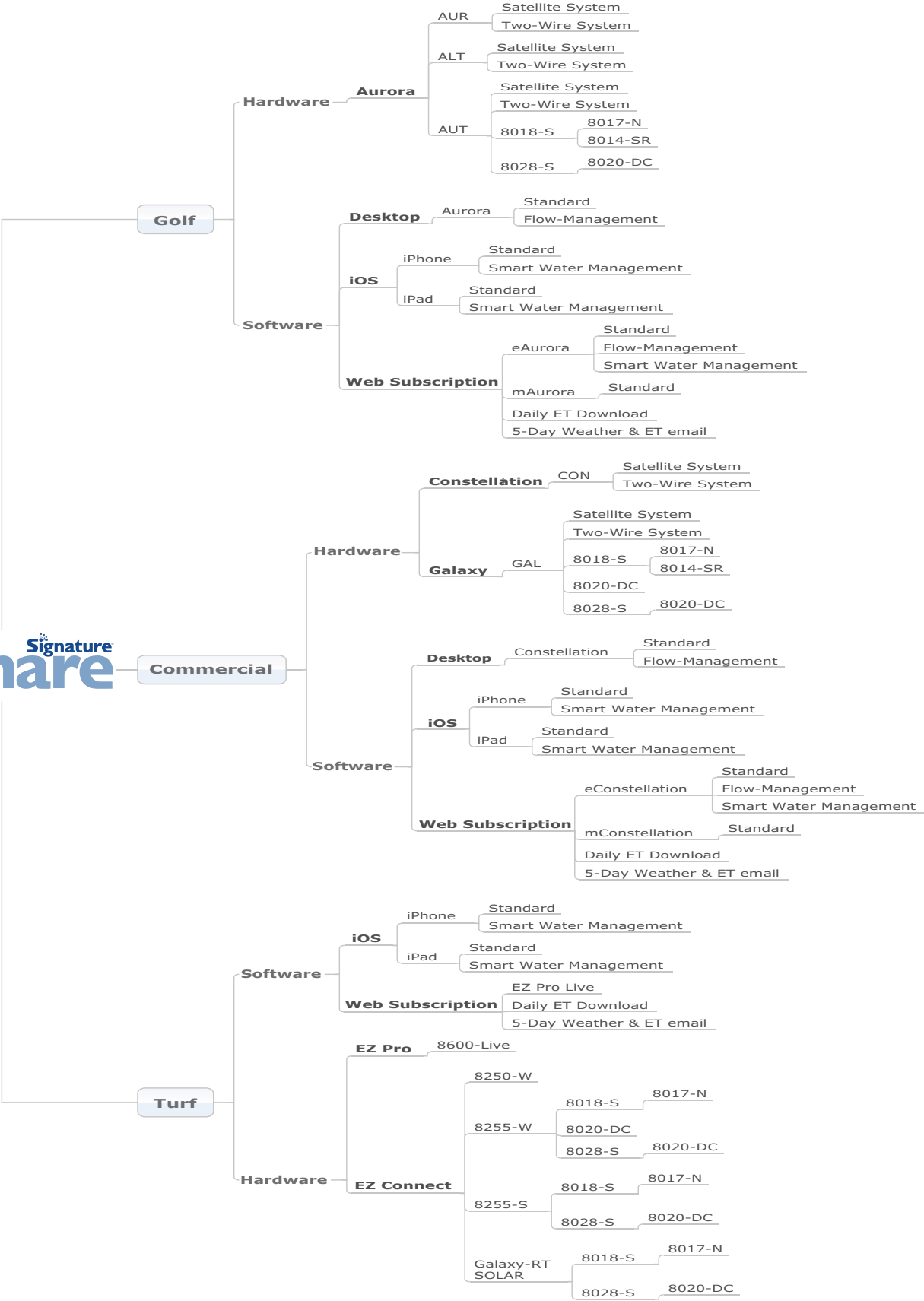
**Network Communications:**  
H = Hardwire (standard)  
U = UHF Network Modem  
S = Spread Spectrum USA  
I = Spread Spectrum International  
E = Ethernet Network Modem

**Remote Communications:**  
0 = None  
1 = VHF Remote Modem  
2 = Telephone Land Line Modem (firmware 5.3 or lower)  
3 = GSM Cellular Phone Modem for SMS Applications (firmware 5.3 or lower)  
4 = GSM Cellular Phone Modem for Web Applications  
5 = CDMA Cellular Phone Modem USA for Web Applications  
6 = Ethernet Modem

**Example:** Constellation Signature series controller in a black plastic pedestal with 110 volt transformer, using 16 station small terminal valve modules with premium surge protection, 16 stations with hardwire communications and no remote access. The final part number would be: **CONSPEBIAP016H0**

**NOTE:** Not all combinations are available.  
Check with your local distributor for details.

CENTRAL CONTROL





## COMMERCIAL/TURF

Summary Features List	iOS Share™	WEB EZ PRO™ LIVE	WEB eConstellation™ LITE	WEB eConstellation™ PRO	DESKTOP Constellation® Professional
<b>APPLICATIONS</b>					
Residential	✓	✓	✓		
Commercial / Municipal	✓	✓	✓	✓	✓
<b>STANDARD FEATURES</b>					
Remote Access from any Internet Computer		✓	✓	✓	✓
24/7 Availability	✓	✓	✓	✓	✓
Automatic Software Upgrades	✓	✓	✓	✓	✓
Satellite Firmware Upgrades	✓		✓	✓	✓
Automatic Data Backups	✓	✓	✓	✓	✓
ET Based Scheduling [Web or W/S]	Web	Web	Web	Web	W/S
Multi-level Access with Passwords	✓	✓	✓	✓	✓
Real-Time 2-Way Communication			✓	✓	✓
Compatible with all EZ PRO® Controllers	✓	✓		✓	✓
Compatible with all Galaxy Satellites	✓		✓	✓	✓
Compatible with all Constellation Satellites			✓	✓	✓
Compatible with Radio Networks	✓		✓	✓	✓
Compatible with Hardwire Networks			✓	✓	✓
Compatible with Web Based Networks	✓	✓	✓	✓	✓
Compatible with Decoder Networks	✓		✓	✓	✓
<b>NETWORK SENSORS SOFTWARE FEATURES</b>					
Manual Operation	✓	✓	✓	✓	✓
Rain Shutdown	✓	✓	✓	✓	✓
Programming	✓	✓	✓	✓	✓
Budget Adjust	✓	✓	✓	✓	✓
Report Generation	✓	✓	✓	✓	✓
Controller Setup	✓	✓	✓	✓	✓
Graphical Map				✓	✓
Group Programming	✓	✓		✓	✓
Flow Management				✓	✓
Projected Flow (Dry Run)				✓	✓

## PRODUCT OVERVIEW - COMMERCIAL

### Online Central Control (web based)

The eSignature Series of Online Central Control or Online Management Systems are internet-based central control system for irrigation control and water management. Communicating with remote irrigation field controllers with wireless connectivity, and allows you management of sites from anywhere in the world via the internet.

Along with all the advantages of internet-based access to remote irrigation field controllers, the eSignature Series of internet based central control provides optional weather-based irrigation scheduling. Location-specific weather data (ET) is delivered daily to irrigation controllers which allow the realization of quantifiable water savings and reduced operational costs.

#### EZ PRO™ LIVE



- **EZ PRO™ Live** works with your existing or new EZ PRO controllers (8600 Series)
- Plug-in module makes your controller accessible from any internet capable computer anywhere in the world
- Menus are user friendly and intuitive using graphical user interface
- Uses real-time weather data and transmits it to each controller (Optional ET Smart Watering Service)

#### eCONSTELLATION™ LITE



- **eConstellation™ Lite** is accessible from any internet capable computer anywhere in the world
- Requires no expensive desktop software purchases or support plans
- Eliminates need for dedicated irrigation computer and extended service plans
- Abolishes time consuming software upgrades and related programming

#### eCONSTELLATION™ PRO



- **eConstellation™ Pro** flow manages from anywhere and downloads to your satellite network
- Remotely monitor sites—across the city, state, or world—from one location or an infinite number of locations
- All programs and site data are stored in your personal and secure eConstellation account
- Multi-user environment with multi-level passwords and access controls

### Central Control (PC based)

**Constellation® Professional** software is the classical Personal Computer (PC) based system for irrigation control and water management. It has the capability of Manual Programming, Group Programming

and Flow Managed Programming. It works with local Weather Stations and Environmental Sensors for programming and scheduling.

#### CONSTELLATION® PROFESSIONAL



- Works with your existing Constellation network
- Works with hardwire, local radio, or any hybrid version
- Works with traditional valves, decoders, or any combination of the two
- Flow Management: Limits flow within the irrigation system to eliminate the possibility of excessive demand placed on the pumps and piping; Capable of determining the most efficient distribution of water flow within specific limitations set by the operator.

#### iOS – iPhone & iPad App



- Control all Signature devices that are compatible with the Share platform.
- No need for expensive computers or software to control irrigation controllers.
- Easily connect to your controllers from anywhere.
- Access to every controller function available on the web.
- Smart Watering wizard to quickly guide you to the most efficient watering.
- Interface designed specifically for easy use on the go.
- Works on all Apple devices newer than iPhone 3G and iOS 4.2 +.

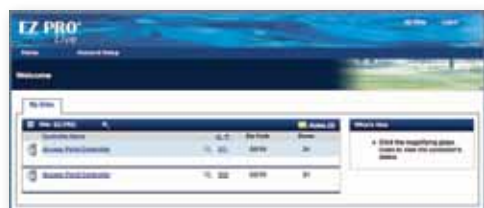


## EZ PRO™ LIVE

### EZ PRO™ LIVE

#### 8603

Communication board



### HOW IT WORKS

**EZ PRO™ Live** is an internet-based central control system used with EZ PRO™ 8600 Series controllers. It communicates with EZ PRO™ irrigation field controllers using cellular connectivity, and allows management of controller from anywhere in the world via the internet. Along with all the advantages of internet-based access to remote irrigation field controllers, EZ PRO™ Live provides an weather-based irrigation scheduling option. Location-specific weather data (ET) is delivered daily to irrigation controllers which allows the realization of quantifiable water savings and reduced operational costs. The exciting features of EZ PRO™ Live can be added to all EZ PRO™ 8600 Series controllers without any changes to the controller other than the addition of a single communications modem board. (May require a cellular data plan from your local carrier.

### FEATURES & BENEFITS

#### REMOTE ACCESS

- EZ PRO™ Live is accessible from any internet capable computer anywhere in the world
- Remotely monitor sites from one location or an infinite number of locations
- All programs are stored in the controller once downloaded, and are available 24/7 on our secure server

#### COST EFFECTIVE

- EZ PRO™ Live requires no expensive desktop software purchases or support plans
- Eliminates need for dedicated irrigation computer and extended service plans
- Abolishes time consuming software upgrades and related programming

#### EASY TO USE

- EZ PRO™ Live requires no extensive backups; we handle all upgrades, support and maintenance
- Upgrades are uploaded seamlessly; when you log on they are ready
- Menus are user friendly and intuitive using graphical user interface

#### WEATHER-BASED IRRIGATION SCHEDULING (ET) [OPTIONAL SERVICE]

- EZ PRO™ Live uses real-time weather data (ET) and transmits it to each controller
- Smart controller functions save water, time, and expense
- Eliminates requirement to purchase a weather station or other weather services
- The addition of an EZ PRO™ Live communications board makes your existing or new EZ PRO™ controller live on the web
- EZ PRO™ Live accesses any new or existing EZ PRO™ 8600 Controller with the addition of a single communications board

#### SMART WATERING APPLICATION

- Configure site agronomics to effectively control irrigation.
- Uses state of the art ET tracking data to replenish crop demands.
- By operating in this mode, eliminates the expense and maintenance of remote sensors or weather stations.
- Totally seamless downloading of ER data and together with site data, will only apply the required irrigations needs ... not anything more.
- No need for expensive computers or software to control irrigation controllers.

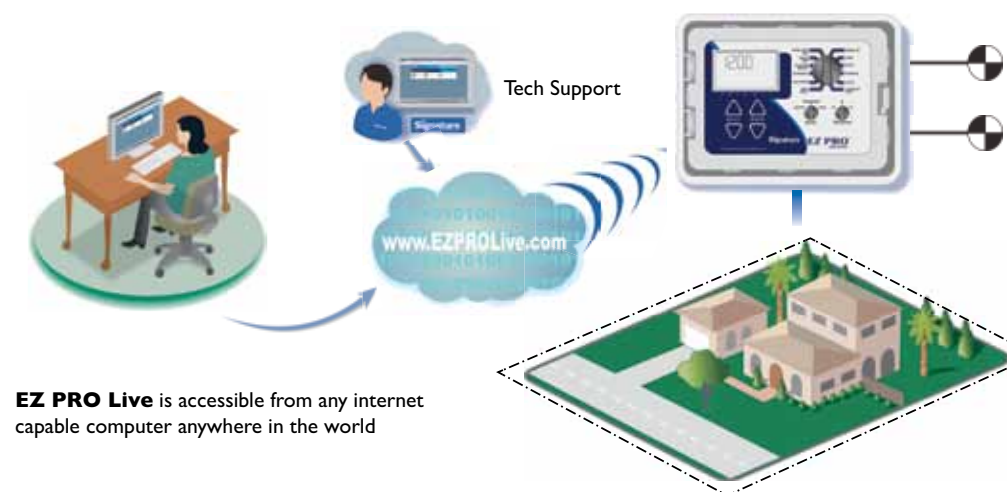
#### STANDARD WATERING APPLICATION

- Operate the controller from the ease of your iPhone or iPad; no complicated manuals or frustrations.
- Simple programming tools effectively guide through setup and operation.
- Integrates with optional ET download for automatic updating of programs.
- Web based software means always the most current user interface.
- Available in multiple languages.

NOTE:

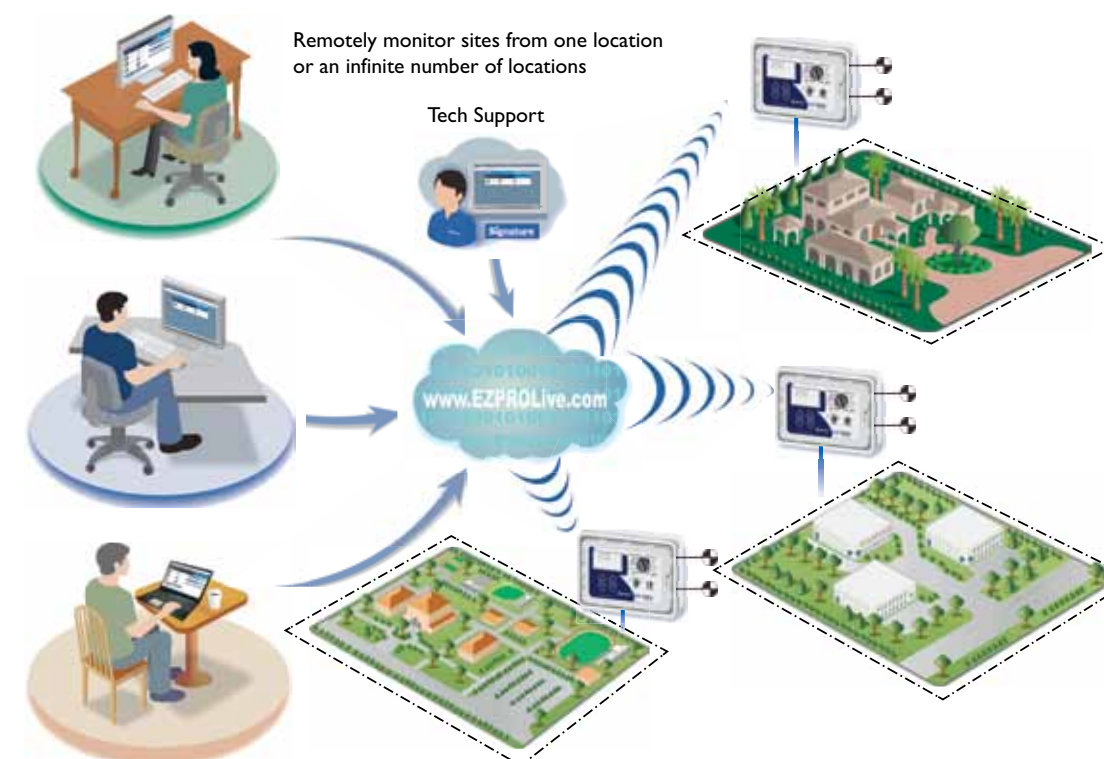
May require a cellular data plan from your local carrier.

### USAGE EXAMPLE: EZ PRO Live — Single User / Single Site



**EZ PRO Live** is accessible from any internet capable computer anywhere in the world

### USAGE EXAMPLE: EZ PRO Live — Multiple Users / Multiple Sites



Remotely monitor sites from one location or an infinite number of locations

# eCONSTELLATION™ LITE/PRO

## eConstellation™ LITE

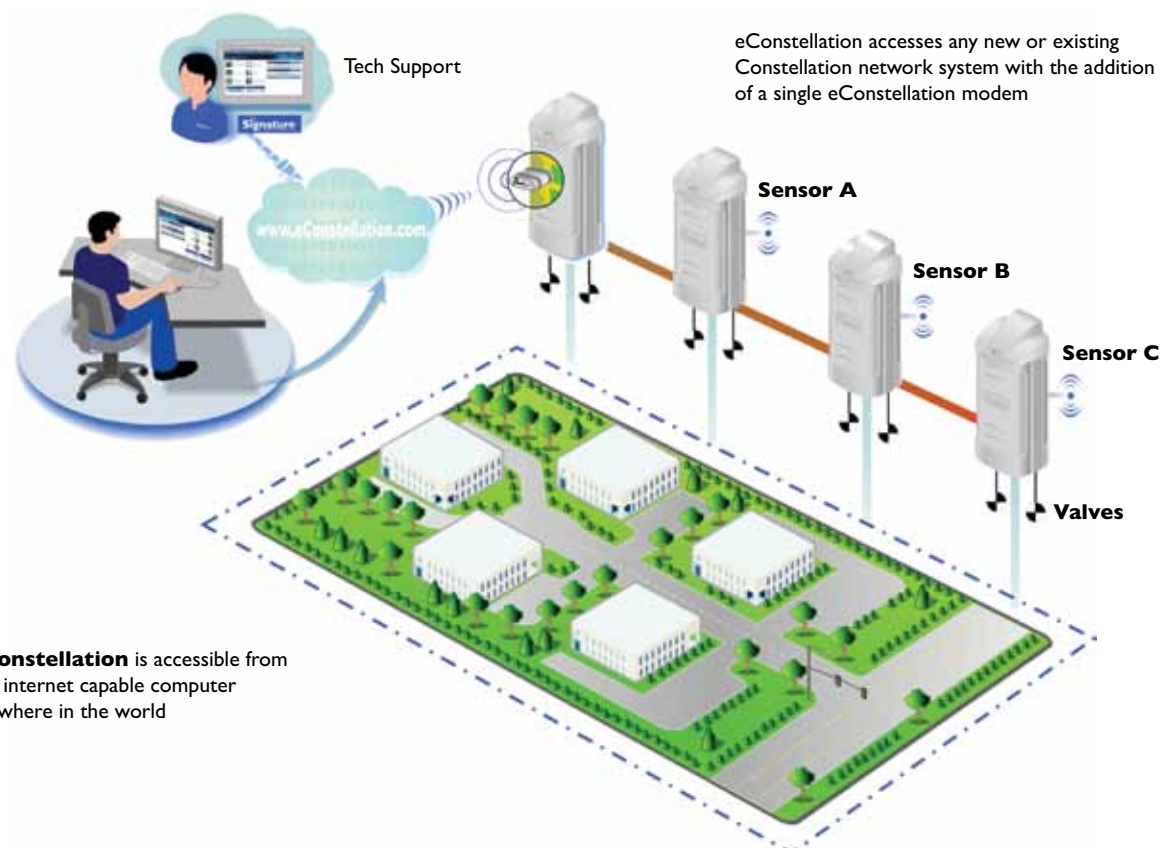
## eConstellation™ PRO

### HOW IT WORKS

**eConstellation™** is an internet-based central control system for use with Constellation and Galaxy Series controllers. It communicates with remote irrigation field controllers using wireless connectivity, and allows management of controller from anywhere in the world via the internet. Along with all the advantages of internet-based access to remote irrigation field controllers, eConstellation provides an weather-based irrigation scheduling option.

Location-specific weather data (ET) is delivered daily to irrigation controllers which allow the realization of quantifiable water savings and reduced operational costs. The exciting features of eConstellation can be added to all Constellation and Galaxy Series controllers and networks without any changes to the controller other than the addition of a single communications modem board. (May require a cellular data plan from your local carrier.)

### USAGE EXAMPLE: eConstellation — Single User / Multiple Controller Site



**eConstellation** is accessible from any internet capable computer anywhere in the world

### FEATURES & BENEFITS

#### REMOTE ACCESS

- eConstellation is accessible from any internet capable computer anywhere in the world
- All programs and site data are stored on our secure server and available 24/7
- Remotely monitor sites - across the city, state, or world - from one location or an infinite number of locations
- All programs and site data are stored in your personal and secure eConstellation account
- Multi-user environment with multi-level passwords and access controls
- Operate on ios Share.

#### COST EFFECTIVE

- eConstellation requires no expensive desktop software purchases or support
- Eliminates need for dedicated irrigation computer and extended service plans
- Abolishes time consuming software upgrades and related programming
- Billing is available in annual or monthly installments
- For seasonal users, access fees are waived during "off" months

#### EASY TO USE

- eConstellation requires no extensive backups; we handle all upgrades, support and maintenance
- Upgrades are uploaded seamlessly; when you log on they are ready
- Menus are user friendly and intuitive using graphical user interface
- On-screen help menus provide user with detailed instructions for simple set-up and fast launch
- Online trouble shooting to read alarms, events, and flow meters

#### WEATHER-BASED IRRIGATION SCHEDULING (ET) [OPTIONAL SERVICE]

- eConstellation uses real-time weather data (ET) and transmits it to each controller in your network
- Smart controller functions save water, time, and expense
- Eliminates requirement to purchase a weather station or other weather services
- Removes any vandalism and maintenance issues with weather stations and sensors
- Irrigate using ET from installation of first controller

#### HIGH PERFORMANCE:

- eConstellation accesses any new or existing Constellation network system with the addition of a single eConstellation modem
- Enjoy the same power and performance of your Constellation networks with no hardware modifications
- Only one access point is required in each Constellation network
- Hardwire, radio, fiber optic or Ethernet communications can be combined on the same network
- Flexible programming operates lighting, fountains, security gates and locks, etc
- The addition of an eConstellation web modem makes your existing or new Constellation network on the web
- eConstellation accesses any new or existing Constellation controller network with the addition of a single GPRS modem

#### FLOW MANAGEMENT (PRO VERSION ONLY):

- All the features of Lite PLUS the ability to flow manage your site
- Optimizes water usage over multiple controller site
- Checks to see that watering fits within water window
- Graphical representation of flow for ease of verification
- Irrigation is easily scheduled to meet complex watering parameters



# eCONSTELLATION™ LITE eCONSTELLATION™ PRO

## USAGE EXAMPLE: eConstellation — Multiple Users / Multiple Controller Sites with Multiple Satellites

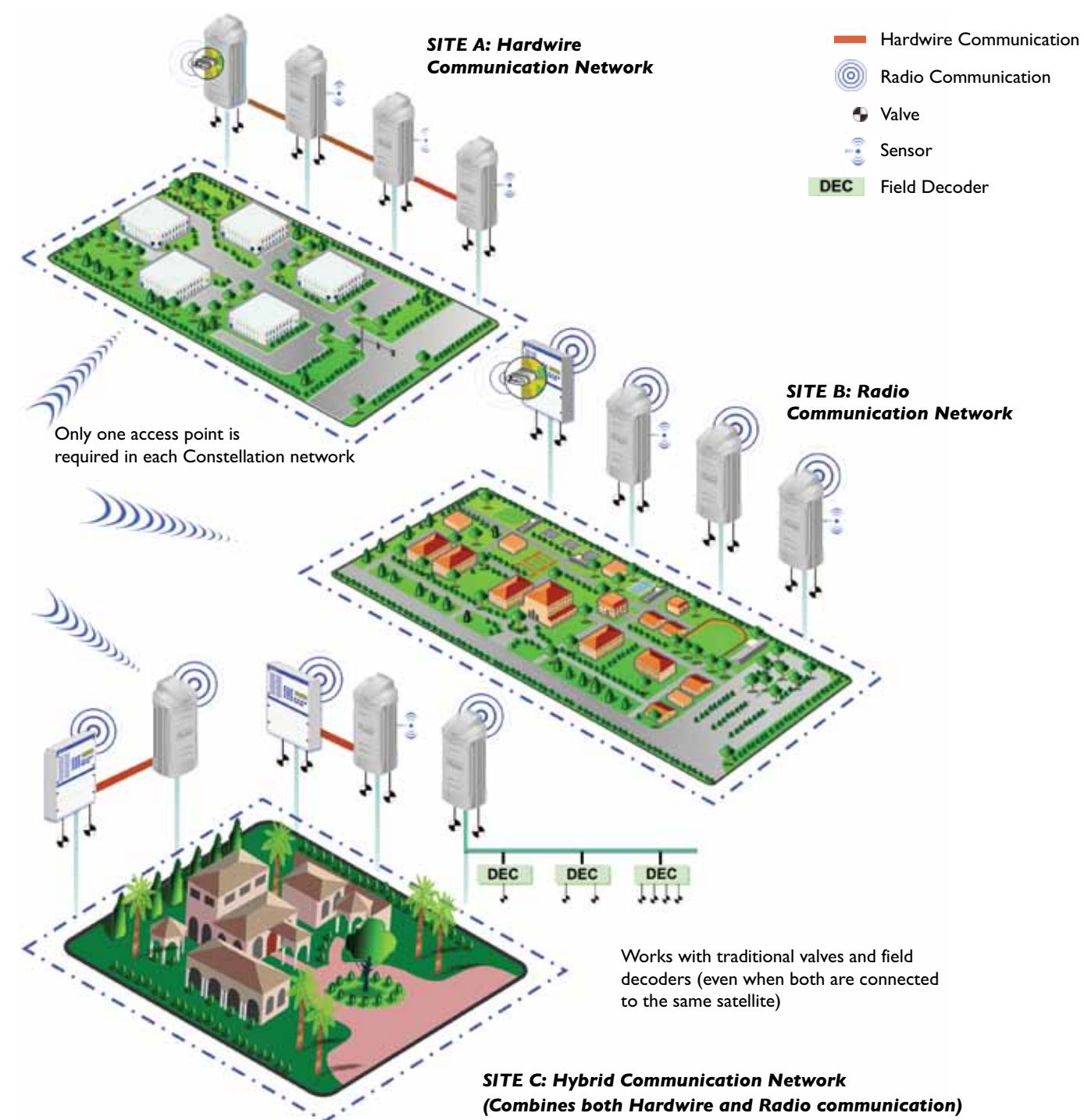
**eConstellation** accesses any new or existing Constellation network system with the addition of a single **eConstellation** modem

Remotely monitor sites - across the city, state, or world - from one location or an infinite number of locations

Multi-user environment with multi-level passwords and access controls

Tech Support

eConstellation requires no extensive backups; we handle all upgrades, support and maintenance



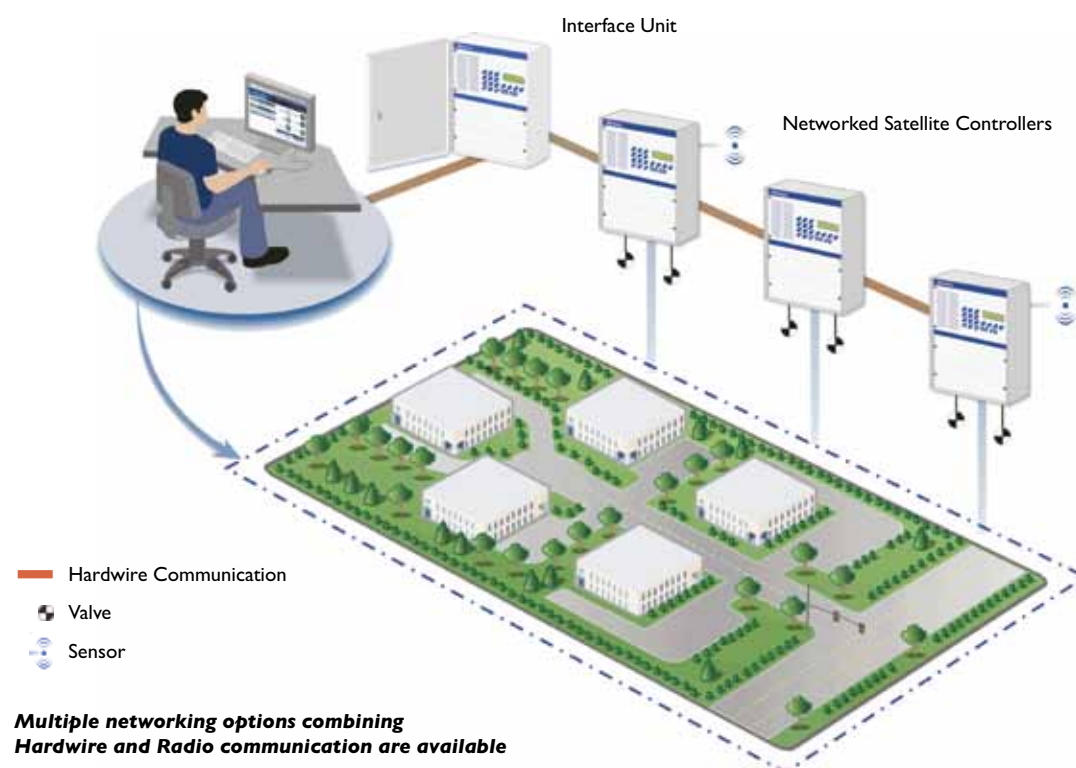
# CONSTELLATION® PROFESSIONAL

## Constellation® Professional

### HOW IT WORKS

**Constellation® Professional** is the traditional-type of central control system for use with Constellation and Galaxy Series controllers. It communicates with remote irrigation field controllers using hardwire, local radio (900MHz or 2.4 GHz Digital Spread Spectrum), Ethernet, and allows management of satellite controllers from one irrigation computer with irrigation software resident on the computer. The features of Constellation Professional can be added to all Constellation and Galaxy Series controllers and networks without any changes to the controller or network. All that is required is (a) an Interface Unit located in close proximity to the irrigation computer to facilitate the field connection, or (b) an Ethernet connection and Ethernet modem in one of the Satellite controllers in the Constellation network. Constellation Professional provides weather-based irrigation scheduling option using a local weather station. ET data is delivered daily to irrigation controllers which allow the realization of quantifiable water savings and reduced operational costs.

### USAGE EXAMPLE: Constellation Professional — Single User / Multiple Controller Site



### FEATURES & BENEFITS

#### NETWORK COMMUNICATION – UNLIMITED OPTIONS

Communication options for Constellation Networks include hardwire, local radio (900 MHz and 2.4 GHz digital spread spectrum radio), cellular phone, Ethernet, fiber-optics, Wi-Fi and others. (Not all options are available in all areas. Contact your local dealer for options available for your specific area.)

#### CENTRAL COMMUNICATION – STANDARD AND REMOTE OPTIONS

Communications options between the central irrigation computer and the Constellation satellite controllers include all those listed above PLUS the ability to access the network from anywhere in the world where you can get an internet connection from your computer.

#### SHARE PLATFORM

Integrates peripheral products such as sensors, battery actuated valves into the system, making a vast network of control options. Merges the power of peer-to-peer to smart valves and improved water management. Reduces installation costs by reducing the amount of copper & trenching. Powerful cross-pollination abound with integration of Signature Share platform for future expansion opportunities.

#### NETWORK MONITORING – ROBUST INTELLIGENCE

The Constellation network monitors itself continuously and can make use of six sensor inputs per satellite controller (2 direct; 4 indirect). The satellite controllers can monitor and adjust to flow, rain (on/off), rain fall adjustments, wind, moisture, temperature or virtually any other sensor to adjust and take action in real time... without the need for the central computer to even be on.

#### SOFTWARE FEATURES (PARTIAL LIST)

- Graphical User Interface
- Weather station monitoring for automated ET-adjusted irrigation schedule
- Automated ET (with optional equipment)
- Flow Management

- Event Calendar Scheduling
- Manual station control
- Dry Run and monitor irrigation water windows
- Operates lighting, fountains, security gates, etc.
- English and metric units
- Multilingual instructions

#### REMOTE OPTION

Untether your control! Move to a laptop and an Ethernet modem in one of your Constellation network satellite controllers and use your computer anywhere in the world where you can get to the Internet. STANDARD!

#### CONTROL FEATURES

Irrigation cycles are easily scheduled to meet varying and complex watering requirements. Cycles can be scheduled with some of the following:

- Standard Start Times
- Stop Times
- Link Start Times
- Water Days
- Intervals
- Program Specific Water Budget
- Controller Specific Water Budget
- Sequential or Parallel Start Event Operation
- Automatic ET Control
- Sensor Starts or Stops or Pauses

#### OTHER FEATURES

Self-monitoring feature finds open/short circuits, activates alarms/pagers, and shuts down automatically if necessary. Hardwire and radio communications can be used on the same network

Independent programming allows control of each station in any sequence, with multiple repeats and pauses.

True two-way communication between central controls and satellites.

#### REMOTE TECHNICAL SUPPORT

High-speed technical support from the factory via an internet connection.





GOLF

Summary Features List	iOS Share	WEB eAurora™ Lite	WEB eAurora™ Pro	DESKTOP Aurora® Professional
APPLICATIONS				
Golf Courses	✓	✓		
Sports Turf	✓	✓	✓	✓
STANDARD FEATURES				
Remote Access from any Internet Computer		✓	✓	✓
24/7 Availability	✓	✓	✓	✓
Automatic Software Upgrades	✓	✓	✓	✓
Satellite Firmware Upgrades	✓	✓	✓	✓
Automatic Data Backups	✓	✓	✓	✓
ET Based Scheduling [Web or W/S]	Web	Web	Web	W/S
Multi-level Access with Passwords	✓	✓	✓	✓
Real-Time 2-Way Communication		✓	✓	✓
Compatible with all EZ PRO® Controllers	✓		✓	✓
Compatible with all Galaxy Satellites	✓	✓	✓	✓
Compatible with all Constellation Satellites		✓	✓	✓
Compatible with Radio Networks	✓	✓	✓	✓
Compatible with Hardwire Networks		✓	✓	✓
Compatible with Web Based Networks	✓	✓	✓	✓
Compatible with Decoder Networks	✓	✓	✓	✓
SOFTWARE FEATURES				
Manual Operation	✓	✓	✓	✓
Rain Shutdown	✓	✓	✓	✓
Programming	✓	✓	✓	✓
Budget Adjust	✓	✓	✓	✓
Report Generation	✓	✓	✓	✓
Controller Setup	✓	✓	✓	
Graphical Map			✓	✓
Group Programming	✓		✓	✓
Flow Management			✓	✓
Projected Flow (Dry Run)			✓	✓

## PRODUCT OVERVIEW - GOLF

### Online Central Control (web based)

The eSignature Series of Online Central Control or Online Management Systems are internet-based central control system for irrigation control and water management. Communicating with remote irrigation field controllers with wireless connectivity, and allows you management of sites from anywhere in the world via the internet.

Along with all the advantages of internet-based access to remote irrigation field controllers, the eSignature Series of internet based central control provides optional weather-based irrigation scheduling. Location-specific weather data (ET) is delivered daily to irrigation controllers which allow the realization of quantifiable water savings and reduced operational costs.

#### AURORA-RT



- The **Aurora-RT™** Satellite Controller operates exclusively in a central controlled environment.
- Immediately connects to Signature's Share platform of products, out of the box.
- Remote control via iOS devices such as iPhones™ & iPads™.
- Ability to control via the internet from anywhere without requiring expensive local communications infrastructure.
- Ease of installation makes the Aurora-RT the choice of Contractors.
- Control standard solenoids via 24VAC wiring or 2-wire decoder configurations

#### eAURORA™ LITE



- **eAURORA™ Lite** is accessible from any internet capable computer anywhere in the world
- Requires no expensive desktop software purchases or support plans
- Eliminates need for dedicated irrigation computer and extended service plans
- Abolishes time consuming software upgrades and related programming

#### eAURORA™ PRO



- **eAURORA™ Pro** flow manages from anywhere and downloads to your satellite network
- Remotely monitor sites—across the city, state, or world—from one location or an infinite number of locations
- All programs and site data are stored in your personal and secure eConstellation account
- Multi-user environment with multi-level passwords and access controls

### Central Control (PC based)

**AURORA® Professional** software is the classical Personal Computer (PC) based system for irrigation control and water management. It has the capability of Manual Programming, Group Programming

and Flow Managed Programming. It works with local Weather Stations and Environmental Sensors for programming and scheduling.

#### AURORA® PROFESSIONAL



- Works with your existing Constellation network
- Works with hardwire, local radio, or any hybrid version
- Works with traditional valves, decoders, or any combination of the two
- Flow Management: Limits flow within the irrigation system to eliminate the possibility of excessive demand placed on the pumps and piping; Capable of determining the most efficient distribution of water flow within specific limitations set by the operator.

#### Smart Watering Application



- Configure site agronomics to effectively control irrigation.
- Uses state of the art ET tracking data to replenish crop demands.
- By operating in this mode, eliminates the expense and maintenance of remote sensors or weather stations.
- Totally seamless downloading of ER data and together with site data, will only apply the required irrigations needs ... not anything more.
- No need for expensive computers or software to control irrigation controllers.

#### Standard Watering Application



- Operate the controller from the ease of your iPhone or iPad; no complicated manuals or frustrations.
- Simple programming tools effectively guide through setup and operation.
- Integrates with optional ET download for automatic updating of programs.
- Web based software means always the most current user interface.
- Available in multiple languages.



# AURORA SHARE

## Aurora-RT



## HOW IT WORKS

- **Aurora-RT™** is an internet-based central control system used with Aurora-RT controllers.
- Communicates with Aurora-RT irrigation field controllers exclusively using cellular connectivity, and allows management of controller from anywhere in the world via the internet or smart phone.
- Along with all the advantages of internet-based access to remote irrigation field controllers, Aurora-RT provides an weather-based irrigation scheduling option.
- Location-specific weather data (ET) is delivered daily to irrigation controllers which allow the realization of quantifiable water savings and reduced operational costs.
- Smart watering software via the Signature Share platform makes the Aurora-RT, a very powerful controller right out of the box. Truly a plug and play controller; no complex radio site surveys or hardwire installation expense.
- (May require a cellular data plan from your local carrier.)

## FEATURES & BENEFITS

### REMOTE ACCESS

- Aurora-RT is accessible from any internet capable computer anywhere in the world
- Compatible to Signature Share platform as well as remotely controlled via iOS devices or SmartPhones.
- Remotely monitor sites from one location or an infinite number of locations
- All programs are stored in the controller once downloaded, and are available 24/7 on our secure server

### COST EFFECTIVE

- Aurora-RT requires no expensive desktop software purchases or support plans
- Eliminates need for dedicated irrigation computer and extended service plans
- Abolishes time consuming software upgrades and related programming

### EASY TO USE

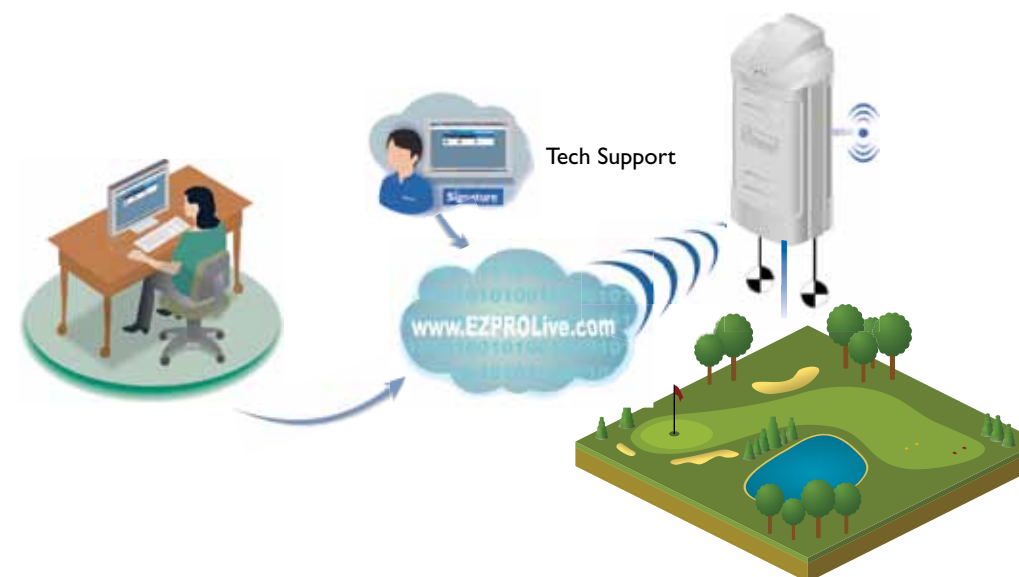
- Aurora-RT requires no extensive backups; we handle all upgrades, support and maintenance
- Upgrades are uploaded seamlessly; when you log on they are ready
- Menus are user friendly and intuitive using graphical user interface

### WEATHER-BASED IRRIGATION SCHEDULING (ET) [OPTIONAL SERVICE]

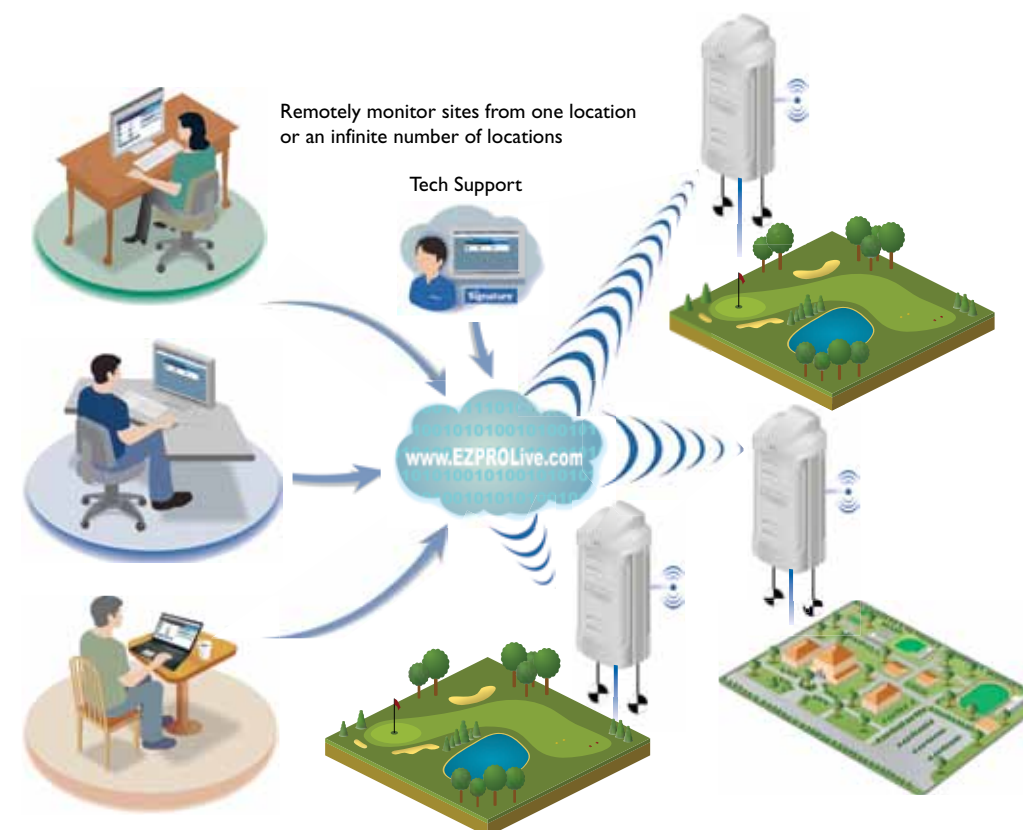
- Aurora-RT uses real-time weather data (ET) and transmits it to each controller
- SmartWater programming allow the controller to precisely irrigate each micro climate individually by programming all agronomical attributes of the irrigated landscape, saving water, time, and expense
- Eliminates requirement to purchase a weather station or other weather services

NOTE:  
May require a cellular data plan from your local carrier.

## USAGE EXAMPLE: SHARE — Single User / Single Site



## USAGE EXAMPLE: SHARE — Multiple Users / Multiple Sites



## eAURORA™ LITE/PRO

### eAurora™ LITE

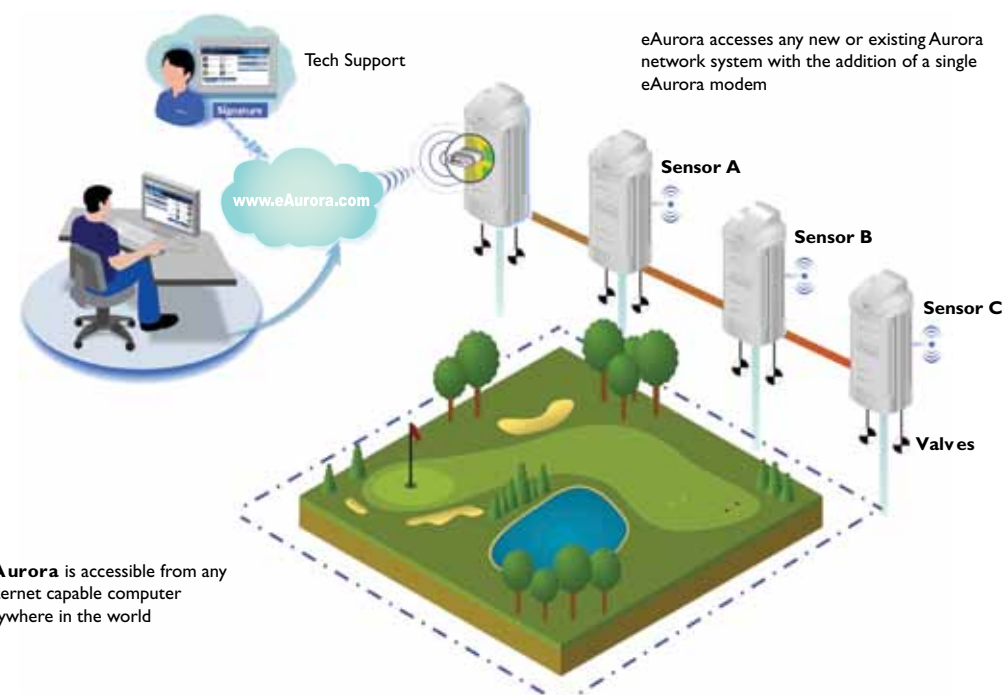
### eAurora™ PRO

### HOW IT WORKS

**eAurora™** is an internet-based central control system for use with Aurora and AuroraLT Series controllers. It communicates with remote irrigation field controllers using wireless connectivity, and allows management of controller from anywhere in the world via the internet. Along with all the advantages of internet-based access to remote irrigation field controllers, eAurora provides an weather-based irrigation scheduling option. Location-specific

weather data (ET) is delivered daily to irrigation controllers which allow the realization of quantifiable water savings and reduced operational costs. The exciting features of eAurora can be added to all Aurora and AuroraLT Series controllers and networks without any changes to the controller other than the addition of a single communications modem board. (May require a cellular data plan from your local carrier.)

### USAGE EXAMPLE: eAurora — Single User / Multiple Controller Site



eAurora is accessible from any internet capable computer anywhere in the world

### FEATURES & BENEFITS

#### REMOTE ACCESS

- eAurora is accessible from any internet capable computer anywhere in the world
- All programs and site data are stored on our secure server and available 24/7
- Remotely monitor sites - across the city, state, or world - from one location or an infinite number of locations
- All programs and site data are stored in your personal and secure eAurora account
- Multi-user environment with multi-level passwords and access controls

#### COST EFFECTIVE

- eAurora requires no expensive desktop software purchases or support
- Eliminates need for dedicated irrigation computer and extended service plans
- Abolishes time consuming software upgrades and related programming
- Billing is available in annual or monthly installments
- For seasonal users, access fees are waived during "off" months

#### EASY TO USE

- eAurora requires no extensive backups; we handle all upgrades, support and maintenance
- Upgrades are uploaded seamlessly; when you log on they are ready
- Menus are user friendly and intuitive using graphical user interface
- On-screen help menus provide user with detailed instructions for simple set-up and fast launch
- Online trouble shooting to read alarms, events, and flow meters

#### WEATHER-BASED IRRIGATION SCHEDULING (ET):

- eAurora uses real-time weather data (ET) and transmits it to each controller in your network
- Smart controller functions save water, time, and expense
- Eliminates requirement to purchase a weather station or other weather services
- Removes any vandalism and maintenance issues with weather stations and sensors
- Irrigate using ET from installation of first controller

#### HIGH PERFORMANCE:

- eAurora accesses any new or existing Aurora network system with the addition of a single eAurora modem
- Enjoy the same power and performance of your Aurora networks with no hardware modifications
- Only one access point is required in each Aurora network
- Hardwire, radio, fiber optic or Ethernet communications can be combined on the same network
- Flexible programming operates lighting, fountains, security gates and locks, etc
- The addition of an eAurora web modem makes your existing or new Aurora network on the web
- eAurora accesses any new or existing Aurora controller network with the addition of a single GPRS modem

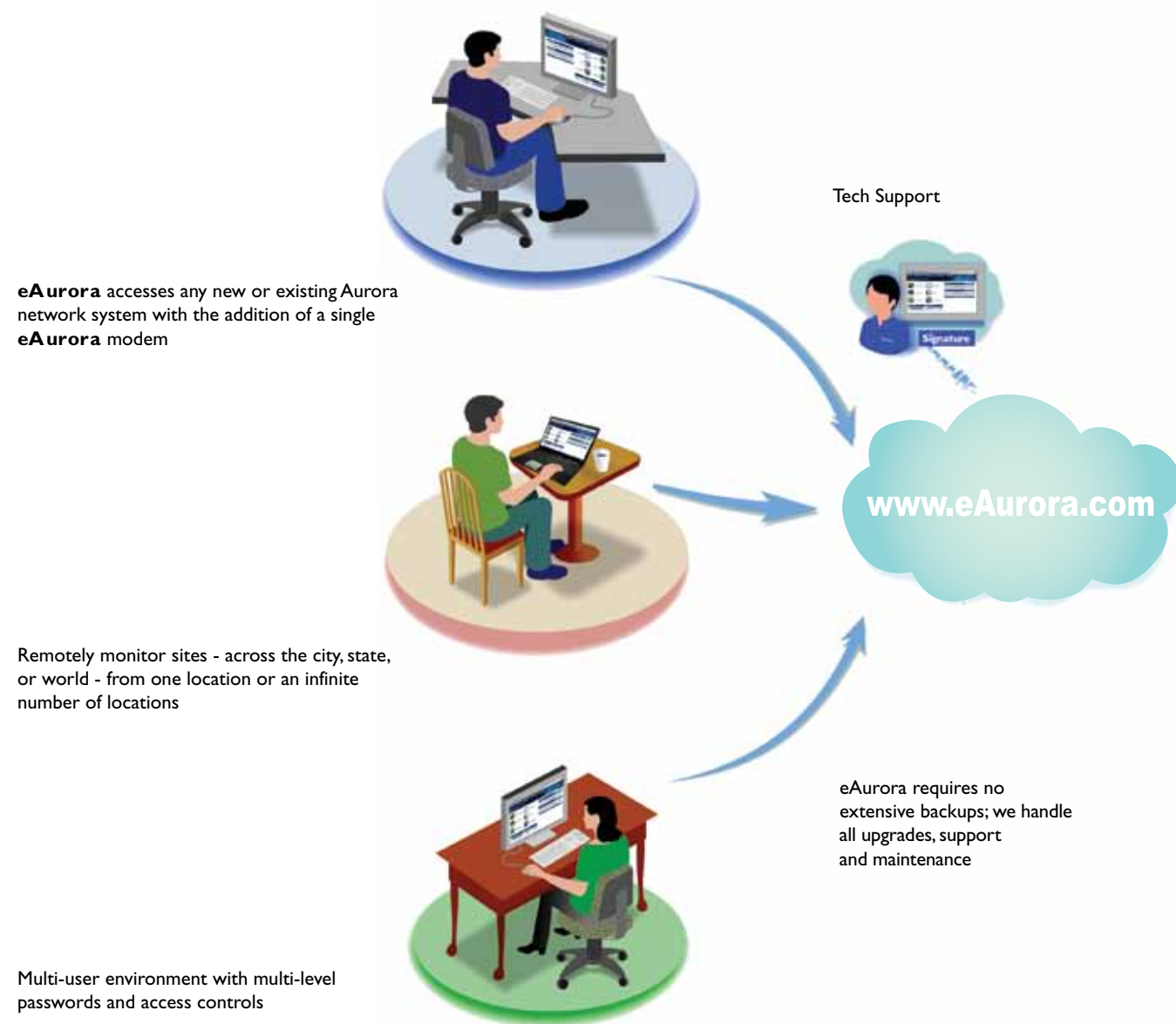
#### FLOW MANAGEMENT (PRO VERSION ONLY):

- All the features of Lite PLUS the ability to flow manage your site
- Optimizes water usage over multiple controller site
- Checks to see that watering fits within water window
- Graphical representation of flow for ease of verification
- Irrigation is easily scheduled to meet complex watering parameters



## eAURORA™ LITE/PRO

### USAGE EXAMPLE: eAurora — Multiple Users / Multiple Controller Sites with Multiple Satellites



# AURORA® PROFESSIONAL

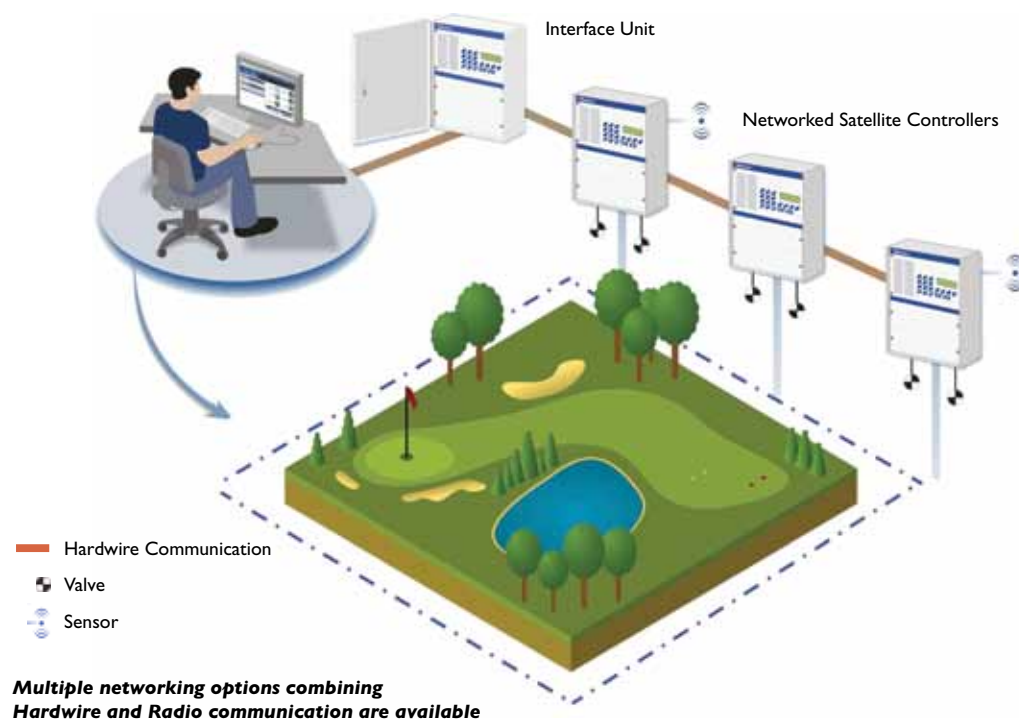
## Aurora® Professional

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or network. All that is required is (a) an Interface Unit located in close proximity to the irrigation computer to facilitate the field connection, or (b) an Ethernet connection and Ethernet modem in one of the Satellite controllers in the Aurora network. Aurora Professional provides weather-based irrigation scheduling option using a local weather station. ET data is delivered daily to irrigation controllers which allow the realization of quantifiable water savings and reduced operational costs.

### USAGE EXAMPLE: Aurora Professional — Single User / Multiple Controller Site



### FEATURES & BENEFITS

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Self-monitoring feature finds open/short circuits, activates alarms/pagers, and shuts down automatically if necessary. Hardwire and radio communications can be used on the same network

Independent programming allows control of each station in any sequence, with multiple repeats and pauses. True two-way communication between central controls and satellites.

#### REMOTE TECHNICAL SUPPORT

High-speed technical support from the factory via an internet connection.



ROTORS



ROTORS

APPLICATIONS	5500	6000	6500	7000	7500	D50/D55	D70/D75
SPACING 18'-32' (5,5 m-9,8 m)	✓						
SPACING 30'-51' (9,2 m-15,6 m)		✓					
SPACING 44'-60' (13,4 m-18,3 m)			✓				
SPACING 41'-63' (12,5 m-19,2 m)				✓			
SPACING 53'-74' (16,2 m-22,6 m)					✓	✓	
SPACING 72'-86' (21,9 m-26,2 m)							✓
RESIDENTIAL	✓	✓					
COMMERCIAL/MUNICIPAL	✓	✓	✓	✓	✓	✓	✓
ATHLETIC FIELDS	✓	✓	✓	✓	✓	✓	✓
HIGH VANDALISM AREAS	✓	✓	✓	✓	✓	✓	✓
LOW PRESSURE SYSTEMS	✓	✓					
RISER MOUNTED	✓	✓					
GROUND COVER/SHRUBS	✓	✓					
RECLAIMED WATER	✓	✓	✓	✓	✓	✓	✓
SLOPES	✓	✓	✓	✓	✓	✓	✓
HIGH ROTATION SPEED			✓		✓		



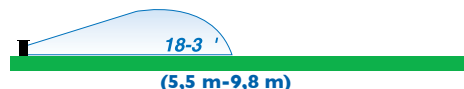
ROTORS

## PRODUCT OVERVIEW

### 5500



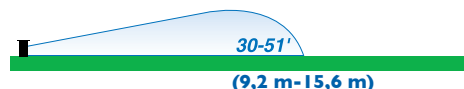
- The 5500 Pro series rotors are constructed of high impact plastic and all internal metal parts are made of stainless steel.
- 3/4" (2 cm) inlet
- No tools are required to adjust the arc from 40° – 360° by using the easy to use Click-Set disc.
- This series comes with 4 interchangeable nozzles with a discharge range between 0.5 – 2.5 gpm (0,11 – 0,57 m³/hr).
- All models come with a rubber protective cap and an optional vandal resistant retaining screw.
- The built in slip clutch protects the gears and motor from damage when adjusting for a part circle. If the rotor is manually moved out of position it will automatically reset to the defined pattern.
- NIR² (Nozzle Insertion / Radius Reduction) eliminates the need to remove the cap while fine tuning the radius and inserting the nozzle.
- 5500 comes in many various styles: shrub head version, heavy duty stainless version, 12" (30,5 cm) high pop version, anti-drain valve (ADV) version and the standard version.



### 6000



- The 6000 Pro series rotors are constructed of high impact plastic and all internal metal parts are made of stainless steel.
- 3/4" (2 cm) inlet
- No tools are required to adjust the arc from 40° – 360° by using the easy to use Click-Set disc.
- This series comes with 8 interchangeable nozzles with a discharge range between 1.0 – 9.5 gpm (0,23 – 2,16 m³/hr). There is also a low angle nozzle tree available.
- All models come with a rubber protective cap and an optional vandal resistant retaining screw.
- The built in slip clutch protects the gears and motor from damage when adjusting for a part circle. If the rotor is manually moved out of position it will automatically reset to the defined pattern.
- NIR² (Nozzle Insertion / Radius Reduction) eliminates the need to remove the cap while fine tuning the radius and inserting the nozzle.
- 6000 comes in many various styles: shrub head version, heavy duty stainless version, 12" (30,5 cm) high pop version, anti-drain valve (ADV) version and the standard version.



### 6500



- The 6500 Pro Series 1" (25,4 mm) inlet series rotors are constructed of High impact plastic and all internal metal parts are made of stainless steel.
- No tools are required to adjust the arc from 40° – 360° by using the easy to use Click-Set disc.
- This series comes with 4 interchangeable nozzles with a discharge range between 2.8 – 13.2 gpm (0,64 – 3,00 m³/hr).
- All models come with a rubber protective cap and an optional vandal resistant retaining screw.
- The built in slip clutch protects the gears and motor from damage when adjusting for a part circle. If the rotor is manually moved out of position it will automatically reset to the defined pattern.
- NIR² (Nozzle Insertion / Radius Reduction) eliminates the need to remove the cap while fine tuning the radius and inserting the nozzle.
- 6500 comes in various styles: heavy duty stainless version with anti-drain valve (ADV), High speed rotation and the standard version with ADV.



### 7000



- The 7000 Pro Series 1" (25,4 mm) inlet series rotors are constructed of High impact plastic and all internal metal parts are made of stainless steel.
- The arc will adjust from 40° – 360° by using the easy to use Click-Set disc.
- This series comes with 6 interchangeable nozzles with a discharge range between 5.6 – 19.6 gpm (1,27 – 4,45 m³/hr).
- All models come with a rubber protective cap.
- The built in slip clutch protects the gears and motor from damage when adjusting for a part circle. If the rotor is manually moved out of position it will automatically reset to the defined pattern.
- NIR² (Nozzle Insertion / Radius Reduction) eliminates the need to remove the cap while fine tuning the radius and inserting the nozzle.
- 7000 comes in two styles: heavy duty stainless version with anti-drain valve (ADV) and the standard version with ADV.



### 7500



- The 7500 Pro Series 1" (25,4 mm) inlet series rotors are constructed of High impact plastic and all internal metal parts are made of stainless steel.
- The arc will adjust from 40° – 360° by using the easy to use Click-Set disc.
- This series comes with 6 interchangeable nozzles with a discharge range between 9.4 – 27.5 gpm (2,13 – 6,24 m³/hr).
- All models come with a rubber protective cap.
- The built in slip clutch protects the gears and motor from damage when adjusting for a part circle. If the rotor is manually moved out of position it will automatically reset to the defined pattern.
- NIR² (Nozzle Insertion / Radius Reduction) eliminates the need to remove the cap while fine tuning the radius and inserting the nozzle.
- 7500 comes in two styles: stainless version with anti-drain valve (ADV) and the high speed stainless version with ADV.



### D50/D55



- A full 4-inch pop-up clears tall turfgrass for even coverage.
- Stainless-steel riser resists damage and vandalism.
- Special design eliminates blow-by and reduces pressure loss to improve system performance.
- Dual-direction flushing protects internals from debris and ensures positive pop-up/down.
- Radius can be adjusted up to 25 percent for best coverage.
- Quick lock design allows internals to be serviced from the rotor's top.



### D70/D75



- A full 4-inch pop-up clears tall turfgrass for even coverage.
- Stainless-steel riser resists damage and vandalism.
- Special design eliminates blow-by and reduces pressure loss to improve system performance.
- Dual-direction flushing protects internal from debris and ensures positive pop-up/down.
- Radius can be adjusted up to 25 percent for best coverage.
- Quick lock design allows internal to be serviced from the rotor's top.





ROTORS

5500-PRO

5500-Pro

5500-RW

5500-Pro for Reclaimed Water

5501-PRO

5500-Pro Shrub-Head

5505-PRO

5500-Pro with stainless steel riser and ADV

5512-PRO

5500-Pro 12" (30,5 cm) High-Pop, with ADV

Accessories

6090

Lavender Cover

6096

Wrench

6099

Anti-drain valve (not shown)

6090



6096



Radius reduction  
adjustment hole



Pull-up slot



SPECIFICATIONS

OPERATING RANGE:

20-65 psi (1,4 – 4,5 bar) (5500, 5501)  
25-65 psi (1,7 – 4,5 bar) (5505, 5512)

MAXIMUM PRESSURE:

75 psi (5,2 bar)

DISCHARGE:

0.5 to 2.5 gpm (0,11 – 0,57 m<sup>3</sup>/hr)

SPRAY TRAJECTORY:

13°

POP-UP HEIGHT:

4" (10 cm) (5500, 5505)  
12" (30,5 cm) (5512)

BODY HEIGHT:

7 1/2" (19 cm) (5501)  
7 3/8" (18,7 cm) (5500, 5505)  
16 7/8" (43 cm) (5512)

EXPOSED CAP DIAMETER:

1 7/8" (4,7 cm)

CAP DIAMETER:

2 7/8" (7,3 cm)

TYPE OF CAP:

Rubber with locking screw

INLET SIZE:

3/4" (19 mm) female (NPT and BSP)

SCREEN MESH:

.045 sq. in. (1,14 mm<sup>2</sup>) / 1150 micron

ADV MODELS:

Holds back up to 10' (3 m) difference  
in elevation

# PER BOX:

10 (5512)  
20

FEATURES

- Bayonet protective cap.
- NIR<sup>2</sup> feature (Nozzle Insertion/Radius Reduction) on all models eliminates the need to remove the cap for nozzle adjustments.
- Four interchangeable Acu-Cover nozzles ranging from 0.5 to 2.5 gpm (0,11 – 0,57 m<sup>3</sup>/hr).
- 5512 Pro pops up a full 12" (30,5 cm). Ideal for shrubs and ground cover areas, at the base of hillsides where risers are not appropriate and where liability is a concern.
- Better pattern coverage than turning down a mid-range gear drive.
- Water lubricated gear motor.
- Click-Set® collars are quick and easy to adjust.
- Continuous 360° rotation or part-circle adjustable 40° to 310°.
- Ratcheting slip clutch protects gears and motor from damage while adjusting turret for part-circle adjustments - wet or dry.
- Wrench, piston clamp and installation instructions included (Model 5501 has no clamp).



5500 PRO SERIES

13° trajectory  
Nozzle color



Pressure	Max Radius	Min Radius	Discharge	Precipitation Rate <sup>1</sup>	Nozzle Number	Pressure	Max Radius	Min Radius	Discharge	Precipitation Rate <sup>1</sup>
PSI	FT	FT	GPM	IN/HR ■ IN/HR ▲		BAR	kPa	m	m	L/min ■ m <sup>3</sup> /hr ▲
20	18	14	0.5	0.30 0.37	51	1.4	138	5.5	4.1	1.9 0.11
35	20	15	0.7	0.34 0.42		2.5	242	6.1	4.6	2.6 0.16
50	21	16	0.8	0.35 0.44		3.5	345	6.4	4.8	3.0 0.18
20	20	15	0.8	0.39 0.48	52	1.4	138	6.1	4.6	3.0 0.18
35	24	18	1.2	0.40 0.50		2.5	242	7.3	5.5	4.5 0.27
50	25	19	1.3	0.40 0.50		3.5	345	7.6	5.7	4.9 0.30
20	22	17	1.1	0.44 0.55	53	1.4	138	6.7	5.0	4.2 0.25
35	27	20	1.6	0.42 0.53		2.5	242	8.2	6.2	6.1 0.36
50	28	21	1.8	0.44 0.55		3.5	345	8.5	6.4	6.8 0.41
20	23	17	1.6	0.58 0.73	54	1.4	138	7.0	5.3	6.1 0.36
35	31	23	2.2	0.44 0.55		2.5	242	9.5	7.1	8.3 0.50
50	32	24	2.5	0.47 0.59		3.5	345	9.8	7.3	9.5 0.57

<sup>1</sup> Precipitation rates for square and triangular spacing calculated at 50% of diameter for half-circle operation. Assumes zero wind for precipitation and radius. Adjust for local conditions.



# ROTORS

## 6000-PRO

6000-Pro

## 6000-RW

6000-Pro for Reclaimed Water

## 6000-7

6000-Pro with #7 Nozzle,  
Factory Installed

## 6001 PRO

6000-Pro Shrub Head

## 6002 PRO

6000-Pro with ADV

## 6005 PRO

6000-Pro with stainless steel  
riser and ADV

## 6012 PRO

6000-Pro 12" (30,5 cm)  
High-Pop, with ADV

## Accessories

### 6090

Lavender Cover

### 6096

Wrench

### 6099

Anti-drain valve (not shown)



Radius reduction  
adjustment hole



Pull-up slot

## SPECIFICATIONS

### OPERATING RANGE:

20-65 psi (1,4 –4,5 bar) (6000, 6001, 6002)  
25-65 psi (1,7 – 4,5 bar) (6005, 6012)

### MAXIMUM PRESSURE:

75 psi (5,2 bar)

### DISCHARGE:

1.0 to 9.5 gpm (0,23 – 2,16 m³/hr)

### SPRAY TRAJECTORY:

25°

### POP-UP HEIGHT:

4" (10 cm) (6000, 6005)  
12" (30,5 cm) (6012)

### BODY HEIGHT:

7 1/2" (19 cm) (6001)  
7 3/8" (18,7 cm) (6000, 6005)  
16 7/8" (43 cm) (6012)

### EXPOSED CAP DIAMETER:

1 7/8" (4,7 cm)

### CAP DIAMETER:

2 7/8" (7,3 cm)

### TYPE OF CAP:

Rubber with locking screw

### INLET SIZE:

3/4" (19 mm) female (NPT and BSP)

### SCREEN MESH:

.045 sq. in. (1,14 mm²) / 1150 micron

### ADV MODELS:

Holds back up to 10' (3 m) difference  
in elevation

### # PER BOX:

10 (6012)  
20

## FEATURES

- Bayonet protective cap.
- NIR² feature (Nozzle Insertion/Radius Reduction) on all models eliminates the need to remove the cap for nozzle adjustments.
- Eight interchangeable Acu-Cover nozzles ranging from 1.0 to 9.5 gpm (0,23 – 2,16 m³/hr).
- Seven optional low-angle nozzles (13°) for windy areas or for throwing under trees.
- Proven reliability of the water driven gear motor.
- 6012 Pro pops up a full 12" (30,5 cm). Ideal for shrubs and ground cover areas, at the base of hillsides where risers are not appropriate and where liability is a concern.
- Click-Set® collars are quick and easy to adjust.
- Continuous 360° rotation or part-circle adjustable 40° to 310°.
- Ratcheting slip clutch protects gears and motor from damage while adjusting turret for part-circle adjustments - wet or dry.
- Wrench, piston clamp and installation instructions included (Model 6001 has no clamp).



Acu-Cover Nozzles



Other Gear Drive Nozzles

## 6000 PRO SERIES

25° trajectory  
Nozzle color



Pressure	Max Radius	Min Radius	Discharge	Precipitation Rate¹	Nozzle Number	Pressure	Max Radius	Min Radius	Discharge	Precipitation Rate¹
PSI	FT	FT	GPM	IN/HR ■ IN/HR ▲		BAR	kPa	m	m	L/min m³/hr mm/hr ■ mm/hr ▲
20	30	23	1.0	0.21 0.27	4	1.4	138	9.2	6.9	3.8 0.23 5.4 6.8
35	31	23	1.4	0.28 0.35		2.5	242	9.5	7.1	5.3 0.32 7.1 8.9
50	34	26	1.7	0.28 0.35		3.5	345	10.4	7.8	6.4 0.39 7.2 9.0
20	33	25	1.2	0.21 0.26	5	1.4	138	10.1	7.5	4.5 0.27 5.4 6.7
35	37	28	1.6	0.23 0.28		2.5	242	11.3	8.5	6.1 0.36 5.7 7.1
50	38	29	1.9	0.25 0.32		3.5	345	11.6	8.7	7.2 0.43 6.4 8.0
20	32	24	1.4	0.26 0.33	6	1.4	138	9.8	7.3	5.3 0.32 6.7 8.3
35	38	29	1.9	0.25 0.32		2.5	242	11.6	8.7	7.2 0.43 6.4 8.0
50	40	30	2.3	0.28 0.35		3.5	345	12.2	9.2	8.7 0.52 7.0 8.8
20	38	29	2.2	0.29 0.37	7	1.4	138	11.6	8.7	8.3 0.50 7.5 9.3
35	40	30	2.7	0.33 0.41		2.5	242	12.2	9.2	10.2 0.61 8.3 10.3
50	41	31	3.1	0.36 0.44		3.5	345	12.5	9.4	11.7 0.70 9.0 11.3
35	38	29	3.1	0.41 0.52	8	2.5	242	11.6	8.7	11.7 0.70 10.5 13.1
50	42	32	4.0	0.44 0.54		3.5	345	12.8	9.6	15.1 0.91 11.1 13.8
65	43	32	4.6	0.48 0.60		4.6	449	13.1	9.8	17.4 1.04 12.2 15.2
35	42	32	4.2	0.46 0.57	9	2.5	242	12.8	9.6	15.9 0.95 11.6 14.5
50	47	35	5.4	0.47 0.59		3.5	345	14.3	10.8	20.4 1.23 12.0 14.9
65	48	36	6.3	0.53 0.66		4.6	449	14.6	11.0	23.8 1.43 13.4 16.7
35	42	32	5.4	0.59 0.74	10	2.5	242	12.8	9.6	20.4 1.23 15.0 18.7
50	48	36	6.8	0.57 0.71		3.5	345	14.6	11.0	25.7 1.54 14.4 18.0
65	49	37	8.0	0.64 0.80		4.6	449	14.9	11.2	30.3 1.82 16.3 20.3
35	42	32	6.4	0.70 0.87	11	2.5	242	12.8	9.6	24.2 1.45 17.7 22.1
50	48	36	8.1	0.68 0.84		3.5	345	14.6	11.0	30.7 1.84 17.2 21.4
65	51	38	9.5	0.70 0.88		4.6	449	15.6	11.7	36.0 2.16 17.9 22.3

¹ Precipitation rates for square and triangular spacing calculated at 50% of diameter for half-circle operation. Assumes zero wind for precipitation and radius. Adjust for local conditions.

## 6095 LOW ANGLE

13° trajectory (optional for 6000 series only)  
Nozzle color



Pressure	Max Radius	Min Radius	Discharge	Precipitation Rate¹	Nozzle Number	Pressure	Max Radius	Min Radius	Discharge	Precipitation Rate¹
PSI	FT	FT	GPM	IN/HR ■ IN/HR ▲		BAR	kPa	m	m	L/min m³/hr mm/hr ■ mm/hr ▲
20	26	20	0.9	0.26 0.32	4	1.4	138	7.9	5.9	3.4 0.20 6.5 8.1
35	33	25	1.3	0.23 0.29		2.5	242	10.1	7.5	4.9 0.30 5.8 7.3
50	34	26	1.5	0.25 0.31		3.5	345	10.4	7.8	5.7 0.34 6.3 7.9
20	26	20	1.1	0.31 0.39	5	1.4	138	7.9	5.9	4.2 0.25 8.0 9.9
35	33	25	1.4	0.25 0.31		2.5	242	10.1	7.5	5.3 0.32 6.3 7.8
50	35	26	1.7	0.27 0.33		3.5	345	10.7	8.0	6.4 0.39 6.8 8.5
20	26	20	1.4	0.40 0.50	6	1.4	138	7.9	5.9	5.3 0.32 10.1 12.6
35	33	25	1.9	0.34 0.42		2.5	242	10.1	7.5	7.2 0.43 8.5 10.6
50	36	27	2.3	0.34 0.43		3.5	345	11.0	8.2	8.7 0.52 8.7 10.8
20	31	23	2.5	0.50 0.62	7	1.4	138	9.5	7.1	9.5 0.57 12.7 15.9
35	35	26	3.1	0.49 0.61		2.5	242	10.7	8.0	11.7 0.70 12.4 15.4
50	37	28	3.5	0.49 0.61		3.5	345	11.3	8.5	13.2 0.79 12.5 15.6
35	32	24	3.2	0.60 0.75	8	2.5	242	9.8	7.3	12.1 0.73 15.3 19.1
50	38	29	4.0	0.53 0.67		3.5	345	11.6	8.7	15.1 0.91 13.6 16.9
65	39	29	4.7	0.60 0.74		4.6	449	11.9	8.9	17.8 1.07 15.1 18.9
35	34	26	3.9	0.65 0.81	9	2.5	242	10.4	7.8	14.8 0.89 16.5 20.6
50	37	28	4.9	0.69 0.86		3.5	345	11.3	8.5	18.5 1.11 17.5 21.8
65	40	30	5.7	0.69 0.86		4.6	449	12.2	9.2	21.6 1.29 17.4 21.7
35	33	25	5.1	0.90 1.12	10	2.5	242	10.1	7.5	19.3 1.16 22.9 28.6
50	39	29	6.4	0.81 1.01		3.5	345	11.9	8.9	24.2 1.45 20.6 25.7
65	42	32	7.5	0.82 1.02		4.6	449	12.8	9.6	28.4 1.70 20.8 25.9

¹ Precipitation rates for square and triangular spacing calculated at 50% of diameter for half-circle operation. Assumes zero wind for precipitation and radius. Adjust for local conditions.



ROTORS

6500-PRO (6510)

6500/6510 Standard with ADV

6500-RW (6510-RW)

6500/6510 for  
Reclaimed Water & ADV

6503-PRO (6513)

6500-Pro High Speed Rotation,  
and stainless steel riser

6505-PRO(6515)

6500/6510 Standard with  
stainless steel riser and ADV

Note: Versions in parenthesis  
feature BSP threading

Accessories

6090

Lavender Cover

6096

Wrench

6099

Anti-drain valve (not shown)

6500



6503



6505



6500RW



6090



6096



Radius reduction  
adjustment hole



Pull-up slot

SPECIFICATIONS

OPERATING RANGE:

40-75 psi (2,7 – 5,2 bar)

MAXIMUM PRESSURE:

80 psi (5,5 bar)

DISCHARGE:

2.8 to 13.2 gpm (0,64 – 3,00 m³/hr)

SPRAY TRAJECTORY:

25°

POP-UP HEIGHT:

4" (10 cm)

BODY HEIGHT:

8" (20,3 cm)

EXPOSED CAP DIAMETER:

1 7/8" (4,7 cm)

CAP DIAMETER:

2 7/8" (7,3 cm)

TYPE OF CAP:

Rubber with locking screw

INLET SIZE:

1" (25,4 mm) female NPT (6500, 6503, 6505)

1" (25,4 mm) female BSP (6510, 6513, 6515)

SCREEN MESH:

.045 sq. in. (1,14 mm2) / 1150 micron

ADV MODELS:

Holds back up to 10' (3 m) difference  
in elevation

# PER BOX:

20

FEATURES

- Bayonet protective cap.
- NIR² feature (Nozzle Insertion/Radius Reduction) on all models eliminates the need to remove the cap for nozzle adjustments.
- Four interchangeable Acu-Cover nozzles ranging from 2.8 to 13.2 gpm (0,64 – 3,00 m³/hr).
- Rubber cap has locking screw (6092) for vandal protection (standard on all units).
- Proven reliability of the water driven gear motor.
- Click-Set® collars are quick and easy to adjust.
- Continuous 360° rotation or part-circle adjustment 40° to 310°.
- Ratcheting slip clutch protects gears and motor from damage while adjusting turret for part-circle adjustments - wet or dry.
- 6503 Pro offers one minute revolution for quick syringe applications.
- Heavy-duty case with stabilizer ribs increases stability even in loose soil.
- Wrench, piston clamp and installation instructions included.



6500 PRO SERIES

25° trajectory

Nozzle color



Pressure	Max Radius	Min Radius	Discharge	Precipitation Rate¹	Nozzle Number	Pressure	Max Radius	Min Radius	Discharge	Precipitation Rate¹
PSI	FT	FT	GPM	IN/HR ■ IN/HR ▲		BAR	kPa	m	m	L/min m³/hr mm/hr ■ mm/hr ▲
45	44	33	2.8	0.23 0.29	61	3.1	310	13.4	10.1	10.6 0.64
60	46	35	3.3	0.27 0.34		4.1	414	14.0	10.5	12.5 0.75
75	46	35	3.8	0.31 0.39		5.2	517	14.0	10.5	14.4 0.86
45	48	36	5.2	0.39 0.49	62	3.1	310	14.6	11.0	19.7 1.18
60	52	39	6.1	0.41 0.52		4.1	414	15.9	11.9	23.1 1.39
75	54	41	7.0	0.44 0.54		5.2	517	16.5	12.4	26.5 1.59
45	51	38	7.4	0.52 0.65	63	3.1	310	15.6	11.7	28.0 1.68
60	54	41	8.8	0.55 0.68		4.1	414	16.5	12.4	33.3 2.00
75	55	41	10.1	0.60 0.75		5.2	517	16.8	12.6	38.2 2.29
45	52	39	9.7	0.67 0.83	64	3.1	310	15.9	11.9	36.7 2.20
60	57	43	11.6	0.66 0.82		4.1	414	17.4	13.0	43.9 2.63
75	60	45	13.2	0.66 0.84		5.2	517	18.3	13.7	50.0 3.00

¹ Precipitation rates for square and triangular spacing calculated at 50% of diameter for half-circle operation. Assumes zero wind for precipitation and radius. Adjust for local conditions.

6503/6513 PRO HIGH SPEED

25° trajectory

Nozzle color



Pressure	Max Radius	Min Radius	Discharge	Precipitation Rate¹	Nozzle Number	Pressure	Max Radius	Min Radius	Discharge	Precipitation Rate¹
PSI	FT	FT	GPM	IN/HR ■ IN/HR ▲		BAR	kPa	m	m	L/min m³/hr mm/hr ■ mm/hr ▲
45	43	32	2.8	0.29 0.34	61	3.1	310	13.1	9.8	10.6 0.64
60	43	32	3.3	0.34 0.40		4.1	414	13.1	9.8	12.5 0.75
75	43	32	3.8	0.40 0.46		5.2	517	13.1	9.8	14.4 0.86
45	44	33	5.2	0.52 0.60	62	3.1	310	13.4	10.1	19.7 1.18
60	46	35	6.1	0.56 0.64		4.1	414	14.0	10.5	23.1 1.39
75	47	35	7.0	0.61 0.71		5.2	517	14.3	10.7	26.5 1.59
45	48	36	7.4	0.62 0.72	63	3.1	310	14.6	11.0	28.0 1.68
60	50	38	8.8	0.68 0.79		4.1	414	15.2	11.4	33.3 2.00
75	50	38	10.1	0.78 0.90		5.2	517	15.2	11.4	38.2 2.29
45	46	35	9.7	0.89 1.02	64	3.1	310	14.0	10.5	36.7 2.20
60	49	37	11.6	0.93 1.08		4.1	414	14.9	11.2	43.9 2.63
75	51	38	13.2	0.98 1.13		5.2	517	15.5	11.7	50.0 3.00

¹ Precipitation rates for square and triangular spacing calculated at 50% of diameter for half-circle operation. Assumes zero wind for precipitation and radius. Adjust for local conditions.

ROTORS

7000/7010E PRO

7000-Pro Standard with ADV

7000-RW/7010E-RW

7000-Pro for Reclaimed Water & ADV

7005/7015E

7000-Pro Standard with stainless steel riser and ADV

Note: "E" versions ( or versions in parenthesis) feature BSP threading

Accessories

6101

Sod Cup Kit

6102

Lavender Cover

6097

Wrench



SPECIFICATIONS

OPERATING RANGE:

40-90 psi (2,7 – 6,2 bar)

MAXIMUM PRESSURE:

100 psi (6,9 bar)

DISCHARGE:

5.6 to 19.6 gpm (1,27 – 4,45 m³/hr)

SPRAY TRAJECTORY:

25°

POP-UP HEIGHT:

4 1/2" (11,4 cm)

BODY HEIGHT:

9 1/2" (24,1 cm)

EXPOSED CAP DIAMETER:

2 1/2" (6,3 cm)

TYPE OF CAP:

Rubber with locking screw

INLET SIZE:

1" (25,4 mm) female NPT (7000, 7015)

1" (25,4 mm) female BSP (7010E, 7015E)

SCREEN MESH:

.045 sq. in. (1,14 mm²) / 1150 micron

ADV MODELS:

Holds back up to 10' (3 m) difference in elevation

# PER BOX:

10

FEATURES

- Bayonet protective cap.
- NIR² feature (Nozzle Insertion/Radius Reduction) on all models eliminates the need to remove the cap for nozzle adjustments.
- Six interchangeable Acu-Cover nozzles ranging from 5.6 to 19.6 gpm (1,27 – 4,45 m³/hr).
- Rubber cap has two locking screws for vandal protection.
- Click-Set® collars are quick and easy to adjust.
- Gear drive may be installed 1/2" (1,3 cm) below grade.
- Proven reliability of the water driven gear motor.
- Continuous 360° rotation or part-circle adjustable 40° to 310°.
- Heavy-duty case with stabilizer ribs increases stability even in loose soil.
- Ratcheting slip clutch protects gears and motor from damage while adjusting turret for part-circle adjustments - wet or dry.
- Wrench, piston clamp and installation instructions included.



7000 PRO SERIES

25° trajectory

Nozzle color



Pressure					Nozzle Number					Pressure					Nozzle Number				
PSI	Max Radius	Min Radius	Discharge	Precipitation Rate¹	PSI	Max Radius	Min Radius	Discharge	Precipitation Rate¹	PSI	Max Radius	Min Radius	Discharge	Precipitation Rate¹	PSI	Max Radius	Min Radius	Discharge	Precipitation Rate¹
45	41	31	5.6	0.64 0.74	1	3.1	310	12.5	9.4	21.2	1.27	16.3	18.8	45	54	41	10.7	0.71	0.82
60	42	32	5.9	0.64 0.74	1	4.1	414	12.8	9.6	22.3	1.34	16.4	18.9	60	55	41	12.2	0.78	0.90
75	42	32	7.2	0.79 0.91	1	5.2	517	12.8	9.6	27.3	1.64	20.0	23.0	75	56	42	14.0	0.86	0.99
90	43	32	7.8	0.81 0.94	1	6.2	621	13.1	9.8	29.5	1.77	20.6	23.8	90	58	44	15.3	0.88	1.01
45	48	36	6.9	0.58 0.67	2	3.1	310	14.6	11.0	26.1	1.57	14.6	16.9	45	55	41	11.5	0.73	0.85
60	49	37	7.8	0.63 0.72	2	4.1	414	14.9	11.2	29.5	1.77	15.9	18.3	60	57	43	13.2	0.78	0.90
75	49	37	8.9	0.71 0.82	2	5.2	517	14.9	11.2	33.7	2.02	18.1	20.9	75	57	43	15.1	0.89	1.03
90	50	38	9.8	0.75 0.87	2	6.2	621	15.2	11.4	37.1	2.23	19.2	22.1	90	59	44	16.4	0.91	1.05
45	52	39	8.7	0.62 0.72	3	3.1	310	15.9	11.9	32.9	1.98	15.7	18.2	45	56	42	13.7	0.84	0.97
60	53	40	9.9	0.68 0.78	3	4.1	414	16.2	12.1	37.5	2.25	17.2	19.9	60	59	44	15.7	0.87	1.00
75	53	40	11.3	0.77 0.89	3	5.2	517	16.2	12.1	42.8	2.57	19.7	22.7	75	61	46	18.8	0.97	1.12
90	54	41	12.4	0.82 0.95	3	6.2	621	16.5	12.3	46.9	2.82	20.8	24.0	90	63	47	19.6	0.95	1.10
45	54	41	10.7	0.71 0.82	4	3.1	310	16.5	12.3	40.5	2.43	17.9	20.7	45	55	41	11.5	0.73	0.85
60	55	41	12.2	0.78 0.90	4	4.1	414	16.8	12.6	46.2	2.77	19.7	22.8	60	57	43	13.2	0.78	0.90
75	56	42	14.0	0.86 0.99	4	5.2	517	17.1	12.8	53.0	3.18	21.8	25.2	75	57	43	15.1	0.89	1.03
90	58	44	15.3	0.88 1.01	4	6.2	621	17.7	13.3	57.9	3.48	22.2	25.7	90	59	44	16.4	0.91	1.05
45	55	41	11.5	0.73 0.85	5	3.1	310	16.8	12.6	43.5	2.61	18.6	21.5	45	56	42	13.7	0.84	0.97
60	57	43	13.2	0.78 0.90	5	4.1	414	17.4	13.0	50.0	3.00	19.9	22.9	60	59	44	15.7	0.87	1.00
75	57	43	15.1	0.89 1.03	5	5.2	517	17.4	13.0	57.2	3.43	22.7	26.2	75	61	46	18.8	0.97	1.12
90	59	44	16.4	0.91 1.05	5	6.2	621	18.0	13.5	62.1	3.73	23.0	26.6	90	63	47	19.6	0.95	1.10
45	56	42	13.7	0.84 0.97	6	3.1	310	17.1	12.8	51.9	3.11	21.4	24.7	45	55	41	11.5	0.73	0.85
60	59	44	15.7	0.87 1.00	6	4.1	414	18.0	13.5	59.4	3.57	22.1	25.5	60	57	43	13.2	0.78	0.90
75	61	46	18.8	0.97 1.12	6	5.2	517	18.6	13.9	71.2	4.27	24.7	28.5	75	61	46	18.8	0.97	1.12
90	63	47	19.6	0.95 1.10	6	6.2	621	19.2	14.4	74.2	4.45	24.1	27.9	90	63	47	19.6	0.95	1.10

¹ Precipitation rates for square and triangular spacing calculated at 50% of diameter for half-circle operation. Assumes zero wind for precipitation and radius. Adjust for local conditions.



# ROTORS

## 7500/7510E-PRO

7500-Pro Standard with ADV

## 7500-RW/7510E-RW

7500-Pro for Reclaimed Water & ADV

## 7503 (7513E)

7503-Pro High speed rotation, stainless steel riser and ADV

Note: "E" versions (or versions in parenthesis) feature BSP threading

## Accessories

### 6101

Sod Cup Kit

### 6102

Lavender Cover

### 6097

Wrench



6101



6102



## SPECIFICATIONS

### OPERATING RANGE:

40-90 psi (2,7 – 6,2 bar)

### MAXIMUM PRESSURE:

100 psi (6,9 bar)

### DISCHARGE:

9.4 to 27.5 gpm (2,13 – 6,24 m³/hr)

### SPRAY TRAJECTORY:

25°

### POP-UP HEIGHT:

4 1/2" (11,4 cm)

### BODY HEIGHT:

9 1/2" (24,1 cm)

### EXPOSED CAP DIAMETER:

2 1/2" (6,3 cm)

### TYPE OF CAP:

Rubber with locking screw

### INLET SIZE:

1" (25,4 mm) female NPT (7500, 7503)

1" (25,4 mm) female BSP (7510E, 7513E)

### SCREEN MESH:

.045 sq. in. (1,14 mm²) / 1150 micron

### ADV MODELS:

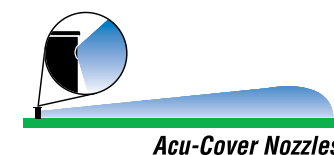
Holds back up to 10' (3 m) difference in elevation

### # PER BOX:

10

## FEATURES

- NIR² feature (Nozzle Insertion/Radius Reduction) on all models eliminates the need to remove the cap for nozzle adjustments.
- Six interchangeable Acu-Cover nozzles ranging from 9.4 to 27.5 gpm (2,13 – 6,24 m³/hr).
- Rubber cap has two locking screws for vandal protection.
- Click-Set® collars are quick and easy to adjust
- Gear drive may be installed 1/2" (1,3 cm) below grade.
- Proven reliability of the water driven gear motor
- Continuous 360° rotation or part-circle adjustable 40° to 310°.
- Heavy-duty case with stabilizer ribs increases stability even in loose soil.
- Ratcheting slip clutch protects gears and motor from damage while adjusting turret for part-circle adjustments - wet or dry.
- Wrench, piston clamp and installation instructions included.



## 7500 PRO SERIES

25° trajectory

Nozzle color



Pressure	Max Radius	Min Radius	Discharge	Precipitation Rate¹	Nozzle Number	Pressure	Max Radius	Min Radius	Discharge	Precipitation Rate¹
PSI	FT	FT	GPM	IN/HR IN/HR		BAR	kPa	m	m	L/min m³/hr mm/hr mm/hr
45	53	40	9.4	0.64 0.80	3	3.1	310	16.2	12.1	35.6 213
60	56	42	10.9	0.67 0.83		4.1	414	17.1	12.8	41.3 247
75	57	43	12.2	0.72 0.90		5.2	517	17.4	13.0	46.2 277
90	58	44	13.4	0.77 0.96		6.2	621	17.7	13.3	50.7 304
45	54	41	11.4	0.75 0.94	4	3.1	310	16.5	12.4	43.1 259
60	59	44	13.2	0.73 0.91		4.1	414	18.0	13.5	50.0 300
75	61	46	14.9	0.77 0.96		5.2	517	18.6	14.0	56.4 338
90	62	47	16.4	0.82 1.02		6.2	621	18.9	14.2	62.1 372
45	57	43	12.3	0.73 0.91	5	3.1	310	17.4	13.0	46.6 279
60	61	46	14.4	0.75 0.93		4.1	414	18.6	14.0	54.5 327
75	65	49	16.2	0.74 0.92		5.2	517	19.8	14.9	61.3 368
90	66	50	17.8	0.79 0.98		6.2	621	20.1	15.1	67.4 404
60	64	48	17.5	0.82 1.03	6	4.1	414	19.5	14.6	66.2 397
75	68	51	20.0	0.83 1.04		5.2	517	20.7	15.6	75.7 454
90	68	51	22.1	0.92 1.15		6.2	621	20.7	15.6	83.6 502
60	65	49	19.6	0.89 1.11	7	4.1	414	19.8	14.9	74.2 445
75	69	52	21.3	0.86 1.07		5.2	517	21.0	15.8	80.6 484
90	73	55	24.6	0.89 1.11		6.2	621	22.3	16.7	93.1 558
60	66	50	21.8	0.96 1.20	8	4.1	414	20.1	15.1	82.5 495
75	71	53	24.8	0.95 1.18		5.2	517	21.7	16.2	93.9 563
90	74	56	27.5	0.97 1.21		6.2	621	22.6	16.9	104.1 624

¹ Precipitation rates for square and triangular spacing calculated at 50% of diameter for half-circle operation. Assumes zero wind for precipitation and radius. Adjust for local conditions.

## 7503/7513 PRO HIGH SPEED

25° trajectory

Nozzle color



Pressure	Max Radius	Min Radius	Discharge	Precipitation Rate¹	Nozzle Number	Pressure	Max Radius	Min Radius	Discharge	Precipitation Rate¹
PSI	FT	FT	GPM	IN/HR IN/HR		BAR	kPa	m	m	L/min m³/hr mm/hr mm/hr
45	48	36	9.4	0.79 0.98	3	3.1	310	14.6	11.0	35.6 213
60	50	38	10.9	0.84 1.05		4.1	414	15.3	11.4	41.3 247
75	50	38	12.2	0.94 1.17		5.2	517	15.3	11.4	46.2 277
90	53	40	13.4	0.92 1.15		6.2	621	16.2	12.1	50.7 304
45	51	38	11.4	0.84 1.05	4	3.1	310	15.6	11.7	43.1 259
60	54	41	13.2	0.87 1.09		4.1	414	16.5	12.4	50.0 300
75	55	41	14.9	0.95 1.18		5.2	517	16.8	12.6	56.4 338
90	55	41	16.4	1.04 1.30		6.2	621	16.8	12.6	62.1 372
45	52	39	12.3	0.88 1.09	5	3.1	310	15.9	11.9	46.6 279
60	55	41	14.4	0.92 1.14		4.1	414	16.8	12.6	54.5 327
75	57	43	16.2	0.96 1.20		5.2	517	17.4	13.0	61.3 368
90	58	44	17.8	1.02 1.27		6.2	621	17.7	13.3	67.4 404
60	58	44	17.5	1.00 1.25	6	4.1	414	17.7	13.3	66.2 397
75	60	45	20.0	1.07 1.33		5.2	517	18.3	13.7	75.7 454
90	61	46	22.1	1.14 1.43		6.2	621	18.6	14.0	83.6 502
60	58	44	19.6	1.12 1.40	7	4.1	414	17.7	13.3	74.2 445
75	60	45	21.3	1.14 1.42		5.2	517	18.3	13.7	80.6 484
90	61	46	24.6	1.27 1.59		6.2	621	18.6	14.0	93.1 558
60	59	44	21.8	1.21 1.50	8	4.1	414	18.0	13.5	82.5 495
75	61	46	24.8	1.28 1.60		5.2	517	18.6	14.0	93.9 563
90	64	48	27.5	1.29 1.61		6.2	621	19.5	14.6	104.1 624

¹ Precipitation rates for square and triangular spacing calculated at 50% of diameter for half-circle operation. Assumes zero wind for precipitation and radius. Adjust for local conditions.

# ROTORS

## D50C25A\*

1" Full Circle Rotor with Check Valve, Acme

## D50E2570A\*

1" Full Circle Rotor, Electric VIH, Acme

## D50H25A\*

1" Full Circle Rotor, Hydraulic VIH, Acme

## D50B25A\*

1" Full Circle Block Rotor, with Drain Valve Acme

\* Pressure Regulation  
(Electric Model Only)

60, 70 (Standard Pressure), or 80 PSI

\*Inlet thread availability; NPT, BSP, or Acme  
(standard stocking item)

\* Re-Claimed Water Versions Available

D50C\* D50E\* D50H\*



D50B\* D55B\*



## D55C25A\*

1" Part Circle Rotor with Check Valve, Acme

## D55E2570A\*

1" Part Circle Rotor, Electric VIH, Acme

## D55H25A\*

1" Part Circle Rotor, Hydraulic VIH, Acme

## D55B25A\*

1" Part Circle Block Rotor, with Check Valve, Acme

## D55XC2514A\*

1" X-Series Rotor, with Check Valve, Acme

## D55XE251470A\*

1" X-Series Rotor, Electric VIH, Acme

## D55XH2514A\*

1" X-Series Rotor, Hydraulic VIH, Acme

\* Pressure Regulation  
(Electric Model Only)

60, 70 (Standard Pressure), or 80 PSI

\*Inlet thread availability; NPT, BSP, or Acme  
(standard stocking item)

\* Re-Claimed Water Versions Available

## Accessories

### D001

Snap ring/pilot valve tool

### D002

Pilot valve key

### D003

1" valve insertion tool

## SPECIFICATIONS

### Flange Body Series

#### OPERATING RANGE:

50-80 psi (3,4 – 5,5 bar)

#### MAXIMUM PRESSURE:

100 psi (6,9 bar)

#### MINIMUM PRESSURE:

40 psi (2,7 bar)

#### DISCHARGE:

11.0 to 31.3 gpm (2,49 – 7,11 m³/hr)

#### POP-UP HEIGHT:

4" (10 cm)

#### BODY HEIGHT:

9¾" (24,8 cm)

#### TOP DIAMETER:

6½" (17,1 cm)

#### INLET SIZE:

1" (25,4 mm) Female NPT, BSP, Acme

#### # PER BOX:

4 x D50C/D55C, D50E/D55E or  
D50HD55H Series

### Block Body Series

#### OPERATING RANGE:

50-70 psi (3,4 – 4,8 bar)

#### MAXIMUM PRESSURE:

100 psi (6,9 bar)

#### MINIMUM PRESSURE:

40 psi (2,7 bar)

#### DISCHARGE:

11.0 to 31.3 gpm (2,49 – 7,11 m³/hr)

#### POP-UP HEIGHT:

4" (10 cm)

#### CHECK VALVE:

Holds back up to 15' (4,5 m) difference in elevation

#### BODY HEIGHT:

8¼" (20,9 cm) (D50/D55B Series)

#### TOP DIAMETER:

6" (15,2 cm) (D50/D55B Series)

#### INLET SIZE:

1" (25,4 mm) Female NPT, BSP, Acme

#### # PER BOX:

8 x D50/D55B Series

## FEATURES

- A full 4-inch pop-up clears tall turfgrass for even coverage.
- Rolled-over flange keeps turfgrass clear of riser and nozzle.
- Stainless-steel riser resists damage and vandalism.
- Tough, commercial-grade plastic case stands up to punishment.
- Special design eliminates blow-by and reduces pressure loss to improve system performance.
- Dual-direction flushing protects internals from debris and ensures positive pop-up/down.
- Uniform coverage with square or triangular spacing.
- Full-circle and adjustable patterns for maximum flexibility.
- Easy arc adjustment in the field without any tools.
- Nozzle kit offers fully interchangeable nozzles and is included with each rotor.
- Unique manual On/Off control for hydraulic rotors.
- Heavy-duty spring assures positive retraction.
- Radius can be adjusted up to 25 percent for best coverage.
- Compact cartridge design allows for quick and easy repair.
- Quick lock design allows internals to be serviced from the rotor's top.
- D50/D55 C Models include factory-installed check valve.
- D50/D55 E Models feature electric valve and head.
- D50/D55 H Models are N.O. hydraulically controlled.
- D50/D55 B Compact Models feature factory-installed drain valve.
- D55 X-Series are dual part-circle rotors with adjustable radii.

## D50 SERIES

Pressure	Max Radius	Discharge	Precipitation Rate¹	Nozzle Number	Pressure	Max Radius	Discharge	Precipitation Rate¹
PSI	FT	GPM	IN/HR ■ IN/HR ▲		BAR	kPa	m	L/s m³/hr mm/hr ■ mm/hr ▲
60	37	7.9	0.56 0.64	8 Black	4.1	410	11.2	0.5 1.8 14.18 16.37
70	37	10.1	0.71 0.82		4.8	480	11.2	0.6 2.3 18.13 20.93
80	—	—	—		5.5	550	—	—
60	39	9.9	0.63 0.72	12 Gray	4.1	410	11.9	0.6 2.2 15.99 18.47
70	39	11.5	0.73 0.84		4.8	480	11.9	0.7 2.6 18.58 21.45
80	—	—	—		5.5	550	—	—
60	47	13.8	0.60 0.69	14 Yellow	4.1	410	14.3	0.9 3.1 15.35 17.73
70	47	15.4	0.67 0.78		4.8	480	14.3	1.0 3.5 17.13 19.78
80	—	—	—		5.5	550	—	—
60	51	16.9	0.63 0.72	16 Orange	4.1	410	15.5	1.1 3.8 15.97 18.44
70	55	18.3	0.58 0.67		4.8	480	16.7	1.2 4.2 14.87 17.17
80	—	—	—		5.5	550	—	—
60	53	19.8	0.68 0.78	18 Brown	4.1	410	16.1	1.2 4.5 17.32 20.00
70	57	20.2	0.60 0.69		4.8	480	17.3	1.3 4.6 15.28 17.64
80	—	—	—		5.5	550	—	—
60	55	19.7	0.63 0.72	19 Red	4.1	410	16.7	1.2 4.5 16.00 18.48
70	55	21.1	0.67 0.78		4.8	480	16.7	1.3 4.8 17.14 19.79
80	59	22.2	0.61 0.71		5.5	550	18.0	1.4 5.0 15.59 18.00
60	59	22.6	0.63 0.72	25 Blue	4.1	410	17.9	1.4 5.1 15.95 18.42
70	67	26.6	0.57 0.66		4.8	480	20.4	1.7 6.0 14.56 16.81
80	69	28.5	0.58 0.67		5.5	550	21.0	1.8 6.5 14.63 16.90
60	62	28.0	0.70 0.81	28 Green	4.1	410	18.8	1.8 6.4 17.90 20.67
70	71	30.8	0.59 0.68		4.8	480	21.6	1.9 7.0 15.01 17.34
80	72	32.4	0.60 0.70		5.5	550	21.9	2.0 7.4 15.28 17.64

\* Factory Installed

## D55 SERIES

Pressure	Max Radius	Discharge	Precipitation Rate¹	Nozzle Number	Pressure	Max Radius	Discharge	Precipitation Rate¹
PSI	FT	GPM	IN/HR ■ IN/HR ▲		BAR	kPa	m	L/s m³/hr mm/hr ■ mm/hr ▲
60	37	7.9	0.56 0.64	8 Black	4.1	410	11.2	0.5 1.8 14.18 16.37
70	37	10.1	0.71 0.82		4.8	480	11.2	0.6 2.3 18.13 20.93
80	—	—	—		5.5	550	—	—
60	40	9.0	0.54 0.63	12 Gray	4.1	410	12.2	0.6 2.0 13.82 15.96
70	40	12.0	0.72 0.83		4.8	480	12.2	0.8 2.7 18.43 21.28
80	—	—	—		5.5	550	—	—
60	49	11.9	0.48 0.55	14 Yellow	4.1	410	14.9	0.8 2.7 12.18 14.06
70	47	14.5	0.63 0.73		4.8	480	14.3	0.9 3.3 16.13 18.63
80	—	—	—		5.5	550	—	—
60	53	15.0	0.51 0.59	16 Orange	4.1	410	16.1	0.9 3.4 13.12 15.15
70	51	16.3	0.60 0.70		4.8	480	15.5	1.0 3.7 15.40 17.78
80	—	—	—		5.5	550	—	—
60	57	16.8	0.50 0.58	18 Brown	4.1	410	17.3	1.1 3.8 12.71 14.67
70	55	18.3	0.58 0.67		4.8	480	16.7	1.2 4.2 14.87 17.17
80	—	—	—		5.5	550	—	—
60	55	19.7	0.63 0.72	19 Red	4.1	410	16.7	1.2 4.5 16.00 18.48
70	55	21.1	0.67 0.78		4.8	480	16.7	1.3 4.8 17.14 19.79
80	59	22.2	0.61 0.71		5.5	550	18.0	1.4 5.0 15.59 18.00
60	61	21.2	0.55 0.63	25* Blue	4.1	410	18.5	1.3 4.8 14.00 16.17
70	59	24.4	0.68 0.78		4.8	480	17.9	1.5 5.5 17.22 19.89
80	65	26.4	0.60 0.69		5.5	550	19.8	1.7 6.0 15.27 17.64
60	63	26.4	0.64 0.74	28 Green	4.1	410	19.2	1.7 6.0 16.35 18.87
70	65	26.2	0.60 0.69		4.8	480	19.8	1.7 6.0 15.24 17.60
80	67	32.4	0.66 0.76		5.5	550	20.4	1.9 6.9 16.66 19.24

\* Factory Installed



# ROTORS

## D70C50A

1 1/2" Full Circle Rotor with Check Valve, Acme

## D70E5080A

1 1/2" Full Circle Rotor; Electric VIH, Acme

## D70H50A

1 1/2" Full Circle Rotor; Hydraulic VIH, Acme

\* Pressure Regulation  
(Electric Model Only)

60, 70, 80 (Standard Pressure), 90 or 100 PSI

\* Inlet thread availability; NPT, BSP, or Acme  
(standard stocking item)

\* Re-Claimed Water Versions Available



## SPECIFICATIONS

### OPERATING RANGE:

60-100 psi (4,1 – 6,9 bar)

### MAXIMUM PRESSURE:

100 psi (6,9 bar)

### MINIMUM PRESSURE:

40 psi (2,7 bar)

### DISCHARGE:

11.0 to 31.3 gpm (2,49 – 7,11 m³/hr)

### POP-UP HEIGHT:

4" (10 cm)

### BODY HEIGHT:

10 3/4" (27,3 cm)

### TOP DIAMETER:

7 1/2" (19,1 cm)

### INLET SIZE:

1 1/2" (38,1 mm) female NPT

1 1/2" (38,1 mm) female BSP

1 1/2" (38,1 mm) female Acme

### CHECK VALVE MODELS:

Holds back up to 15' (4,5 m) difference  
in elevation

### # PER BOX:

4

## FEATURES

- A full 4-inch pop-up clears tall turfgrass for even coverage.
- Rolled-over flange keeps turfgrass clear of riser and nozzle.
- Stainless-steel riser resists damage and vandalism.
- Tough, commercial-grade plastic case stands up to punishment.
- Special design eliminates blow-by and reduces pressure loss to improve system performance.
- Dual-direction flushing protects internals from debris and ensures positive pop-up/down.
- Uniform coverage with square or triangular spacing.
- Full-circle and adjustable patterns for maximum flexibility.
- Easy arc adjustment in the field without any tools.
- Nozzle kit offers fully interchangeable nozzles and is included with each rotor.
- Unique manual On/Off control for hydraulic rotors.
- Heavy-duty spring assures positive retraction.
- Radius can be adjusted up to 25 percent for best coverage.
- Compact cartridge design allows for quick and easy repair.
- Quick lock design allows internals to be serviced from the rotor's top.
- D70/D75 C Models include factory-installed check valve.
- D70/D75 E Models feature electric valve and head..
- D70/D75 H Models are N.O. hydraulically controlled.
- D75 X-Series are dual part-circle rotors with adjustable radii.

## D70 SERIES

Pressure	Max Radius	Discharge	Precipitation Rate¹	Nozzle Number	Pressure	Max Radius	Discharge	Precipitation Rate¹
PSI	FT	GPM	IN/HR ■ IN/HR ▲		BAR	kPa	m	L/s m³/hr mm/hr ■ mm/hr ▲
60	67	33.2	0.71 0.82	37 Red	4.1 410	20.4	2.1 7.5	18.19 21.00
70	73	36.1	0.65 0.75		4.8 480	22.2	2.3 8.2	16.65 19.23
80	77	48.1	0.78 0.90		5.5 550	23.4	3.0 10.9	19.94 23.03
90	73	36.1	0.65 0.75	40 Gray	6.2 620	22.2	2.3 8.2	16.65 19.23
60	65	34.3	0.78 0.90		4.1 410	19.8	2.2 7.8	19.95 23.04
70	73	38.6	0.70 0.81		4.8 480	22.2	2.4 8.8	17.82 20.58
80	79	50.6	0.78 0.90	45 Green	5.5 550	24.0	3.2 11.5	19.90 22.98
90	75	42.6	0.73 0.73		6.2 620	22.8	2.7 9.7	18.61 21.50
60	67	36.8	0.79 0.91		4.1 410	20.4	2.3 8.4	20.16 23.28
70	76	41.7	0.70 0.80	50* Black	4.8 480	23.1	2.6 9.5	17.74 20.49
80	85	52.5	0.70 0.81		5.5 550	25.8	3.3 11.9	17.87 20.63
90	83	45.9	0.64 0.74		6.2 620	25.2	2.9 10.4	16.36 18.89
60	73	44.6	0.81 0.93	57 Blue	4.1 410	22.2	2.8 10.1	20.56 23.74
70	77	46.9	0.76 0.88		4.8 480	23.4	3.0 10.7	19.46 22.47
80	89	56.2	0.68 0.79		5.5 550	27.1	3.5 12.8	17.42 20.12
90	89	51.3	0.62 0.72	57 Blue	6.2 620	27.1	3.2 11.6	15.91 18.37
60	75	46.0	0.79 0.91		4.1 410	22.8	2.9 10.5	20.11 23.23
70	79	48.8	0.75 0.87		4.8 480	24.0	3.1 11.1	19.20 22.17
80	93	61.7	0.69 0.79	57 Blue	5.5 550	28.3	3.9 14.0	17.54 20.26
90	93	54.2	0.60 0.70		6.2 620	28.3	3.4 12.3	15.39 17.77

\* Factory Installed

## D75 SERIES

Pressure	Max Radius	Discharge	Precipitation Rate¹	Nozzle Number	Pressure	Max Radius	Discharge	Precipitation Rate¹
PSI	FT	GPM	IN/HR ■ IN/HR ▲		BAR	kPa	m	L/s m³/hr mm/hr ■ mm/hr ▲
60	67	27.5	0.59 0.68	32* Yellow	4.1 410	20.4	1.7 6.2	15.03 17.35
70	69	29.3	0.59 0.68		4.8 480	21.0	1.8 6.6	15.10 17.44
80	69	31.6	0.64 0.74		5.5 550	21.0	2.0 7.2	16.31 18.83
90	71	33.1	0.63 0.73	36 Gray	6.2 620	21.6	2.1 7.5	16.11 18.60
60	67	28.0	0.60 0.69		4.1 410	20.4	1.8 6.4	15.32 17.69
70	69	32.2	0.65 0.75		4.8 480	21.0	2.0 7.3	16.59 19.16
80	69	34.0	0.69 0.79	41 Orange	5.5 550	21.0	2.1 7.7	17.52 20.23
90	73	36.5	0.66 0.76		6.2 620	22.2	2.3 8.3	16.82 19.43
60	65	32.3	0.74 0.85		4.1 410	19.8	2.0 7.3	18.80 21.71
70	71	34.5	0.76 0.76	41 Orange	4.8 480	21.6	2.2 7.8	16.81 19.41
80	73	37.7	0.79 0.79		5.5 550	22.2	2.4 8.6	17.40 20.10
90	73	39.9	0.72 0.83		6.2 620	22.2	2.5 9.1	18.40 21.25

\* Factory Installed

## Accessories

### D001

Snap ring/pilot valve tool

### D002

Pilot valve key

### D004

1 1/2" valve insertion tool

## ROTORS

REPLACEMENT  
INTERNALS**DI5025**

D50 Replacement Internal, #25 Blue Nozzle

**DI50B25**

D50B Replacement Internal, #25-Blue Nozzle

**DI5525**

D55 Replacement Internal, #25-Blue Nozzle

**DI55B25**

D55B Replacement Internal, #25-Blue Nozzle

**DI55X2514**D55X Replacement Internal,  
#25-Blue (Front) / #14-Yellow (Rear)**DI7050**

D70 Replacement Internal, #50-Black Nozzle

**DI7532**

D75 Replacement Internal, #32-Yellow Nozzle

**DI75X3518**D75X Replacement Internal,  
#35-Yellow (Front) / #18-Brown (Rear)RAINBIRD REPLACEMENT  
INTERNALS**DI47R25**Rain Bird 47DR Replacement Internal,  
#25-Blue Nozzle**DI47RX2514**Rain Bird 47DR X-Series Replacement Internal,  
#25-Blue (Front) / #14-Yellow (Rear)**DI51R25**Rain Bird 51DR Replacement Internal,  
#25-Blue Nozzle**DI700R25**Rain Bird Eagle 700 Replacement Internal,  
#25-Blue Nozzle**DI750R25**Rain Bird Eagle 750 Replacement Internal,  
#25-Blue Nozzle**DI750RX2514**Rain Bird Eagle 750 X-Series Replacement Internal,  
#25-Blue (Front) / #14-Yellow (Rear)

## SPECIFICATIONS

## REPLACEMENTS FOR TORO®:

## 1" Inlet Bodies

**DI6734T Full-circle,  
DI6735T Part-circle,  
DI865T Part-circle**

Radius:52'-75'

Flowrate:11.0-35.5 GPM

Replacement Upgrades for:

Toro 630, 660, 730, 760 and 830, 860

## 1½" Inlet Bodies

**DI674754T Full-circle**

Radius:66'-100'

Flowrate:25.1-66.0 GPM

Replacement Upgrade for:

Toro 650, 670, 680, 750, 780

**DI6785T Part-circle**

Radius:56'-82'

Flowrate:13.0-35.3 GPM

Replacement Upgrade for:

Toro 650, 680, 750, 780

**DI694T Full-circle**

Radius:91'-100'

Flowrate:57.0-66.0 GPM

Replacement Upgrade for:Toro 690

## REPLACEMENTS FOR RAIN BIRD®:

## 1¼" Inlet Bodies

**DI700R Full-circle,  
DI750R Part-circle**

Radius:53'-72'

Flowrate:12.5-33.0 GPM

Replacement Upgrades for:

RainBird Eagle 700, Eagle 750

## 1½" Inlet Bodies

**DI51R Full-circle, DI47R Part-circle**

Radius:53'-72'

Flowrate:12.5-33.0

GPM Replacement Upgrades for:

RainBird 47D, 51D

## TORO REPLACEMENT INTERNALS

**DI6734T25**1" Toro 630/730, 660/760 Insert,  
#25-Blue Nozzle**DI6735T25**1" Toro 635/735, 665/765 Insert,  
#25-Blue Nozzle**DI6735TX25**1" Toro 630, 660, 730 & 760  
X-Series Insert, #25-Blue (Front) /  
#14-Yellow (Rear)**DI6785T26**1½" Toro 650/750, 680/780 Insert,  
#26-Blue Nozzle**DI6785TX16**1½" Toro 650/750, 680/780  
X-Series Insert, #30-Yellow (Front) /  
#16-Orange (Rear)**DI674754T50**1½" Toro 650/750, 680/780 Insert,  
#50-Black Nozzle**DI694T50**

1½" Toro 690 Insert, #50-Black Nozzle

**DI834T25**

1" Toro 830/860 Insert, #25-Blue Nozzle

**DI865T25**

1" Toro 835/865 Insert, #25-Blue Nozzle

## DI6785T Performance Data

Pressure			Nozzle Number	Pressure			Toro® Nozzle Reference	
PSI	FT	GPM		BAR	m	L/s	650	780
50	56	13.0	16 Orange	3.4	17.0	0.82	54	83
60	57	14.2		4.1	17.3	0.89		
70	58	15.4		4.8	17.6	0.97		
80	59	16.4		5.5	17.9	1.03		
90	60	17.5		6.2	18.2	1.10		
100	61	18.6		6.9	18.5	1.17		
50	61	16.4	21 Brown	3.4	18.5	1.03	55	84
60	62	18.0		4.1	18.8	1.13		
70	64	19.4		4.8	19.5	1.22		
80	65	20.7		5.5	19.8	1.30		
90	68	21.9		6.2	20.7	1.38		
100	70	23.1		6.9	21.3	1.45		
50	62	21.8	26 Blue	3.4	18.8	1.37	56	85
60	64	23.4		4.1	19.5	1.47		
70	66	24.8		4.8	20.1	1.56		
80	67	26.0		5.5	20.4	1.64		
90	70	28.1		6.2	21.3	1.77		
100	70	28.1		6.9	21.3	1.77		
50	65	22.4	29 Red	3.4	19.8	1.41	57	—
60	70	25.2		4.1	21.3	1.58		
70	72	27.0		4.8	21.9	1.70		
80	75	28.8		5.5	22.8	1.81		
90	77	30.6		6.2	23.4	1.93		
100	79	32.1		6.9	24.0	2.02		
50	66	25.8	32 Gray	3.4	20.1	1.62	58	86
60	71	26.9		4.1	21.6	1.69		
70	75	29.7		4.8	22.8	1.87		
80	78	31.7		5.5	23.7	1.99		
90	80	33.5		6.2	24.3	2.11		
100	82	35.3		6.9	24.9	2.22		

## DI700R/DI750R &amp; DI51R/DI47R Performance Data

Pressure			Nozzle Number	Pressure			Rain Bird® Nozzle Reference	
PSI	FT	GPM		BAR	m	L/s	47D	51D
50	52	12.5	14 Orange	3.4	15.8	0.78	18	—
60	55	13.5		4.1	16.7	0.85		
70	57	15.0		4.8	17.3	0.94		
80	61	17.0		5.5	18.5	1.16		
90	61	18.0		6.2	18.5	1.16		
100	61	19.0		6.9	18.5	1.16		
50	55	17.0	16 Brown	3.4	16.7	1.05	16	16
60	58	18.5		4.1	17.6	1.11		
70	60	20.0		4.8	18.2	1.14		
80	62	22.0		5.5	18.9	1.19		
90	62	23.5		6.2	18.9	1.19		
100	62	24.0		6.9	18.9	1.19		
50	60	22.0	18 Blue	3.4	18.2	1.38	18	18
60	62	23.5		4.1	18.9	1.48		
70	65	25.0		4.8	19.8	1.57		
80	66	26.0		5.5	20.1	1.64		
90	67	27.0		6.2	20.4	1.70		
100	67	28.5		6.9	20.4	1.79		
50	64	24.5	20 Red	3.4	19.5	1.54	20	20
60	66	26.0		4.1	20.1	1.64		
70	67	27.5		4.8	20.4	1.73		
80	68	29.0		5.5	20.7	1.82		
90	70	31.5		6.2	21.3	1.98		
100	70	33.0		6.9	21.3	2.08		

## DI6734T, DI6735T &amp; DI865T Performance Data

Pressure			Nozzle Number	Pressure			Toro® Nozzle Reference	
PSI	FT	GPM		BAR	m	L/s	650	780
50	56	13.0	16 Orange	3.4	17.0	0.82	54	83
60	57	14.2		4.1	17.3	0.89		
70	58	15.4		4.8	17.6	0.97		
80	59	16.4		5.5	17.9	1.03		
90	60	17.5		6.2	18.2	1.10		
100	61	18.6		6.9	18.5	1.17		
50	61	16.4	21 Brown	3.4	18.5	1.03	55	84
60	62	18.0		4.1	18.8	1.13		
70	64	19.4		4.8	19.5	1.22		
80	65	20.7		5.5	19.8	1.30		
90	68	21.9		6.2	20.7	1.38		
100	70	23.1		6.9	21.3	1.45		
50	62	21.8	26 Blue	3.4	18.8	1.37	56	85
60	64	23.4		4.1	19.5	1.47		
70	66	24.8		4.8	20.1	1.56		
80	67	26.0		5.5	20.4	1.64		
90	70	28.1		6.2	21.3	1.77		
100	70	28.1		6.9	21.3	1.77		
50	65	22.4	29 Red	3.4	19.8	1.41	57	—
60	70	25.2		4.1	21.3	1.58		
70	72	27.0		4.8	21.9	1.70		
80	75	28.8		5.5	22.8	1.81		
90	77	30.6		6.2	23.4	1.93		
100	79	32.1		6.9	24.0	2.02		
50	66	25.8	32 Gray	3.4	20.1	1.62	58	86
60	71	26.9		4.1	21.6	1.69		
70	75	29.7		4.8	22.8	1.87		
80	78	31.7		5.5	23.7	1.99		
90	80	33.5		6.2	24.3	2.11		
100	82	35.3		6.9	24.9	2.22		

## DI5070 &amp; DI3575 Performance Data

Pressure	Radius	Discharge	Nozzle Number	Pressure	Radius	Discharge	Rain Bird® Nozzle Reference	
PSI	FT	GPM		BAR	m	L/s	700	750
50	21	4.9	06 Blank	3.4	6.4	0.30	—	—
60	34	5.4		4.1	10.3	0.34		
70	39	6.3		4.8	11.8	0.39		
80	—	—		5.5	—	—		
90	—	—		6.2	—	—		
100	—	—		6.9	—	—		
50	30	6.8	08 Black	3.4	9.1	0.42	—	—
60	32	7.6		4.1	9.7	0.47		
70	34	8.4		4.8	10.3	0.52		
80	—	—		5.5	—	—		
90	—	—		6.2	—	—		
100	—	—		6.9	—	—		
50	53	11.0	14 Yellow	3.4	16.1	0.69	14	14
60	55	12.9		4.1	16.7	0.81		
70	57	14.5		4.8	17.3	0.91		
80	—	14.5		5.5	17.3	0.91		
90	—	—		6.2	—	—		
100	—	—		6.9	—	—		
50	56	13.1	16 Orange	3.4	17.0	0.82	16	16
60	58	14.8		4.1	17.6	0.93		
70	60	16.2		4.8	18.2	1.02		
80	—	16.2		5.5	—	1.02		
90	—	—		6.2	—	—		
100	—	—		6.9	—	—		
50	61	16.5	16 Brown	3.4	18.5	1.04	18	18
60	62	17.6		4.1	18.8	1.11		
70	63	18.7		4.8	19.2	1.17		
80	—	18.7		5.5	—	1.17		
90	—	—		6.2	—	—		
100	—	—		6.9	—	—		
50	63	21.8	25 Blue	3.4	19.2	1.37	20	20
60	64	23.4		4.1	19.5	1.47		
70	65	24.8		4.8	19.8	1.56		
80	68	26.0		5.5	20.7	1.64		
90	—	—		6.2	—	—		
100	—	—		6.9	—	—		
50	65	24.5	28 Green	3.4	19.8	1.54	—	—
60	67	26.5		4.1	20.4	1.67		
70	69	28.1		4.8	21.0	1.77		
80	74	30.5		5.5	22.5	1.92		
90	—	—		6.2	—	—		
100	—	—		6.9	—	—		

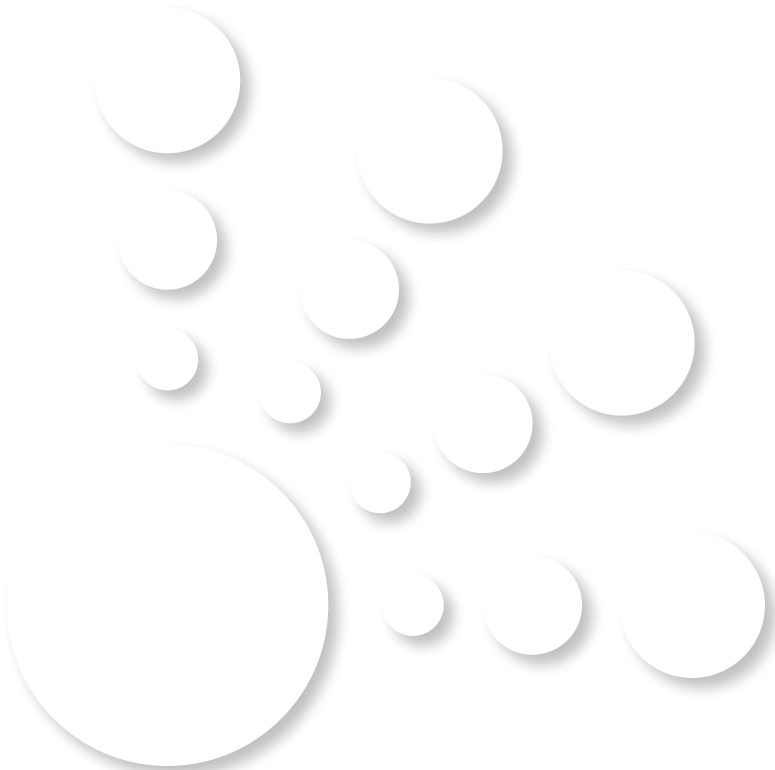


SPRAYS

APPLICATIONS	63XA	63XB	63XC	63XD	63XE	63S
TURF GRASS)	✓	✓	✓	✓	✓	✓
GROUND COVER	✓	✓	✓	✓	✓	✓
RESIDENTIAL	✓	✓	✓	✓	✓	✓
RECLAIMED WATER	✓	✓	✓	✓	✓	✓
COMMERCIAL/MUNICIPAL	✓	✓	✓	✓	✓	✓
HIGH TRAFFIC AREAS			✓	✓	✓	
HIGH VANDALISM AREAS			✓	✓	✓	
WATER CONSERVATION — IStop™		✓	✓	✓		

FEATURES						
ANTI-DRAIN VALVE (ADV)	(Opt.)*	✓	(Opt.)*	(Opt.)*	✓	(Opt.)*
PRESSURE REGULATION				✓	✓	
WATER CONSERVATION — IStop™			✓	✓	✓	

\*Field Retrofit Option



## PRODUCT OVERVIEW

### STANDARD MODELS

#### 63XA



##### STANDARD

- High impact corrosion resistant construction with stainless steel metal components.
- Dome cap design will ensure sand and debris flush away from the riser to provide for longer life.
- Double lipped wiper seal will help keep debris away from the riser.
- 1/2" (12,7 mm) bottom inlet is standard on all models.
- All models can be upgraded with an anti-drain valve (ADV) and the new iStop™.
- Standard male thread on the riser.
- All models can be upgraded to use iStop™ with installation of retrofit kit 63XR.

#### 63XB



##### WITH ADV

- The 63XB series comes with all the same great features as the standard 63XA model with the addition of the anti-drain valve (ADV).
- The anti-drain valve (ADV) will prevent low head drainage and prevent flooding or erosion.
- Will hold back up to 10 ft (3 m) difference in elevation.
- All models can be upgraded to use iStop™ with installation of retrofit kit 63XR.

#### 63S



- High impact corrosion resistant construction with stainless steel metal components.
- Dome cap design will ensure sand and debris flush away from the riser to provide for longer life.
- Double lipped wiper seal will help keep debris away from the riser.
- 1/2" (12,7 mm) bottom inlet is standard on all models.
- Standard male thread on the riser.

### NOZZLES



- Wide range of matched precipitation fixed spray.
- Color coded bodies for easy identification.
- Multi-arc nozzles from 8 ft – 17 ft (2.4 m – 5.2 m) radius that can be adjusted from 0° - 360°.
- Fixed spray nozzles from 8 ft – 15 ft (2.4 m – 4.6 m) radius in all the various patterns.
- Wide variety of special pattern nozzles.

### ADVANCED MODELS USING iStop™

#### 63XC



##### WITH iStop™

- The 63XC series comes with all the same great features as the standard 63XA model with the addition of the new iStop™ feature.
- The new iStop™ saves water by stopping the flow of water on broken or damaged heads as well as stopping the flow of water during nozzle maintenance.

#### 63XD



##### WITH iStop™ AND PR

- The 63XD series comes the with the iStop™ feature and the addition of a pressure regulating valve.
- The new iStop™ saves water by stopping the flow of water on broken or damaged heads as well as stopping the flow of water during nozzle maintenance.
- The pressure regulator maintains optimum nozzle performance and prevents misting.

#### 63XE



##### WITH iStop™, PR AND ADV

- The 63XE series comes the with the iStop™ feature, a pressure regulating valve, and a factory installed anti-drain valve (ADV).
- The new iStop™ saves water by stopping the flow of water on broken or damaged heads as well as stopping the flow of water during nozzle maintenance.
- The pressure regulator maintains optimum nozzle performance and prevents misting.
- The anti-drain valve (ADV) will prevent low head drainage and prevent flooding or erosion.
- Will hold back up to 10 ft (3 m) difference in elevation.

#### 63XR

##### iStop™ RETROFIT KITS



- Retrofit any existing 6300 sprayhead with new iStop™.
- The new iStop™ saves water by stopping the flow of water on broken or damaged heads as well as stopping the flow of water during nozzle



SPRAYS

STANDARD  
63XA-02

2 1/2" (6,3 cm) Pop-Up Body

63XA-04

4" (10,2 cm) Pop-Up Body

63XA-06

6" (15,2 cm) Pop-Up Body

63XA-12

12" (30,5 cm) Pop-Up Body

Pre-Installed MAN

2 1/2" (6,3 cm) Pop-up

Factory Installed MAN Nozzle

63XA-02 I2

63XA-02 I5

63XA-02 I7

4" (10,2 cm) Pop-up

Factory Installed MAN Nozzle

63XA-04 I2

63XA-04 I5

63XA-04 I7

6" (15,2 cm) Pop-up

Factory Installed MAN Nozzle

63XA-06 I2

63XA-06 I5

63XA-06 I7

WITH ADV

63XB-02

2 1/2" (6,3 cm) Pop-up

63XB-04

4" (10,2 cm) Pop-up

63XB-06

6" (15,2 cm) Pop-up

63XB-12

12" (30,5 cm) Pop-up

WITH iStop™

63XC-02

2 1/2" (6,3 cm) Pop-up

63XC-04

4" (10,2 cm) Pop-up

63XC-06

6" (15,2 cm) Pop-up

63XC-12

12" (30,5 cm) Pop-up



SPECIFICATIONS

OPERATING RANGE:

15-60 psi (1-4,1 bar)

20-60 psi (1,3-4,1 bar) ADV models

OPTIMUM PRESSURE:

30 psi (2 bar)

MAXIMUM PRESSURE:

60 psi (4,1 bar)

SEALING PRESSURE:

10 psi (0,7 bar)

20 psi (1,3 bar) ADV models

POP-UP HEIGHT:

2 1/2" (6,3 cm) (63X-02)

4" (10,2 cm) (63X-04)

6" (15,2 cm) (63X-06)

12" (30,5 cm) (63X-12)

BODY HEIGHT:

3 1/2" (8,9 cm) (63X-02)

37/8" (9,8 cm) (63X-04)

57/8" (15 cm) (63X-06)

15" (38,1 cm) (63X-12)

SHRUB MODEL AVAILABLE

FLUSH RATE:

0.2 gpm (0,75 l/min)

INLET SIZE:

1/2" (12,7 mm) NPT Female thread

CHECK HEIGHT:

10 ft (3 m) elevation change

SCREEN MESH:

.045 sq. in. (1,14 mm2) / 1150 micron

EFFLUENT CAP AVAILABLE

# PER BOX:

50

63X-02 Series, 63X-04 Series, 63X-06

Series

25

63X-12 Series

WITH iStop™ and PR

63XA-02

2 1/2" (6,3 cm) Pop-up

63XA-04

4" (10,2 cm) Pop-up

63XA-06

6" (15,2 cm) Pop-up

WITH iStop™,

PR and ADV

63XA-02

2 1/2" (6,3 cm) Pop-up

63XA-04

4" (10,2 cm) Pop-up

63XA-06

6" (15,2 cm) Pop-up

iStop™ 63XR

RETROFIT KITS

63XR-02

2 1/2" (6,3 cm)

Retrofit iStop™ Kit

63XR-04

4" (10,2 cm)

Retrofit iStop™ Kit

63XR-06

6" (15,2 cm)

Retrofit iStop™ Kit

63XR-12

12" (30,5 cm)

Retrofit iStop™ Kit

Accessories

6318

Piston Extension

6319

Anti-drain valve (ADV)

6390RWC

Identifies reclaimed water site

6300

Shrub Adapter

7300

Adjustable Bubbler

8819

Brass automatic drain valve

63XR



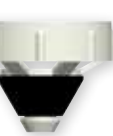
6390RWC



7300



6319



6300



ACCESSORY FEATURES

iStop™ 63XR RETROFIT KIT

- Shuts off if the nozzle is removed
- Shuts off is the riser is broken at any point above the top level of the cap
- Retrofit any existing 6300 sprayhead with new iStop™

6318 (Not Shown)

- Adds 6" (15,24 cm) to any series pop-up
- Perfect for landscape areas that need extra clearance
- It threads directly onto the top of the piston and accepts all Signature spray nozzles

6319

- Anti-drain valve (ADV) helps eliminate low head drainage and puddling. Holds back up to 10 ft (3 m) difference in elevation.

6300

- Adapt from 1/2" (12,7mm) NPT to a standard female thread spray nozzle

7300

- Provides an umbrella pattern that can be adjusted with a stainless steel set screw
- Bubbler installs on standard 1/2" (12,7 mm) riser and has a maximum flow of 4.9 gpm (7,6 l/min) at 18" (45 cm) radius

8819

- Prevents underground line breakage due to freezing
- Solid brass body
- Automatically opens when line pressure drops below three psi
- 1/2" male threads
- 5 year warranty on materials and workmanship

Pressure			Model	Pressure			Discharge <sup>1</sup>		
PSI	Radius <sup>1</sup>	Discharge <sup>1</sup>		BAR	kPa	m	L/min	m³/hr	
20	0.8	2.9	7300 FULL (360°)	1.4	138	0.2	11.0	0.66	
30	0.9	3.5		2.1	207	0.3	13.2	0.79	
40	1.1	4.1		2.8	276	0.3	15.5	0.93	
50	1.2	4.5		3.5	345	0.4	17.0	1.02	
60	1.2	4.9		4.2	414	0.4	18.5	1.11	

<sup>1</sup> Radius and flow can be reduced with adjustment screw.

## SPRAYS

## STANDARD

## 63S-03

3" (7,6 cm) Pop-Up Body

## 63S-04

4" (10,2 cm) Pop-Up Body

## Pre-Installed MAN

2 1/2" (6,3 cm) Pop-up  
Factory Installed MAN Nozzle

## 63S-03 I2

## 63S-03 I5

## 63S-03 I7

4" (10,2 cm) Pop-up

Factory Installed MAN Nozzle

## 63S-04 I2

## 63S-04 I5

## 63S-04 I7

63S-03



63S-04



## SPECIFICATIONS

## OPERATING RANGE:

15-60 psi (1-4,1 bar)

## OPTIMUM PRESSURE:

30 psi (2 bar)

## MAXIMUM PRESSURE:

60 psi (4,1 bar)

## SEALING PRESSURE:

Less than 15 psi (1 bar)

## POP-UP HEIGHT:

3" (7,6 cm) (63S-03)

4" (10,2 cm) (63S-04)

## BODY HEIGHT:

5 1/8" (13,0 cm) (63S-03)

6" (15,2 cm) (63S-04)

## FLUSH RATE:

0.2 gpm (0,75 l/min)

## INLET SIZE:

1/2" (12,7 mm) NPT Female thread

## SCREEN MESH:

.045 sq. in. (1,14 mm<sup>2</sup>) / 1150 micron

## # PER BOX:

50 (63S-03 Series, 63S-04 Series)

## 8' (2,4 m) FIXED PATTERN (5° Trajectory - flat)

Pressure			Radius	Discharge	Precipitation Rate <sup>1</sup>		Model	Pressure			Radius	Discharge	Precipitation Rate <sup>1</sup>						
PSI	FT. R	GPM	■ IN/HR ▲	BARS	M	M/H		L/min	■ MM/HR ▲										
15	6	1.0	2.3	2.8	7284 8F-FLT FULL (360°)								1.1	104	1.8	0.23	3.8	58.4	71.1
20	7	1.2	2.1	2.6									1.4	138	2.1	0.27	4.5	53.3	66.0
25	7	1.2	2.0	2.5									1.8	173	2.1	0.27	4.5	50.8	63.5
30	8	1.5	1.9	2.4									2.1	207	2.4	0.34	5.7	48.2	61.0
15	6	0.5	2.3	2.8	7282 8H-FLT 1/2 (180°)								1.1	104	1.8	0.11	1.9	58.4	71.1
20	7	0.6	2.1	2.6									1.4	138	2.1	0.14	2.3	53.3	66.0
25	7	0.6	2.0	2.5									1.8	173	2.1	0.14	2.3	50.8	63.5
30	8	0.7	1.9	2.3									2.1	207	2.4	0.16	2.6	48.2	61.0
15	6	0.3	2.3	2.8	7281 80-FLT 1/4 (90°)								1.1	104	1.8	0.07	1.1	58.4	71.1
20	7	0.3	2.1	2.6									1.4	138	2.1	0.07	1.1	53.3	66.0
25	7	0.3	2.0	2.5									1.8	173	2.1	0.07	1.1	50.8	63.5
30	8	0.4	1.9	2.3									2.1	207	2.4	0.09	1.5	48.2	61.0

## 10' (3,1 m) FIXED PATTERN (15° Trajectory - low angle)

15	7	1.2	2.3	2.6	7274 10F-LA FULL (360°)	1.1	104	2.1	0.27	4.5	58.4	66.0
20	8	1.3	2.0	2.3		1.4	138	2.4	0.30	4.9	50.8	58.4
25	9	1.4	1.7	2.0		1.8	173	2.7	0.32	5.3	43.2	50.8
30	10	1.6	1.5	1.8		2.1	207	3.1	0.36	6.1	38.1	45.7
15	7	0.6	2.3	2.6	7272 10H-LA 1/2 (180°)	1.1	104	2.1	0.14	2.3	58.4	66.0
20	8	0.6	2.0	2.3		1.4	138	2.4	0.14	2.3	50.8	58.4
25	9	0.7	1.7	2.0		1.8	173	2.7	0.16	2.6	43.2	50.8
30	10	0.8	1.5	1.8		2.1	207	3.1	0.18	3.0	38.1	45.7
15	7	0.3	2.3	2.6	7271 100-LA 1/4 (90°)	1.1	104	2.1	0.06	1.1	58.4	66.0
20	8	0.3	2.0	2.3		1.4	138	2.4	0.06	1.1	50.8	58.4
25	9	0.4	1.7	2.0		1.8	173	2.7	0.09	1.5	43.2	50.8
30	10	0.4	1.5	1.8		2.1	207	3.1	0.09	1.5	38.1	45.7

## 12' (3,7 m) FIXED PATTERN (30° Trajectory - low gallonage)

15	9	1.8	2.1	2.5	7374 12F FULL (360°)	1.1	104	2.7	0.40	6.8	53.3	63
20	10	2.1	2.0	2.3		1.4	138	3.1	0.48	7.9	50.8	58
25	11	2.4	1.9	2.2		1.8	173	3.4	0.54	9.1	48.2	55
30	12	2.6	1.7	2.0		2.1	207	3.7	0.59	9.8	43.2	50
15	9	1.4	2.1	2.5	7373 12T0 3/4 (270°)	1.1	104	2.7	0.32	5.3	53.3	63
20	10	1.6	2.0	2.3		1.4	138	3.1	0.36	6.1	50.8	58
25	11	1.8	1.9	2.2		1.8	173	3.4	0.41	6.8	48.2	55
30	12	2.0	1.7	2.0		2.1	207	3.7	0.45	7.6	43.2	50
15	9	1.2	2.1	2.5	7375 12T1 2/3 (240°)	1.1	104	2.7	0.27	5.5	53.3	63
20	10	1.4	2.0	2.3		1.4	138	3.1	0.32	5.3	50.8	58
25	11	1.6	1.9	2.2		1.8	173	3.4	0.36	6.1	48.2	55
30	12	1.7	1.7	2.0		2.1	207	3.7	0.39	6.4	43.2	50
15	9	0.9	2.1	2.5	7372 12H 1/2 (180°)	1.1	104	2.7	0.20	3.4	53.3	63
20	10	1.1	2.0	2.3		1.4	138	3.1	0.25	4.2	50.8	58
25	11	1.2	1.9	2.2		1.8	173	3.4	0.27	4.5	48.2	55
30	12	1.3	1.7	2.0		2.1	207	3.7	0.30	4.9	43.2	50
15	9	0.6	2.1	2.5	7376 12T 1/3 (120°)	1.1	104	2.7	0.14	2.3	53.3	63
20	10	0.7	2.0	2.3		1.4	138	3.1	0.16	2.6	50.8	58
25	11	0.8	1.9	2.2		1.8	173	3.4	0.18	3.0	48.2	55
30	12	0.9	1.7	2.0		2.1	207	3.7	0.20	3.1	43.2	50
15	9	0.5	2.1	2.5	7371 120 1/4 (90°)	1.1	104	2.7	0.11	1.9	53.3	63
20	10	0.5	2.0	2.3		1.4	138	3.1	0.11	1.9	50.8	58
25	11	0.6	1.9	2.2		1.8	173	3.4	0.14	2.3	48.2	55
30	12	0.7	1.7	2.0		2.1	207	3.7	0.16	2.6	43.2	50

## 15' (4,6 m) FIXED PATTERN (30° Trajectory - standard)

15	11	2.6	2.1	2.4	7074 15F FULL (360°)	1.1	104	3.4	0.59	9.8	53.3	60.7
20	12	3.0	2.0	2.3		1.4	138	3.7	0.68	11.4	50.8	58.4
25	14	3.3	1.6	1.9		1.8	173	4.3	0.75	12.5	40.6	48.2
30	15	3.7	1.6	1.8		2.1	207	4.6	0.84	14.0	40.6	45.7
15	11	2.0	2.1	2.4	7073 15T0 3/4 (270°)	1.1	104	3.4	0.45	7.6	53.3	60.7
20	12	2.3	2.0	2.3		1.4	138	3.7	0.52	8.7	50.8	58.4
25	14	2.5	1.6	1.9		1.8	173	4.3	0.57	9.5	40.6	48.2
30	15	2.8	1.6	1.8		2.1	207	4.6	0.64	10.6	40.6	45.7
15	11	1.7	2.1	2.4	7075 15T1 2/3 (240°)	1.1	104	3.4	0.39	6.4	53.3	60.7
20	12	2.0	2.0	2.3		1.4	138	3.7	0.48	7.9	50.8	58.4
25	14	2.2	1.6	1.9		1.8	173	4.3	0.50	8.3	40.6	48.2
30	15	2.5	1.6	1.8		2.1	207	4.6	0.57	9.5	40.6	45.7
15	11	1.3	2.1	2.4	7072 15H 1/2 (180°)	1.1	104	3.4	0.30	4.9	53.3	60.7
20	12	1.5	2.0	2.3		1.4	138	3.7	0.34	5.7	50.8	58.4
25	14	1.7	1.6	1.9		1.8	173	4.3	0.39	6.4	40.6	48.2
30	15	1.9	1.6	1.8		2.1	207	4.6	0.43	7.2	40.6	45.7
15	11	0.9	2.1	2.4	7076 15T 1/3 (120°)	1.1	104	3.4	0.20	3.4	53.3	60.7
20	12	1.0	2.0	2.3		1.4	138	3.7	0.22	3.8	50.8	58.4
25	14	1.1	1.6	1.9		1.8	173	4.3	0.25	4.2	40.6	48.2
30	15	1.2	1.6	1.8		2.1	207	4.6	0.27	4.6	40.6	45.7
15	11	0.7	2.1	2.4	7071 15Q 1/4 (90°)	1.1	104	3.4	0.16	2.6	53.3	60.7
20	12	0.8	2.0	2.3		1.4	138	3.7	0.18	3.0	50.8	58.4
25	14	0.6	1.6	1.9		1.8	173	4.3	0.18	3.0	40.6	48.2
30	15	0.9	1.6	1.8		2.1	207	4.6	0.20	3.4	40.6	45.7



VALVES



VALVES

VALVES

APPLICATIONS	Quantum	9000	7900	9501	9502	9515-9520
RESIDENTIAL		✓	✓	✓		
COMMERCIAL/MUNICIPAL			✓	✓	✓	✓
FLOW CONTROL		✓	✓	✓	✓	✓
W/O FLOW CONTROL	✓	✓	✓	✓		
HIGH PRESSURE	✓			✓	✓	
RECLAIMED WATER		✓	✓	✓	✓	✓
EZ CONNECT™				✓	✓	

APPLICATIONS	1" QCV 7640
COMMERCIAL	✓
ATHLETIC FIELDS	✓
SPORTS TURF	✓
RECLAIMED WATER	✓
1" INLET (25,4 MM)	✓

## PRODUCT OVERVIEW

### Quantum Series



- Simple proven design has few moving parts.
- Available with built in pressure regulation.
- Comes in 1" (25,4 mm) — 2" (50,8 mm) Male BSP and NPT models.
- Easy to operate internal bleed system.
- Heavy duty glass filled Nylon construction.

### 9501



- 3/4" (19,05 mm) & 1" (25,4 mm) EZ connect union valve makes installation and valve replacement a snap.
- Heavy duty glass filled nylon construction.
- Available with or without flow control.
- Many 3/4" (19,05 mm) and 1" (25,4 mm) fittings available: BSP female, BSP male, Barb, Slip, NPT Female and NPT male.
- Bayonet mounted bonnet for quick and easy servicing.

### 9502



- 1 1/2" – 2" (38,1 mm – 50,8 mm) EZ connect union valve makes installation and valve replacement a snap.
- Heavy duty glass filled nylon body with a PVC bonnet.
- Many 1 1/2" (38,1 mm) and 2" (50,8 mm) fittings available: BSP female, Slip, NPT Female and Isolation valves.
- Eight stainless steel nuts grip into the bonnet to accommodate for extreme climatic fluctuations.

### 9515-9520



- 1 1/2" (38,1 mm) and 2" (50,8 mm) combination globe or angle valve.
- Heavy duty glass filled nylon body with a PVC bonnet.
- Eight stainless steel nuts grip into the bonnet to accommodate for extreme climatic fluctuations.
- 200 PSI (13,8 bar) rated for heavy duty applications.

### 1" QCV 7640



- 1" (25,4 mm) quick coupling valves with rubber covers.
- Available with locking covers.
- Reclaimed water covers.
- Featuring acme threads for convenient flow control.

### 9000



- Simple proven design has few moving parts.
- Available with or without flow control.
- Comes in 1" (25,4 mm) NPT, Slip or BSP versions.
- Easy to operate internal manual bleed.
- PVC construction makes gluing a snap with the slip configuration.

### 7900



- Heavy duty glass filled nylon construction.
- Simple proven design has few moving parts.
- Available with or without flow control.
- Comes in 1" (25,4 mm) NPT or BSP versions.
- Bayonet mounted bonnet for quick and easy servicing.



## VALVES

### D100E (MC100EB)\*

1" (25,4 mm) electric globe pressure regulated valve NPT MxM

### D150E (MC150EB)\*

1 1/2" (38,1 mm) electric globe pressure regulated valve NPT MxM

### D150E3 (MC150EB3)\*

1 1/2" (38,1 mm) 3-way electric globe pressure regulated valve NPT MxM

### D150H (MC150HB)\*

1 1/2" (38,1 mm) hydraulic globe pressure regulated valve NPT MxM

### D200E (MC200EB)\*

2" (50,8 mm) electric globe pressure regulated valve NPT MxM

### D200EB (MC200EB)\*

2" (50,8 mm) electric globe pressure regulated valve BSP MxM

### D200E3 (MC200EB3)\*

2" (50,8 mm) 3-way electric globe pressure regulated valve NPT MxM

### D200H (MC200HB)\*

2" (50,8 mm) hydraulic globe pressure regulated valve NPT MxM

\*EB = BSP Conventional



## SPECIFICATIONS

### FACTORY PRESSURE SETTINGS:

Available in 35, 50, 65 and 80 psi

### STANDARD FACTORY SETTINGS:

80 psi (5,5 bar)

### SOLENOID:

24 VAC 50/60 Hz

Inrush Amps: 0.30

Holding Amps: 0.20

Quantum Series Valve Pressure Loss

PSI Loss	Flow Rate (GPM)								
	30	40	50	70	90	100	120	150	180
1 1/2"	1.5	1.5	1.5	1.5	3.5	4.0	5.0	5.5	8.0
2"	1.5	1.5	1.5	3.5	4.5	5.5	6.0	9.0	—
PSI Loss	Flow Rate (GPM)								
	5	10	20	30	40				
1"	2.0	2.5	3.5	5.0	8.5				

## FEATURES

- High Performance
- Low pressure loss
- Unique snap ring serviceability
- 200 PSI pressure rating
- Common solenoid with valve-in-head (E-models)
- Male pipe threads for strength and high-pressure rating

### 9001 (9003)

Manual Internal Bleed 1" (25,4 mm) globe

### 9002

Manual Internal Bleed 1" (25,4 mm) globe slip

### 9011 (9013)

Manual Internal Bleed 1" (25,4 mm) globe with flow control

### 9012

Manual Internal Bleed 1" (25,4 mm) globe slip with flow control

*Note: Versions in parenthesis feature BSP threading*

## Accessories

### 7962

24V AC 50/60 HZ

### 7962RW

24V AC 50/60 HZ  
Reclaimed water solenoid

## FEATURES

- Directly compatible with SoloRain® series of battery-operated actuators
- Simple, proven design has few moving parts
- Easy-to-use flow control allows tailored adjustments in all job site conditions
- Fully encapsulated solenoid with a stainless steel plunger
- Molded in solenoid seat for tighter tolerance parts
- Manual internal bleed is easy to operate – just twist the solenoid
- Fabric reinforced diaphragm for increased durability
- High grade PVC makes solvent welding an ease with slip configurations
- Six stainless steel phillips head screws
- Flat is added on all slip versions to force glue away from solenoid port, to prevent clogging



## SPECIFICATIONS

### FLOW RANGE:

Less than 1 to 30 gpm  
(0,23 – 6,81 m³/hr)

### MINIMUM PRESSURE:

10 psi (0,7 bar)

### MAXIMUM PRESSURE:

150 psi (10,3 bar)

### INPUT:

24V AC

### INRUSH CURRENT:

0.50 amps or less

### HOLDING CURRENT:

0.23 amps

### THREADING:

NPT (9001, 9011)

Slip (9002, 9012)

BSP (9003, 9013)

### DIMENSIONS (l x w x h)

4 1/2" (10,8 cm) x 3 7/8" (9,8 cm) x 5 1/8" (13 cm) (9001, 9011, 9012)

### # PER BOX:

20

### 9001, 9002, 9003 GLOBE VALVE 9011, 9012, 9013 GLOBE VALVE

Flow	Pressure Loss	Flow	Pressure Loss	Flow	Pressure Loss
GPM	PSI	L/min	kPa	m³/hr	BAR
1	4.0	3.8	28	0.23	0.3
5	2.5	18.9	17	1.14	0.2
10	2.0	37.9	14	2.27	0.1
15	2.5	56.8	17	3.41	0.2
20	3.5	75.7	24	4.54	0.2
25	4.5	94.6	31	5.68	0.3
30	6.5	113.6	45	6.81	0.5

## VALVES

### 7901 (7916)

Manual Internal Bleed 1" (25,4 mm) globe

### 7911 (7917)

Manual Internal Bleed 1" (25,4 mm) globe with flow control

*Note: Versions in parenthesis feature BSP threading*

### Accessories

#### 7962

24V AC 50/60 HZ

#### 7962RW

24V AC 50/60 HZ  
Reclaimed water solenoid

7901



7911



7962



7962RW



## SPECIFICATIONS

### FLOW RANGE:

Less than 1 to 30 gpm  
(0,23 – 6,81 m³/hr)

### MINIMUM PRESSURE:

10 psi (0,7 bar)

### MAXIMUM PRESSURE:

150 psi (10,3 bar)

### INPUT:

24V AC

### INRUSH CURRENT:

0.50 amps or less

### HOLDING CURRENT:

0.23 amps

### THREADING:

NPT (7901, 7911)

BSP (7916, 7917)

### DIMENSIONS (l x w x h)

4" (10,2 cm) x 2 3/4" (7 cm) x 5" (12,7 cm)  
(7901, 7911)

3 3/4" (9,5 cm) x 2 3/4" (7 cm) x 5 7/8" (15 cm)  
(7931, 7941)

### # PER BOX:

20

## FEATURES

- Directly compatible with SoloRain® series of battery-operated actuators
- Body and bonnet made of glass reinforced nylon to prevent leaks and breaks
- Simple valve configuration and design; few moving parts
- Solenoid has stainless steel plunger and spring to prevent corrosion
- Manual internal bleed keeps valve box dry
- Bayonet-mounted bonnet with captured diaphragm for quick and easy servicing
- Fabric reinforced diaphragm for increased durability
- Easy-to-use flow control permits manual adjustment of water flow rate (does not apply to models 7901, 7916)
- ACCESSORIES  
7962RW: Reclaimed water solenoid

### 7901 (7916 BSP) & 7911 (7917 BSP) 1" (25,4 mm) Globe Valve

Flow	Pressure Loss	Flow	Pressure Loss	Flow	Pressure Loss
GPM	PSI	L/min	kPa	m³/hr	BAR
1	4.0	3.8	28	0.23	0.3
5	2.5	18.9	17	1.14	0.2
10	2.0	37.9	14	2.27	0.1
15	2.5	56.8	17	3.41	0.2
20	3.5	75.7	24	4.54	0.2
25	4.5	94.6	31	5.68	0.3
30	6.5	113.6	45	6.81	0.5

### 7931 & 7941 1" (25,4 mm) Angle Valve

Flow	Pressure Loss	Flow	Pressure Loss	Flow	Pressure Loss
GPM	PSI	L/min	kPa	m³/hr	BAR
1	4.0	3.8	28	0.23	0.3
5	2.5	18.9	17	1.14	0.2
10	2.0	37.9	14	2.27	0.1
15	2.5	56.8	17	3.41	0.2
20	3.0	75.7	21	4.54	0.2
25	4.0	94.6	28	5.68	0.3
30	5.5	113.6	38	6.81	0.4

### 9501

Manual Internal Bleed 1" (25,4 mm) union globe

### 9501FC

Manual Internal Bleed 1" (25,4 mm) union globe with flow control

### 3/4" Fittings

(19,05 mm)  
9501-075BM  
9501-075BR  
9501-075NF  
9501-075NM  
9501-075S

### 1" Fittings

(25,4 mm)  
9501-100BF  
9501-100BM  
9501-100BR  
9501-100NF  
9501-100NM  
9501-100S

### Accessories

#### 7962

24V AC 50/60 HZ

#### 7962RW

24V AC 50/60 HZ  
Reclaimed water solenoid

#### 9501-100IN

1" (25,4 mm) Isolation Valve

## FEATURES

- Directly compatible with SoloRain® series of battery-operated actuators
- Body and bonnet made of glass reinforced nylon to prevent leaks and breaks
- Manual internal bleed keeps valve box dry
- Bayonet-mounted bonnet with captured diaphragm for quick and easy servicing
- Fabric reinforced diaphragm for increased durability
- Easy-to-use flow control permits manual adjustment of water flow rate (does not apply to model 9501)
- One-piece fully encapsulated glass filled nylon solenoid with a stainless steel plunger
- Plunger is captured with removable retainer for easy cleaning
- High-grade PVC unions located on the inlet and outlet allow maximum versatility of pipe size (3/4" (19,05 mm) and/or 1" (25,4 mm) and numerous combinations. Installation and removal of the valve is a breeze!

9501



9501FC



7962



7962RW



## SPECIFICATIONS

### FLOW RANGE:

Less than 1 to 30 gpm  
(0,23 – 6,81 m³/hr)

### MINIMUM PRESSURE:

10 psi (0,7 bar)

### MAXIMUM PRESSURE:

150 psi (10,3 bar)

### INPUT:

24V AC

### INRUSH CURRENT:

0.50 amps or less

### HOLDING CURRENT:

0.23 amps

### DIMENSIONS (l x w x h)

4 1/2" (10,8 cm) x 3 7/8" (9,8 cm) x  
5 1/8" (13 cm)

### # PER BOX:

20

### Reading model #'s:

**BF=** BSP female fitting

**BM=** BSP male fitting

**BR=** Barb fitting

**NF=** NPT female fitting

**NM=** NPT male fitting

**S=** Slip fitting

### 9501-075 SERIES (3/4" (19,05 mm) FITTINGS)

Flow	Pressure Loss	Flow	Pressure Loss	Flow	Pressure Loss
GPM	PSI	L/min	kPa	m³/hr	BAR
1	2.5	3.8	17	0.23	0.17
5	2.7	18.9	18.6	1.14	0.18
10	3.7	37.9	25.5	2.27	0.25
15	4.5	56.8	31	3.41	0.30
20	5.0	75.7	34.5	4.54	0.34

### 9501-100 SERIES (1" (25,4 mm) FITTINGS)

Flow	Pressure Loss	Flow	Pressure Loss	Flow	Pressure Loss
GPM	PSI	L/min	kPa	m³/hr	BAR
1	3.0	3.8	20.7	0.23	0.20
5	2.7	18.9	18.6	1.14	0.18
10	2.5	37.9	17.3	2.27	0.17
15	2.5	56.8	17.3	3.41	0.17
20	3.5	75.7	24.0	4.54	0.24
25	4.5	94.6	31.0	5.68	0.31
30	6.5	113.6	44.8	6.81	0.44



## VALVES

### 9502

Heavy duty union valve

#### 1 1/2" Fittings

(38,1 mm)  
9502-150N  
9502-150S  
9502-150B

#### 2" Fittings

(50,8 mm)  
9502-200B  
9502-200N  
9502-200S

### Accessories

#### 7962

24V AC 50/60 HZ

#### 7962RW

24V AC 50/60 HZ  
Reclaimed water solenoid

#### 9502-150IN

1 1/2" isolation valve

#### 9502-200IN

2" isolation valve



**Reading model #'s:**  
**N= NPT threading;**  
**S= Slip;**  
**B= BSP threading;**  
**I= Isolation Valve**

### SPECIFICATIONS

#### FLOW RANGE:

20-200 gpm (4,54 – 45,40 m³/hr)

#### MINIMUM PRESSURE:

15 psi (1,03 bar)

#### MAXIMUM PRESSURE:

200 psi (13,8 bar)

#### INPUT:

24V AC

#### INRUSH CURRENT:

0.50 amps or less

#### HOLDING CURRENT:

0.23 amps

#### DIMENSIONS (l x w x h)

7 7/8" (28,3 cm) x 5 1/2" (14 cm) x  
8" (20,3 cm) (globe)

#### BODIES WITH FITTINGS INSTALLED:

11 1/8" (20 cm) x 5 1/2" (14 cm) x  
5" (12,7 cm) (globe)

#### # PER BOX:

4 (valve bodies)  
16 (fittings)  
4 (isolation valves)

- Glass-filled nylon body with eight molded in brass studs, a stainless steel metering rod and high-grade PVC bonnet for heavy-duty applications up to 200 psi (13,8 bar)
- High-grade PVC unions located on the inlet and outlet allow maximum versatility of pipe size (1 1/2" (38,1 mm) and/or 2" (50,8 mm) and fitting combinations (slip and/or threaded). Installation and removal of the valve is a breeze!

#### PRESSURE LOSS

Flow (GPM)	9500 1 1/2" Globe (PSI)	9500 2" Globe (PSI)	Flow (L/min)	9500 1 1/2" Globe (Kpa)	9500 2" Globe (Kpa)	Flow (m³/hr)	9500 1 1/2" Globe (BARS)	9500 2" Globe (BARS)
20	3.0	—	75.7	20.7	—	4.54	.20	—
30	3.5	—	113.5	24.2	—	6.81	.24	—
40	3.7	—	151.4	25.5	—	9.08	.25	—
50	3.9	2.9	189.3	26.9	20.1	11.35	.27	.20
60	4.0	3.0	227.1	27.6	20.7	13.62	.28	.21
80	5.0	3.5	302.8	34.5	24.2	18.16	.34	.24
100	6.0	4.2	378.5	41.4	28.9	22.70	.41	.29
120	8.0	6.5	454.2	55.2	44.9	27.40	.55	.45
140	10.0	8.2	529.9	69.0	56.6	31.78	.69	.56
160	—	11.0	605.6	—	75.9	36.32	—	.75
180	—	11.5	681.3	—	79.3	40.86	—	.79
200	—	16.5	757.0	—	113.8	45.40	—	1.14

### 9515NC\*, 9515BC\*

1 1/2" (38,1 mm) Globe  
or Angle Valve

### 9520NC\*, 9520BC\*

2" (50,8 mm) Globe  
or Angle Valve

\*NC = NPT Conventional

\*BC = BSP Conventional

### Accessories

#### 7962

24V AC 50/60 HZ

#### 7962RW

24V AC 50/60 HZ  
Reclaimed water solenoid



### SPECIFICATIONS

#### FLOW RANGE:

9515: 15-150 gpm (3,40 – 34,07 m³/hr)

9520: 15-200 gpm (3,40 – 45,42 m³/hr)

#### MINIMUM PRESSURE:

15 psi (1,03 bar)

#### MAXIMUM PRESSURE:

200 psi (13,8 bar)

#### INPUT:

24V AC

#### INRUSH CURRENT:

0.50 amps or less

#### HOLDING CURRENT:

0.23 amps

#### DIMENSIONS (l x w x h)

6 3/4" (17,1 cm) x 5 1/2" (14 cm) x  
8" (20,3 cm) (9515 with plug)  
6 3/4" (17,1 cm) x 5 1/2" (14 cm) x  
8 1/2" (21,6 cm) (9520)

#### # PER BOX:

4

### FEATURES

- Directly compatible with SoloRain® series of battery-operated actuators
- Manual internal bleed is easy to operate – just twist the solenoid
- Flow Control, standard on all valves, allows adjustment of water flow when needed
- One-piece fully encapsulated glass-filled nylon solenoid with a stainless steel plunger. Plunger is captured with removable retainer for easy cleaning
- Manual bleed by rotating solenoid approximately 3/4 of a turn counter clockwise
- Eight stainless steel 1/2" (12,7 mm) nuts grip into bonnet for extreme and fluctuating climatic conditions
- One-piece fabric reinforced diaphragm for increased durability
- 200 psi (13,8 bar) rated valve for heavy-duty applications
- Glass-filled nylon body with eight molded in brass studs, a stainless steel metering rod and high-grade PVC bonnet

#### PRESSURE LOSS

Flow (GPM)	9515NC 1 1/2" Globe	9515NC 1 1/2" Angle	9520NC 2" Globe	9520NC 2" Angle	Flow (m³/hr)	9515BC 1 1/2" Globe	9515BC 1 1/2" Angle	9520BC 2" Globe	9520BC 2" Angle
15	3.0	2.8	—	—	3.40	20.7	19.3	—	—
20	3.0	2.8	—	—	4.54	20.7	19.3	—	—
30	3.5	3.0	—	—	6.81	24.2	20.7	—	—
40	3.7	3.2	—	—	9.08	25.5	22.0	—	—
50	3.9	3.4	2.9	1.9	11.36	26.9	23.5	20.1	13.1
60	4.0	3.7	3.0	2.3	13.63	27.6	25.5	20.7	15.8
80	5.0	4.1	3.5	2.5	18.17	34.5	28.3	24.2	17.2
100	6.0	4.5	4.2	3.1	22.71	41.4	31.1	28.9	21.3
120	8.0	6.0	6.5	3.8	27.25	55.2	41.4	44.9	26.2
140	10.0	7.0	8.2	4.9	31.79	69.0	48.3	56.6	33.8
160	—	—	11.0	5.5	36.34	—	—	75.9	37.9
180	—	—	11.5	5.8	40.80	—	—	79.3	46.9
200	—	—	16.5	8.2	45.42	—	—	113.8	56.5

# QUICK COUPLING VALVES

## Quick Coupling Keys

### 7640

Quick Coupling Key 3/4"

### 7641

Quick Coupling Key 1"

## Quick Coupling Valves 1"

### 7642

Quick Coupling Valve with Yellow Non-Locking Cover 1" NPT (25,4 mm)

### 7642B

Quick Coupling Valve with Yellow Non-Locking Cover 1" BSP (25,4 mm)

### 7643

Quick Coupling Valve with Yellow Locking Cover 1" NPT (25,4 mm)

### 7643B

Quick Coupling Valve with Yellow Locking Cover 1" BSP (25,4 mm)

### 7644

Quick Coupling Valve with Lavender Non-Locking Cover 1" NPT (25,4 mm)

### 7644B

Quick Coupling Valve with Lavender Non-Locking Cover 1" BSP (25,4 mm)

### 7645

Quick Coupling Valve with Lavender Locking Cover 1" NPT (25,4 mm)

### 7645B

Quick Coupling Valve with Lavender Locking Cover 1" BSP (25,4 mm)

7640



7643



7645



## FEATURES

Signature quick coupling valves and keys use Acme® threads for slow and steady flow control instead of immediate on/off. All models feature rubber cover. Optional locking cover available. Optional lavender rubber cover identifies reclaimed water site – molded in "RECLAIMED WATER - DO NOT DRINK": in English and Spanish.



Acme® threads provide convenient flow control

## QUICK COUPLING KEYS

Model	For Valve Models	ENGLISH			METRIC		
		Thread Size		Height	Thread Size		Height
7640	All models	3/4"	1/2"	5 1/4"	25,4 mm	19,05 mm	13,3 cm
7641	All models	1"	3/4"	5 1/4"	19,05 mm	12,7 mm	13,3 cm

## QUICK COUPLING VALVES

Quick Coupler Model	Rubber Cover	Locking Cover	Warning Cover	ENGLISH			METRIC		
				Max Capacity GPM	Bottom Pipe Thread	Overall Height	Max Capacity l/m	Bottom Pipe Thread	Overall Height
7642 & B	•			20	1"	3 3/4"	75,7	25,4mm	9,5 cm
7643 & B	•	•		20	1"	3 3/4"	75,7	25,4mm	9,5 cm
7644 & B	•		•	20	1"	3 3/4"	75,7	25,4mm	9,5 cm
7645 & B	•	•	•	20	1"	3 3/4"	75,7	25,4mm	9,5 cm

## Swivel ells

### 8810

3/4" (19,05 mm) FPT x 3/4" (19,05 mm) GHT

### 8811

1" (25,4 mm) FPT x 3/4" (19,05 mm) GHT

### 8812

1" (25,4 mm) FPT x 1" (25,4 mm) GHT

8010



### 8819

Brass automatic drain valve I

8819



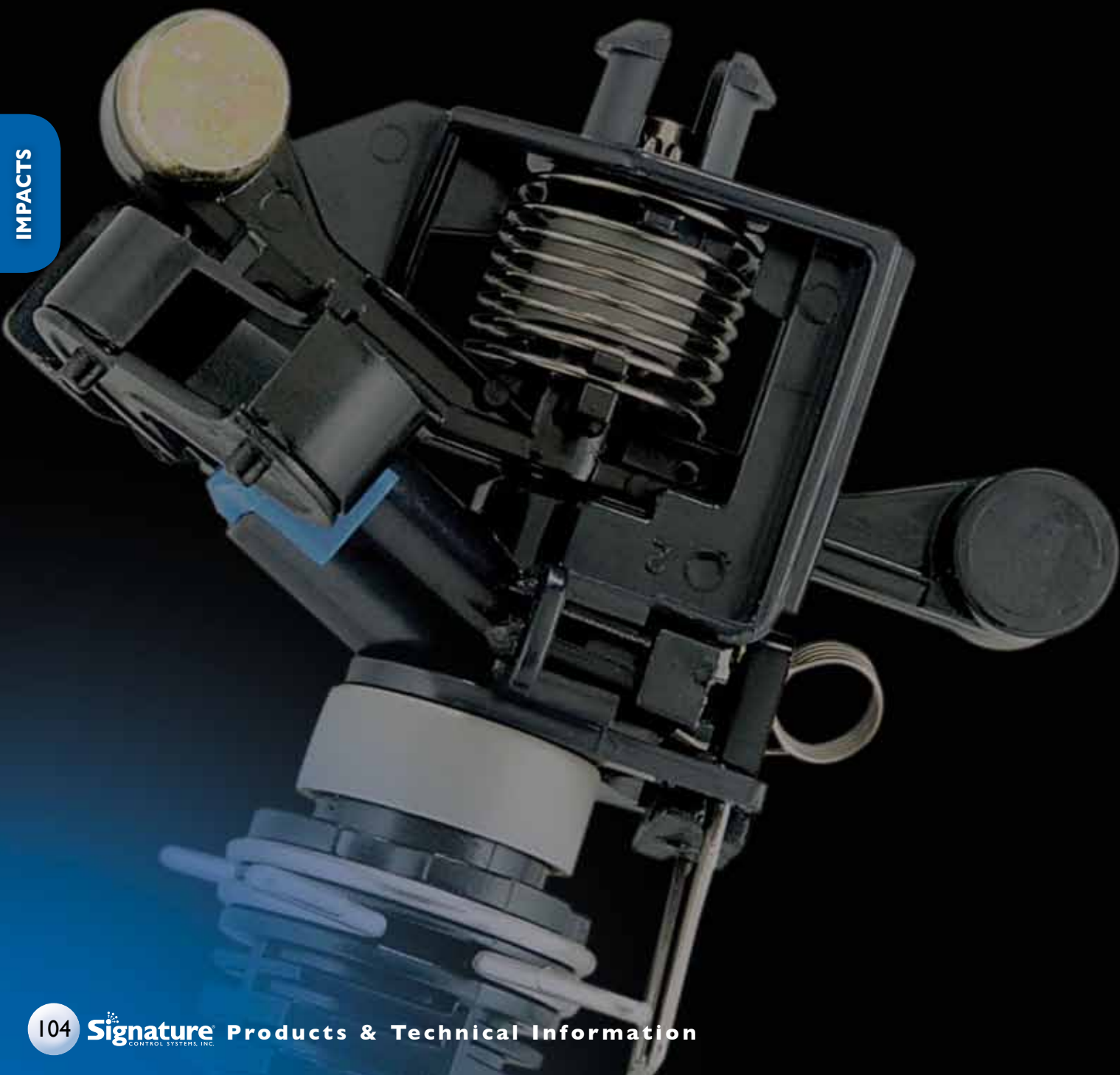
## FEATURES

### 8819 Specific:

- Prevents underground line breakage due to freezing
- Solid brass body
- Automatically opens when line pressure drops below three psi
- 1/2" male threads
- 5 year warranty on materials and workmanship



IMPACTS



IMPACTS

APPLICATIONS	6700	1370	1973
RADIUS 40' (12,2 M)	✓	✓	✓
1/2" (1,27 CM) INLET			✓
DUAL 1/2" (1,27 CM) & 3/4"(1,9 CM) INLET	✓		
1/2" (1,27 CM) MALE THREADS			✓
RESIDENTIAL	✓	✓	
NURSERIES	✓	✓	✓
COMMERCIAL/MUNICIPAL	✓	✓	
HIGH VANDALISM AREAS	✓		
LOW PRESSURE SYSTEMS	✓	✓	✓
RISER MOUNTED		✓	✓
GROUND COVER/SHRUBS	✓	✓	
RECLAIMED WATER	✓	✓	✓
SLOPES	✓	✓	

IMPACTS





## PRODUCT OVERVIEW

### 6700



- Includes seven color coded nozzles.
- Combination 1/2" (1,27 cm) & 3/4" (1,9 cm) inlet.
- Adjustable from 20° - 360°.
- Spacing from 23' – 43' (7 m – 13 m) with a flow rate of 1.5 – 6.3 gpm (5,68 – 23,85 l/min).

### 1370

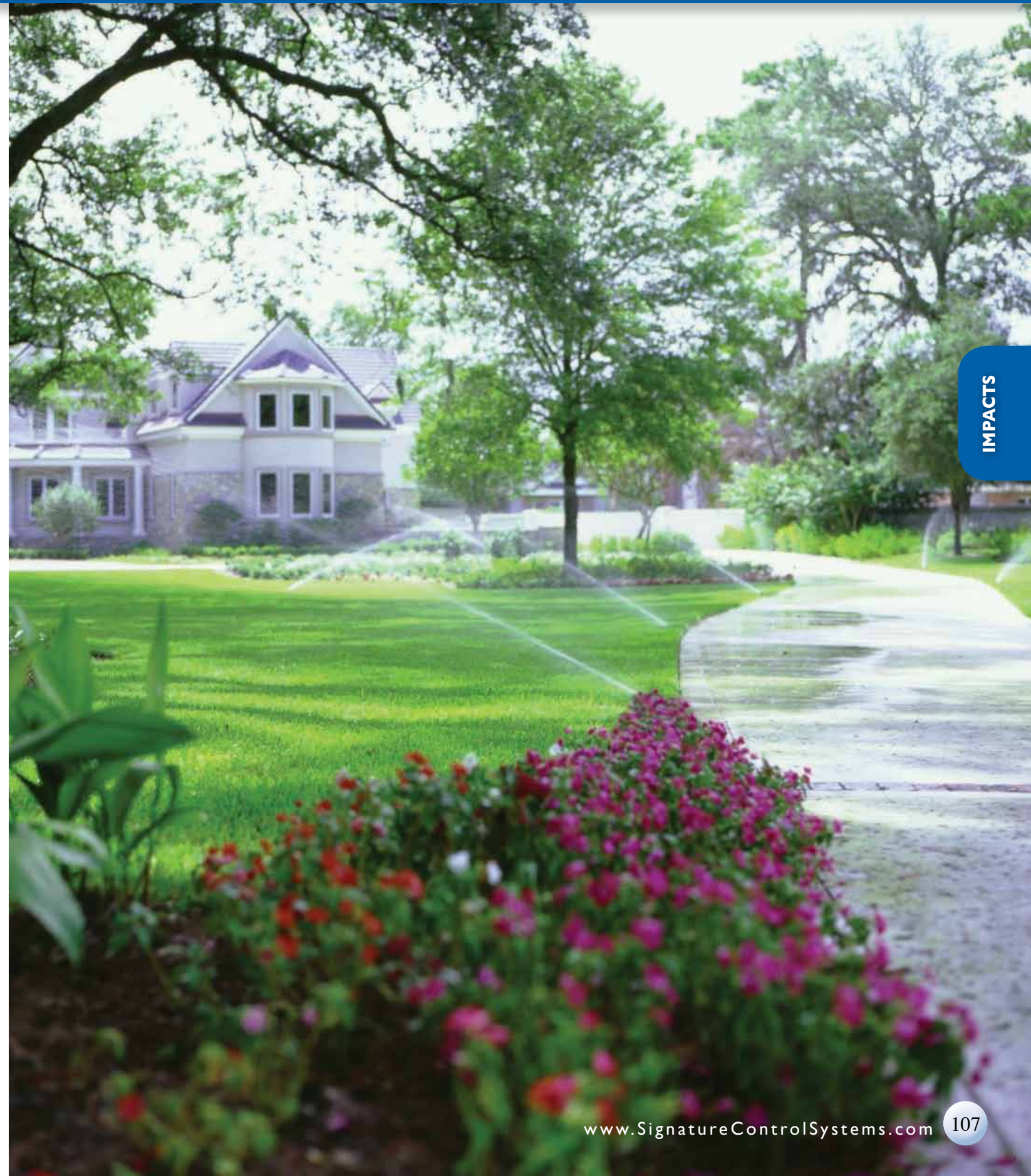


- Perfect for mounting on risers installs.
- Features 1/2" (1,27 cm) male threads.
- Includes five color coded nozzles.
- Adjustable from 20° - 360°.
- Spacing from 23' – 43' (7 m – 13 m) with a flow rate of 1.5 – 6.3 gpm (5,68 – 23,85 l/min).

### 1973



- Ideal for riser installs in planting areas.
- 1/2" (1,27 cm) female threads.
- 40' (12,2 m) diameter coverage.
- 3.4 – 4.4 gpm (12,8 – 16,6 l/min) flow.





## IMPACTS

**6700**

Pro Impact

**Accessories****6701**

Lavender Cover

**8601**

Wrench

**8820**

Anti Drain Valve (ADV)

**NOZZLE COLOR CODES**

<b>Red</b>	<b>6</b>	<b>Beige</b>	<b>12</b>
<b>Black</b>	<b>7</b>	<b>Black</b>	<b>7LA</b>
<b>Blue</b>	<b>8</b>	<b>Yellow</b>	<b>10LA</b>
<b>Yellow</b>	<b>10</b>		

**NOZZLE PERFORMANCE CHARTS FOR 6700 and 1370****ENGLISH**

Pressure	Nozzle	Radius	Flow	Precipitation Rate <sup>1</sup>
PSI		FT	GPM	IN/HR ■ IN/HR ▲
25	6	34	1.5	0.25 0.29
	07 LA	36	2.2	0.33 0.38
	7	37	2.1	0.30 0.34
	8	38	2.4	0.32 0.37
	10 LA	23	3.1	1.13 1.30
	10	33	3	0.53 0.61
35	12	32	4	0.75 0.87
	6	38	1.8	0.24 0.28
	07 LA	37	2.7	0.38 0.44
	7	39	2.4	0.30 0.35
	8	40	2.9	0.35 0.40
	10 LA	25	3.6	1.11 1.28
45	10	34	3.6	0.60 0.69
	12	37	5	0.70 0.81
	6	38	2.1	0.28 0.32
	07 LA	39	3	0.38 0.44
	7	39	2.8	0.35 0.41
	8	40	3.2	0.39 0.44
55	10 LA	27	4.2	1.11 1.28
	10	34	4.1	0.68 0.79
	12	39	5.7	0.72 0.83
	6	38	2.4	0.32 0.37
	07 LA	40	3.4	0.41 0.47
	7	41	3	0.34 0.40
60	8	41	3.7	0.42 0.49
	10 LA	27	4.6	1.22 1.40
	10	34	4.6	0.77 0.88
	12	43	6.3	0.66 0.76
	6	38	2.5	0.33 0.39
	07 LA	41	3.5	0.40 0.46

**METRIC**

Pressure	Nozzle	Radius	Flow	Precipitation Rate <sup>1</sup>
BAR		m	L/min	mm/HR ■ mm/HR ▲
1.72	6	10.36	5.68	3.17 3.66
	07 LA	10.97	8.33	4.15 4.79
	7	11.28	7.95	3.75 4.33
	8	11.58	9.08	4.06 4.69
	10 LA	7.01	11.73	14.33 16.54
	10	10.06	11.36	6.73 7.78
2.41	12	9.75	15.14	9.55 11.03
	6	11.58	6.81	3.05 3.52
	07 LA	11.28	10.22	4.82 5.57
	7	11.89	9.08	3.86 4.45
	8	12.19	10.98	4.43 5.12
	10 LA	7.62	13.63	14.08 16.26
3.10	10	10.36	13.63	7.61 8.79
	12	11.28	18.93	8.93 10.31
	6	11.58	7.95	3.56 4.11
	07 LA	11.89	11.36	4.82 5.57
	7	11.89	10.60	4.50 5.20
	8	12.19	12.11	4.89 5.65
3.79	10 LA	8.23	15.90	14.08 16.26
	10	10.36	15.52	8.67 10.01
	12	11.89	21.58	9.16 10.58
	6	11.58	9.08	4.06 4.69
	07 LA	12.19	12.87	5.19 6.00
	7	12.50	11.36	4.36 5.04
4.14	8	12.50	14.01	5.38 6.21
	10 LA	8.23	17.41	15.43 17.81
	10	10.36	17.41	9.73 11.23
	12	13.11	23.85	8.33 9.62
	6	11.58	9.46	4.23 4.89
	07 LA	12.50	13.25	5.09 5.88

<sup>1</sup> Precipitation rates for square and triangular spacing calculated at 50% of diameter for half-circle operation. Assumes zero wind for precipitation and radius. Adjust for local conditions.

**SPECIFICATIONS****OPERATING RANGE:**

25-60 psi

**OPTIMUM PRESSURE:**

40 psi

**MAXIMUM PRESSURE:**

60 psi

**PART-CIRCLE RANGE:**

20° - 340°

**POP-UP HEIGHT:**

3" (7,6 cm)

**BODY HEIGHT:**

9 1/4" (23,5 cm)

**BOTTOM INLET SIZE:**

1/2" and 3/4" (1,27 cm and 1,9 cm)

**SIDE INLET SIZE:**

1/2" (1,27 cm)

**TOP DIAMETER:**

5" (12,7 cm)

**# PER BOX:**

20

**FEATURES**

- Includes seven easily interchangeable, color-coded nozzles and 2 low-angle nozzles.
- No tool is required to change nozzles.
- Heavy-duty plastic case with sturdy, reinforced ribbed design.
- Double-weighted arm for slower rotation and increased distance of throw.
- Powerful reverse action.
- Adjustable arm spring for low-pressure and low-gallonage operation.
- Full-circle or adjustable arc 20° to 340°.
- Distance controller diffuser pin.
- Multi-function, pressure-activated wiper seal.
- Inlet filter screen.
- Combination 1/2" (1,27 cm) or 3/4" (1,9 cm) bottom inlet
- Side inlet 1/2" (1,27 cm)
- Serviceable through the top of the case.

**1370 & 1973****1370**

Adjustable Beta head with 1/2" (1,27 cm) bearing

**1973**

Whiz Head rotary sprinkler

**ENGLISH**

WHIZ HEAD®	Pressure age (psi)	Flow (gpm)	Cover-Dia. (ft)
	30	3.4	40
	40	3.9	40
	50	4.4	40

**METRIC**

WHIZ HEAD®	Pressure age (bar)	Flow (l/min)	Cover-Dia. (m)
	2	12,8	12,2
	2,7	14,7	12,2
	3,5	16,6	12,2

**FEATURES****1370**

Beta impact spray heads provide outstanding performance at an affordable price. Made with high impact plastic, they are durable, keeping maintenance to a minimum.

- Includes five easily interchangeable, color-coded nozzles and 2 low-angle nozzles.
- No tool is required to change nozzles.
- 1/2" (1,27 cm) male threads
- Non-clog nozzle and straight-through flow design
- Sealed bearing keeps dirt and debris out
- Anti-backsplash arm keeps water off buildings
- Adjust pattern and spray with diffuser pin and exclusive Click-Set® trip collars
- Use 1370's for riser installations
- Diffuser pin maintains set spray pattern adjustment

**1973**

- Ideal for riser installations in planting areas
- 1/2" (1,27 cm) female threaded inlet
- Made of high-impact corrosion resistant plastic
- Stainless steel bearing and large orifice nozzle



# SENSORS

SENSORS



## PRODUCT OVERVIEW

### RAIN SWITCH 8501



- Easily installs on any Galaxy or Constellation satellite.
- Includes 25 ft (7,6 m) of 20 AWG two-conductor wire.
- Maintenance-free patented sensing mechanism.
- Automatically shuts off and starts irrigation based on local parameters.

SENSORS

### SOIL SENSOR ANALOG ACAS1 ACANSC



- Easily installs on any Galaxy or Constellation satellite.
- Includes 10 ft (3 m) of 20 AWG two-conductor wire.
- Maintenance-free patented sensing mechanism.
- Automatically shuts off and starts irrigation based on local parameters.
- Tough polycarbonate construction for direct burial
- 4-20 mA Sensing board required (sold separately).

### SOIL SENSOR NETWORK ACNS1 ACNS2 ACNS3 ACNS4 ACNS5 ACNS6 ACNS7



- Easily installs on any Galaxy or Constellation satellite (Firmware v6.00+).
- Includes 10 ft (3 m) of 20 AWG two-conductor wire.
- Maintenance-free patented sensing mechanism.
- Automatically shuts off and starts irrigation based on local parameters.
- Tough polycarbonate construction for direct burial.
- Variety of sensing programming parameters

## SENSORS

### Rain Switch

**8501**

Rain-Trip®

#### FEATURES

- Unit ready for bracket mount or 1/2" (12,7 mm) conduit/pipe thread mount at bottom
- Adjusts easily from 1/8" (3,2 mm) to 1" (25,4 mm) rainfall
- Compatible with most controller brands (Ready for normally-closed or normally-open hookup)
- Supplied with 25 (7,6 m) ft of hookup wire
- Saves unneeded watering
- Designed to be used with low voltage irrigation systems only

#### SPECIFICATIONS



### Soil Sensor:- Network

**ACNS1**

Soil Moisture Sensor

**ACNS2**

Soil EC (Electrical Conductivity) Sensor

**ACNS3**

Soil Temperature Sensor

**ACNS4**

Soil Wetted Front Sensor

**ACNS5**

Soil Moisture, Soil EC

**ACNS6**

Soil Moisture, EC, Temperature

**ACNS7**

Soil Moisture, EC, Temp & Wetted Front Sensor



### Soil Sensor:- Analog

**ACAS1**

Soil Moisture Sensor  
Analog Output

**ACANS1**

Sensor Card  
(required for 4-20mA  
linear sensors)

(not shown)

#### FEATURES

- Provides linear measure of soil moisture content
- Works on any Constellation® firmware



#### FEATURES

- Can broadcast up to four outputs (soil moisture, EC, soil temperature and wetted front) across the network and trigger any program on any controller in the network to either start or stop based on adjustable targets set in a program for any of the four sensor outputs
- The firmware allows for the selection of any one output or a combination of the four outputs in one sensor
- The firmware can be upgraded from the controller without having to dig up the sensor
- Each controller can have a maximum of 2 1,000 ft runs of 18 AWG 4 conductor / 2 pair wire connecting up to 15 sensors
- Up to 999 controllers and/or sensors on one network
- The PRO-sense design makes it easy to install with little or no soil or root disruption

#### Note:

Constellation Firmware v6.00 or higher required



ACCESSORIES

# ACCESSORIES



APPLICATIONS	HOT SHOT™	COOL SHOT™	FAN SHOT™	WETTING AGENT™	THE GUZZLER™	HOSE HEAD™
TURF GRASS	✓	✓	✓	✓	✓	✓
ORNAMENTALS	✓	✓	✓	✓	✓	✓
GROUND COVER	✓	✓	✓	✓	✓	✓
RESIDENTIAL	✓	✓	✓	✓	✓	✓
RECLAIMED WATER	✓	✓	✓	✓	✓	✓
COMMERCIAL/MUNICIPAL	✓	✓	✓	✓	✓	✓

ACCESSORIES



## PRODUCT OVERVIEW

ACCESSORIES

### Hot Shot™



- Available in both 3/4" and 1" hose thread sizes
- The multi-pattern nozzle is great for jet cleaning equipment to soaking delicate plant material
- Heavy duty aluminum construction
- Lavender nozzles available for non-potable water applications

### Cool Shot™



- Available in both 3/4" and 1" hose thread sizes
- Provides heavy shower for soaking or heavy irrigating
- Cool Shot Plus includes regulator with on – off control
- Heavy duty aluminum or plastic version available
- Lavender nozzles available for non-potable water applications

### Fan Shot™



- Available in both 3/4" and 1" hose thread sizes
- Fan Shot Plus includes regulator with on – off control
- Economical High impact plastic construction
- Multiple nozzles available for various pressures

### Wetting Agent Applicator



- Perfect for applying wetting agents or fertilizers
- Available in both 3/4" and 1" hose thread sizes
- Can be installed at the beginning or end of your hose
- Available with the Cool Shot nozzle
- Economical High impact plastic construction

### Hose Head™



- Turns many sprinkler heads into a hose bib with a 360° swivel
- Includes both 3/4" and 1" hose thread fittings
- Adapts from Hunter G60, G70 & G90
- Adapts from Rain Bird eagle 700 & 900 series
- Adapts from Toro 630, 680, 750, 780, 850, & 880 series
- Adapts from Signature D50 & D70 series
- Adapts from Signature 280 Series

ACCESSORIES



## HOSE END

ACCESSORIES

### **DNO75HSM**

HotShot™ Multi-Pattern Hose Nozzle  
3/4" Hose Thread

### **DNO75HSMP**

HotShot™ Multi-Pattern Hose Nozzle  
3/4" Hose Thread (Lavender)

### **DN100HSM**

HotShot™ Multi-Pattern Hose Nozzle  
1" Hose Thread

### **DN100HSMP**

HotShot™ Multi-Pattern Nozzle  
1" Hose Thread (Lavender)

### **DNO75CS**

CoolShot™ Shower-Pattern Hose Nozzle  
3/4" Hose Thread

### **DNO75CSL**

CoolShot™ Shower-Pattern Hose Nozzle  
3/4" Hose Thread (Lavender)

### **DN100CS**

CoolShot™ Shower-Pattern Hose Nozzle  
1" Hose Thread

### **DN100CSL**

CoolShot™ Shower-Pattern Hose Nozzle  
1" Hose Thread (Lavender)

### **DNO75CSP**

CoolShot™ Plus Shower-Pattern Hose Nozzle  
3/4" Hose Thread

### **DNO75CSPL**

CoolShot™ Plus Shower-Pattern Hose Nozzle  
3/4" Hose Thread (Lavender)

### **DN100CSP**

CoolShot™ Plus Shower-Pattern Hose Nozzle  
1" Hose Thread

### **DN100CSPL**

CoolShot™ Plus Shower-Pattern Hose Nozzle  
1" Hose Thread (Lavender)

### **DNO75CSPE**

CoolShot™ Plus Economy Shower-Pattern  
Hose Nozzle, 3/4" Hose Thread

### **DN100CSPE**

CoolShot™ Plus Economy Shower-Pattern  
Hose Nozzle, 1" Hose Thread (Lavender)



## HOT SHOT™ FEATURES

### **Hot Shot™ with Regulator**

#### **Multi Pattern Nozzle**

If you could only have one nozzle, this would be it. This heavy duty Hot Shot™ sprays hot spots, jet cleans equipment and soaks even the most delicate plant material. The Hot Shot™ is available with a lavender nozzle for use in non-potable applications. The hot shot is available in both 3/4" and 1" hose threads.



## COOL SHOT™ FEATURES

### **Cool Shot™ and Cool Shot™ Plus**

#### **Shower Head Nozzles**

The Cool Shot™ families of nozzles are available in three varieties, the standard Cool Shot™, the Cool Shot™ Plus, and the Cool Shot™ Plus Economy. The Cool Shot's™ shower pattern is perfect for soaking or heavy watering of all types of plant material. The Cool Shot™ Plus with regulator includes on – off flow control and the Cool Shot™ Plus Economy gives you all the same great features while taking advantage of the cost saving plastic construction. All Cool Shot™ nozzles are available in both 3/4" and 1" sizes. All Cool Shot™ nozzles can be ordered with the lavender non-potable water nozzles preinstalled.

### **DN075FS10**

FanShot™ Nozzle, 10 GPM  
Yellow Nozzle, 3/4" Hose Thread

### **DN075FS20**

FanShot™ Nozzle, 20 GPM  
Red Nozzle, 3/4" Hose Thread

### **DN075FS30**

FanShot™ Nozzle, 30 GPM  
Blue Nozzle, 3/4" Hose Thread

### **DN100FS10**

FanShot™ Nozzle, 10 GPM  
Yellow Nozzle, 1" Hose Thread

### **DN100FS20**

FanShot™ Nozzle, 20 GPM  
Red Nozzle, 1" Hose Thread

### **DN100FS30**

FanShot™ Nozzle, 30 GPM  
Blue Nozzle, 1" Hose Thread

### **DN100FSP10**

FanShot™ Plus with 10 GPM  
Yellow Nozzle, 1" Hose Thread

### **DN100FSP20**

FanShot™ Plus with 20 GPM  
Red Nozzle, 1" Hose Thread

### **DN100FSP30**

FanShot™ Plus with 30 GPM  
Blue Nozzle, 1" Hose Thread

### **D075APL**

Wetting Agent Applicator  
3/4" Hose inlet — 3/4" outlet

### **D100APL**

Wetting Agent Applicator  
1" Hose inlet — 1" outlet

### **D075APLCS**

Wetting Agent Applicator  
3/4" Hose inlet — 3/4" outlet with  
CoolShot™ Nozzle

### **D100APLCS**

Wetting Agent Applicator  
1" Hose inlet — 1" outlet with  
CoolShot™ Nozzle

### **SN100G**

The Guzzler™ High Suction Hand Pump



**Wetting  
Agent  
Applicator**



**Hose Head™**



### **Fan Shot™ and Fan Shot™ Plus**

The Fan Shot is a slotted fan spray nozzle designed for various flows both with and without regulators. The Fan Shot is available in 3/4" and 1" models. All of the color coded nozzles can be purchased on regulated or non-regulated bodies, individually or in a combo kit. Blue = 30 gpm, Red = 20 gpm, Yellow = 10 gpm.

### **Wetting Agent Applicator**

Apply your costly wetting agents or fertilizers evenly and efficiently. This on-off, variable flow control unit connects easily to the beginning or end of your 3/4" and 1" hose. It's also available with a factory installed Cool Shot Nozzle.

### **Hose Head All-In-One Hose Adapter & Swivel**

The Hose Head adaptor is a quick and easy way to convert a standard Rotor into a 360° swiveling hose bib. The Hose Head adapter will allow you to connect a standard 1" or 3/4" hose to many Rain Bird, Hunter, Toro and John Deere rotors. Simply remove the internal assembly, install the Hose Head and you're set. Each Hose head comes with both 3/4" and 1" fittings. The Hose Head will work with: Rain Bird Eagle 700 900 series, Hunter G60 G70 G800 series, Toro 630 650 660 680 730 750 760 780 830 850 860 880 series, Signature D50 D55 D70 D75 series and Signature 280 series.

### **D100HA**

Valve-in-Head Hose Adapter & Swivel  
for 286/287 Series & Toro 650, 680,  
750, 780, 850, 880

### **D150HA**

Valve-in-Head Hose Adapter & Swivel  
for 288/289 Series & Toro 650, 680,  
750, 780, 850, 880

### **D70HHA**

Valve-in-Head Hose Adapter & Swivel  
for Hunter G60/70 Series

### **D90HHA**

Valve-in-Head Hose Adapter & Swivel  
for Hunter G90 Series

### **D800HHA**

Valve-in-Head Hose Adapter & Swivel  
for Hunter G800 Series

### **D700RHA**

Valve-in-Head Hose Adapter & Swivel  
for Eagle 700/750 Series

### **D900RHA**

Valve-in-Head Hose Adapter & Swivel  
for Eagle 900/950 Series

TECHNICAL

FRICTION LOSS CHARACTERISTICS

PVC SCHEDULE 40 IPS PLASTIC PIPE

(1120, 1220) C = 150  
PSI LOSS PER 100 FEET OF TUBE (PSI/100 FT)

Velocity of flow values are computed from the general equation:  
$$V = .408 \frac{Q}{d^2}$$

Friction pressure loss values are computed from the equation:  
$$h_f = 0.2083 \left( \frac{100}{C} \right)^{1.852} \frac{Q^{1.852}}{d^{4.966}}$$

SIZE OD ID WALL THK	Sizes 1/2" thru 6"																				
	1/2"		3/4"		1"		1 1/4"		1 1/2"		2"		2 1/2"		3"		4"		6"		
	0.840 0.622 0.109		1.050 0.824 0.113		1.315 1.049 0.133		1.660 1.380 0.140		1.900 1.610 0.145		2.375 2.067 0.154		2.875 2.469 0.203		3.500 3.068 0.216		4.500 4.026 0.237		6.625 6.065 0.280		
Flow G.P.M.	Velocity F.P.S.	P.S.I. Loss	Velocity F.P.S.	P.S.I. Loss	Velocity F.P.S.	P.S.I. Loss	Velocity F.P.S.	P.S.I. Loss	Velocity F.P.S.	P.S.I. Loss	Velocity F.P.S.	P.S.I. Loss	Velocity F.P.S.	P.S.I. Loss	Velocity F.P.S.	P.S.I. Loss	Velocity F.P.S.	P.S.I. Loss	Velocity F.P.S.	P.S.I. Loss	
1	1.05	0.43	0.60	0.11	0.37	0.03	0.21	0.01	0.15	0.00											
2	2.11	1.55	1.20	0.39	0.74	0.12	0.42	0.03	0.31	0.02	0.19	0.00									
3	3.16	3.28	1.80	0.84	1.11	0.26	0.64	0.07	0.47	0.03	0.28	0.01	0.20	0.00							
4	4.22	5.60	2.40	1.42	1.48	0.44	0.85	0.12	0.62	0.05	0.38	0.02	0.26	0.01							
5	5.27	8.46	3.00	2.15	1.85	0.66	1.07	0.18	0.78	0.08	0.47	0.02	0.33	0.01	0.21	0.00					
6	6.33	11.86	3.60	3.02	2.22	0.93	1.28	0.25	0.94	0.12	0.57	0.03	0.40	0.01	0.26	0.01					
7	7.38	15.77	4.20	4.01	2.59	1.24	1.49	0.33	1.10	0.15	0.66	0.05	0.46	0.02	0.30	0.01					
8	8.44	20.20	4.80	5.14	2.96	1.59	1.71	0.42	1.25	0.20	0.76	0.06	0.53	0.02	0.34	0.01					
9	9.49	25.12	5.40	6.39	3.33	1.97	1.92	0.52	1.41	0.25	0.85	0.07	0.60	0.03	0.39	0.01					
10	10.55	30.54	6.00	7.77	3.70	2.40	2.14	0.63	1.57	0.30	0.95	0.09	0.66	0.04	0.43	0.01					
11	11.60	36.43	6.60	9.27	4.07	2.86	2.35	0.75	1.73	0.36	1.05	0.11	0.73	0.04	0.47	0.02					
12	12.65	42.80	7.21	10.89	4.44	3.36	2.57	0.89	1.88	0.42	1.14	0.12	0.80	0.05	0.52	0.02	0.30	0.00			
14	14.76	56.94	8.41	14.48	5.19	4.47	2.99	1.18	2.20	0.56	1.33	0.17	0.93	0.07	0.60	0.02	0.35	0.01			
16	16.87	72.92	9.61	18.55	5.93	5.73	3.42	1.51	2.51	0.71	1.52	0.21	1.07	0.09	0.69	0.03	0.40	0.01			
18	18.98	90.69	10.81	23.07	6.67	7.13	3.85	1.88	2.83	0.89	1.71	0.26	1.20	0.11	0.78	0.04	0.45	0.01			
20	21.09	110.23	12.01	28.04	7.41	8.66	4.28	2.28	3.14	1.08	1.90	0.32	1.33	0.13	0.86	0.05	0.50	0.01			
22			13.21	33.45	8.15	10.33	4.71	2.72	3.46	1.29	2.10	0.38	1.47	0.16	0.95	0.06	0.55	0.01			
24			14.42	39.30	8.89	12.14	5.14	3.20	3.77	1.51	2.29	0.45	1.60	0.19	1.04	0.07	0.60	0.02			
26			15.62	45.58	9.64	14.08	5.57	3.17	4.09	1.75	2.48	0.52	1.74	0.22	1.12	0.08	0.65	0.02			
28			16.82	52.28	10.38	16.15	5.99	4.25	4.40	2.01	2.67	0.60	1.87	0.25	1.21	0.09	0.70	0.02			
30			18.02	59.41	11.12	18.35	6.42	4.83	4.72	2.28	2.86	0.68	2.00	0.29	1.30	0.10	0.75	0.03			
35					12.97	24.42	7.49	6.43	5.50	3.04	3.34	0.90	2.34	0.38	1.51	0.13	0.88	0.04	0.38	0.00	
40					14.83	31.27	8.56	8.23	6.29	3.89	3.81	1.15	2.67	0.49	1.73	0.17	1.00	0.04	0.44	0.01	
45					16.68	38.89	9.64	10.24	7.08	4.84	4.29	1.43	3.01	0.60	1.95	0.21	1.13	0.06	0.49	0.01	
50					18.53	47.27	10.71	12.45	7.87	5.88	4.77	1.74	3.34	0.73	2.16	0.26	1.25	0.07	0.55	0.01	
55							11.78	14.85	8.65	7.01	5.25	2.08	3.68	0.88	2.38	0.30	1.38	0.08	0.61	0.01	
60							12.85	17.45	9.44	8.24	5.72	2.44	4.01	1.03	2.60	0.36	1.51	0.10	0.66	0.01	
65							13.92	20.23	10.23	9.56	6.20	2.83	4.35	1.19	2.81	0.41	1.63	0.11	0.72	0.02	
70							14.99	23.21	11.01	10.96	6.68	3.25	4.68	1.37	3.03	0.48	1.76	0.13	0.77	0.02	
75							16.06	26.37	11.80	12.46	7.16	3.69	5.01	1.56	3.25	0.54	1.88	0.14	0.83	0.02	
80							17.13	29.72	12.59	14.04	7.63	4.16	5.35	1.75	3.46	0.61	2.01	0.16	0.88	0.02	
85							18.21	33.26	13.37	15.71	8.11	4.66	5.68	1.96	3.68	0.68	2.13	0.18	0.94	0.02	
90							19.28	36.97	14.16	17.46	8.59	5.18	6.02	2.18	3.90	0.76	2.26	0.20	0.99	0.03	
95									14.95	19.30	9.07	5.72	6.35	2.41	4.11	0.84	2.39	0.22	1.05	0.03	
00									15.74	21.22	9.54	6.29	6.69	2.65	4.33	0.92	2.51	0.25	1.10	0.03	
110									17.31	25.32	10.50	7.51	7.36	3.16	4.76	1.10	2.76	0.29	1.22	0.04	
120									18.88	29.75	11.45	8.82	8.03	3.72	5.20	1.29	3.02	0.34	1.33	0.05	
130											12.41	10.23	8.70	4.31	5.63	1.50	3.27	0.40	1.44	0.05	
140											13.36	11.74	9.37	4.94	6.06	1.72	3.52	0.46	1.55	0.06	
150											14.32	13.33	10.03	5.62	6.50	1.95	3.77	0.52	1.66	0.07	
160											15.27	15.03	10.70	6.33	6.93	2.20	4.02	0.59	1.77	0.08	
170											16.23	16.81	11.37	7.08	7.36	2.46	4.27	0.66	1.88	0.09	
180											17.18	18.69	12.04	7.87	7.80	2.74	4.53	0.73	1.99	0.10	
190											18.14	20.66	12.71	8.70	8.23	3.02	4.78	0.81	2.10	0.11	
200											19.09	22.72	13.38	9.57	8.66	3.33	5.03	0.89	2.21	0.12	
225														15.05	11.90	9.75	4.14	5.66	1.10	2.49	0.15
250														16.73	14.47	10.83	5.03	6.29	1.34	2.77	0.18
275														18.40	17.26	11.92	6.00	6.92	1.60	3.05	0.22
300																13.00	7.05	7.55	1.88	3.32	0.26
325																14.08	8.17	8.18	2.18	3.60	0.30
350																15.17	9.38	8.81	2.50	3.88	0.34
375																16.25	10.65	9.43	2.84	4.15	0.39
400																17.33	12.01	10.06	3.20	4.43	0.44
425																18.42	13.43	10.69	3.58	4.71	0.49
450																19.50	14.93	11.32	3.98	4.99	0.54
475																		11.95	4.40	5.26	0.60
500																		12.58	4.84	5.54	0.66
550																		13.84	5.77	6.10	0.79
600																		15.10	6.78	6.65	0.92

# FRICTION LOSS CHARACTERISTICS

## PVC CLASS 125 IPS PLASTIC PIPE

(1120, 1220) SDR 32.5 C = 150  
PSI LOSS PER 100 FEET OF PIPE (PSI/100 FT)

Velocity of flow values are computed from the general equation:

$$V = .408 \frac{Q}{d^2}$$

Friction pressure loss values are computed from the equation:

$$h_f = 0.2083 \left( \frac{100}{C} \right)^{1.852} \frac{Q^{1.852}}{d^{4.866}}$$

SIZE OD ID WALL THK	Sizes 1" thru 6" Flow GPM 1 thru 600															
	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	6"								
	1.315	1.660	1.900	2.375	2.875	3.500	4.500	6.625								
	1.211	1.548	1.784	2.229	2.699	3.284	4.224	6.217								
		0.052	0.056	0.058	0.073	0.088	0.108	0.138	0.204							
Flow G.P.M.	Velocity F.P.S.	P.S.I. Loss	Velocity F.P.S.	P.S.I. Loss	Velocity F.P.S.	P.S.I. Loss	Velocity F.P.S.	P.S.I. Loss	Velocity F.P.S.	P.S.I. Loss	Velocity F.P.S.	P.S.I. Loss	Velocity F.P.S.	P.S.I. Loss	Velocity F.P.S.	P.S.I. Loss
1	0.27	0.02	0.17	0.01	0.12	0.00										
2	0.55	0.06	0.34	0.02	0.25	0.01										
3	0.83	0.13	0.51	0.04	0.38	0.02										
4	1.11	0.22	0.68	0.07	0.51	0.03										
5	1.39	0.33	0.85	0.10	0.64	0.05										
6	1.66	0.46	1.02	0.14	0.76	0.07										
7	1.94	0.62	1.19	0.19	0.89	0.09										
8	2.22	0.79	1.36	0.24	1.02	0.12										
9	2.50	0.98	1.53	0.30	1.15	0.15										
10	2.78	1.19	1.70	0.36	1.28	0.18										
11	3.06	1.42	1.87	0.43	1.41	0.22										
12	3.33	1.67	2.04	0.51	1.53	0.25										
14	3.89	2.22	2.38	0.67	1.79	0.34										
16	4.45	2.85	2.72	0.86	2.05	0.43										
18	5.00	3.54	3.06	1.07	2.30	0.54										
20	5.56	4.31	3.40	1.30	2.56	0.65										
22	6.12	5.14	3.74	1.56	2.82	0.78										
24	6.67	6.04	4.08	1.83	3.07	0.92										
26	7.23	7.00	4.42	2.12	3.33	1.06										
28	7.78	8.03	4.76	2.43	3.58	1.22										
30	8.34	9.13	5.10	2.76	3.84	1.39										
35	9.73	12.14	5.95	3.68	4.48	1.84										
40	11.12	15.55	6.81	4.71	5.12	2.36										
45	12.51	19.34	7.66	5.86	5.76	2.94										
50	13.91	23.50	8.51	7.12	6.40	3.57										
55	15.30	28.04	9.36	8.49	7.05	4.26										
60	16.69	32.94	10.21	9.98	7.69	5.00										
65	18.08	38.21	11.06	11.57	8.33	5.80										
70	19.47	43.83	11.91	13.27	8.97	6.55										
75			12.76	15.08	9.61	7.56										
80			13.62	17.00	10.25	8.52										
85			14.47	19.02	10.89	9.53										
90			15.32	21.14	11.53	10.60										
95			16.17	23.37	12.17	11.71										
100			17.02	25.69	12.81	12.88										
110			18.72	30.65	14.10	15.37										
120					15.38	18.06										
130					16.66	20.94										
140					17.94	24.04										
150					19.22	27.30										
160																
170																
180																
190																
200																
225																
250																
275																
300																
325																
350																
375																
400																
425																
450																
475																
500																
550																
600																

Note: Shaded areas of chart indicate velocities over 5' per second. Use with Caution.

## PVC CLASS 160 IPS PLASTIC PIPE

(1120, 1220) SDR 26 C = 150  
PSI LOSS PER 100 FEET OF PIPE (PSI/100 FT)

Velocity of flow values are computed from the general equation:

$$V = .408 \frac{Q}{d^2}$$

Friction pressure loss values are computed from the equation:

$$h_f = 0.2083 \left( \frac{100}{C} \right)^{1.852} \frac{Q^{1.852}}{d^{4.866}}$$

SIZE OD ID WALL THK	Sizes 1" thru 6" Flow GPM 1 thru 600															
	1"	1 1/4"		1 1/2"		2"		2 1/2"		3"		4"		6"		
	1.315	1.660		1.900		2.375		2.875		3.500		4.500		6.625		
	1.211	1.548		1.784		2.229		2.699		3.284		4.224		6.217		
	0.052	0.056		0.058		0.073		0.088		0.108		0.138		0.204		
Flow G.P.M.	Velocity F.P.S.	P.S.I. Loss	Velocity F.P.S.	P.S.I. Loss	Velocity F.P.S.	P.S.I. Loss	Velocity F.P.S.	P.S.I. Loss	Velocity F.P.S.	P.S.I. Loss	Velocity F.P.S.	P.S.I. Loss	Velocity F.P.S.	P.S.I. Loss	Velocity F.P.S.	P.S.I. Loss
1	0.28	0.02	0.17	0.01	0.13	0.00										
2	0.57	0.06	0.34	0.02	0.26	0.01	0.16	0.00								
3	0.85	0.14	0.52	0.04	0.39	0.02	0.25	0.01								
4	1.14	0.23	0.69	0.07	0.53	0.04	0.33	0.01	0.23	0.00						
5	1.42	0.35	0.86	0.11	0.66	0.05	0.42	0.02	0.28	0.01						
6	1.71	0.49	1.04	0.15	0.79	0.08	0.50	0.03	0.34	0.01	0.23	0.00				
7	1.99	0.66	1.21	0.20	0.92	0.10	0.59	0.03	0.40	0.01	0.27	0.01				
8	2.28	0.84	1.39	0.25	1.06	0.13	0.67	0.04	0.46	0.02	0.31	0.01				
9	2.57	1.05	1.56	0.31	1.19	0.16	0.76	0.05	0.52	0.02	0.35	0.01				
10	2.85	1.27	1.73	0.38	1.32	0.20	0.84	0.07	0.57	0.03	0.39	0.01				
11	3.14	1.52	1.91	0.45	1.45	0.23	0.93	0.08	0.63	0.03	0.43	0.01				
12	3.42	1.78	2.08	0.53	1.59	0.28	1.01	0.09	0.69	0.04	0.46	0.01	0.28	0.00		
14	3.99	2.37	2.43	0.71	1.85	0.37	1.18	0.12	0.81	0.05	0.54	0.02	0.33	0.01		
16	4.57	3.04	2.78	0.91	2.12	0.47	1.35	0.16	0.92	0.06	0.62	0.02	0.37	0.01		
18	5.14	3.78	3.12	1.13	2.38	0.58	1.52	0.20	1.04	0.08	0.70	0.03	0.42	0.01		
20	5.71	4.59	3.47	1.37	2.65	0.71	1.69	0.24	1.15	0.09	0.78	0.04	0.47	0.01		
22	6.28	5.48	3.82	1.64	2.91	0.85	1.86	0.29	1.27	0.11	0.86	0.04	0.52	0.01		
24	6.85	6.44	4.17	1.92	3.18	1.00	2.03	0.34	1.38	0.13	0.93	0.05	0.56	0.02		
26	7.42	7.47	4.51	2.23	3.44	1.15	2.20	0.39	1.50	0.15	1.01	0.06	0.61	0.02		
28	7.99	8.57	4.86	2.56	3.71	1.32	2.37	0.45	1.62	0.18	1.09	0.07	0.66	0.02		
30	8.57	9.74	5.21	2.91	3.97	1.50	2.54	0.51	1.73	0.20	1.17	0.08	0.70	0.02		
35	9.99	12.95	6.08	3.87	4.64	2.00	2.96	0.68	2.02	0.27	1.36	0.10	0.82	0.03	0.38	0.00
40	11.42	16.59	6.95	4.95	5.30	2.56	3.39	0.86	2.31	0.34	1.56	0.13	0.94	0.04	0.43	0.01
45	12.85	20.63	7.82	6.16	5.96	3.19	3.81	1.08	2.60	0.42	1.75	0.16	1.06	0.05	0.49	0.01
50	14.28	25.07	8.69	7.49	6.63	3.88	4.24	1.31	2.89	0.52	1.95	0.20	1.18	0.06	0.54	0.01
55	15.71	29.91	9.56	8.93	7.29	4.62	4.66	1.56	3.18	0.62	2.15	0.24	1.30	0.07	0.60	0.01
60	17.14	35.14	10.43	10.49	7.95	5.43	5.09	1.83	3.47	0.72	2.34	0.28	1.41	0.08	0.65	0.01
65	18.57	40.76	11.29	12.17	8.62	6.30	5.51	2.12	3.76	0.84	2.54	0.32	1.53	0.09	0.70	0.01
70	19.99	46.76	12.16	13.96	9.28	7.23	5.93	2.44	4.05	0.96	2.73	0.37	1.65	0.11	0.76	0.02
75			13.03	15.86	9.94	8.21	6.36	2.77	4.34	1.09	2.93	0.42	1.77	0.12	0.81	0.02
80			13.90	17.88	10.60	9.25	6.78	3.12	4.63	1.23	3.12	0.47	1.89	0.14	0.87	0.02
85			14.77	20.00	11.27	10.35	7.21	3.49	4.91	1.38	3.32	0.53	2.00	0.16	0.92	0.02
90			15.64	22.23	11.93	11.51	7.63	3.88	5.20	1.53	3.51	0.59	2.12	0.17	0.98	0.03
95			16.51	24.58	12.59	12.72	8.05	4.29	5.49	1.69	3.71	0.65	2.24	0.19	1.03	0.03
100			17.38	27.03	13.26	13.99	8.48	4.72	5.78	1.86	3.91	0.72	2.36	0.21	1.09	0.03
110			19.12	32.24	14.58	16.69	9.33	5.63	6.36	2.22	4.30	0.86	2.60	0.25	1.20	0.04
120					15.91	19.61	10.18	6.61	6.94	2.61	4.69	1.01	2.83	0.30	1.30	0.05
130					17.24	22.74	11.02	7.67	7.52	3.03	5.08	1.17	3.07	0.34	1.41	0.05
140					18.56	26.09	11.87	8.80	8.10	3.47	5.47	1.34	3.31	0.39	1.52	0.06
150					19.89	29.64	12.72	10.00	8.68	3.94	5.86	1.52	3.54	0.45	1.63	0.07
160							13.57	11.27	9.26	4.45	6.25	1.71	3.78	0.50	1.74	0.08
170							14.42	12.61	9.83	4.97	6.64	1.92	4.01	0.56	1.85	0.09
180							15.27	14.02	10.41	5.53	7.03	2.13	4.25	0.63	1.96	0.10
190							16.11	15.49	10.99	6.11	7.43	2.35	4.49	0.69	2.07	0.11
200							16.96	17.03	11.57	6.72	7.82	2.59	4.72	0.76	2.18	0.12
225									13.02	8.36	8.79	3.22	5.31	0.95	2.45	0.14
250							19.08	21.19	14.47	10.16	9.77	3.91	5.91	1.15	2.72	0.18
275									15.91	12.12	10.75	4.67	6.50	1.37	3.00	0.21
300									17.36	14.24	11.73	5.49	7.09	1.61	3.27	0.25
325									18.81	16.51	12.70	6.36	7.68	1.87	3.54	0.29
350											13.68	7.30	8.27	2.15	3.81	0.33
375											14.66	8.29	8.86	2.44	4.09	0.37
400											15.64	9.35	9.45	2.75	4.36	0.42
425											16.62	10.46	10.04	3.07	4.63	0.47
450											17.59	11.62	10.63	3.42	4.90	0.52
475											18.57	12.85	11.23	3.78	5.18	0.58
500											19.55	14.13	11.82	4.15	5.45	0.63
550													13.00	4.96	6.00	0.76
600													14.18	5.82	6.54	0.89



FRICTION LOSS CHARACTERISTICS

PVC CLASS 200 IPS PLASTIC PIPE

(1120, 1220) SDR 21 C = 150  
PSI LOSS PER 100 FEET OF PIPE (PSI/100 FT)

Velocity of flow values are computed from the general equation:

$$V = .408 \frac{Q}{d^2}$$

Friction pressure loss values are computed from the equation:

$$h_f = 0.2083 \left( \frac{100}{C} \right)^{1.852} \frac{Q^{1.852}}{d^{4.866}}$$

		Sizes 3/4" thru 6" Flow GPM 1 thru 600															
SIZE		3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	6"							
OD		1.050	1.315	1.660	1.900	2.375	2.875	3.500	4.500	6.625							
ID		.930	1.211	1.548	1.784	2.229	2.699	3.284	4.224	6.217							
WALL THK		.060	0.052	0.056	0.058	0.073	0.088	0.108	0.138	0.204							
Flow G.P.M.	Velocity F.P.S.	P.S.I. Loss	Velocity F.P.S.	P.S.I. Loss	Velocity F.P.S.	P.S.I. Loss	Velocity F.P.S.	P.S.I. Loss	Velocity F.P.S.	P.S.I. Loss	Velocity F.P.S.	P.S.I. Loss	Velocity F.P.S.	P.S.I. Loss	Velocity F.P.S.	P.S.I. Loss	
1	0.47	0.06	0.28	0.02	0.18	0.01	0.13	0.00									
2	0.94	0.22	0.57	0.07	0.36	0.02	0.27	0.01									
3	1.42	0.46	0.86	0.14	0.54	0.04	0.41	0.02	0.17	0.00							
4	1.89	0.79	1.15	0.24	0.72	0.08	0.55	0.04	0.35	0.01	0.24	0.01					
5	2.36	1.20	1.44	0.36	0.90	0.12	0.68	0.06	0.44	0.02	0.30	0.01					
6	2.83	1.68	1.73	0.51	1.08	0.16	0.82	0.08	0.53	0.03	0.36	0.01	0.24	0.00			
7	3.30	2.23	2.02	0.67	1.26	0.22	0.96	0.11	0.61	0.04	0.42	0.01	0.28	0.01			
8	3.77	2.85	2.30	0.86	1.44	0.28	1.10	0.14	0.70	0.05	0.48	0.02	0.32	0.01			
9	4.25	3.55	2.59	1.07	1.62	0.34	1.24	0.18	0.79	0.06	0.54	0.02	0.36	0.01			
10	4.72	4.31	2.88	1.30	1.80	0.42	1.37	0.22	0.88	0.07	0.60	0.03	0.40	0.01			
11	5.19	5.15	3.17	1.56	1.98	0.50	1.51	0.26	0.97	0.09	0.66	0.03	0.44	0.01			
12	5.66	6.05	3.46	1.83	2.17	0.59	1.65	0.30	1.06	0.10	0.72	0.04	0.48	0.02		0.00	
14	6.60	8.05	4.04	2.43	2.53	0.78	1.93	0.40	1.23	0.14	0.84	0.05	0.56	0.02	0.34	0.01	
16	7.55	10.30	4.61	3.11	2.89	1.00	2.20	0.52	1.41	0.17	0.96	0.07	0.65	0.03	0.39	0.01	
18	8.49	12.81	5.19	3.87	3.25	1.24	2.48	0.64	1.59	0.22	1.08	0.09	0.73	0.03	0.44	0.01	
20	9.43	15.58	5.77	4.71	3.61	1.51	2.75	0.78	1.76	0.26	1.20	0.10	0.81	0.04	0.49	0.01	
22	10.38	18.58	6.34	5.62	3.97	1.80	3.03	0.93	1.94	0.32	1.32	0.12	0.89	0.05	0.54	0.01	
24	11.32	21.83	6.92	6.60	4.34	2.12	3.30	1.09	2.12	0.37	1.44	0.15	0.97	0.06	0.59	0.02	
26	12.27	25.32	7.50	7.65	4.70	2.46	3.58	1.27	2.29	0.43	1.56	0.17	1.05	0.07	0.63	0.02	
28	13.21	29.04	8.08	8.78	5.06	2.82	3.86	1.46	2.47	0.49	1.68	0.19	1.13	0.07	0.68	0.02	
30	14.15	33.00	8.65	9.98	5.42	3.20	4.13	1.66	2.65	0.56	1.80	0.22	1.22	0.09	0.73	0.02	
35	16.51	43.91	10.10	13.27	6.32	4.26	4.82	2.20	3.09	0.75	2.11	0.29	1.42	0.11	0.86	0.03	
40	18.87	56.23	11.54	17.00	7.23	5.45	5.51	2.82	3.53	0.95	2.41	0.38	1.62	0.14	0.98	0.04	
45			12.98	21.14	8.13	6.78	6.20	3.51	3.97	1.19	2.71	0.47	1.83	0.18	1.10	0.05	
50			14.42	25.70	9.04	8.24	6.89	4.26	4.41	1.44	3.01	0.57	2.03	0.22	1.23	0.06	
55			15.87	30.66	9.94	9.83	7.58	5.09	4.85	1.72	3.31	0.68	2.23	0.26	1.35	0.08	
60			17.31	36.02	10.85	11.55	8.27	5.97	5.30	2.02	3.61	0.80	2.44	0.31	1.47	0.09	
65			18.75	41.77	11.75	13.40	8.96	6.93	5.74	2.35	3.92	0.93	2.64	0.36	1.59	0.10	
70					12.65	15.37	9.65	7.95	6.18	2.69	4.22	1.06	2.84	0.41	1.72	0.12	
75					13.56	17.47	10.34	9.03	6.62	3.06	4.52	1.21	3.05	0.46	1.84	0.14	
80					14.46	19.68	11.03	10.18	7.06	3.44	4.82	1.36	3.25	0.52	1.96	0.15	
85					15.37	22.02	11.72	11.39	7.50	3.85	5.12	1.52	3.45	0.59	2.09	0.17	
90					16.27	24.48	12.41	12.66	7.95	4.28	5.42	1.69	3.66	0.65	2.21	0.19	
95					17.18	27.06	13.10	13.99	8.39	4.74	5.72	1.87	3.86	0.72	2.33	0.21	
100					18.08	29.76	13.79	15.39	8.83	5.21	6.03	2.06	4.07	0.79	2.46	0.23	
110					19.89	35.50			9.71	6.21	6.63	2.45	4.47	0.94	2.70	0.28	
120							16.54	21.57	10.60	7.30	7.23	2.88	4.88	1.11	2.95	0.33	
130							17.92	25.02	11.48	8.47	7.84	3.34	5.29	1.29	3.19	0.38	
140							19.30	28.70	12.36	9.71	8.44	3.84	5.69	1.47	3.44	0.43	
150									13.25	11.04	9.04	4.36	6.10	1.68	3.69	0.49	
160									14.13	12.44	9.64	4.91	6.51	1.89	3.93	0.55	
170									15.01	13.91	10.25	5.50	6.91	2.11	4.18	0.62	
180									15.90	15.47	10.85	6.11	7.32	2.35	4.42	0.69	
190									16.78	17.10	11.45	6.75	7.73	2.60	4.67	0.76	
200									17.66	18.80	12.06	7.43	8.14	2.85	4.92	0.84	
225									19.87	23.38	13.56	9.24	9.15	3.55	5.53	1.04	
250									15.07	11.23	10.17	4.31	6.15	1.27	2.83	0.19	
275									16.58	13.39	11.19	5.15	6.76	1.51	3.12	0.23	
300									18.09	15.74	12.21	6.05	7.38	1.78	3.40	0.27	
325									19.60	18.25	13.22	7.01	7.99	2.06	3.69	0.31	
350											14.24	8.05	8.61	2.36	3.97	0.36	
375											15.26	9.14	9.22	2.69	4.25	0.41	
400											16.28	10.30	9.84	3.03	4.54	0.46	
425											17.29	11.53	10.45	3.39	4.82	0.52	
450											18.31	12.81	11.07	3.77	5.11	0.57	
475											19.33	14.16	11.68	4.16	5.39	0.63	
500													12.30	4.58	5.67	0.70	
550													13.53	5.46	6.24	0.83	
600													14.76	6.42	6.81	0.93	

Note: Shaded areas of chart indicate velocities over 5' per second. Use with Caution.

PVC CLASS 315 IPS PLASTIC PIPE

(1120, 1220) SDR 13.5 C = 150  
PSI LOSS PER 100 FEET OF PIPE (PSI/100 FT)

Velocity of flow values are computed from the general equation:

$$V = .408 \frac{Q}{d^2}$$

Friction pressure loss values are computed from the equation:

$$h_f = 0.2083 \left( \frac{100}{C} \right)^{1.852} \frac{Q^{1.852}}{d^{4.866}}$$

		Sizes 1/2" thru 6" Flow GPM 1 thru 600															
SIZE		1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	6"						
OD		0.840	1.050	1.315	1.660	1.900	2.375	2.875	3.500	4.500	6.625						
ID		0.716	0.894	1.121	1.414	1.618	2.023	2.449	2.982	3.834	5.643						
WALL THK		0.062	0.078	0.097	0.123	0.141	0.176	0.213	0.259	0.333	0.491						
Flow G.P.M.	Velocity F.P.S.	P.S.I. Loss	Velocity F.P.S.	P.S.I. Loss	Velocity F.P.S.	P.S.I. Loss	Velocity F.P.S.	P.S.I. Loss	Velocity F.P.S.	P.S.I. Loss	Velocity F.P.S.	P.S.I. Loss	Velocity F.P.S.	P.S.I. Loss	Velocity F.P.S.	P.S.I. Loss	
1	0.79	0.22	0.51	0.07	0.32	0.02	0.20	0.01	0.15	0.00							
2	1.59	0.78	1.02	0.27	0.64	0.09	0.40	0.03	0.31	0.01	0.19	0.00					
3	2.38	1.65	1.53	0.56	0.97	0.19	0.61	0.06	0.46	0.03	0.29	0.01	0.20	0.00			
4	3.18	2.82	2.04	0.96	1.29	0.32	0.81	0.10	0.62	0.05	0.39	0.02	0.27	0.01			
5	3.97	4.26	2.55	1.45	1.62	0.48	1.02	0.16	0.77	0.08	0.49	0.03	0.34	0.01	0.22	0.00	
6	4.77	5.97	3.06	2.03	1.94	0.67	1.22	0.22	0.93	0.11	0.59	0.04	0.40	0.02	0.27	0.01	
7	5.57	7.95	3.57	2.70	2.27	0.90	1.42	0.29	1.09	0.15	0.69	0.05	0.47	0.02	0.32	0.01	
8	6.36	10.18	4.08	3.45	2.59	1.15	1.63	0.37	1.24	0.19	0.79	0.06	0.54	0.03	0.36	0.01	
9	7.16	12.66	4.59	4.30	2.92	1.43	1.83	0.46	1.40	0.24	0.89	0.08	0.61	0.03	0.41	0.01	
10	7.95	15.38	5.10	5.22	3.24	1.74	2.04	0.56	1.55	0.29	0.99	0.10	0.68	0.04	0.45	0.01	
11	8.75	18.35	5.61	6.23	3.57	2.07	2.24	0.67	1.71	0.35	1.09	0.12	0.74	0.05	0.50	0.02	
12	9.55	21.56	6.12	7.32	3.89	2.43	2.44	0.79	1.87	0.41	1.19	0.14	0.81	0.05	0.55	0.02	
14	11.14	28.69	7.14	9.74	4.54	3.24	2.85	1.05	2.18	0.54	1.39	0.18	0.95	0.07	0.64	0.03	
16	12.73	36.74	8.16	12.47	5.19	4.15	3.26	1.34	2.49	0.70	1.59	0.23	1.08	0.09	0.73	0.04	
18	14.32	45.69	9.18	15.51	5.84	5.16	3.67	1.67	2.80	0.87	1.79	0.29	1.22	0.12	0.82	0.04	
20	15.91	55.54	10.20	18.86	6.49	6.27	4.08	2.03	3.11	1.05	1.99	0.35	1.36	0.14	0.91	0.05	
22	17.50	66.26	11.23	22.50	7.14	7.48	4.48	2.42	3.42	1.25	2.19	0.42	1.49	0.17	1.00	0.06	
24	19.10	77.84	12.25	26.43	7.79	8.79	4.89	2.84	3.74	1.47	2.39	0.50	1.63	0.20	1.10	0.08	
26			13.27	30.65	8.44	10.19	5.30	3.29	4.05	1.71	2.59	0.58	1.76	0.23	1.19	0.09	
28			14.29	35.16	9.09	11.69	5.71	3.78	4.36	1.96	2.79	0.66	1.90	0.26	1.28	0.10	
30			15.31	39.95	9.74	13.29	6.12	4.29	4.67	2.23	2.99	0.75	2.04	0.30	1.37	0.11	
35			17.86	53.15	11.36	17.68	7.14	5.71	5.45	2.96	3.48	1.00	2.38	0.39	1.60	0.15	
40					12.98	22.64	8.16	7.31	6.23	3.80	3.98	1.28	2.72	0.51	1.83	0.19	
45					14.61	28.15	9.18	9.10	7.01	4.72	4.48	1.59	3.06	0.63	2.06	0.24	
50					16.23	34.22	10.20	11.06	7.79	5.74	4.98	1.94	3.40	0.76	2.29	0.29	
55					17.85	40.83	11.22	13.19	8.57	6.85	5.48	2.31	3.74	0.91	2.52	0.35	
60					19.48	47.97	12.24	15.50	9.35	8.04	5.98	2.71	4.08	1.07	2.75	0.41	
65							13.26	17.97	10.13	9.33	6.48	3.15	4.42	1.24	2.98	0.48	
70							14.28	20.62	10.90	10.70	6.97	3.61	4.76	1.42	3.21	0.55	
75							15.30	23.43	11.68	12.16	7.47	4.10	5.10	1.62	3.44	0.62	
80							16.32	26.40	12.46	13.71	7.97	4.62	5.44	1.82	3.67	0.70	
85							17.34	29.54	13.24	15.33	8.47	5.17	5.78	2.04	3.89	0.78	
90							18.36	32.84	14.02	17.05	8.97	5.75	6.12	2.27	4.12	0.87	
95							19.38	36.30	14.80	18.84	9.47	6.35	6.46	2.51	4.35	0.96	
100									15.58	20.72	9.96	6.99	6.80	2.76	4.58	1.06	
110									17.14	24.72	10.96	8.34	7.48	3.29	5.04	1.26	
120									18.70	29.04	11.96	9.79	8.16	3.87	5.50	1.48	
130											12.96	11.36	8.84	4.48	5.96	1.72	
140											13.95	13.03	9.52	5.14	6.42	1.97	
150											14.95	14.81	10.20	5.84	6.88	2.24	
160									15.95	16.69	10.88	6.59	7.34	2.53	4.44	0.74	
170									16.94	18.67	11.56	7.37	7.79	2.83	4.71	0.83	
180									17.94	20.75	12.24	8.19	8.25	3.14	4.99	0.93	
190									18.94	22.94	12.92	9.05	8.71	3.47	5.27	1.02	
200									19.93	25.23	13.60	9.95	9.17	3.82	5.55	1.12	
225																	
250																	
275																	
300																	
325																	
350																	
375																	
400																	
425																	
450																	
475																	
500																	
550																	
600																	

# FRICTION LOSS CHARACTERISTICS

## POLYETHYLENE (PE) SDR-PRESSURE RATED TUBE

(2306, 3206, 3306) SDR 7, 9, 11.5, 15 C = 140  
PSI LOSS PER 100 FEET OF TUBE (PSI/100 FT)

Velocity of flow values are computed from the general equation:

$$V = .408 \frac{Q}{d^2}$$

Friction pressure loss values are computed from the equation:

$$h_f = 0.2083 \left( \frac{100}{C} \right)^{1.852} \frac{Q^{1.852}}{d^{4.866}}$$

Sizes 1/2" thru 6" Flow GPM 1 thru 600																					
SIZE	1/2"	3/4"		1"		1 1/4"		1 1/2"		2"		2 1/2"		3"		4"		6"			
ID	0.622	0.824		1.049		1.380		1.610		2.067		2.469		3.068		4.026		6.065			
Flow G.P.M.	Velocity F.P.S.	P.S.I. Loss	Velocity F.P.S.	P.S.I. Loss	Velocity F.P.S.	P.S.I. Loss	Velocity F.P.S.	P.S.I. Loss	Velocity F.P.S.	P.S.I. Loss	Velocity F.P.S.	P.S.I. Loss	Velocity F.P.S.	P.S.I. Loss	Velocity F.P.S.	P.S.I. Loss	Velocity F.P.S.	P.S.I. Loss	Velocity F.P.S.	P.S.I. Loss	
1	1.05	0.49	0.60	0.12	0.37	0.04	0.21	0.01	0.15	0.00	0.09	0.00									
2	2.10	1.76	1.20	0.45	0.74	0.14	0.42	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	0.28	0.01	0.20	0.00							
4	4.21	6.35	2.40	1.62	1.48	0.50	0.85	0.13	0.62	0.06	0.38	0.02	0.26	0.01							
5	5.27	9.60	3.00	2.44	1.85	0.76	1.07	0.20	0.78	0.09	0.47	0.03	0.33	0.01	0.21	0.00					
6	6.32	13.46	3.60	3.43	2.22	1.06	1.28	0.28	0.94	0.13	0.57	0.04	0.40	0.02	0.26	0.01					
7	7.38	17.91	4.20	4.56	2.59	1.41	1.49	0.37	1.10	0.18	0.66	0.05	0.46	0.02	0.30	0.01					
8	8.43	22.93	4.80	5.84	2.96	1.80	1.71	0.47	1.25	0.22	0.76	0.07	0.53	0.03	0.34	0.01					
9	9.49	28.52	5.40	7.26	3.33	2.24	1.92	0.59	1.41	0.28	0.85	0.08	0.60	0.03	0.39	0.01					
10	10.54	34.67	6.00	8.82	3.70	2.73	2.14	0.72	1.57	0.34	0.95	0.10	0.66	0.04	0.43	0.01					
11	11.60	41.36	6.60	10.53	4.07	3.25	2.35	0.86	1.73	0.40	1.05	0.12	0.73	0.05	0.47	0.02	0.27	0.00			
12	12.65	48.60	7.21	12.37	4.44	3.82	2.57	1.01	1.88	0.48	1.14	0.14	0.80	0.06	0.52	0.02	0.30	0.01			
14	14.76	64.65	8.41	16.46	5.19	5.08	2.99	1.34	2.20	0.63	1.33	0.19	0.93	0.08	0.60	0.03	0.35	0.01			
16	16.87	82.79	9.61	21.07	5.93	6.51	3.42	1.71	2.51	0.81	1.52	0.24	1.07	0.10	0.69	0.04	0.40	0.01			
18	18.98	102.97	10.81	26.21	6.67	8.10	3.85	2.13	2.83	1.01	1.71	0.30	1.20	0.13	0.78	0.04	0.45	0.01			
20			12.01	31.86	7.41	9.84	4.28	2.59	3.14	1.22	1.90	0.36	1.33	0.15	0.86	0.05	0.50	0.01			
22			13.21	38.01	8.15	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			14.42	44.65	8.89	13.79	5.14	3.63	3.77	1.72	2.29	0.51	1.60	0.21	1.04	0.07	0.60	0.02			
26			15.62	41.79	9.64	16.00	5.57	4.21	4.09	1.99	2.48	0.59	1.74	0.25	1.12	0.09	0.65	0.02			
28			16.82	59.41	10.38	18.35	5.99	4.83	4.40	2.28	2.67	0.68	1.87	0.29	1.21	0.10	0.70	0.03			
30			18.02	67.50	11.12	20.85	6.42	5.49	4.72	2.59	2.86	0.77	2.00	0.32	1.30	0.11	0.75	0.03	0.33	0.00	
35					12.97	27.74	7.49	7.31	5.50	3.45	3.34	1.02	2.34	0.43	1.51	0.15	0.88	0.04	0.38	0.01	
40					14.83	35.53	8.56	9.36	6.29	4.42	3.81	1.31	2.67	0.55	1.73	0.19	1.00	0.05	0.44	0.01	
45					16.68	44.19	9.64	11.64	7.08	5.50	4.29	1.63	3.01	0.69	1.95	0.24	1.13	0.06	0.49	0.01	
50					18.53	53.71	10.71	14.14	7.87	6.68	4.77	1.98	3.34	0.83	2.16	0.29	1.25	0.08	0.55	0.01	
55							11.78	16.87	8.65	7.97	5.25	2.36	3.68	1.00	2.38	0.35	1.38	0.09	0.61	0.01	
60							12.85	19.82	9.44	9.36	5.72	2.78	4.01	1.17	2.60	0.41	1.51	0.11	0.66	0.01	
65							13.92	22.99	10.23	10.86	6.20	3.22	4.35	1.36	2.81	0.47	1.63	0.13	0.72	0.02	
70							14.99	26.37	11.01	12.46	6.68	3.69	4.68	1.56	3.03	0.54	1.76	0.14	0.77	0.02	
75							16.06	29.97	11.80	14.16	7.16	4.20	5.01	1.77	3.25	0.61	1.88	0.16	0.83	0.02	
80							17.13	33.77	12.59	15.95	7.63	4.73	5.35	1.99	3.46	0.69	2.01	0.18	0.88	0.03	
85							18.21	37.79	13.37	17.85	8.11	5.29	5.68	2.23	3.68	0.77	2.13	0.21	0.94	0.03	
90							19.28	42.01	14.16	19.84	8.59	5.88	6.02	2.48	3.90	0.86	2.26	0.23	0.99	0.03	
95									14.95	21.93	9.07	6.50	6.35	2.74	4.11	0.95	2.39	0.25	1.05	0.03	
100									15.74	24.12	9.54	7.15	6.69	3.01	4.33	1.05	2.51	0.28	1.10	0.04	
110									17.31	28.77	10.50	8.53	7.36	3.59	4.76	1.25	2.76	0.33	1.22	0.05	
120									18.88	33.80	11.45	10.02	8.03	4.22	5.20	1.47	3.02	0.39	1.33	0.05	
130											12.41	11.62	8.70	4.90	5.63	1.70	3.27	0.45	1.44	0.06	
140											13.36	13.33	9.37	5.62	6.06	1.95	3.52	0.52	1.55	0.07	
150											14.32	15.15	10.03	6.38	6.50	2.22	3.77	0.59	1.66	0.08	
160											15.27	17.08	10.70	7.19	6.93	2.50	4.02	0.67	1.77	0.09	
170											16.23	19.11	11.37	8.05	7.36	2.80	4.27	0.75	1.88	0.10	
180											17.18	21.24	12.04	8.95	7.08	3.11	4.53	0.83	1.99	0.11	
190											18.14	23.48	12.71	9.89	8.23	3.44	4.78	0.92	2.10	0.12	
200											19.09	25.81	13.38	10.87	8.66	3.78	5.03	1.01	2.21	0.14	
225													15.05	13.52	9.75	4.70	5.66	1.25	2.49	0.17	
250													16.73	16.44	10.83	5.71	6.29	1.52	2.77	0.21	
275													18.40	19.61	11.92	6.82	6.92	1.82	3.05	0.25	
300															13.00	8.01	7.55	2.13	3.32	0.29	
325															14.08	9.29	8.18	2.48	3.60	0.34	
350															15.17	10.65	8.81	2.84	3.88	0.39	
375															16.25	12.10	9.43	3.23	4.15	0.44	
400															17.33	13.64	10.06	3.64	4.43	0.50	
425															18.42	15.26	10.69	4.07	4.71	0.55	
450															19.50	16.97	11.32	4.52	4.99	0.62	
475																	11.95	5.00	5.26	0.68	
500																	12.58	5.50	5.54	0.75	
550																	13.84	6.56	6.10	1.89	
600																	15.10	7.70	6.65	1.05	

Note: Shaded areas of chart indicate velocities over 5' per second. Use with Caution.

## PIPE FITTINGS

Expressed as Equivalent Footage of Pipe

Steel Fitting Type	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	6	8
Coupling	.6	.8	1.0	1.2	1.5	2.0	2.5	3.0	4.0	6.0	8.0
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 1/2"	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°	.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											
Coupling	1.5	2.5	3	3	4	6	7	8	11	18	24
Run of St. Tee	2.5	3	4	5	6	8	9	11	15	21	28
Tee, Side Outlet	7	9	12	15	18	24	30	36	45	70	90
Tee, Run Reduced 1/2"	3.5	4.5	6	8	9	11	14	17	24	35	45
Elbow, 90°	3.5	4.5	6	8	9	11	14	17	24	34	45
Elbow, 45°	1.5	2	3	3.5	4	5	7	8	10	16	20



FRICTION LOSS CHARACTERISTICS

WATER METERS

AWWA STANDARD PRESSURE LOSS: (PSI)

Flow G.P.M.	Nominal Size						
	5/8	3/4	1	1-1/2	2	3	4
1	0.2	0.1					
2	0.3	0.2					
3	0.4	0.3					
4	0.6	0.5	0.1				
5	0.9	0.6	0.2				
6	1.3	0.7	0.3				
7	1.8	0.8	0.4				
8	2.3	1.0	0.5				
9	3.0	1.3	0.6				
10	3.7	1.6	0.7				
11	4.4	1.9	0.8				
12	5.1	2.2	0.9				
13	6.1	2.6	1.0				
14	7.2	3.1	1.1				
15	8.3	3.6	1.2				
16	9.4	4.1	1.4	0.4			
17	10.7	4.6	1.6	0.5			
18	12.0	5.2	1.8	0.6			
19	13.4	5.8	2.0	0.7			
20	15.0	6.5	2.2	0.8			
22		7.9	2.8	1.0			
24		9.5	3.4	1.2			
26		11.2	4.0	1.4			
28		13.0	4.6	1.6			
30		15.0	5.3	1.8	0.7		
32			6.0	2.1	0.8		
34			6.9	2.4	0.9		
36			7.8	2.7	1.0		
38			8.7	3.0	1.2		
40			9.6	3.3	1.3		
42			10.6	3.6	1.4		
44			11.7	3.9	1.5		
46			12.8	4.2	1.6		
48			13.9	4.5	1.7		
50			15.0	4.9	1.9	0.7	
52				5.3	2.1		
54				5.7	2.2		
56				6.2	2.3		
58				6.7	2.5		
60				7.2	2.7	1.0	
65				8.3	3.2	1.1	
70				9.8	3.7	1.3	
75				11.3	4.3	1.5	
80				12.8	4.9	1.6	0.7
90				16.1	6.2	2.0	0.8
100				20.0	7.8	2.5	0.9
110					9.5	2.9	1.0
120					11.3	3.4	1.2
130					13.0	3.9	1.4
140					15.1	4.5	1.6
150					17.3	5.1	1.8
160					20.0	5.8	2.1
170						6.5	2.4
180						7.2	2.7
190						8.0	3.0
200						9.0	3.2
220						11.0	3.9
240						13.0	4.7
260						15.0	5.5
280						17.3	6.3
300						20.0	7.2
350							10.0
400							13.0
450							16.2
500							20.0





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