



IRRIGATION

PART 1 - PRODUCTS

1.1 CONTROLLERS

- A. Provide Smartline Controller(s), models SL9600TW as indicated on the Drawings, manufactured by Weathermatic Sprinkler Division of Telsco Industries. Controller(s) shall be a four (4) program controller(s) with capability of 48 or 96 decoder addressed zones. The SL9648TW will incorporate 48 decoder address module for operating 48 decoders. The SL9696TW will incorporate 96 decoder address module for operating 96 decoders.
1. Controller shall be capable of standard timed watering or auto adjust watering times when equipped with an optional SLW weather monitor manufactured by Weathermatic. Auto Adjust watering shall be based on real time, on-site weather data and system audit data entered by the user. Auto adjust timing shall be based on the Hargreaves ET calculation formula. Controller shall provide reviewable watering deficits, scheduled run times by zone and a total run time recap for each zone which is resettable by the user. A "more or less" function shall be provided to allow run time adjustment by zone for shade/sunlight, system efficiency and other local factors. Auto adjust mode shall also include automatic calculation of run/soak times based on both soil type and zone elevation.
 2. Each program shall have eight independent start times, calendar schedules, watering budgets by month and a soak/cycle for varying soil percolation rates.
 3. Controller shall have two (second user assignable) pump start/master valve position, which shall be programmable to operate on demand from any selected zone. A programmable safety delay shall be included for zone to zone delay and master valve to zone delay for opening and closure.
 4. Controller shall have input for rain and freeze sensor devices selectable by zone. SLW weather monitor shall incorporate the rain and freeze shutdown functions and shall incorporate a 48-hour delay (adjustable 0 – 99 hours) after closure of the rain sense switch.
 5. Controller shall have self-diagnostic capabilities to detect "short" or "open" zones and the ability to display lists of faults on an LCD display for the user. Diagnostics shall also include LCD display of volt/amp readings by zone and for transformer output as well as backup battery reading. A chatter function shall also be provided to assist in locating buried valves. The controller shall automatically prevent master valve opening or pump start when the valve locator diagnostic is used.
 6. Controller display shall be backlit for clear viewing in all lighting conditions. Zone timing shall be settable from 1 minute to 9 hours and 55 minutes.
 7. All programs shall operate concurrently or in a stack sequence of start time operation.
 8. Program schedules shall include options for days of the week, odd date, even date or an interval of 1 to 30 days. A 'no water' window shall be available to inhibit daily operations of a program between two selected times on a given day; omission of up to 15 specified calendar dates or specific days of the week. Adjustments for leap year shall be automatic.
 9. Manual operation shall be provided by program, by station, or on a programmable test program with durations from ten (10) seconds to ten (10) minutes. The programmable test program shall also check for short and open conditions on each zone each time it is run.
 10. A "non-volatile" memory shall retain all programming and real-time clock shall be provided to maintain date and time.
 11. Controller shall be capable of incorporating Weathermatic's SmartLink AirCard allowing for web-based interface into controller to allow communications between SmartLink web site and controller.
- B. Controller shall be enclosed in a U.L., CE and C-Mark Listed rainproof plastic enclosure with optional key lock. Enclosure shall be a wall mount (pedestal mount) model with removable knockouts on the lower side and back of the housing for choice of wiring location. The operating panel shall be a totally enclosed module that is removable from the housing for programming at a separate location. A test post for 24V a.c. operation shall be accessible with or without the operating panel.
1. Controller shall be completely electric in operation. Controller shall be installed and wired in accordance with manufacturer's published instructions. Controller shall be capable of operating from an independent power supply. Primary shall be 115V a.c. 60hz or 230V, 50hz.

- C. Controller shall have a have a manufacturer's limited warranty of two (2) years standard or three (3) years when installed with two wire cable model SLWIRE supplied by Weathermatic Sprinkler Division of Telsco Industries and connected using model SLCONN aluminum connectors and dry splice connections supplied with the decoders

1.2 STAINLESS STEEL ENCLOSURE

- A. The stainless steel pedestal shall be model SLPED-ENC as manufactured by Weathermatic Sprinkler Division of Telsco Industries.
- B. Enclosures shall be fabricated from 16 gauge stainless steel with a brushed finish. Enclosures shall be NEMA type 3R rated weather-resistant with filtered side louvers for cross-ventilation. A removable stainless steel door shall be mounted to the front of the enclosure and include a cam style key-lock to restrict access to the enclosure. Enclosure shall measure 19 ¾" wide x 24" high x 15" deep.
- C. Enclosures shall have a manufacturer's limited warranty of two (2) years.

1.3 SOLAR ASSEMBLY

- A. The solar assembly shall be model shall be model SLSOLAR-48 as assembled by Weathermatic Sprinkler Division of Telsco Industries, or approved equal.
- B. SLSOLAR48 assembly shall consist of a SOLARBATT-48, SOLARCHG, and (2) SOLARPAN-50.
- C. SOLARBATT-48 shall be an American made GEL maintenance free deep cycle battery. The GEL battery case shall be a shock absorbent thick wall polypropylene. The charging grid shall be a high purity lead calcium-tin alloy. The battery shall be non-spillable and be a recombination reaction (recombinant battery) which prevents escape of hydrogen and oxygen gases. The battery may be operated in virtually any position except upside-down. SOLARBATT-48 shall have the following electrical specifications: Nominal Voltage: 12V; Amp Hour Capacity @ 20 hr rate: 97.6 a/h; Reserve Capacity @ 25 amp discharge rate: 190 mins; BCI Group Size: 30H; Marine Cranking Amps @ 32* F: 640 amps; Cold Cranking Amps @ 0* F: 450 amps; Terminal Type: dual terminal
- D. SOLARCHG digital meter shall be a universal, four digit display with custom icons that is compatible with several Morningstar controllers and inverters. The digital meter shall display voltage, current, temperature, logged data, settings, alarms and error reporting. The digital meter shall display this data as present, cumulative and maximums/minimums measurements. The digital meter shall also display battery level and operating state. The digital meter's icons and units indicators shall be displayed to indicate whether the numerical information relates to solar, load, battery 1 or 2, options, errors or self-test. The digital meter shall have three soft buttons to allow for navigation of the meter menus. The unit shall also have custom icons and back lighting. The digital meter shall be designed for low self-consumption to avoid draining the system batteries. Self-consumption shall be 6 mA with backlight off and 15 mA with backlight on. The temperature may be displayed in either °C or °F, the backlight timer may be adjusted for desired running time and the amp-hours and minimum/maximum values may be reset.
- E. SOLARCHG voltage inverter shall be a pure sine wave inverter designed specifically for electrification requiring AC power using solar. The pure sine wave design shall provide an AC equivalent to grid power. The unit shall utilize a toroidal transformer design to generate a stable wave form throughout the range of input voltages. The voltage inverter shall handle a 200% surge during load start-up to a maximum of 600 watts. Self-consumption shall be 450mA while powering loads and automatically powers down to stand-by mode during no load conditions. The unit shall have electronic protections that will automatically protect against faults and user mistakes such as short circuit, overload, high temperature and low voltage disconnect. Recovery from most faults shall be automatic.
- F. SOLARPAN-50 shall be high quality industrial solar modules that have a low iron High-transmission 3.2mm tempered glass front that is impact resistant. The panel frames shall be constructed from clear anodized extruded aluminum. The units shall have pre-drilled holes for easy mounting to mounting frame. Each panel shall have TPT/TPE Tedlar backsheet. The solar cells shall be encapsulated in EVA and bonded to the Tedlar backsheet. Each panel unit shall consist of 36 solar cells that are connected in series. A weather proof junction box shall be mounted to each panel to allow for connection with a waterproof strain relief connectors and conduits or weather resistant output cables.
- G. SLSOLAR48 shall have a manufacturer's limited warranty of one (1) year.