

LEIT X, XR and XRC Controller Specifications

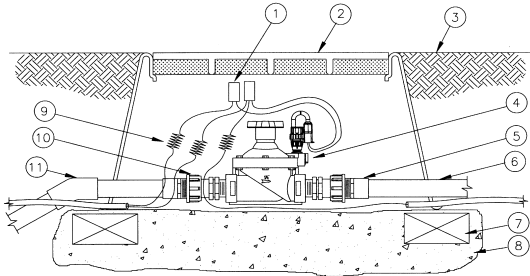
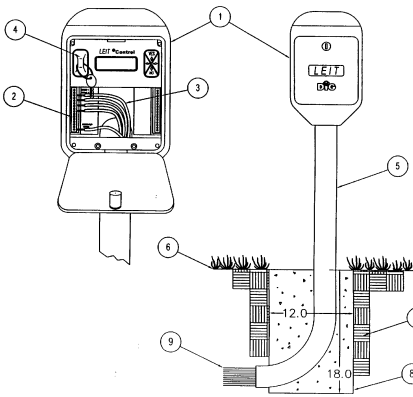
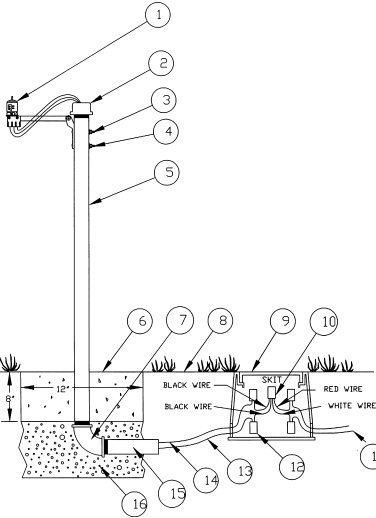
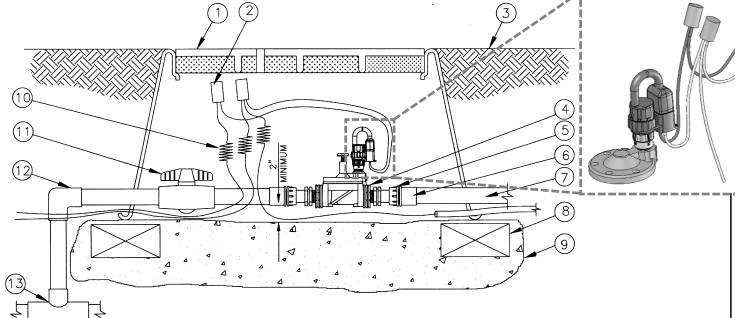
Section 02810

Part 1 Introduction

1.1 LEIT X, XR and XRC controllers are advanced water-management irrigation controllers. The controllers utilize ambient light as the source of energy to operate up to 28 valves using a low voltage, high efficiency, watertight, 2-way magnetic solenoid actuator that operates at 5-volts. Built to the highest quality standards (ISO 9002), the LEIT X, XR and XRC controllers have a menu base program with straightforward programming that allows for a wide range of irrigation programs such as valve grouping, 4 programs with 3 start times, run times up to 6 hours, budget, rain delay, status reports, history reports, manual runs and more. The controller design uses the most advanced time-tested photovoltaic module, which provides more power to harness light energy day and night, anytime, anyplace. Used for sprinkler or drip systems, the LEIT X, XR and XRC controllers are commercial quality water management controllers for any type of environment and for a wide range of uses.

Part 2 Typical Installation

2.1 Drawing File no.: LEIT X.exe

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| <p>160HE-160 1-1/2" and 160HE-200 2" REMOTE CONTROL VALVE FOR LEIT CONTROLLER ASSEMBLY</p>  <p>LEGEND</p> <ul style="list-style-type: none"> 1 DRY SPLICE CONNECTORS 2 VALVE BOX WITH COVER 12" SIZE 3 FINISH GRADE TOP 4 DIG REMOTE CONTROL VALVE WITH FLOW CONTROL AND LEIT DC SOLENOID MODEL: 160HE-150 1-1/2" MODEL: 160HE-200 2" 5 PVC SCH 40 MALE ADAPTER 6 PVC MAIN LINE 7 BRICK SUPPORT AT EACH CORNER 8 PEA GRAVEL SUMP MINIMUM 3" 9 CONTROL WIRE TO OTHER VALVE 10 SWIVEL FITTING FOR EASY CONNECTION MODEL: 23-152 1-1/2" MODEL: 23-202 2" 11 PVC SCH 40-45° ELL | <p>LIGHT ENERGIZED IRRIGATION CONTROLLER LEIT CONTROL X, XR AND XRC</p>  <p>LEGEND</p> <ul style="list-style-type: none"> 1 AMBIENT LIGHT POWERED IRRIGATION CONTROLLER. MODEL X: 10-28 STATIONS MODEL XR (WITH OPTIONAL RADIO): 4-28 STATIONS MODEL XRC WITH RADIO REMOTE: 4-28 STATIONS 2 TERMINAL STRIP 3 12 OR 14 GAUGE WIRE 4 PROGRAMMING KEY MODEL #LEIT KEY 5 35" STEEL MOUNTING COLUMN MODEL #MCOLXS (SHORT) OR 50" STEEL MOUNTING COLUMN MODEL #MCOLXL (LONG) 6 FINISH GRADE 7 6-1/2" OF BACKFILL SOIL 8 POURED CONCRETE BASE - 1-1/2" CU.FT. INSTALL PER MANUFACTURER'S INSTALL GUIDE 9 DIRECT BURIAL CONTROL WIRES TO CONTROL VALVES |
| <p>RAIN SENSOR ASSEMBLY COLUMN MOUNTED</p>  <p>LEGEND</p> <ul style="list-style-type: none"> 1 "MINI CLIK" RAIN SENSOR 2 DIG PLASTIC PIPE CAP 1" PART #23-001 OR 1-1/2" #23-053 WITH HOLE FOR WIRES 3 DRILL TWO 3/16" HOLES IN PIPE FOR SENSOR BRACKET 4 (2) #8-32 MACHINE SCREWS WITH WASHER, LOCK WASHER AND NUT 5 1" OR 1-1/2" GALVANIZED PIPE 6-10 FEET HIGH 6 12" X 12" CONCRETE BASE, 8" DEEP MINIMUM 7 1" OR 1-1/2" PIPE ELBOW 8 FINISH GRADE 9 6" ROUND VALVE BOX 10 SKIT ADAPTER PART #8821-4 USE WITH EACH SENSOR 11 TO CONTROLLER OR VALVE 12 (4) DRY SPLICE CONNECTORS 13 NORMALLY CLOSED WIRE FROM SENSOR 14 COMMON WIRE FROM SENSOR 15 1" OR 1-1/2" NIPPLE 16 GRAVEL | <p>160HE-075 3/4" AND 160HE-100 1" REMOTE CONTROL VALVE FOR LEIT CONTROLLER ASSEMBLY</p>  <p>LEGEND</p> <ul style="list-style-type: none"> 6 PVC SCH 40 MALE ADAPTER 7 PVC LATERAL LINE 8 BRICK SUPPORT AT EACH CORNER 9 PEA GRAVEL SUMP - MINIMUM 3" 10 12 OR 14 GAUGE WIRE 11 BACK-UP NPT PVC BALL VALVE 12 PVC SCH 40 90° ELL 13 SCH 40 TEE |

Part 3 System Descriptions

3.1 Automatic Irrigation Controller [Light]

Irrigation controllers shall be single, solid-state independent controllers conforming to the following:

The controller shall be powered by an internal, ultra high efficiency, photovoltaic module with a microelectronic energy management system fueled by ambient light. The controller shall have a 2-way radio communication capability using the ISM band 900-928 MHz (LEIT XRC only). The controller shall be protected by a vandal-resistant, waterproof enclosure fashioned from high impact composite material and made to endure extreme environments. The controller shall function day and night in any weather condition and in most outdoor locations where no direct sunlight is required. It shall communicate to a micro-power solenoid actuator via two-way digital control pulses at 5-volts DC. The X and XR controllers require daily exposure to light levels with a minimum of 2,000 lux. This is equivalent to having sunlight around 8 AM in a shady area. The LEIT XRC shall have a minimum of 15,000 to 20,000 lux, which is equivalent to having a daylight around 9 AM to 10 AM in a cloudy day.

3.1.1 Controller Features

- a. Controller model X shall operate 10, 12, 16, 20, 24, 28-stations and a master valve.
- b. Controller model XR upgradable to LEIT Link radio (the controller can be sent back to the factory to be loaded with the hardware for radio, software already included) shall operate 4, 6, 8, 10, 12, 16, 20, 24, 28-stations and a master valve.
- c. Controller model XRC with a 2-way radio shall operate 4, 6, 8, 10, 12, 16, 20, 24, 28 stations and a master valve
- d. The controllers shall operate and use a micro-powered solenoid actuator with globe valve or a micro-powered solenoid actuator with the correct adapter to be mounted on any other valve.
- e. Controller shall have bilingual software in English and Spanish.
- f. The controller LCD screen shall be activated with a special key powered by a 9-volt alkaline battery to provide access and security to a simple 4-button programming pad, the LCD shall display all the schedule information.
- g. The controller shall have 4 independent programs with 3 start times per station.
- h. The controller shall allow custom grouping, allowing the controller to operate any number of stations within a group sequentially (if hydraulic limitations are not exceeded).
- i. Ability to program in one minute increments up to 5 hours and 59 minutes with separate setting for hours and minutes.
- j. The LEIT XRC controller shall have a 2-way radio capability using the ISM band 900-928 MHz to communicate with a LEIT Link radio from a distance of up to 800' line of sight.
- k. A programmable watering calendar with a choice of a 1-39 day interval, odd/even days or any day(s) of the week.
- l. A feature that shall include password protection for added security.
- m. Rain stop from 1-99 days with automatic restart.
- n. A 12 month budget adjustment from 10% to 200% in 10% increments.
- o. A manual feature that allows a single desired station to cycle start for any preset, preferred duration.
- p. The controller shall have the option to operate automatic, semi-automatic and manual cycle via the controller.
- q. The controller shall have a monthly off feature that allows turning off any month of the year.
- r. Status and history reports to review controller functions and the amount of watering time applied during current and previous month.
- s. The controller shall have the option to assign any switch type rain sensor, moisture sensor or freeze sensor to an individual valve or to the entire system using a SKIT adapter. (Rain sensor is recommended.)
- t. The controller shall activate the micro-powered solenoid actuator LEMA 1600HE to a distance of up to 7500' (2270m) using NFPA 70 copper conductor 12-gauge (1.6 mm) irrigation wire type UF.
- u. The controller shall be capable of operating pump start relay or a master valve using a RKIT 8810S relay interface module.
- v. The XRC controller shall use a 2-way radio remote handset that can operate in the ISM band 900-928 MHz. To use a 2-way radio communication in the ISM band 900-928 MHz, the controller shall use a LEIT Link 2-way Radio Remote Handset
- w. The controller shall have lightning protection to fully isolate the controller from electrical ground, and offer virtual immunity to ground currents from overhead power lines and/or close proximity lightning strikes.
- x. The controller shall have a full 3-year repair or replacement warranty, prorated from in-service date.
- y. The controller shall have a lifetime lightning warranty.
- z. The controller and its components shall be manufactured by DIG Corporation, Vista, CA.

3.1.2 Controller Components Descriptions

- a. Mounting column
 - a1. The controller shall be mounted on a galvanized mounting column with a length of about 35" short or 50" long with a curved sweep at the bottom to permit ease of wire pull.
- b. Micro-powered solenoid actuator
 - b1. Micro-powered solenoid actuator with globe valve
The remote control valve, with a micro-powered solenoid actuator shall be a globe type, normally closed, using bipolar pulse. The valve shall be pressure rated up to 150 PSI and have balanced opening and closing. The valve(s) body size shall have a 3/4" up to 2" FNPT inlet and outlet, constructed of weather resistant, high impact glass reinforced nylon and stainless steel spring (303). The valve(s) one piece diaphragm shall have

buna-N reinforced nylon fabric (NR). The valve(s) shall have a flow control and internal manual bleed located under the micro-powered actuator solenoid and allow for manual operation by turning the manual bleed handle to the left to open and to the right to close. The valve(s) shall provide easy access for removing all parts from the top of the valve without disturbing normal valve installation.

b2. Micro-powered solenoid actuator only

Micro-powered solenoid actuator (LEMA 1600HE) shall be with the correct adapter to be mounted on any valve (please refer to the back page for detail). The controller shall communicate to the micro-powered solenoid actuator via two-way digital control pulses.

- c. LEIT Key – The controller shall use one LEIT Key (powered by a 9-volt battery) to provide access and to activate the controller's LCD screen.

3.1.3 Controller Accessories Descriptions

- a. Stainless steel enclosure
For added protection the controller shall have the option to add a (304) Stainless Steel vandal resistant enclosure with strip perforations on top, allowing light to enter the controller, plus a lockable hinged door. (Lock included)
- b. Sensor adapter – The controller or the micro-powered solenoid actuator shall have an option to connect to all types of switch type sensors via the SKIT sensor adapter. The SKIT adapter shall be used as an interface between the controller and a compatible rain, moisture or freeze protection sensor.
- c. MV/P adapter: The controller shall have an option to switch on/off an AC or DC circuit via the RKIT relay interface adapter. The RKIT adapter shall be used as an interface between the controller and AC switch device.
- d. Swivel fittings – Micro-powered solenoid actuator with globe valve shall be used with swivel fittings as a union and shall allow, in case of repair, that the valve may be brought to the surface to be serviced without removing the irrigation box or cutting the pipe. The swivel fitting shall be constructed of injected molded polypropylene, UV resistant. The swivel fitting shall feature high impact strength plastic and be highly chemical resistant. The male thread of the swivel fittings shall be attached to both sides of the valve. The female thread side of the swivel fitting shall have a large swivel 1", 1 1/2" or 2" (FNPT) with encapsulated Nitric rubber "O" ring in such a manner that allows quick and easy tightening to a PVC male adapter without tools and teflon tape. The swivel fitting operating pressure shall not exceed 150 PSI.

Part 4 Submittals

The following items shall be submitted by filling in the appropriate number of units and submitting (QTY) with a copy of catalog and instruction manual.

- a. The LEIT X powered irrigation controller shall be _____ each of the LEIT [X10] 4 ten station, [X12] twelve station, [X16] sixteen station, [X20] twenty station, [X24] 24 station and [x28] twenty-eight station
OR
The LEIT XR powered irrigation controller shall be _____ each of the LEIT [XR04] four station, [XR06] six station, [XR08] eight station, [XR10] ten station, [XR12] twelve station, [XR16] 16 station, [XR20] twenty station, [XR24] twenty-four station and [XR28] twenty-eight station
OR
The LEIT XRC powered irrigation controller with 2-way radio shall be _____ each of the LEIT [XRC04] four station, [XRC06] six station, [XRC08] eight station, [XRC10] ten station, [XRC12] twelve station, [XRC16] 16 station, [XRC20] twenty station, [XRC24] twenty-four station and [XRC28] twenty-eight station
- b. The two-way data communication micro-powered solenoid actuator or valve shall be _____ each of:
1. Long distance micro-powered solenoid actuator and valve model [160HE-075] for 3/4", [160HE-100] for 1", [160HE-150] for 1 1/2" and [160HE-200] for 2" actuator and valve(s) or equal.
 2. If other than the above are selected, use the two-way data communication micro-powered solenoid actuator model LEMA 1600HE with the correct adapter to match the valve in use (See back page for adapter compatibility).
- c. The light powered irrigation controller shall require _____ each of LEIT Key to enter the system. The same key can be used with any LEIT controller.
- d. Each irrigation controller shall require one mounting column and shall have _____ each of MCOL XS (35") short or MCOLXL (50") long mounting column and column kit.
- e. The controller shall require if applicable _____ each of the RKIT 8810S relay interface adapter, used as an interface between the controller and pump switch.
- f. The LEIT XRC irrigation controller with LEIT Link 2-way radio can operate via a radio frequency of 900-928 MHz using a 2-way radio and shall be required _____ each of the radio handset. LEIT Link Multi-Pro can communicate with up to 99 controllers or LEIT Link Master can operate with up to 99 groups of controllers, each with up to 99 controllers.
- g. The 1", 1 1/2" and 2" valves shall use a male swivel adapter as a union with 2 per valve for 1" _____ model 23-003 for 1 1/2" _____ model 23-152 and for 2" _____ model 23-202
- h. The light powered irrigation controller shall also require _____ each of the ENCL X (if a stainless steel enclosure is required for extra protection against vandalism and theft).

Part 5 Installation

5.1 Electrical Circuits

Install irrigation wires at least six inches below finish grade and lay to the side and below main line.

- a. Control wire for LEIT operated valve with LEMA 1600HE shall be NFPA 70 copper conductor, 14-gauge [1.8 mm] irrigation wire, type UF, shall be used for station wire with runs up to 4500' (1360 m). NFPA 70 copper conductor 12-gauge [1.6 mm] irrigation wire, type UF, shall be used for station wire with runs up to 7500' (2270 m).
- b. Electrical splices shall be waterproof and shall be located in valve box.
- c. An expansion curl shall be provided so that in case of repairs the valve may be brought to the surface to be serviced without disconnecting the control wire.

X, XR and XRC Radio Series Controllers System



Features

- Series X operates 10, 12, 16, 20, 24 and 28 stations plus a master valve or pump start without AC power hookup, batteries or conventional solar panels
- Series XR operates 4, 6, 8, 10, 12, 16, 20, 24 and 28 stations plus a master valve or pump start without AC power hookup, batteries or conventional solar panels
- Series XRC using 900-928 MHz, 2-way radio operates 4, 6, 8, 10, 12, 16, 20, 24 and 28 stations plus a master valve or pump start without AC power hookup, batteries or conventional solar panels
- Bilingual software in English and Spanish
- Controller functions and operations are 100% tested
- Controller waterproofing is 100% tested
- Built to the highest quality control standard (ISO 9002)
- Non-volatile memory holds programs indefinitely without batteries
- Functions day or night and in any weather in most outdoor locations
- All power is provided by an internal, ultrahigh efficiency photovoltaic module and microelectronic energy management system fueled by ambient light
- Can replace any LEIT 8000 or Solatrol controller with 1500S or 1500E actuator or older
- Compatible with most brands, styles and sizes of valves (refer to LEMA 1600HE series actuator specification sheet)
- LEIT XRC has remote programming and management capability separate from LEIT Link remote controller handset
- LEIT XRC 2-way radio frequency module operates in the ISM band 900-928 MHz
- Programming is easy, using a self-guiding menu and 4 durable sealed buttons
- Assign rain, moisture or freeze sensors to an individual valve or to the entire system using the SKIT 8821-4 adaptor
- Liquid crystal display is easy to read under almost any daylight conditions
- Simple to install, easy access wire connector accommodates standard irrigation wire up to 12 gauge
- Terminal strip can handle 28 hot wire stations, 2 MV/P wires and 2 common wires

- Lightning protection, the controller is fully isolated from electrical ground, offering virtual immunity to ground currents from overhead power lines and/or close proximity lightning strikes
- Manual watering or semi-automatic cycle by station with quick override

Programming Features

- 4 independent programs per valve and 3-start times per program allow for mixed irrigation applications
- Duration's from 1 minute to 5 hours and 59 minutes to operate drip or sprinkler systems
- Custom programming with 7-day calendar or interval of 1 to 39 days in odd/even or every day rotation
- Individual monthly water budgeting from 10% to 200% in 10% increments
- Rain delay up to 99 days with auto-restart
- History report for each valve verifies actual watering time for the last and current months
- Station custom grouping allows the controller to operate more than one group and any number of stations per group together (if hydraulic limitations are not exceeded)

Ordering Information

Model X10 10-stations plus MV/P
 Model X12 12-stations plus MV/P
 Model X16 16-stations plus MV/P
 Model X20 20-stations plus MV/P
 Model X24 24-stations plus MV/P
 Model X28 28-stations plus MV/P

Model XR04 4-stations plus MV/P
 Model XR06 6-stations plus MV/P
 Model XR08 8-stations plus MV/P
 Model XR10 10-stations plus MV/P
 Model XR12 12-stations plus MV/P

Model XR16 16-stations plus MV/P
 Model XR20 20-stations plus MV/P
 Model XR24 24-stations plus MV/P
 Model XR28 28-stations plus MV/P
 Model XRC04 4-stations plus MV/P
 Model XRC06 6-stations plus MV/P
 Model XRC08 8-stations plus MV/P
 Model XRC10 10-stations plus MV/P
 Model XRC12 12-stations plus MV/P
 Model XRC16 16-stations plus MV/P
 Model XRC20 20-stations plus MV/P
 Model XRC24 24-stations plus MV/P
 Model XRC28 28-stations plus MV/P

LEIT Link Handset

LEIT Multi-Pro Remote with up to 99 controllers

LEIT Link Master Remote with up to 99 groups, 99 controllers per group

Valves

160HE-075 3/4" plastic valve with flow control

160HE-100 1" plastic valve with flow control

160HE-150 1-1/2" plastic valve with flow control

160HE-200 2" plastic valve with flow control

Actuator

LEMA 1600HE solenoid actuator

Adapters

30-920 Irritrol 100, 200B, 205, 217B, 700 series, 2400, 2500, 2600 series; Bermad 200 series; Toro P220, 252 and 220 series brass valves; HIT 500 series; Superior 950; Griswold 2000 and DW; Hunter HBV

30-921 Rainbird DV, DVF, PGA, PEB, GB, EFB, BPE, PESB and ASVF valves

30-922 Hunter ASV, HPV, ICV, PGV and AS VF series valves

30-923 Weathermatic 12000, 21000 series

