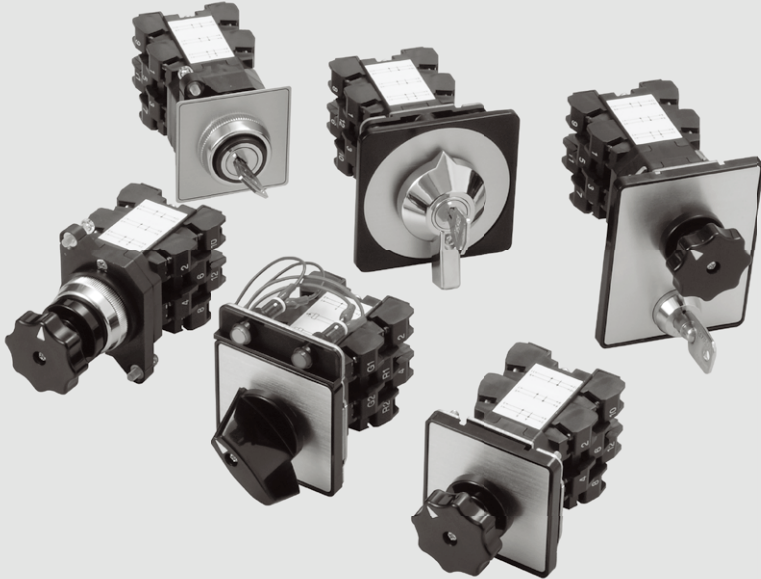




CAM-OPERATED CONTROL SWITCH

# H TYPE

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



### FEATURES

- Up-screw terminal is accepted. Screws don't drop off and wiring labor efficiency is enhanced by the style.
- Finger protection structure is accepted for safety and terminal cover is not necessary.
- Contact arrangement is labeled on the body.
- High oil and flame resistant nylon resin is accepted.
- 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 TUV approval is acquired except for HJ type. (Please see page F68 for conformed standards.)

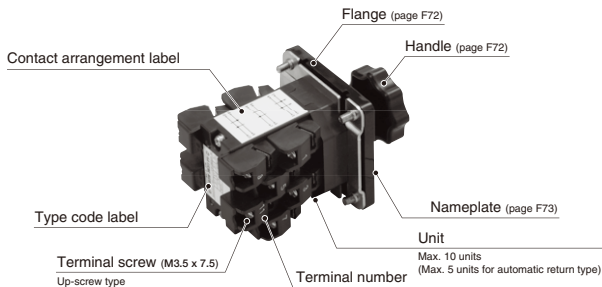


Up-screw type



Finger protection structure

### STRUCTURES



## SPECIFICATIONS (RATINGS, PERFORMANCE)

Item	Type	HE Type	HK Type	HS Type	HL Type	HF Type	HJ Type	H□O Type	
Rating	Contact	Silver contact (normal)						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							
Performance	Max. wire size	2mm <sup>2</sup> (2 wires)							
	Terminal screw size	M3.5x7.5							
	Insulation resistance	1,000MΩ or more (by 500V mega)							
	Contact resistance	50mΩ max. (initial)							
	Electrical lifetime	250,000 times (AC-15 220V 7.5A)						100,000 times	
		100,000 times (DC-13 110V 1.3A)							
	Mechanical lifetime	5,000,000 times	250,000 times	5,000,000 times	1,000,000 times	250,000 times	1,000,000 times		
	Vibration resistance	Vibration: 16.7Hz, Vibration Amplitude: 3mm, 3 directions / 1 hour							
Shock resistance	500m/s <sup>2</sup> (Duration), 100m/s <sup>2</sup> (Malfunction), 6 directions / 3 times each								
Protection grade	IP40 (Panel front), IP20 (Terminal)			IP65 (Panel front), IP20 (Terminal)		IP40 (Panel front), IP20 (Terminal)			
Normal use condition	Operating temperature	-20 to 60°C							
	Storing temperature	-40 to 70°C (No freeze, no dew condensation)							
	Humidity	45 to 85% (90% in 20°C max.)							
	Altitude	2,000 m max.							
Standard	<ul style="list-style-type: none"> <li>• JIS C 8201-5-1 (2007)</li> <li>• JIS C 8201-1 (2007)</li> </ul>		<ul style="list-style-type: none"> <li>• IEC 60947-5-1 : 2003 (eqv.EN 60947-5-1 : 2004)</li> <li>• IEC 60947-1 : 2007 (eqv.EN 60947-1 : 2007)</li> </ul>			<ul style="list-style-type: none"> <li>• NECA C 4522 (2002)</li> <li>• NECA C 4520 (2002)</li> </ul>			

## 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

Standard : IEC60947-5-1 8.3.3.5.3

Standard : IEC60947-5-1 8.3.3.5.2

Ue : Rated operational voltage Ie : Rated operational current

## RATING OF CONTACTS

Contact	Rating			Remark	Rating			Remark
	Load class	Rated operational voltage (Ue)	Rated operational current (Ie)		Load class	Rated operational voltage (Ue)	Rated operational current (Ie)	
Rated operational current (Ie) for load class and rated operational voltage (Ue)  ① Silver contact (normal)	AC-12	24V AC	10A	IEC60947-5-1 3.1  Resistive load cos φ =0.9	DC-12	24V DC	10A	IEC60947-5-1 3.1  Resistive load L/R(T0.95)=1ms
		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	
		550V AC	2A			550V DC	0.3A	
	AC-15	24V AC	10A	Inductive load cos φ =0.3	DC-13	24V DC	5A	Inductive load L/R(T0.95)=300ms
		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					
② Silver twin contacts	-	Minimum applicable load (reference): 5V AC-500mA or more, 5V DC-100mA or more (in good environment)						
		24V AC	0.5A	Resistive load cos φ =0.9				
		50V AC	0.25A					
		12V DC	0.5A	Inductive load L/R(T0.95)=1ms				
		24V DC	0.25A					
Minimum applicable load (reference): 5V DC-1mA or more (in good environment)								



CAM-OPERATED CONTROL SWITCH

# H TYPE

## HOW TO ORDER

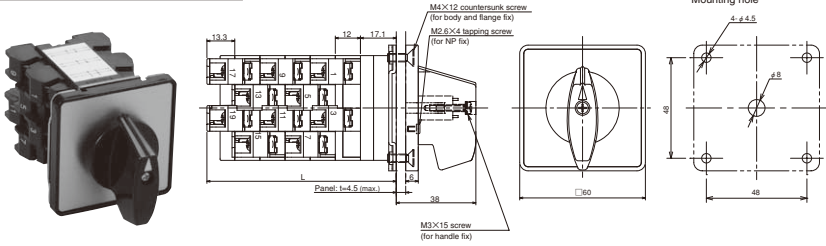
No. ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ ⑬ ⑭

**H E 1 - M 2 1 0 5 H B / G W R E**

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	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 F74 to 81. * For other contact arrangement, please use "Switch Order Sheet" on F83.		
		<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)</p> <p>8 notch (45° -8)    9 notch (30° -9)    10 notch (30° -10)    11 notch (30° -11)    12 notch (30° -12)</p>			
⑥	Unit number	1 to 10 (10 : 0)    * Automatic return type: max. 5 units			
⑦ ⑧	Contact arrangement	01 to 99, CC (special)			
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	E: 24V DC LED lamp			

## DIMENSIONS

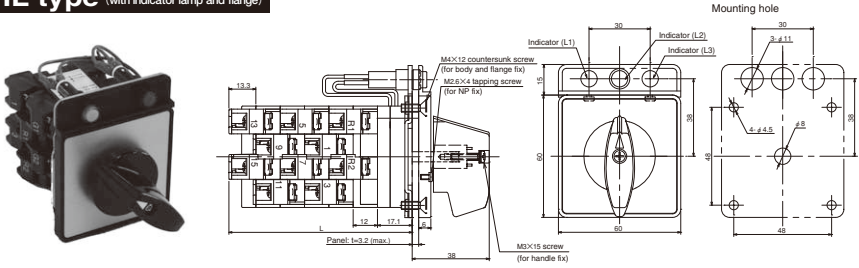
### HE type (with flange)



No. of units	1P	2P	3P	4P	5P	6P	7P	8P	9P	10P
L (mm)	42.4	54.4	66.4	78.4	90.4	102.4	114.4	126.4	138.4	150.4

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

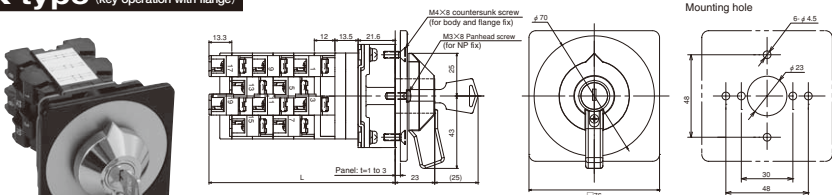
### HL type (with indicator lamp and flange)



No. of units	1P	2P	3P	4P	5P	6P	7P	8P	9P
1 lamp : L (mm)	54.4	66.4	78.4	90.4	102.4	114.4	126.4	138.4	150.4
2 lamps : L (mm)	66.4	78.4	90.4	102.4	114.4	126.4	138.4	150.4	
3 lamps : L (mm)	78.4	90.4	102.4	114.4	126.4	138.4	150.4		

L dimension for handle lock type is 17.5mm longer than the above dimensions.  
Lamp unit is not included in unit number.

### HK type (key operation with flange)



No. of units	1P	2P	3P	4P	5P	6P	7P	8P	9P	10P
L (mm)	60.4	72.4	84.4	96.4	108.4	120.4	132.4	144.4	156.4	168.4

\* Key is removable at each position.

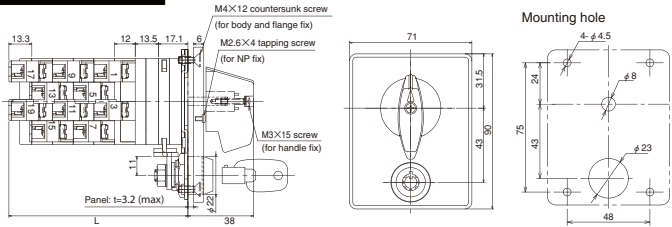


CAM-OPERATED CONTROL SWITCH

# H TYPE

## DIMENSIONS

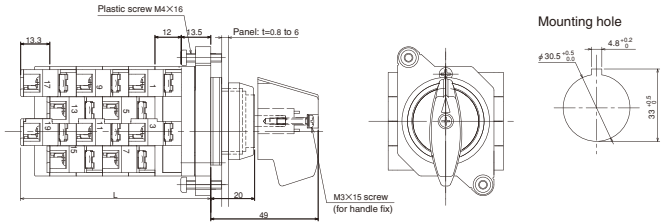
### HS type (Separate key with flange)



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.
- \* Master key is available.

### HF type ( $\phi$ 30mm hole mounting (ring nut mounting))

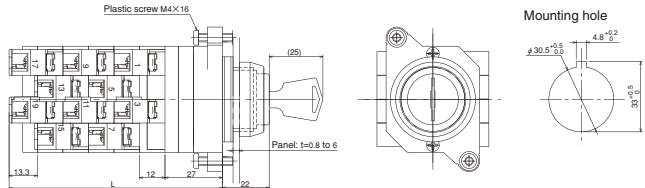
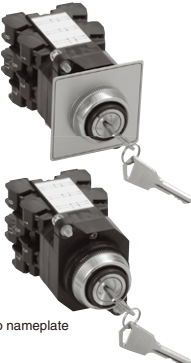


No. of units	1P	2P	3P	4P	5P	6P	7P	8P	9P	10P
L (mm)	38.8	50.8	62.8	74.8	86.8	98.8	110.8	122.8	134.8	146.8

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

- \* No nameplate

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



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 (M3x15)</p>

### Flange set

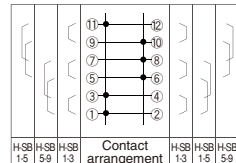
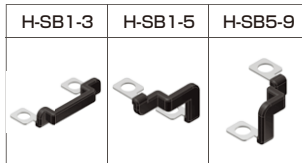
<p>H-FL-E-B-SET</p> <p>(for HE type)</p>	<p>H-FL-L-□-B-SET □ : 1 (1 lamp) 2 (2 lamps) 3 (3 lamps)</p> <p>(for HL type)</p>	<p>H-FL-K-B-SET</p> <p>(for HK type)</p>	<p>H-FL-S-B-SET</p> <p>(for HS type)</p>
Screw ① Countersunk screw M4 x 12 4pcs. ② Tapping screw M2.6 x 4 1pc.	Screw ① Countersunk screw M4 x 12 4pcs. ② Tapping screw M2.6 x 4 1pc.	Screw ① Countersunk screw M4 x 8 4pcs. ② Panhead screw M3 x 8 2pcs.	Screw ① Countersunk screw M4 x 12 4pcs. ② Tapping screw M2.6 x 4 1pc.

\* Flange for indicator lamp type is available.

### 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 aluminated.

### Nameplate (lettered)

H-NP-57-201EC	H-NP-57-202EC

\* Other letters are available. Please use "Switch order sheet" on page F83.

## CONTACT ARRANGEMENT DIAGRAM

### 2-position changeover

#### 2 contacts (1 unit)

Code	2101	2102	2103	2104	2105	2106	2107	2108
Contact arrangement								

#### 4 contacts (2 units)

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

#### 6 contacts (3 units)

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

#### 8 contacts (4 units)

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

Code	2410	2411	2412
Contact arrangement			

#### 10 contacts (5 units)

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





CAM-OPERATED CONTROL SWITCH

# H TYPE

## CONTACT ARRANGEMENT DIAGRAM

### 3-position changeover

#### 2 contacts (1 unit)

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

#### 4 contacts (2 units)

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

#### 6 contacts (3 units)

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

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

Code	3328	3329	3330	3331	3332
Contact arrangement					

● 8 contacts (4 units)

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

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

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

Code	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)

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

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

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

■ 4-position changeover

● 4 contacts (2 units)

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

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

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

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

## ● 6 contacts (3 units)

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

## ● 8 contacts (4 units)

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



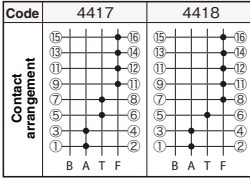
CAM-OPERATED CONTROL SWITCH

# H TYPE

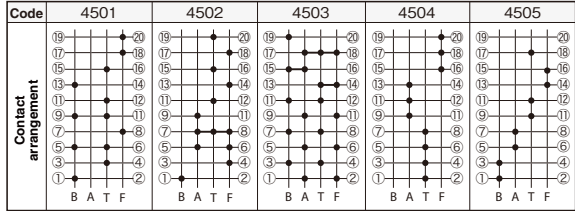
## CONTACT ARRANGEMENT DIAGRAM

### 4-position changeover

#### ● 8 contacts (4 units)

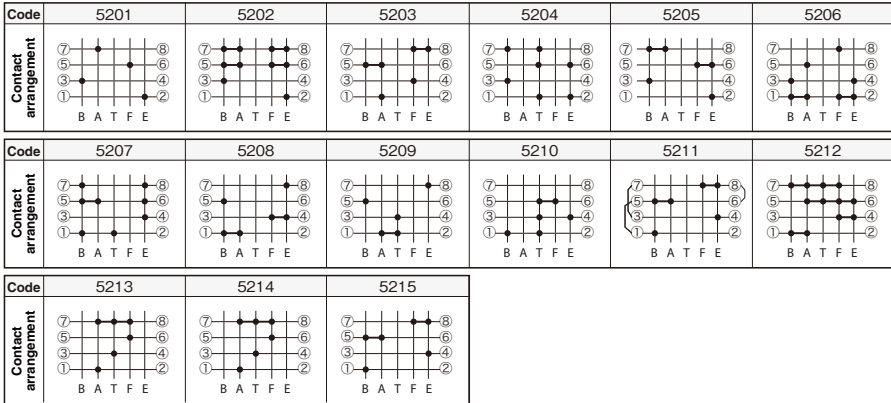


#### ● 10 contacts (5 units)

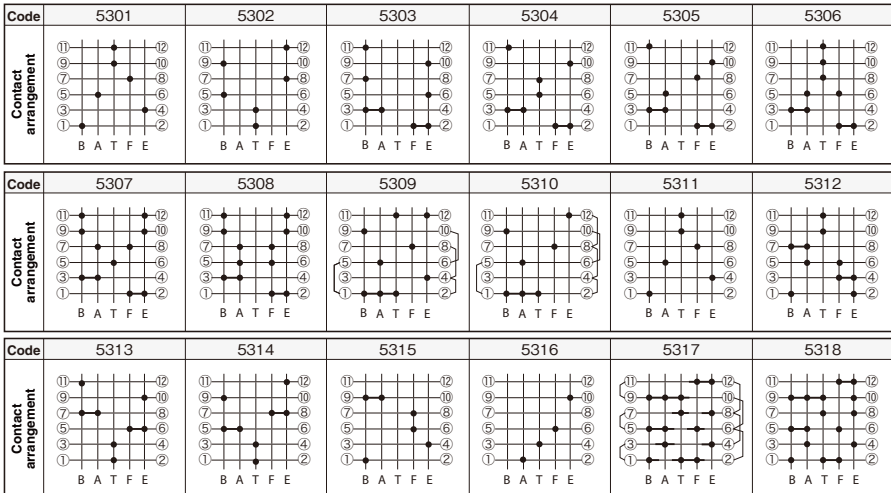


### 5-position changeover

#### ● 4 contacts (2 units)



#### ● 6 contacts (3 units)



Code	5320	5322
Contact arrangement		

● 8 contacts (4 units)

Code	5401	5402	5403	5404	5405	5406
Contact arrangement						

Code	5407	5408	5409	5410	5411	5412
Contact arrangement						

Code	5413	5414	5415	5416	5417	5418
Contact arrangement						

● 10 contacts (5 units)

Code	5501	5502	5503	5504	5505	5506
Contact arrangement						



CAM-OPERATED CONTROL SWITCH

# H TYPE

## CONTACT ARRANGEMENT DIAGRAM

### 5-position changeover

●10 contacts (5 units)

Code	5507	5508	5509	5510	5511
Contact arrangement					

### 6-position changeover

●6 contacts (3 units)

Code	6301
Contact arrangement	

●8 contacts (4 units)

Code	6401
Contact arrangement	

### 7-position changeover

●6 contacts (3 units)

Code	7302
Contact arrangement	

●8 contacts (4 units)

Code	7401	7402	7403
Contact arrangement			

### 8-position changeover

●8 contacts (4 units)

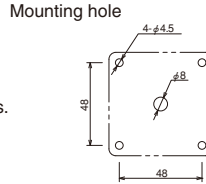
Code	8401	8402	8403
Contact arrangement			

## INSTRUCTIONS

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

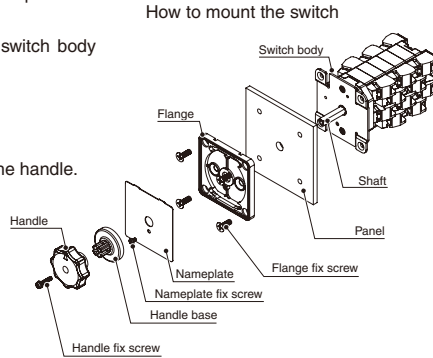
#### 1) Mounting hole

- 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 fix 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.



# Switch Order Sheet

■ Company name

■ Product type code

\_\_\_\_\_

\_\_\_\_\_

■ Order number

■ Quantity

■ Delivery date

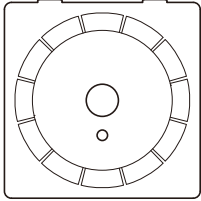
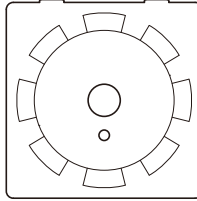
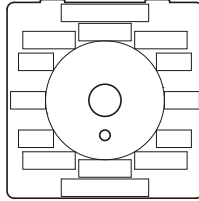
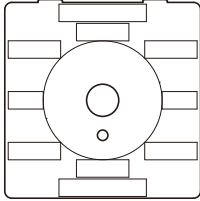
■ Nameplate letter (Standard is Plain nameplate)

Horizontal (for 2 to 8 notches)

Horizontal (for 9 to 12 notches)

Circle (for 2 to 8 notches)

Circle (for 9 to 12 notches)



■ Contact arrangement diagram

Please check the notch number.

Notch											
	(90°-2)	(45°-3)	(45°-4)	(45°-5)	(45°-6)	(45°-7)	(45°-8)	(30°-9)	(30°-10)	(30°-11)	(30°-12)
Notch number	2	3	4	5	6	7	8	9	10	11	12

Terminal number		Terminal number
(39)		(40)
(37)		(38)
(35)		(36)
(33)		(34)
(31)		(32)
(29)		(30)
(27)		(28)
(25)		(26)
(23)		(24)
(21)		(22)
(19)		(20)
(17)		(18)
(15)		(16)
(13)		(14)
(11)		(12)
(9)		(10)
(7)		(8)
(5)		(6)
(3)		(4)
(1)		(2)
Notch position	B A T F E G J O D P K V	



Panel side