



CAM-OPERATED CONTROL SWITCH

# H TYPE

Safety structure, high oil and flame resistant cam-operation switch



## FEATURES

- Up screw type is adopted. Screws do not drop off so wiring hour can be reduced.
- Finger protection structure is adopted for safety so terminal cover is not necessary.
- Contact arrangement is labeled on the body.
- High oil and flame resistant nylon resin is used.
- Twin-contact specification is available for low voltage - low current use. (H□O type)
- Water proof types are available. (HF and HJ type, IP 65)
- All types conform to RoHS directive.
- All types conform to EN (IEC) standard and acquired TUV certification. (except HJ type)  
(Please see page A90 for conformed standards.)

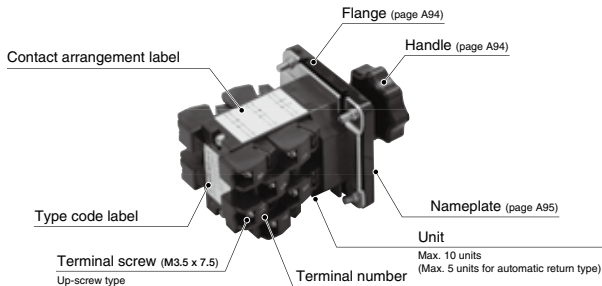


Up-screw type



Finger protection structure

## STRUCTURES



## SPECIFICATIONS (RATINGS, PERFORMANCE)

Item	Type	HE Type	HK Type	HS Type	HL Type	HF Type	HJ Type	H□O Type
<b>Rating</b>	<b>Contact</b>	standard contact (silver)						Twin-contact (normal)
	Rated insulation voltage (Ui)	600V						
	Rated current-carrying capacity (Ith)	10 A						2 A
	Power-frequency withstand voltage	2,500V AC / 1 min.						
	Impulse withstand voltage	6 kV						
<b>Performance</b>	<b>Max. wire size</b>	2mm <sup>2</sup> (2 wires)						
	<b>Terminal screw size</b>	M3.5x7.5						
	<b>Insulation resistance</b>	1,000MΩ or more (by 500V mega)						
	<b>Contact resistance</b>	50mΩ or less (initial)						
	<b>Electrical life</b>	250,000 times (AC-15 220V 7.5A)						100,000 times
		100,000 times (DC-13 110V 1.3A)						
	<b>Mechanical life</b>	5,000,000 times	250,000 times	5,000,000 times	1,000,000 times	250,000 times	1,000,000 times	
	<b>Vibration resistance</b>	Vibration: 16.7Hz, Vibration Amplitude: 3mm, 3 directions / 1 hour						
<b>Shock resistance</b>	500m/s <sup>2</sup> (Duration), 100m/s <sup>2</sup> (Malfunction), 6 directions / 3 times each							
<b>Protection grade</b>	IP40 (Panel front), IP20 (Terminal)			IP65 (Panel front), IP20 (Terminal)		IP40 (Panel front), IP20 (Terminal)		
<b>Standard operating condition</b>	<b>Operating temperature</b>	-20 to 60°C						
	<b>Storing temperature</b>	-40 to 70°C (No freeze, no dew condensation)						
	<b>Humidity</b>	45 to 85% (90% in 20°C max.)						
	<b>Altitude</b>	2,000 m or less						
<b>Standard</b>	• JIS C 8201-5-1 (2007) • JIS C 8201-1 (2007)		• IEC 60947-5-1 : 2003 (eqv.EN 60947-5-1 : 2004) • IEC 60947-1 : 2007 (eqv.EN 60947-1 : 2007)		• NECA C 4522 (2002) • NECA C 4520 (2002)			

## MAKING AND BREAKING CAPACITY

### ■ Making and breaking capacity under normal conditions

Load class	Make			Break		
	Voltage (V)	Current (A)	Cos φ T0.95(ms)	Voltage (V)	Current (A)	Cos φ T0.95(ms)
AC-12	1Ue	1Ie	0.9	1Ue	1Ie	0.9
AC-15	1Ue	10Ie	0.3	1Ue	1Ie	0.3
DC-12	1Ue	1Ie	1	1Ue	1Ie	1
DC-13	1Ue	1Ie	300	1Ue	1Ie	300

### ■ Making and breaking capacity under abnormal conditions

Load class	Make			Break		
	Voltage (V)	Current (A)	Cos φ T0.95(ms)	Voltage (V)	Current (A)	Cos φ T0.95(ms)
AC-15	1.1Ue	10Ie	0.3	1.1Ue	10Ie	0.3
DC-13	1.1Ue	1.1Ie	300	1.1Ue	1.1Ie	300

Switching : 10 times. There is no problems of the electrical and mechanical fault.  
 Standard : IEC60947-5-1 8.3.3.5.3

Switching : 6050 times  
 Standard : IEC60947-5-1 8.3.3.5.2  
 Ue : Rated operational voltage Ie : Rated operational current

## RATING OF CONTACTS

Contact	Rating			Note	Rating			Note	
	Load class	Rated operating current (Ie)	Rated operating voltage (Ie)		Load class	Rated operating current (Ie)	Rated operating voltage (Ie)		
Operating load class Rated operating current (Ie) Rated operating voltage (Ue)  ① Silver contact (normal)	Class AC-12	24V AC	10A	IEC60947-5-1 3.1	DC-12	24V DC	10A	Resistance load cos φ =0.9	
		110V AC	10A			48V DC	5A		
		220V AC	7.5A			110V DC	3A		
		440V AC	2.5A			220V DC	0.8A		
		550V AC	2A			440V DC	0.4A		
	AC-15	24V AC	10A		DC-13	24V DC	5A		Inductive load cos φ =0.3
		110V AC	7.5A			110V DC	1.3A		
		220V AC	7.5A			220V DC	0.45A		
		440V AC	2.5A			440V DC	0.2A		
		550V AC	1.5A			550V DC	0.15A		
Minimum applicable load (reference): 5V AC-500mA or more, 5V DC-100mA or more (however environment should be good)									
② Silver twin contacts	-	24V AC	0.5A	Resistance load cos φ =0.9	-	24V DC	0.5A	Inductive load L/R(T0.95)=1ms	
		50V AC	0.25A			12V DC	0.2A		
		12V DC	0.5A			24V DC	0.25A		
		24V DC	0.25A			Minimum applicable load (reference): 5V DC-1mA or more (however environment is good)			



CAM-OPERATED CONTROL SWITCH

# H TYPE

## HOW TO ORDER

**H** **E** **1** - **M** **2** **1** **0** **5** **H** **B** / **G** **W** **R** **E**  
 No. ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ ⑬ ⑭

No.	Item	Item	Code		
①	Basic type	H type cam-operated switch	H		
②	Mounting / Operational mechanism	Normal (with flange)	E		
		Normal (no flange)	X		
		Indicator lamp (with flange)	L		
		Key operation (with flange)	K		
		Separate key (with flange)	S		
		φ30mm hole mounting (ring nut mounting)	F		
		φ30mm hole mounting, key operation (ring nut mounting)	J		
		③	Contact type	Silver contact (normal)	1
Silver twin contact	0				
④	Return style	Manual return	M		
		Automatic return (only 3 notch)	A		
		Mix return (right: automatic, left: manual)	C		
		Automatic return with handle lock mechanism	L		
		Manual return with handle lock mechanism	B		
⑤	Notch number / type	2 to 9 notch: 2 to 9 10 notch: 0 11 notch: X 12 notch: Y	Please select a notch No. from page A96 to 103. * For specifications of other contact types, please make enquiry to Fuji Electric Industry.		
		<p>             2 notch (90° -2)    3 notch (45° -3)    4 notch (45° -4)    5 notch (45° -5)    6 notch (45° -6)    7 notch (45° -7)              8 notch (45° -8)    9 notch (30° -9)    10 notch (30° -10)    11 notch (30° -11)    12 notch (30° -12)           </p>			
⑥	No. of units	1 to 10 (10 : 0)    * Automatic return type: max. 5 units			
⑦ ⑧	Contact arrangement	01 to 99, CC (special contact specification)			
⑨	Handle	H: Beak shape, K: Egg shape, R: Rose shape, P: Pistol shape, S: Stick shape			
⑩	Handle color	B: Black, R: Red			
⑪ ⑫ ⑬	Indicator color/ position	Left (L1)	Middle (L2)	Right (L3)	Code
		—	Milky white	—	W
		Red	—	Green	RG
		Green	—	Red	GR
		Green	Milky white	Red	GWR
⑭	Lamp voltage	24V DC LED lamp: E			
⑮	Nameplate	Please select a nameplate from page A95.			

\* We can not assemble a switch with standard contact and twin contacts.





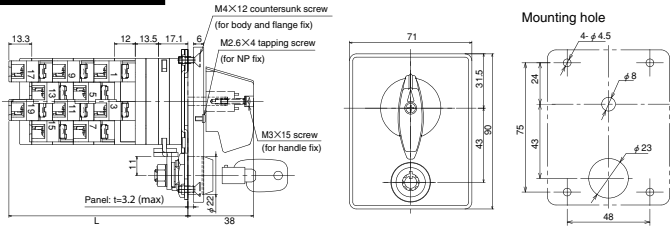
CAM-OPERATED CONTROL SWITCH

# H TYPE

## OUTLINES

Separate key and flange

### HS type

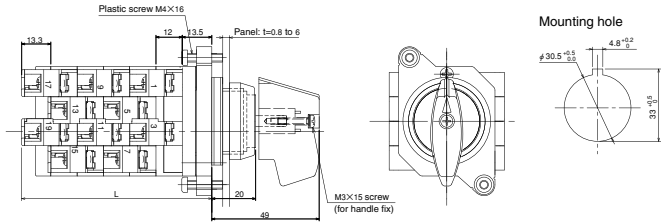


No. of units	1P	2P	3P	4P	5P	6P	7P	8P	9P	10P
L (mm)	55.9	67.9	79.9	91.9	103.9	115.9	127.9	139.9	151.9	163.9

- \* Key is removable at each position.
- \* About cylinder key, it's possible to specify a master key from out variation of the key. Please make enquiry to Fuji Electric Industry.

$\phi$  30mm hole mounting (ring nut mounting)

### HF type



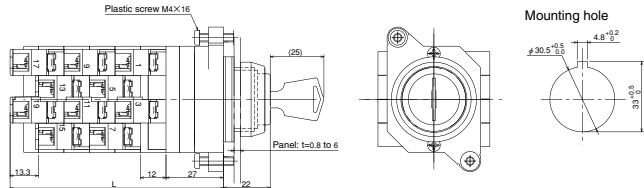
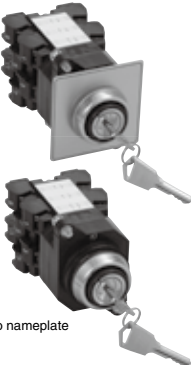
No. of units	1P	2P	3P	4P	5P	6P	7P	8P	9P	10P
L (mm)	38.8	50.8	62.8	74.8	86.8	98.8	110.8	122.8	134.8	146.8

L dimension for handle lock type is 17.5mm longer than the above dimensions.

- \* No nameplate

$\phi$  30mm hole mounting, key operation (ring nut mounting)

### HJ type




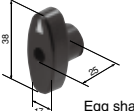
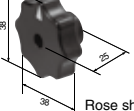



No. of units	1P	2P	3P	4P	5P	6P	7P	8P	9P	10P
L (mm)	52.3	64.3	76.3	88.3	100.3	112.3	124.3	136.3	148.3	160.3

- \* Key is removable at each position.



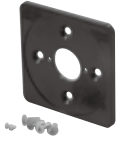

## ACCESSORIES

### Handle set

□ : B (Black), R (Red)

<p>H-HD-H-□-SET</p>  <p>Beak shape</p>	<p>H-HD-K-□-SET</p>  <p>Egg shape</p>	<p>H-HD-R-□-SET</p>  <p>Rose shape</p>
<p>H-HD-P-□-SET</p>  <p>Pistol shape</p>	<p>H-HD-S-□-SET</p>  <p>Stick shape</p>	<p><b>Attachment</b></p>  <p>Handle base (For Egg, Rose shape)</p> <p>Handle adapter (For Beak, Pistol, Stick shape)</p> <p>Fix screw (M3 x15)</p>

### Flange set

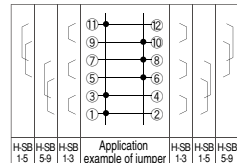
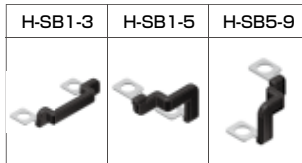
<p>H-FL-E-B-SET</p>  <p>(For HE type)</p>	<p>H-FL-L-□-B-SET □ : 1 (1 lamp) 2 (2 lamps) 3 (3 lamps)</p>  <p>(For HL type)</p>	<p>H-FL-K-B-SET</p>  <p>(For HK type)</p>	<p>H-FL-S-B-SET</p>  <p>(For HS type)</p>
<p>Screw ① Countersunk screw M4 x12 4pcs. ② Tapping screw M2.6x4 1pc.</p>	<p>Screw ① Countersunk screw M4 x12 4pcs. ② Tapping screw M2.6x4 1pc.</p>	<p>Screw ① Countersunk screw M4 x8 4pcs. ② Panhead screw M3 x8 2pcs.</p>	<p>Screw ① Countersunk screw M4 x12 4pcs. ② Tapping screw M2.6x4 1pc.</p>

\* Flange for indicator lamp type also available (For HE type).

### Ring nut



### Jumper





CAM-OPERATED CONTROL SWITCH

# H TYPE

## ACCESSORIES

### Nameplate (Plain)

H-NP-57-000	H-NP-K57-000	H-NP-S57-000	H-NP-F57-000
t=0.5 (For HE type, HL type)	t=0.5 (For HK type)	t=0.5 (For HS type)	t=0.5 (For HJ type, HF type) * With black border.

\* Nameplate is aluminized.

### Nameplate (Lettered)

H-NP-57-201C	H-NP-57-202C	H-NP-57-203C	H-NP-57-301C
H-NP-57-201EC	H-NP-57-202EC		

\* Other letters also available. Please make enquiry.

## CONTACT ARRANGEMENT DIAGRAM

### ■ 2-position changeover

#### ● 2 contacts (1 unit)

Type	2101	2102	2103	2104	2105	2106	2107	2108
Contact arrangement								

#### ● 4 contacts (2 units)

Type	2201	2202	2203	2204	2205	2206	2207	2208	2209
Contact arrangement									

#### ● 6 contacts (3 units)

Type	2301	2302	2303	2304	2305	2306	2307	2308	2309
Contact arrangement									

#### ● 8 contacts (4 units)

Type	2401	2402	2403	2404	2405	2406	2407	2408	2409
Contact arrangement									

Type	2410	2411	2412
Contact arrangement			

#### ● 10 contacts (5 units)

Type	2501	2502	2503	2504	2505	2506	2507	2508	2509
Contact arrangement									

A SWITCH

PILOT LAMP & INDICATOR

CONNECTING DEVICES

ELECTRONIC DEVICES

CONTROL CENTER PARTS





CAM-OPERATED CONTROL SWITCH

# H TYPE

## CONTACT ARRANGEMENT DIAGRAM

### 3-position changeover

#### 2 contacts (1 unit)

Type	3101	3102	3103	3104	3105	3106	3107	3108	3109
Contact arrangement									
Type	3110	3111	3112	3113	3114				
Contact arrangement									

#### 4 contacts (2 units)

Type	3201	3202	3203	3204	3205	3206	3207	3208	3209
Contact arrangement									
Type	3210	3211	3212	3213	3214	3215	3216	3217	3218
Contact arrangement									
Type	3219	3220	3221	3222	3223	3224	3225	3226	3227
Contact arrangement									
Type	3228	3229	3230						
Contact arrangement									

#### 6 contacts (3 units)

Type	3301	3302	3303	3304	3305	3306	3307	3308	3309
Contact arrangement									
Type	3310	3311	3312	3313	3314	3315	3316	3317	3318
Contact arrangement									

Type	3319	3320	3321	3322	3323	3324	3325	3326	3327
Contact arrangement									

Type	3328	3329	3330	3331	3332
Contact arrangement					

## ●8 contacts (4 units)

Type	3401	3402	3403	3404	3405	3406	3407	3408	3409
Contact arrangement									

Type	3410	3411	3412	3413	3414	3415	3416	3417	3418
Contact arrangement									

Type	3419	3420	3421	3422	3423	3424	3425	3426	3427
Contact arrangement									

Type	3428	3429	3430	3431	3432	3433	3434
Contact arrangement							



CAM-OPERATED CONTROL SWITCH

# H TYPE

## CONTACT ARRANGEMENT DIAGRAM

■ 3-position changeover

● 10 contacts (5 units)

Type	3501	3502	3503	3504	3505	3506	3507	3508	3509	
Contact arrangement										
	B	B	B	B	B	B	B	B	B	
	A	A	A	A	A	A	A	A	A	
	T	T	T	T	T	T	T	T	T	
	F	F	F	F	F	F	F	F	F	

Type	3510	3511	3512	3513	3514	3515	3516	3517	3518
Contact arrangement									
	B	B	B	B	B	B	B	B	B
	A	A	A	A	A	A	A	A	A
	T	T	T	T	T	T	T	T	T
	F	F	F	F	F	F	F	F	F

Type	3519	3520	3521	3522	3523	3524	3525
Contact arrangement							
	B	B	B	B	B	B	B
	A	A	A	A	A	A	A
	T	T	T	T	T	T	T
	F	F	F	F	F	F	F

■ 4-position changeover

● 4 contacts (2 units)

Type	4201	4202	4203	4204	4205	4206	4207	4208
Contact arrangement								
	B	B	B	B	B	B	B	B
	A	A	A	A	A	A	A	A
	T	T	T	T	T	T	T	T
	F	F	F	F	F	F	F	F

Type	4209	4210	4211	4212	4213	4214	4215	4216
Contact arrangement								
	B	B	B	B	B	B	B	B
	A	A	A	A	A	A	A	A
	T	T	T	T	T	T	T	T
	F	F	F	F	F	F	F	F

Type	4217	4218	4219	4220	4221	4222	4223	4224
Contact arrangement								
	B	B	B	B	B	B	B	B
	A	A	A	A	A	A	A	A
	T	T	T	T	T	T	T	T
	F	F	F	F	F	F	F	F

Type	4225	4226	4227	4228
Contact arrangement				
	B	B	B	B
	A	A	A	A
	T	T	T	T
	F	F	F	F

● 6 contacts (3 units)

Type	4301	4302	4303	4304	4305	4306	4307	4308
Contact arrangement								
Type	4309	4310	4311	4312	4313	4314	4315	4316
Contact arrangement								
Type	4317	4318	4319	4320	4321	4322	4323	4324
Contact arrangement								
Type	4325	4326	4327	4328	4329	4330	4331	4332
Contact arrangement								
Type	4333	4334	4335					
Contact arrangement								

● 8 contacts (4 units)

Type	4401	4402	4403	4404	4405	4406	4407	4408
Contact arrangement								
Type	4409	4410	4411	4412	4413	4414	4415	4416
Contact arrangement								



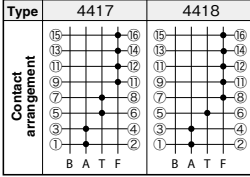
CAM-OPERATED CONTROL SWITCH

# H TYPE

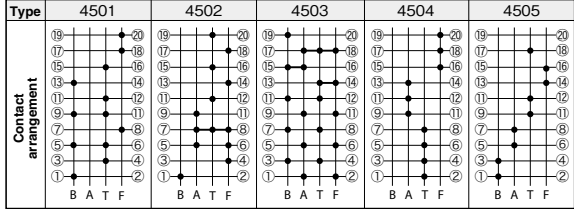
## CONTACT ARRANGEMENT DIAGRAM

### 4-position changeover

#### 8 contacts (4 units)

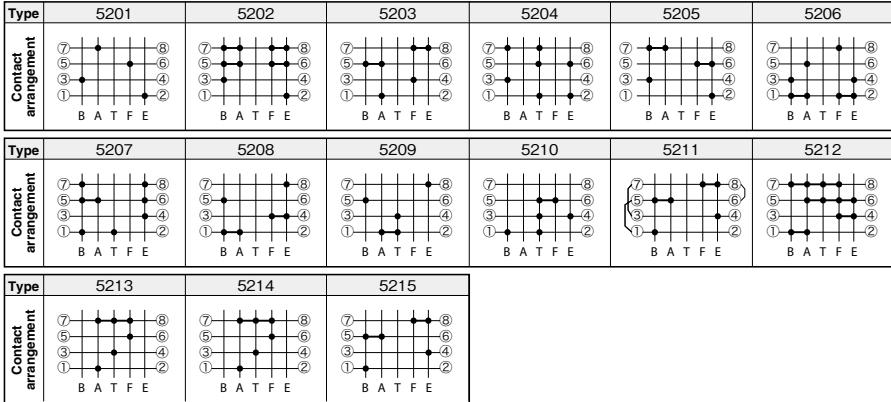


#### 10 contacts (5 units)

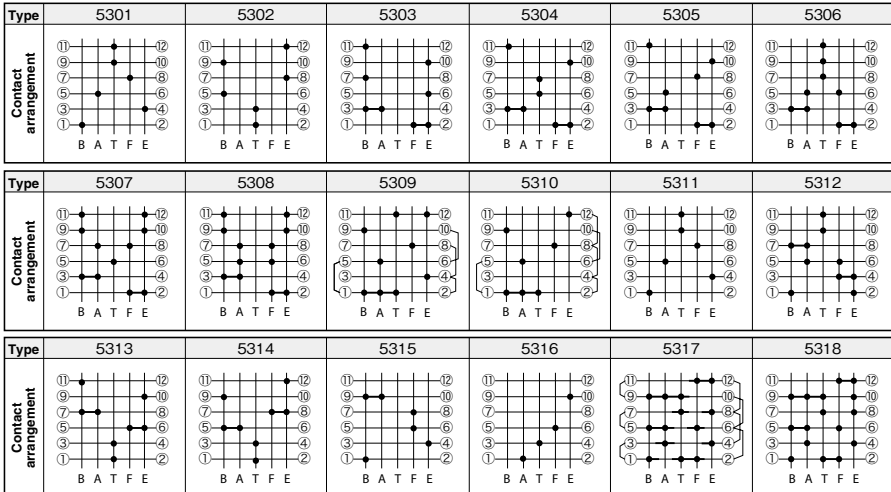


### 5-position changeover

#### 4 contacts (2 units)



#### 6 contacts (3 units)



Type	5320	5322
Contact arrangement		

### ● 8 contacts (4 units)

Type	5401	5402	5403	5404	5405	5406
Contact arrangement						

Type	5407	5408	5409	5410	5411	5412
Contact arrangement						

Type	5413	5414	5415	5416	5417	5418
Contact arrangement						

### ● 10 contacts (5 units)

Type	5501	5502	5503	5504	5505	5506
Contact arrangement						



CAM-OPERATED CONTROL SWITCH

# H TYPE

## CONTACT ARRANGEMENT DIAGRAM

### 5-position changeover

●10 contacts (5 units)

Type	5507	5508	5509	5510	5511
Contact arrangement					

### 6-position changeover

●6 contacts (3 units)

●8 contacts (4 units)

Type	6301
Contact arrangement	

Type	6401
Contact arrangement	

### 7-position changeover

●6 contacts (3 units)

●8 contacts (4 units)

Type	7302
Contact arrangement	

Type	7401
Contact arrangement	

Type	7402
Contact arrangement	

Type	7403
Contact arrangement	

### 8-position changeover

●8 contacts (4 units)

Type	8401
Contact arrangement	

Type	8402
Contact arrangement	

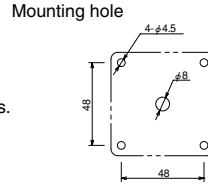
Type	8403
Contact arrangement	

## INSTRUCTIONS

### ■ How to mount on the panel (HE type)

#### 1) Mounting hole

- ① Max. panel thickness is 4.5mm.
  - ② Please make holes as shown on the right diagram.
- \* Mounting hole and max. panel thickness vary from switch types.

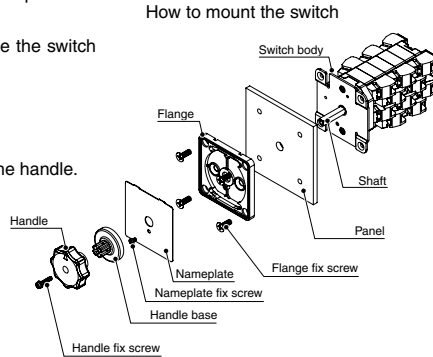


#### 2) Mounting procedure

- ① Get the switch shaft through a center hole in the panel.  
(Contact arrangement label side is upper.)
- ② Mount the flange from the front and assemble the switch body with 4 piece countersunk screws.
- ③ Mount the nameplate on the flange.
- ④ Fix the nameplate with a tapping screw.
- ⑤ Fix the handle base on the shaft and mount the handle.

Handle's installation angle can be changed every 22.5 degree.

- ⑥ Fix the handle with the handle fix screw.



#### 3) Screw torque

Screw type	Screw size / type	Proper tightening torque
Flange fix screw	M4×12 countersunk screw M4×8 countersunk screw (for HK type)	1.2 N · m
Nameplate fix screw	M2.6×4 tapping screw M3×8 pan head screw (for HK type)	0.6 N · m 0.5 N · m
Handle fix screw	M3×15 screw	0.5 N · m

\* Mounting procedure and proper torque are same as other type switches.

### ■ Wiring

- 1) Terminal screw Up-screw style pan head screw with a square washer (M3.5×7.5)
- 2) Applicable wire size 2 wires (max. 2mm<sup>2</sup>) are applicable.
- 3) Wiring direction Horizontal direction
- 4) Tightening torque

Screw type	Screw size / type	Proper tightening torque
Terminal screw	pan head screw with a square washer (M3.5×7.5)	0.8 N · m

\* Please put insulation cover on crimp terminal for insulation.