Series MR

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: 24.5 ~ 73.5mNm for MRA; 4.90 ~ 24.5mNm 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

Mount: Zinc alloy with zinc plating

Movable Contacts: Phospher Bronze 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: Brass with silver plating for MRA; phosphor bronze with gold plating for MRF & MRK

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

Environmental Data

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

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

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/s^2) 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.

Toggles

Rockers

Pushbuttons

Illuminated PB

Programmable

Keylocks

Rotaries **G**

Slides

Tactiles

Tilt

Touch

Indicators

Accessories

Supplement

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

TYPICAL SWITCH ORDERING EXAMPLE
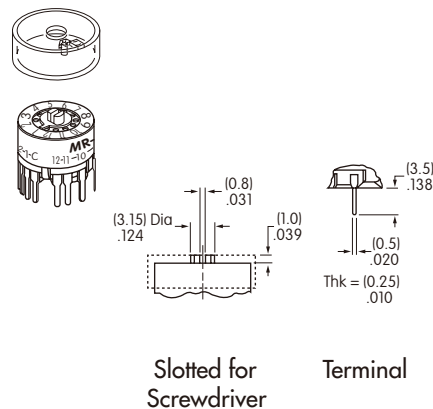
MR　A　206　–　A　☐
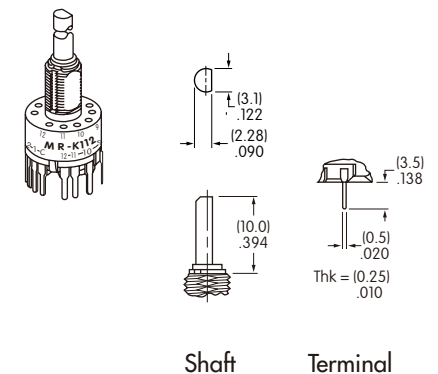
Actuators & Terminals
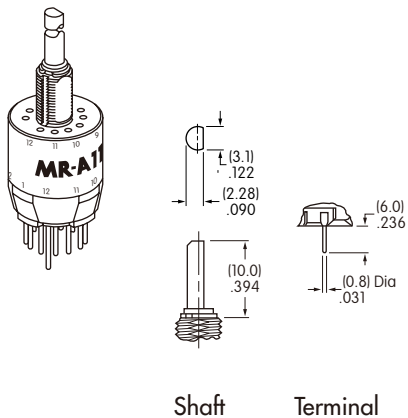
A	Shaft Actuated with PC Terminals
F	Low Profile Screwdriver Actuated with PC Terminals
K	Low Profile Shaft Actuated with PC Terminals

Poles & Circuits

112	SP with 2-12 Positions
206	DP with 2-6 Positions
403	4P with 2-3 Positions

Knobs

A	Plain Black
B	Small Color Tipped
C	Large Color Tipped

Colors

For Plain Knob	
No Code	Black
For Color Tipped	
A	Black
B	White
C	Red
E	Yellow
F	Green
G	Blue
H	Gray

DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

MRA206-A

Shaft Actuated with Plain Black Knob

DP with 2-6 Adjustable Positions

PC Terminals

ACTUATORS & TERMINALS

A Shaft Actuated with PC Terminals

(3.1) .122
(2.28) .090
(6.0) .236
(10.0) .394
(0.8) Dia .031

Shaft　Terminal

F Low Profile Screwdriver Actuated with PC Terminals

(0.8) .031
(3.15) Dia .124
(1.0) .039
(3.5) .138
(0.5) .020
Thk = (0.25) .010

Slotted for Screwdriver　Terminal

K Low Profile Shaft Actuated with PC Terminals

(3.1) .122
(2.28) .090
(3.5) .138
(10.0) .394
(0.5) .020
Thk = (0.25) .010

Shaft　Terminal

Toggles

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Illuminated PB

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Supplement

POLES & CIRCUITS

Pole	Model	Number of Positions	Stopper Settings	Number of Terminals	Schematics
SP	**MRA112**	2–12	2, 3, 4, . . . 12	1 COM, 12 LOAD	
	MRF112	2–12	2, 3, 4, . . . 12	1 COM, 12 LOAD	
	MRK112	2–12	2, 3, 4, . . . 12	1 COM, 12 LOAD	
DP	**MRA206**	2–6	2, 3, 4, 5, 6	2 COM, 12 LOAD	
	MRF206	2–6	2, 3, 4, 5, 6	2 COM, 12 LOAD	
	MRK206	2–6	2, 3, 4, 5, 6	2 COM, 12 LOAD	
4P	**MRA403**	2–3	2, 3	4 COM, 12 LOAD	
	MRF403	2–3	2, 3	4 COM, 12 LOAD	
	MRK403	2–3	2, 3	4 COM, 12 LOAD	

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.
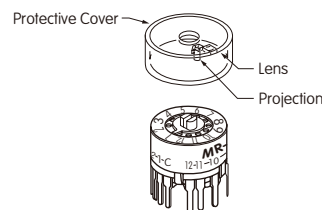
MRK & MRA Models

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
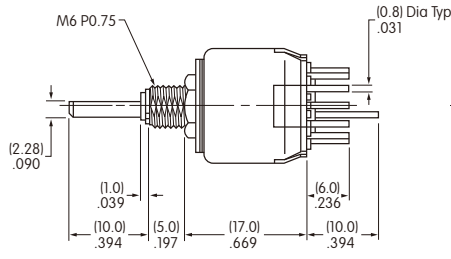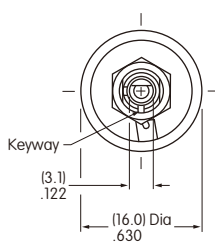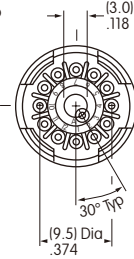**Packaged Loose with Each Switch:**

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

Factory Assembled:

— Hex Nut —
— Stopper Plate —
— Metal Washer (MRA) —
— Rubber Washer

Toggles
Rockers
Pushbuttons
Illuminated PB
Programmable
Keylocks
Rotaries G
Slides
Tactiles
Tilt
Touch
Indicators
Accessories
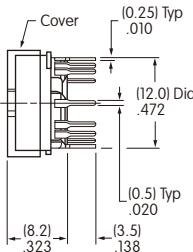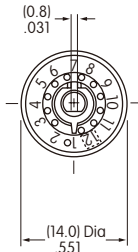Supplement
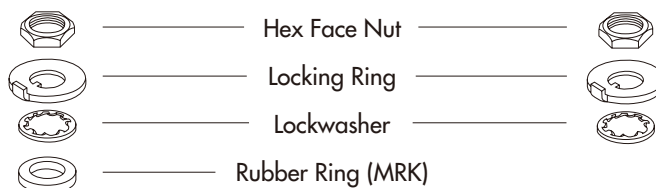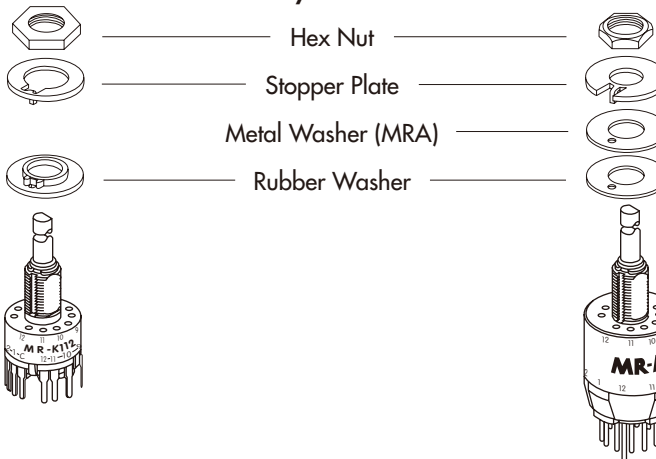
TYPICAL SWITCH DIMENSIONS

MRA • PC Terminals
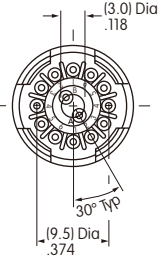
1 Pole **2 Pole** **4 Pole**
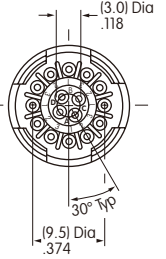
MRA112

MRF • PC Terminals
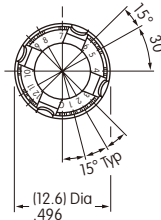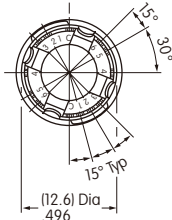
1 Pole **2 Pole** **4 Pole**
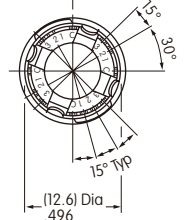
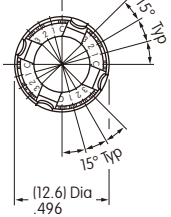**MRF403**

MRK • PC Terminals
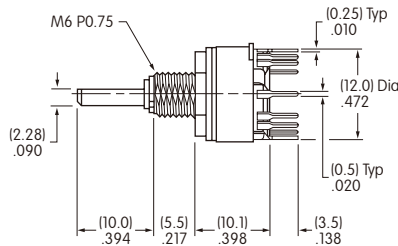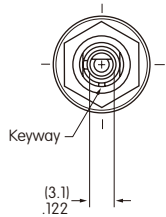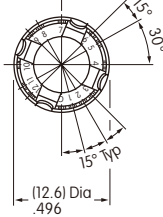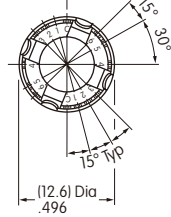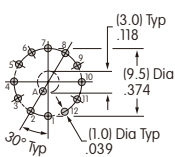
1 Pole **2 Pole** **4 Pole**
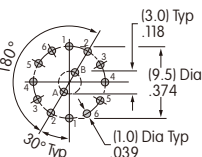

MRK112 MRK devices are designed to be panel mounted. Installation without panel mounting will affect reliability.
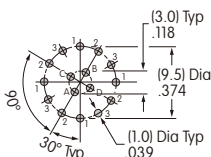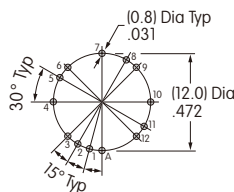
FOOTPRINTS
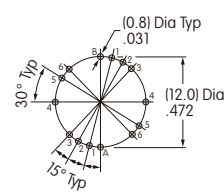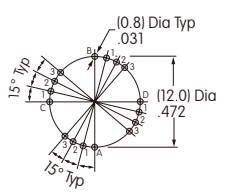
Single Pole **MRA112**   Double Pole **MRA206**   Four Pole **MRA403**   Single Pole **MRF112 MRK112**   Double Pole **MRF206 MRK206**   Four Pole **MRF403 MRK403**

Toggles
Rockers
Pushbuttons
Illuminated PB
Programmable
Keylocks
Rotaries G
Slides
Tactiles
Tilt
Touch
Indicators
Accessories
Supplement

KNOBS

A AT433
Plain Black

Material:
Polyacetal

Color:
Black
only

(19.0) Dia
.748
(11.0) Dia
.433
(13.0) .512
(9.5) .374
(0.5) .020
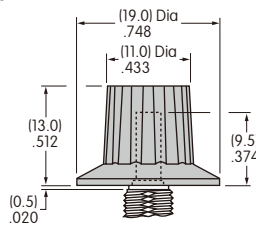
B AT4103 Small
Color Tipped

Base Material:
Polyester
Base Color:
Black

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

(16.0) Dia
.630
(9.5) Dia
.374
(14.3) .563
(9.5) .374
(0.5) .020
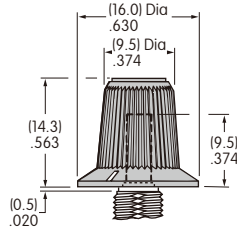
C AT4104 Large
Color Tipped

Base Material:
Polyester
Base Color:
Black

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

(18.0) Dia
.709
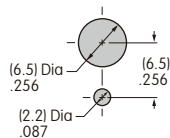(11.0) Dia
.433
(15.8) .622
(9.5) .374
(0.5) .020
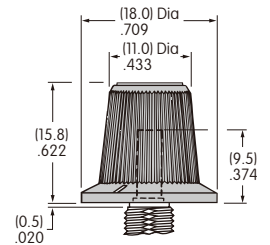
Color Codes: **A** Black **B** White **C** Red **E** Yellow **F** Green **G** Blue **H** Gray
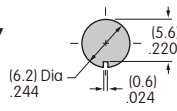
PANEL CUTOUTS & MAXIMUM EFFECTIVE PANEL THICKNESS
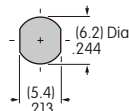
MRA & MRK

Nonsealed Panel

Without
Keyway

(6.5) Dia .256
(6.5) .256
(2.2) Dia .087

With
Keyway

(6.2) Dia .244
(5.6) .220
(0.6) .024

MRK

Sealed Panel

(6.2) Dia .244
(5.4) .213

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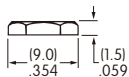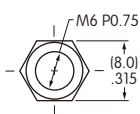MRA .067″ (1.7mm) MRK .087″ (2.2mm)

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

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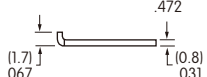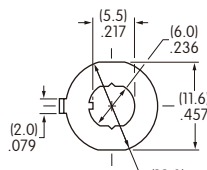MRK .106″ (2.7mm)

STANDARD MOUNTING HARDWARE

AT513M
Metric Hexagon Nut

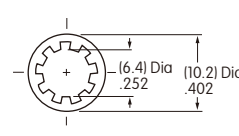Material:
Brass, nickel plating
1 for MRA; 1 for MRK

M6 P0.75
(8.0) .315
(9.0) .354
(1.5) .059

AT545
Locking Ring

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

(5.5) .217
(6.0) .236
(11.6) .457
(2.0) .079
(12.0) .472
(1.7) .067
(0.8) .031

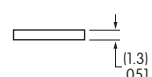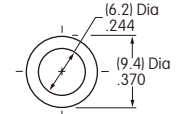**AT509**
Lockwasher

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

(6.4) Dia .252
(10.2) Dia .402
(0.5) .020

AT535
Rubber Ring

Material:
Nitrile butadiene rubber
1 for MRK

(6.2) Dia .244
(9.4) Dia .370
(1.3) .051

OPTIONAL SUPPORT BRACKET

AT543
Support Bracket for MRK
Material:
Steel with tin plating

(18.0) .709
(18.0) .709
(14.9) .587
(3.8) Typ .150
(0.5) Typ .020
(13.0) .511
(0.8) Typ .031

(17.5) .689
(17.2) .677
(1.2) Dia Typ .047
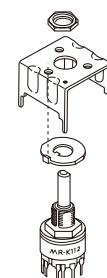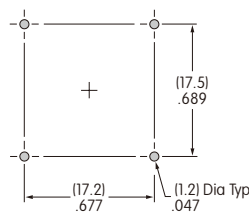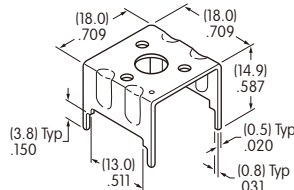
A support bracket
is needed when
the MRK is mounted
only to a PC board
and does not have
the bushing through
a panel.