

# Underhill™ Mirage™

## Sports Turf Sprinklers



### Water Your Entire Field from the Sidelines

Underhill™ Mirage™ M-160 sprinklers, with a throw radius of over 160 ft. (50 m), are often installed completely outside the playing area of football and soccer fields. Precision rotation speed adjustment and the available artificial turf cover has made them worldwide favorites for synthetic sports fields. M-160 technology is also well regarded for highly efficient irrigation and dust control. Employing precision German engineering in design and manufacture, Underhill™ is now offering the finest sprinklers in the world.

### Make In-Field Sprinklers Disappear

For larger areas where irrigation must be installed within the playing area, Underhill™ Mirage™ M-115 sprinklers cover a lot of ground and pull a disappearing act when not in use. A large 4" deep x 9" diameter (101 mm x 229 mm) natural grass sod cup cover and the 8.1" (206 mm) pop-up offers virtual invisibility in the field, and unmatched protection for players and mowers as well as prevention against vandalism. The M-125 Series features an increased radius and plastic or artificial turf lids in green and tan.

The superior characteristics of Mirage™ sprinklers is proven daily at the futuristic Allianz Arena in Munich, the new FIFA complex in Zurich, Athens 2004 Olympic sites and many other landmark projects worldwide. (A list of installations is available on request.)

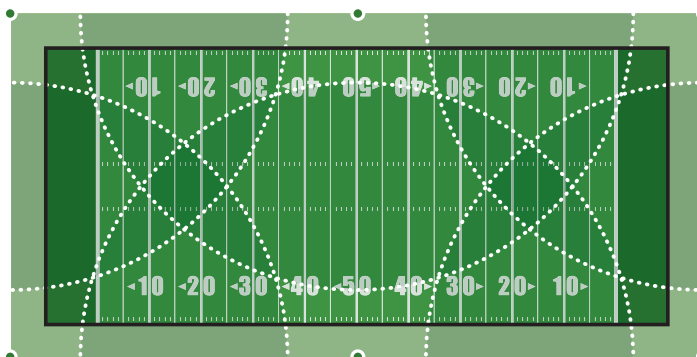
**Underhill™**

www.underhill.us



## M-160 Series

The Synthetic Sports Field Specialist. With a powerful 164 ft. (50 m) throw radius, M-160 sprinklers are absolutely unbeatable at cooling artificial turf, dust control and irrigation. Featuring ultra-precise rotation speed adjustment, these piston-drive water cannons get the job done quickly and efficiently. M-160 Series sprinklers provide full or part circle operation and are capable of showering an entire football field from the sidelines. Select plastic or artificial turf cover, in green or tan.



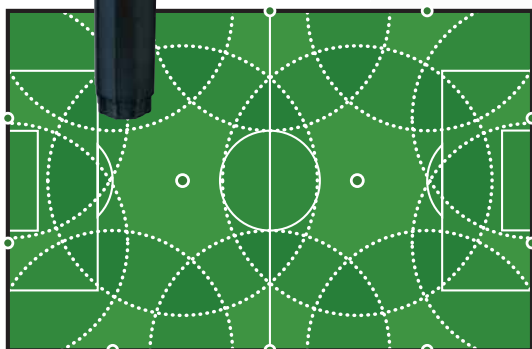
*Underhill™ Mirage™ sprinklers get the job done in big way.*



## M-115 Series

**Natural Turf Sod Cup + Towering 8" Pop Up.** A very impressive long-throw sprinkler in its own right, the M-115 Series is most noted for the extra large 4" (101 mm) deep sod cup cover which holds a 9" (229 mm) diameter section of natural grass. It is virtually invisible when not in use, a feature which provides excellent protection against vandalism and damage from mowing equipment. Athletes enjoy the nearly seamless playing surface, enhancing their performance and reducing injury.

A typical large rectangular sports field would require only three full circle M-115-F sprinklers placed invisibly in the playing area, supplemented by eight part circle M-125-P heads at the sidelines to achieve complete irrigation and the ultimate in safety and economy. A professional baseball field requires between six and nine M-115-F sprinklers supplemented by 16 M-115-P heads at the infield edge and along the warning track. Syringe the infield and warning track areas by simply flipping the part circle sprinklers into full circle mode.



## M-125 Series

M-125 Series sprinklers feature the same internals as the M-115 Series, but are supplied artificial turf or plastic covers in green or tan, and two extra high capacity nozzles for an extended throw radius. They are designed for installation in artificial turf fields, or in the out-of-play areas of natural turf fields.



## Model Selection Guide

	M-115-F	M-115-P	M-125-F	M-125-P	M-160-FP
<b>Max Radius</b>	115 ft. (35 m)	115 ft. (35 m)	125 ft. (38 m)	125 ft. (38 m)	164 ft. (50 m)
<b>Valve Type</b>	In Head or Block	In Head or Block	In Head or Block	In Head or Block	Under Head - Extra
<b>Lid Cover</b>	SOD CUP - Natural Grass 4" (101mm) Depth 9" (229 mm) Diameter	SOD CUP - Natural Grass 4" (205mm) Depth 229" (254 mm) Diameter	ARTIFICIAL TURF Green, Tan 7" (180 mm) Diameter	ARTIFICIAL TURF Green, Tan 7" (180 mm) Diameter	ARTIFICIAL TURF Green, Tan 15.6" (395 mm) Diameter
<b>Typical Applications</b>	Natural Turf: Play Areas	Natural Turf: Playable Sidelines	Artificial Turf: Play and Sideline Areas Natural Turf: Sidelines (w/M115E in Play Areas)	Artificial Turf: Play and Sideline Areas Natural Turf: Sidelines (w/M115E in Play Areas)	Positioned at Sidelines: Artificial Turf Cooling Natural Turf Irrigation
<b>Field Usage Examples</b>	Football, Baseball, Soccer, Field Hockey Parks	Baseball Foul Areas, Soccer, Field Hockey Parks	All Sports	All Sports	Football, Soccer, Race Tracks
<b>Decoder</b>	Optional	Optional	Optional	Optional	Optional
<b>Nozzles</b>	3	2	3	2	2 + Spreader
<b>Nozzle #s (mm)</b>	7, 8, 9, 10, 11 12, 13, 14, 15	7, 8, 9, 10, 11 12, 13, 14, 15	7, 8, 9, 10, 11, 12 13, 14, 15, 16, 17.5	7, 8, 9, 10, 11, 12 13, 14, 15, 16, 17.5	16, 18, 20, 22, 24
<b>Standard Nozzle #</b>	15	15	17.5	17.5	26
<b>Pop-Up Height</b>	8.1" (206 mm)	8.1" (206 mm)	4" (99 mm)	4" (99 mm)	2 3/4" (70 mm)
<b>Arc</b>	360 degrees	30 - 360 degrees	360 degrees	30 - 360 degrees	30 - 360 degrees
<b>Trajectory</b>	22 degrees	22 degrees	22 degrees	22 degrees	23 degrees
<b>Rotation Speed</b>					Precision Adjustable 100-240 seconds
<b>Inlet (Specify)</b>	1 1/2" (NPT or BSP)	1 1/2" (NPT or BSP)	1 1/2" (NPT or BSP)	1 1/2" (NPT or BSP)	2 1/2" F side outlet (NPT or BSP)
<b>Height</b>	26.0" 660 mm	26.0" 660 mm	17.7" 450 mm	17.7" 450 mm	23.6" 600 mm
<b>Swing Joint</b>	Triple Top Out 12"	Triple Top Out 12"	Triple Top Out 12"	Triple Top Out 12"	Not Applicable

### Specifying Model Numbers: How to Order Mirage Sprinklers

Model	Valve	Arc	Range Nozzle	Inlet Type	Cover Type
M-115 M-125 M-160	E - In Head  (Omit to order block system sprinklers)	F - Full Circle P - Part Circle FP - Full Circle and Part Circle in one	M-115 : 7 - 15 M-125 : 7 - 17.5 M-160 : 6 - 26	N - NPT B - BSP	G - Green Artificial Turf T - Tan Artificial Turf PG - Plastic (Green) PT - Plastic (Tan) S - Sod Cup

**FOR EXAMPLE:**  
When ordering a full/part circle M-160 sprinkler with NPT threads, 26 mm range nozzle, and green artificial turf cover, you would order:  
**M-160-FP-26-N-G**

To order the part circle M-115 valve-in-head sprinkler with BSP threads, 15 mm range nozzle, and natural grass sod cup, you would specify:  
**M-115E-P-15-B-S**

## Installation Made Easy



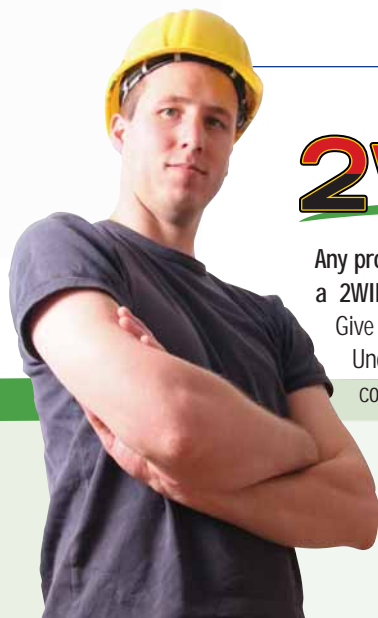
Any project over 1/2 acre deserves a 2WIRE™ cost savings estimate.

Give us a call us and we'll do it for you using your numbers. Underhill™ 2WIRE™ decoders and adapter modules can convert your favorite controller to 2-wire operation. Now you can put the controller anywhere along the 2-wire path where you have AC power...very handy during installation or phased jobs.



### Swing Joints

Save your installation crew a lot of time on the job by getting the right swing joints when you order sprinklers. Our **Triple Top-Out 12" Swing Joints** provide versatile sprinkler positioning and adjustments.







# Performance Charts

## U.S. Units

### Mirage 160

M160-FP Full/Part Circle

NOZZLE		PRESSURE (PSI)				
		60	75	90	105	120
16	Radius (ft.)	101	109	116	124	131
	Flow (GPM)	96	107	117	126	135
18	Radius (ft.)	105	113	121	129	137
	Flow (GPM)	117	131	143	155	165
20	Radius (ft.)	108	117	126	135	144
	Flow (GPM)	141	157	172	186	199
22	Radius (ft.)	111	121	131	141	150
	Flow (GPM)	167	187	205	221	236
24	Radius (ft.)	115	125	136	147	157
	Flow (GPM)	196	219	240	259	277
26	Radius (ft.)	118	129	141	152	164
	Flow (GPM)	227	254	278	301	321

### Precipitation Rate Formula:

To calculate  $P_r$  (inches/hour), use:

$$P_r = \frac{96.25 \times \text{Total GPM}}{\text{Total Area Covered (sq. ft.)}}$$

## Metric Units

### Mirage 160

M160-FP Full/Part Circle

NOZZLE		PRESSURE (Bar)				
		4	5	6	7	8
16	Radius (m)	31.0	33.3	35.5	37.8	40.0
	Flow (m <sup>3</sup> /hr.)	21.7	24.6	26.6	28.7	30.7
18	Radius (m)	32.0	34.5	37.0	39.5	42.0
	Flow (m <sup>3</sup> /hr.)	26.5	29.7	32.5	35.1	37.5
20	Radius (m)	33.0	35.8	38.5	41.3	44.0
	Flow (m <sup>3</sup> /hr.)	32.0	35.7	39.1	42.3	45.2
22	Radius (m)	34.0	37.0	40.0	43.0	46.0
	Flow (m <sup>3</sup> /hr.)	37.9	42.4	46.5	50.2	53.6
24	Radius (m)	35.0	38.3	41.5	44.8	48.0
	Flow (m <sup>3</sup> /hr.)	44.6	49.7	54.5	58.8	62.9
26	Radius (m)	36.0	39.5	43.0	46.5	50.0
	Flow (m <sup>3</sup> /hr.)	51.6	57.7	63.2	68.4	73.0

### Precipitation Rate Formula:

To calculate  $P_r$  (mm/hour), use:

$$P_r = \frac{360,000 \times \text{m}^3/\text{hr.}}{D \times S_h \times S_r}$$

$D$  = Degrees of Arc  
 $S_h$  = Head Spacing (m)  
 $S_r$  = Row Spacing (m)

### Mirage 125 / 115

Full Circle, 3-Nozzle

M125E-F Artificial Turf Lid (Nozzles 7-17.5)

M115E-F 4" Sod Cup (Nozzles 7-15)

NOZZLE		PRESSURE (PSI)					
		45	60	75	90	105	120
7	Radius (ft.)	62	64	68	70	72	73
	Flow (GPM)	25	28	31	35	37	40
8	Radius (ft.)	64	67	71	74	76	79
	Flow (GPM)	29	33	37	41	44	47
9	Radius (ft.)	66	70	73	77	81	84
	Flow (GPM)	34	39	44	48	51	55
10	Radius (ft.)	67	72	76	81	86	90
	Flow (GPM)	39	45	50	55	59	63
11	Radius (ft.)	69	75	81	87	92	95
	Flow (GPM)	43	50	56	61	66	70
12	Radius (ft.)	71	79	87	92	96	101
	Flow (GPM)	48	55	62	68	73	78
13	Radius (ft.)	72	82	90	95	100	105
	Flow (GPM)	54	62	69	76	82	88
14	Radius (ft.)	74	85	95	100	105	110
	Flow (GPM)	60	69	77	85	91	98
15	Radius (ft.)	75	89	98	105	110	115
	Flow (GPM)	66	76	85	94	101	108
16	Radius (ft.)	77	90	100	108	115	120
	Flow (GPM)	69	80	89	98	106	113
17.5	Radius (ft.)	79	92	102	112	110	125
	Flow (GPM)	79	91	102	112	120	126

### Mirage 125 / 115

Full Circle, 3-Nozzle

M125E-F Artificial Turf Lid (Nozzles 7-17.5)

M115E-F 101 mm Sod Cup (Nozzles 7-15)

NOZZLE		PRESSURE (Bar)					
		3	4	5	6	7	8
7	Radius (m)	19.0	19.5	20.6	21.4	21.9	22.3
	Flow (m <sup>3</sup> /hr.)	5.6	6.3	7.1	7.9	8.3	9.0
8	Radius (m)	19.5	20.5	21.5	22.5	23.3	24.0
	Flow (m <sup>3</sup> /hr.)	6.7	7.6	8.5	9.4	10.1	10.8
9	Radius (m)	20.0	21.2	22.4	23.6	24.7	25.7
	Flow (m <sup>3</sup> /hr.)	7.8	8.9	10.0	11.0	10.8	12.6
10	Radius (m)	20.5	21.9	23.3	24.7	26.1	27.4
	Flow (m <sup>3</sup> /hr.)	8.9	10.1	11.3	12.5	13.4	14.3
11	Radius (m)	21.0	23.0	24.8	26.6	27.9	29.1
	Flow (m <sup>3</sup> /hr.)	9.8	11.3	12.6	13.9	14.9	15.9
12	Radius (m)	21.5	24.0	26.5	28.0	29.4	30.7
	Flow (m <sup>3</sup> /hr.)	11.0	12.6	14.1	15.5	16.7	17.8
13	Radius (m)	22.0	25.0	27.5	29.0	30.5	32.0
	Flow (m <sup>3</sup> /hr.)	12.2	14.0	15.7	17.2	18.5	20.0
14	Radius (m)	22.5	26.0	29.0	30.5	32.0	33.5
	Flow (m <sup>3</sup> /hr.)	13.7	15.7	17.6	19.3	20.8	22.2
15	Radius (m)	23.0	27.0	30.0	32.0	33.5	35.0
	Flow (m <sup>3</sup> /hr.)	15.1	17.4	19.4	21.3	23.0	24.6
16	Radius (m)	23.5	27.5	30.5	33.0	35.0	36.5
	Flow (m <sup>3</sup> /hr.)	15.8	18.1	20.3	22.3	24.0	25.7
17.5	Radius (m)	24.0	28.0	31.0	34.0	33.5	38.0
	Flow (m <sup>3</sup> /hr.)	18.0	20.7	23.1	25.4	27.4	28.6

### Mirage 125 / 115

Part Circle, 2-Nozzle

M125E-P Artificial Turf Lid (Nozzles 7-17.5)

M115E-P 4" Sod Cup (Nozzles 7-15)

NOZZLE		PRESSURE (PSI)					
		45	60	75	90	105	120
7	Radius (ft.)	62	64	68	70	72	73
	Flow (GPM)	20	23	26	28	30	32
8	Radius (ft.)	64	67	71	74	76	79
	Flow (GPM)	25	29	32	35	37	40
9	Radius (ft.)	66	70	73	77	81	84
	Flow (GPM)	30	34	38	42	40	48
10	Radius (ft.)	67	72	76	81	86	90
	Flow (GPM)	35	40	44	48	52	56
11	Radius (ft.)	69	75	81	87	92	95
	Flow (GPM)	39	45	50	54	59	63
12	Radius (ft.)	71	79	87	92	96	101
	Flow (GPM)	44	50	56	61	66	71
13	Radius (ft.)	72	82	90	95	100	105
	Flow (GPM)	49	57	63	69	75	80
14	Radius (ft.)	74	85	95	100	105	110
	Flow (GPM)	56	64	72	78	84	90
15	Radius (ft.)	75	89	98	105	110	115
	Flow (GPM)	62	72	80	83	95	101
16	Radius (ft.)	77	90	100	108	115	120
	Flow (GPM)	65	75	84	91	99	105
17.5	Radius (ft.)	79	92	102	112	110	125
	Flow (GPM)	75	86	96	105	113	121

### Mirage 125 / 115

Part Circle, 2-Nozzle

M125E-P Artificial Turf Lid (Nozzles 7-17.5)

M115E-P 101 mm Sod Cup (Nozzles 7-15)

NOZZLE		PRESSURE (Bar)					
		3	4	5	6	7	8
7	Radius (m)	19.0	19.5	20.6	21.4	21.9	22.3
	Flow (m <sup>3</sup> /hr.)	4.6	5.2	5.8	6.4	6.8	7.3
8	Radius (m)	19.5	20.5	21.5	22.5	23.3	24.0
	Flow (m <sup>3</sup> /hr.)	5.7	6.5	7.2	7.9	8.5	9.1
9	Radius (m)	20.0	21.2	22.4	23.6	24.7	25.7
	Flow (m <sup>3</sup> /hr.)	6.8	7.8	8.7	9.5	9.2	10.9
10	Radius (m)	20.5	21.9	23.3	24.7	26.1	27.4
	Flow (m <sup>3</sup> /hr.)	7.9	9.0	10.0	11.0	11.8	12.6
11	Radius (m)	21.0	23.0	24.8	26.6	27.9	29.1
	Flow (m <sup>3</sup> /hr.)	8.8	10.2	11.3	12.4	13.3	14.2
12	Radius (m)	21.5	24.0	26.5	28.0	29.4	30.7
	Flow (m <sup>3</sup> /hr.)	10.0	11.5	12.8	14.0	15.1	16.1
13	Radius (m)	22.0	25.0	27.5	29.0	30.5	32.0
	Flow (m <sup>3</sup> /hr.)	11.2	12.9	14.4	15.7	16.9	18.1
14	Radius (m)	22.5	26.0	29.0	30.5	32.0	33.5
	Flow (m <sup>3</sup> /hr.)	12.7	14.6	16.3	17.8	19.2	20.5
15	Radius (m)	23.0	27.0	30.0	32.0	33.5	35.0
	Flow (m <sup>3</sup> /hr.)	14.1	16.3	18.1	18.8	21.4	22.9
16	Radius (m)	23.5	27.5	30.5	33.0	35.0	36.5
	Flow (m <sup>3</sup> /hr.)	14.8	17.0	19.0	20.8	22.4	24.0
17.5	Radius (m)	24.0	28.0	31.0	34.0	33.5	38.0
	Flow (m <sup>3</sup> /hr.)	17.0	19.6	21.8	23.9	25.8	27.5



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