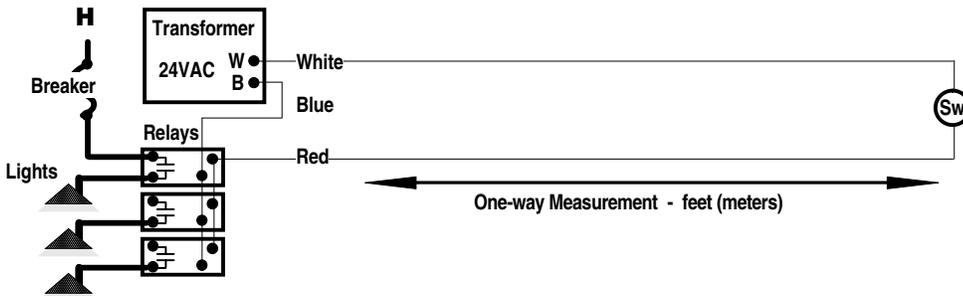


	PART No.	DESCRIPTION	SPECIFICATION	
		The transformer supplies the switching for Douglas 2-wire relay control. 2-wire relays are latching type and only require power to switch on or off. One transformer is sufficient to service many relays and devices.	<p><b>Input</b></p> <ul style="list-style-type: none"> <li>• Line voltage 120,240,277 or 347V. Select correct model for line voltage.</li> </ul> <p><b>Output</b></p> <ul style="list-style-type: none"> <li>• 24VAC at full load. At no or low loads, the voltage is 29V. As the current draw increases, the transformer voltage decreases. A fully loaded class 2 transformer will output 24V.</li> </ul> <ul style="list-style-type: none"> <li>• Douglas products are designed to operate correctly over the entire range of voltages provided by the transformer.</li> </ul> <p><b>Class 2 - Current Limiting</b></p> <ul style="list-style-type: none"> <li>• Transformers that are approved for powering Class 2 circuits are current limited to prevent excessive currents caused by shorts. This is a key safety feature to help prevent fires from shorts.</li> </ul> <ul style="list-style-type: none"> <li>• The Class 2 current limiting feature permits the use of wire that is of a light gauge and has less stringent insulation requirements.</li> </ul>	
	<p><b>WR-4075 Series: Standard Duty</b></p> <ul style="list-style-type: none"> <li>• 40VA steady draw, 75VA pulsed draw.</li> <li>• Current limiting and internally fused with an automatically resetting thermal fuse.</li> </ul>			
	<p><b>WR-4075-120/277</b></p>	120/277V Primary : 24VAC* Secondary		
	<p><b>WR-4075-120/347</b></p>	120/347V Primary : 24VAC* Secondary		
	<p><b>WR-4075-240</b></p>	240V Primary : 24VAC* Secondary		
		* Secondary voltage varies from 24V to 29V depending upon load.		
	<p><b>WR-4040 Series: Light Duty</b></p> <ul style="list-style-type: none"> <li>• 40VA steady draw, 40VA pulsed draw.</li> <li>• Current limiting and internally fused with a one time event fuse.</li> </ul>			
<p><b>WR-4040-120</b></p>	120V Primary : 24VAC Secondary			

**CONNECTIONS**



**WIRE DISTANCE CHART - 18Ga Wire**

Number of Relays per Switch		Wire Length One way measure in feet (meters)	Wire Gauge American Wire Gauge
1.5A & 3.0A rated switches (WR-8001, WR-8501, WR-8503)	1	2000 (600)	18 AWG
	2	1500 (450)	18 AWG
	3	1000 (300)	18 AWG
	4	500 (150)	18 AWG
3.0 A rated switches (WR-8001, WRK-8201)	6	300 (90)	18 AWG
	8	160 (50)	18 AWG

**Environment**

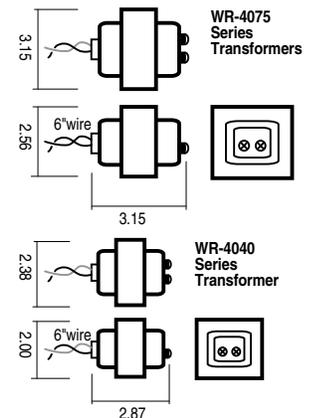
- Indoors, stationary, non-vibrating, non-corrosive atmosphere and non-condensing humidity.
- Ambient temperature: -20°F to +120°F (-28°C to +50°C)

**Approvals & Certifications**

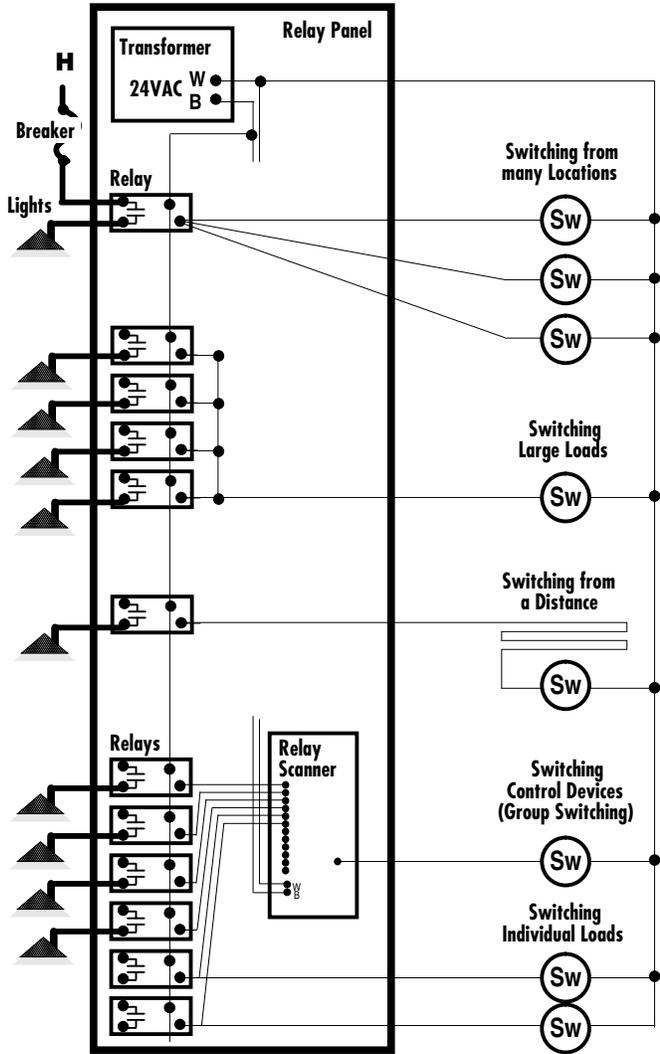
- UL Approved
- CSA Certified

**DIMENSIONS & MOUNTING**

Douglas transformers have a nipple & mounting nut suited for a 7/8" hole (1/2" pipe hole & tread size)



**Relay Panel Schematic**



**TRANSFORMER LOADS**

Douglas relays do not use any power while in the latched on or off state. Power is only used when the relay switches over.

In the vast majority of cases, only 1 transformer per relay panel will be all that is required. Theoretically, there is no limit to the amount of relays that can be switched by 1 transformer.

There are Douglas devices other than relays that do use low amounts of steady state power. For example, the LEDs of the LED style switches use power. Relay scanners, time clocks, and other electronic devices also use power. If a large number of these devices are powered by one transformer, do a "LOADING CALCULATION" to ensure that there is no overload. In the rare case there is an overload, split the circuits and use more than 1 transformer.

**LOADING CALCULATIONS**

If a large number of devices are being connected to a transformer, check to ensure that the transformer loading is correct. The example shown below illustrates the method of calculation.

EXAMPLE: A system has the following components.

- 100 LED switches
- 48 2-wire relays
- 2 Relay scanners
- 1 Photocell controller

Check how many relays can be switched at one time.

A) Calculate the maximum number of relays that can be switched at one time ignoring wiring distance:

$$\begin{array}{l}
 \text{1) Total the steady state current requirement} \\
 \text{Led Switches } 100 \times 4\text{mA} = 400\text{mA} \\
 \text{Relays } 48 \times 0\text{mA} = 0\text{mA} \\
 \text{Relay Scanners } 2 \times 100\text{mA} = 200\text{mA} \\
 \text{Photocell Controller } 1 \times 100\text{mA} = \underline{100\text{mA}} \\
 \hline
 700\text{mA}
 \end{array}$$

2) Check that the steady state current requirement does not exceed 1.6 Amperes. In the rare cases that the steady state current exceeds 1.6 A, extra transformers will have to be added and circuitry will have to be split.

For this example, the steady state current is 700mA which is less than 1.6 amperes (1600mA).

3) Subtract the steady state current from the total momentary current available to obtain the amount of current available for switching relays.

Total current available from a WR-4075 series transformer for a momentary switching pulse is 3000mA (75VA).

For this example, the current available for switching relays is 2300mA (3000 - 700).

4) Divide the total available relay current by the current draw of a relay (350mA) to obtain the maximum number of relays that can be switched at one time.

$$2300 \div 350 = 6.57 - \text{Round the answer down to 6 relays.}$$

B) The maximum number of relays that can be switched at one time is either the value obtained by the above calculation or the value determined by the maximum wiring distance allowed - WHICHEVER IS LESS.

If the wire distance is 600 feet and the wire gauge is #18 AWG, then the limit is 4 relays, not 6 relays (see wire distance chart).

**Transformer Loading Diagram**

Steady loads are deducted from current limit to determine momentary current available relay switching.

