

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



Specifications and Ratings

Contact Ratings

Rated Insulation Voltage	600V
Rated Continuous Current	10A
Contact Ratings by Utilization Category IEC 60947-5-1	AC-15 (A600) DC-13 (P600)

Characteristics

Contact Ratings by Utilization Category

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

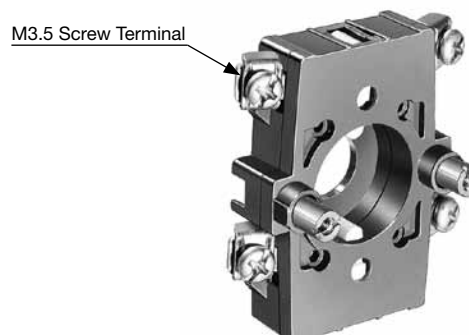
Note: The operational current represents the classification by making and breaking currents (IEC 60947-5-1).

Specifications

Contact Arrangement	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)	

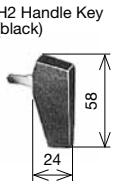
CSB Contact Block

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.



CS Series Cam Switches ø30/ø25

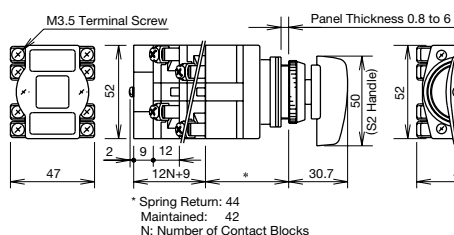
Cam Switches

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 69. (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 key handle is required, specify H2.	See page 63 to 65.	
 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)	C1007 C1008 C1009 C1010 C1018 C2006 C2007 C2021 See page 63 to 65.	Type CQ See page 68.
 (Photo: With Y2 handle)								
UCSQM	(Enclosed)	Spring return: 1 to 3 decks	Spring return: 3 positions	Spring return: 45° only	Spring return two-way			Type CQM See page 68.
 Indicator Left: Green Right: Red Left Right Spring Return 2-way								

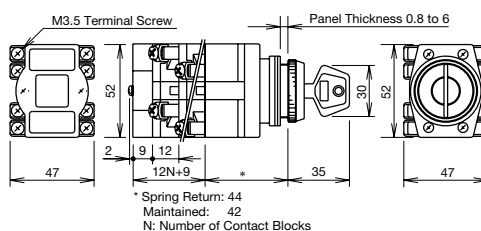
For handles and accessories, see page 60 and 61.

Dimensions

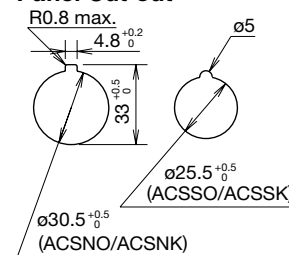
ACSNO/ACSSO



ACS NK/ACSSK

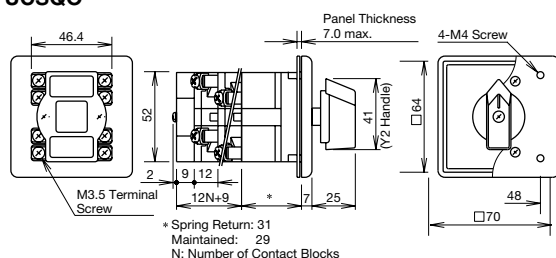


Panel Cut-out

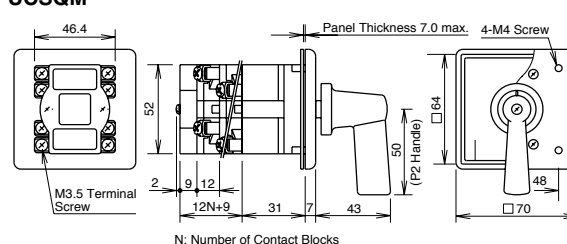


- Minimum horizontal/vertical mounting centers
With P2 handle: 125
With other handles: 70

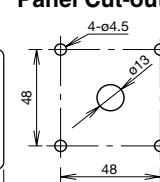
UCSQO



UCSQM



Panel Cut-out



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

All dimensions in mm.

ø30/ø25 CS Series Cam Switches

Ordering Information

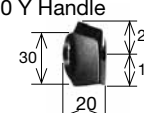
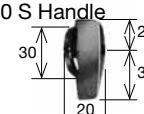
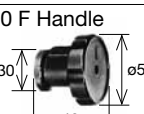
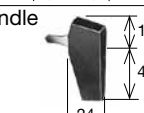
When ordering, specify items ① through ⑦ as the designation example below.

①	②	③	④	⑤	⑥	⑦
Model	Contact Block Decks	Positions	Angle	Spring Return	Handle	Circuit No.
①	②	③	④	⑤	⑥	⑦
	Decks	Code	Positions	Code	Return	Code
ACSNO	1 deck	1	2 positions	2	30°	3
ACSNK	2 decks	2	3 positions	3	45°	4
ACSSO	3 decks	3	4 positions	4	60°	6
ACSSK	4 decks	4	5 positions	5	90°	9
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	ACSNO/ACSSK: 45° and 90° only Spring return: 45° only	Spring return code is required only for spring return.	25S2 is for ACSSO only.	For standard contact arrangements, use designation code on pages 63 to 65. For custom contact arrangements, use the Custom Contact Arrangement Specification Sheet on page 66.

Designation Example

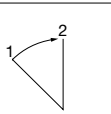
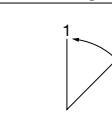
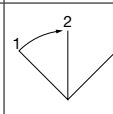
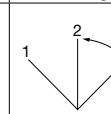
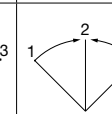
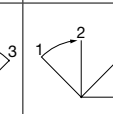
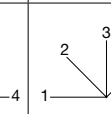
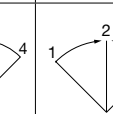
1. When a special contact arrangement is required, specify the contact arrangement using the Custom Contact Arrangement Specification Sheet on page 66.
2. A specified handle is attached.
3. Accessories such as nameplates and jumpers are separately ordered.
4. The key of the key operated cam switch is removable from every position. Specify other key removable configurations if required.

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		ACSNK ACSSK

Spring Return Operation

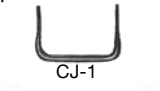
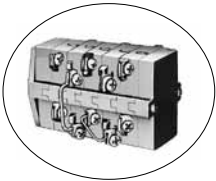
Available combinations of operator positions, angles, and return directions are listed in the table below.

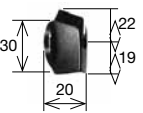
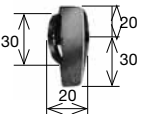
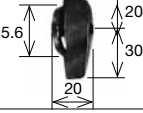
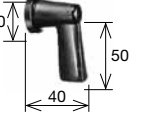
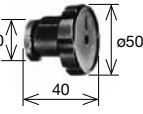
Positions	2-position		3-position			4-position		3-position
	From Left	From Right	From Left	From Right	Two-way	From Left	From Right	Two-way
Return Direction								
③ ④ ⑤ Codes	24RO	24OR	34RO	34OR	34RR	44RO	44OR	34RR
Applicable Cam Switches	ACSNO, ACSSO, ACSNK, ACSSK, UCSQO							UCSQM
Contact Block Decks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

Note: Maintained do not require spring return code ⑤.

CS Series Accessories and Replacement Parts ø30/ø25

Accessories and Replacement Parts

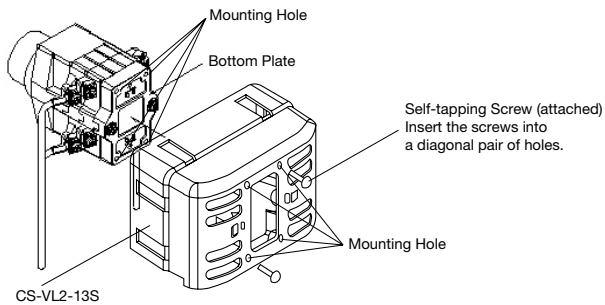
Shape	Material	Part No.	Ordering No.	Package Quantity	Remarks
Jumper  CJ-1  CJ-2 	Metal (copper)	CJ-1	CJ-1PN10	10	For connecting terminals of adjoining contact blocks
		CJ-2	CJ-2PN10	10	For connecting terminals of the same contact block
Rubber Boot  	Rubber (nitril)	CR-1	CR-1	1	For preventing ingress of dust into the contact blocks Not applicable for the UCSQO and UCSQM
Terminal Cover  CS-VL2-13S  CS-VL2-46S Supplied with 2 self-tapping screws for mounting	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
ø25, ø30 Y Handle 	Plastic (Black)	CSH-YB	CSH-YB	1
ø25, ø30 S Handle 	Plastic (Black)	CSH-SB	CSH-SB	1
ø25 S Handle 	Plastic (Black)	CSH-25SB	CSH-25SB	1
ø25, ø30 P Handle 	Plastic (Black)	CSH-PB	CSH-PB	1
ø25, ø30 F Handle 	Plastic (Black)	CSH-FB	CSH-FB	1
Key Handle 	Plastic (Black)	CSH-H2B	CSH-H2B	1
Spare Keys 	Metal (brass nickel-plated)	CSH-K301	CSH-K301PN02	2
Handle Shaft 	Plastic	CS-HF2C	CS-HF2CPN05	5
Handle Screw 	For Y, ø30 S, and ø25 S handles M3 × 12	CS-SCW-M3-12	CS-SCW-M3-12PN10	10
Handle Screw 	For P and F handles M3 × 25	CS-SCW-M3-25	CS-SCW-M3-25PN10	10

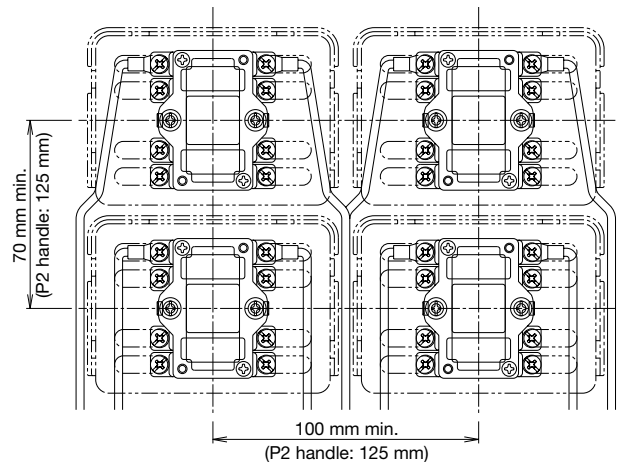
Instructions

Installing the Terminal Cover for the CS series Cam Switches

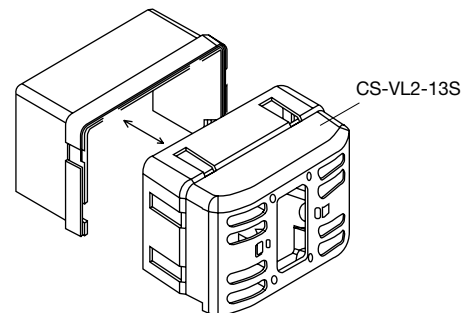
- Complete wiring before installing the terminal cover on the bottom plate of the contact block.
- The terminal cover has six holes. Of the four round holes at four corners, use two diagonal pair of holes to install the terminal cover. Either pair can be used.
- Insert the attached self-tapping screws 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

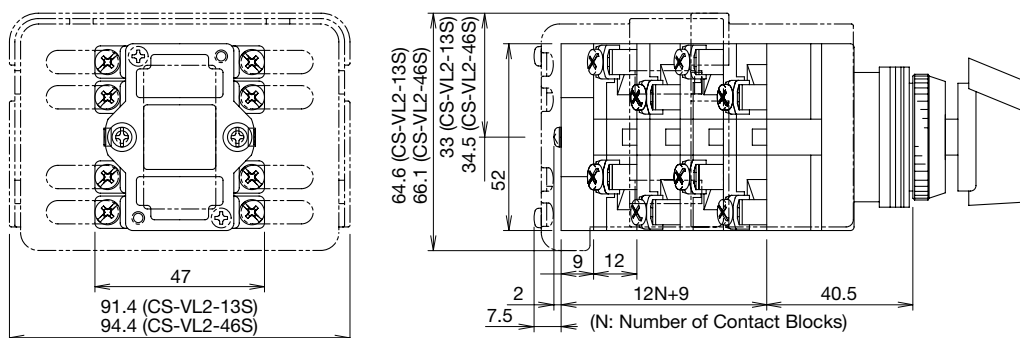


- Although the minimum mounting centers are 100 mm horizontally and 70 mm vertically, determine the mounting centers in consideration of convenience of wiring. For the P2 handle, the minimum mounting centers are 125 mm horizontally and vertically.



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

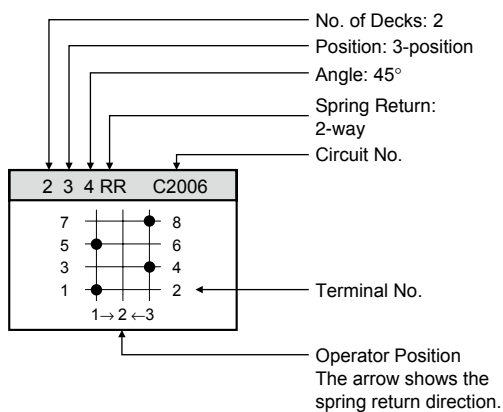
Terminal Cover Dimensions



All dimensions in mm.

Standard Contact Arrangements

- The following table lists 76 standard contact arrangements for easy designation of required cam switch operation.
- When other contact arrangements are required, specify the number of contact block decks, operator positions, angles, and contact operation using the Custom Contact Arrangement Specification Sheet on page 66.



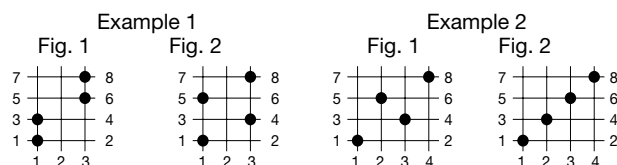
Symbol	Contact Operation
●	Contacts closed.
—	Contacts remain closed between two operator positions.
—	Overlapping Contacts Contacts of different decks are both closed at one point while the handle is turned to the next position.
○	Residual Contacts When the handle is returned to the center, the contacts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

Listing Order of the Table

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

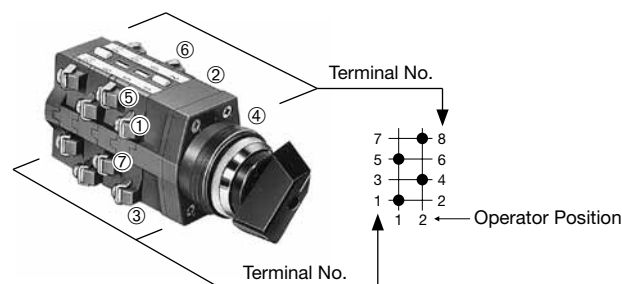
Same Circuits

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



Terminal Numbers

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



Standard Contact Arrangement 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

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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

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4 5 4 C4009 	5 3 4 C5001 	6 4 4 C6001 	6 12 3 C6002
6 4 9 C6003 	6 9 3 C6004 	6 6 6 C6005 	6 6 4 C6006

Application Examples (Voltmeter and Ammeter Circuits)

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

Custom Contact Arrangement Specification Sheet

- The preceding pages provide 76 standard contact arrangements. When other contact arrangements are required, specify the number of contact block decks, operator positions, angles, and contact operation using the Custom Contact Arrangement Specification Sheet shown below.
- For available number of contact blocks and operator positions, see the Ordering Information on page 60.

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.

Deck 2	7					
	5					
Deck 1	3					
	1					
Angle						
Positions		1	2	3	4	5
Spring Return						

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 Arrangement Specification Sheet														
Part No.: ① Model ② Decks ③ Positions ④ Angle ⑤ Spring Return ⑥ Handle												Quantity: _____		
Deck	Terminal No.	Contact Arrangement 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														