

General Specifications

Electrical Capacity (Resistive Load)

Logic Level: 0.4VA maximum @ 48V AC/DC maximum
(Applicable Range 0.1mA ~ 0.1A @ 20mV ~ 48V)
Note: Find additional explanation of operating range in Supplement section.

Other Ratings

Contact Resistance: 50 milliohms maximum
Insulation Resistance: 1,000 megohms minimum @ 500V DC
Dielectric Strength: 1,000V AC minimum between contacts for 1 minute minimum;
1,500V AC minimum between contacts & case for 1 minute minimum
Mechanical Life: 100,000 operations minimum for bat lever models
50,000 operations minimum for locking lever models
Electrical Life: 50,000 operations minimum
Contact Timing: Nonshorting (break-before-make)
Angle of Throw: 24°

Materials & Finishes

Toggle/Lever: Brass with chrome plating
Bushing: Brass with nickel plating
Support Bracket: Straight PC: phosphor bronze with tin plating; right angle & vertical: brass with tin plating
Housing: Polybutylene terephthalate (PBT) (UL94V-0)
Base: 1- and 2-pole GFR polyamide (UL94V-0); 4-pole liquid crystal polymer (LCP) (UL94V-0)
Movable Contacts: Phosphor bronze with gold plating
Stationary Contacts: Brass with gold plating
Terminals: Brass with gold plating

Environmental Data

Operating Temp Range: -10°C through +70°C (+14°F through +158°F)
Humidity: 90 ~ 95% humidity for 240 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/s²) acceleration (tested in 6 right angled directions, with 5 shocks in each direction)

PCB Processing

Soldering: Wave Soldering recommended. See Profile A in Supplement section.
Manual Soldering: 1- & 2-pole: 3 seconds maximum @ 350°C maximum;
4-pole: 4 seconds maximum @ 410°C maximum
Cleaning: Hand clean locally using alcohol based solution.
See Cleaning specifications in Supplement section.

Standards & Certifications

Flammability Standards: UL94V-0 rated housing & base
The D2 Series toggles have not been tested for UL recognition or CSA certification.
These switches are designed for use in a low-current, logic level circuit.
When used as intended in a logic level circuit, the results do not produce hazardous energy.

Distinctive Characteristics

Base of heat resistant resin meets UL94V-0 flammability rating.

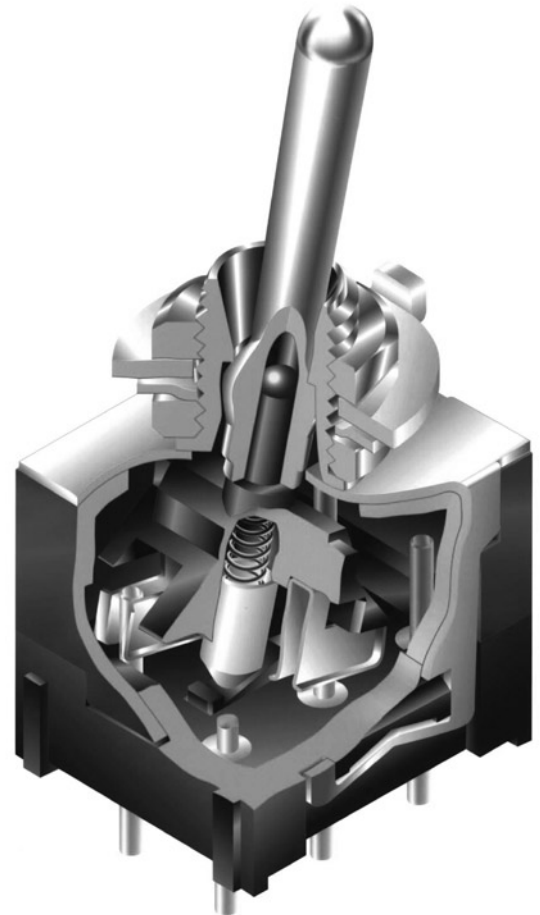
Maximized voltage capability of 48V allows use in medium source applications and increases operating life.

Award-winning STC contact mechanism with benefits unavailable in conventional mechanisms: smoother positive detent actuation, increased contact stability, and unparalleled reliability. (Additional STC details under Terms and Acronyms in the Supplement section.)

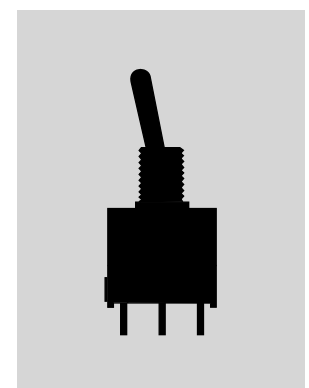
Round .031" (0.8mm) diameter PC terminals for easy PCB assembly.

Terminal spacing conforms to standard .100" (2.54mm) PC board grid spacing.

Molded-in terminals prevent entry of flux, solvents, and other contaminants.



Actual Size



A
Toggles

Rockers

Pushbuttons

Illuminated PB

Programmable

Keylocks

Rotaries

Slides

Tactiles

Tilt

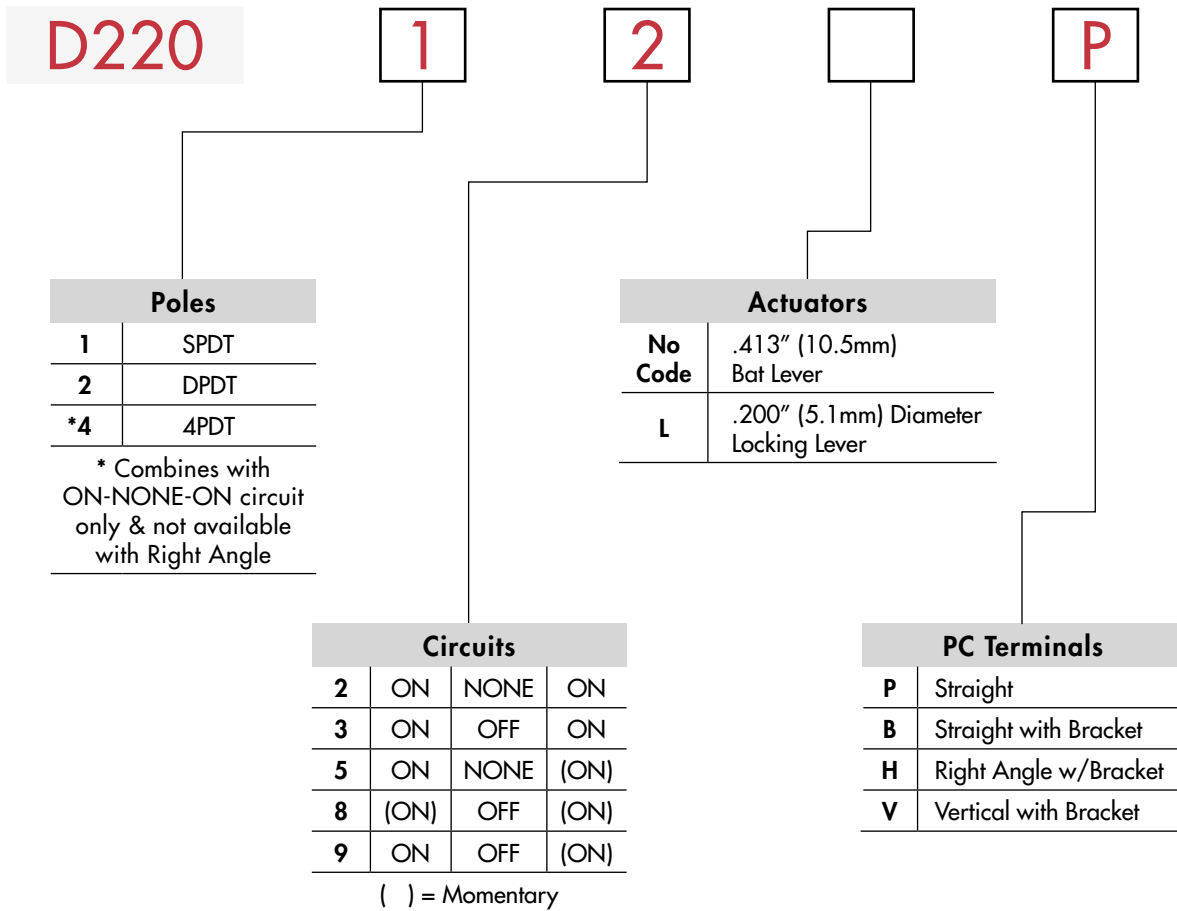
Touch

Indicators

Accessories

Supplement

TYPICAL SWITCH ORDERING EXAMPLE



DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

D22012P

.413" (10.5mm)
Bat Lever



SPDT
ON-NONE-ON Circuit

Straight PC Terminals

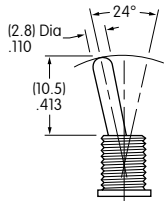
POLES & CIRCUITS								
Pole	Model	Toggle Position () = Momentary			Connected Terminals			Throw & Schematics
		Down <small>Keyway</small>	Center	Up	Down <small>Keyway</small>	Center	Up	
SP	D22012 D22013 D22015 D22018 D22019	ON ON ON (ON) ON	NONE OFF NONE OFF OFF	ON ON (ON) (ON) (ON)	2-3	OPEN	2-1	Note: Terminal numbers are not actually on the switch. SPDT
DP	D22022 D22023 D22025 D22028 D22029	ON ON ON (ON) ON	NONE OFF NONE OFF OFF	ON ON (ON) (ON) (ON)	2-3 5-6	OPEN	2-1 5-4	DPDT
4P	D22042	ON	NONE	ON	2-3 5-6 8-9 11-12	OPEN	2-1 5-4 8-7 11-10	4PDT

ACTUATORS

No Code

.413" (10.5mm)
Bat Lever

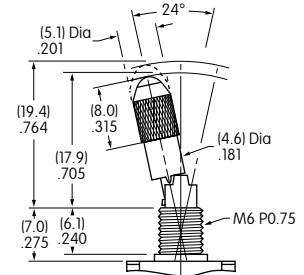
Material:
Chrome over brass



L

.413" (5.1mm) Diameter
Locking Lever

Material:
Chrome over brass



PC TERMINALS

P

Straight



B

Straight with Bracket



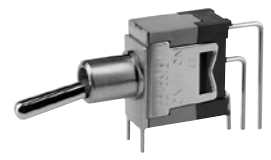
H

Right Angle with Bracket



V

Vertical with Bracket

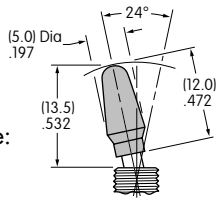


OPTIONAL CAPS & CAP COLORS

AT415
Bat Lever Cap

Material:
Polyethylene

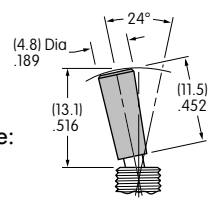
Colors Available:
A B C E F G



AT444 Bat Lever
Conical Cap

Material:
Polyethylene

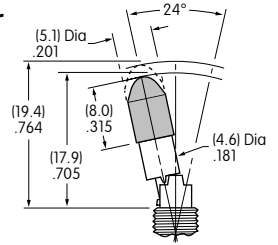
Colors Available:
A B C E F G



AT427 Cap Supplied
with Locking Lever

Material:
Anodized
Aluminum

Colors Available:
A C G



Colors Codes: A Black B White C Red E Yellow F Green G Blue

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

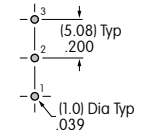
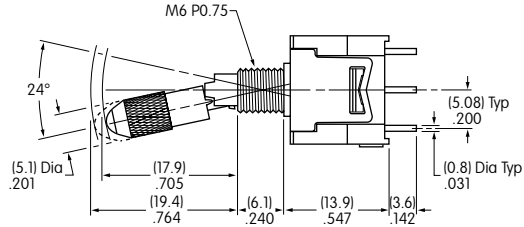
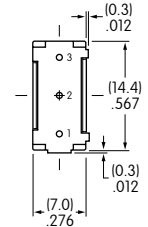
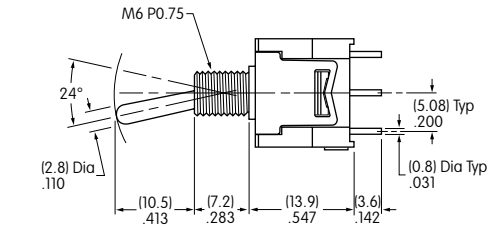
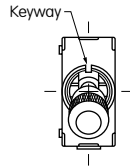
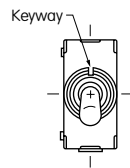
TYPICAL SWITCH DIMENSIONS

Straight PC • Single Pole



D22012P

D22012LP



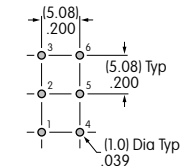
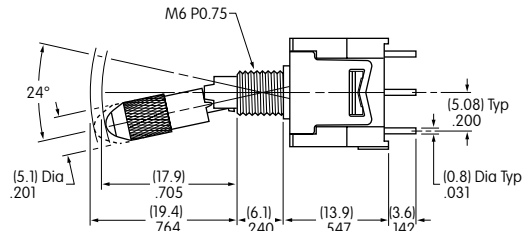
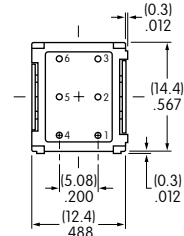
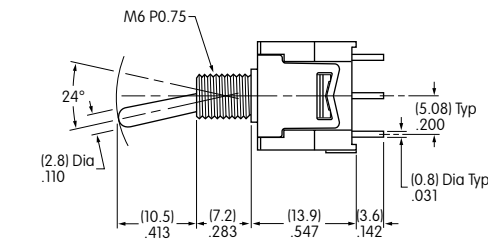
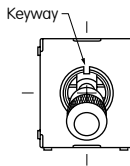
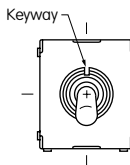
Actuator in Down Position

Straight PC • Double Pole



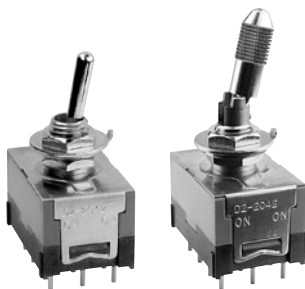
D22022P

D22022LP



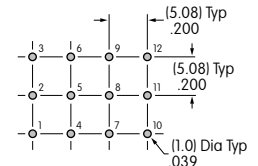
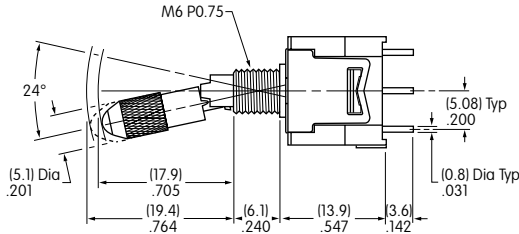
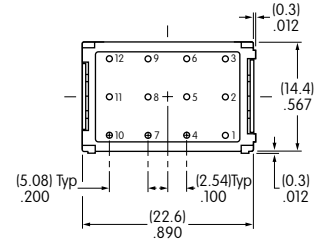
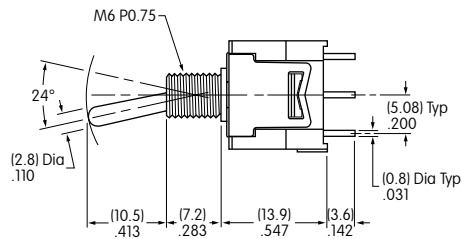
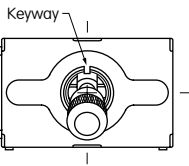
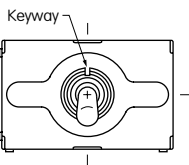
Actuator in Down Position

Straight PC • Four Pole



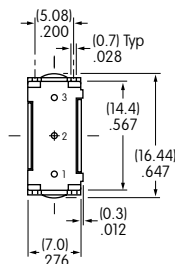
D22042P

D22042LP

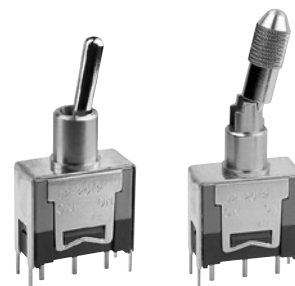


Actuator in Down Position

TYPICAL SWITCH DIMENSIONS

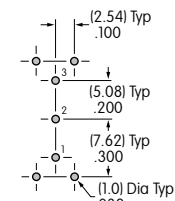


Straight PC • Bracket Single Pole



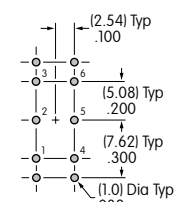
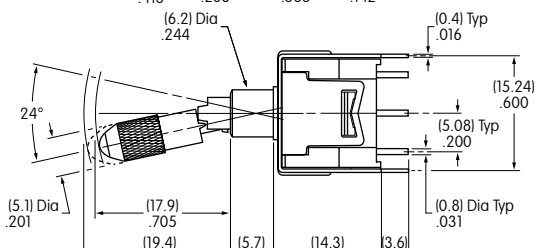
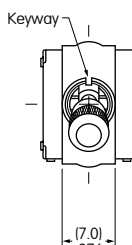
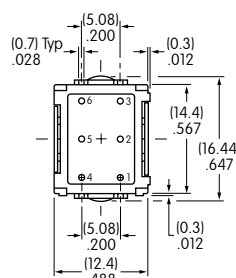
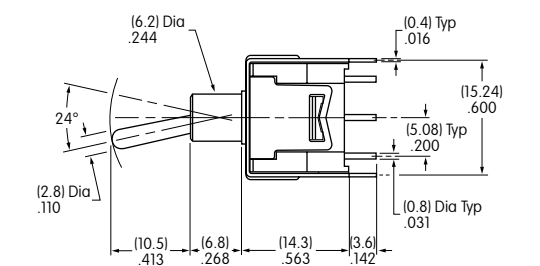
D22012B

D22012LB

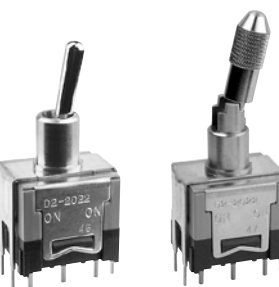


Actuator in Down Position

Straight PC • Bracket Double Pole

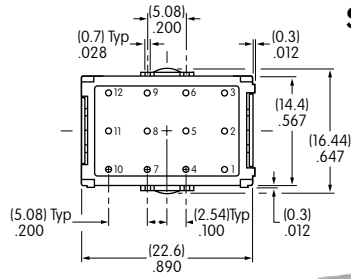
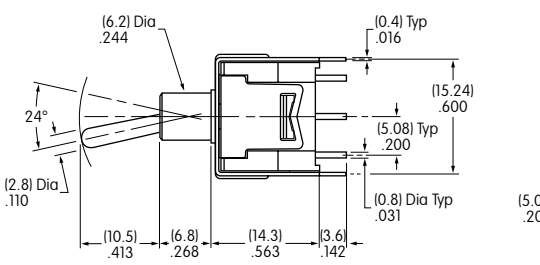
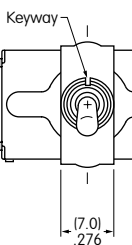


Actuator in Down Position

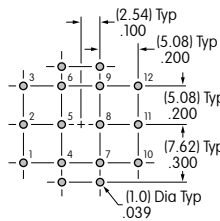
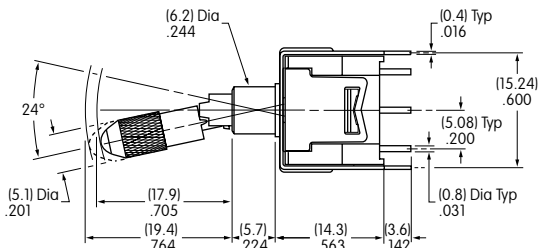
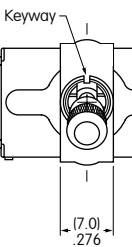


D22022B

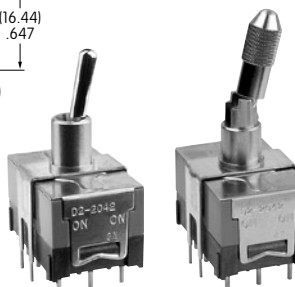
D22022LB



Straight PC • Bracket Four Pole



Actuator in Down Position



D22042B

D22042LB

A Toggles

Rockers

Pushbuttons

Illuminated PB

Programmable

Keylocks

Rotaries

Slides

Tactiles

Tilt

Touch

Indicators

Accessories

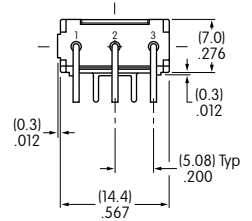
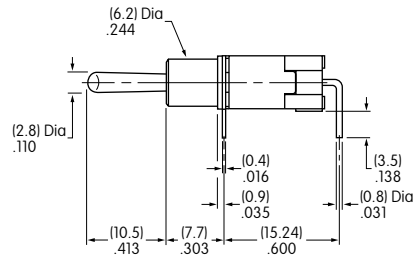
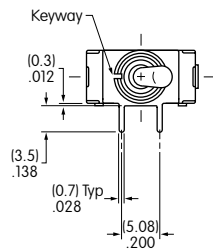
Supplement

TYPICAL SWITCH DIMENSIONS

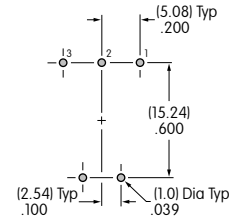
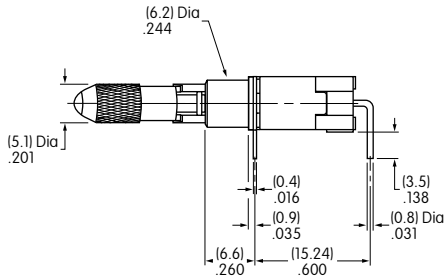
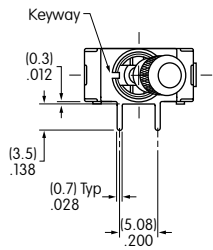
Right Angle PC • Single Pole



D22012H



D22012LH

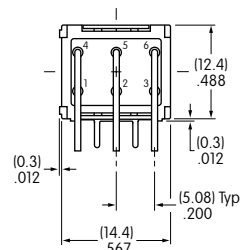
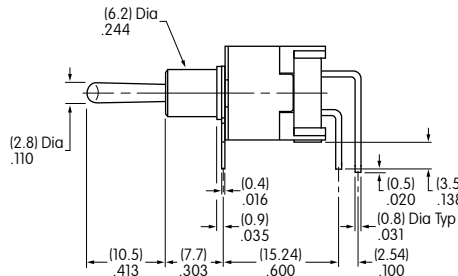
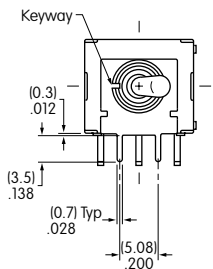


Actuator in Down Position

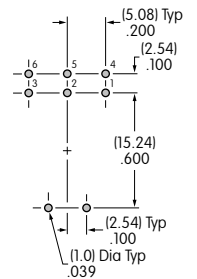
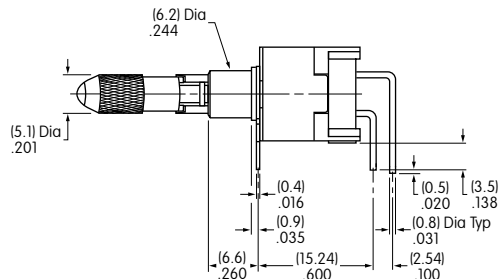
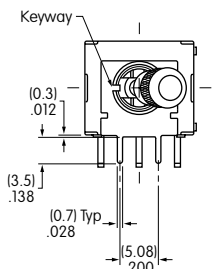
Right Angle PC • Double Pole



D22022H



D22022LH



Actuator in Down Position

Rockers

Pushbuttons

Illuminated PB

Programmable

Keylocks

Rotaries

Slides

Tactiles

Tilt

Touch

Indicators

Accessories

Supplement

TYPICAL SWITCH DIMENSIONS

Vertical PC • Single Pole



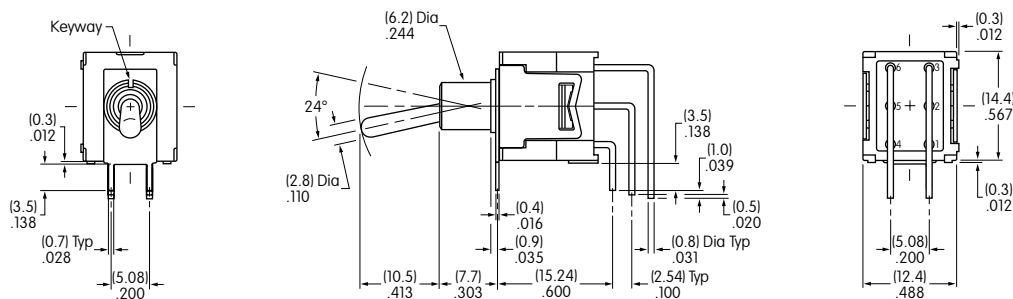
D22012V



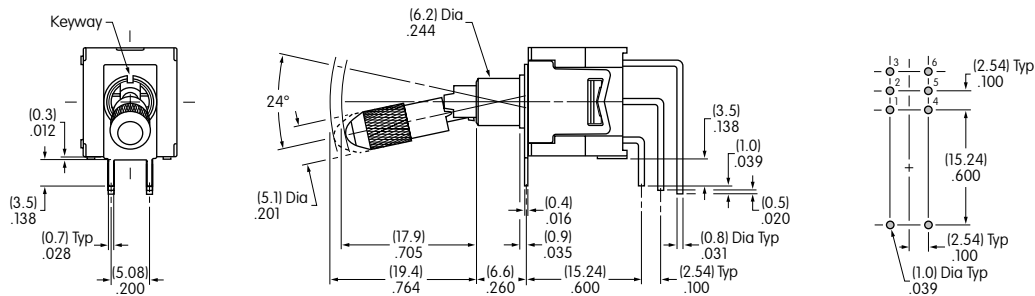
D22012LV

Actuator in Down Position

Vertical PC • Double Pole



D22022V



D22022LV

Actuator in Down Position

A Toggles

Rockers

Pushbuttons

Illuminated PB

Programmable

Keylocks

Rotaries

Slides

Tactiles

Tilt

Touch

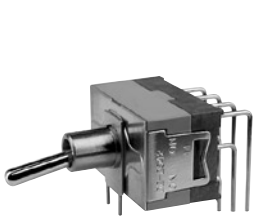
Indicators

Accessories

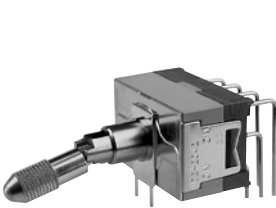
Supplement

TYPICAL SWITCH DIMENSIONS

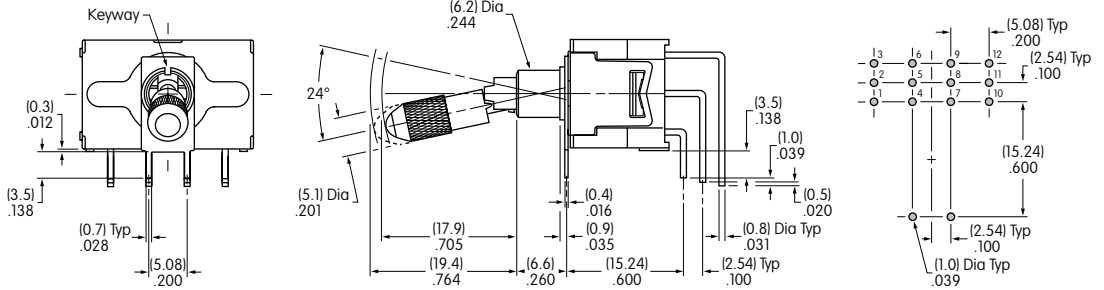
Vertical PC • Four Pole



D22042V



D22042LV

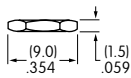
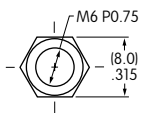


Actuator in Down Position

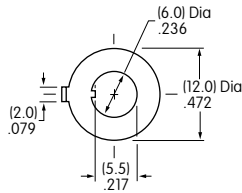
STANDARD HARDWARE

OPTIONAL

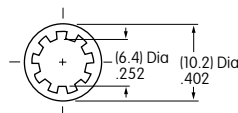
AT513M Hex Nut
Brass with nickel plating
2 supplied



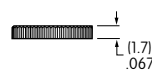
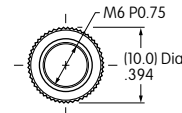
AT507M Locking Ring
Steel with zinc/chromate
1 supplied



AT509 Lockwasher
Steel with zinc/chromate
1 supplied



AT501M Knurled Face Nut
Brass with chrome plating

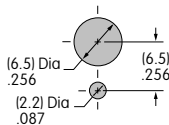


PANEL CUTOUTS & MAXIMUM PANEL THICKNESS

With Standard Hardware

.087" (2.2mm) for Standard Lever

.051" (1.3mm) for Locking Lever



Without Bottom Hex Nut

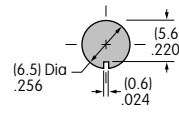
.154" (3.9mm) for Standard Lever

.110" (2.8mm) for Locking Lever

Without Locking Ring

.118" (3.0mm) for Standard Lever

.083" (2.1mm) for Locking Lever



Without Locking Ring & Bottom Hex Nut

.185" (4.7mm) for Standard Lever

.142" (3.6mm) for Locking Lever

