

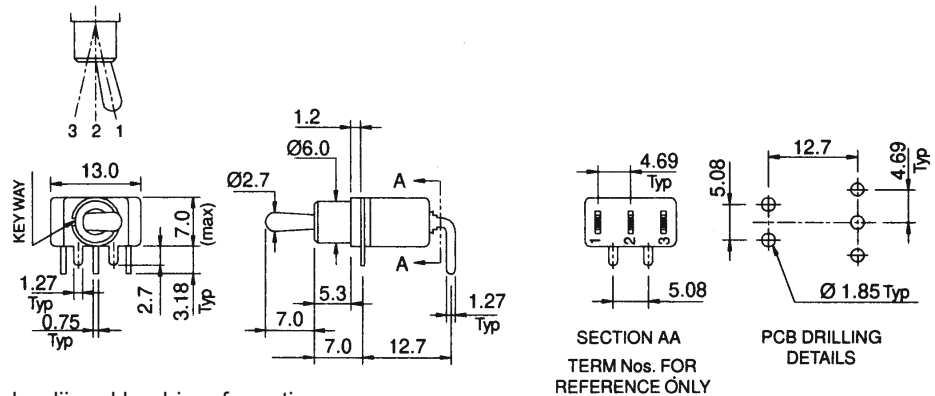
# TOGGLE SWITCHES



## Series 20 - PCB Mounting Types - Horizontal Operation (PCR)

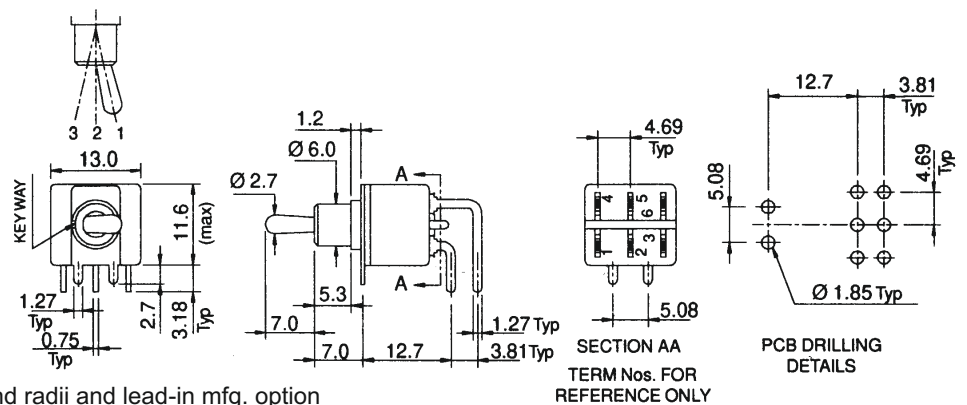
### DESCRIPTION :

**Integral (Series 20) Toggle Switches** of the PCB mounting types with horizontal operation meet the needs of customers wanting a high quality, high current carrying switch in small volume. Standardisation of design in components used from single to three poles, careful choice of materials and attention to details result in reliable and consistent performance. They are available with popular actuator types and sizes. Design variations in the contacts result in all the required switching functions. Though all the mounting bush options are available, the standard ones are unthreaded type, since the mounting on the PCB is rigid.



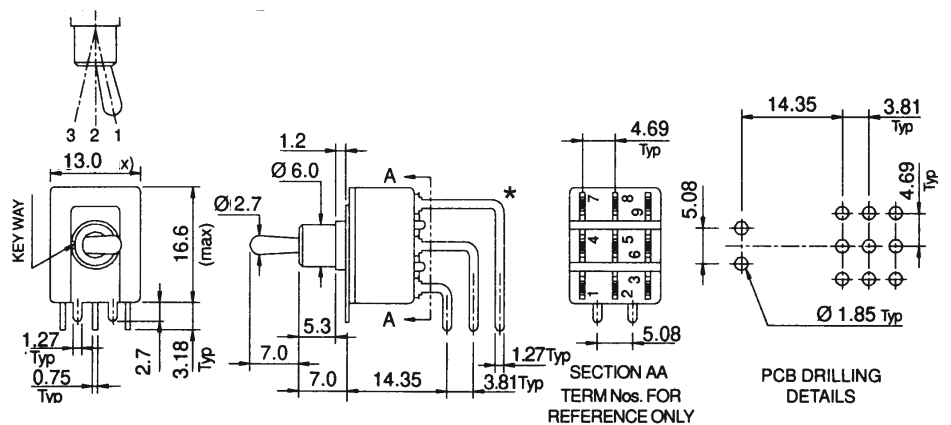
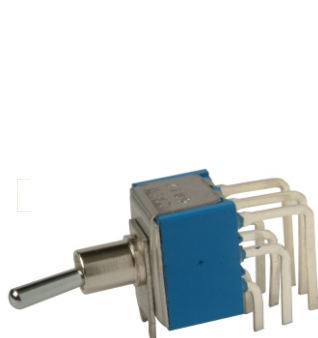
### 1 POLE

Terminal bend radii and lead-in mfg. option



### 2 POLE

Terminal bend radii and lead-in mfg. option



### 3 POLE

Terminal bend radii and lead-in mfg. option

### NOTE :

Actuator shown in Pos. 1 (i.e. Away from key way)  
Refer to A9/A10 for alternate selection of ACTUATORS & MOUNTING

All Dimensions in mm.

### SWITCHING FUNCTION

| Order Code | Pos. 1 | Pos. 2 | Pos. 3 |
|------------|--------|--------|--------|
| <b>1</b>   | ON     | NONE   | ON     |
| <b>3</b>   | ON     | OFF    | ON     |
| <b>5</b>   | (ON)   | OFF    | (ON)   |
| <b>7</b>   | ON     | OFF    | (ON)   |
| <b>8</b>   | ON     | NONE   | (ON)   |

| CONNECTED TERMINALS | Pos.1 | Pos.2 | Pos.3 |
|---------------------|-------|-------|-------|
| 1 POLE              | 2-3   | OPEN  | 2-1   |
| 2 POLE              | 2-3   | OPEN  | 2-1   |
|                     | 5-6   |       | 5-4   |
| 3 POLE              | 2-3   |       | 2-1   |
|                     | 5-6   | OPEN  | 5-4   |
|                     | 8-9   |       | 8-7   |

(Refer to **A12** for other special switching functions)

### SPECIFICATIONS

**CONTACT RATING** : 3 Amps @ 230 V AC ; 5A @ 28 V DC. See Contact selection for others.

**ELECTRICAL LIFE** : 100,000 make-and-break cycles at full load on all models ending in-1 (ON-NONE-ON). All other models, 40,000 cycles.

**CONTACT RESISTANCE** : Below 10 milliohms initial @ 2-6 V DC. 100 mA for both silver and gold plated contacts.

**INSULATION RESISTANCE** : 1000 Megohms min.

**DIELECTRIC STRENGTH** : 1000 V RMS min. @ sea level.

**OPERATING TEMP.** : -30° C to 85° C.

### MATERIALS & FINISHES

**BODY** : Diallyl Phthalate (DAP)      **HARDWARE** : Brass nickel plated

**ACTUATOR** : Brass Nickel plated      **TERMINAL SEAL** : Epoxy

**HOUSING** : Stainless steel      **CONTACTS** : See below under contact selection.

**BUSHING** : Brass nickel plated

### CONTACT SELECTION

| Order Code |                                  | For (Resistive Load)   |
|------------|----------------------------------|--|
| <b>0</b>   | CONTACTS & ALL TERMINALS.        | : Copper/Copper alloy silver plated                                    |
|            | <b>RATING</b>                    | : 2 Amps. @ 230 V AC   |
| <b>1</b>   | END CONTACTS                     | : Coin silver, silver plated   |
|            | CENTRE CONTACTS & ALL TERMINALS. | : Copper alloy silver plated.  |
|            | <b>RATING</b>                    | : 3 Amps. @ 230 V AC; 5A @ 28 V DC.                                    |
| <b>2</b>   | CONTACTS & TERMINALS             | : Copper alloy with gold plate over nickel plate.                      |
|            | <b>RATING</b>                    | : 0.4 VA max. @ 20 V AC or DC max.                                     |
| <b>3</b>   | END CONTACTS                     | : Coin silver with gold plate over nickel plate.                       |
|            | CENTRE CONTACTS                  | : Copper alloy with gold plate over nickel plate.                      |
|            | ALL TERMINALS.                   |  |
|            | <b>RATING</b>                    | : 0.4 VA max. @ 20 V AC or DC max or 3 Amps @ 230 V AC ; 5A @ 28 V DC. |

(This contact can be used where either dry circuit or power conditions exist. However when dry circuit rating is exceeded the gold plating is removed from the contact and the switch cannot be used in dry circuits.)

### MOUNTING SELECTION

| Order Code |  |
|------------|--|
| <b>0</b>   | M6x0.75 Threaded bush 5.3 long with key way.                             |
| <b>1</b>   | M6x0.75 Threaded bush 6.9 long with key way.                             |
| <b>2</b>   | Ø6 Unthreaded bush 6.9 long with key way                                 |
| <b>3</b>   | Ø6 Unthreaded bush 5.3 long with key way.                                |
| <b>4</b>   | M6x0.75 Threaded bush 6.60 long with panel and Toggle splash proof seal. |
| <b>5</b>   | M6x0.75 Threaded bush 6.9 long with milled flat.                         |

(Refer to **A10** for details)

### ACTUATOR SELECTION

| Order Code      |                                    |
|-----------------|------------------------------------|
| <b>01</b>       | Toggle 10.4 long                   |
| <b>02</b>       | Toggle 7.0 long                    |
| <b>03</b>       | Toggle 21.4 long                   |
| <b>04 to 11</b> | Plastic moulded caps.              |
| <b>12</b>       | Toggle 10.4 long with Rubber boot. |
| <b>13 to 15</b> | Toggle 10.4 long with cap.         |
| <b>20 to 30</b> | Actuator with lock                 |

(Refer to **A9** for details)

| POLE SELECTION | One      | Two      | Three    |
|----------------|----------|----------|----------|
| Order Code     | <b>1</b> | <b>2</b> | <b>3</b> |

ORDERING CODE

**2**



**5**



**L**

Extended terminal (without cutting)

**integral**

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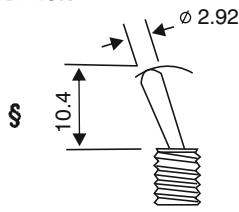
D-388/1, 1st Block, 1st Stage, Peenya Industrial Estate, Bangalore - 560 058, India

**Telefax:** (080) 2839 1707 / 2839 1708 / 2839 1709 / 2839 1710

An ISO 9001:2008 Company **Website:** www.integralsys.in **E-mail:** inty.systems@gmail.com / sales@integralsys.in

## Series 20 Actuator Selection (M6x0.75)

\* Refer Note

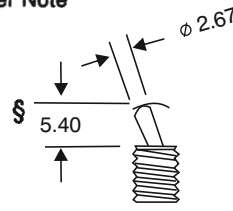


Order Code : 01

§

Add 1.60 mm for bushing under Order Code '0' & '3'

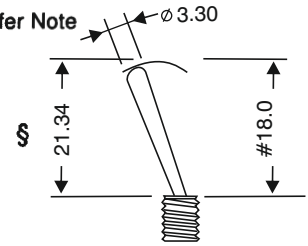
\* Refer Note



Order Code : 02

Add 1.60 mm for bushing under Order Code '0' & '3'

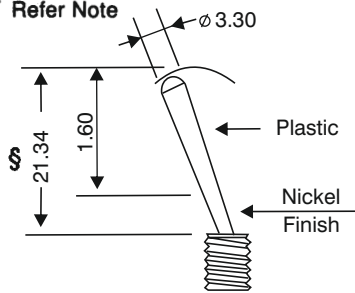
\* Refer Note



Order Code : 03 # 50

Add 1.60 mm for bushing under Order Code '0' & '3'

\* Refer Note



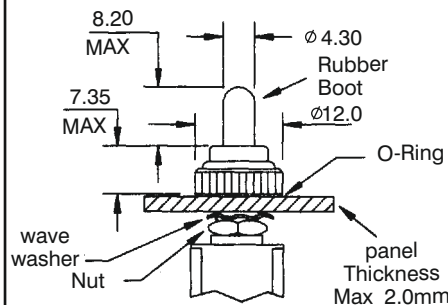
Order Code : 04 to 11  
(See Table below)

§

Add 1.60 mm for bushing under Order Code '0' & '3'

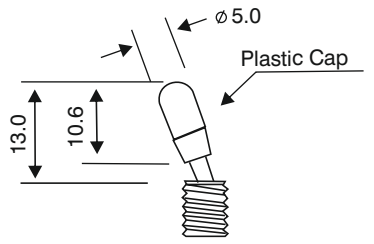
(Plastic moulded actuator)

| Order Code | Moulding Colour |
|------------|-----------------|
| 04         | White           |
| 05         | Black           |
| 06         | Red             |
| 07         | Yellow          |
| 08         | Green           |
| 09         | Blue (Std)      |
| 10         | Brown           |
| 11         | Grey            |



RUBBER BOOT (Black)  
Order Code : 12  
Available only with Actuator or and Bush 1,4,5

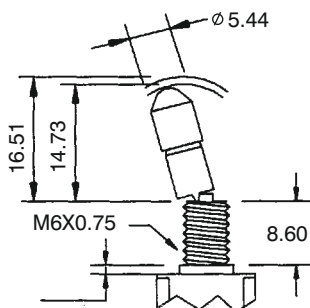
\* Refer Note



Order Code : 13 to 16  
(See Table below)

Actuator with cap

| Order Code | Cap Colour   |
|------------|--------------|
| 13         | Black (Std.) |
| 14         | Red          |
| 15         | Yellow       |
| 16         | Green        |



Actuator with Lock

| Order Code | Cap Colour    |
|------------|---------------|
| 20         | Black (Std.)  |
| 21         | White         |
| 22         | Red           |
| 23         | Golden yellow |
| 24         | Nickel Plated |

### VARIOUS TYPES OF SWITCHING FUNCTION

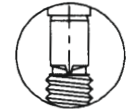
(Key way on right side)



Type - 1  
2 pos. lock



Type - 3 & 9  
3 pos. lock



Type 5 & 6  
1 pos. lock



Type - 7  
2 pos. lock



Type - 8  
1 pos. lock

\* NOTE : Dimensions shown above are with respect to bushing types (2,3,4 & 5)

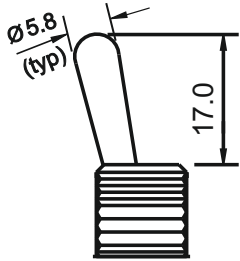


All Dimensions in mm.

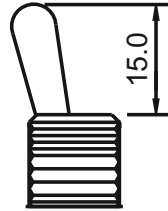
# TOGGLE SWITCHES



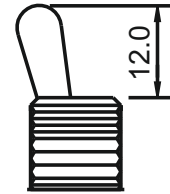
## Series - 20 Actuator Selection (For M12 Bushes)



Order Code : 43



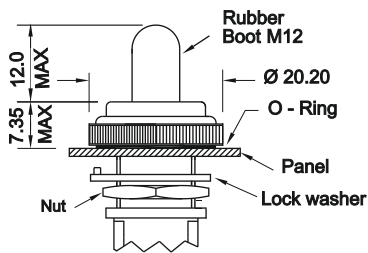
Order Code : 41



Order Code : 44

### PANEL SEALING TYPE

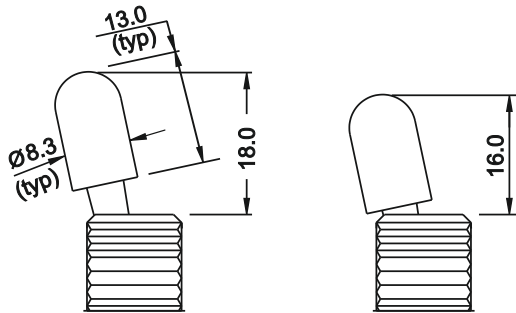
(Rubber Boot Type)



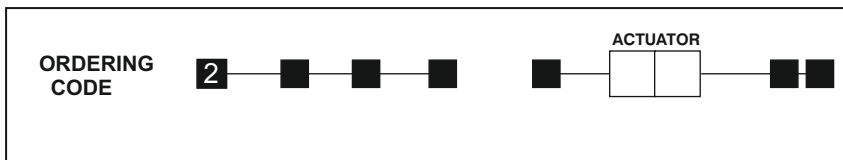
Order Code : 42

Note:- Actuator Length will be - 15.0mm only.

### PLASTIC CAP SELECTION



NOTE:- Cap's available in Red & Black Colour only. for 15.0 & 17.0 mm Actuator only.



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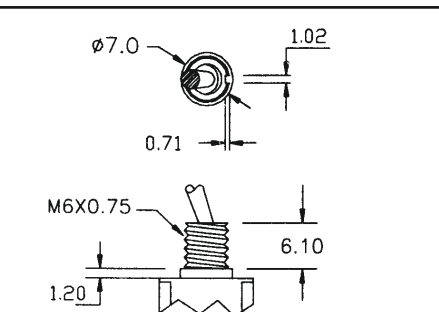
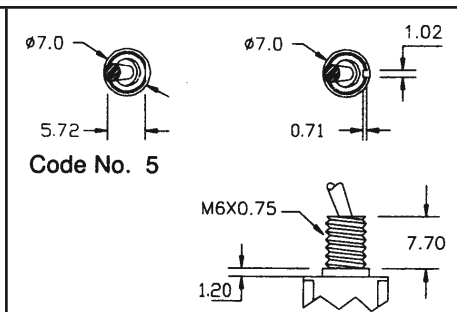
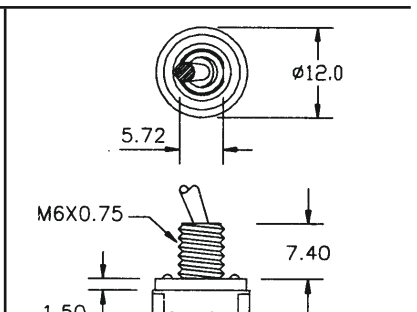
D-388/1, 1st Block, 1st Stage, Peenya Industrial Estate, Bangalore - 560 058, India

Telefax: (080) 2839 1707 / 2839 1708 / 2839 1709 / 2839 1710

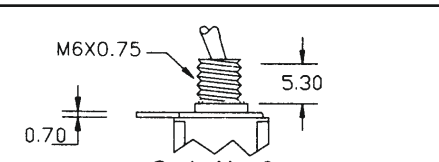
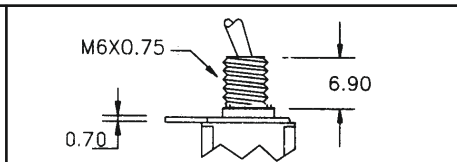
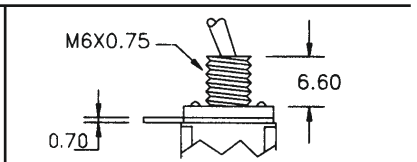
An ISO 9001:2008 Company Website: www.integralsys.in E-mail: inty.systems@gmail.com / sales@integralsys.in

**Series 20 Mounting Selection (M6x0.75)**

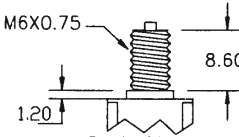
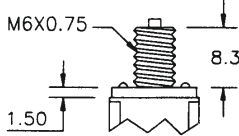
**BUSH DETAILS FOR PC STRAIGHT AND SOLDER TYPES**

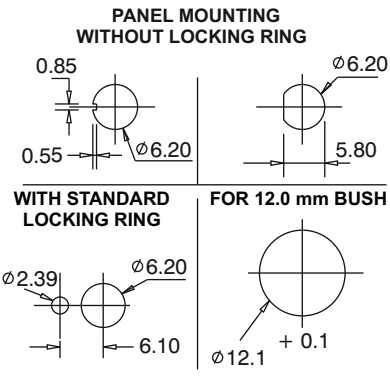
|   |   |  |
|---|---|--|
|  <p><b>Code No. 0</b></p> <p><b>Order Code</b>      <b>Description</b></p> <p><b>0</b>    Short threaded bush</p> <p><b>3</b>    Same as 0 without threading</p> |  <p><b>Code No. 1</b></p> <p><b>Order Code</b>      <b>Description</b></p> <p><b>1</b>    Standard threaded bush</p> <p><b>2</b>    Same as 1 without threading</p> <p><b>5</b>    Same as 1 with milled flat</p> |  <p><b>Code No. 4</b></p> <p><b>Order Code</b>      <b>Description</b></p> <p><b>4</b>    Threaded bush with panel seal and toggle splash proof seal.</p> |
|---|---|--|

**BUSH DETAILS FOR PCR / PCRV TYPES**

|   |   |   |
|---|---|---|
|  <p><b>Code No. 0</b></p> <p><b>Order Code</b>      <b>Description</b></p> <p><b>0</b>    Short threaded bush</p> <p><b>3</b>    Same as 0 without threading</p> |  <p><b>Code No. 1</b></p> <p><b>Order Code</b>      <b>Description</b></p> <p><b>1</b>    Standard threaded bush</p> <p><b>2</b>    Same as 1 without threading</p> <p><b>5</b>    Same as 1 with milled flat</p> |  <p><b>Code No. 4</b></p> <p><b>Order Code</b>      <b>Description</b></p> <p><b>4</b>    Threaded bush with panel seal toggle and splash proof seal. (Available on request)</p> |
|---|---|---|

**BUSH DETAILS (FOR LOCKING TYPE)**

|   |  |
|---|--|
|  <p><b>Code No. 1</b></p> <p><b>Order Code</b>      <b>Description</b></p> <p><b>1</b>    Threaded bush</p> <p><b>2</b>    Same as 1 without threading</p> |  <p><b>Code No. 7</b></p> <p><b>Order Code</b>      <b>Description</b></p> <p><b>7</b>    Threaded bush with panel seal and toggle splash proof seal.</p> |
|---|--|



**NOTE :**


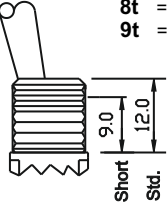
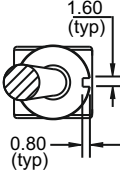
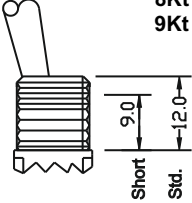
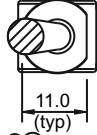
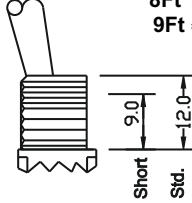

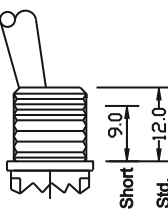

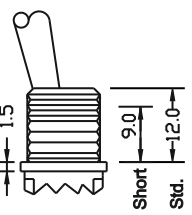

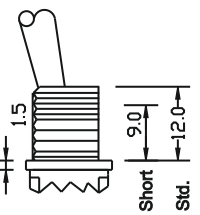

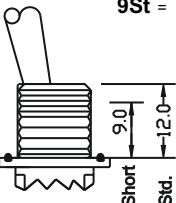

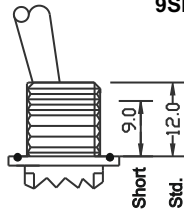

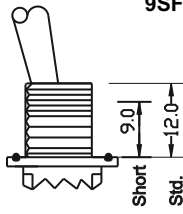
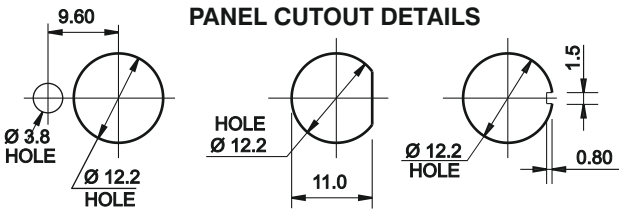

Above shown various types of bushes with M6 x 0.75 threading are readily available. For any other special type bush please contact factory.

BUSHING FINISH will be nickel plated (Standard)



All Dimensions in mm.

## Series - 20 Mounting Selection for M12 Bushes

|  |  |   |  |
|--|--|---|--|
|  <p><b>Order Code</b><br/><b>Standard Bush</b></p> <p><b>8</b> = Ø12 Unthreaded Bush<br/><b>9</b> = M12x0.75 Threaded Bush</p> <p><b>Short Bush</b></p> <p><b>8t</b> = Ø12 Unthreaded Bush<br/><b>9t</b> = M12x0.75 Threaded Bush</p>    |  <p><b>Order Code</b><br/><b>Standard Bush</b></p> <p><b>8K</b> = Ø12 Unthreaded Bush<br/><b>9K</b> = M12x0.75 Threaded Bush</p> <p><b>Short Bush</b></p> <p><b>8Kt</b> = Ø12 Unthreaded Bush<br/><b>9Kt</b> = M12x0.75 Threaded Bush</p>    |  <p><b>Order Code</b><br/><b>Standard Bush</b></p> <p><b>8F</b> = Ø12 Unthreaded Bush<br/><b>9F</b> = M12x0.75 Threaded Bush</p> <p><b>Short Bush</b></p> <p><b>8Ft</b> = Ø12 Unthreaded Bush<br/><b>9Ft</b> = M12x0.75 Threaded Bush</p>   |  |
|  <p><b>Order Code</b><br/><b>Standard Bush</b></p> <p><b>8C</b> = Ø12 Unthreaded Bush<br/><b>9C</b> = M12x0.75 Threaded Bush<br/><b>9CS</b> = M12x0.75 Threaded Bush</p> <p><b>Short Bush</b></p> <p><b>8Ct</b> = Ø12 Unthreaded Bush<br/><b>9Ct</b> = M12x0.75 Threaded Bush<br/><b>9CSt</b> = M12x0.75 Threaded Bush</p>  |  <p><b>Order Code</b><br/><b>Standard Bush</b></p> <p><b>8KC</b> = Ø12 Unthreaded Bush<br/><b>9KC</b> = M12x0.75 Threaded Bush<br/><b>9KCS</b> = M12x0.75 Threaded Bush</p> <p><b>Short Bush</b></p> <p><b>8KCt</b> = Ø12 Unthreaded Bush<br/><b>9KCt</b> = M12x0.75 Threaded Bush<br/><b>9KCSt</b> = M12x0.75 Threaded Bush</p>  |  <p><b>Order Code</b><br/><b>Standard Bush</b></p> <p><b>8FC</b> = Ø12 Unthreaded Bush<br/><b>9FC</b> = M12x0.75 Threaded Bush<br/><b>9FCS</b> = M12x0.75 Threaded Bush</p> <p><b>Short Bush</b></p> <p><b>8FCt</b> = Ø12 Unthreaded Bush<br/><b>9FCt</b> = M12x0.75 Threaded Bush<br/><b>9FCS</b> = M12x0.75 Threaded Bush</p>  |  |
| <p><b>NOTE :- PANEL SEALING CAN BE GIVEN FOR ABOVE BUSH SELECTION EXCEPT FOR UNTHREADED BUSH.</b></p>  |  |   |  |
| <p><b>SPLASH PROOF</b></p>   |  |   |  |
|  <p><b>Order Code</b><br/><b>Standard Bush</b></p> <p><b>9S</b> = M12x0.75 Threaded Bush</p> <p><b>Short Bush</b></p> <p><b>9St</b> = M12x0.75 Threaded Bush</p>   |  <p><b>Order Code</b><br/><b>Standard Bush</b></p> <p><b>9Sk</b> = M12x0.75 Threaded Bush</p> <p><b>Short Bush</b></p> <p><b>9SkT</b> = M12x0.75 Threaded Bush</p>   |  <p><b>Order Code</b><br/><b>Standard Bush</b></p> <p><b>9SF</b> = M12x0.75 Threaded Bush</p> <p><b>Short Bush</b></p> <p><b>9SFt</b> = M12x0.75 Threaded Bush</p>    |  |
| <p><b>PANEL CUTOUT DETAILS</b></p>    |  |   | <p>Above shown various type of Bushes with M12 x 0.75 Threading are readily available. For any other special type Bush please Contact Factory.</p> <p>BUSHING FINISH will be Nickel Plated (Standard)</p>  |
| <p>t=Short Bush, R=Round, K=Key way, F= Milled Flat, C= Collar, S=Sealing.</p>   |  |   |  |

# TOGGLE SWITCHES



## Series 20 - Special Custom Built Switches

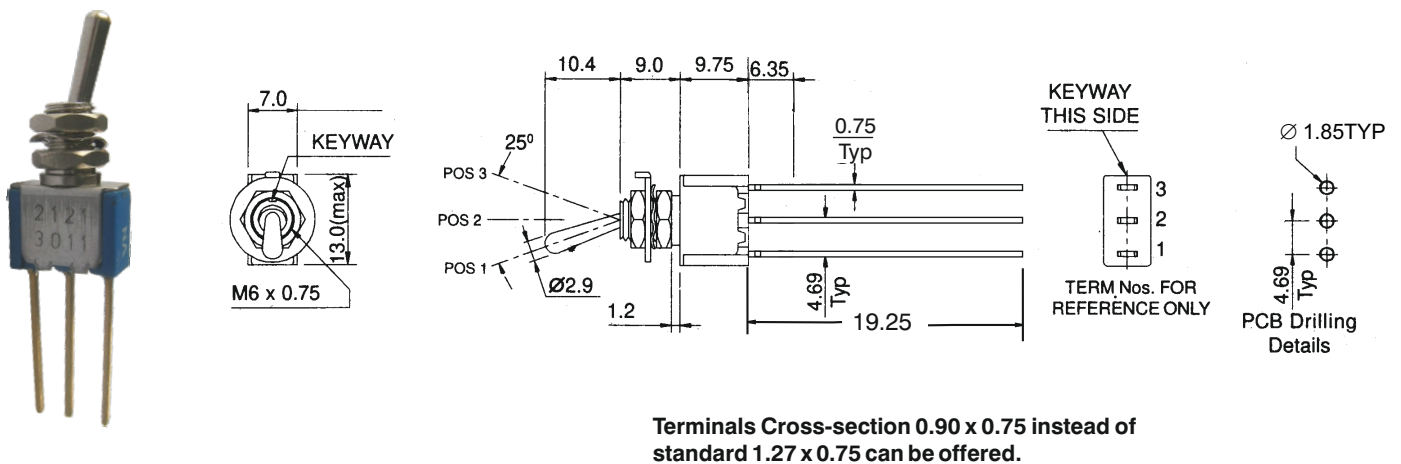
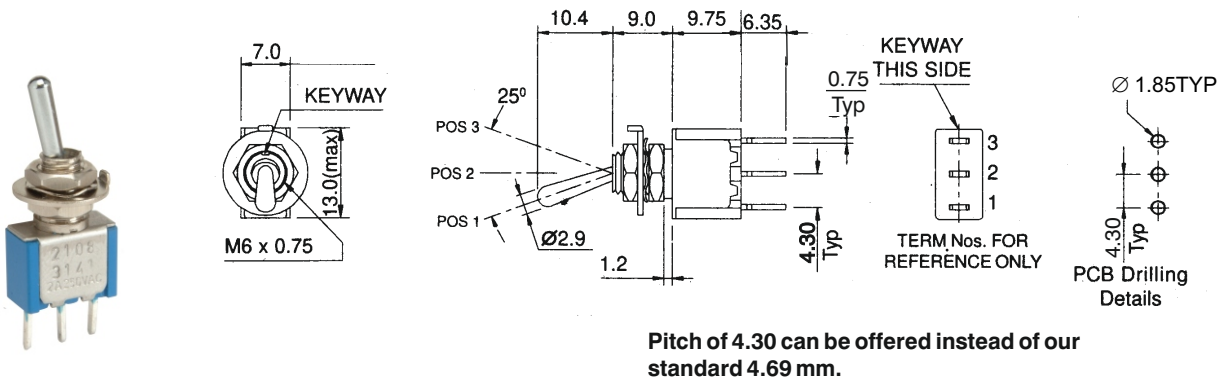
### DESCRIPTION :

In Series 20 Toggle Switches, modifications are possible to meet customer's special requirements.

A very large number of variations are possible in our standard line of switches due to a wide selection possible in choosing the number of poles, switching function, contact selection, actuator and mounting selection.

However sometimes there may be a customer requirement which is not met by any one of the innumerable combination. In such cases Integral can develop samples as per the customer's drawings. Due to employment of modern production techniques even small number of samples can be made to exact dimension.

### For Example :



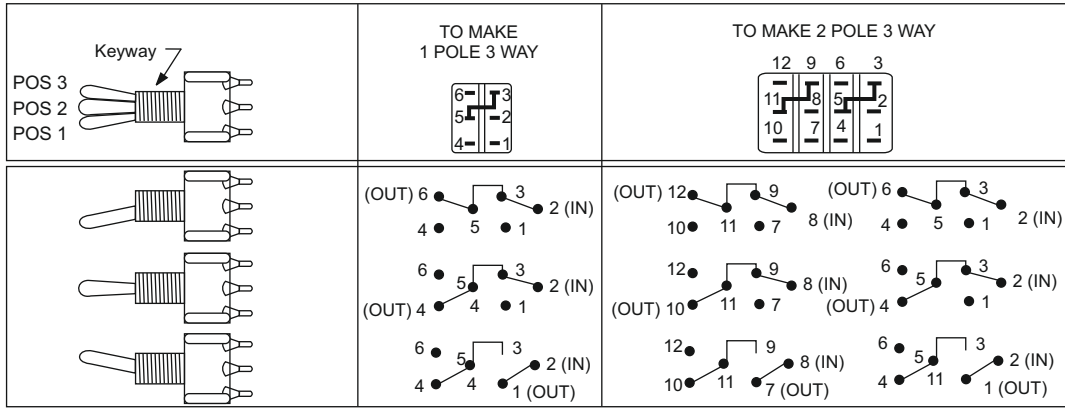
The factory can be contacted for special switches with specifications/drawings/samples, if available. Counter samples will be offered at the earliest.

All Dimensions in mm.

## Series 20 Special Switching Functions

On our Standard 20 Series Toggle Switches, IP-3 Position and 2P-3 Position Toggle Switch with ON-ON-ON Switch Functions may be externally wired for 3 Way Function (See Wiring Design and Schematics given below)

Note : External Jumpers to be added by customer wiring for 3 Way Switches



| ORDER CODE | POSITION 1 | POSITION 2 | POSITION 3 |
|------------|------------|------------|------------|
| 4          | ON         | ON         | MOM        |
| 6          | MOM        | ON         | MOM        |
| 9          | ON         | ON         | ON         |

| ORDER CODE | SWITCHING FUNCTION | CONNECTED TERMINALS |       |            |       |            |       |
|------------|--------------------|---------------------|-------|------------|-------|------------|-------|
|            |                    | POSITION 1          |       | POSITION 2 |       | POSITION 3 |       |
| 2          | 1P 3 WAY           | 2-3                 | 5-6   | 2-3        | 5-4   | 2-1        | 5-4   |
| 4          | 2P 3 WAY           | 2-3                 | 5-6   | 2-3        | 5-4   | 2-1        | 5-4   |
|            |                    | 8-9                 | 11-12 | 8-9        | 11-10 | 8-7        | 11-10 |

