General Specifications

Electrical Capacity (Resistive Load)

For MRA: 250mA @ 125V AC

For MRF or MRK: 0.4VA maximum @ 28V AC/DC maximum

(Applicable Range 0.1mA ~ 0.1A @ 20mV ~ 28V)

Note: Find additional explanation of operating range in Supplement section.

Other Ratings

Contact Resistance: 10 milliohms maximum for MRA; 50 milliohms maximum for MRF & MRK

Insulation Resistance: 100 megohms minimum @ 500V DC

Dielectric Strength: 1,000V AC minimum for 1 minute minimum for MRA

500V AC minimum for 1 minute minimum for MRF & MRK

Mechanical Life: 30,000 operations minimum **Electrical Life:** 10,000 operations minimum

Range of Operating Torque: 0.02 ~ 0.07Nm for MRA; 0.005 ~ 0.02Nm for MRF & MRK

> **Contact Timing:** Nonshorting (break-before-make)

> > MRA - self-cleaning, sliding contact; MRF & MRK - self-cleaning, rotary contactor disk

Indexing: 30°

Materials & Finishes

Shaft: Brass with nickel plating

Stopper Plate: Steel with zinc plating for MRA & MRK; polyamide cover with stopper for MRF

Bushing/Housing: Zinc alloy with zinc plating

Copper with silver plating for MRA; phosphor bronze with gold plating for MRF & MRK **Movable Contacts:** Brass with silver plating for MRA; phosphor bronze with gold plating for MRF & MRK **End Contacts & Terminals:** Brass with silver plating for MRA; phosphor bronze with gold plating for MRF & MRK Common Contacts & Terminals:

> Diallyl phthalate for MRA; fiberglass reinforced polyamide for MRF & MRK Base:

Environmental Data

Operating Temperature Range: -10°C through +70°C (+14°F through +158°F)

90 ~ 95% humidity for 96 hours @ 40°C (104°F) **Humidity:**

Vibration: 10 ~ 55Hz with peak-to-peak amplitude of 1.5mm traversing the frequency range & returning

in 1 minute; 3 right angled directions for 2 hours

Shock: 50G (490m/s²) acceleration (tested in 3 right angled directions, with 3 shocks in each direction)

Sealing: MRK model meets IP67 of IEC60529 standards

Installation

Mounting Torque: .686Nm (6.08 lb•in)

Cap Installation Force: 19.6 ~ 29.4N (4.41 ~ 6.61 lbf) for MRA & MRK

Processing

Soldering Time & Temperature: Wave Soldering for MRA: See Profile A in Supplement section.

> Wave Soldering for MRF & MRK: See Profile B in Supplement section. Manual Soldering for MRA: See Profile A in Supplement section. Manual Soldering for MRF & MRK: See Profile B in Supplement section.

Cleaning: Automated cleaning recommended. Stopper plate, as well as washers for MRA & MRK, must be in

place to maintain automated cleaning. See Cleaning specifications in Supplement section.

Standards & Certifications

MRA, MRF, & MRK models have not been tested for UL recognition or CSA certification. These switches are designed for use in a low-voltage, low-current, logic-level circuit.

When used as intended in a logic-level circuit, the results do not produce hazardous energy.



Distinctive Characteristics

Low profile body of MRF model accommodates space limitations required for PCB mounting. For the MRA and MRK bushing mount models, the range of behind panel body depths is .323" to .669" (8.2mm to 17.0mm).

Positive detent mechanism for distinct feel and audible feedback.

Metal bushing and housing construction increases durability.

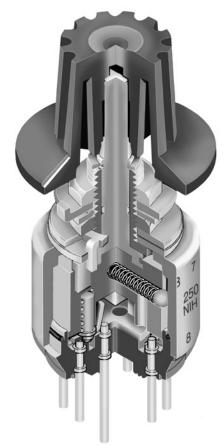
Adjustable stopper plate allows 2–12 position settings.

High contact reliability achieved by the self-cleaning contact mechanism.

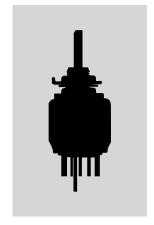
Break-before-make contact timing with sliding contacts in MRA and rotary contactor disk in MRF and MRK models.

Interior housing seal and molded-in PC terminals, plus shaft rubber o-ring on MRA and MRK and polyamide cover on MRF model, allow cleaning after automated soldering.

MRK model meets IP67 of IEC60529 specifications (similar to NEMA 4 & 13).



Actual Size





MR

Actuators & Terminals

PC Terminals

206

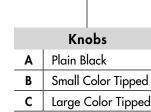
403

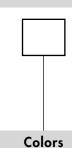
TYPICAL SWITCH ORDERING EXAMPLE

Poles & Circuits 112 SP with 2-12 Positions

DP with 2-6 Positions

4P with 2-3 Positions





| For Plain Knob | | |
|------------------|--------|--|
| No Code | Black | |
| For Color Tipped | | |
| Α | Black | |
| В | White | |
| С | Red | |
| E | Yellow | |
| F | Green | |
| G | Blue | |
| Н | Gray | |

| Α | Shaft Actuated with PC Terminals |
|---|----------------------------------------------------|
| F | Low Profile Screwdriver Actuated with PC Terminals |
| | Low Profile Shaft Actuated with |

DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

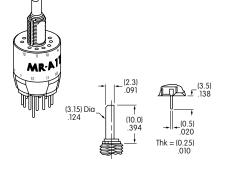
MRA206-A



ACTUATORS & TERMINALS



Shaft Actuated with PC Terminals

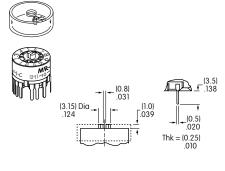


Shaft

Terminal

F

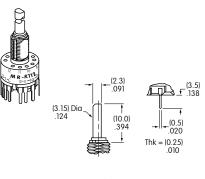
Low Profile Screwdriver Actuated with PC Terminals



Slotted for Terminal Screwdriver



Low Profile **Shaft Actuated** with PC Terminals



Shaft

Terminal

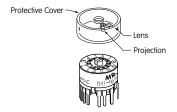


POSITION SETTING FOR MRA, MRF, & MRK MODELS

Each switch is supplied with the stopper set for the maximum number of positions allowed for that model. Prior to installation, the desired position setting should be made. Contact factory for continuous rotation.

MRF Models

- 1. Remove the protective cover from the switch body.
- 2. Turn the shaft counterclockwise to the extreme left by using a screwdriver.
- 3. Inside the cover is a magnifying lens which would be positioned over the number which is to be the maximum position used; when the cover is then snapped into the switch, the projection beside the lens fits into the correct hole for setting the stop.

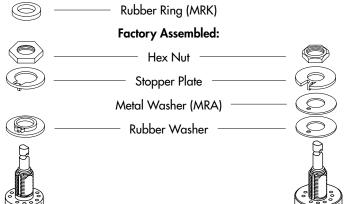


MRK & MRA Models

- 1. Using the actuator knob, turn the shaft counterclockwise to the extreme left. If the shaft is not turned counterclockwise to the extreme left, proper setting cannot be achieved. At this extreme position, the white line on the knob points to the number 1 position shown on the side of the switch.
- 2. Remove the knob from the shaft and loosen the nut far enough to allow raising the stopper plate, plus washer(s), for resetting to the desired position.
- 3. Note the position numbers on the side of the switch; these correspond to the terminal numbers and stopper holes. Insert the stopper in the hole numbered for the maximum desired number of stop settings. Satisfactory switch functioning cannot be assured if the stopper plate is not properly positioned.
- 4. Tighten the nut (beveled side up) firmly against the stopper plate.

Standard Mounting Hardware Packaged Loose with Each Switch:

| ———— Hex Face Nut | |
|-------------------|--|
| Locking Ring | |
| Lockwasher — | |
| Rubber Ring (MRK) | |





Toggles

Rockers

Programmable Illuminated PB Pushbuttons

Keylocks

Sotaries

Slides

Ė

Indicators

Accessories

Supplement |



2 Pole

_(3.0) Dia .118

4 Pole

.374 Dia

4 Pole

(12.6) Dia _

- (12.6) Dia -

4 Pole

_ (12.6) Dia __ .496

(3.0) Dia .118

1 Pole

⊷(3.0) Dia .118

_(0.8) Dia Typ .031

MRA • PC Terminals

Keylocks

Touch Indicators Supplement | Accessories

(2.3) (3.15) Dia (1.0) (9.5) Dia (10.0) .394 (9.5) Dia .374 (16.0) Dia .630 (10.0) **MRA112 MRF** • PC Terminals 1 Pole 2 Pole (0.25) Typ .010 Cover (12.0) Dia .472 _(0.5) Typ .020 ⊢(12.6) Dia .496 **MRF403 MRK** • PC Terminals 1 Pole 2 Pole (0.25) Typ .010 M6 P0.75 (12.0) Dia .472

(2.28) _

Keyway

(3.1) Dia

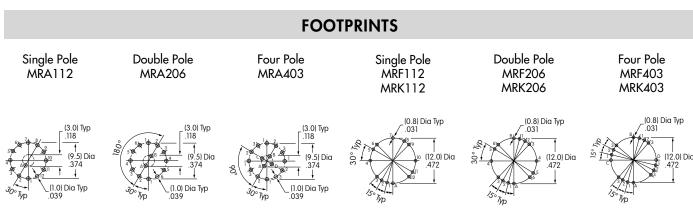
M6 P0.75

TYPICAL SWITCH DIMENSIONS

MRK112 MRK devices are designed to be panel mounted. Installation without panel mounting will affect reliability.

(5.5) (10.1)

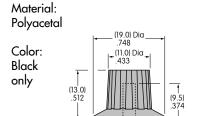
_(0.5) Typ .020



KNOBS



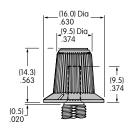
AT433 Plain Black



AT4103 Small **Color Tipped**

Base Material: Polyester Base Color: Black

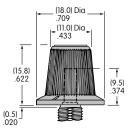
Polyamide Tip Colors: A, B, C, E, F, G, H



AT4104 Large Color Tipped

Base Material: **Polyester** Base Color: Black

Polyamide Tip Colors: A, B, C, E, F, G, H



Color Codes:

(0.5)















Gray

PANEL CUTOUTS & MAXIMUM EFFECTIVE PANEL THICKNESS

MRA & MRK

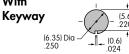
Nonsealed Panel

Without Keyway (2.2) Dia - With

AT545

Material:

Locking Ring



MRK

Sealed Panel



With Standard Hardware on Nonsealed Panel: MRA .067" (1.7mm) MRK .087" (2.2mm)

Without Locking Ring on Nonsealed Panel: MRA .098" (2.5mm) MRK .118" (3.0mm)

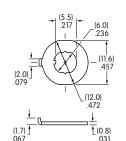
With AT513M & AT535 only on Sealed Panel: MRK .106" (2.7mm)

STANDARD MOUNTING HARDWARE

AT513M Metric Hexagon Nut

Material: Brass, nickel plating 1 for MRA; 1 for MRK

-M6 P0.75

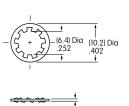


Steel, chromate over zinc plating

1 for MRA; 1 for MRK

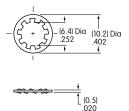
AT509 Lockwasher

Material: Steel, chromate over zinc plating 1 for MRA; 1 for MRK



AT535 **Rubber Ring**

Material: Nitrile butadiene rubber 1 for MRK



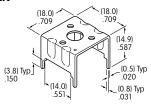


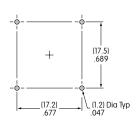


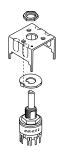
OPTIONAL SUPPORT BRACKET

AT543 Support Bracket for MRK

Material: Steel with tin plating







A support bracket is needed when the MRK is mounted only to a PC board and does not have the bushing through a panel.

