Technical Bulletin

Bulletin No. **009 Rev B**
Subject: **Wire Gauge versus Maximum Length for Valve Wire**

Product Applicability: **All Controllers**
Engineering Release: **R. A. Olson**
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When selecting the wire size for wiring between controller and valves, the distance should be taken into account. The following guidelines are based on a 10 percent loss of voltage with a six watt solenoid. If multiple stations are ON at the same time, the common wire should be upgraded to the next size if the common length exceeds half of the maximum shown.

Length	Wire size
2000 feet	14 AWG
3000 feet	12 AWG
5000 feet	10 AWG

3910-B Royal Avenue
Simi Valley, CA 93063
Tel: (805) 527-4498
Fax: (805) 527-2813

Wire Guage vs. Voltage Loss Table

Wire Guage (AWG)	Length (Feet)	Resistance (Ohms)	Voltage Loss / Voltage Available (AC) One Load = 24 VAC, 96 Ohms, 250 mA				
			One Load	Two Loads	Three Loads	Four Loads	Five Loads
10	1000	0.9988	250 mV / 23.8 V	500 mV / 23.5 V	750 mV / 23.3 V	1.0 V / 23.0 V	1.2 V / 22.8 V
	2500	2.497	625 mV / 23.4 V	1.2 V / 22.8 V	1.9 V / 22.1 V	2.5 V / 21.5 V	3.1 V / 20.9 V
	5000	4.994	1.2 V / 22.8 V	2.5 V / 21.5 V	3.7 V / 20.3 V	5.0 V / 19.0 V	6.2 V / 17.8 V
12	1000	1.59	398 mV / 23.6 Vdc	795 mV / 23.2 V	1.2 V / 22.8 V	1.6 V / 22.4 V	2.0 V / 22.0 V
	2500	3.975	994 mV / 23.0 V	2.0 V / 22.0 V	3.0 V / 21.0 V	4.0 V / 20.0 V	5.0 V / 19.0 V
	5000	7.95	2.0 V / 22.0 V	4.0 V / 20.0 V	6.0 V / 18.0 V	8.0 V / 16.0 V	10.0 V / 14.0 V
14	1000	2.52	630 mV / 23.4 V	1.3 V / 22.7 V	1.9 V / 22.1 V	2.5 V / 21.5 V	3.2 V / 20.8 V
	2500	6.3	1.6 V / 22.4 V	3.2 V / 20.8 V	4.7 V / 19.3 V	6.3 V / 17.7 V	7.9 V / 16.1 V
	5000	12.6	3.2 V / 20.8 V	6.3 V / 17.7 V	9.5 V / 14.5 V	12.6 V / 11.4 V	15.8 V / 8.2 V

End of Bulletin