

## 24 VAC Solenoid Valves Wire Sizing – 50Hz

9.8 VA Valves (EZ) with 26.5 Volt Transformers - Equivalent Feet of Circuit								
80 psi (5.5 bar) Water Pressure at Valve								
Common Wire Size	Control Wire Size		14 ●	12 ●	10 ●	8 ●	6 ●	4 ●
	18 ●	16 ●						
18	3700							
16	4600	6000						
14	5400	7400	9600					
12	6000	8600	11800	15200				
10	6500	9600	13700	18700	24200			
8	6900	10400	15400	21800	29700	38500		
6	7100	10900	16600	24300	34600	47100	60600	
4	7300	11300	17500	26300	38800	55100	74600	97000
100 psi (6.9 bar) Water Pressure at Valve								
Common Wire Size	Control Wire Size		14 ●	12 ●	10 ●	8 ●	6 ●	4 ●
	18 ●	16 ●						
18	3200							
16	4000	5200						
14	4700	6400	8300					
12	5200	7400	10200	13200				
10	5600	8300	11900	16200	20900			
8	5900	9000	13300	18900	25700	33300		
6	6100	9500	14300	21100	29900	40700	52400	
4	6300	9800	15100	22800	33500	47700	64600	83900
125 psi (8.6 bar) Water Pressure at Valve								
Common Wire Size	Control Wire Size		14 ●	12 ●	10 ●	8 ●	6 ●	4 ●
	18 ●	16 ●						
18	2900							
16	3500	4600						
14	4100	5700	7400					
12	4600	6600	9000	11700				
10	5000	7400	10500	14400	18600			
8	5300	8000	11800	16800	22800	29600		
6	5400	8400	12700	18700	26600	36200	46600	
4	5600	8700	13400	20200	29800	42300	57300	74600
150 psi (10.4 bar) Water Pressure at Valve								
Common Wire Size	Control Wire Size		14 ●	12 ●	10 ●	8 ●	6 ●	4 ●
	18 ●	16 ●						
18	2600							
16	3200	4100						
14	3700	5000	6600					
12	4100	5900	8100	10400				
10	4500	6600	9400	12800	16600			
8	4700	7100	10500	15000	20400	26400		
6	4900	7500	11400	16700	23800	32300	41600	
4	5000	7800	12000	18100	26600	37800	51300	66600
200 psi (13.8 bar) Water Pressure at Valve								
Common Wire Size	Control Wire Size		14 ●	12 ●	10 ●	8 ●	6 ●	4 ●
	18 ●	16 ●						
18	2400							
16	2900	3800						
14	3400	4700	6100					
12	3800	5500	7500	9700				
10	4100	6100	8800	11900	15500			
8	4400	6600	9800	13900	19000	24600		
6	4500	7000	10600	15500	22100	30100	38700	
4	4600	7200	11100	16800	24800	35200	47700	62000

## Commercial Valve Wire Sizing Procedure

### Step 1

Determine actual distance, along wire run, from controller out to the first valve on a circuit and between each succeeding valve on a multiple valve circuit. Example: (Two watt solenoid, 26.5 volt transformer, 50Hz, at 150 psi water pressure at valves.)

### Step 2

Calculate the equivalent circuit length for each valve circuit on the controller. (See chart to left)

### Step 3

Selecting Common Wire Size: Using the longest equivalent length calculated above, go to the appropriate valve chart and select a common wire and a control wire that are as close to the same size as possible (the common wire size should always be equal to or one size larger than the control wire size.) In the example above, the circuit for station #3 has the longest equivalent length, 7000 feet. In the chart (for this example use the chart for 150 psi water pressure at the valve and a 26.5 volt transformer) select a wire size combination of size 14 and 12 wire. Select common wire as size 12 wire. Since one common wire shall be used for all valves on the controller, you have now established the common wire size for that controller as size 12 wire.

### Step 4

Sizing Circuit Control Wires: Reading only from the row for the common wire size selected in Step 3 (size 12), proceed to select each control wire size from the chart using the calculated equivalent length for each circuit.

### EXAMPLE:

**Station #1:** Equiv. Length = 1 valve x 2000 ft. = 2000 ft. select size 18 control wire

**Station #2:** Equiv. Length = (1 valve x 1000 ft.) + (2 valves x 2000 ft.) = 5000 ft. select size 16 control wire

**Station #3:** Equiv. Length = (1 valve x 500 ft.) + (2 valves x 1000 ft.) + (3 valves x 1500 ft.) = 7000 ft. select size 14 control wire

## 24 VAC Solenoid Valves Wire Sizing – 60Hz

### 9.8 VA Valves (EZ) with 26.5 Volt Transformers - Equivalent Feet of Circuit

#### 80 psi (5.5 bar) Water Pressure at Valve

Common Wire Size	Control Wire Size		14 ●	12 ●	10 ●	8 ●	6 ●	4 ●
	18 ●	16 ●						
18	3200							
16	4000	5200						
14	4700	6400	8300					
12	5200	7500	10200	13200				
10	5700	8300	11900	16200	21000			
8	6000	9000	13300	18900	25800	33400		
6	6200	9500	14400	21100	30100	40900	52600	
4	6300	9800	15200	22900	33700	47800	64800	84200

#### 100 psi (6.9 bar) Water Pressure at Valve

Common Wire Size	Control Wire Size		14 ●	12 ●	10 ●	8 ●	6 ●	4 ●
	18 ●	16 ●						
18	2900							
16	3500	4600						
14	4100	5600	7300					
12	4600	6600	9000	11700				
10	5000	7400	10500	14300	18600			
8	5300	8000	11800	16700	22800	29500		
6	5400	8400	12700	18700	26500	36100	46500	
4	5600	8700	13400	20200	29700	42200	57200	74400

#### 125 psi (8.6 bar) Water Pressure at Valve

Common Wire Size	Control Wire Size		14 ●	12 ●	10 ●	8 ●	6 ●	4 ●
	18 ●	16 ●						
18	2400							
16	3000	3900						
14	3500	4800	6300					
12	3900	5600	7700	9900				
10	4300	6300	9000	12200	15800			
8	4500	6800	10000	14300	19400	25200		
6	4600	7100	10800	15900	22700	30800	39700	
4	4700	7400	11400	17200	25400	36100	48800	63500

#### 150 psi (10.4 bar) Water Pressure at Valve

Common Wire Size	Control Wire Size		14 ●	12 ●	10 ●	8 ●	6 ●	4 ●
	18 ●	16 ●						
18	2200							
16	2700	3500						
14	3100	4300	5600					
12	3500	5000	6800	8800				
10	3800	5600	8000	10900	14100			
8	4000	6000	8900	12700	17300	22400		
6	4100	6300	9600	14100	20100	27400	35300	
4	4200	6600	10200	15300	22600	32100	43400	56500

#### 200 psi (13.8 bar) Water Pressure at Valve

Common Wire Size	Control Wire Size		14 ●	12 ●	10 ●	8 ●	6 ●	4 ●
	18 ●	16 ●						
18	1800							
16	2300	2900						
14	2600	3600	4700					
12	3000	4200	5800	7500				
10	3200	4700	6800	9200	12000			
8	3400	5100	7600	10800	14700	19000		
6	3500	5400	8200	12000	17100	23300	30000	
4	3600	5600	8600	13000	19200	27300	36900	48000

## Commercial Valve Wire Sizing Procedure

### Step 1

Determine actual distance, along wire run, from controller out to the first valve on a circuit and between each succeeding valve on a multiple valve circuit. Example: (Two watt solenoid, 26.5 volt transformer, 60Hz, at 150 psi water pressure at valves.)

### Step 2

Calculate the equivalent circuit length for each valve circuit on the controller. (See chart to left)

### Step 3

Selecting Common Wire Size: Using the longest equivalent length calculated above, go to the appropriate valve chart and select a common wire and a control wire that are as close to the same size as possible (the common wire size should always be equal to or one size larger than the control wire size.) In the example below, the circuit for station #3 has the longest equivalent length, 7000 feet. In the chart (for this example use the chart for 150 psi water pressure at the valve and a 26.5 volt transformer) select a size 12 wire for both common and control wire. Since one common wire shall be used for all valves on the controller, you have now established the common wire size for that controller as size 12 wire.

### Step 4

Sizing Circuit Control Wires: Reading only from the row for the common wire size selected in Step 3 (size 12), proceed to select each control wire size from the chart using the calculated equivalent length for each circuit.

### EXAMPLE:

**Station #1:** Equiv. Length = 1 valve x 2000 ft. = 2000 ft. select size 18 control wire

**Station #2:** Equiv. Length = (1 valve x 1000 ft.) + (2 valves x 2000 ft.) = 5000 ft. select size 16 control wire

**Station #3:** Equiv. Length = (1 valve x 500 ft.) + (2 valves x 1000 ft.) + (3 valves x 1500 ft.) = 7000 ft. select size 12 control wire