



PWY-400-S01 Pathway

Wire Sharing System

Installation Guide



Model PWY-400-S01

The Pathway provides a reliable, cost effective method to add flow monitoring and control to installed systems where existing pavement, hardscape or other landscape features make conventional wiring prohibitively expensive.

The Pathway PWY-400 is a communications system that allows a CST flow sensor and master valve to be retrofit to an irrigation system utilizing existing zone wire to carry data and valve control signals to the irrigation controller.

The irrigation controller must have flow monitoring and control capabilities.

**READ THROUGH THIS GUIDE BEFORE
INSTALLING THE *Pathway System***



The Controller Module is installed at the irrigation controller and the Field Module is installed in an existing zone valve box near the proposed location of the new flow sensor and master valve. The control and common wires of this “host” zone valve become the communications path between the Pathway modules.

The Controller Module requires a 24 VAC power supply of sufficient size to operate its circuitry and solenoid valves connected to it. Alternatively, some controllers offer 24VAC auxiliary power for hand-held remotes or rain switches that may also be used to power the Pathway Control Module.

New wire installation is only required to connect the Field Module to the new flow sensor and master valve.

Both modules incorporate “day-light” bright LED’s providing feedback to confirm operation or assist in troubleshooting is necessary.

This product is compatible with most irrigation controllers equipped with flow monitoring functions. It may be used to add a flow sensor, a master control valve or both. If you have questions specific to your controller compatibility or application, please contact CST prior to field installation.

Sensor compatibility:

The CST PWY Field Module has been optimized to work with CST sensors and is designed for 5 volt compatibility. While operation with 3rd party sensors may be possible, CST cannot guarantee that these sensors are operating within the manufacturer's specification limits and as such is not responsible for reliable operation of same.

Controller compatibility:

The CST Pathway System has been tested with many irrigation controllers. A partial list of compatible control product includes:

- Calsense
- ET Water
- Hunter ACC
- Rain Bird ESP LXMEF or ESP LXME with flow module
- Rainmaster Eagle
- Toro Sentinel
- Weathermatic Smartline with Smartlink
- Weathertrak
- Check with CST for other controllers.

Field Wiring / Distance:

The CST Pathway System has been demonstrated to operate reliably on a variety of common irrigation wiring systems. However, as the signal quality is dependent upon existing wiring configuration, insulation quality, splices, distances, etc., CST cannot assure operation in every situation. Please contact CST prior to installation for recommendations and guidance.

Installation

Step 1. Locate the host valve

- A. Locate and identify a zone valve that will act as the field module location or “host” or “intercepted” valve for the Pathway system.
- 1) Pick the closest valve to the proposed location of the new flow sensor and master valve.
 - 2) Make sure it is an active valve and note its zone number at the controller.

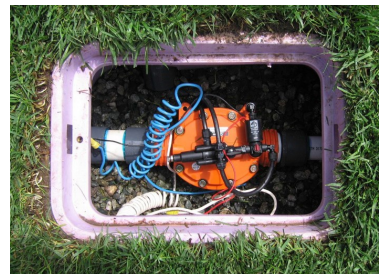
**NOTE: Disconnect Power from the irrigation controller before making any wire connections.
Do not reconnect power until both modules of the Pathway system are wired.**

Step 2. Install the flow sensor/master valve

- A. Install the CST flow sensor and master valve according to factory installation guides and best industry practices.
- B. Install wiring from the host valve box to the location of the new flow sensor and master valve.
- 1) Four conductors are required: two for the flow sensor and two for the master valve solenoid.
 - 2) We recommend the use of a 2 pair twisted, shielded direct burial cable.
 - 3) Size the conductors to the power requirement of the solenoid.



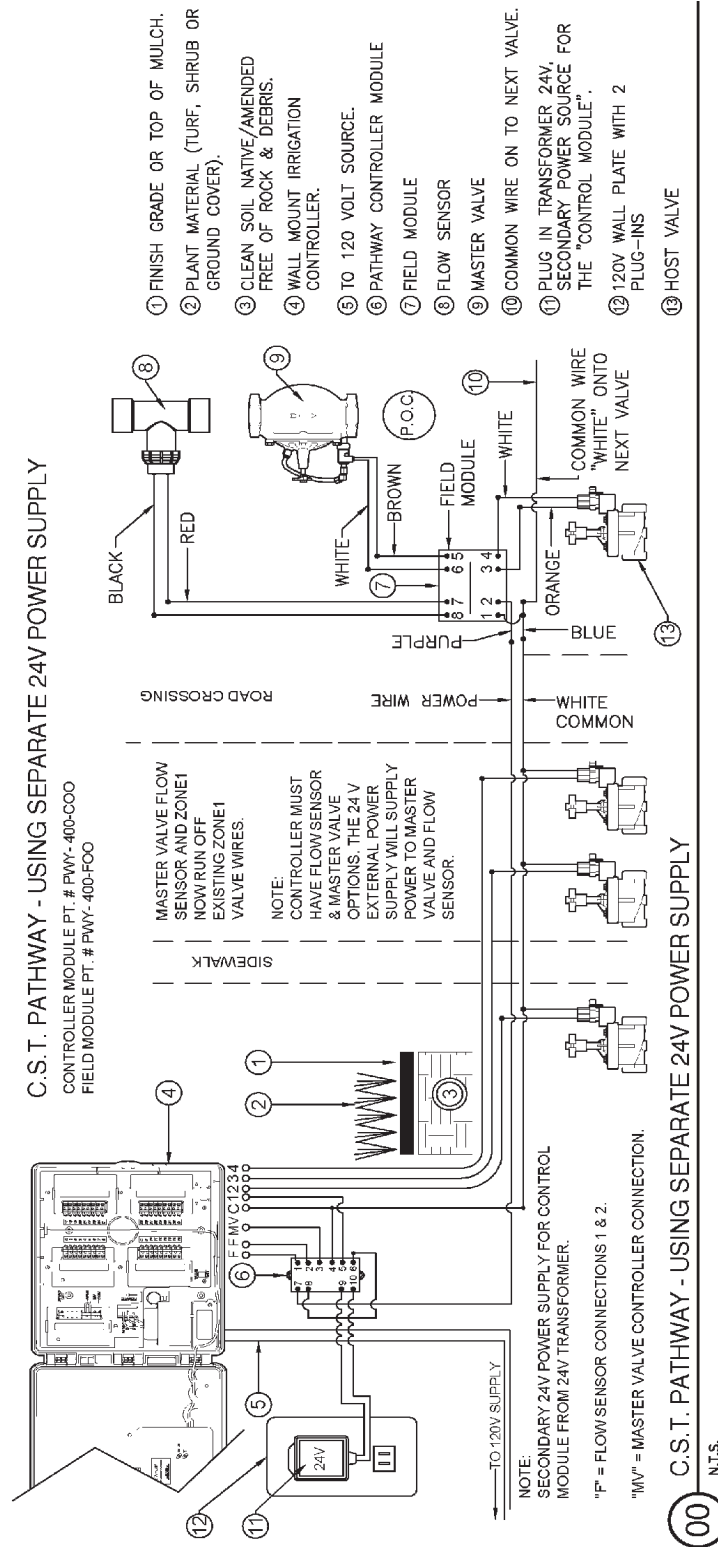
New CST Flow Sensor



New Master Valve (NO)



Pathway FM Module installed at
“Host” Zone Valve





**Wire Connections
For Detail Drawing**

Field Module (FM) Connections	
No.	Wire Color
1	Blue
2	Purple
3	Orange
4	White
5	Brown
6	White
7	Red
8	Black
Controller Module (CM) Connections	
No.	Terminals
1	SENSOR -
2	SENSOR+
3	MASTER VALVE L
4	MASTER VALVE C
5	ZONE VALVE L
6	ZONE VALVE C
7	NETWORK L
8	NETWORK C
9	POWER C
10	POWER L

Connect To...

- Valve "common" wire lead from controller
- Host zone valve "power" wire lead from controller
- Host valve solenoid wire lead
- Host valve solenoid wire lead
- Master valve solenoid wire lead
- Master valve solenoid wire lead
- Flow Sensor "Red" wire lead (+)
- Flow Sensor "Black" wire lead (-)

Connect To...

- Flow Sensor (-) terminal or wire lead of irrigation controller
- Flow Sensor (+) terminal or wire lead of irrigation controller
- Master valve terminal of irrigation controller
- Irrigation controller's "Common" wire terminal with field common wires connected
- "Host" zone valve terminal of irrigation controller only
- Connect with jumper wire to Network "C" terminal of this module
- Power wire to the host valve disconnected from the corresponding controller zone valve terminal
- Connect with jumper wire to zone valve "C" terminal of this module
- 24 VAC power separate power supply C
- 24 VAC power from separate power supply L

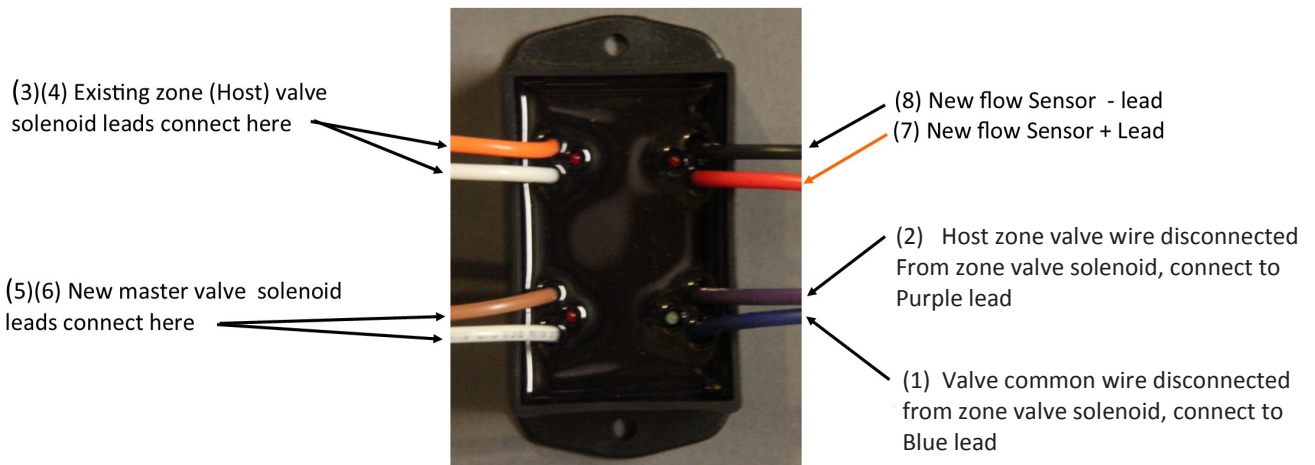
Step 3. Install Field Module

A. The Pathway Field Module (FM) is intended for outdoor installation in a valve box. Make all splices to wire leads with watertight splice kits included. The Field module may be mounted to the inside cover or wall of the valve box using enclosed fasteners through the mounting tabs on the ends of the enclosure. Locate the FM where the LEDs will be visible during start-up or troubleshooting.



B. Wire Connections

- 1) Disconnect the zone valve common wire from the valve solenoid and connect the wire to the BLUE NETWORK lead of the FM.
- 2) Disconnect the zone valve power wire from the valve solenoid and connect it to the PURPLE NETWORK lead of the FM.
- 3) Connect one solenoid lead to the ORANGE ZONE VALVE lead of the FM.
- 4) Connect the other solenoid lead to the WHITE ZONE VALVE lead of the FM.
- 5) Connect one lead from the master valve to the BROWN MASTER VALVE lead of the FM.
- 6) Connect the other lead from the master valve to the WHITE MASTER VALVE lead of the FM.
- 7) Connect the + RED lead from the flow sensor to the RED(+) FLOW SENSOR lead of the FM.



Step 4. Install Controller Module using separate 24 VAC power supply

- A. The Pathway Controller Module (CM) is intended for installation in protected locations.
- 1) Install the module indoors adjacent to the irrigation controller.
 - 2) If the irrigation controller is mounted outdoors, install the Controller Module (CM) inside the controller enclosure, pedestal or use the NEMA 4 rated Pathway enclosure, CST part number PWY-400-ENC.
- B. Mount the CM in a vertical orientation with the connection terminals on the sides of the enclosure to enhance airflow and minimize internal temperatures.
- 1) Use appropriate fasteners to attach the CM to the wall, panel or enclosure.
 - 2) Leave space on both sides of the device to insert the connecting wires to the screw terminals.

C. Wire Connections

- 1) Connect the Flow sensor - terminal (or lead) of the controller to the Flow sensor - terminal of the CM.
- 2) Connect the Flow sensor + terminal (or lead) of the controller to the Flow sensor + terminal of the CM.
- 3) Connect the Master Valve output terminal of the controller to the Master valve L terminal of the CM.
- 4) Connect the Master Valve common terminal of the controller to the Master Valve C terminal of the CM.

NOTE: The Common Terminal(s) of the controller are often shared between the master valve, pump start circuit and zone valves. If so, connect controller common to the master valve common on the CM. The MV common and ZV common terminals of the CM are connected internally.

- 5) Locate the zone valve terminal on the controller that has been identified in Step 1.A. as the valve location (Host Valve) for the Pathway Field Module (FM). Disconnect the field wire lead from the terminal and connect the controller terminal to the zone valve L terminal of the CM.
- 6) Attach the previously disconnected zone valve lead to the NETWORK L terminal of the CM.
- 7) Add a wire from the NETWORK C terminal of the CM to the Zone valve C terminal of the CM.
- 8) Connect a 24 VAC power supply to the Power terminals of the CM. The power supply must be adequate to operate the zone valve and master valve solenoids with the Pathway circuitry. Power ratings of .75 to 1 amp will cover most applications. If unsure of the solenoid current draw, check with the valve manufacturer.



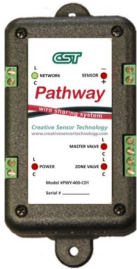
Alternative: Install Controller Module using 24 VAC power from the Irrigation Controller

Some irrigation controllers are equipped with auxiliary 24 VAC output terminals to power accessories.

This may be used to power the Pathway system if:

- the power supply has sufficient power to operate the Pathway circuitry and the zone and master valve solenoids. Nominally .75 to 1 amp.
- The auxiliary power polarity is identified. The auxiliary “common” must be the same as the controller valve commons.

If uncertain, check with the controller manufacturer.

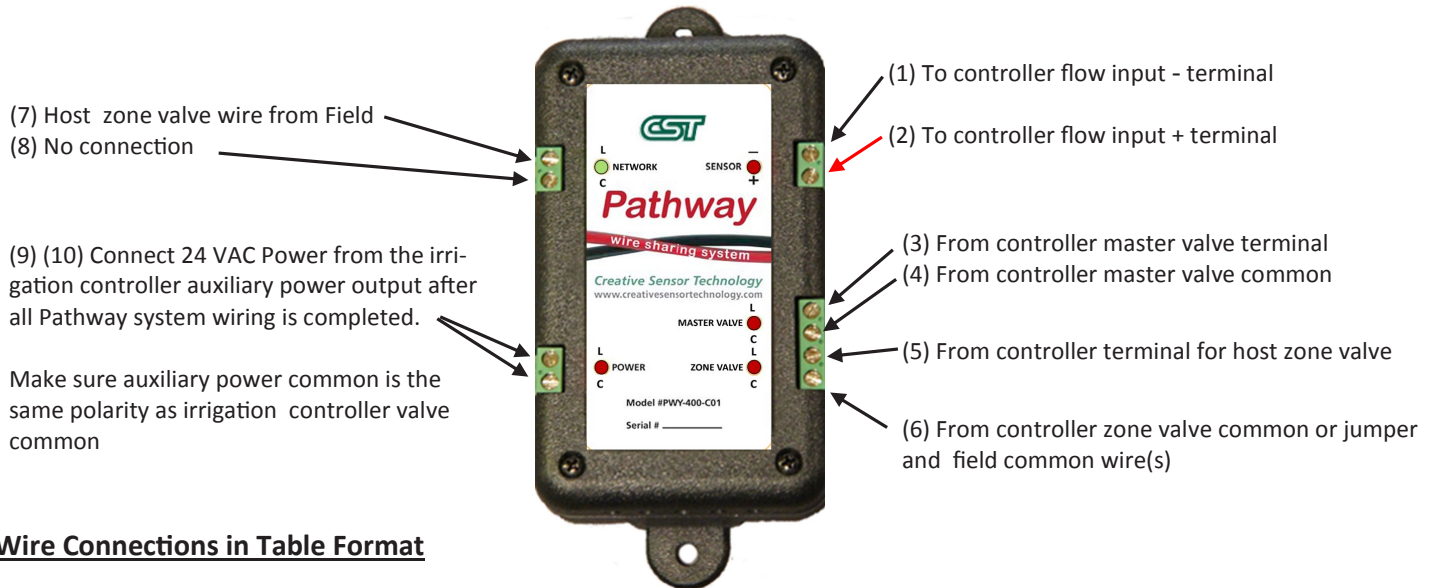


Disconnect power from irrigation controller before proceeding.

- A. The Pathway Controller Module (CM) is intended for installation in protected locations.
 - 1) Install the module indoors adjacent to the irrigation controller.
 - 2) If the irrigation controller is mounted outdoors, install the Controller Module (CM) inside the controller enclosure, pedestal or use the NEMA 4 rated Pathway enclosure, CST part no. PWY-400-ENC.
- B. Mount the CM in a vertical orientation with the connection terminals on the sides of the enclosure to enhance airflow and minimize internal temperatures.
 - 1) Use appropriate fasteners to attach the CM to the wall, panel or enclosure.
 - 2) Leave space on both sides of the device to insert the connecting wires to the screw terminals.
- C. Wire Connections
 - 1) Connect the Flow Sensor - terminal (or lead) of the controller to the Flow Sensor - terminal of the CM.
 - 2) Connect the Flow Sensor + terminal (or lead) of the controller to the Flow Sensor + terminal of the CM.
 - 3) Connect the Master Valve Output terminal of the controller to the Master Valve **L** terminal of the CM.
 - 4) Connect the Master Valve Common terminal of the controller to the Master Valve **C** terminal of the CM.

NOTE: The Common Terminal(s) of the controller are often shared between the master valve, pump start circuit and zone valves. If so, connect controller common to the master valve common on the CM. The MV common and ZV common terminals of the CM are connected internally.

- 5) Locate the Zone Valve terminal on the controller that has been identified in Step 1.A. as the valve location (Host Valve) for the Pathway Field Module (FM). Disconnect the field wire lead from the terminal and connect the controller terminal to the ZONE VALVE **L** terminal of the CM.
- 6) Attach the previously disconnected zone valve lead to the Network **L** terminal of the CM.
- 7) Connect nothing to the Network **C** terminal of the CM.
- 8) Connect 24 VAC power from the irrigation controller to these terminals. Maintain polarity.



Wire Connections in Table Format

Field Module (FM) Connections		
No.	Wire Color	Connect To...
1	Blue	Valve "common" wire lead from controller
2	Purple	Host zone valve "power" wire lead from controller
3	Orange	Host valve solenoid wire lead
4	White	Host valve solenoid wire lead
5	Brown	Master valve solenoid wire lead
6	White	Master valve solenoid wire lead
7	Red	Flow Sensor "Red" wire lead (+)
8	Black	Flow Sensor "Black" wire lead (-)
Controller Module (CM) Connections		
No.	Terminals	Connect To...
1	SENSOR -	Flow Sensor minus (-) terminal of irrigation controller
2	SENSOR +	Flow Sensor plus (+) terminal of irrigation controller
3	MASTER VALVE L	Master valve terminal of irrigation controller
4	MASTER VALVE C	irrigation controller valve common wire terminal with field common wires connected
5	ZONE VALVE L	"Host" zone valve terminal of irrigation controller only
6	ZONE VALVE C	This terminal is internally connected to the Master Valve C terminal
7	NETWORK L	Power wire to the "host" valve disconnected from the corresponding controller zone valve terminal
8	NETWORK C	Not Connected
9	POWER L	24 VAC power from the controller's auxillary power load or "hot" terminal
10	POWER C	24 VAC power from the controller's auxillary power common terminal



Step 5. Power up the system

- A. Restore power to the irrigation controller.
- B. Apply power to the Pathway Controller Module.
 - 1) Observe Controller Module – Power, Network and Sensor LEDs should blink 3 times upon start-up. Then the Red Power LED and the Green Network LED should blink continuously.
 - 2) Observe Field Module– Network and Sensor LEDs should blink 3 times upon start up. Then the Green Network LED should blink continuously.
- C. When flow sensor is operating- RED Flow LED should glow continuously on both modules.
- D. When controller activates Host Zone Valve– Red ZV LED should glow on both modules and zone valve should energize.
- E. When controller activates Master Valve– Red MV LED should glow on both modules and master valve should energize.

Warranty

Creative Sensor Technology, Inc. (The “Seller”) of 125 Paradise Lane, Rochester, MA 02770 warrants to the Original Purchaser (The “Purchaser”) of its products supplied hereunder to be free from significant defects in material and workmanship under normal use and service for a period of 18 months from the date of shipment by the Seller or 12 months from the date of installation by the Purchaser, whichever period shall be shorter (“the Warranty Period”), unless otherwise agreed in writing or provided for in a written product-specific warranty.

This warranty does not apply to products that are the subject of negligence, accident, or damage by circumstances beyond Seller’s control, or any improper operation, maintenance, storage, installation or use. This warranty also does not apply to accessory items that were not manufactured by Seller, all of which are sold “as is” and without warranty by Seller. This warranty does not cover limited life components such as bearings, shafts or impellers where wear rate is a function of application and environment.

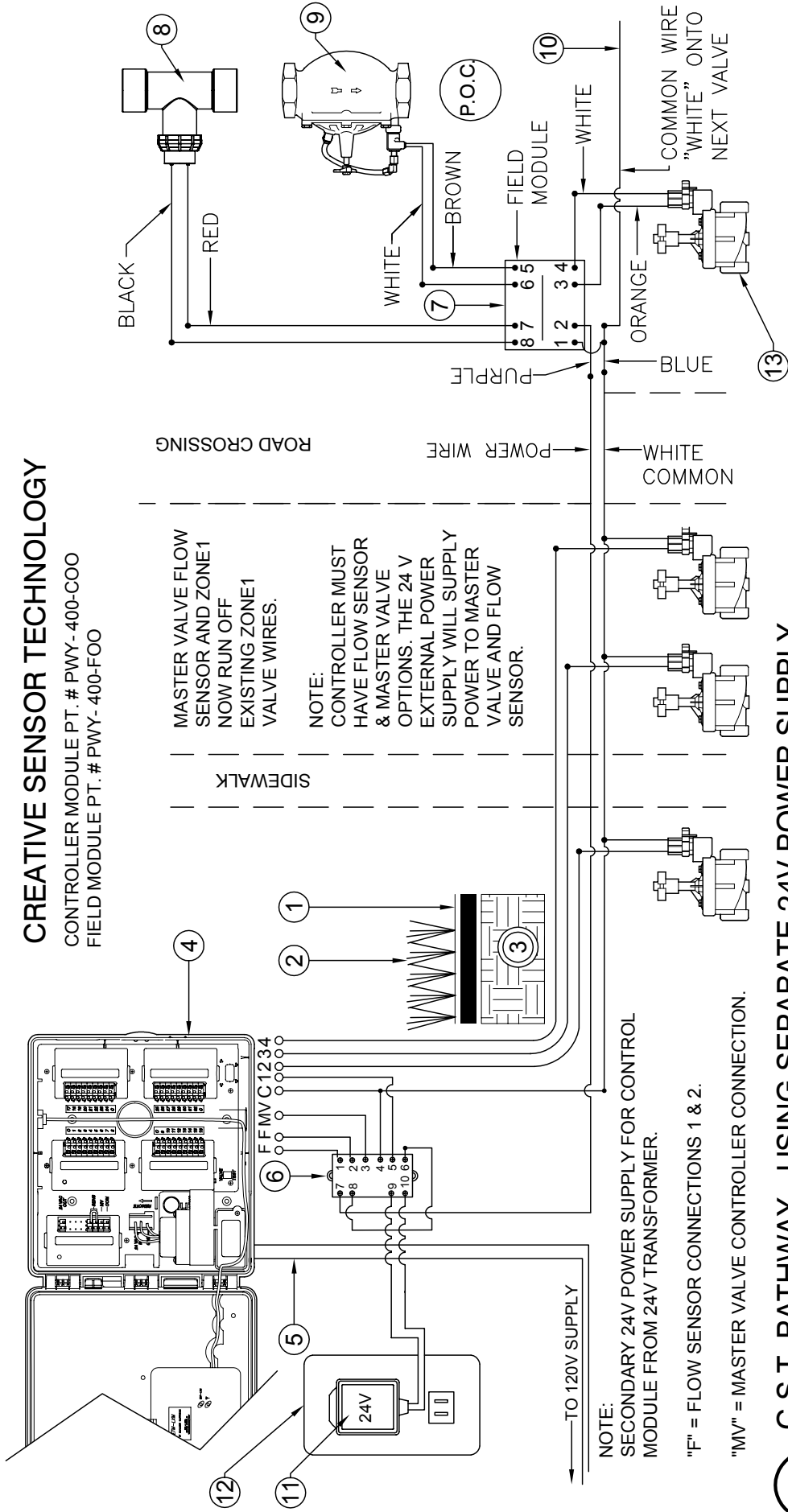
If the Purchaser wishes to make a claim hereunder, he shall send written notice to Seller of any defect within the warranty period. A failure to provide such notice constitutes a waiver of the remedies specified herein. If Seller receives timely notification and if the products are proved to Seller’s satisfaction to have a warranted defect, Seller will, at its own discretion, expense and within a reasonable period of time, either (1) repair, correct or cure the warranted defect(s), or (2) replace the defective product, or (3) give the Purchaser a refund of the price it paid for the product, prorated where appropriate to adjust for the value of any product accepted and retained by the Purchaser.

These remedies shall be the Purchaser’s exclusive remedies (and the sole and exclusive liability of the Seller) for any defects or deficiencies relating to or arising out of product sold by the Seller. The foregoing limited warranty is exclusive and is in lieu of all other warranties, expressed, implied or arising by law, custom or conduct, including but not limited to the implied warranties of merchantability and fitness for a particular purpose, which are expressly disclaimed.

CREATIVE SENSOR TECHNOLOGY

CONTROLLER MODULE PT. # PWY-400-COO

FIELD MODULE PT. # PWY-400-FOO



MASTER VALVE FLOW SENSOR AND ZONE1 NOW RUN OFF EXISTING ZONE1 VALVE WIRES.

NOTE: CONTROLLER MUST HAVE FLOW SENSOR & MASTER VALVE OPTIONS. THE 24 V SUPPLY WILL SUPPLY POWER TO MASTER VALVE AND FLOW SENSOR.

NOTE: SECONDARY 24V POWER SUPPLY FOR CONTROL MODULE FROM 24V TRANSFORMER.

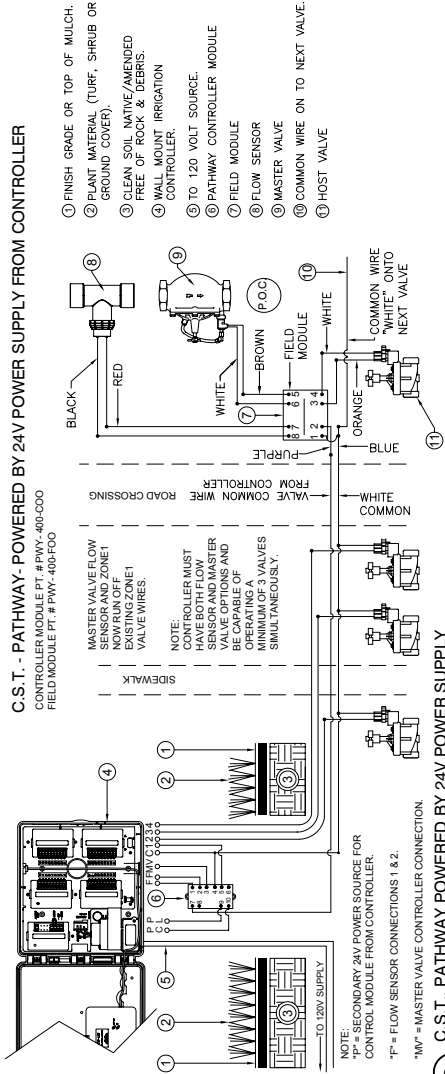
"F" = FLOW SENSOR CONNECTIONS 1 & 2.

"MV" = MASTER VALVE CONTROLLER CONNECTION.

C.S.T. PATHWAY - USING SEPARATE 24V POWER SUPPLY

C.S.T. - PATHWAY- POWERED BY 24V POWER SUPPLY FROM CONTROLLER

CONTROLLER MODULE PT. # PWY-400-COO
FIELD MODULE PT. # PWY-400-FOO



NOTE:
"P" = SECONDARY 24V POWER SOURCE FOR CONTROL MODULE FROM CONTROLLER.
"F" = FLOW SENSOR CONNECTIONS 1 & 2.
"M" = MASTER VALVE CONTROLLER CONNECTION.

C.S.T. - PATHWAY POWERED BY 24V POWER SUPPLY

N.T.S.

FIELD MODULE CONNECTIONS	
1	BLUE VALVE COMMON WIRE LEAD FROM CONTROLLER
2	PURPLE HOST ZONE VALVE POWER WIRE LEAD FROM CONTROLLER
3	ORANGE HOST VALVE SOLENOID WIRE LEAD
4	WHITE HOST VALVE SOLENOID WIRE LEAD
5	BROWN MASTER VALVE SOLENOID WIRE LEAD
6	WHITE MASTER VALVE SOLENOID WIRE LEAD
7	RED FLOW SENSOR "RED" WIRE LEAD (+)
8	BLACK FLOW SENSOR "RED" WIRE LEAD (-)
CONTROLLER MODULE (CM) CONNECTIONS	
1	SENSOR - FLOW SENSOR PLUS (+) TERMINAL OF IRRIGATION CONTROLLER
2	SENSOR + FLOW SENSOR MINUS (-) TERMINAL OF IRRIGATION CONTROLLER
3	MASTER VALVE "L" MASTER VALVE TERMINAL OF IRRIGATION CONTROLLER
4	MASTER VALVE "C" IRRIGATION CONTROLLER "COMMON" WIRE TERMINAL WITH FIELD COMMON WIRES CONNECTED
5	ZONE VALVE "L" "HOST" ZONE VALVE TERMINAL OF IRRIGATION CONTROLLER ONLY
6	ZONE VALVE "C" NO CONNECTION. THIS TERMINAL IS INTERNALLY CONNECTED TO THE MASTER VALVE "C" TERMINAL.
7	NETWORK "L" POWER WIRE TO THE HOST VALVE DISCONNECTED FROM THE CORRESPONDING CONTROLLER ZONE VALVE TERMINAL
8	NETWORK "C" NOT CONNECTED
9	POWER "L" 24 VAC POWER FROM THE CONTROLLER'S AUXILIARY POWER LOAD OR "HOT" TERMINAL
10	POWER "C" 24 VAC POWER FROM THE CONTROLLER'S AUXILIARY POWER COMMON TERMINAL