

- Recreational Level Field maintenance includes: weekly field inspections; 2x/week litter removal; 2x/week skin maintenance; mowing/trimming (1x/week March through October, as needed November through February); field marking when permitted for games; and warm-season turfgrass maintenance program.

- Practice Level Field maintenance includes: monthly field inspections; litter removal every 3 days; skin maintenance once biweekly; and mowing/trimming every 10 days. Field marking becomes the responsibility of the permit group when permit begins.

The SOP also outlines our administrative and record keeping functions. Daily work assignments (tasks) are detailed on work order tracking forms. The crew supervisor notes tasks performed and completion time, travel, equipment and supplies used. This data is entered into a database that enables me to generate reports that help to quickly identify whether we are meeting our maintenance standards, track costs associated with field maintenance and compare cost versus revenue per field.

Municipalities across the nation are forced by today's economic downturn to tighten their budgets. Houston is no exception. As this article is

being written we are exploring ways to continue providing a high level of service to our community while reducing costs. The most important resource a sports turf manager can have when preparing a budget is data.

Look at the number of fields you are responsible for maintaining. Know the square foot or acreage of all your fields. Know what it cost to maintain fields at the various field classifications.

Some considerations that must be taken into account when preparing your budget are the expectation of the field user and city officials. Resources must be allocated strategically so as to maintain established standards. The sports turf manager must be aware of how their fields are being used for practice, for example, are user groups

allowed to exceed field capacity hours? This will greatly affect you budget allocation. We have found that by encouraging community participation in sports turf maintenance we are able to stretch our budget dollars.

We promote community involvement in sports field maintenance through our "Adopt-a-Sports Field" program. This program welcomes organizations or individuals who wish to "adopt" a sports field in lieu of paying permitting fees associated with the use of ball fields. This adoption



» DAVID BELTRAN,
Field Technician

MAKE A CLEAN SWEEP!



- The patented Recirculating Air System minimizes dust that can filter back onto seats and facilities.
- PTO- and gas engine-powered models let you tow with any tractor or utility vehicle while wireless remote control puts management in the operator's seat.

- The wide brush in combination with the Turbo Vac system provides excellent pick-up on all surfaces, including pavement, artificial turf and granular rubber pellets.
- A wear-resistant, replaceable blower housing liner and direct hydraulic drives help reduce maintenance costs.

To find out more, visit
www.harperindustries.com/104a

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151 E. Hwy. 160 · Harper, Kansas 67058 · Phone: 620.896.7381 · Toll-Free: 1.800.835.1042 · info@harperindustries.com
www.harperindustries.com

is available for youth leagues only. We currently have 75 fields that are adopted and maintained by youth organizations. We have had an increase in participation each year since the program's inception in 2005.

Youth organizations enter into an agreement with the Parks and Recreation Department to provide field maintenance for a 6-month period. All maintenance tasks are clearly defined. The organization essentially agrees to perform field maintenance at our Recreational Field level. The organization conducts weekly field inspections and forwards the report to my office. My staff inspects each adopted field monthly to ensure compliance with maintenance standards.

Our sports field staff conducts two field maintenance clinics each year. We invite all Adopt-a-Sports Field participants and other field use groups to attend. We review maintenance standards, explain our field inspection form and demonstrate proper maintenance procedures. An annual meeting is held each year with field users where department guidelines are reviewed. The objective is to have open lines of communication with our user groups.

I am always looking for opportunities to speak with field users. It could be at a field maintenance clinic that we host or the opening day of little league season. My job is to educate and inform individuals, and organizations on proper field maintenance techniques, tools or supplies that will enable them to be effective in maintaining sports fields.

To facilitate communication with city officials, department directors, recreation program managers, and the general public we are working on the enhancement of our department

website. This generation depends more and more on web-based information. Using our department website offers us the opportunity to convey our mission and vision.

Our goal is to have a website that communicates field standards, procedures for permitting fields, field locations and the ability to voice comments or express concerns regarding their field use experience. We will use the site to feature a monthly article with field maintenance tips and our exceptional fields along with the responsible staff. The site will list current programs and highlighting historical event such as the 2008 Division II Women Softball and Lacrosse Championship and the USA Olympic Softball Team exhibition game.

The positive impact of sports facilities at the community level is frequently overlooked.

Every city would like to boost about the "quality of life" it provides for the residents. By providing safe, playable and aesthetically pleasing fields, we enhance the "quality of life" in our community. Yes, you too can make a difference in your community.

Thanks to the many members of STMA who have shared their winning strategies with me. Thanks also to my department director Joe Turner and deputy director Abel Gonzales who encourage my staff and I to take advantage of training opportunities through STMA, Texas Turfgrass Association and numerous video resources. ■

Anthony R. Wise is Division Manager for the Sports Field Management Section, City of Houston-Parks & Recreation.

EXHIBIT E Level 1 Maintenance Schedule

Field Name: _____ Address: _____
 Type of Field: _____

Condition: _____ Compaction: _____
 Type of Grass: _____ Drainage: _____
 Type of Mower: _____ Irrigation: _____
 Type of Soil: _____ Thatch: _____

Soil Test: _____ Notes: _____
 Date: _____ Nitrogen: _____
 pH: _____ Phosphor: _____
 Potassium: _____

Time of Year	Fertilization	Aeration	Topdress	Overseed	1/3 Rule Mowing Ht.	Watering	Weed Control
March	24-6-12 w/ 50% SCU 1lb. N				1 1/2"	As Needed	Pre-Emergent Herbicide
April					1"	As Needed	Apply Ant Bait
May	21-0-0 1 1/2 lb. N	Core 4" 2 Directions	Drag Cores		1"	3/8" - 3x per week	
June	21-0-0 1 1/2 lb. N	Solid Tine			1"	3/8" - 3x per week	Post-Emergent Herbicide
July		Solid Tine			1"	3/8" - 3x per week	
August	24-6-12 w/ 50% SCU 1 lb. N				1"	3/8" - 3x per week	Post-Emergent Herbicide As Needed
September		Core 4" 2 Directions	Drag Cores		1"	3/8" - 3x per week	Apply Ant Bait
October	21-0-0 1/2lb. N	Verticle mow before overseeding		Perennial Rye 12 lbs.	1 1/2"	Light & Frequent	
November				Perennial Rye 3 lbs.	2"	As Needed	
December					2"	As Needed	
January	21-0-0 1/2lb. N				2"	As Needed	
February					2"	As Needed	

*FERTILIZER N-P-K BASED ON SOIL AND TISSUE ANALYSIS.
 **APPLICATION RATE SHOULD YEILD 6LBS. N PER YEAR.

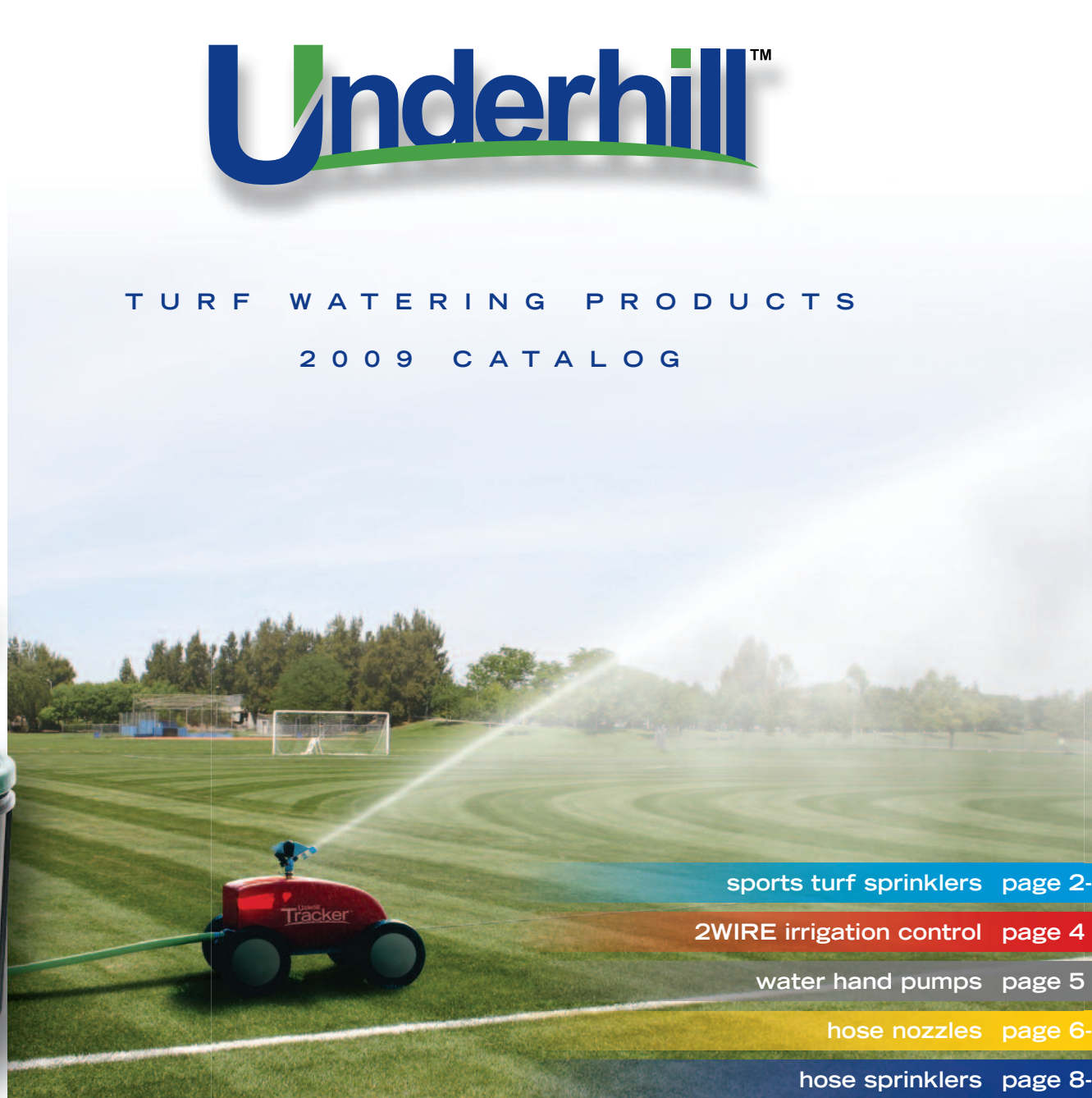


➤ **MIGUEL BARROSO**, Field Supervisor



Underhill™

TURF WATERING PRODUCTS 2009 CATALOG



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Products that work...smart.™



An industry leader in innovative watering products for golf, sports field and other large turf areas, Underhill brings 30 years of know-how in developing our inventory of "Products that work...smart.™"

sports turf sprinklers

Mirage™

HUGE THROW, HIGH-PERFORMANCE SPORTS TURF SPRINKLERS

Underhill Mirage pop-up turf sprinklers, featuring precision engineering and huge throw radius, can be installed completely outside the playing area of sports fields. Employing precision German engineering in design and manufacture, Underhill offers the finest large turf sprinklers in the world.

M-160: With its powerful **164 ft. throw radius**, the Mirage™ M-160 is a worldwide favorite for cooling and cleaning synthetic sports fields, dust control and irrigation. Featuring ultra-precise rotation speed adjustment, these piston-drive cannons get the job done quickly and efficiently.

M-125: A very impressive long-throw sprinkler in its own right with a **125 ft. radius**, the M-125 is perfect for installation in artificial turf fields, or in the out-of-play areas of natural turf fields.

M-115: For areas where irrigation must be installed within the playing area, the M-115's large 4" (101 mm) deep sod cup cover, which holds a 9" (220 mm) diameter section of natural grass, "disappears" when not in use, staying out of the way of athletes and mowers.

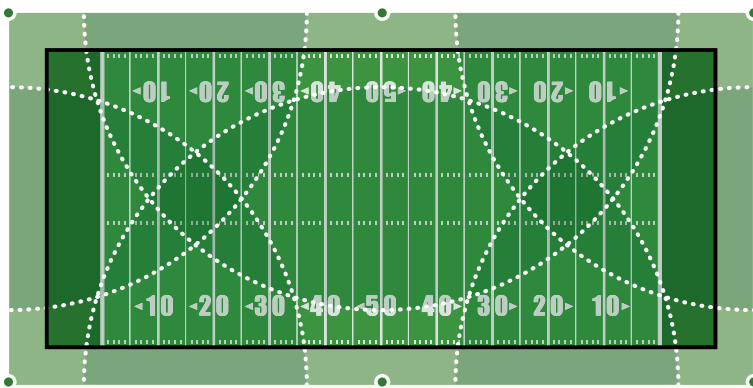


This little module converts irrigation controllers to 2-wire. You'll save a ton in wiring costs, installation and maintenance.

See Page 4

Mirage M-160 pictured at right with artificial turf lid covering to blend in with surroundings when not in use.

Incredible but true... with its huge 164 ft. radius throw, the M-160 can shower a regulation size football field with only 6 heads!



model selection guide

	M-115	M-125	M-160
Max Radius	115 ft. (35 m)	125 ft. (38 m)	164 ft. (50 m)
Valve Type	In Head or Block	In Head or Block	3" Sleeve Valve
Lid Cover	Sod Cup - Natural Grass 4" (101mm) Depth 9.5" (242 mm) Diameter	7" (180 mm) Diameter	15.6" (395 mm) Diameter
Typical Applications	Natural Turf: Play Areas	Artificial Turf: Sideline Areas Natural Turf: Sidelines	Positioned at Sidelines: Artificial Turf Cooling Natural Turf Irrigation
Field Usage Examples	All Sports	All Sports	Football, Soccer, Race Tracks
Nozzle #s (mm)	7, 8, 9, 10, 11, 12 13, 14, 15	7, 8, 9, 10, 11, 12 13, 14, 15, 16, 17.5	16, 18, 20, 22, 24, 26
Pop-Up Height	8.1" (206 mm)	4" (99 mm)	2 3/4" (70 mm)
Arc	30 - 360 degrees	30 - 360 degrees	30 - 360 degrees
Trajectory	22 degrees	22 degrees	23 degrees
Rotation Speed	60 seconds	60 seconds	Precision Adjustable 100-240 seconds
Inlet (Specify)	1 1/2"	1 1/2"	2 1/2" side inlet
Height	26.7" 678 mm	17.7" 450 mm	24.5" 622 mm



The superior characteristics of Mirage sprinklers is proven daily around the world: from the futuristic Allianz Arena in Munich, to the Olympic stadiums in Athens 2004 and Beijing 2008, to large collegiate sports complexes in the United States.

ordering

- Part # M160-FP Mirage™ 160 full/part circle
- Part # M160-EP Mirage™ 160 full/part circle, with 3" electric valve
- Part # M125-EF Mirage™ 125 full circle, valve-in-head
- Part # M125-EP Mirage™ 125 full/part circle, valve-in-head
- Part # M125-BF Mirage™ 125 full circle, block
- Part # M125-BP Mirage™ 125 full/part circle, block
- Part # M115-EF Mirage™ 115 full circle, valve-in-head
- Part # M115-EP Mirage™ 115 full/part circle, valve-in-head
- Part # M115-BF Mirage™ 115 full circle, block
- Part # M115-BP Mirage™ 115 full/part circle, block



2Wire

JUST TWO WIRES AND ONE MODULE FOR CONTROL OF UP TO 48 STATIONS

With over 150,000 field successes, Underhill™ 2WIRE irrigation control systems are a proven leader in converting controllers like the Hunter® ICC to the simplicity and low cost of two-wire technology. Installation is a breeze and after your system is in, you'll enjoy reduced maintenance costs and unbelievably easy system expansion (just splice into the 2-wire path and add a decoder). Add the Hunter® IRC remote control and you've created the ultimate (and most affordable) way to syringe anywhere on your field at the press of a button.

EXPAND EXISTING MULTI-WIRE SYSTEMS

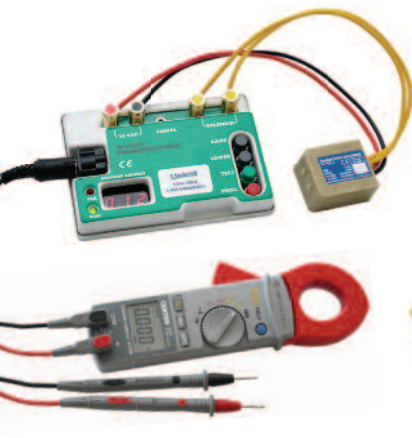
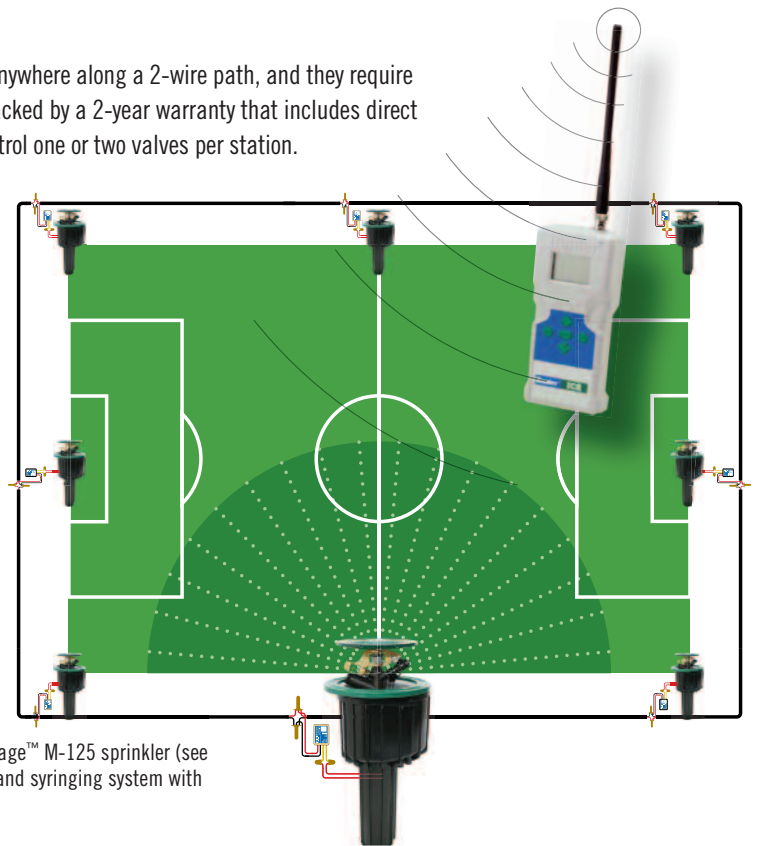
To run a 2WIRE system in tandem with your existing system, simply install the decoder module into the controller, run a 2-wire path to the new valves, and operate your ICC as normal for all stations (up to 48 total). To add stations in hard to reach areas (across a road, path, parking lot, etc.), you can even "piggyback" onto the existing system out in the field and avoid trenching back to the controller!

NO GROUNDING NECESSARY

Underhill™ decoders quickly install anywhere along a 2-wire path, and they require no grounding. So reliable, they are backed by a 2-year warranty that includes direct lightning hits! Each decoder can control one or two valves per station.



An irrigation installation featuring the powerful Mirage™ M-125 sprinkler (see page 2-3) and 2Wire decoders becomes an on-demand syringing system with the Hunter® IRC remote control.



Setting up stations is a breeze with our portable decoder programmer. And for troubleshooting wiring in the field, the digital clamp meter measures AC volts, current and resistance, and the faultfinding transformer adds the proper voltage to the two-wire path.



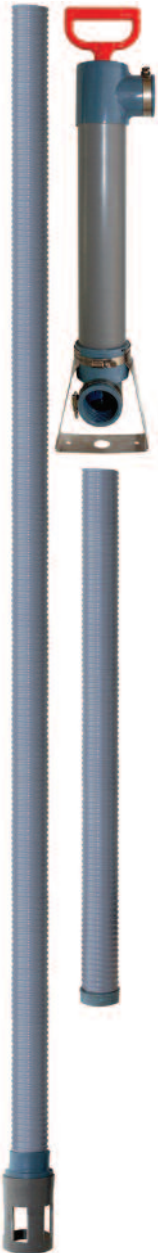
ordering

Part # TW-ICC-48	ICC Decoder Module
Part # TW-TK-DEC-1	2WIRE Decoder (includes 4 DBY connectors)
Part # DEC-PROG-115	Portable decoder programmer, 115V
Part # DEC-PROG-240	Portable decoder programmer, 240V
Part # TW-DCM	Digital Clamp Meter
Part # Transfrmr-115	Faultfinding Transformer 30V, 5A
Part # TW-2C-14-1000	2-conductor, 14 AWG wire reel, 1000 ft.
Part # TW-2C-14-2500	2-conductor, 14 AWG wire reel, 2500 ft.

Gulp™ Series Pumps

WATER REMOVAL SUCTION PUMPS

Whether you need to remove water from sprinklers and valve boxes or displace gallons of standing water in the field, the Underhill Gulp™ series of water removal hand pumps has the right tool for the job. Constructed from heavy-duty, corrosion-proof materials, these pumps are self-priming and easy to clean. The Gulp Syringe™ and Gulp™ are ideal for carrying on maintenance carts for small, routine needs. For larger water removal jobs, BigGulp™ pumps a gallon of water in only four strokes and SuperGulp™ can move 16 gallons of water in one minute.



SUPER GULP

- 16 GPM pumping capability
- 4" dia. x 2 ft. pump chamber
- 3" dia. x 3 ft. outlet hose
- 3" dia. x 7 ft. outlet hose



BIG GULP

- 35 oz./stroke
- 3 ft. pump chamber
- 36" or 72" outlet hose



GULP

- 8 oz./stroke
- 1 ft. pump chamber
- 10" outlet pipe



GULP SYRINGE

- 8 oz./stroke
- 1 ft. pump chamber
- 11" outlet tube

Use the BigGulp™ Riser Attachment to help prevent mud and rocks from entering the pump chamber.

ordering

- | | |
|-----------------|---------------------------------|
| Part # A-G12 | Gulp™ |
| Part # A-G12S | Gulp™ Syringe |
| Part # A-G3636K | BigGulp™ with 36" outlet hose |
| Part # A-G3672K | BigGulp™ with 72" outlet hose |
| Part # A-G2484 | SuperGulp™ with 84" outlet hose |
| Part # A-G01 | BigGulp™ Riser Attachment |



Magnum™

SOLID METAL HOSE NOZZLE

Underhill™ Magnum™ contains no plastic internal parts to break, stick or wear out. Our unique ratchet mechanism easily adjusts from gentle fan to powerful jet stream and prevents over-tightening damage. Precision-machined, incredibly smooth operation and outstanding distribution patterns make it ideal for high-demand areas like sports fields. Magnum™ is also an excellent equipment wash-down nozzle.

features

- Built for 1" and 3/4" flow rates
- Fire hose quality nozzle feels great in your hands
- Ultra-durable construction withstands any abuse
- Solid metal internal body - no plastic parts to break or wear out
- Beautiful, consistent spray patterns for life
- Ratchet mechanism prevents over-tightening damage
- Multi-pattern sprays - effortless control with hydraulic assist on/off

specifications

Materials: stainless steel, aluminum, TPR rubber

Flow: 37 GPM at 80 psi

Inlet: 3/4" hose thread (1" brass adapter available, see Page 7)

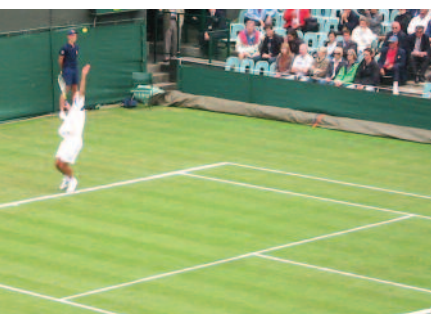


Magnum™ nozzle pictured with 1" brass adapter (sold separately on Page 7)



solid metal internal

Won't stick...won't break



CoolPro™

Cool Without Over Watering - No Root Damage

A hot summer day can be murder on high quality turf areas (like baseball infields and golf greens). Use too much water and you risk damage to the roots. CoolPro™ is the first nozzle specifically designed for the single purpose of lightly misting the turf canopy to cool without over watering. And its 25 foot fogging pattern gets the job done quickly.

features

- 3/4" inlet (1" brass adapter available, see Page 7)
- Ergonomic handle/valve provides easy grip and variable on/off control.
- Solid metal design for durability: zinc, aircraft aluminum and stainless steel.
- Patented Precision™ nozzle fogs at 70 psi to deliver a 25 ft. pattern with only 4-6 GPM

Perfect for tournament play, CoolPro™ puts down only enough water to cool the turf canopy. It prevents wilting while maintaining good ball speed. CoolPro is a great tool for protecting grass on hot days without damaging roots.

ordering

Part # NG450

Part # HNC075

MAGNUM Hose Nozzle

CoolPro™ Hose Nozzle



Precision™

PATTERNS SO REMARKABLE, NOZZLES SO GOOD... THEY'RE PATENTED.

It's hard to beat a variable spray nozzle for versatility...unless you have this set of solid metal fixed spray hose nozzles precisely engineered for specific watering needs. Millions of soft, uniform droplets provide rapid yet surprisingly gentle water application. From watering fragile seed beds to drenching sports fields, Precision™ spray patterns are designed with ideal flow rates and droplet sizes to offer you the ultimate solution for every hand watering application.



Rainbow™

LOW FLOW RATE: LANDSCAPING, LIGHT WATERING
Ideal for watering transplants and seed beds. Excels at lower pressure flows. **15 GPM @ 80 psi.**



Rainmaker™

LOW TO MEDIUM FLOW: SYRINGE AND SPOT WATERING
Perfect for syringing and great for hand watering turf and landscape with 3/4" hose at lower pressures. **23 GPM @ 80 psi.**



Cloudburst™

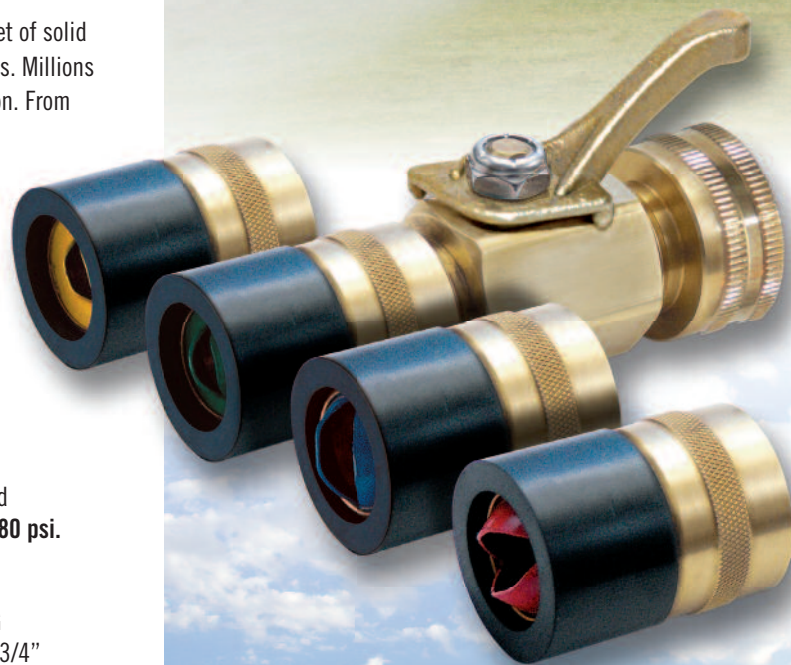
MEDIUM TO HIGH FLOW: SUPPLEMENTAL TURF WATERING
High volume drenching and syringing. Ideal flow rate for 3/4" and 1" hoses. **48 GPM @ 80 psi.**



Cyclone™

HIGH FLOW RATE: PRE-GAME SKINS WATERING, SOAKING
Powerful fan-shaped spray covers a HUGE area - gets heavy watering jobs done quickly. Ideal flow rate for 1" hoses. **50+GPM @ 80 psi.**

GPM will vary with pressure at nozzle.



high-flow valves



HIGHEST FLOW VALVES AVAILABLE

COMPOSITE / STAINLESS STEEL

- 3/4" hose thread inlet/outlet
- oversized handle
- up to 55 GPM

SOLID BRASS

- 3/4" hose thread inlet/outlet
- up to 50 GPM

hose adapters / quick-connectors



ordering

- | | |
|---------------|---|
| Part # HN1500 | Precision™ Rainbow™ Hose Nozzle |
| Part # HN2300 | Precision™ Rainmaker™ Hose Nozzle |
| Part # HN4800 | Precision™ Cloudburst™ Hose Nozzle |
| Part # HN5000 | Precision™ Cyclone™ Hose Nozzle |

- | | |
|------------------|--|
| Part # CV075H | High-Flow 3/4" Valve - Brass |
| Part # A-BV77FM | High-Flow 3/4" Valve - Composite/Steel |
| Part # A-BA107FM | 1" FHT x 3/4" MHT Brass Hose Adapter |
| Part # A-BA107MF | 1" MHT x 3/4" FHT Brass Hose Adapter |
| Part # A-BQ7M | 3/4" Quick-Connect, male end |
| Part # A-BQ7F | 3/4" Quick-Connect, female end |
| Part # HN-075W | replacement washer, 3/4" hose |

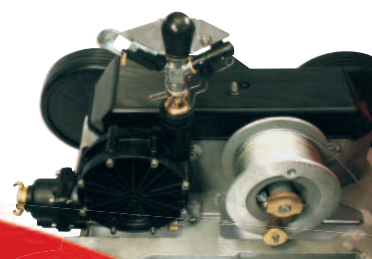
Tracker™

PORTABLE IRRIGATION MACHINE

The Tracker™ offers a very economical solution for supplementing seasonal watering needs of 1/4 acre to 2 acre areas. It is also ideal for irrigating athletic fields, cemeteries, golf course roughs, or other large areas where an underground system is impractical. Built to last with precision German engineering and high quality materials, this portable powerhouse can irrigate an entire football field in just two passes.

Tracker™ requires minimal labor to operate. Powered by water, it pulls itself along a nylon cable, dragging up to 360 ft. of 1" reinforced heavy-duty hose (sold separately). Each pass irrigates about 2/3 acre per 8 hours of operations.

Precision German engineering, high quality components...built to last!



features

- Adjustable Speed Control: 20-70 ft./hr.
- 360 ft. nylon cable provides maximum irrigated length of 400 ft.
- Standard full or part circle sprinkler (8-15 GPM)
- 70-85 ft. pass width
- Automatic shut-off at end of pass
- Galvanized anchor stake
- Water turbine drive and gear box
- Includes 1" brass quick-connect adapter



specifications

- Weight: 58 lbs.
- Size: Length 33", Width 22", Height 22"
- Materials: Aluminum, Brass, ABS



Use Tracker™ to help irrigate sports fields, golf courses, driving ranges, or supplement watering in other areas where an irrigation system is not available. Tracker's maximum 400 ft. irrigation path makes it also ideal for large campuses and corrals and its compact size allows it to operate in narrow spaces such as cemetery rows.

ordering

Part # T-400	Tracker™ Portable Irrigation Machine
Part # A-BQ7M	3/4" Quick-Connect, male end
Part # A-BQ7F	3/4" Quick-Connect, female end



Solid brass one-piece quick coupler valves and valve keys can help you get your Tracker™ set up quickly.

See Pages 12-13