Tracker™

PORTABLE IRRIGATION MACHINE

The Tracker™ offers a very economical solution for supplementing seasonal watering needs of 1/4 acre to 2 acre areas. Ideal for irrigation of roughs, fairways, driving ranges and other areas where underground irrigation is unavailable. Built to last with precision German engineering and high quality materials, this portable powerhouse can irrigate an area the size of a 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.

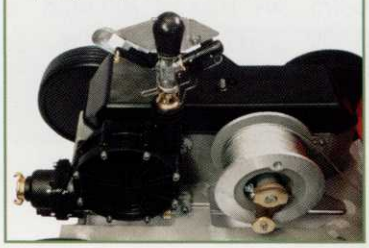
features

- 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
- Hose Required: 1"
- Minimum Water Pressure: 50 psi

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



Use Tracker™ to help areas where an irrigation system is not available. Tracker's maximum 400 ft. irrigation path makes it practical for large areas and its compact size allows it to operate in narrow spaces such as in between trees.

ordering

Part # T-400 Tracker™ Portable Irrigation Machine

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

See Pages 12-13

Quick Coupler Valves & Keys

SOLID BRASS, SINGLE SLOT/LUG ESSENTIALS

Built to last, Underhill valves and keys are constructed of solid red brass and stainless steel. Valves incorporate rugged one-piece design.

Valve: Part # QV-075R
(3/4" FPT inlet)
Key: Part # QK-075
(3/4" MPT x 1/2" FPT outlet)

Valve: Part # QV-100R
(1" FPT inlet)
Key: Part # QK-100
(1" MPT x 3/4" FPT outlet)

Valve: Part # QV-150R
(1-1/2" FPT inlet)
Key: Part # QK-150
(1-1/2" MPT x 1-1/4" FPT outlet)

hose swivels

Part # HS-075	3/4" FPT x 3/4" MHT outlet
Part # HS-100	1" FPT x 3/4" MHT outlet
Part # HS-101	1" FPT x 1" MHT outlet
Part # HS-151	1-1/2" FPT x 1" MHT outlet

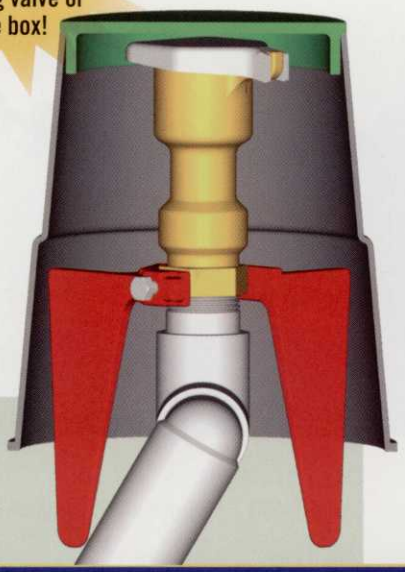
The Claw™ pictured with 1" quick coupler, key and hose swivel.

The Claw™

EASY RETROFIT
Installs without removing valve or valve box!

QUICK COUPLER MOTION RESTRAINT

When quick coupler valves become unscrewed from swing joints, it's more than just a hassle - it can be dangerous. The Claw™, new from Underhill, offers a simple solution. Embedded in the soil below the quick coupler, and then securely attached to its base, The Claw provides significant resistance to rotational, vertical and horizontal motion, preventing the valve from moving. Made from high strength ductile iron, this compact anchor attaches easily with a single steel bolt.



ordering

Part # QCA-075100	The Claw™ for 3/4" and 1" valves
Part # QCA-150	The Claw™ for 1-1/2" valves

Impact Sprinklers

Underhill's SI100F 1" inlet brass impact atop the portable base RollerPro™ (see page 10) puts a powerful sprinkler anywhere you can run a hose.

SOLID BRASS, ULTRA-RELIABLE WORKHORSES

For reliable, trouble-free, high-performance year after year, you just can't beat our brass impact sprinklers. Available in full circle and full/part circle, in inlet sizes of 3/4", 1" and 1-1/4".

features

- Solid brass construction
- Stainless steel drive spring
- Bearing assembly hood for longer wear life
- Chemical resistant bearing seals
- Solid brass nozzle

3/4"
Flow: 5-15 GPM
Spacing: 40-60 ft.

1"
Flow: 15-45 GPM
Spacing: 50-80 ft.

1-1/4"
Flow: 25-120 GPM
Spacing: 75-110 ft.

ordering

		GPM	Radius (ft.)
Part # SI075F	3/4" MPT Full Circle Sprinkler	13	57
Part # SI075P	3/4" MPT Part/Full Circle Sprinkler	11	48
Part # SI100F	1" MPT Full Circle Sprinkler	23	71
Part # SI100P	1" MPT Part/Full Circle Sprinkler	23	71
Part # SI125F	1-1/4" MPT Full Circle Sprinkler	51	96
Part # SI125P	1-1/4" MPT Part/Full Circle Sprinkler	54	78

Performance data shown at 80 psi. GPM and radius will vary with pressure at sprinkler

VersaLid™

UNIVERSAL REPLACEMENT LID FOR ALL VALVE BOXES

VersaLid™ is the easy solution for broken or missing valve box lids. No need to guess what brand a buried box is or even worse - dig it up to find out - VersaLid's locking system fits all 6"-7" round valve boxes.

features

- Stepped locking system
- T-Top design minimizes dirt in valve box
- Fits all 6"-7" round boxes
- Interchangeable, easy to install
- Greater top-load strength and more UV-resistant than structural foam lids

ordering

Part # VL-6 VersaLid™ 6"-7" valve box lid

DeepDrip™

TREE WATERING STAKES

DeepDrip™ stakes allow you to water and fertilize your trees at the roots, encouraging deeper roots and healthier trees. Water gets underground fast, so you can water for shorter periods and enjoy considerable water conservation. They also help to aerate the soil with oxygen, and you can add fertilizer into the shaft to direct nutrients to the root zone.

DeepDrip™ watering stakes can be installed during or after tree planting. Once in, you have instant access to the root system for fertilizer delivery or to set up deep automatic drip watering.

THREE LENGTHS FOR USE WITH ALL TREE SIZES

DeepDrip comes in three sizes, each designed for use with automatic landscape drip systems or a hose. The 14.5" unit is ideal for small trees and shrubs with shallow roots, like rose bushes and ornamental trees (or in commercial use for boxed trees). The 24.5" stake is best for most other tree varieties except for palms and similarly deeper rooted trees, which will benefit from the longer 36" stakes.

BUILT SMART - AND EASY TO USE

The DeepDrip's reinforced tip and cap are made from ABS and the upper shaft is made from Schedule 40 PVC. Multiple holes in the bottom half of the spike, internally covered by a mesh filter, allow water to flow out but keep dirt from getting in and clogging the tube. The UV-protected cap acts as a reinforced cover when pounding the stake into the ground, keeps debris from entering the shaft and holds a 1/4" drip line/emitter securely in place. By inserting a screwdriver through the two holes at the top of the upper shaft, stakes can be easily pulled up to remove/reposition or rotated to deter root invasion.

ordering

Part # A-DD14	DeepDrip™ 14.5" watering stake
Part # A-DD24	DeepDrip™ 24.5" watering stake
Part # A-DD36	DeepDrip™ 36" watering stake

MicroEase™

MICRO-IRRIGATION KITS

Convert your current, inefficient irrigation into a highly effective, low-maintenance, water-saving drip system. MicroEase™ kits can connect to a water faucet, existing sprinkler system or 1/2" riser, providing efficient, low volume irrigation ideal for clubhouse surrounds and other landscaping, shrubbery and planter areas.

PRO KIT
(faucet connection)

CONVERSION KIT
(sprinkler/riser connection)

ordering

Part # ME-SS-PK	MicroEase™ Pro Kit: spray spikes (25)
Part # ME-8SS-PK	MicroEase™ Pro Kit: 8-stream spikes (25)
Part # ME-SS-SCK	MicroEase™ Conversion Kit: spray spikes (9)
Part # ME-8SS-SCK	MicroEase™ Conversion Kit: 8-stream spikes (9)

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

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Form No. UIGWP-B09

Products that work...smart.™

needs – and was installed basically at no cost through a lease agreement developed by the solar outfitter, Mercury Solar Systems in New Rochelle, N.Y., who created a Power Provider Agreement (PPA) with the local utility company.

As a private club, Wee Burn didn't qualify for the tax credits, says Mercury Solar Systems President Jared Haines. "So having our company create the PPA was the only way to make the system pencil out," he says, noting a daily-fee course could buy the system and take advantage of the incentives.

"Our membership was interested in making a statement about our commitment to the environment and our carbon footprint by adding solar to our facility," says Warren Burdock general manager at Wee Burn Golf Club. "The solar company installed the system, took the tax incentives, developed a PPA agreement and worked out an arrangement for the carbon offsets. For us, our energy costs are 12 percent less for the power generated by the solar grid."

Visit golfcourseindustry.com's Online Extra section to see a video about the Island Golf Course's solar panel system.

BLOWIN' IN THE WIND

While harnessing the sun's energy has been a focal point of renewable technologies for several decades, attempts to harness the boundless power of the wind have seen vast improvements in technology in recent years. When talking about wind power, one first thinks of the 80-foot-long prop blades associated with the commercial wind farms around the country, but there has been significant development in smaller turbines that can service home sites, commercial buildings in metropolitan settings and can be a viable energy source for golf course operations. While the viability of wind generation is more site-specific as a steady wind source is needed, the cost of wind generation can be lower than a solar array and can be used in rather creative ways.

Consider the windmill system at the Interbay Golf Center in Seattle. Superintendent Rocky Tharp maintains this learning center and nine-hole golf facility, which has a small retention pond where algae suppression is an ongoing challenge. Last summer Tharp installed a small windmill by the pond that powers a compressor, which pumps air into the pond to control the algae bloom. His $1,500 system eliminated the need to run power out to the pond and helped him eliminate the use of standard copper sulfate previously used for algae control.

"I set up this system last fall and so far it has worked very well," Tharp says. "The other payback is that the public is encouraged by the proactive approach that we have taken at this city-operated facility."

At Rochester Golf Club in Milton, Mass., superintendent Stuart Tallman has operated a small windmill on site for three years. His windmill was set up through a grant from the Massachusetts Technological Collaboration (MTC), a state agency looking for ways to introduce renewable energy sources.

"Our windmill is a 10 kilowatt Burgey windmill, but I've found that our 50-foot tower isn't high enough to get it above the trees and into a more consistent wind stream," Tallman says. "We're generating a little over half the power originally projected, so our payback is projected for 10 years now. Still the system has helped to cut $3,500 a year from my electrical bill. The system is tied into the grid creating a net metering arrangement that makes the meter run backwards when it's generating power. During the winter months when the course is closed, it's generating power and building up a reserve."

Robert Luff is the owner of the Sagamore Hampton Golf Course in Seaport, N.H., which is located just a few miles inland from the Atlantic Ocean and sits on a hillside.

He began to research alternative power sources 10 years ago and found little support from both the utility company or the governing bodies.

"Things have changed dramatically since I began to research the idea," Luff says. "Today I can get a net metering agreement from the power provider and there are more incentives to help make the systems affordable. In my case I found that I could put up two Sky Stream windmills and generate 3.8 kilowatts per year, about 30 to 35 percent of my power needs for less than a solar array would cost because I had a good wind source here. I was able to work with the city for variances for the 50-foot tall towers and the state incentives make the whole project feasible."

A good example of how community green initiatives will be a continuing driving force can be found in Reno, Nev. In March the city council voted to install various solar and wind generation systems around the city to offset its utility costs. At the city-operated Rosewood Lakes Golf Course, three windmills will be erected.

"I had mentioned to the city that I thought looking at alternatives made sense and I am glad that they are moving forward with the idea," says golf professional Bob Force.

"It just makes sense for golf as an industry to embrace any way to be better environmental stewards," he says. "The payback from these types of programs in terms of showing our concern for the future can't be overlooked."

The project in Reno will highlight two windmill companies based in the city – Mariah Wind and Synergy Corp. One windmill will be set up next to the maintenance building while one will be installed out near one of the pump houses on the golf course. These two sites were chosen to make an easier grid connection to develop a net metering arrangement with the utility company. The city hopes to have the windmills in operation by the fall. **GCI**

Doug Saunders is a freelance writer based in Truckee, Calif.

THE BUZZ ABOUT HDPE PIPE

A consultant's perspective on golf course irrigation pipe options.

BY RICK ROBBINS

We've come a long way since the days of wooden and hand-made brick pipe from the early 1900s. If you've never seen wooden pipe, the construction is ingenious. There's an angled wooden lath cut to form a circle. Surrounding this wooden circle is a continuous wrap of aluminum wire that not only holds the structure together but also keeps the swelling of the wood in check. Next, there was clay tile, copper, galvanized, steel, asbestos cement (AC), ductile iron and polyvinyl chloride (PVC) pipe. AC pipe posed the biggest environmental and health threats, and to expose it now requires a white-suited and masked team of EPA specialists.

The PVC pipe evolution began in the 1940s but wasn't used for irrigation until the mid-1960s when pressurized PVC pipe had been developed. Skeptics at the time criticized the introduction of "plastic" pipe and claimed it could not possibly outperform steel or AC pipe. The early PVC pipe didn't have strict regulations regarding strength, pressure rating, diameter or even manufacturing. However, once the familiar governing bodies of the American Water Works Association, ASTM International (originally known as the American Society for Testing and Materials) and others got involved, standards were created for PVC pipe manufacturers.

GOLF COURSE APPLICATION OF PVC PIPE

PVC pipe has been used almost exclusively in the golf course industry since 1970. Golf course irrigation designers, golf course superintendents and installing contractors all have to been aware of the issues involved with PVC pipe and fittings. These include:

- The class of PVC pipe used (CL 160 vs. CL 200 vs. C 900);
- Adequate thrust blocks (or pipe joint restraints) at all fitting and valve locations and for changes in direction;
- Deflection (bending) limits of PVC pipe (maximum of 5 percent);
- Bedding of pipe and backfill material, particularly in rocky soil;
- In cooler climates, preventing the freezing of any water in the pipe (draining and blowing down the irrigation systems with air);

Talk about productive: our US manufacturing plant is on a site a commercial sprayer could cover in minutes. But our team there formulates, packages and ships millions of gallons of over 200 products every year. That productivity and attention to detail lets us provide you with more options and more value. In other words: better choices for better business. For more, see your Nufarm representative or www.nufarm.com/us.

Better Choices. Better Business.

Nufarm

www.nufarm.com/us

A butt-fusion machine.

An assembled mainline gate valve.

An electro-fused 4-inch by 2-inch saddle.

- For smaller diameter pipe (3 inches and smaller), gluing the pipe properly with the correct primer, glue and method; and
- The anticipated life expectancy of underground, pressurized PVC pipe and fittings.

THE DEVELOPMENT OF HDPE PIPE

The newest pipe is high density polyethylene (HDPE). It came about as irrigation industry experts tried to improve the flexibility and durability of underground pipe. In the 1930s, European countries began using it for utilities. The United States began using it for gas and water utility lines in the 1950s. As the popularity of HDPE pipe increased, so did the technological advances. Manufacturers developed more fittings and improved the pipe manufacturing process and regulatory agencies developed standards for the industry.

In the late 1980s, HDPE pipe was introduced for golf applications in select areas of the United States.

In 1988, Jim Kirchdorfer of ISCO Industries is said to have been the first in the U.S. to use HDPE pipe entirely on a golf course at Quail Chase, a Kentucky golf course he owned. At that time he had to manufacture the fittings for his project because they were not yet made by any other company. Kirchdorfer introduced HDPE pipe to golf course irrigation systems in the late 1970s using HDPE on the tough applications such as stream crossings, exposed pipe, intake pipe and poor soil conditions.

During this early period of HDPE pipe in golf irrigation, from the late 1980s until the mid-1990s, the selection of fittings for the pipe was limited. Manufacturers would make the fittings needed for each individual project. In the late 1990s, manufacturers finally began making the fittings that were most commonly used for golf irrigation. This was a big shot in the arm for the use of HDPE pipe in the golf irrigation industry.

HDPE PIPE VS. PVC PIPE

Connecting pipe to pipe or pipe to fittings, such as HDPE tees, is done with a butt-fuse connection. For this method with large diameter pipe (4 inches and above), two lengths of pipe are placed into a specialized fusion machine (most commonly a McElroy Tracstar).

The operator enters the appropriate data into the fusion machine (for example, 8-inch pipe in 60-degree weather conditions). The edges of the two ends to be fused are shaved, a heat plate heats the ends for the correct amount of time, and the ends are then placed together, essentially fusing them together. A "bead" is created around the outside and inside of the pipe where the fusion took place, and this bead should be the same thickness throughout.

After cooling time, the fused pipe is removed and two new pieces are fused in the same manner. The same process is used for fittings such as tees. Some fusion machines maintain a data logger for every fusion process, which can later be printed for reference. For smaller diameter pipe, 3 inches and below, the process is the same, but it's done by hand with a smaller machine (most commonly a McElroy Pitbull).

If we use our 8-inch pipe and 60-degree weather conditions as an example, 30 to 40 minutes are required for the entire heating and cooling fusion process. The main variables affecting the time are the wall thickness of the pipe and the temperature needed to fuse the pipe correctly.

A qualified contractor can fuse approximately 1,000 feet of 8-inch DR 11, PE4710 resin pipe per day. Butt-fusing takes place above ground, and while it's being done, others can be opening the trenches where the pipe will be placed. Contractors usually have one work area where butt-fusing takes place, and the fused pipe is then dragged to where it's needed.

Connecting 2-inch lateral pipe to mainline pipe requires an electro-fused saddle. An electro-fused HDPE saddle can be ordered for all ranges of pipe size, with a threaded outlet of ¾-inch to 2-inches (or larger with fused or threaded outlet). The underside of the saddle contains electrical wire incorporated into the saddle. On the top are two electrical prongs where the electro-fusion machine is attached. During the electro-fusion process, the electrical wire within the underside of the saddle heats the surface of the saddle and fuses it to the pipe. Once again, for each fusion process the appropriate data is entered into the machine. After the saddle has been fused to the top of the pipe, the contractor can drill a hole through the saddle and into the HDPE pipe, where a cast iron elbow is threaded into the saddle for installing a 2-inch lateral gate valve. The contractor also can use a fully fused HDPE elbow with a fused valve. There are numerous and proven methods to make the connection to the electro-fused saddle.

Sprinklers are connected to 2-inch HDPE pipe rather easily. Contractors have found that using 250 feet to 2,000 feet rolls of pipe is the easiest and most economical method. The pipe is run through a "line tamer" machine to straighten it to make it easier to handle and install. Where the sprinklers are actually connected to the pipe, the Lasco Co. has manufactured a mechanical saddle specifically made for this application.

We have found the process of connecting and installing HDPE pipe to actually be quicker than PVC pipe installation. With large diameter HDPE pipe installation, no thrust blocks are needed and no special bedding is needed for the pipe trench due to the wall thickness of the pipe and fittings. For 2-inch lateral pipe, there is no gluing time involved for connecting PVC pipe every 20 feet (HDPE comes in a minimum of 40-feet length up to 2,000-feet coils) and no fittings are needed except for the saddle at the sprinkler swing joint locations.

RICK ROBBINS