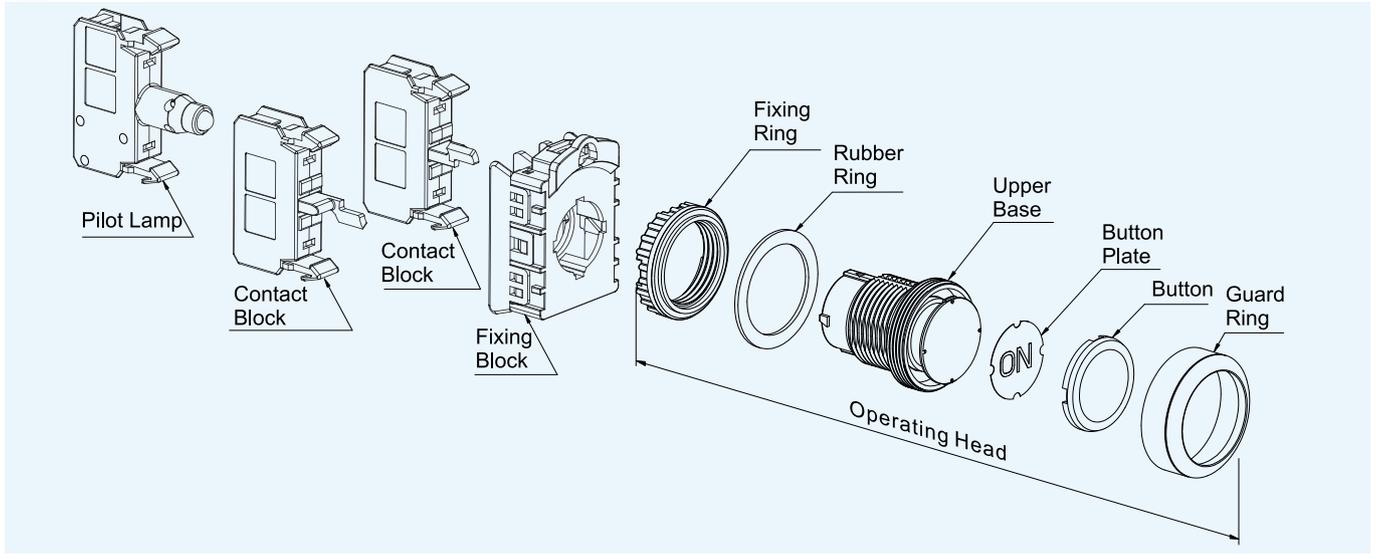


# tend TT2 Ø22/Ø25/Ø30 SERIES CONTROL COMPONENTS TT2

The operating head and contact block of TT2 series are detachable. The protection structure for this series is IP65(ICE144) for waterproof, oil ting and bust proof in harsh environment except Twin-Touch push button and illuminated push button switches are IP40.

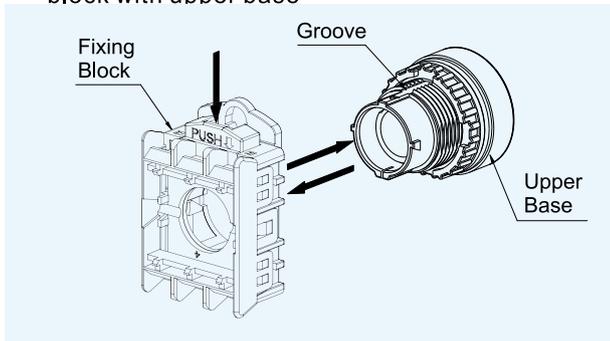
## ■ CONFIGURATION OF SWITCHES



## ■ FEATURES

TT2 series switches are detachable in 3 sub-assembly. It consists of upper base, fixing block and contact block

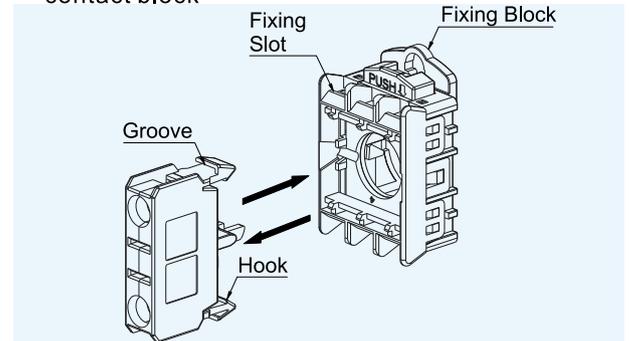
- Assembly and disassembly of fixing block with upper base



Assembly: Align the hole on top of fixing block with groove on the upper base and push them together.

Disassembly: Place downward by hand or use flat screwdriver to push down the orange button thru the hole on top of fixing block.

- Assembly and disassembly of fixing block with contact block

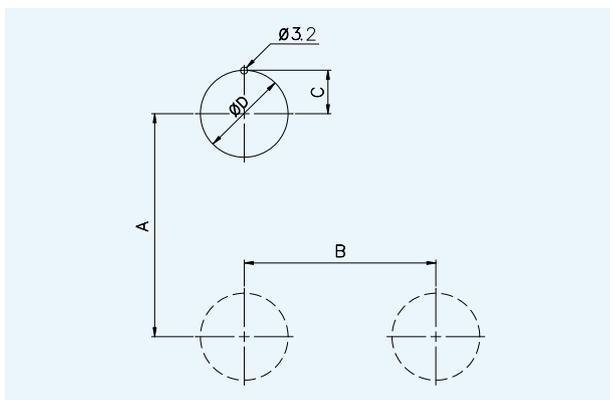


Assembly: Align the fixing slot on the fixing block to clip slot on contact block.

Disassembly: use flat screwdriver toward fixing slot to lift up clip and snap for disassembly.

## ■ PANEL CUT-OUT

Ø22/Ø25/Ø30 Series

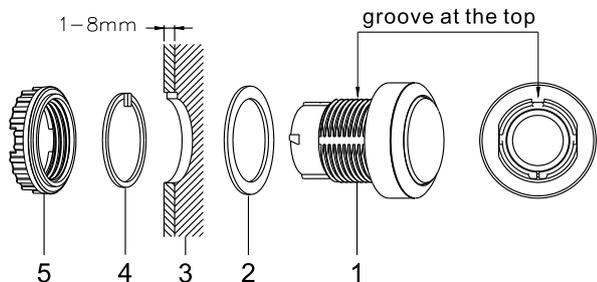


## DIMENSIONS(mm)

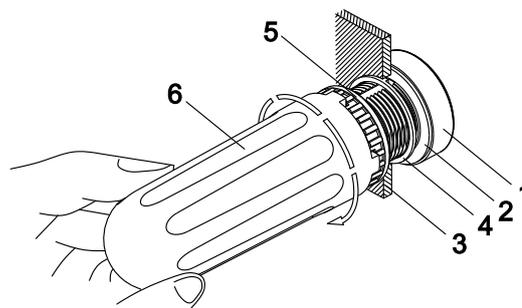
SERIES		Ø22	Ø25	Ø30
A	All types except Twin-touch & Joystick	50min.		
	Twin-Touch	60min.		
	Joystick	90min.		
B	Light push button & selector	31	31	35
	With name plate	41min.		
	Mushroom, Push - Lock, Long & Lever Selector, Twin - touch	39min.		
	Joystick	90min.		
C	All types	11.2	12.7	15.2
D	All types	22.4	25.4	30.4

# tend TT2 Ø22/Ø25/Ø30 SERIES CONTROL COMPONENTS TT2

## ■ MOUNTING METHOD



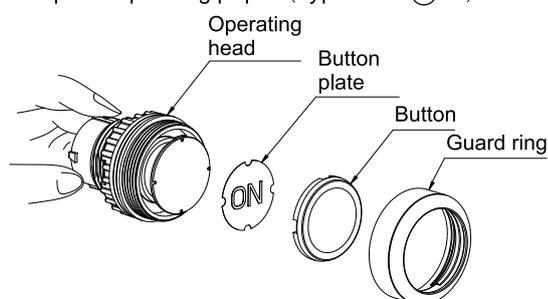
1	2	3	4	5	6
operating head	rubber ring	panel	stop ring	fixing ring	fixing tool



- Install the operating head and rubber ring through the front panel and tighten fixing ring with fixing tool

## ■ INDICATION OF LETTERS AND SYMBOLS

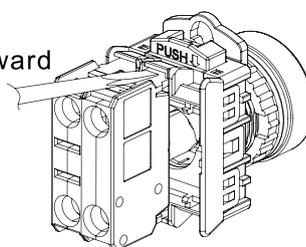
Transparent printing paper (types: see (A)14)



## ■ LAMP REPLACEMENT

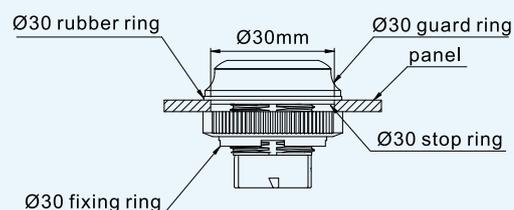
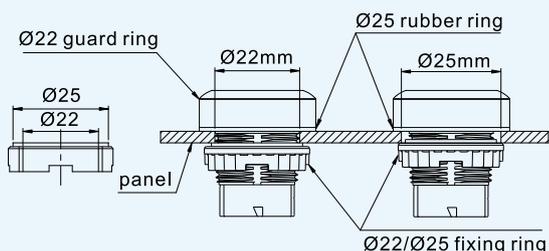
The lamp has to be replaced with lamp base.

Use flat screwdriver toward groove to lift up fixing block for disassembly.



## ■ Ø22mm/Ø25mm SERIES ARE THE SAME DIMENSIONS WITH COMMON FIXING RING.

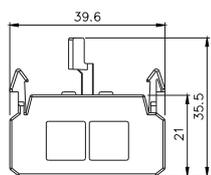
## ● THE ASSEMBLY METHOD FOR Ø30 SERIES



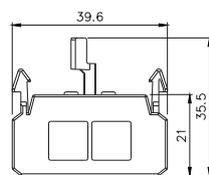
## ■ TYPES OF CONTACT BLOCK AND EXTENTION OF CONTACT BLOCK

There are 1a(1NO) 、1b(1NC) and 1c(1NO、1NC) .

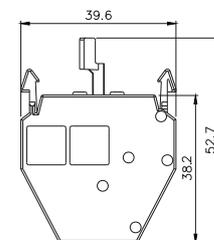
### TT2-A(1a)



### TT2-B(1b)

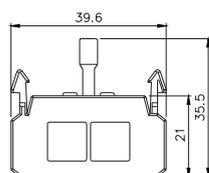


### TT2-C(1c)

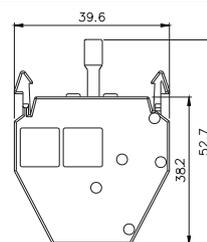


## ■ CONTACT BLOCK FOR TT2MR AND TT3MR SERIES. THE CONTACT BLOCK IS ONLY FOR JOYSTICK AND CAN NOT BE USED IN ANY OTHER TYPE OF SWITCHES.

### TT2MR-A(1a)



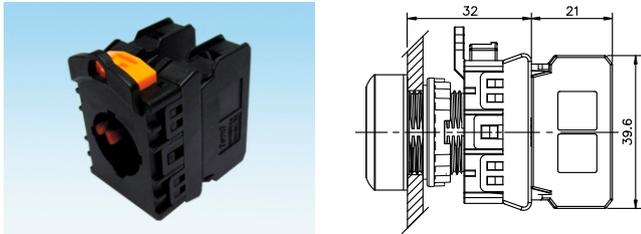
### TT2MR-C(1c)



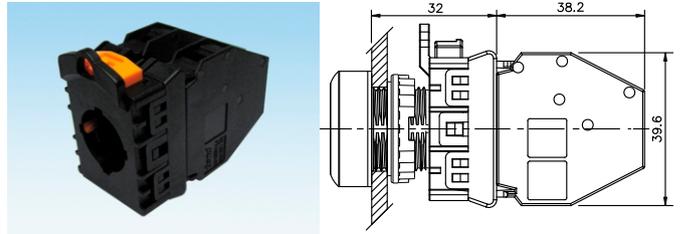
# tend TT2 Ø22/Ø25/Ø30 SERIES CONTROL COMPONENTS TT2

## DIMENSIONS OF STAND CONTACT BLOCK

TT2-1a~TT2-2a, TT2-1b~TT2-2b, TT2-1ab

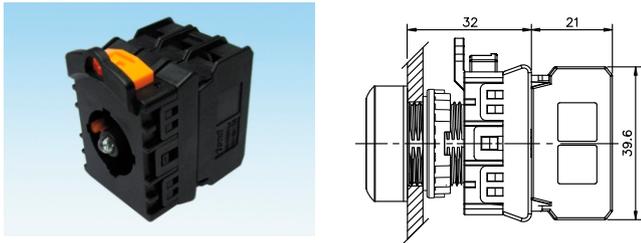


TT2-1c~TT2-2c

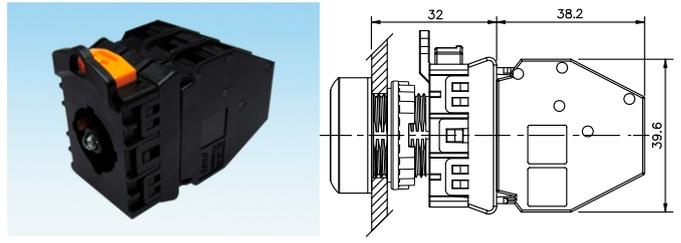


## DIMENSIONS OF DIRECT CONTACT BLOCK

TT2-I1a~TT2-I2a, TT2-I1b~TT2-I2b, TT2-I1ab



Tt2-I1c~TT2-I2c



## CONTACT RATING

AC	AC11	AC24V	AC110V	AC220V	AC380V	AC440V	DC	DC11	DC24V	DC110V	DC220V	DC380V
	Inductive load		10A	6A	4A	2.5A		2A	Inductive load	1.5A	0.5A	0.2A
Resistive load		10A	10A	6A	5A	4A	DC14 Resistive load	10A	2A	0.6A	0.2A	

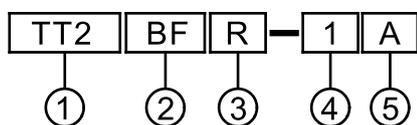
## CHARACTERISTICS

Operating frequency	Mechanically	Push button(momentary) 60 cycles / min., Others 30 cycles / min.
	Electrically	30 cycles / min.
Service life	mechanically	Push button(momentary)3,000,000 operations., Others 300,000 operations.
	Electrically	Push button(momentary)500,000 operations., Others 200,000 operations.
Shock	Durability	Tans former series 600m/s <sup>2</sup> . . others 1000m/s <sup>2</sup>
	Malfunction	Push button(momentary)1000m/s <sup>2</sup> . . others 250m/s <sup>2</sup>
Vibration	Malfunction	10~55Hz double amplitude 1.5mm
Contact resistance	50mΩ max. (Initial value)	
Insulation resistance	100MΩ min. (500VDC)	
Dielectric strength	2500VAC, 50/60 HZ for 1minute	
Ambient temperature	-20°C~+60°C	
Humidity	45~85%RH	

## STANDARD CONTACT BLOCKS

Type	TT2-1A	TT2-1B	TT2-1AB	TT2-1AB(BT用)	TT2-1C	TT2-2A	TT2-2B	TT2-2C
Contact	1a	1b	1a+1b	1a+1b	1a1b	2a	2b	2a2b
Contact Arrangement								

## MODEL DESIGNATION

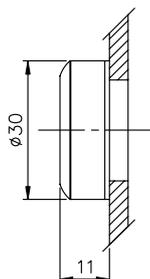
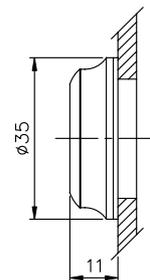
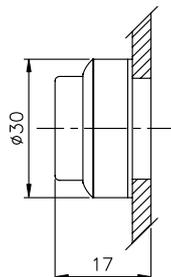
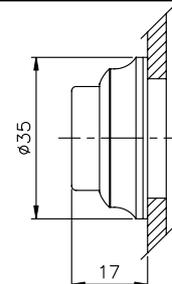
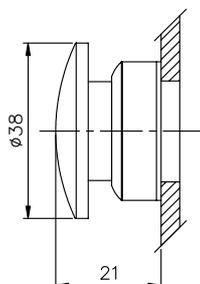
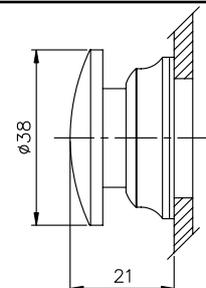
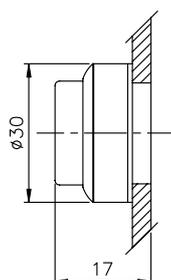
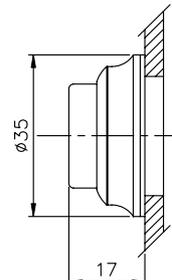


Designation	Signal	Description
1. Mounting hole	TT2 TT3	Ø22mm/Ø25mm Ø30mm
2. Type	BF BL BM BA BK BP BT	Flat Head Long Head Mushroom Head Long Head(Alternate) Push-Lock Push-Pull Twin-Touch ▲

Designation	Signal	Description
3. Lens Color	R	Red
	G	Green
	Y	Yellow
	W	White
	BL B	Blue Black
4. NO. of contacts Fitted	1	1
	2	2
5. Type of contact Block Fitted	A	1a
	B	1b
	C	1a1b
	AB	1a+1b

▲ Only be used with AB contact

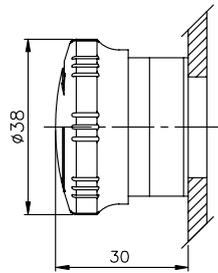
## OPERATING HEADS DIMENSIONS

**TT2BF**

**TT3BF**

**TT2BL**

**TT3BL**

**TT2BM**

**TT3BM**

**TT2BA**

**TT3BA**


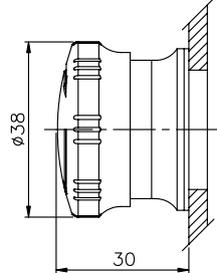
# tend PUSH BUTTON SWITCH (TT2 Ø22/Ø25/Ø30)

TT2

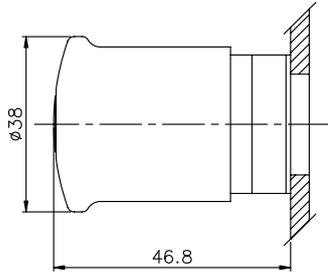
TT2BK



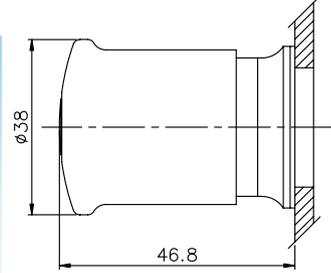
TT3BK



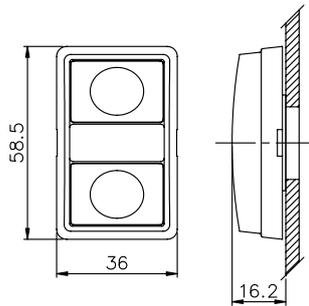
TT2BP



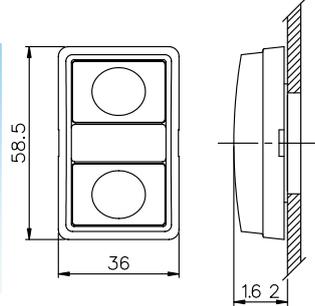
TT3BP



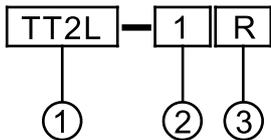
TT2BT



TT3BT



## MODEL DESIGNATION

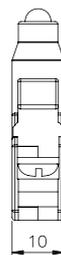
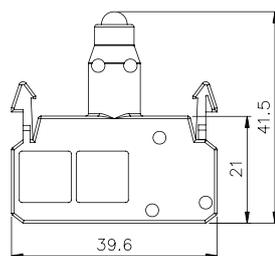


Designation	Signal	Description
1.Type	TT2L	LED Bulb

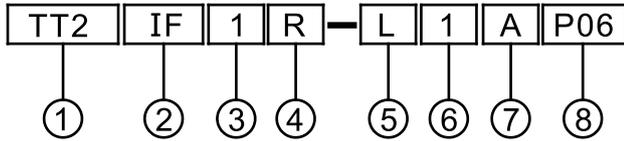
Designation	Signal	Description	
2. Voltage	1	110VAC	6~9mA
	2	220VAC	
	5	6VAC/DC	13~17mA
	7	24VAC/DC	
	8	30VAC/DC	
3. Lens Color	9	12VAC/DC	
	R	Red	
	G	Green	
	O	Orange	
	W	White	
	BL	Blue	

## LAMP HOLDER BLOCKS (DIRECT POWER)

### LED Lamp Base



## MODEL DESIGNATION



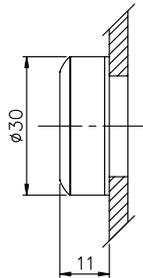
Designation	Signal	Description
1. Mounting Hole	TT2 TT3	Ø22mm/Ø25mm Ø30mm
2. Type	IF IL IM IA IK IT	Flat Head Long Head Mushroom Head Long Head(Alternate) Push-Lock Twin-Touch ▲
3. Voltage	1 2 5 7 8 9	110VAC 220VAC 6VAC/DC 24VAC/DC 30VAC/DC 12VAC/DC

Designation	Signal	Description
4. Lens Color	R	Red
	G	Green
	O	Orange
	W	White
	BL	Blue
	C	Claiy
5. Lamp	L	LED Bulb
6. No. Of Contacts Fitted	1	1
	2	2
7. Type of contact block fitted	A	1a
	B	1b
	C	1a1b
	AB	1a+1b
8. Lettering	00	
	P01~P43	See page A 14 TPP
	M01~M22	See page A 14 TPM

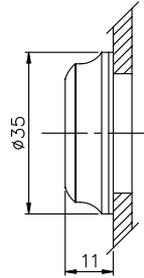
▲ Only be used with AB contact.

## OPERATING HEAD DIMENSIONS

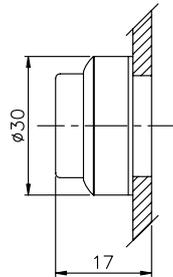
TT2IF



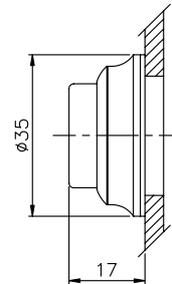
TT3IF



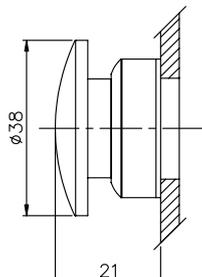
TT2IL



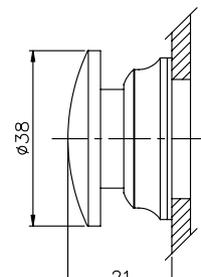
TT3IL



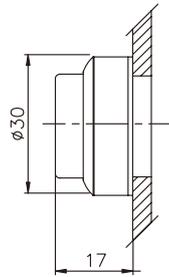
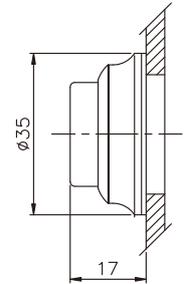
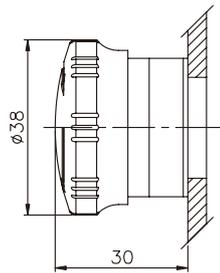
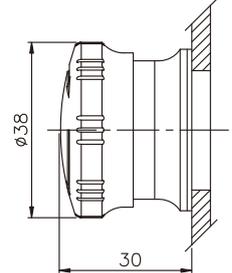
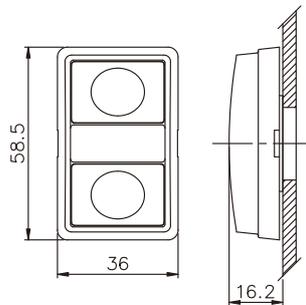
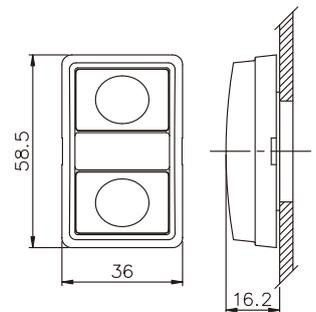
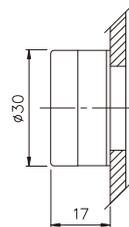
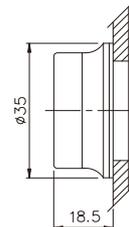
TT2IM



TT3IM



## OPERATING HEAD DIMENSIONS

**TT2IA**

**TT3IA**

**TT2IK**

**TT3IK**

**TT2IT**

**TT3IT**

**TT2IC**

**TT3IC**


## ILLUMINATED PUSH BUTTON(DIRECT POWER)CONTACT BLOCKS

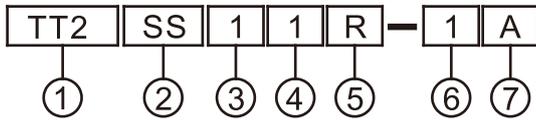
Type	TT2-I1A□□	TT2-I1B□□	TT2-I1AB□□	TT2-I1AB□□ (IT)	TT2-I1C□□	TT2-I2A□□	TT2-I2B□□	TT2-I2C□□
Contact	1a	1b	1a+1b	1a+1b	1a1b	2a	2b	2a2b
Contact Arrangement								

# tend ILLUMINATED PUSH BUTTON ( TT2 Ø22/Ø25/Ø30 WITH TRANSFORMER )

TT2

2 Positions contact block arrangement, 1C contact block arrangement for 2 Positions is 1a1b. 1C contact block arrangement for 3 Positions is 1a 0 1a.

## MODEL DESIGNATION

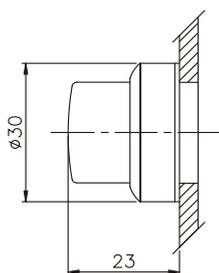


Designation	Signal	Description
1.Mounting Hole	TT2 TT3	Ø22mm/Ø25mm Ø30mm
2.Type	SS SH KS	Knob Operator Lever Operator Key Operator
3.Positions	1	90°X2 3-Position
	2	90° 2-Position
	3	90° 2-Position spring return from right
	4	45°X2 3-Position
	5	45°X2 3-Position spring return from right
	6	45°X2 3-Position spring return from left
	7	45°X2 3-Position 2-Way spring return

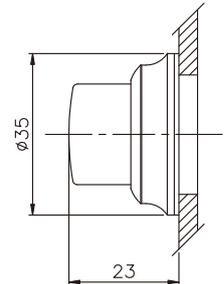
Designation	Signal	Description		
4.Key Withdrawable	1	2-Position	0 1 Key with-drawable	
	2		0 Key with-drawable	
	3		1 Key with-drawable	
	5.Lens Color	5	3-Position	1 0 2 Key with-drawable
		6		0 1 2 Key with-drawable
		7		0 Key with-drawable
				R G B
6.NO.of Contacts Fitted	1 2	1 2		
7.Type of contact block Fitted	A B C AB AA	2-Position	3-Position	
		1a 1b 1a1b 1a+1b —	— — — — 1a+1a(2a)	

## OPERATING HEADS DIMENSIONS

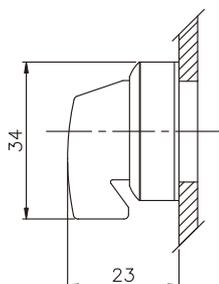
TT2SS



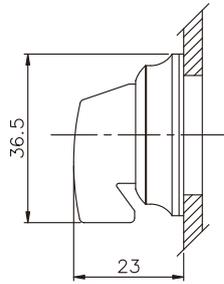
TT3SS



TT2SH

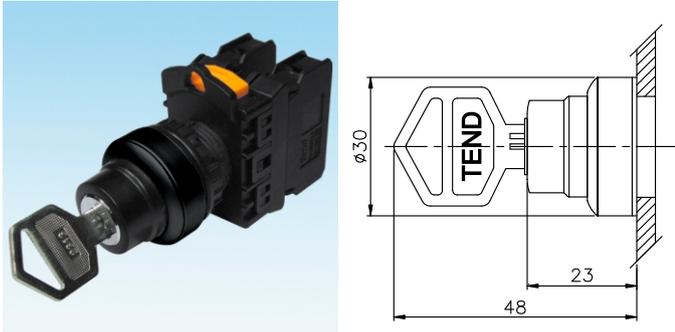


TT3SH

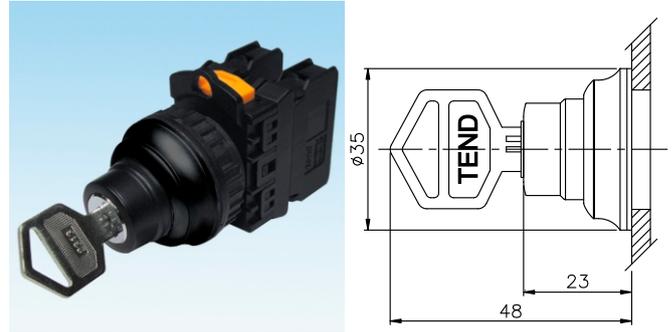


## OPERATING HEADS DIMENSIONS

TT2KS



TT3KS



## SELECTOR SWITCH 2-POSITION CONTACT ARRANGEMENT

Type	TT2-1A	TT2-1B	TT2-1AB	TT2-1C	TT2-2A	TT2-2B	TT2-2C																																																															
Contact	1a	1b	1a+1b	1a1b	2a	2b	2a2b																																																															
Contact Arrangement	<table border="1"> <tr><td>Contact</td><td>0</td><td>1</td></tr> <tr><td>23-24</td><td></td><td>X</td></tr> </table>	Contact	0	1	23-24		X	<table border="1"> <tr><td>Contact</td><td>0</td><td>1</td></tr> <tr><td>11-12</td><td>X</td><td></td></tr> </table>	Contact	0	1	11-12	X		<table border="1"> <tr><td>Contact</td><td>0</td><td>1</td></tr> <tr><td>11-12</td><td>X</td><td></td></tr> <tr><td>23-24</td><td></td><td>X</td></tr> </table>	Contact	0	1	11-12	X		23-24		X	<table border="1"> <tr><td>Contact</td><td>0</td><td>1</td></tr> <tr><td>21-22</td><td>X</td><td></td></tr> <tr><td>23-24</td><td></td><td>X</td></tr> </table>	Contact	0	1	21-22	X		23-24		X	<table border="1"> <tr><td>Contact</td><td>0</td><td>1</td></tr> <tr><td>13-14</td><td></td><td>X</td></tr> <tr><td>23-24</td><td></td><td>X</td></tr> </table>	Contact	0	1	13-14		X	23-24		X	<table border="1"> <tr><td>Contact</td><td>0</td><td>1</td></tr> <tr><td>11-12</td><td>X</td><td></td></tr> <tr><td>21-22</td><td>X</td><td></td></tr> </table>	Contact	0	1	11-12	X		21-22	X		<table border="1"> <tr><td>Contact</td><td>0</td><td>1</td></tr> <tr><td>11-12</td><td>X</td><td></td></tr> <tr><td>13-14</td><td></td><td>X</td></tr> <tr><td>21-22</td><td>X</td><td></td></tr> <tr><td>23-24</td><td></td><td>X</td></tr> </table>	Contact	0	1	11-12	X		13-14		X	21-22	X		23-24		X
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## SELECTOR SWITCH 3-POSITION CONTACT ARRANGEMENT

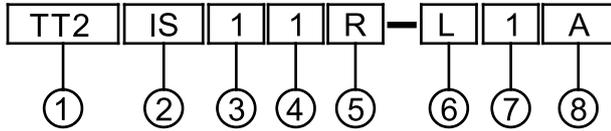
Type	TT2-1AA												
Contact	1a 0 1a												
Contact Arrangement	<table border="1"> <tr><td>Contact</td><td>1</td><td>0</td><td>2</td></tr> <tr><td>13-14</td><td>X</td><td></td><td></td></tr> <tr><td>23-24</td><td></td><td></td><td>X</td></tr> </table>	Contact	1	0	2	13-14	X			23-24			X
Contact	1	0	2										
13-14	X												
23-24			X										

# tend ILLUMINATED PUSH BUTTON ( TT2 Ø22/Ø25/Ø30 WITH TRANSFORMER )

TT2

2 Positions contact block arrangement, 1C contact block arrangement for 2 Positions is 1a1b. 1C contact block arrangement for 3 Positions is 1a 0 1a.

## MODEL DESIGNATION

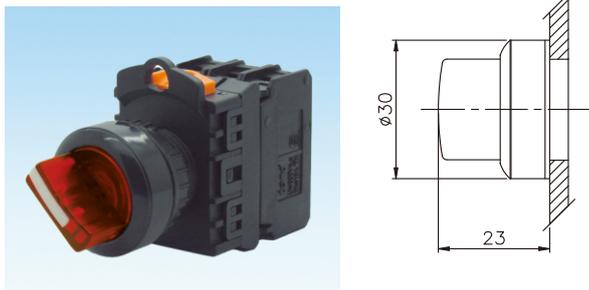


Designation	Signal	Description
1. Mounting Hole	TT2 TT3	Ø22mm/Ø25mm Ø30mm
2. Type	IS IH	Knob operator Lever operator
3. Positions	1	90° X2 3-Position
	2	90° 2-Position
	3	90° 2-Position spring return from right
	4	45° X2 3-Position
	5	45° X2 3-Position spring return from right
	6	45° X2 3-Position spring return from left
	7	45° X2 3-Position 2-way spring return

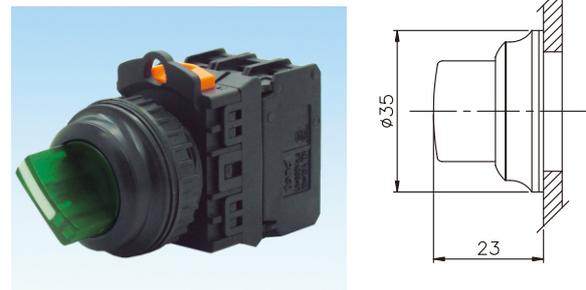
Designation	Signal	Description	
4. Key Withdrawable	1	110VAC	
	2	220VAC	
	5	6VAC/DC	
	7	24VAC/DC	
	8	30VAC/DC	
	9	12VAC/DC	
	5. Lens Color	R	Red
		G	Green
		O	Orange
W		White	
BL		Blue	
6. Lamp	L	LED Bulb	
7. NO. of Contacts Fitted	1	1	
	2	2	
8. Type of contact block Fitted	A	2-Position	3-Position
		1a	—
	B	1b	—
	C	1a1b	—
	AB	1a+1b	—
	AA	—	1a+1a(2a)

## OPERATING HEADS DIMENSIONS

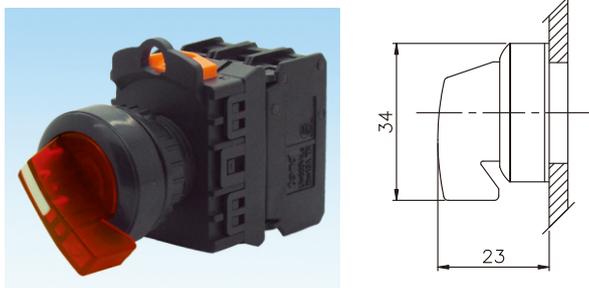
TT2IS



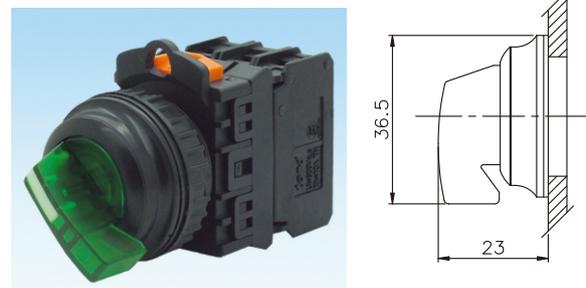
TT3IS



TT2IH



TT3IH



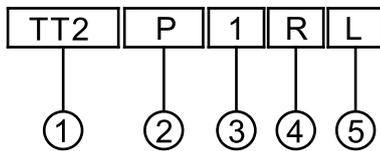
## ILLUMINATED SELECTOR SWITCH(DIRECT POWER)2-POSITION CONTACT ARRANGEMENT

Type	TT2-I1A	TT2-I1B	TT2-I1AB	TT2-I1C	TT2-I2A	TT2-I2B	TT2-I2C																																																															
Contact	1a	1b	1a+1b	1a1b	2a	2b	2a2b																																																															
Contact Arrangement	<table border="1"> <tr> <td>Contact</td> <td>0</td> <td>1</td> </tr> <tr> <td>23-24</td> <td></td> <td>X</td> </tr> </table>	Contact	0	1	23-24		X	<table border="1"> <tr> <td>Contact</td> <td>0</td> <td>1</td> </tr> <tr> <td>11-12</td> <td>X</td> <td></td> </tr> </table>	Contact	0	1	11-12	X		<table border="1"> <tr> <td>Contact</td> <td>0</td> <td>1</td> </tr> <tr> <td>11-12</td> <td>X</td> <td></td> </tr> <tr> <td>23-24</td> <td></td> <td>X</td> </tr> </table>	Contact	0	1	11-12	X		23-24		X	<table border="1"> <tr> <td>Contact</td> <td>0</td> <td>1</td> </tr> <tr> <td>21-22</td> <td>X</td> <td></td> </tr> <tr> <td>23-24</td> <td></td> <td>X</td> </tr> </table>	Contact	0	1	21-22	X		23-24		X	<table border="1"> <tr> <td>Contact</td> <td>0</td> <td>1</td> </tr> <tr> <td>13-14</td> <td></td> <td>X</td> </tr> <tr> <td>23-24</td> <td></td> <td>X</td> </tr> </table>	Contact	0	1	13-14		X	23-24		X	<table border="1"> <tr> <td>Contact</td> <td>0</td> <td>1</td> </tr> <tr> <td>11-12</td> <td>X</td> <td></td> </tr> <tr> <td>21-22</td> <td>X</td> <td></td> </tr> </table>	Contact	0	1	11-12	X		21-22	X		<table border="1"> <tr> <td>Contact</td> <td>0</td> <td>1</td> </tr> <tr> <td>11-12</td> <td>X</td> <td></td> </tr> <tr> <td>13-14</td> <td></td> <td>X</td> </tr> <tr> <td>21-22</td> <td>X</td> <td></td> </tr> <tr> <td>23-24</td> <td></td> <td>X</td> </tr> </table>	Contact	0	1	11-12	X		13-14		X	21-22	X		23-24		X
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## ILLUMINATED SELECTOR SWITCH (DIRECT POWER)3-POSITION CONTACT ARRANGEMENT

Type	TT2-I1AA												
Contact	1a 0 1a												
Contact Arrangement	<table border="1"> <tr> <td>Contact</td> <td>1</td> <td>0</td> <td>2</td> </tr> <tr> <td>13-14</td> <td>X</td> <td></td> <td></td> </tr> <tr> <td>23-24</td> <td></td> <td></td> <td>X</td> </tr> </table>	Contact	1	0	2	13-14	X			23-24			X
Contact	1	0	2										
13-14	X												
23-24			X										

## MODEL DESIGNATION

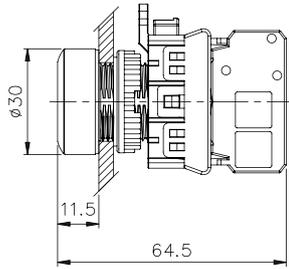


Designation	Signal	Description
1.Mounting Hole	TT2 TT3	Ø22mm/Ø25mm Ø30mm
2.Type	P	Direct Power

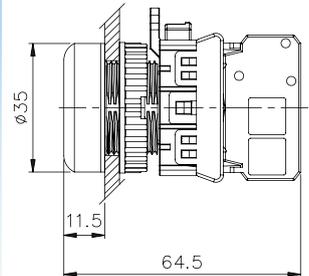
Designation	Signal	Description	
3.Voltage	1	110VAC	
	2	220VAC	
	5	6VAC/DC	
	7	24VAC/DC	
	8	30VAC/DC	
	9	12VAC/DC	
	4.Lens Color	R	Red
		G	Green
		O	Orange
W		White	
BL		Blue	
5.Lamp	L	LED Bulb	

## PILOT LAMP(DIRECT POWER)DIMENSIONS

TT2P

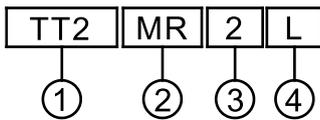


TT3P



# tend JOYSTICK (TT2 Ø22/Ø25/Ø30)

## MODEL DESIGNATIONS

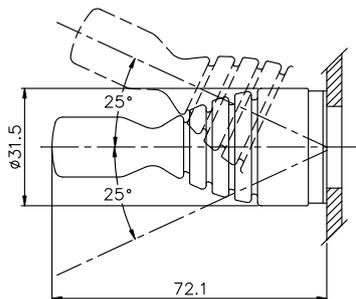


The contact block of the Joystick will have printed marking UDLR for Up ,Down, Left & Right direction. The contact block is only for Joystick and can not be used in any other type of switches.

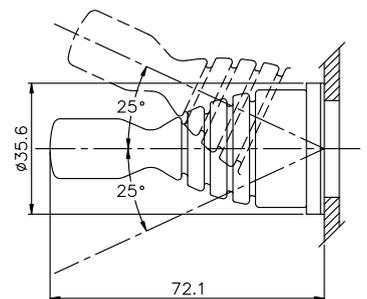
Designation	Signal	Description
1.Mounting Hole	TT2 TT3	Ø22mm/Ø25mm Ø30mm
2.Type	MR	Joystick
3.Direct	2 4	Up & down 2 directions Up,down,left &right 4 directions
4.Movement Way	L R	Retain Return

## JOYSTICK DIMENSIONS

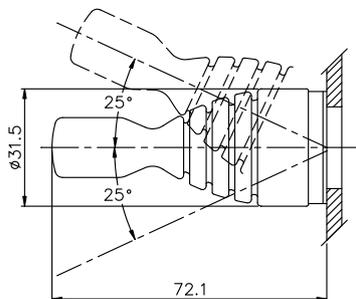
TT2MR2



TT2MR4



TT3MR2



TT3MR4

