




# ø30 ARN/ARNS Series Mono-lever Switches

## Single lever offers up to four directions of control

- Mono-lever switches operate in four directions using a single lever. Switch contacts are actuated in the direction in which the lever is pushed, enabling quick and accurate control in any desired direction. Ideal for machine tools and industrial machines. The lever action can be maintained or spring-returned in any combination.
- Also available with interlock mechanism to prevent inadvertent actuation.



Applicable Standards	Mark	File No. or Organization
UL 508		UL Listing File No. E68961
CSA C22.2 No.14		CSA File No. LR21451
GB14048.5		Contact IDEC for details.

## Specifications and Ratings

### Contact Ratings by Utilization Category

Rated Insulation Voltage				600V					
Rated Continuous Current				10A					
Operational Voltage				24V	48V	50V	110V	220V	440V
Operational Current	AC 50/60 Hz	AC-12	Control of resistive loads and solid state loads	10A	—	10A	10A	6A	2A
		AC-15	Control of electromagnetic loads (> 72 VA)	10A	—	7A	5A	3A	1A
	DC	DC-12	Control of resistive loads and solid state loads	10A	5A	—	2.2A	1.1A	—
		DC-13	Control of electromagnets	4A	2A	—	1.1A	0.6A	—

Note: The operational current represents the classification by making and breaking currents (IEC 60947-5-1).

### Specifications

Contact Configuration	Double-break slow action Each contact block contains two independent contacts (2NO, 1NO-1NC, 2NC) Up to four contact blocks can be mounted
Operating Temperature	-25 to +50°C (no freezing)
Storage Temperature	-35 to +80°C (no freezing)
Operating Humidity	45 to 85% RH (no condensation)
Insulation Resistance	100 MΩ minimum (500V DC megger)
Dielectric Strength	Between live and dead parts: 2,500V AC, 1 minute
Mechanical Life	500,000 operations minimum
Electrical Life	(Interlocking: 250,000 operations minimum)
Lever Knob	Black
Weight (approx.)	276g (ARN4-1111-202020)

### BR Contact Block


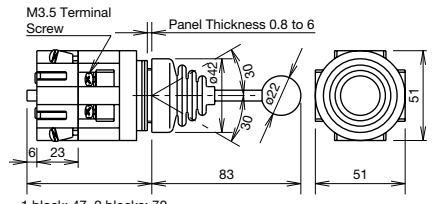

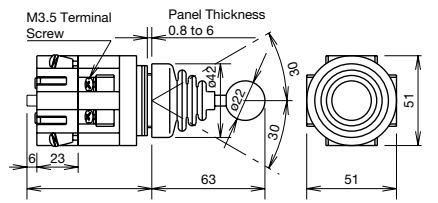

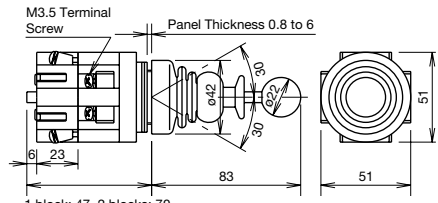
The contact block is made of nylon resin. Each contact block contains two pairs of double-break silver contacts. There are three types as shown in the diagram below and up to four contact blocks can be mounted in any direction.

A wide variety of circuits allows diverse combinations of control.

### Control Mechanism

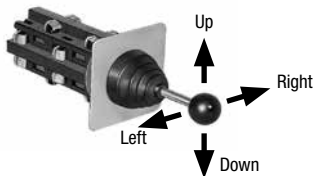
When the operator lever is pushed to about 30° in each direction from the neutral position, the contact in that direction activates. The lever can operate in two, three, or four directions, and combinations of maintained or spring-return from any position are possible.

Mono-lever Switches

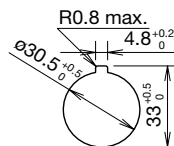
Operator	Position	Lever Action	Part No.	Dimensions (mm)
 <p>ARN (Long Lever)</p>	2-position (Up-Down)	Maintained	ARN2-1010-④B	 <p>M3.5 Terminal Screw Panel Thickness 0.8 to 6</p> <p>1 block: 47, 2 blocks: 70 3 blocks: 93, 4 blocks: 116</p> <p>Minimum horizontal/vertical mounting centers: 110</p>
		Spring return	ARN2-2020-④B	
	2-position (Left-Right)	Maintained	ARN2-0101-④B	
		Spring return	ARN2-0202-④B	
	4-position (Up-Down-Left-Right)	Maintained	ARN4-1111-④B	
		Spring return	ARN4-2222-④B	
 <p>ARNS (Short Lever)</p>	2-position (Up-Down)	Maintained	ARNS2-1010-④B	 <p>M3.5 Terminal Screw Panel Thickness 0.8 to 6</p> <p>1 block: 47, 2 blocks: 70 3 blocks: 93, 4 blocks: 116</p> <p>Minimum horizontal/vertical mounting centers: 70</p>
		Spring return	ARNS2-2020-④B	
	2-position (Left-Right)	Maintained	ARNS2-0101-④B	
		Spring return	ARNS2-0202-④B	
	4-position (Up-Down-Left-Right)	Maintained	ARNS4-1111-④B	
		Spring return	ARNS4-2222-④B	
 <p>ARNL (Interlocking)</p> <p>The operator lever is locked only in the center position.</p>	2-position (Up-Down)	Maintained	ARNL2-1010-④B	 <p>M3.5 Terminal Screw Panel Thickness 0.8 to 6</p> <p>1 block: 47, 2 blocks: 70 3 blocks: 93, 4 blocks: 116</p> <p>Minimum horizontal/vertical mounting centers: 110</p>
		Spring return	ARNL2-2020-④B	
	2-position (Left-Right)	Maintained	ARNL2-0101-④B	
		Spring return	ARNL2-0202-④B	
	4-position (Up-Down-Left-Right)	Maintained	ARNL4-1111-④B	
		Spring return	ARNL4-2222-④B	

Specify Contact Configuration from the table below in place of ④. Terminal covers are ordered separately.

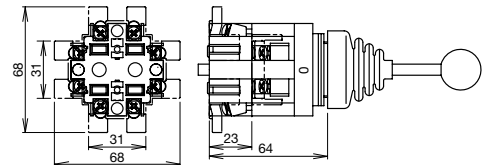
Lever Operator Position



Panel Cut-Out



Mono-Lever with Terminal Cover



Ordering Information

When ordering, specify items ① to ⑤ according to the following example.

[Example] ① ARN ② 4 - ③ 1012 - ④ 20 00 02 11 ⑤ B

Up Right Down Left

① Model	② No. of Contact Blocks	③ Lever Action	④ Contact Arrangement	⑤ Lever Knob Color
ARN ARNS ARNL	1: 1 block 2: 2 blocks 3: 3 blocks 4: 4 blocks	Order of Entry: Up→Right→ Down→Left  1: Maintained 2: Spring return 0: Blocked	Order of Entry: Up→Right→ Down→Left  10: 1NO 01: 1NC 11: 1NO-1NC 20: 2NO 02: 2NC 00: Blocked	B: black

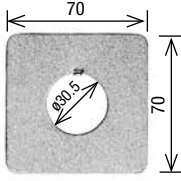





Contact Block Position	Direction of Lever Operation				Terminal No.	Contact Block Type
	Lever Operation Mode					
	1	0	1	2		
1	1	NO	-	-	2	BR-2E
	3	-	-	NC	4	
2	5	-	NO *	-	6	BR-1E
	7	-	-	NO	8	
3	9	NO	-	-	10	BR-2E
	11	-	-	NC	12	
4	13	-	NC *	-	14	BR-3E
	15	-	-	NC	16	

\*: Contacts marked with \* do not operate.

- To calculate the number of contact blocks required, add the number of NO and NC contacts on each pair of adjoining positions (up + right, right + down, down + left, and left + up). The largest of the four sums is the number of contact blocks required. Up to four contact blocks can be mounted.
- Specify the same number of contacts for the contact blocks of opposing corner (up-down, right-left), except for the blocked direction.

- When UL and CSA markings are required on the mono-lever switch, specify as shown below.  
[Example] ARN4-1012-20000211B-U


Accessories and Maintenance Parts

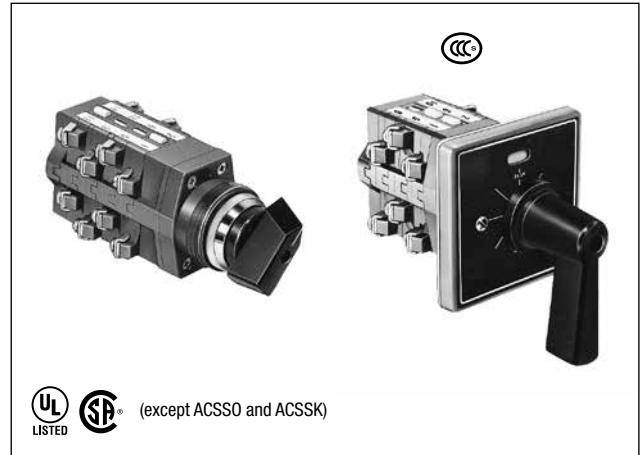
Shape	Specification	Part No.	Ordering No.	Package Quantity	Description
Nameplate		MLO	MLO	1	Chrome-plated brass (matte surface)
			MLOPN10	10	
Terminal Cover		ARN-VL2	ARN-VL2	1	Terminal covers are ordered separately. When ordering, specify the Part No. and the required quantity. Order 2 pieces for each contact block.
Contact Block (BR)		BR-1E	BR-1E	1	2NO contact
		BR-2E	BR-2E	1	1NO-1NC contact
		BR-3E	BR-3E	1	2NC contact
Bellows		ARN-BL	ARN-BL	1	For ARN/ARNS (Locking ring not included)
Bellows (Interlocking)		ARNL-BL	ARNL-BL	1	For ARNL (Locking ring not included)
Knob		ARNB-③	ARNB-③	1	Specify a color code in place of ①. B (black), G (green), R (red) For ARN/ARNS

# ø30/ø25 CS Series Cam Switches

## 71 standard circuits to choose from

- Wide variety of heavy-duty oiltight cam switches
- Operators available up to 12 positions
- Contact blocks rated at 600V, 10A
- Ideal for ammeter/voltmeter applications
- UL listed and CSA approved

Applicable Standards	Mark	File No. or Organization
GB14048.5		CCC No.2012010305525956 (ACSNO, ACSNK) No.2013010305604910 (ACSSO, ACSSK) No.2013010305600565 (UCSQO, UCSQM)



## Specifications and Ratings

### Contact Ratings by Utilization Category

Rated Insulation Voltage			600V			
Rated Continuous Current			10A			
Operational Voltage			24V	110V	220V	440V
Operational Current	AC 50/60 Hz	AC-12 Control of resistive loads and solid state loads	—	10A	6A	2A
		AC-15 Control of electromagnetic loads (> 72 VA)	—	5A	3A	1A
	DC	DC-12 Control of resistive loads and solid state loads	8A	3A	1A	0.4A
		DC-13 Control of electromagnets	5A	1.2A	0.45A	0.2A

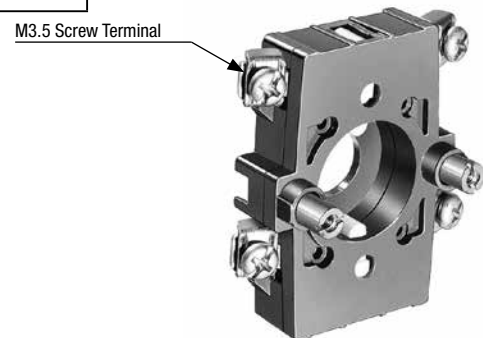
Note: The operational current represents the classification by making and breaking currents (IEC 60947-5-1).

### Specifications





Contact Configuration	Double-break slow action contacts Two contacts in one deck Up to 6 decks available (Spring-return: Up to 3 decks)	
Operation	Maintained	Spring return
Angle	30°, 45°, 60°, 90°	45°
Operator Positions	2 to 12	2, 3, 4
Operating Temperature	-20 to +50°C (no freezing)	
Storage Temperature	-40 to +80°C (no freezing)	
Operating Humidity	45 to +85% RH (no condensation)	
Insulation Resistance	100 MΩ (500V DC megger)	
Dielectric Strength	2500V AC, 1 minute (between live and dead parts)	
Mechanical Life	1 to 3 decks: 500,000 operations 4 to 6 decks: 200,000 operations	
Electrical Life	200,000 operations minimum	
Degree of Protection	ACSNO, ACSSO: IP65 (IEC 60529) ACSNK, ACSSK: IP54 (IEC 60529) UCS: IP40 (IEC 60529)	
Weight (approx.)	319g (ACSNO-663-S2B)	

### CSB Contact Block

The CSB contact block contains two poles of double-break contacts. The contacts are operated by a cam designed to perform a required contact operation. Up to six contact blocks can be mounted on a maintained-action operator base, and up to three contact blocks on a spring return operator base.

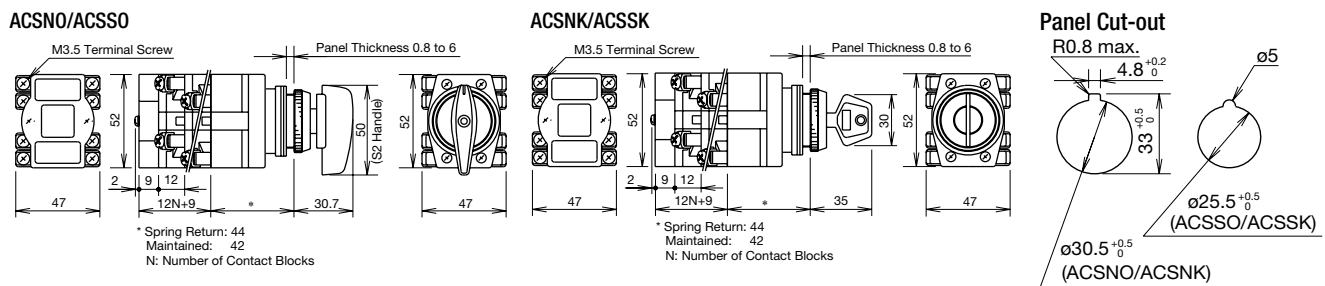


Cam Switches

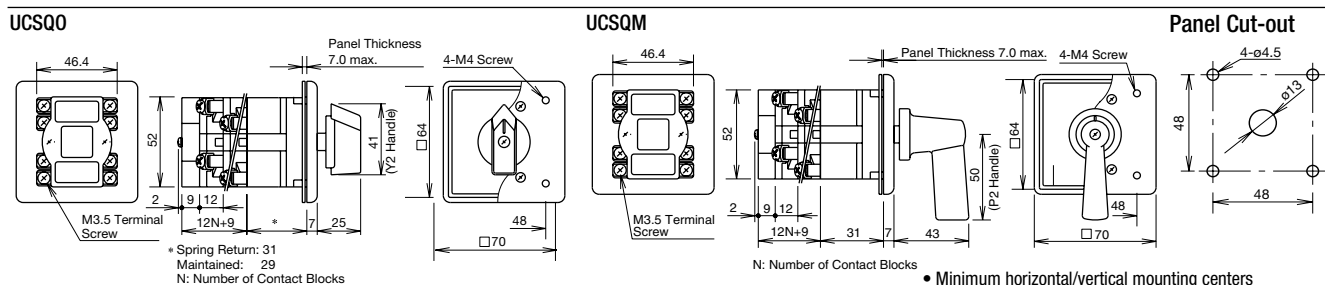
① Model		② Contact Block Decks	③ Positions	④ Angle	⑤ Spring Return	⑥ Handle	⑦ Contact Arrangement	Nameplate
ø30 Series	ø25 Series							
ACSNO	ACSSO	Maintained: 1 to 6 decks Spring return: 1 to 3 decks	Maintained: 2 to 12 positions Spring return: 2 to 4 positions	Maintained: 30°, 45°, 60°, 90° Spring return: 45° only	Spring return from right Spring return from left Spring return two-way	Y2, S2, P2, F2, 25S2 (25S2 is for ACSSO only) (one specified handle supplied)		See page 61. (ordered separately)
 (Photo: ACSNO with Y2 handle)								
ACS NK	ACSSK	Maintained: 1 to 6 decks Spring return: 1 to 3 decks	Maintained: 2 to 8 positions Spring return: 2 to 4 positions	Maintained: 45°, 90° Spring return: 45° only	Spring return from right Spring return from left Spring return two-way	Two standard keys are supplied. When the H2 handle key is required, specify H2.		See page 55 to 57.
 Standard Key (2 keys supplied)								
UCSQO	(Enclosed)	Maintained: 1 to 6 decks Spring return: 1 to 3 decks	Maintained: 2 to 12 positions Spring return: 2 to 4 positions	Maintained: 30°, 45°, 60°, 90° Spring return: 45° only	Spring return from right Spring return from left Spring return two-way	Y2, S2, F2, P2 (one specified handle supplied)		Type CQ See page 60.
 (Photo: With Y2 handle)								
UCSQM	(Enclosed)	Spring return: 1 to 3 decks	Spring return: 3 positions	Spring return: 45° only	Spring return two-way		C1007 C1008 C1009 C1010 C1018 C2006 C2007 C2021 See page 55 to 57.	Type CQM See page 60.
 Indicator Left: Green Right: Red Left Right Spring Return 2-way								

For handles and accessories, see page 52 and 53.

Dimensions



- Minimum horizontal/vertical mounting centers  
 With P2 handle: 125  
 With other handles: 70



- Minimum horizontal/vertical mounting centers  
 With P2 handle: 125  
 With other handles: 70

All dimensions in mm.

### Ordering Information

When ordering, specify items ① through ⑦ as the designation example below.

①	②		③		④		⑤		⑥	⑦	⑧
Model	Contact Block Decks		Positions		Angle		Spring Return		Handle	Key irremovable position	Circuit No.
①	Decks	Code	Positions	Code	Angle	Code	Return	Code	⑥	⑦	⑧
ACSNO	1 deck	1	2 positions	2	30°	3	Spring return from left	RO	(Code) Y2, S2, P2, F2, H2, 25S2 (Color) B: Black See table below.	For ACSNK/ACSSK, specify the code(s) of irremovable position(s) in numerical order.	For standard contact configurations, use designation code on pages 55 to 57. For custom contact configurations, use the Custom Contact Configuration Specification Sheet on page 58.
ACSNK	2 decks	2	3 positions	3	45°	4	Spring return from right	OR			
ACSSO	3 decks	3	4 positions	4	60°	6	Spring return from right	RR			
ACSSK	4 decks	4	5 positions	5	90°	9	Spring return two-way				
UCSQO	5 decks	5	6 positions	6							
UCSQM	6 decks	6	7 positions	7							
			8 positions	8							
			9 positions	9							
			10 positions	10							
			11 positions	11							
			12 positions	12							
	Spring return: 1 to 3 decks only		Spring return: 2 to 4 positions only		ACSNK/ACSSK: 45° and 90° only Spring return: 45° only		Spring return code is required only for spring return.		25S2 is for ACSSO only.		
									Standard ACSNK/ACSSK: no specification required		

### Designation Example

UCSQO - 2 3 4 RR - S2B - C2006  
① ②③④⑤ ⑥ ⑧

ACSNO - 2 3 4 RR - Y2B - MAU-C2006-ZT2  
① ②③④⑤ ⑥ ⑧

- When a special contact configuration is required, specify the contact configuration using the Custom Contact Configuration Specification Sheet on page 58.
- A specified handle is attached.
- Accessories such as nameplates and jumpers are separately ordered.
- The key of the key operated cam switch is removable at every position unless otherwise specified. The key is irremovable at return position. The return and irremovable positions must be specified in Part No. Positions at 180° from irremovable positions are also irremovable.  
Example: 4-positions, spring return from right, irremovable at positions 3 and 4

**ACSNK-3440R-134-C3012**

### Handle Designation Code

Shape	Code	Color	Applicable Cam Switch
	Y2	B: black	ACSNO ACSSO UCSQO UCSQM
	S2		
	25S2		
	P2		ACSNO ACSSO UCSQO UCSQM
	F2		
	H2		ACSNO ACSSO UCSQO UCSQM

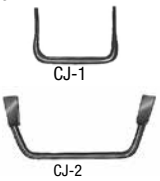


### Spring Return Operation

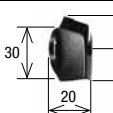
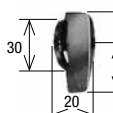

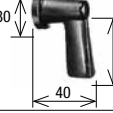
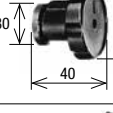
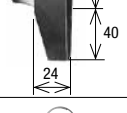




Available combinations of operator positions, angles, and return directions are listed in the table below.

Positions	2-position		3-position			4-position		3-position
	From Left	From Right	From Left	From Right	Two-way	From Left	From Right	Two-way
Return Direction								
③ ④ ⑤ Codes	24RO	24OR	34RO	34OR	34RR	44RO	44OR	34RR
Applicable Cam Switches	ACSNO, ACSSO, ACSNK, ACSSK, UCSQO							UCSQM
Contact Block Decks	1 to 3 decks							

Note: Maintained do not require spring return code ⑤.

Accessories and Replacement Parts

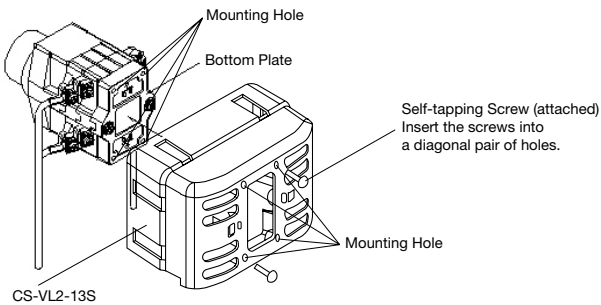
Shape	Material	Part No.	Ordering No.	Package Quantity	Remarks
 <p>CJ-1</p> <p>CJ-2</p>	Metal (copper)	CJ-1	CJ-1PN10	10	For connecting terminals of adjoining contact blocks
		CJ-2	CJ-2PN10	10	For connecting terminals of the same contact block
	Nitril rubber	CR-1	CR-1	1	For preventing ingress of dust into the contact blocks Not applicable for the UCSQO and UCSQM
 <p>CS-VL2-13S</p> <p>CS-VL2-46S</p>	Plastic (PPE)	CS-VL2-13S	CS-VL2-13S	1	For 1 to 3 decks of contact blocks
		CS-VL2-46S	CS-VL2-46S	1	For 4 to 6 decks of contact blocks

Shape	Material (Color)	Part No.	Ordering No.	Package Quantity
 <p>ø25, ø30 Y Handle</p>	Polybutylene terephthalate (Black)	CSH-YB	CSH-YB	1
 <p>ø25, ø30 S Handle</p>	Polybutylene terephthalate (Black)	CSH-SB	CSH-SB	1
 <p>ø25 S Handle</p>	Phenol resin (Black)	CSH-25SB	CSH-25SB	1
 <p>ø25, ø30 P Handle</p>	Phenol resin (Black)	CSH-PB	CSH-PB	1
 <p>ø25, ø30 F Handle</p>	Bakelite (Black)	CSH-FB	CSH-FB	1
 <p>Key Handle</p>	Phenol resin (Black)	CSH-H2B	CSH-H2B	1
 <p>Spare Keys</p>	Metal (brass nickel-plated)	CSH-K301	CSH-K301PN02	2
 <p>Handle Shaft</p>	Polyamide	CS-HF2C	CS-HF2CPN05	5
 <p>Handle Screw</p>	For Y, ø30 S, and ø25 S handles M3 × 12	CS-SCW-M3-12	CS-SCW-M3-12PN10	10
 <p>Handle Screw</p>	For P and F handles M3 × 25	CS-SCW-M3-25	CS-SCW-M3-25PN10	10

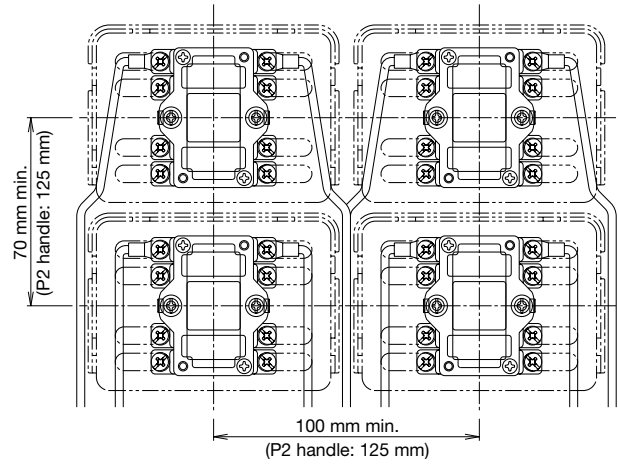
Instructions

Installing the Terminal Cover for the CS series Cam Switches

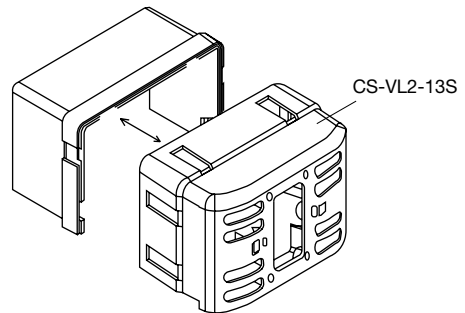
- Complete wiring before installing the terminal cover on the bottom plate of the contact block.
- The terminal cover has six holes. Of the four round holes at four corners, use two diagonal pair of holes to install the terminal cover. Either pair can be used.
- Insert the attached self-tapping screws into the pair of holes and tighten the screws to a torque of 0.8 to 1.0 N·m.
- For 1 through 3 decks of contact blocks, use terminal cover CS-VL2-13S.
- For 4 through 6 decks of contact blocks, use terminal cover CS-VL2-46S.
- The CS-VL2-46S consists of the CS-VL2-13S and a terminal cover for the fourth through sixth decks. Combine the two parts together as shown. Note that once combined, the two parts cannot be separated.



Minimum Mounting Centers for Installing the Terminal Cover

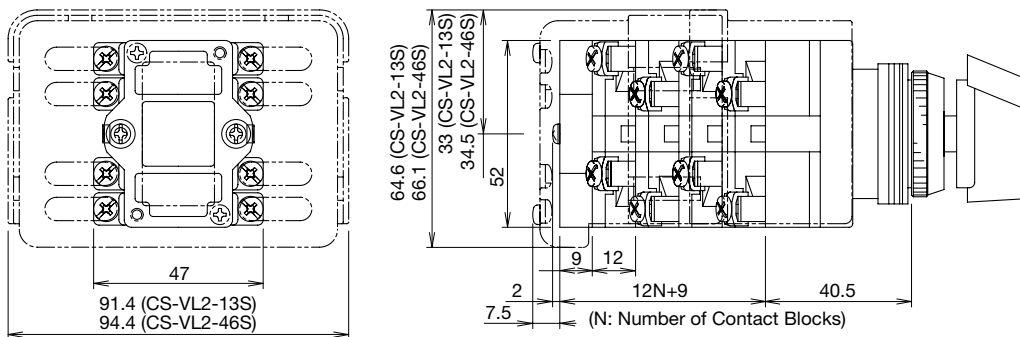


- Although the minimum mounting centers are 100 mm horizontally and 70 mm vertically, determine the mounting centers in consideration of convenience of wiring. For the P2 handle, the minimum mounting centers are 125 mm horizontally and vertically.



For 4 through 6 decks of contact blocks (CS-VL2-46S)

Terminal Cover Dimensions

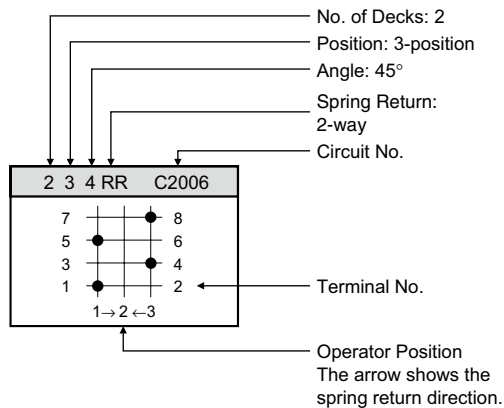


All dimensions in mm.



### Standard Contact Configurations

- The following table lists 76 standard contact configurations for easy designation of required cam switch operation.
- When other contact configurations are required, specify the number of contact block decks, operator positions, angles, and contact operation using the Custom Contact Configuration Specification Sheet on page 58.



Symbol	Contact Operation
●	Contacts closed.
▬	Contacts remain closed between two operator positions.
	Overlapping Contacts Contacts of different decks are both closed at one point while the handle is turned to the next position.
	Residual Contacts When the handle is returned to the center, the contacts remain closed. The contacts are opened when the handle is turned to the opposite direction.

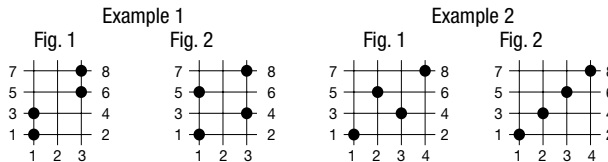
#### Listing Order of the Table

Standard Contact Configuration Chart				
1 2 9 C1001	1 2 9 C1002	1 2 4 OR C1003	1 2 4 OR C1004	1 3 4 C1005
1 3 4 C1006	1 3 4 RR C1007	1 3 4 RR C1008	1 3 4 RR C1009	1 3 4 RR C1010
1 4 4 C1011	1 2 9 C1013	1 2 9 C1014	1 2 4 OR C1015	1 3 4 C1016
1 2 4 C1017	1 3 4 RR C1018	1 2 6 C1019		
2 2 9 C2001	2 2 9 C2002	2 3 4 C2003	2 3 4 C2004	2 3 4 C2005

The 76 standard contact configurations are listed in the order of the circuit number.

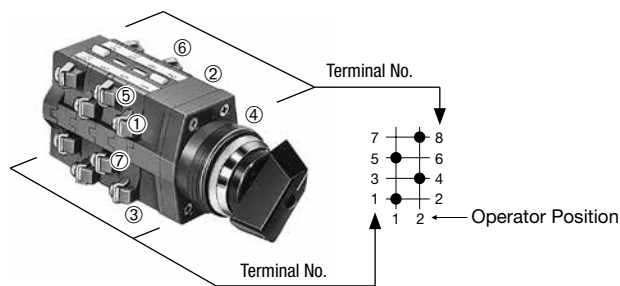
#### Same Circuits

Shown in the following examples, circuits of Fig. 1 and Fig. 2 have the same functions. When ordering, examine the standard contact configurations. Your requirements may be satisfied simply by changing external wiring of the standard contact configurations.



#### Terminal Numbers

- The terminal numbers on the contact blocks correspond with the numbers shown in the chart as shown below.



2 3 4 RR C2006 	2 3 4 RR C2007 	2 4 4 C2008 	2 4 4 C2009 	2 4 9 C2011 
2 2 9 C2014 	2 2 9 C2015 	2 3 4 C2016 	2 3 4 C2017 	
2 3 4 C2019 	2 3 4 C2020 	2 3 4 RR C2021 	2 4 4 C2022 	
		2 5 3 C2027 	2 3 6 C2028 	2 3 6 C2029 
3 2 9 C3001 	3 3 4 C3002 	3 5 4 C3003 	3 6 4 C3004 	3 3 4 C3005 
3 4 9 C3008 	3 4 9 C3009 	3 2 9 C3010 	3 3 4 C3011 	3 4 4 C3012 
3 6 3 C3013 	3 3 6 C3014 	3 6 6 C3015 	3 5 3 C3016 	3 4 4 C3017 
3 3 6 C3018 		4 4 4 C4001 	4 8 4 C4002 	4 4 9 C4003 
4 2 4 C4004 	4 2 9 C4005 	4 2 9 C4006 	4 4 9 C4007 	4 3 4 C4008 

<p>4 5 4 C4009</p>	<p>5 3 4 C5001</p>	<p>6 4 4 C6001</p>	<p>6 12 3 C6002</p>
<p>6 4 9 C6003</p>	<p>6 9 3 C6004</p>	<p>6 6 6 C6005</p>	<p>6 6 4 C6006</p>

**Application Examples (Voltmeter and Ammeter Circuits)**

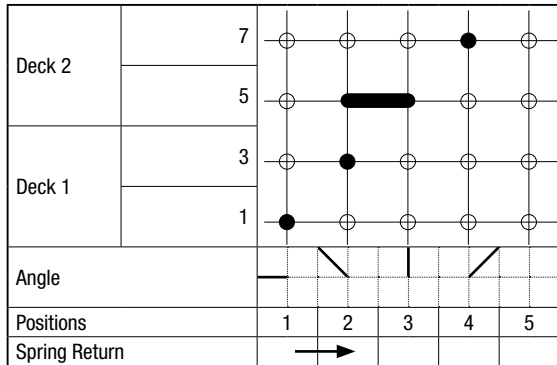
<p>1 2 6 C1019 (ammeter switching, 1CT circuit)</p>	<p>2 3 6 C2029 (ammeter switching, 2CT circuit)</p>	<p>2 4 9 C2011 (ammeter switching, 2CT circuit)</p>
<p>2 4 4 C2022 (voltmeter switching, 3PT circuit)</p>	<p>3 4 9 C3008 (voltmeter switching, 2PT circuit)</p>	<p>3 4 9 C3009 (voltmeter switching, 3PT circuit)</p>
<p>6 4 9 C6003 (ammeter switching, 3CT circuit)</p>	<p>4 4 9 C4003 (ammeter switching, 3CT circuit)</p>	<p>4 4 9 C4007 (ammeter switching, 2CT circuit)</p>

### Custom Contact Configurations Specification Sheet

- The preceding pages provide 68 standard contact configurations. When other contact configurations are required, specify the number of contact block decks, operator positions, angles, and contact operation using the Custom Contact Configuration Specification Sheet shown below.
- For available number of contact blocks and operator positions, see the Ordering Information on page 52.

#### 1. Specify operator positions

Indicate the operator positions starting at the first position. When spring return operation is required, mark an arrow between two operator positions to indicate the spring return direction.



#### 2. Specify contact operation at each operator position

Indicate the required operation of all contacts at each operator position using the following symbols.

Symbol	Contact Operation
●	Contacts closed.
■	Contacts remain closed between two operator positions.
○●	Overlapping Contacts Contacts of different decks are both closed at one point while the handle is turned to the next position. Overlapping contacts are not available for handle angles of 30° and 45°.
○●	Residual Contacts When the handle is returned to the center, the contacts remain closed. The contacts are opened when the handle is turned to the opposite direction.

- One deck of contact block contains two poles of contacts and four terminals. When the handle is made to turn 180° or more, special attention is needed. Since one cam operates the two poles of contacts on opposite positions, the same contact operation repeats on the other pole of contacts when the handle is turned 180°. When different contact operation is needed for handle angles of 180° or more, use another deck of contact block.

CS Series Cam Switch Custom Contact Configuration Specification Sheet														
Part No.: [ ] [ ] [ ] [ ] [ ] [ ]											Quantity: _____			
① Model    ② Decks    ③ Positions    ④ Angle    ⑤ Spring Return    ⑥ Handle														
Deck	Terminal No.	Contact Configuration Chart												Terminal No.
Deck 6	23	○	○	○	○	○	○	○	○	○	○	○	○	24
	21	○	○	○	○	○	○	○	○	○	○	○	○	22
Deck 5	19	○	○	○	○	○	○	○	○	○	○	○	○	20
	17	○	○	○	○	○	○	○	○	○	○	○	○	18
Deck 4	15	○	○	○	○	○	○	○	○	○	○	○	○	16
	13	○	○	○	○	○	○	○	○	○	○	○	○	14
Deck 3	11	○	○	○	○	○	○	○	○	○	○	○	○	12
	9	○	○	○	○	○	○	○	○	○	○	○	○	10
Deck 2	7	○	○	○	○	○	○	○	○	○	○	○	○	8
	5	○	○	○	○	○	○	○	○	○	○	○	○	6
Deck 1	3	○	○	○	○	○	○	○	○	○	○	○	○	4
	1	○	○	○	○	○	○	○	○	○	○	○	○	2
Angle														
Positions		1	2	3	4	5	6	7	8	9	10	11	12	
Spring Return														