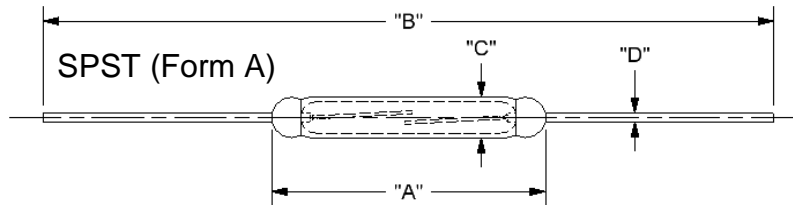
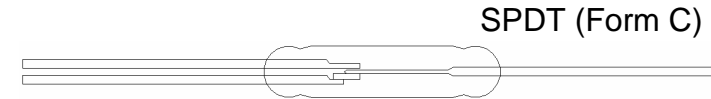


# HAMLIN®

## Application Note AN110A



### Switch Selector Guide



| Switch Name | Key Features                     | Contact Form | Switching Power Max [W] | Switching Voltage Max [Volt] (Note 1) | Switching Current Max [Ampere] (Note 2) | Standard Sensitivity (Pull-In) Range [AT] | "A" Glass Body Length Max [mm[inch]] | "B" Overall Length (Wires) [mm[inch]] | "C" Glass Body Diameter Max [mm[inch]] | "D" Wire Diameter Nominal [mm[inch]] |
|-------------|----------------------------------|--------------|-------------------------|---------------------------------------|---|---|--------------------------------------|---------------------------------------|--|--------------------------------------|
| MITI-3V1    | Ultra Small (7mm glass body)     | A (SPST)     | 10 W                    | 170 Vdc                               | 0.5 Adc                                 | 6-15                                      | 7.00 [.276]                          | 46.00 [1.810]                         | 1.80 [.071]                            | 0.38 [.015]                          |
| MDSR-10     | Very Small (10mm glass body)     | A (SPST)     | 10 W                    | 200 Vdc                               | 0.5 Adc                                 | 10-25                                     | 10.16 [.400]                         | 40.38 [1.590]                         | 1.80 [.071]                            | 0.43 [.017]                          |
| MDSR-7      | Small (12.7mm glass body)        | A (SPST)     | 10 W                    | 200 Vdc                               | 0.5 Adc                                 | 10-25                                     | 12.70 [.500]                         | 40.38 [1.590]                         | 1.80 [.071]                            | 0.47 [.019]                          |
| FLEX-14     | Flexible Leads (14mm glass body) | A (SPST)     | 10 W                    | 200 Vdc                               | 0.5 Adc                                 | 10-30                                     | 14.00 [.551]                         | 44.30 [1.744]                         | 2.28 [.090]                            | 0.47 [.019]                          |
| MDCG-4      | General Purpose Switch           | A (SPST)     | 10 W                    | 200 Vdc                               | 0.5 Adc                                 | 12-38                                     | 15.24 [.600]                         | 40.38 [1.590]                         | 2.28 [.090]                            | 0.50 [.020]                          |
| MDRR-6      | 240 VAC switching                | A (SPST)     | 10 W                    | 265 Vac                               | 0.35 Aac                                | 17-38                                     | 15.24 [.600]                         | 40.38 [1.590]                         | 2.28 [.090]                            | 0.50 [.020]                          |
| MLRR-4      | Small Hysteresis (Differential)  | A (SPST)     | 20 W                    | 200 Vdc                               | 1.0 Adc                                 | 17-38                                     | 15.24 [.600]                         | 40.38 [1.590]                         | 2.54 [.100]                            | 0.61 [.024]                          |
| MLRR-3      | Long Leads, Switching Load/Life  | A (SPST)     | 20 W                    | 200 Vdc                               | 1.0 Adc                                 | 17-38                                     | 15.24 [.600]                         | 56.64 [2.230]                         | 2.54 [.100]                            | 0.61 [.024]                          |
| MARR-5      | Very High Voltage                | A (SPST)     | 10 W                    | 1000 Vdc                              | 0.5 Adc                                 | 17-38                                     | 19.69 [.775]                         | 56.77 [2.235]                         | 2.66 [.105]                            | 0.55 [.022]                          |
| MRPR-1      | Wide Hysteresis (Differential)   | A (SPST)     | 50 W                    | 200 Vdc                               | 1.0 Adc                                 | 22-43                                     | 19.69 [.775]                         | 56.64 [2.230]                         | 2.84 [.112]                            | 0.63 [.025]                          |
| MRPR-3      | High Power                       | A (SPST)     | 50 W                    | 200 Vdc                               | 1.5 Adc                                 | 22-43                                     | 19.69 [.775]                         | 56.64 [2.230]                         | 2.84 [.112]                            | 0.63 [.025]                          |
| MRPR-8      | 240 VAC switching, High Power    | A (SPST)     | 50 W                    | 265 Vac                               | 0.7 Aac                                 | 22-43                                     | 20.32 [.800]                         | 56.64 [2.230]                         | 2.84 [.112]                            | 0.63 [.025]                          |
| DRR-129     | Big, High Power                  | A (SPST)     | 100 W                   | 400 Vdc                               | 3.0 Adc                                 | 42-83                                     | 50.80 [2.000]                        | 82.55 [3.250]                         | 5.25 [.207]                            | Flattened                            |
| MDRR-DT     | Small Form C (SPDT)              | C (SPDT)     | 5 W                     | 175 Vdc                               | 0.25 Adc                                | 15-30                                     | 14.73 [.580]                         | 51.66 [2.034]                         | 2.54 [.100]                            | 0.51&0.56 [.020&.022]                |
| DRR-DTH     | Big Power Form C (SPDT)          | C (SPDT)     | 30 W                    | 500 Vdc                               | 0.5 Adc                                 | 50-80                                     | 39.67 [1.562]                        | 85.73 [3.375]                         | 5.33 [.210]                            | 1.02&1.27 [.040&.050]                |
| DRT-DTH     | Big High Power Form C (SPDT)     | C (SPDT)     | 50 W                    | 500 Vdc                               | 1.5 Adc                                 | 50-80                                     | 39.67 [1.562]                        | 85.73 [3.375]                         | 5.33 [.210]                            | 1.02&1.27 [.040&.050]                |

#### NOTES:

1. AC voltage rating is .707 times DC rating except MDRR-6 is 200 Vdc and MRPR-8 is 250 Vdc
2. AC current rating is .707 times DC rating (For MDRR-6 & MRPR-8, DC current rating is 1.414 times AC current rating)



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### **MITI-3V1**

Because of the higher cost, this reed switch is used only when size is an important factor. This switch is also available in surface-mount as the MISM-3V1R (Tape & Reel) and MISM-3V1B (Bulk Pack).

### **MDSR-10**

This is a cost-effective small reed switch. This switch is also available in surface-mount as the MDSM-10R (Tape & Reel), MDSM-10B (Bulk Pack), and the 59170 (overmolded).

### **MDSR-7**

This is a small reed switch, but not as small as the switches above. The glass diameter is the same small size as the switches above. This switch is also available in an overmolded PCB-mount package, including surface-mount, as the 59165 and 59045.

### **FLEX-14**

The leads on the FLEX-14 are easily formed or bent to meet an application's requirements. In addition, the slightly shorter glass length and slightly longer lead length provide greater flexibility in designing into products.

### **MDCG-4**

The MDCG-4 is one of Hamlin's most popular reed switches. It is available in a wide range of sensitivities. It is also available in an overmolded PCB-mount package as the 59050, and surface-mount as the MDSM-4R (Tape & Reel) and MDSM-4B (Bulk Pack).

### **MDRR-6**

The MDRR-6 is physically very similar to the MDCG-4, but it utilizes a pressurized nitrogen atmosphere that allows switching 240 Vac power line mains voltages. The MDRR-6 also has good life on non-suppressed inductive loads as well as less demanding ones. It is available in a wide variety of Hamlin sensor packages including the PCB-Mount 59050.

### **MLRR-4**

The MLRR-4 has the smallest hysteresis between activate and deactivate (close differential). This can be an advantage in some sensing applications, but it can also be a disadvantage in sensing applications where the magnet is moving slowly. The MLRR-4 also performs well switching small incandescent lamps (< 28 V, < 0.2 A). This switch is also available in surface-mount as the MLSM-4R (Tape & Reel) and MLSM-4B (Bulk Pack).

### **MLRR-3**

This reed switch has the longest wire leads of any of the 15.24 mm / 0.600 inch glass length switches. The MLRR-3 is a cost-effective small 20 Watt switch. It has good life on a wide range of loads. It is also available in surface-mount as the MLSM-3R (Tape & Reel) and MLSM-3B (Bulk Pack).



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### **MARR-5**

The MARR-5 has advantages in high voltage and low temperature applications because the electrical contacts are in a vacuum instead of a nitrogen atmosphere. The voltage ratings are 1000 Vdc switching and 2000 Vdc breakdown (see data sheet for additional information). The switch is rated at a rather high 35 AT (Ampere-turn) in order to meet the 1000 Vdc switching voltage at low currents ( $< 10$  mA). If a higher switching current or RC arc suppression is used, a higher switching voltage or lower switch AT value can be realized. Contact Hamlin for recommendations. As the switch AT increases (sensitivity decreases), the contact gap increases, resulting in increased voltage capability. Typical breakdown voltage is 100 times the AT value. In addition, the MARR-5 can be used at temperatures near absolute zero if carefully packaged. For additional information, see Hamlin Application Note AN105 – Extreme Temperature Reed Switch Operation

### **MRPR-1**

Because of its flexible reed and thin contact coating, the MRPR-1 has the largest hysteresis between activate and deactivate (wide differential). The carry current of 3.0 Adc is also quite high.

### **MRPR-3**

The MRPR-3 is very good at switching relatively high power loads up to 50 W, 200 Vdc 140 Vac, 1.5 Adc 1.1 Aac, including inductive loads with or without an inrush current.

### **MRPR-8**

The MRPR-8 utilizes a pressurized nitrogen atmosphere that allows switching 240 Vac power line mains voltages and higher power levels compared to the MDRR-6

### **MDRR-DT**

This is a single-pole double-throw (SPDT) reed switch, also known as a Form C reed switch. The addition of a normally-closed contact to the standard normally-open contact meets the needs of a wide variety of applications. It is not unusual for the normally-closed contact to be the only contact used in an application. However, this capability results in compromises that affect the switching voltage & current, as well as cost.

### **DRR-129**

The DRR-129 has the highest electrical contact ratings of all Hamlin's reed switches. This is because of the large wire diameter and large contact gap. These characteristics also create disadvantages in size, cost, and low magnetic sensitivity. Still, the 100 W, 400 V 3 A switching capability is sometimes needed in applications.

### **DRR-DTH & DRT-DTH**

Like the MDRR-DT, these are single-pole double-throw (SPDT) reed switches. Their large size increases electrical performance but also increases cost. The DRR-DTH uses a contact coating similar to many of Hamlin's reed switches. The DRT-DTH uses a tungsten contact coating that is very good on heavy loads but tends to increase contact resistance when switching light loads such as  $< 0.25$  A,  $< 6$  V.

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