Quality

Smart Solutions FOR THE Professional®



SMARTLINE®

SALCO PRODUCTS DRIP IRRIGATION

SPRAYS	page 2
SPRINKLER ACCESSORIES	page 12
ROTORS	page 13
VALVES	page 16
SMART CONTROLS	page 25
LOW VOLUME	page 40
REFERENCE	page 60
TRADE WARRANTY	Back Cover

Weathermatic®

PRODUCT CATALOG 2009 2010

888-4 THE PRO www.weathermatic.com



Max Snoddy

Founder's Statement

Our quality is integrity – of our people, of our design, and of our manufacturing.

Vision Statement

Weathermatic will be a global leader in providing smart water conserving products and solutions for the outdoors.

Mission Statement

In pursuit of our Vision, we manufacture the highest quality, water efficient irrigation products with a passionate commitment to our dedicated family of customers.

Values

Integrity, Quality, Humility, Godly Character, Stewardship, Relationships.

WQuality

Weathermatic® Quality

Quality is why Weathermatic exists. Max Snoddy started Weathermatic in 1945 because the products on the market did not meet his requirements. His founding statement made it clear: **"Our quality is integrity, of our people, our design, and our manufacturing."** We were a contractor at that time, so, not only did we build the product, we installed and serviced it. Almost 65 years later, contracting is still in our blood and keeps our commitment true to the quality standards Max set out for us.

Today, **quality is our top priority** and part of everything we do. Quality starts in **our understanding of product application and translates into specifications** meeting the highest standards in the industry. Early in the design process, we utilizing cutting edge computer simulation technology and fabricated prototype models. And before a product is ready for manufacturing or a product change is qualified, we complete a **battery of extreme and destructive** tests benchmarked against industry competitors including: environmental chambers with extreme temperatures and humidity; hydrostatic testing for maximum pressures; reclaimed and dirty water testing; duration testing for tens of thousands of cycles; and field testing in locations throughout the world. Quality in design is carried through on the production line. **Before their release from our factory, we 100% water test every valve and rotor; every controller and weather station must pass a rigorous diagnostic check.**

Quality is made possible by the passion, experience, knowledge, and hard work of our people. People like James Holley who leads our Product Research Center. James has worked with Weathermatic for 30 years following in the footsteps of his father who worked with us for 35 years before him. Ingrained for generations, **quality is in our culture**.

Our industry is entering a new era of Smart products designed to use water more efficiently and effectively. As we lead and continually introduce new products like our SmartInline drip tubing and breakthroughs in SmartLine control systems, we will remember **at the core of any product technology must be first and foremost – quality**. So we trust for decades to come, you will look to Weathermatic as:

"The Quality Leader in Smart Irrigation"

Smart Solutions FOR THE Professional®

Why **Weathermatic?**

Smart Products supported by *Smart People* so you make *Smart Profits!*

Smart Products

In the new world of irrigation, less is more. So you need more than a sprinkler system, you need a "Water Management System." Weathermatic delivers quality and reliability in breakthrough products like SmartLine – now featuring the **SLW15 wireless weather station** so installation is simple and predictable in new and retrofit applications. And as the industry drives toward low volume, our Salco line, proven over 40 years, now features **SmartInline pressure compensating drip tubing** to complement one of the most comprehensive low volume lines in the industry. Smart products are found throughout the Weathermatic line like **Turbo series rotors** that adjust without a key and come standard with water saving check valves and low angle nozzles on every head. The core of the product family for five decades running is the legendary **Weathermatic valve** – proven water savers as the industry's only complete line of 100% reverse-flow, normally closed valves. Put all these Smart Products together and build a complete **Weathermatic Water Management System**.

Smart People

Weathermatic is made up of true industry experts who know their stuff – the product design, performance, and application. It's not by accident our sales and service team members **average over 20 years in the industry**. **We work every day with our network of distributors** in 60 countries worldwide to serve and support professional contractors, specifiers, municipalities, and institutions. **Our people understand you need more than a product; you need solutions – Smart Solutions.**

Smart Profits

A convergence of trends combines: slowing construction; an emphasis on upgrading existing irrigation systems; and diversification from traditional product lines. So at just the right time, Weathermatic product solutions give professionals and their customers the opportunity to make Smart Profits. Whether you're upgrading a system with a SmartLine control system and Salco low volume or installing a complete "Water Management System," **Weathermatic gives professionals differentiation from the competition and an edge,** while delivering significant **water and money savings to their customers** – a true win-win. Smart profits make our industry professionals and their customers **successful and sustainable in any economy**.









TURBO TOP 10

Consider 10 Reasons why the Turbo is the **Smart Solution!**

1 DOUBLE-THICK RUBBER COVER

- The beefiest in the business to protect the head and the customer
- Visible "+" and "–" arrows guide arc adjustment
- Surrounded by a ribbed screw-on cover for a sure grip in wet conditions

2 TOTALLY TOOL-LESS ARC ADJUSTMENT

- Arc adjustment ring has visible arc indicators for easiest "dry" adjustment – just grip the ring and dial it in!
- Wet set "point and shoot" adjustment without a tool is the fastest in the business. Just hold the ring and turn the top.
- Ratchets like a spray head to align arc. No channel locks required.
- Factory pre-set at 180°
- Vandal-resistant slip clutch and strong sonic weld prevent breakage as is common with other brands

3 WIDEST RANGE RACK

- 14 nozzles in one tree, 27 – 61'
- Includes 4 SmartAngle (low angle) and 2 Flow+ nozzles to provide 1" rotor range in a ¾" body
- Factory pre-installed nozzles available
- Sonic weld

4 HI TECH, SELF-CLEANING MICRO FILTER

- 20 micron filter originally developed for the medical industry protects reversing mechanism from dirt and debris

5 PRESSURE-ACTIVATED WIPER SEAL

- Superior material and size provides extreme reliability in sandy conditions
- 10-year rated seal exceeds 6000 cycles of performance
- Pops up and seals below 20 psi

6 HEAVY-GAUGE SPRING FOR POSITIVE RETRACTION

- 20 lbs. of force vs. 10 lbs. for the competition

7 READY-CHECK™ CHECK VALVE

- There when you need it at no added cost
- Holds up to 12' of elevation to prevent low head drainage

8 100% WATER TESTED

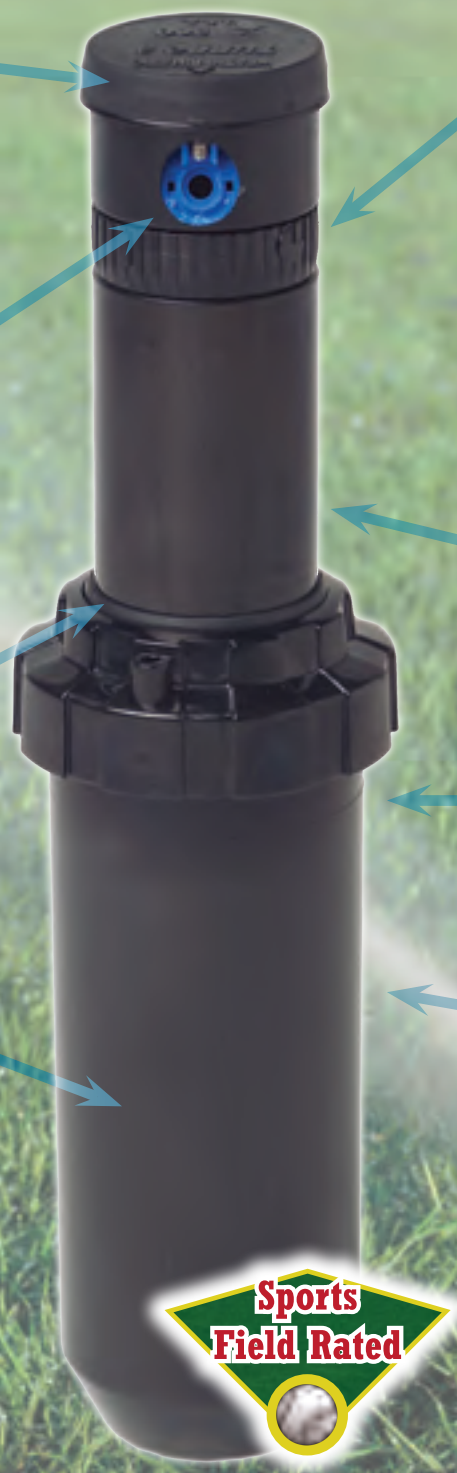
- Verifies rotation, rotation speed and reversing action on every sprinkler

9 FIVE YEAR WARRANTY "NO QUESTIONS ASKED"

- Return rate of less than 2%
- 20 years of proven performance

10 AMAZING VALUE FOR THE PRICE!

- Commercial sprinkler performance, strength and value for a residential price
- Try the entire Turbo Series and experience the Turbo difference!





T3 / T35 – TURBO ROTARY SPRINKLERS

Sports Field Rated

FEATURES

- 5 year warranty and 100% water tested
- Thick, vandal resistant rubber cover is standard; visible arrows indicate + or – arc adjustment
- Radius adjustment screw decreases radius up to 25%
- "Punch-thru" cover to protect nozzle retaining screw from debris
- Easy-grip threaded cover
- 14 field-changeable nozzles including SmartAngle (low angle) and Flow+ all on one tree
- Safety clutch for vandal protection; ratchets like a sprayhead
- Part circle models adjust from 40 – 360°; no tools required
- Expanded "arc dwell" on part circle models provides full coverage along borders
- Pressure activated wiper seal and strong stainless steel spring on pop-up models to ensure positive retraction
- High-tech micro filter protects reversing mechanism
- Streamlined large flow tube to minimize pressure loss through sprinkler
- Impeller flow regulator automatically matches rotation to nozzle selection
- Smooth impeller gear drive for highly uniform watering
- Large area, basket type, removable strainer for debris protection
- Standard Ready Check™ check valve on T3 and T35 models is easily reversed in the field to a "check" position. Check valve holds back 12' (3,7 m/hd) of elevated water.

CONSTRUCTION

- High-strength non-corrosive plastics and metals used throughout sprinkler
- Sealed, lubricant packed drive housing provides long life performance

OPTIONS *(FACTORY INSTALLED)*

- Non-potable cover (add "N" suffix)
- Vandal cover lock (add "XV" prefix)
- Check valve (add "CV" prefix)

ACCESSORIES

- T3ST Nozzle install collar

MODEL SPECIFICATION

T3, T35	Pop-up adjustable arc
T3-36, T35-36	Pop-up full circle
T3S	Adjustable arc shrub model
T3SS	Stainless steel pop-up adjustable arc
T3-36SS	Stainless steel pop-up full circle



T3SS

T3

T3 DIMENSIONS

Height (closed): 7 5/8" (19,4 cm)
Pop-up Height: 4" (10,2 cm)
Inlet: ¾" IPS

T35 DIMENSIONS

Height (closed): 8 13/16" (22,4 cm)
Pop-up Height: 4" (10,2 cm)
Inlet: 1" IPS (specify ISO for international)
Exposed Top Diameter: 1 ¾" (4,4 cm)

T3S SHRUB DIMENSIONS

Height: 8 3/16" (20,8 cm) **Inlet:** ¾" IPS



T3S

T3 / T35 PERFORMANCE

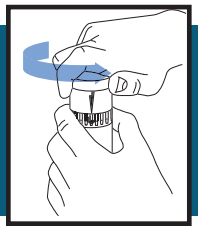
	STANDARD					METRIC				
Nozzle	Pressure psi	Radius ft.	Flow gpm	Precip. in/hr ■	Precip. in/hr ▲	Pressure bar	Radius m	Flow m³/hr	Precip. mm/hr ■	Precip. mm/hr ▲
STANDARD ANGLE 26° TRAJECTORY										
1	30	28	0.7	0.17	0.20	2,1	8,5	0,16	4	5
	40	32	0.8	0.15	0.17	2,8	9,8	0,18	4	4
	50	33	0.9	0.16	0.18	3,4	10,1	0,20	4	5
	60	33	1.0	0.18	0.20	4,1	10,1	0,23	4	5
1.5	30	31	1.0	0.20	0.23	2,1	9,4	0,23	5	6
	40	35	1.4	0.19	0.22	2,8	10,7	0,27	5	6
	50	36	1.6	0.24	0.27	3,4	11,0	0,36	6	7
	60	36	1.8	0.27	0.31	4,1	11,0	0,41	7	8
2	30	28	1.2	0.29	0.34	2,1	8,5	0,27	7	9
	40	35	1.4	0.22	0.25	2,8	10,7	0,32	6	6
	50	35	1.9	0.30	0.34	3,4	10,7	0,43	8	9
	60	35	2.3	0.36	0.42	4,1	10,7	0,52	9	11
3	30	30	1.7	0.36	0.42	2,1	9,1	0,39	9	11
	40	38	2.0	0.27	0.31	2,8	11,6	0,45	7	8
	50	39	2.4	0.30	0.35	3,4	11,9	0,55	8	9
	60	41	2.8	0.32	0.37	4,1	12,6	0,64	8	9
3.5	40	41	3.5	0.40	0.46	2,8	12,5	0,79	10	12
	50	42	3.7	0.40	0.47	3,4	12,8	0,84	10	12
	60	43	4.3	0.45	0.52	4,1	13,1	0,98	11	13
4	40	44	4.0	0.40	0.46	2,8	13,4	0,91	10	12
	50	45	4.3	0.41	0.47	3,4	13,7	0,98	10	12
	60	46	5.0	0.45	0.53	4,1	14,0	1,14	11	13
6	40	45	5.5	0.52	0.60	2,8	13,7	1,25	13	15
	50	46	6.3	0.57	0.66	3,4	14,0	1,43	15	17
	60	47	6.9	0.60	0.69	4,1	14,3	1,57	15	18
8	40	45	6.3	0.60	0.69	2,8	13,7	1,43	15	18
	50	47	7.5	0.65	0.75	3,4	14,3	1,70	17	19
	60	51	8.1	0.60	0.69	4,1	15,5	1,84	15	18
SmartAngle 13° LOW ANGLE TRAJECTORY										
2.0LA	30	29	1.6	0.37	0.42	2,1	8,8	0,36	9	11
	40	33	1.9	0.34	0.39	2,8	10,1	0,43	9	10
	50	34	2.1	0.35	0.40	3,4	10,4	0,48	9	10
2.5LA	30	31	2.1	0.42	0.49	2,1	9,4	0,48	11	12
	40	35	2.6	0.41	0.47	2,8	10,7	0,59	10	12
	50	36	2.9	0.43	0.50	3,4	11,0	0,66	11	13
3.5LA	30	31	2.7	0.54	0.62	2,1	9,4	0,61	14	16
	40	35	3.2	0.50	0.58	2,8	10,7	0,73	13	15
	50	37	3.5	0.49	0.57	3,4	11,3	0,79	13	14
4.5LA	30	33	3.0	0.53	0.61	2,1	10,1	0,68	13	16
	40	37	3.4	0.48	0.55	2,8	11,3	0,77	12	14
	50	37	4.1	0.58	0.67	3,4	11,3	0,93	15	17
FLOW+ NOZZLES 26° TRAJECTORY										
9	50	50	9.5	0.73	0.84	3,4	15,2	2,16	19	21
	60	54	10.8	0.71	0.82	4,1	16,5	2,45	18	21
	70	55	11.7	0.74	0.86	4,8	16,8	2,66	19	22
13	50	57	12.4	0.73	0.85	3,4	17,4	2,82	19	22
	60	59	13.8	0.76	0.88	4,1	18,0	3,13	19	22
	70	61	14.9	0.77	0.89	4,8	18,6	3,38	20	23

■ *Square spacing based on 50% of diameter*
▲ *Triangular spacing based on 50% of diameter*
Note: All precipitation rates are calculated for 180° operation. Divide by 2 for full circle precipitation rates

OPERATING RANGE

	STANDARD	METRIC
Precipitation Rate	Approx. 0.4 – 0.6" per hour @ 50 psi	10 – 15 mm per hour @ 3,5 bar
Radius	23 – 61'	7,0 – 18,6 m
Pressure	20 – 70 psi	1,4 – 4,8 bar
Flow	0.5 – 14.9 gpm	0,11 – 3,39 m³/h

Closed-case, gear-driven rotors rated for athletic fields, parks, and large turf areas



"POINT AND SHOOT" ARC ADJUSTMENT WITHOUT TOOLS

Sports Field Rated



CT70 NOZZLES

DOWNLOAD TECH SPECS AT:
www.weathermatic.com



CT70SS

CT70

CT70 ROTARY SPRINKLER

FEATURES

- 5 year trade warranty and 100% water tested
- Thick, vandal resistant rubber cover is standard; visible arrows indicate + or – arc adjustment
- Radius adjustment screw decreases radius up to 25%
- "Punch-thru" cover to protect nozzle retaining screw from debris
- Easy grip threaded cover
- 5 field changeable nozzles
- Safety clutch for vandal protection; ratchets like a sprayhead
- Part circle models adjust from 40 – 360°; no tools required
- Expanded "arc dwell" on part circle models provides full coverage along borders
- Pressure activated wiper seal and strong stainless steel spring on pop-up models to ensure positive retraction
- High-tech micro filter protects reversing mechanism
- Streamlined large flow tube to minimize pressure loss through sprinkler
- Impeller flow regulator automatically matches flow to nozzle selection
- Smooth impeller gear drive for highly uniform watering
- Large area, basket type, removable strainer for debris protection
- Standard Ready Check™ check valve on CT70 and CT70-36 models is easily reversed in the field to a "check" position. Check valve holds back 15' (4,6 m/hd) of elevated water

CONSTRUCTION

- High-strength non-corrosive plastics and metals used throughout sprinkler
- Sealed, lubricant packed drive housing provides long life performance

OPTIONS *(FACTORY INSTALLED)*

- Non-potable cover (add "N" suffix)
- Vandal cover lock (add "XV" prefix)

ACCESSORIES

- T3ST Nozzle install collar

MODEL SPECIFICATION

CT70	Adjustable arc
CT70-36	Full circle

DIMENSIONS

Height (closed):	8 13/16" (22,4 cm)
Pop-up Height:	4" (10,2 cm)
Inlet:	1" IPS (specify ISO for international)
Exposed Top Diameter:	1 ¾" (4,4 cm)

International threads: add ISO suffix

OPERATING RANGE

	STANDARD	METRIC
Precipitation Rate	Approx. 0.6 – 1.0" per hour @ 60 psi	15,8 – 27 mm per hour @ 4,2 bar
Radius	49 – 74'	14,9 – 22,6 m
Pressure	40 – 90 psi	2,8 – 6,2 bar
Flow	8.1 – 28.0 gpm	1,84 – 6,36 m³/h

CT70 PERFORMANCE

	STANDARD			METRIC		
Nozzle	**Pressure** psi	**Radius*** ft.	**Flow** gpm	**Pressure** bar	**Radius*** m	**Flow** m³/hr
71	40	49	8.1	2,8	14,9	1,84
	50	51	9.1	3,4	15,5	2,07
	60	53	10.0	4,2	16,2	2,27
	70	55	11.0	4,8	16,8	2,50
	80	56	11.8	5,5	17,0	2,68
72	50	54	10.7	3,4	16,5	2,43
	60	55	11.8	4,2	16,8	2,68
	70	57	12.6	4,8	17,4	2,86
	80	58	13.8	5,5	17,7	3,13
73	50	57	14.0	3,4	17,4	3,18
	60	58	15.3	4,2	17,7	3,48
	70	60	16.8	4,8	18,3	3,82
	80	61	17.8	5,5	18,6	4,04
74	60	59	16.6	4,2	18,0	3,77
	70	62	18.1	4,8	18,9	4,11
	80	63	19.2	5,5	19,2	4,36
	90	65	20.4	6,2	19,8	4,63
75	60	66	22.5	4,2	20,1	5,11
	70	67	24.7	4,8	20,4	5,61
	80	72	26.5	5,5	21,9	6,02
	90	74	28.0	6,2	22,6	6,36

Nozzle trajectory: 26°

**Radius of coverage shown is for still air with no diffusion. Maximum radius reduction with diffuser screw is 25%.*

Note: Performance data derived from tests that conform to ASAE Standard S398.1. Uniform precipitation data developed with Hyperspace™ Software is available upon request.

Note: see page 65 for spacing and precipitation rate formulas.

PVC SCHEDULE 40 IPS PLASTIC PIPE

C = 150

Loss per 100' of pipe (psi/100')

Size	½"		¾"		1"		1 ¼"		1 ½"		2"		2 ½"		3"		4"		6"	
O.D.	0.840		1.050		1.315		1.660		1.900		2.375		2.875		3.500		4.500		6.625	
I.D.	0.622		0.824		1.049		1.380		1.610		2.067		2.469		3.068		4.026		6.065	
Wall Dim.	0.109		0.113		0.133		0.140		0.145		0.154		0.203		0.216		0.237		0.280	
Flow gpm	Velocity fps	psi loss	Velocity fps	psi loss	Velocity fps	psi loss	Velocity fps	psi loss	Velocity fps	psi loss	Velocity fps	psi loss	Velocity fps	psi loss	Velocity fps	psi loss	Velocity fps	psi loss	Velocity fps	psi loss
1	1.06	0.503	0.60	0.123	0.37	0.037	0.21	0.001	0.16	0.004	0.01	0.001	0.07	0.001	0.04	0.000	0.03	0.000	0.01	0.000
2	2.11	1.815	1.20	0.444	0.74	0.134	0.42	0.034	0.31	0.016	0.19	0.005	0.13	0.002	0.09	0.001	0.05	0.000	0.02	0.000
3	3.16	3.842	1.80	0.940	1.11	0.283	0.64	0.073	0.47	0.034	0.28	0.001	0.20	0.004	0.13	0.001	0.08	0.000	0.03	0.000
4	4.22	6.542	2.40	1.601	1.48	0.482	0.85	0.124	0.62	0.058	0.38	0.017	0.26	0.007	0.17	0.002	0.10	0.001	0.04	0.000
5	5.27	9.885	3.00	2.419	1.85	0.728	1.07	0.187	0.78	0.088	0.47	0.026	0.33	0.011	0.21	0.004	0.13	0.000	0.06	0.000
6	6.33	13.850	3.60	3.389	2.22	1.020	1.28	0.263	0.94	0.123	0.57	0.036	0.40	0.015	0.26	0.005	0.15	0.001	0.07	0.000
7	7.38	18.421	4.20	4.508	2.59	1.357	1.49	0.349	1.10	0.163	0.66	0.048	0.46	0.020	0.30	0.007	0.18	0.002	0.08	0.000
8	8.44	23.582	4.80	5.771	2.96	1.738	1.71	0.447	1.25	0.209	0.76	0.061	0.53	0.026	0.34	0.009	0.20	0.002	0.09	0.000
9	9.49	29.324	5.40	7.176	3.33	2.161	1.92	0.556	1.41	0.260	0.85	0.076	0.60	0.032	0.39	0.011	0.23	0.003	0.10	0.000
10			6.00	8.720	3.70	2.625	2.14	0.676	1.57	0.315	0.95	0.092	0.66	0.039	0.43	0.013	0.25	0.004	0.11	0.001
11			6.60	10.402	4.07	3.132	2.35	0.806	1.73	0.376	1.05	0.110	0.73	0.046	0.47	0.016	0.28	0.004	0.12	0.001
12			7.21	12.218	4.44	3.679	2.57	0.947	1.88	0.442	1.14	0.129	0.80	0.055	0.52	0.019	0.30	0.005	0.13	0.001
14			8.41	16.251	5.19	4.893	2.99	1.259	2.20	0.588	1.33	0.172	0.93	0.073	0.60	0.025	0.35	0.007	0.16	0.001
16			9.61	20.804	5.93	6.264	3.42	1.612	2.51	0.753	1.52	0.220	1.07	0.093	0.69	0.032	0.40	0.009	0.18	0.001
18			10.81	25.869	6.67	7.789	3.85	2.004	2.83	0.936	1.71	0.274	1.20	0.116	0.78	0.040	0.45	0.011	0.20	0.001
20			12.01	31.437	7.41	9.465	4.28	2.436	3.14	1.137	1.90	0.333	1.33	0.140	0.86	0.048	0.50	0.013	0.22	0.002
22					8.15	11.290	4.71	2.905	3.46	1.357	2.10	0.397	1.47	0.167	0.95	0.057	0.55	0.015	0.24	0.002
24					8.89	13.262	5.14	3.413	3.77	1.593	2.29	0.467	1.60	0.197	1.04	0.067	0.60	0.018	0.27	0.002
26					9.64	15.378	5.57	3.957	4.09	1.848	2.48	0.541	1.74	0.228	1.12	0.078	0.65	0.021	0.29	0.003
28					10.38	17.638	5.99	4.539	4.40	2.119	2.67	0.621	1.87	0.262	1.21	0.090	0.70	0.024	0.31	0.003
30					11.12	20.039	6.42	5.157	4.72	2.408	2.86	0.705	2.00	0.297	1.30	0.102	0.75	0.027	0.33	0.004
35					12.97	26.652	7.49	6.859	5.50	3.202	3.34	0.938	2.34	0.395	1.51	0.136	0.88	0.036	0.38	0.005
40							8.56	8.780	6.29	4.010	3.81	1.201	2.67	0.506	1.73	0.174	1.00	0.046	0.44	0.006
45							9.64	10.918	7.08	5.098	4.29	1.493	3.01	0.629	1.95	0.216	1.13	0.058	0.49	0.008
50							10.71	13.268	7.87	6.195	4.77	1.815	3.34	0.765	2.16	0.262	1.25	0.070	1.55	0.009
55							11.78	15.826	8.65	7.390	5.25	2.164	3.68	0.912	2.38	0.313	1.38	0.083	0.61	0.011
60							12.85	18.590	9.44	8.680	5.72	2.543	4.01	1.071	2.60	0.367	1.51	0.098	0.66	0.013
65									10.23	10.066	6.20	2.948	4.35	1.242	2.81	0.426	1.63	0.114	0.72	0.015
70									11.01	11.545	6.68	3.382	4.68	1.425	3.03	0.489	1.76	0.130	0.77	0.018
75									11.80	13.117	7.16	3.842	5.01	1.619	3.25	0.555	1.88	0.148	0.83	0.020
80									12.59	14.780	7.63	4.329	5.35	1.824	3.46	0.626	2.01	0.167	0.88	0.023
85											8.11	4.843	5.68	2.041	3.68	0.700	2.13	0.187	0.94	0.025
90											8.59	5.383	6.02	2.268	3.90	0.778	2.26	0.208	0.99	0.028
95											9.07	5.949	6.35	2.507	4.11	0.860	2.39	0.229	1.05	0.031
100											9.54	6.542	6.69	2.757	4.33	0.945	2.51	0.252	1.10	0.034
110											10.50	7.803	7.36	3.288	4.76	1.127	2.76	0.301	1.22	0.041
120											11.45	9.166	8.03	3.863	5.20	1.324	3.02	0.353	1.33	0.048
130											12.41	10.629	8.70	4.479	5.63	1.536	3.27	0.410	1.44	0.055
140													9.37	5.137	6.06	1.761	3.52	0.470	1.55	0.064
150													10.03	5.837	6.50	2.001	3.77	0.534	1.66	0.072
160													10.70	6.577	6.93	2.255	4.02	0.602	1.77	0.081
170													11.37	7.357	7.36	2.523	4.27	0.673	1.88	0.091
180													12.04	8.178	7.80	2.804	4.53	0.748	1.99	0.101
190													12.71	9.038	8.23	3.099	4.78	0.827	2.10	0.112
200															8.66	3.407	5.03	0.909	2.21	0.123
225															9.75	4.237	5.66	1.131	2.49	0.153
250															10.83	5.149	6.29	1.374	2.77	0.186
275															11.92	6.142	6.92	1.639	3.05	0.222
300															13.00	7.214	7.55	1.926	3.32	0.260
325																	8.18	2.233	3.60	0.302
350																	8.81	2.561	3.88	0.346
375																	9.43	2.910	4.15	0.393
400																	10.06	3.279	4.43	0.443
425																	10.69	3.668	4.71	0.496
450																	11.32	4.077	4.99	0.551
475																	11.95	4.506	5.26	0.609
500																	12.58	4.954	5.54	0.669
550																			6.10	0.799
600																			6.65	0.938

Shading indicates velocities over 5 fps (not recommended).

PVC CLASS 200 IPS PLASTIC PIPE

SDR21 C = 150

Loss per 100' of pipe (psi/100')

Size	½" (1)		¾"		1"		1 ¼"		1 ½"		2"		2 ½"		3"		4"		6"	
O.D.	0.840		1.050		1.315		1.660		1.900		2.375		2.875		3.500		4.500		6.625	
I.D.	0.716		0.930		1.189		1.502		1.720		2.149		2.601		3.166		4.072		5.993	
Wall Dim.	0.062		0.060		0.063		0.079		0.090		0.113		0.137		0.167		0.214		0.316	
Flow gpm	Velocity fps	psi loss	Velocity fps	psi loss	Velocity fps	psi loss	Velocity fps	psi loss	Velocity fps	psi loss	Velocity fps	psi loss	Velocity fps	psi loss	Velocity fps	psi loss	Velocity fps	psi loss	Velocity fps	psi loss
1	0.80	0.248	0.47	0.067	0.29	0.020	0.18	0.006	0.14	0.003	0.09	0.001	0.06	0.000	0.04	0.000	0.02	0.000	0.01	0.000
2	1.59	0.896	0.94	0.243	0.58	0.072	0.36	0.023	0.28	0.012	0.18	0.004	0.12	0.002	0.08	0.001	0.05	0.000	0.02	0.000
3	2.39	1.896	1.42	0.514	0.87	0.152	0.54	0.048	0.41	0.025	0.27	0.008	0.18	0.003	0.12	0.001	0.07	0.000	0.03	0.000
4	3.19	3.229	1.89	0.876	1.16	0.259	0.72	0.082	0.55	0.042	0.35	0.014	0.24	0.005	0.16	0.002	0.01	0.001	0.05	0.000
5	3.98	4.879	2.36	1.323	1.44	0.391	0.91	0.123	0.69	0.063	0.44	0.021	0.30	0.008	0.20	0.003	0.12	0.001	0.06	0.000
6	4.78	6.837	2.83	1.854	1.73	0.548	1.09	0.173	0.83	0.089	0.53	0.030	0.36	0.012	0.24	0.004	0.15	0.001	0.07	0.000
7	5.58	9.093	3.31	2.466	2.02	0.729	1.27	0.230	0.97	0.118	0.62	0.039	0.42	0.015	0.29	0.006	0.17	0.002	0.08	0.000
8	6.37	11.641	3.78	3.157	2.31	0.933	1.45	0.294	1.10	0.151	0.71	0.051	0.48	0.020	0.33	0.008	0.20	0.002	0.09	0.000
9	7.17	14.475	4.25	3.926	2.60	1.160	1.63	0.366	1.24	0.188	0.80	0.063	0.54	0.025	0.37	0.009	0.22	0.003	0.10	0.000
10	7.97	17.590	4.72	4.771	2.89	1.410	1.81	0.444	1.38	0.228	0.88	0.076	0.60	0.030	0.41	0.011	0.25	0.003	0.11	0.001
11	8.77	20.981	5.20	5.690	3.18	1.682	1.99	0.530	1.52	0.272	0.97	0.091	0.66	0.036	0.45	0.014	0.27	0.004	0.13	0.001
12	9.56	24.646	5.67	6.684	3.47	1.975	2.17	0.623	1.66	0.320	1.06	0.107	0.72	0.042	0.49	0.016	0.30	0.005	0.14	0.001
14	11.16	32.779	6.61	8.890	4.05	2.627	2.54	0.828	1.93	0.425	1.24	0.142	0.85	0.056	0.57	0.021	0.34	0.006	0.16	0.000
16	12.75	41.964	7.56	11.381	4.62	3.363	2.90	1.060	2.21	0.545	1.42	0.182	0.97	0.071	0.65	0.027	0.39	0.008	0.18	0.001
18	14.34	52.181	8.50	14.152	5.20	4.182	3.26	1.318	2.49	0.677	1.59	0.227	1.09	0.089	0.73	0.034	0.44	0.001	0.20	0.002
20	15.94	63.411	9.45	17.198	5.78	5.082	3.62	1.602	2.76	0.823	1.77	0.275	1.21	0.108	0.82	0.041	0.49	0.012	0.23	0.002
22			10.39	20.514	6.36	6.062	3.98	1.911	3.04	0.982	1.95	0.328	1.33	0.129	0.90	0.049	0.54	0.014	0.25	0.002
24			11.34	24.097	6.93	7.121	4.35	2.244	3.31	1.153	2.12	0.386	1.45	0.151	0.98	0.058	0.59	0.017	0.27	0.003
26			12.28	27.943	7.51	8.258	4.71	2.602	3.59	1.337	2.30	0.447	1.57	0.175	1.06	0.067	0.64	0.020	0.30	0.003
28			13.22	32.049	8.09	9.471	5.07	2.820	3.87	1.534	2.48	0.513	1.69	0.201	1.14	0.076	0.69	0.023	0.32	0.003
30			14.17	36.412	8.67	10.761	5.43	3.200	4.14	1.742	2.65	0.583	1.81	0.228	1.22	0.087	0.74	0.026	0.34	0.004
35			16.53	48.428	10.11	14.311	6.34	4.260	4.83	2.317	3.01	0.775	2.11	0.304	1.43	0.116	0.86	0.034	0.40	0.005
40					11.56	18.322	7.24	5.450	5.52	2.967	3.54	0.993	2.42	0.389	1.63	0.148	0.99	0.044	0.45	0.007
45					13.00	22.783	8.15	6.780	6.21	3.689	3.98	1.234	2.72	0.483	1.83	0.184	1.11	0.054	0.51	0.008
50					14.45	27.686	9.05	8.240	6.90	4.483	4.42	1.500	3.02	0.587	2.04	0.224	1.23	0.066	0.57	0.010
55					15.89	33.024	9.96	9.830	7.59	5.347	4.86	1.789	3.32	0.701	2.24	0.267	1.35	0.079	0.63	0.012
60							10.86	11.550	8.28	6.281	5.31	2.102	3.62	0.823	2.45	0.313	1.48	0.092	0.68	0.014
65							11.77	13.400	8.98	7.283	5.75	2.437	3.92	0.954	2.65	0.363	1.60	0.107	0.74	0.016
70							12.68	15.370	9.67	8.354	6.19	2.795	4.23	1.094	2.85	0.417	1.72	0.123	0.80	0.019
75							13.58	17.470	10.36	9.491	6.63	3.176	4.53	1.243	3.06	0.473	1.85	0.140	0.85	0.021
80							14.49	19.680	11.05	10.694	7.08	3.578	4.83	1.401	3.26	0.533	1.97	0.157	0.91	0.024
85							15.39	22.020	11.74	11.964	7.52	4.003	5.13	1.567	3.46	0.597	2.09	0.176	0.97	0.027
90									12.43	13.298	7.96	4.450	5.43	1.742	3.67	0.663	2.22	0.196	1.02	0.030
95									13.12	14.697	8.40	4.918	5.74	1.926	3.87	0.733	2.34	0.216	1.08	0.033
100									13.81	16.160	8.85	5.407	6.04	2.117	4.08	0.806	2.46	0.238	1.14	0.036
110									15.19	19.276	9.73	6.450	6.64	2.525	4.48	0.961	2.71	0.284	1.25	0.043
120											10.61	7.576	7.25	2.967	4.89	1.129	2.96	0.333	1.36	0.051
130											11.50	8.785	7.85	3.440	5.30	1.310	3.20	0.386	1.48	0.059
140											12.38	10.076	8.45	3.946	5.71	1.502	3.45	0.443	1.59	0.068
150											13.27	11.448	9.06	4.483	6.11	1.707	3.70	0.503	1.71	0.077
160											14.15	12.900	9.66	5.051	6.52	1.923	3.94	0.567	1.82	0.086
170											15.04	14.431	10.27	5.651	6.93	2.151	4.19	0.635	1.93	0.097
180													10.87	6.281	7.34	2.391	4.43	0.705	2.05	0.107
190													11.47	6.942	7.74	2.643	4.68	0.779	2.16	0.119
200													12.08	7.633	8.15	2.906	4.93	0.857	2.27	0.131
225													13.59	9.491	9.17	3.613	5.54	1.066	2.56	0.162
250													15.01	11.533	10.19	4.391	6.16	1.295	2.84	0.197
275															11.21	5.238	6.77	1.545	3.13	0.235
300															12.23	6.152	7.39	1.815	3.41	0.277
325															13.25	7.134	8.01	2.104	3.70	0.321
350															14.26	8.183	8.62	2.413	3.98	0.368
375															15.28	9.297	9.24	2.742	4.27	0.418
400																	9.85	3.090	4.55	0.471
425																	10.47	3.456	4.83	0.527
450																	11.09	3.842	5.12	0.586
475																	11.70	4.246	5.40	0.647
500																	12.32	4.669	5.69	0.712
550																	13.55	5.569	6.26	0.849
600																	14.78	6.542	6.82	0.997

(1) SDR 13.5 pipe for ½". SDR21 not standard.

Shading indicates velocities over 5 fps (not recommended).

POLYETHYLENE (PE) SDR PRESSURE RATED TUBE

C = 140

Loss per 100' of pipe (psi/100')

Size	½"		¾"		1"		1 ¼"		1 ½"		2"		2 ½"		3"		4"	
I.D.	0.622		0.824		1.049		1.380		1.610		2.067		2.469		3.068		4.026	
Flow gpm	Velocity fps	psi loss	Velocity fps	psi loss	Velocity fps	psi loss	Velocity fps	psi loss	Velocity fps	psi loss	Velocity fps	psi loss	Velocity fps	psi loss	Velocity fps	psi loss	Velocity fps	psi loss
1	1.06	0.488	0.60	0.124	0.37	0.038	0.21	0.010	0.16	0.005	0.01	0.001	0.07	0.001	0.04	0.000	0.03	0.000
2	2.11	1.759	1.20	0.448	0.74	0.138	0.43	0.036	0.32	0.017	0.19	0.003	0.13	0.002	0.09	0.001	0.05	0.000
3	3.17	3.723	1.80	0.948	1.11	0.293	0.64	0.077	0.47	0.036	0.29	0.007	0.20	0.005	0.13	0.002	0.08	0.000
4	4.22	6.340	2.41	1.614	1.48	0.499	0.86	0.131	0.63	0.062	0.38	0.012	0.27	0.008	0.17	0.003	0.10	0.001
5	5.28	9.580	3.01	2.438	1.86	0.753	1.07	0.198	0.79	0.094	0.48	0.018	0.34	0.012	0.22	0.004	0.13	0.001
6	6.34	13.422	3.61	3.417	2.23	1.055	1.29	0.278	0.95	0.131	0.57	0.025	0.40	0.016	0.26	0.006	0.15	0.002
7	7.39	17.852	4.21	4.544	2.60	1.404	1.50	0.369	1.10	0.175	0.67	0.034	0.47	0.022	0.30	0.008	0.18	0.002
8	8.45	22.854	4.81	5.817	2.97	1.797	1.72	0.473	1.26	0.223	0.76	0.043	0.54	0.028	0.35	0.001	0.20	0.003
9	9.50	28.418	5.41	7.234	3.34	2.235	1.93	0.588	1.42	0.278	0.86	0.053	0.60	0.035	0.39	0.012	0.23	0.003
10	10.56	34.534	6.02	8.790	3.71	2.716	2.15	0.715	1.58	0.338	0.96	0.065	0.67	0.042	0.43	0.015	0.25	0.004
11	11.61	41.193	6.62	10.485	4.08	3.239	2.36	0.853	1.73	0.403	1.05	0.077	0.74	0.050	0.48	0.017	0.28	0.005
12	12.67	48.388	7.22	12.317	4.45	3.805	2.57	1.001	1.89	0.473	1.15	0.091	0.80	0.059	0.52	0.021	0.30	0.005
14	14.78	64.355	8.42	16.381	5.20	5.061	3.00	1.332	2.21	0.629	1.34	0.121	0.94	0.079	0.61	0.027	0.35	0.007
16	16.89	82.389	9.63	20.972	5.94	6.479	3.43	1.705	2.52	0.805	1.53	0.155	1.07	0.101	0.69	0.035	0.40	0.009
18	19.01	102.448	10.83	26.078	6.68	8.056	3.86	2.120	2.84	1.001	1.72	0.193	1.21	0.126	0.78	0.043	0.45	0.012
20	21.12	124.496	12.03	31.690	7.42	9.790	4.29	2.577	3.15	1.217	1.91	0.234	1.34	0.153	0.87	0.053	0.50	0.014
22			13.24	37.800	8.17	11.677	4.72	3.074	3.47	1.452	2.10	0.279	1.47	0.182	0.95	0.063	0.55	0.017
24			14.44	44.402	8.91	13.717	5.15	3.610	3.78	1.705	2.29	0.328	1.61	0.214	1.04	0.074	0.60	0.020
26			15.64	51.489	9.65	15.906	5.58	4.187	4.01	1.977	2.49	0.380	1.74	0.248	1.13	0.086	0.66	0.023
28			16.85	59.055	10.39	18.243	6.01	4.802	4.41	2.268	2.68	0.436	1.88	0.284	1.22	0.098	0.71	0.026
30			18.05	67.094	11.14	20.727	6.44	5.455	4.73	2.577	2.87	0.495	2.01	0.323	1.30	0.112	0.76	0.030
35			21.06	89.236	12.99	27.567	7.51	7.256	5.52	3.427	3.35	0.659	2.35	0.430	1.52	0.149	0.88	0.040
40					14.85	35.291	8.58	9.289	6.30	4.387	3.82	0.843	2.68	0.550	1.74	0.190	1.01	0.051
45					16.71	43.883	9.65	11.550	7.09	5.455	4.30	1.049	3.02	0.684	1.95	0.237	1.13	0.063
50					18.56	53.328	10.73	14.036	7.88	6.630	4.78	1.274	3.35	0.831	2.17	0.288	1.26	0.077
55					20.42	63.610	11.80	16.743	8.67	7.908	5.26	1.520	3.69	0.992	2.39	0.343	1.39	0.091
60							12.87	19.667	9.46	9.289	5.74	1.785	4.02	1.165	2.60	0.403	1.51	0.107
65							13.94	22.806	10.24	10.772	6.21	2.070	4.36	1.351	2.82	0.468	1.64	0.125
70							15.02	26.157	11.03	12.354	6.69	2.375	4.69	1.549	3.04	0.536	1.76	0.143
75							16.09	29.718	11.82	14.036	7.17	2.698	5.03	1.760	3.25	0.609	1.89	0.162
80							17.16	33.487	12.61	15.816	7.65	3.040	5.36	1.983	3.47	0.686	2.02	0.183
85							18.23	37.461	13.40	17.693	8.13	3.401	5.70	2.219	3.69	0.768	2.14	0.205
90									14.18	19.667	8.61	3.780	6.03	2.466	3.91	0.854	2.27	0.227
95									14.97	21.736	9.08	4.178	6.37	2.726	4.12	0.943	2.39	0.251
100									15.76	23.899	9.56	4.594	6.70	2.997	4.34	1.037	2.52	0.276
110									17.34	28.508	10.52	5.480	7.37	3.575	4.77	1.237	2.77	0.330
120											11.47	6.437	8.04	4.199	5.21	1.453	3.02	0.387
130											12.43	7.464	8.71	4.870	5.64	1.685	3.28	0.449
140											13.39	8.561	9.38	5.585	6.08	1.933	3.53	0.515
150											14.34	9.726	10.05	6.346	6.51	2.196	3.78	0.585
160											15.30	10.960	10.72	7.150	6.94	2.475	4.03	0.659
170											16.25	12.261	11.39	7.999	7.38	2.768	4.28	0.738
180													12.06	8.891	7.81	3.077	4.54	0.820
190													12.73	9.827	8.25	3.401	4.79	0.906
200													13.40	10.805	8.68	3.740	5.04	0.996
225													15.08	13.435	9.76	4.650	5.67	1.239
250													16.75	16.327	10.85	5.651	6.30	1.505
275															11.93	6.740	6.93	1.796
300															13.02	7.917	7.56	2.109
325															14.10	9.181	8.19	2.446
350															15.19	10.530	8.82	2.806
375															16.27	11.964	9.45	3.187
400																	10.08	3.592
425																	10.71	4.018
450																	11.34	4.466
475																	11.97	4.936
500																	12.60	5.427
550																	13.86	6.474
600																	15.12	7.604

Shading indicates velocities over 5 fps (not recommended).

TYPE K COPPER WATER TUBE

C = 140

Loss per 100' of pipe (psi/100')

Size	½"		⅝"		¾"		1"		1 ¼"		1 ½"		2"		2 ½"		3"	
I.D.	0.527		0.652		0.745		0.995		1.245		1.481		1.959		2.435		2.907	
Flow gpm	Velocity fps	psi loss	Velocity fps	psi loss	Velocity fps	psi loss	Velocity fps	psi loss	Velocity fps	psi loss	Velocity fps	psi loss	Velocity fps	psi loss	Velocity fps	psi loss	Velocity fps	psi loss
1	1.47	1.147	0.96	0.390	0.74	0.213	0.41	0.052	0.26	0.018	0.19	0.008	0.11	0.002	0.07	0.001	0.05	0.000
2	2.94	4.135	1.92	1.400	1.47	0.768	0.83	0.188	0.53	0.063	0.37	0.027	0.21	0.007	0.14	0.002	0.01	0.001
3	4.41	8.755	2.88	2.960	2.21	1.625	1.24	0.397	0.79	0.134	0.56	0.057	0.32	0.015	0.21	0.005	0.15	0.002
4	5.88	14.908	3.84	5.040	2.94	2.767	1.65	0.677	1.05	0.228	0.74	0.098	0.43	0.025	0.28	0.009	0.19	0.004
5	7.35	22.526	4.80	7.620	3.68	4.182	2.06	1.022	1.32	0.344	0.93	0.148	0.53	0.038	0.34	0.013	0.24	0.006
6	8.83	31.563	5.77	10.670	4.42	5.859	2.48	1.432	1.58	0.482	1.12	0.207	0.64	0.053	0.41	0.018	0.29	0.008
7	10.30	41.979	6.73	14.200	5.15	7.792	2.89	1.905	1.84	0.641	1.30	0.275	0.75	0.071	0.48	0.024	0.34	0.010
8	11.77	53.742	7.69	18.170	5.89	9.976	3.30	2.439	2.11	0.820	1.49	0.352	0.85	0.090	0.55	0.031	0.39	0.013
9			8.65	22.600	6.62	12.405	3.71	3.033	2.37	1.020	1.68	0.438	0.96	0.112	0.62	0.039	0.44	0.017
10			9.61	27.460	7.36	15.075	4.13	3.685	2.64	1.239	1.86	0.532	1.06	0.137	0.69	0.047	0.48	0.020
11			10.57	32.760	8.01	17.981	4.54	4.396	2.90	1.478	2.05	0.635	1.17	0.163	0.76	0.056	0.53	0.024
12			11.53	38.480	8.83	21.122	4.95	5.164	3.16	1.737	2.23	0.745	1.28	0.191	0.83	0.066	0.58	0.028
14					10.30	28.092	5.78	6.868	3.69	2.310	2.61	0.992	1.49	0.255	0.96	0.088	0.68	0.037
16					11.78	35.964	6.60	8.792	4.22	2.957	2.98	1.269	1.70	0.326	1.10	0.113	0.77	0.048
18							7.43	10.933	4.74	3.677	3.35	1.578	1.92	0.405	1.24	0.140	0.87	0.060
20							8.25	13.286	5.27	4.468	3.72	1.918	2.13	0.493	1.38	0.170	0.97	0.072
22							9.08	15.848	5.80	5.329	4.01	2.288	2.34	0.588	1.52	0.203	1.06	0.086
24							9.90	18.616	6.33	6.260	4.47	2.688	2.55	0.690	1.65	0.239	1.16	0.102
26							10.73	21.587	6.85	7.259	4.84	3.116	2.77	0.800	1.79	0.277	1.26	0.118
28							11.55	24.759	7.38	8.326	5.21	3.574	2.98	0.918	1.93	0.317	1.35	0.135
30									7.91	9.460	5.59	4.061	3.19	1.043	2.07	0.360	1.45	0.153
35									9.22	12.581	6.52	5.401	3.73	1.387	2.41	0.479	1.69	0.204
40									10.54	16.107	7.45	6.915	4.26	1.776	2.76	0.614	1.93	0.261
45									11.86	20.028	8.38	8.598	4.79	2.208	3.10	0.763	2.18	0.325
50											9.31	10.448	5.32	2.683	3.44	0.927	2.42	0.395
55											10.24	12.463	5.85	3.201	3.79	1.106	2.66	0.471
60											11.17	14.640	6.39	3.760	4.13	1.299	2.90	0.553
65													6.92	4.360	4.48	1.507	3.14	0.641
70													7.45	5.001	4.82	1.728	3.38	0.736
75													7.98	5.681	5.17	1.963	3.63	0.836
80													8.52	6.402	5.51	2.212	3.87	0.942
85													9.05	7.162	5.86	2.475	4.11	1.053
90													9.58	7.961	6.20	2.751	4.35	1.171
95													10.11	8.798	6.55	3.040	4.59	1.294
100													10.64	9.674	6.89	3.343	4.83	1.423
110													11.71	11.539	7.58	3.987	5.32	1.697
120															8.27	4.684	5.80	1.994
130															8.96	5.431	6.28	2.312
140															9.65	6.229	6.77	2.651
150															10.33	7.077	7.25	3.012
160															11.02	7.975	7.73	3.394
170															11.71	8.921	8.22	3.797
180																	8.70	4.221
190																	9.18	4.665
200																	9.67	5.129
225																	10.88	6.378

Shading indicates velocities over 5 fps (not recommended).

*WIRE SIZING CHART FOR 24 VAC SOLENOIDS**

Equivalent circuit length (in feet)

5.5 VA solenoid electric valves with 26.5 V transformer

80 psi		CONTROL WIRE SIZE							
		18	16	14	12	10	8	6	4
Valve Common Size	18	3,000	3,700	4,300	4,800	5,200	5,500	5,200	5,800
	16	3,700	4,800	5,900	6,900	7,700	8,300	8,800	9,100
	14	4,300	5,900	7,700	9,400	11,000	12,300	13,300	14,000
	12	4,800	6,900	9,400	12,200	15,000	17,500	19,600	21,100
	10	5,200	7,700	11,000	15,000	19,400	23,900	27,800	31,100
	8	5,500	8,300	12,300	17,500	23,900	30,900	38,000	44,300
	6	5,700	8,800	13,300	19,600	27,800	38,000	49,200	60,400
	4	5,800	9,100	14,000	21,100	31,100	44,300	60,400	78,200

Multiplying factor for two valves per station: 0.42

100 psi		CONTROL WIRE SIZE							
		18	16	14	12	10	8	6	4
Valve Common Size	18	2,800	3,500	4,100	4,500	4,900	5,200	5,400	5,500
	16	3,500	4,500	5,500	6,500	7,300	7,800	8,300	8,500
	14	4,100	5,500	7,200	8,900	10,300	11,600	12,500	13,200
	12	4,500	6,500	8,900	11,500	14,100	16,500	18,400	19,900
	10	4,900	7,300	10,300	14,100	18,300	22,500	26,200	29,300
	8	5,200	7,800	11,600	16,500	22,500	29,100	35,700	41,700
	6	5,400	8,300	12,500	18,400	26,200	35,700	46,300	56,900
	4	5,500	8,500	13,200	19,900	29,300	41,700	56,900	73,600

Multiplying factor for two valves per station: 0.40

125 psi		CONTROL WIRE SIZE							
		18	16	14	12	10	8	6	4
Valve Common Size	18	2,600	3,200	3,800	4,200	4,600	4,800	5,000	5,100
	16	3,200	4,200	5,200	6,000	6,700	7,300	7,700	7,900
	14	3,800	5,200	6,700	8,200	9,600	10,800	11,600	12,200
	12	4,200	6,000	8,200	10,700	13,100	15,300	17,100	18,500
	10	4,600	6,700	9,600	13,100	17,000	20,900	24,400	27,300
	8	4,800	7,300	10,800	15,300	20,900	27,100	33,200	38,800
	6	5,000	7,700	11,600	17,100	24,400	33,200	43,100	52,900
	4	5,100	7,900	12,200	18,500	27,300	38,800	52,900	68,500

Multiplying factor for two valves per station: .038

150 psi		CONTROL WIRE SIZE							
		18	16	14	12	10	8	6	4
Valve Common Size	18	2,400	3,000	3,500	3,900	4,300	4,500	4,600	4,700
	16	3,000	3,900	4,800	5,600	6,300	6,800	7,200	7,400
	14	3,500	4,800	6,200	7,700	9,000	10,000	10,800	11,400
	12	3,900	5,600	7,700	10,000	12,200	14,300	16,000	17,300
	10	4,300	6,300	9,000	12,200	15,900	19,500	22,800	25,400
	8	4,500	6,800	10,000	14,300	19,500	25,300	31,000	36,200
	6	4,600	7,200	10,800	16,000	22,800	31,000	40,200	49,400
	4	4,700	7,400	11,400	17,300	25,400	36,200	49,400	63,900

Multiplying factor for two valves per station: .031

For proper wire sizing the resistance must not exceed the maximum ohms per 1,000 feet listed below.

AWG Wire Size	Ohms/1000 ft.
18	6.39
16	4.02
14	2.52
12	1.59
10	1.00
8	0.63

Resistance is determined by the formula:

$$Rw = \frac{AVL \times 1000}{L \times 2 \times Ivs}$$

Rw = Resistance of wire (ohms)

AVL = Allowable voltage loss
(Controller Output Voltage – Minimum Valve Operating Voltage)

L = Wire length, controller to valve

Ivs = Solenoid in-rush current (for number of valves)

** American wire gauge solid copper*

INSTALLATION

- Pop-up rotary sprinklers should be installed with flexible risers to minimize pipe damage; swing-joint risers are recommended for projects where heavy grounds maintenance equipment is required

OPERATING PRESSURE

- Operating pressures listed are measured at base of sprinklers; sprinklers will not operate properly or give best distribution pattern at pressures less than minimum listed in tables

CAUTION

- Water supply must be reasonably free of sand and debris to avoid malfunction and excessive wear
- When necessary, valve full and part circle sprinklers separately to avoid extreme variation in rates of precipitation

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SPACING

- Equilateral triangular spacing is recommended for most uniform distribution; square spacing may be necessary where borders are prevalent and must be protected from over-throw
- Wind effect on sprinkler distribution must be compensated for by the proper spacing of sprinkler heads; maximum rotary sprinkler spacings are commonly based on diameter of coverage and wind velocity (see deration table below)

WIND DERATION FOR ROTARY SPRINKLERS

- Diameters of coverage shown in tables are for still air

  Head Spacing = Diameter of coverage (selected from Perf. Table) x Deration factor (listed below)

- Spacing with wind deration as follows:

Wind		Multiply Diameter in Table by:	
mph	km/h	☒	▲
5	8	.55	.50
10	16	.50	.45

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PRECIPITATION RATES

CALCULATING PRECIPITATION RATES

Depending upon the construction of the irrigation system, the precipitation rate may be calculated by either a "sprinkler spacing" or a "total area" method.

SPRINKLER SPACING METHOD

The precipitation rate should be calculated for each individual zone. If all sprinkler heads on the same zone have the same spacing, flow rate, and arc of coverage, use one of the following formulas:

ANY ARC AND ANY SPACING:

$$\text{P.R. (in/hr)} = \frac{\text{GPM (for any Arc)} \times 34{,}650}{\text{Degrees of Arc} \times \text{Head Spacing (ft)} \times \text{Row Spacing (ft)}}$$

$$\text{P.R. (mm/hr)} = \frac{\text{m}^3\text{/hr (for any Arc)} \times 360.000}{\text{Degrees of Arc} \times \text{Head Spacing (m)} \times \text{Row Spacing (m)}}$$

EQUILATERAL TRIANGULAR SPACING:

$$\text{P.R. (in/hr)} = \frac{\text{GPM of 360 Arc} \times 96.25}{(\text{Head Spacing})^2 \times 0.866}$$

$$\text{P.R. (mm/hr)} = \frac{\text{m}^3\text{/hr of 360 Arc} \times 1.000}{(\text{Head Spacing})^2 \times 0{,}866}$$

TOTAL AREA METHOD

The precipitation rate for a "system" is the average precipitation rate of all sprinklers in an area, regardless of the spacing, flow rate, or arc for each head. The Total Area Method calculates all the flows of all of the heads in any given area.

$$\text{P.R. (in/hr)} = \frac{\text{Total GPM} \times 96.25}{\text{Total Area}}$$

$$\text{P.R. (mm/hr)} = \frac{\text{m}^3\text{/hr} \times 1.000}{\text{Total Area}}$$

METRIC NOTE

To convert from Bars to kPa, use 1 Bar = 100 kPa

To convert m^3/hr to l/s use 1 m^3/hr = 16,67 l/m

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