



**OWNER'S MANUAL  
FOR PRO SERIES  
PC-8, PC-12, PC-16  
IRRIGATION  
CONTROLLERS**

Champion Brass Mfg. Co., Los Angeles, CA 90012



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## 1.0 INTRODUCTION

Having purchased a CHAMPION controller, you have selected a product of the highest quality which will bring you years of trouble-free service and enhance the appearance of your landscape through efficient control of water.

Your Pro Series controller contains many features which will simplify the control of your irrigation system as well as simplify troubleshooting of your system should a problem arise. Although you may certainly use our controllers just by referring to the Quick Reference sheet on the inside of the controller's door, we suggest you take a few moments to read this manual which details all the capabilities of our units.

## 2.0 PC-8, -12, -16 CONTROLLER FEATURES

1. All solid state design with accuracy to the second. No moving parts to wear out.
2. Protected 24 key keyboard.
3. Multiple displays provide truly simple programming and information recall. The display indicates the active program.
4. Weatherproof, watertight case.
5. 9V battery (not included) keeps the program information and time and day during power failures. Rechargeable NiCad battery optional (Part #PRB).
6. Automatic Default Program in case of power and battery failure will water every station 10 min. per day.
7. Manual reset for circuit breaker.
8. Master Valve/Pump start circuit which may also be controlled by itself in the Manual mode.
9. Three programs available to the user.
10. Four start times per program.
11. The watering length for each station may be set from 1 min. to 9 hr. 59 min. in 1 min. increments.
12. Manually activated syringe cycle.
13. All stations in a program water in sequence.
14. Water days for each program may be based either on a seven day week or on a skip days routine allowing every 2nd, 3rd, 4th, 5th, 6th or 7th day watering.
15. Rain Switch (Auto/Off) turns off all stations without disturbing the program.

16. Standard Voltage—120V, 50-60 Hz.
17. Pedestal available for all controllers.
18. Manually activated System Check feature will sequentially water all stations for 1 min. 45 sec.
19. Manual program will run any program.
20. Manual station will run a selected station for a selected time.
21. Program Overlap Protection (POP) ensures that only one program waters at a time.
22. UL approved.

## 2.1 KEY EXPLANATION

 thru  — Numeral keys used for entering numbers.

 thru  — Day keys used for entering days.

 — Used to select the program, either 1, 2 or 3.

 — Used to enter both stations and their associated watering lengths.

 — Used to establish the watering days based on a seven day week. It is used in place of SKIP DAYS.

 — Used to establish the number of days between waterings, either 1, 2, 3, 4, 5 or 6 and the first day of the current week to begin watering. It is used in place of WATER DAYS.

    — Used for establishing start times for a program.

 — Used for setting the time of day and the day of the week.

 — Used for selecting AM or PM when entering times.

 — Used for clearing stations, days, etc.

 — Used for manually activating a program, stations, the master valve/pump or the system check/syringe feature.

 — Used for entering information after placing it in the display.

 — Gets you out of anything and back to the Automatic mode.

### 3.0 HELLO MODE AND AUTOMATIC DEFAULT PROGRAM

When the controller is first powered up, the display will show HELLO. In the HELLO mode the Automatic Default Program (ADP) will run every station every day for 10 minutes. Should you have a power failure and not have a good battery plugged in which would keep the controller's information and time intact, the ADP program ensures that your landscape will be watered when power returns.

In the HELLO mode, the ADP will begin the first watering cycle 6 hours after power is reapplied and then continue at 24 hour intervals until the controller is reprogrammed.

Pressing any key will automatically clear the HELLO mode and ADP.

### 3.1 AUTOMATIC MODE

The controller is in the Automatic mode whenever time is displayed and the day of the week indicator is lit.

Pressing  will always return the controller to the Automatic mode.

When a program is watering in the Automatic mode, the program number will be displayed as a convenience.

To stop and cancel a program that is watering, press:

  — The clock goes back to the Automatic mode.

### 3.2 RAIN SWITCH

The controller has a rain switch. The switch must be in the AUTO position any time watering is desired. In the AUTO position, watering *will* occur if the controller is programmed to do so.

The switch should be placed in the OFF position when no watering is desired, such as when it is raining, etc. In the OFF position, *no watering will occur* because the switch prevents power from going to the valves.

### 3.3. BATTERY BACKUP AND POWER FAILURES

The controller uses a 9 volt alkaline or rechargeable NiCad battery (not included) to keep your program information and time intact during power failures. When power goes out, the display of the controller will go blank to conserve battery power. When power returns the display will light up and, after one minute, show the correct time and day.

If HELLO appears in the display, the battery is dead and all program information has been lost. The controller will run the ADP, as explained in 3.0, until you reprogram it.

Following return of power, should anything other than HELLO or the time and day appear in the display, remove and discard the battery, press the RESET button for approximately 5 seconds, reprogram the controller and install a new battery.

The battery connector is located in back of the lower front panel of the controller.

Battery Type: 9 volt Alkaline "Transistor" such as Eveready #522 or optional Rechargeable NiCad Battery Pack (Part #PRB).

## 4.0 BASIC PROGRAMMING EXAMPLES

Shown below are examples of how to program the controller as well as how to review and clear information.

### 4.1 FUNDAMENTAL INFORMATION REQUIRED IN A PROGRAM

The basic information required in a controller is:

1. The time of day and the day of the week, and within a particular program,
2. The watering days,
3. The station or stations and the watering length for each,
4. The start time or times at which watering will begin on the chosen watering days.

### 4.2 SET TIME (NOTE: 12:00 Midnight is 12:00 AM).

This is used to set the current time of day and the current day of the week.

EXAMPLE 1: The time is 2:00 PM, Saturday. Press:

SET  
TIME

MON 2 0 0 AM/PM ENTER

SAT 7 ENTER

— The clock goes back to the Automatic mode.

EXAMPLE 2: The time is 10:35 AM, Tuesday. Press:

SET  
TIME

SUN 1 0 3 5 ENTER

TUE 3 ENTER

— The clock goes back to the Automatic mode.

### 4.3 PROGRAM

This is used to select the program you wish to work with. Once selected, you need not change the program number until you wish to program or review information in a *different program*. There are 3 programs available for your use. They are referred to as 1, 2 and 3.

If desired, it is also possible to both select and clear all information in a program using this function.

#### 4.3.1 PROGRAM SELECTION

This is done to select the program you wish to work with, either 1, 2 or 3. While programming other functions, the selected program number is displayed as a convenience.

**EXAMPLE:** You wish to work with Program 2. Press:

   — The clock goes back to the Automatic mode.

#### 4.3.2. PROGRAM CLEAR

If desired, it is possible to both select and clear all information in a program.

**EXAMPLE:** You wish to select and clear all information in Program 1. Press:

   — The clock goes back to the Automatic mode.

### 4.4 WATERING DAY SELECTIONS

Watering days for each program may be based on a 7 day week OR a skip days mode. Although you cannot do both within the same program, each of the 3 programs may be set to either mode. For example, Program 1 may be on a 7 day weekly basis but Program 2 might be on a skip days basis.

#### 4.4.1 WATER DAYS

This is used to select watering days based on a 7 day week. Watering will occur on the days selected each and every week. Selected days are shown in the top display. The program number is shown in the display as a convenience.

**EXAMPLE:** You wish to water on Sunday, Wednesday and Friday. Press:

  
   
   
   
 — The clock goes back to the Automatic mode.

To clear a watering day, such as Sunday, press:

if done, press  — The clock goes back to the Automatic mode.

To review **WATER DAYS** information, press:



when done, press  — The clock goes back to the Automatic mode.

#### 4.4.2 SKIP DAYS

This is used to establish a number of days *between* waterings, either 1, 2, 3, 4, 5 or 6 and the day of the current week on which the first watering will begin. If information has been entered in the past, the skip day number will be shown in the display and the next day of watering will be shown in the top display. The program number is shown in the display as a convenience.

**Note:** By using the skip days mode you can have a program water every 2nd, 3rd, 4th, 5th, 6th or 7th day as may be desired.

**EXAMPLE:** You wish to skip 2 days, for every third day watering, and to start it this Wednesday. Press:



— The clock goes back to the Automatic mode.

To clear all **SKIP DAYS** information, press:



— The clock goes back to Automatic mode.

To review **SKIP DAYS** information, press:



when done, press  — The clock goes back to the Automatic mode.

#### 4.5 STATIONS AND WATERING LENGTHS

Any stations may be placed in any program. The same stations may be placed in more than one program at a time if desired. The watering length for each station may be set from 1 min. to 9 hrs. and 59 min.

##### 4.5.1 STATIONS

This is used to select the stations and the length of watering for each station. After entering the station, the watering length for the station is entered. Selected stations are shown in the top display. The program number is shown in the display as a convenience.

**EXAMPLE:** You wish to water station 1 for 10 min., station 2 for 10 min., station 6 for 15 min. and station 7 for 8 min. Press:

STAT-  
IONS

SUN  
1

ENTER

SUN  
1

0

ENTER

MON  
2

ENTER

SUN  
1

0

ENTER

FRI  
6

ENTER

SUN  
1

THU  
5

ENTER

SAT  
7

ENTER

8

ENTER

QUIT — The clock goes back to the Automatic mode.

To clear a station and its watering length, such as station 7, press:

STAT-  
IONS

SAT  
7

CLEAR

when done, press 

QUIT

 — The clock goes back to the Automatic mode.

To review STATIONS information, press:

STAT-  
IONS

when done, press 

QUIT

 — The clock goes back to the Automatic mode.

To review the watering length of a station, such as station 6, press:

STAT-  
IONS

FRI  
6

ENTER

the watering length is displayed.

Press 

CLEAR

 to clear the station and its watering length or

press 

ENTER

 to leave the watering length as is and continue reviewing or

if done reviewing, press 

QUIT

 — The clock goes back to the Automatic mode.

#### 4.6 START TIMES AND PROGRAM OVERLAP PROTECTION

There are four start times available for each of the three programs. They are referred to as START TIME 1...START TIME 4.

Additionally, the controller features Program Overlap Protection (POP). This ensures that even if start times overlap, only one program will run at a time. Simply stated, any time a program is watering and a start time for a program

comes up, the conflicting start time will be delayed until the current program completes its watering.

For example, if Program 1 is one hour long due to the stations and watering lengths placed in it, and you set three of its start times to 7:00 AM, the program will water three times—from 7:00 to 8:00, 8:00 to 9:00, and 9:00 to 10:00 thereby providing two repeat cycles.

Another example, if Program 1 was again one hour long and was set to start at 7:00 AM Monday, Wednesday and Friday and Program 3 was set to start at 7:30 AM on Monday and Tuesday, then on Monday program 3 would begin at 8:00 AM, when Program 1 ended, but on Tuesday it would begin at 7:30 AM.

POP assures you that you will always get the number of watering cycles you desire and at the same time your system will never be underpressurized because two programs are running simultaneously.

#### 4.6.1 START TIME

This is used to set the start time for a program. The program number is shown in the display as a convenience.

**EXAMPLE:** You wish the program to start watering at 7:10 AM and 4:30 PM. Press:

START  
TIME  
1

SAT  
7

SUN  
1

0

ENTER

— The clock goes back to the Automatic mode.

START  
TIME  
2

WED  
4

TUE  
3

0

AM  
PM

ENTER

— The clock goes back to the Automatic mode.

To review a start time, such as START TIME 2, press:

START  
TIME  
2

when done, press QUIT — The clock goes back to the Automatic mode.

To clear a start time, such as a START TIME 2, press:

START  
TIME  
2

CLEAR

QUIT

—The clock goes back to the Automatic mode.

## 5.0 MANUALLY ACTIVATED FUNCTIONS WITH EXAMPLES

The Manual mode makes available four different options shown below:

### 5.1 MANUAL PROGRAM

This is used to run a program.

**EXAMPLE:** You wish to run Program 1. Press:

    — The clock goes back to the Automatic mode and shows a 1 in the display to indicate Program 1 is running.

To stop and cancel the watering program, press:

  — The clock goes back to the Automatic mode.

## 5.2 MANUAL STATION

This is used to run a selected station for a selected time.

**EXAMPLE:** You wish to water station 6 for 25 min. Press:

     
   — The display shows the station and the watering time. As time elapses, the watering time will downcount and when there is no time left, the station will shut off and the clock will go back to the Automatic mode.

To stop and cancel the watering station, press:

  — The clock goes back to the Automatic mode.

## 5.3 MANUAL MASTER VALVE/PUMP

This is used to run only the MV/P for a selected time. To actuate, use the MANUAL STATION (see 5.2) and enter one station higher than the number of stations in the controller. Example: if the controller is an 8-station unit, enter 9.

## 5.4 MANUAL SYSTEM CHECK/SYRINGE CYCLE

This will water each station, from the first to the last, for 1 min. and 45 sec. Press:

  — Do not press ENTER.

CH will appear in the display indicating check mode. When the last station has watered, the clock will go back to the Automatic mode.

To stop and cancel this cycle, press:

  — The clock goes back to the Automatic mode.

**CAUTION:** This mode sequentially runs every station in the controller. For example, you have an 8 station unit but only use 6 stations, it will still apply power to the terminals for station 7 and then to 8 and while doing so will apply power to the Master Valve/Pump terminal.

This may damage a system using a pump because during the period that stations 7 and 8 are activated, the pump will be pumping against a closed system.

If the system uses a master valve, it will be activated during the period that stations 7 and 8 are active and this could cause heating of the master valve's solenoid if the valve depends on water flow to cool it.

So, if all stations are not used, it is strongly recommended that the user cancel the System Check/Syringe Cycle after the last used station has watered.

## 6.0 A SIMPLE EXAMPLE

There is a simple example on the Quick Reference Guide attached to the inside face of the front door of the controller.

## 7.0 A COMPLEX EXAMPLE

The following complex example demonstrates how you may utilize the controller. The example is this:

Your house has a large area of grass, flower garden and rows of trees along the sides and back. All together you have 7 stations controlling the irrigation of your landscape and you have an 8 station controller. You decide to water and program as follows:

Program 1: The lawn area is to be watered every 3rd day beginning this Wednesday.

Station 1 for 10 min.

Station 6 for 15 min.

Station 2 for 10 min.

Station 7 for 8 min.

The program is to start at 6:00 AM.

Program 2: The flower garden is to be watered every day except Sunday.

Station 4 for 6 min.

Station 5 for 6 min.

The program is to start at 7:00 AM and 1:00 PM.

Program 3: The trees are to be watered once a week on Friday.

Station 3 for 9 hrs.

The program is to start at 7:30 AM.

## 7.1 SET TIME

First, let's set the time of day and the day of the week. The time is 2:00 PM, Saturday. Press:



— The clock goes back to the Automatic mode.

## 7.2 PROGRAM 1

You want to place information in Program 1 first and it already has information in it, perhaps from the simple example you tried earlier. You wish to clear it out because you are going to place new information in it. To select and clear the entire contents of Program 1, press:

**PRO-GRAM** **SUN 1** **CLEAR** — The clock goes back to the Automatic mode.

### 7.2.1 WATERING DAY SELECTIONS

Set the watering days for Program 1 to skip 2 days, for every third day watering, and to start it this Wednesday. Press:

**SKIP DAYS**  
**MON 2** **ENTER**  
**WED 4** **ENTER** — The clock goes back to the Automatic mode.

### 7.2.2 STATIONS

Set the stations and their watering lengths for Program 1 to water station 1 for 10 min., station 2 for 10 min, station 6 for 15 min. and station 7 for 8 min. Press:

**STATIONS**  
**SUN 1** **ENTER** **SUN 1** **0** **ENTER**  
**MON 2** **ENTER** **SUN 1** **0** **ENTER**  
**FRI 6** **ENTER** **SUN 1** **THU 5** **ENTER**  
**SAT 7** **ENTER** **8** **ENTER**  
**QUIT** — The clock goes back to the Automatic mode.

### 7.2.3 START TIME

Set the start time for Program 1 to start at 6:00 AM. Press:

**START TIME 1**  
**FRI 6** **0** **0** **ENTER** — The clock goes back to the Automatic mode.

## 7.3 PROGRAM 2

Select Program 2. Press:

**PRO-GRAM** **MON 2** **ENTER** — The clock goes back to the Automatic mode.

### 7.3.1 WATERING DAY SELECTIONS

Set the watering days for Program 2. Press:

WATER  
DAYS

MON  
**2**

ENTER

TUE  
**3**

ENTER

WED  
**4**

ENTER

THU  
**5**

ENTER

FRI  
**6**

ENTER

SAT  
**7**

ENTER

QUIT

— The clock goes back to the Automatic mode.

### 7.3.2. STATIONS

Set the stations and their watering lengths for Program 2. Press:

STAT.  
IONS

WED  
**4**

ENTER

FRI  
**6**

ENTER

THU  
**5**

ENTER

FRI  
**6**

ENTER

QUIT

— The clock goes back to the Automatic mode.

### 7.3.3 START TIME

Set the start time for Program 2. Press:

START  
TIME  
1

SAT  
**7**

**0**

**0**

ENTER

— The clock goes back to the Automatic mode.

START  
TIME  
2

SUN  
**1**

**0**

**0**

AM  
PM

ENTER

— The clock goes back to the Automatic mode.

## 7.4 PROGRAM 3

Select Program 3. Press:

PRO.  
GRAM

TUE  
**3**

ENTER

— The clock goes back to the Automatic mode.

### 7.4.1 WATERING DAY SELECTIONS

Set the watering days for Program 3. Press:

WATER  
DAYS

FRI  
**6**

ENTER

QUIT

— The clock goes back to the Automatic mode.

## 7.4.2 STATIONS

Set the station and its watering length for Program 3. Press:

STAT-  
IONS

TUE 3 ENTER 9 0 0 ENTER

QUIT

— The clock goes back to the Automatic mode.

## 7.4.3 START TIME

Set the start time for Program 3. Press:

START  
TIME  
1

SAT 7 TUE 3 0 ENTER

— The clock goes back to the Automatic mode.

## 8.0 CONTROLLER PLACEMENT

If installed outdoors, controllers should be placed in a shaded and dry environment not subject to direct sprinkler spray or continuous heavy moisture.

### 8.1 MOUNTING THE CONTROLLER

1. On an upright, flat and secure surface, place the mounting bracket at eye level and fasten securely.
2. Mate the bracket on the back of the controller to the mounted bracket and hang the controller.
3. Secure the bottom of the controller by placing a screw through the hole located in its back wall at bottom center.

### 8.2 PEDESTAL MOUNTING (Part #PM)

If the controller is to be pedestal mounted, refer to the instructions included with the pedestal.

## 9.0 ELECTRICAL CONNECTIONS

1. Refer to Figure 1—Power and Field Wiring.
2. Mount controller.
3. Place RAIN SWITCH in OFF position.
4. Remove lower panel.
5. Connect ground screw to ground rod or grounded water pipe.
6. Leaving the transformer in place, remove the shipping lock nut.
7. Thread conduit onto transformer.
8. Connect supply line grounded conduit to conduit.

- 
- CONTROLLER TERMINAL STRIP**
- The diagram illustrates the wiring for a controller terminal strip. The strip has six terminals labeled: 24 VAC, COM, MV, 1, 2, and 3. Each terminal is represented by a circle with a diagonal slash.
- The **24 VAC** terminal is connected to a **TRANSFORMER**.
  - The **COM** terminal is connected to a **CASE GROUND SCREW** on the controller enclosure.
  - The **MV**, **1**, **2**, and **3** terminals are connected to **VALVES AND FIELD WIRING**, represented by four solid black circles.
  - The **CASE GROUND SCREW** is connected to a **#10 COPPER WIRE**, which is then connected to a **GROUND ROD OR GROUNDED WATER PIPE**.

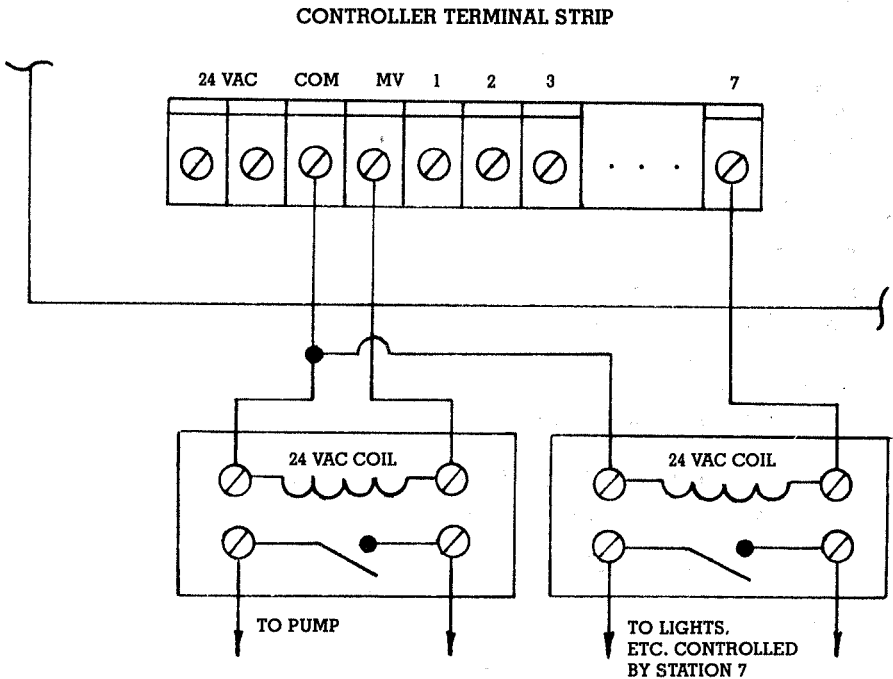
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## WARNING

1. All electrical connections must be as described above and the box must be properly grounded or warranty is void.
2. Disconnect power prior to making electrical connections or servicing controller.
3. For a complete reset of the controller, remove the backup battery and press RESET momentarily.
4. Never short a station terminal or wire to the common terminal or wire to create sparks for station identification.
5. While a station's terminal is activated do not disconnect the station's wire or the common wire or tap them to the terminal.

### 9.1 ELECTRICAL CONNECTION FOR A PUMP AND APPLIANCES

Shown in Figure 2 are the connections for a remote pump start relay as well as how to control miscellaneous appliances such as lighting.



General purpose relays, with contact ratings appropriate for the load, mounted at least 10 feet from controller.

**Figure 2. Electrical Connections for a Pump and Appliances**

## **10.0 IN CASE OF DIFFICULTIES**

### **10.1 DISPLAY IS BLANK**

1. Ensure clock has power.
2. Remove battery and press RESET for 5 seconds.
3. Check secondary voltage of transformer for 24V.

### **10.2 AFTER POWER FAILURE—CAN'T PROGRAM OR DISPLAY IS SCRAMBLED**

1. If using a transistor battery, remove and discard, press RESET for approximately 5 seconds, reprogram and install new battery.
2. If using the NiCad rechargeable battery (#PRB) disconnect it, press reset for approximately 5 seconds, reprogram and reconnect battery.

### **10.3 NO STATIONS TURN ON AUTOMATICALLY**

1. Is the controller in automatic mode—press QUIT.
2. Activate SYSTEM CHECK (section 5.4), if stations turn on, then:  
Check for start times,  
Check for watering days,  
Check for stations and watering lengths.

### **10.4 A STATION STAYS ON**

1. Place RAIN SWITCH in OFF position:  
If the station stays on, then:  
Check for dirt in valve solenoid causing hung solenoid,  
Check for obstruction in valve or possibly a torn diaphragm.  
If station goes off, then:  
Check station's programmed watering length.

## **PC-8, PC-12 AND PC-16 LIMITED WARRANTY**

Champion Brass Mfg. Co. warrants this product to be free from original defects for two years from date of original sale. Champion Brass will replace, free of charge, any part found to be defective under normal use and service within the warranty period (batteries and transformers not included) provided that the product is installed, used and maintained in accordance with all applicable instructions and/or limitations issued by Champion Brass and provided that the unit is returned to the factory prepaid. Champion Brass is not responsible whatsoever for incidental or consequential damages or for products which have been altered, modified or used in any manner not intended for the specific product. No agent or representative of Champion Brass has the authority to waive, alter or add to the printed provisions of this guarantee or to make any representation or warranty not contained herein. This warranty is given expressly and in place of all other expressed or implied warranties of fitness for a particular purpose. Champion Brass cannot and does not assume liability for defective products not manufactured or supplied by us even though such products may be used in conjunction with our own. Champion Brass reserves the right to redesign, alter or modify its products without incurring any liability for anyone's inventory or parts or products that may become obsolete. Champion Brass assumes no liability for damages or charges for labor or expense in making repairs or adjustments. Components manufactured by Champion Brass and supplied as replacement parts are warranted for a period of ninety days from date of shipment from factory (batteries and transformers not included). Champion Brass assumes no liability for damages sustained in the adoption or use of our engineering data or services. Note: Use for prolonged periods without occasional inspection to verify proper operation is beyond the intended use of an automatic sprinkler control. Incidental or consequential damage resulting from such unattended use shall be at the sole risk of the user.