# Two-wire leg connections and rules

General Knowledge · https://husqvarna-water.com/knowledgebase/two-wire-leg-connections-and-rules/

- The output of the HSC wire paths is 24VAC, 50/60 Hz. Voltage is only present on the legs when stations are active.
- There is no polarity on the Hydro-Rain decoder system. Use direct burial-rated irrigation wire.
- The size of the wire determines the effective distance of the two-wire path.
- See the wiring table for distance specifications with various wire sizes.
- Use irrigation-grade wire connectors for all splices. While Hydro-Rain recommends using 3M DBR/Y-6 electrical connectors, the wire connections can be the same type used for traditional solenoid connections.

| American Wire Gauge | Distance (Feet) | International Wire ($mm^2$) | Distance (meters) |
|---|---|---|---|
| AWG 18 | 908 | 0.75 $mm^2$ | 267 |
| | | 1 $mm^2$ | 333 |
| AWG 16 | 1446 | 1.5 $mm^2$ | 500 |
| AWG 14 | 2292 | 2.5 $mm^2$ | 833 |
| AWG 12 | 3650 | 4 $mm^2$ | 1333 |

**NOTE:** Distances in the table are calculated based on 60 Hz for American Wire Gauge and 50 Hz for International, with a wire temperature of 122°F (50°C) and a 10% safety factor.

## CONVERTING EXISTING WIRING

While not recommended, it is possible to convert an existing conventionally wired system to the Hydro-Rain decoder operation by using existing wire bundles to create a two-wire path to each valve location and adding a decoder at each valve.

## TEE-SPLICING THE TWO-WIRE PATHS

Tee-splicing the two-wire path is permissible. Use 3M DBR/Y-6 electrical or waterproof wire connectors in a valve box with adequate slack at the splices to ensure a reliable connection. Hydro-Rain recommends providing approximately 6 feet or 2 meters of slack. Size the wire for the most distant decoder from the controller.

## EARTH GROUNDING

The installer's responsibility is to connect all electronic irrigation equipment for which he is responsible to earth ground in accordance with Article 250 of the National Electrical Code (NEC.)

Earth grounding is required at the controller but not in the two-wire path. However, you may add earth grounding in high-lightning areas for additional protection. We recommend following the earth grounding specifications provided by Paige Electrical. They can be viewed here.

The HSC controller should be grounded to earth using the ground attachment inside the HSC to an approved earth ground installation. Ideally, resulting in a resistance of 10 ohms or less.

*Disclaimer: Hydro-Rain has made every effort to ensure that the information and recommendations contained within are correct. However, neither Hydro-Rain nor its employees warrant nor accept any liability for using this information. You should always follow national and local electrical codes. Wiring, grounding, shielding, and bonding irrigation system components often require competent engineering judgment on a case-by-case basis. You should seek competent engineering assistance from firms specializing in this field.*