

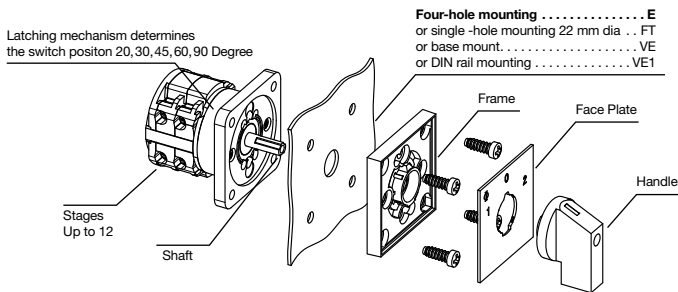
Construction Data

The load switches of the C, CA and CAD-series offer a solution for most cam switch applications. Different contact designs, contact materials and terminals allow for their use as control switches, instrumentation switches and motor control switches, as well as in electronic circuitry and in aggressive environments according to IEC 60947-3 and VDE 0660 part 107.

The stage is the basis for all switches and can be supplied with a maximum of 2 contacts. The terminals are accessible from the side. CA and CAD switches are supplied with open terminals to facilitate wiring and are protected against accidental finger contact according to EN 50274, VDE 0660 part 514 and DGUV V3. Switches up to type CA25B are supplied with captive screws with clamping plates. The switch types CA40-CA63 are supplied with box terminals. Captive plus-minus terminal screws and integrated screwdriver guides facilitate wiring.

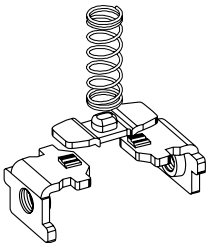
If a positive manual operation or a higher DC rating is required, many of these switches can be fitted with a snap action latching mechanism - suffix „S“ - to the switch type.

The cam-operated switches of the L-series are continuous current rated for off-load switching. They may be used to switch resistive or low inductive loads.



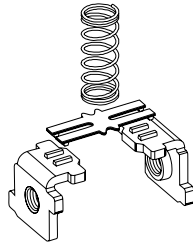
Special Contact Systems

CA4/CA4-1



High contact reliability by multiple cross-point contacts, electronic compatible.

CAD4-1/CAD11/CAD12



High contact reliability by H-bridge design with "cross-wire" contacts. The contact system with gold-plated contacts (CAD12 with silver contact) allows for low voltages, electronic compatible.

| Type | Size | Possible Switching Angles | Max. No. of Stages |
|---------------------------------------|------|---------------------------|--------------------|
| CA4, CA4-1, CAD4-1 | S00 | 30°, 45°, 60°, 90° | 9 |
| CA10-CA25 | S0 | 30°, 45°, 60°, 90° | 12 |
| CA10S-CA25S | S0 | 60°, 90° | on request |
| CAD11, CAD12 | S0 | 30°, 45°, 60°, 90° | 12 |
| CA10B-CA25B | S1 | 30°, 45°, 60°, 90° | 12 |
| C26, C32, C42 | S1 | 20°, 30°, 45°, 60°, 90° | 12 |
| C26S, C32S, C42S | S1 | 60° | on request |
| CA40, CA50, CA63 | S1 | 30°, 45°, 60°, 90° | 12 |
| C43, C80, C125, C200-4 | S2 | 20°, 30°, 45°, 60°, 90° | 12 |
| C315 | S3 | 30°, 45°, 60°, 90° | 12 |
| L350, L351, L630, L631 | S2 | 30°, 45°, 60°, 90° | 12 |
| L1000 | | | |
| L400, L600, L800, L1200, L1600, L2000 | S3 | 30°, 45°, 60°, 90° | 12 |

CA and CAD Switches (CA4-CA25B)



CA Switches (CA40-CA63)



C Switches

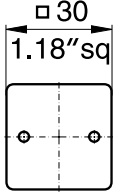
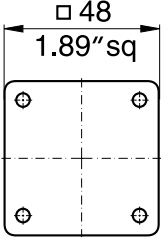
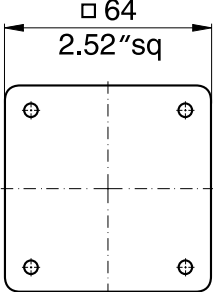
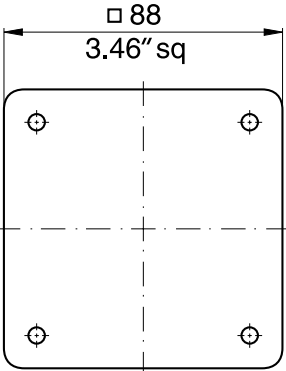
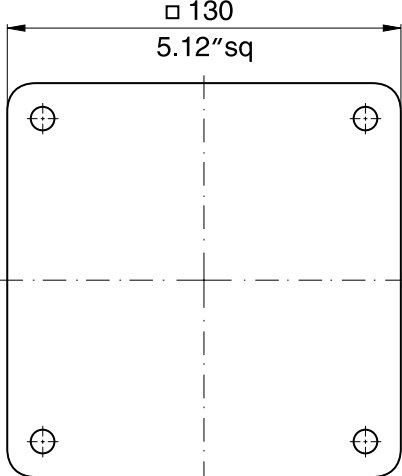


L Switches



Above illustrates the standard terminal positions.

Nominal Ratings

| Switch Size | Type | According to IEC 60947-3/VDE 0660 part 107 | | | |
|--------------------------------------------------------------------------------------------------|-------------------------|------------------------------------------------------|---------------------------------------------|---------------------------------------------------------------------------|------|
| | | Insulation Voltage ¹ U_i V | Thermal Current I_u/I_{th} A | Motor Rating 3 x 380 V-440 V AC-23 AC-3 kW kW | |
| S00  | CA4 | 440 | 10 | 3 | 2,2 |
| | CA4-1 | 440 | 10 | 3 | 2,2 |
| | CAD4-1 | 440 | 5 | - | - |
| | | | | | |
| S0  | CA10 | 690 | 20 | 7,5 | 5,5 |
| | CA11 | 690 | 20 | 7,5 | 5,5 |
| | CA20 | 690 | 25 | 11 | 7,5 |
| | CA25 | 690 | 32 | 15 | 11 |
| | CAD11 | 600 | 6 | - | - |
| | CAD12 | 600 | 6 | - | - |
| S1  | CA10B | 690 | 20 | 7,5 | 5,5 |
| | CA11B | 690 | 20 | 7,5 | 5,5 |
| | CA20B | 690 | 25 | 11 | 7,5 |
| | CA25B | 690 | 32 | 15 | 11 |
| | C26 | 690 | 32 | 15 | 11 |
| | C32 | 690 | 50 | 22 | 15 |
| | C42 | 690 | 63 | 30 | 18,5 |
| | CA40 | 690 | 40 | 18,5 | 15 |
| | CA50 | 690 | 50 | 22 | 18,5 |
| | CA63 | 690 | 63 | 30 | 18,5 |
| S2  | C43 | 690 | 63 | 30 | 18,5 |
| | C80 | 690 | 115 | 45 | 30 |
| | C125 | 690 | 150 | 75 | 37 |
| | C200-4 | 690 | 200 | 75 | 37 |
| | L350 | 690 | 350 | 90 | 37 |
| | L351 | 690 | 350 | 90 | 37 |
| | L630 | 690 | 630 ² | 90 | 37 |
| | L631 | 690 | 630 ² | 90 | 37 |
| | L1000 | 690 | 1000 ² | 90 | 37 |
| | | | | | |
| S3  | C315 | 690 | 315 | 132 | 55 |
| | C316³ | 1000 | 315 | 132 | 55 |
| | L400 | 690 | 500 | 132 | 55 |
| | L600 | 690 | 800 ² | 132 | 55 |
| | L800 | 690 | 1100 ² | 132 | 55 |
| | L1200 | 690 | 1450 ² | 132 | 55 |
| | L1600 | 690 | 1900 ² | 132 | 55 |
| | L2000 | 690 | 2400 ² | 132 | 55 |

For further technical details, refer to pages 44-47.
To furnish with gold contacts and quick connects see page 6.

¹Valid for lines with grounded common neutral termination, overvoltage category III, pollution degree 3. Values for other supply systems on request. ²Ambient temperature 35 °C max. ³Additional switch functions on request.

How to order

Disconnectors and Main Switches according to IEC 60947-3 see Catalog 500

Three types of data (shown below) are required for ordering Blue Line cam-operated switches. Code numbers for ordering are shown in this catalog.

1. Type of Switch

The type of switch required may be easily selected by referring to the table on page 5 which shows the thermal current, power rating and dimensions of each switch. For further technical details, refer to pages 44-47. Variations of contacts and terminals are shown below.

2. Switch Function

The code numbers for standard switches shown on pages 8-32 indicate the switch function, face plate, handle and any optional extras.

Additional coding to modify type and color of handle and face plate is explained below.

3. Type of Mounting

Types of mounting are shown on pages 33-39. Catalog **101** describes enclosures and optional extras.

Specify the mounting code to indicate required mounting.

CA10

A202

VE

Type of Switch

Extending the switch type coding the following combinations will define:

| Amendment | Definition | For switch types |
|----------------|-----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| -1 | with gold contacts ¹ | CA4-1, CA4N-1, CA10-1, CA11-1, CA10B-1, CA11B-1, CAD4-1 |
| -4 | with quick connects | CA4-4 |
| B ² | S0 switches with latching mechanism size S1 | CA10B, CA11B, CA25B, CAD11B, CAD12B |
| C ² | S1 switches with latching mechanism size S2 | CA40C, CA50C, CA63C |
| L | with lockout-relay w/o manual release for std. sw. | CA10L, C25L, C26L, CA40L, CA50L, CA63L |
| M | with lockout-relay with manual release for std. sw. | CA10M, C25M, C26M, C42M, CA40M, CA50M, CA63M |
| X | with power failure release | CA10X, CA20X, CA25X, C26X, C32X, C42X, CA40X, CA50X, CA63X |
| Y | with power failure release and trip-free release | CA10Y, CA20Y, CA25Y |
| S ² | with snap action | CA10S, CA20S, CA25S with 60° or 90° switching C26S, C32S, C42S, CA40S, CA50S, CA63S with 60° switching |
| R | with spring return latching mechanism | CA10R, CA25R, CAD11R, CAD12R |

Example: Coding for switch type **CA10** with gold contacts is **CA10-1**.

Handles, Face Plates and Optional Extras

The handles for standard switches shown on pages 8-32 are suitable for mounting units with four hole mounting. Alternative types of handles available are illustrated on page 42, and mounting units on pages 31-37.

When a handle, face plate or optional extra is required but not covered by the dash number, the code number for the selected component should be entered separately. A comprehensive range of available standard face plates is illustrated on pages 40 and 41. Non-standard or special face plate engravings are available at extra cost.

The large number of optional extras and enclosures is covered in Catalog **101**.

Switch Size

Blue Line switches are available in sizes S00, S0, S1, S2 and S3. These size codes indicate the dimensions of the mounting, the face plate and the handle, as well as the size of optional devices and enclosures.






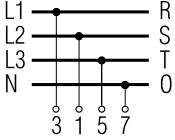






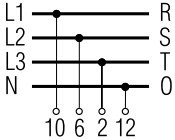






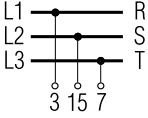
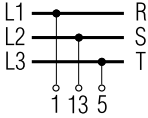







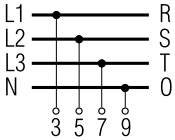

Page 5 lists these sizes and the various switch types they include.

¹Technical data on request. ²Additional length for switches with B, C, S, amendments refer page 54.

| Function | Escutch. Plate | Type/Handle | | | | Code | Stages | Connection Diagram |
|----------|----------------|------------------------|---------------|-------|-----------------|------|--------|--------------------|
| | | CA4 CA4-1 CAD4-1 | CA10- CA25 | CAD.. | CA10B- CA25B | | | |

Voltmeter Switches with „OFF“

[Dimensions p.56](#)

| | | | | | | | | |
|-----------------------------------------|---------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3 phase to neutral |  F779 |  |  |  |  | WAA005 | 2 |   |
| 3 phase to phase and 3 phase to neutral |  F782 |  |  |  |  | A007 | 3 |   |
| 2 separate 3 phase with center „OFF“ |  F786 |  |  |  |  | WAA008 | 4 |     |
| 3 phase and 1 phase to neutral |  F789 |  |  |  |  | WAA010 | 3 |   |

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| | | | | |
|-------------------|-----------------------|------|------------------------|------------------------|
| Single Hole Mount | Terminals rotated 90° | Code | CA4 CA4-1 CAD4-1 | CAD.. CA10- CA25 |
|-------------------|-----------------------|------|------------------------|------------------------|

| | | Code | mm | mm |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|------------------------|--------------------------------------|
|  | <p>Single Hole Mount complete with lock nut and shaft seal Bezel mount, Protection IP 66/67/69k</p> | <ul style="list-style-type: none"> ● FS1 ● FS1-V ● FT1 ● FT1-V ● FT3 ● FT3-V | <p>16/22 16/22</p> | <p>22 22 22/30 22/30</p> |
|  | <p>Square face plate, Protection IP 66/67/69k</p> | <ul style="list-style-type: none"> ● FS2 ● FS2-V ● FT2 ● FT2-V ● FT4 ● FT4-V | <p>16/22 16/22</p> | <p>22 22 22/30 22/30</p> |
|  | <p>S1 square face plate and heavy duty stop, Protection IP 66/67/69k</p> | <ul style="list-style-type: none"> ● FH3 ● FH3-V | | <p>22 22</p> |
|  | <p>Rectangular face plate, Protection IP 66/67/69k</p> | <ul style="list-style-type: none"> ● FS4 ● FS4-V ● FT6 ● FT6-V | <p>16/22 16/22</p> | <p>22 22</p> |
|  | <p>S1 rectangular face plate and heavy duty stop, Protection IP 66/67/69k</p> | <ul style="list-style-type: none"> ● FH4 ● FH4-V | | <p>22 22</p> |
|  | <p>Lock nut spanner</p> | <p>S00 T170 09</p> | | |

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| | |
|-----------------------|-------------------------------------------------------------------------------|
| Selection Data | CA4 CA10 CA11 CA20 CA25 C42 C315 |
| | CA4-1 CA10B CA11B CA20B CA25B C26 C32 C43 CA40 CA50 CA63 C80 C125 C200-4 C316 |

| | | | | | | | | | | | | | | | | | | | |
|--------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|----------------------------------------------------|------------------------------------------------------------------|------|------|-------|------|------------|-------|------|------|-----------------|-------|------|------|------|------|-----|------------|
| Rated Insulation Voltage U_i | IEC 60947-3, EN 60947-3 ¹ VDE 0660 part 107 ¹ | V | 440 | 690 | 690 | 690 | 690 | 690 | 690 | 690 | 690 | 690 | 690 | 690 | 690 | 690 | 690 | 690 | 1000 |
| | SEV ⁴ | V | 380 | 660 | 660 | 660 | 690 | 660 | 660 | 660 | 690 | 690 | 690 | 660 | 660 | - | 660 | | |
| | UL/Canada | V | 300 | 300 | 600 | 600 | 300 | 600 | 600 | 600 | 600 | 600 | 600 | 600 | 600 | - | 600 | | |
| | CEE/NEMKO | V | 400/380 | 380 | 400 | 400 | - | 400 | 400 | 400 | - | - | - | 400 | - | - | - | | |
| | min. voltage | | | | | | | | | | | | | | | | | | on request |
| Rated Impulse Withstand Voltage U_{imp} | | kV | 4 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6/8 |
| Rated Thermal Current I_U/I_{th} | IEC 60947-3, EN 60947-3 VDE 0660 part 107 | A | 10 | 20 | 20 | 25 | 32 | 32 | 50 | 63 | 40 | 50 | 63 | 115 | 150 | 200 | 315 | | |
| | SEV ³ 380 V | A | 10 | 16 | 16 | 25 | 32 | 32 | 40 | 63 | 40 | 50 | 63 | 100 | 150 | - | 315 | | |
| | 660 V | A | - | 12 | 12 | 25 | 32 | 32 | 40 | 63 | 40 | 50 | 63 | - | - | - | 315 | | |
| | UL/Canada | A | 10 | 20 | 20 | 30 | 30 | 40 | 50 | 65 | 45 | 55 | 65 | 100 | 150 | - | 240 | | |
| Rated Operational Current I_e | AC-21A Switching of resistive loads, including moderate overloads | IEC 60947-3, EN 60947-3 VDE 0660 690 V part 107 | A | 10 | 20 | 20 | 25 | 32 | 32 | 40 | 63 | 40 | 50 | 63 | 100 | 150 | 200 | 315 | |
| | AC-1 Resistive or low inductive loads | SEV ⁴ 380 V 660 V | A | 10 | 16 | 16 | 25 | 32 | 32 | 40 | 63 | 40 | 50 | 63 | 100 | 150 | - | 315 | |
| | | | A | - | 12 | 12 | 20 | 32 | 32 | 40 | 63 | 40 | 50 | 63 | - | - | - | 315 | |
| AC-22A Switching of combined resistive or low inductive loads including moderate overloads | IEC 60947-3, EN 60947-3 VDE 0660 220 V-500 V part 107 | A | 10 | 20 | 20 | 25 | 32 | 32 | 40 | 63 | 40 | 50 | 63 | 100 | 150 | 150 | 315 | | |
| | 660 V-690 V | A | - | 20 | 20 | 25 | 32 | 32 | 40 | 63 | 40 | 50 | 63 | 100 | 125 | 125 | 125 | | |
| AC-15 Switching of control devices, contactors, valves etc. | IEC 60947-5-1, EN 60947-5-1 VDE 0660 220 V-240 V part 200 | A | 2,5 | 6 | 6 | 8 | 12 | 14 | 16 | - | 14 | 16 | 16 | - | - | - | - | | |
| | 380 V-440 V | A | 1,5 | 4 | 4 | 5 | 6 | 6 | 7 | - | 6 | 7 | 7 | - | - | - | - | | |
| Pilot Duty | UL/Canada ³ Heavy | VAC | A300 | A300 | A600 | A600 | A300 | A600 | A600 | A600 | A600 | A600 | A600 | - | - | - | A600 | | |
| Ampere Rating Resistive or low inductive loads | UL/Canada ³ | A | 10 | 20 | 20 | 30 | 30 | 40 | 50 | 65 | 45 | 55 | 60 | 100 | 150 | - | 240 | | |
| Resistive load/motor load | CEE | A | 4/2 | 10/6 | 10/6 | 16/10 | - | 25/1032/10 | 40/10 | - | - | - | 63/10 | - | - | - | - | | |
| | NEMKO | A | 6/4 ² | 10/6 | - | 20/10 | - | - | - | - | - | - | - | - | - | - | - | | |
| Breaking capacity | 220 V-240 V | A | 50 | 150 | 150 | 200 | 280 | 280 | 380 | 550 | 290 | 330 | 440 | 860 | 1100 | 1100 | 2000 | | |
| | 380 V-440 V | A | 50 | 150 | 150 | 200 | 250 | 250 | 360 | 550 | 290 | 330 | 440 | 860 | 1100 | 1100 | 2000 | | |
| | 660 V-690 V | A | - | 80 | 80 | 125 | 150 | 150 | 270 | 365 | 170 | 200 | 260 | 400 | 490 | 490 | 340 | | |
| Power loss per contact at I_U | | W | 0,4/0,9 | 0,9 | 0,9 | 0,9 | 0,7 | 1,3 | 1,3 | 1,7 | 1 | 1,8 | 2,8 | 5,8 | 3,8 | 6,7 | 17 | | |
| Resistance to vibration | | | min. 4 g, 2-100 Hz, 1,6 mm | | | | | | | | | on request | | | | | | | |
| Resistance to shock | | | min. 5 g, 6 ms | | | | | | | | | min. 5 g, 30 ms | | | | | | | |
| Short Circuit Protection | Max. fuse size (gG-characteristic) | A | 10 | 25 | 25 | 35 | 35 | 50 | 63 | 80 | 50 | 63 | 63 | 125 | 200 | 200 | 315 | | |
| | Rated short-time withstand current (1s-current) | A | 60 | 140 | 140 | 280 | 480 | 350 | 800 | 1000 | 950 | 950 | 950 | 1300 | 2000 | 2000 | 4200 | | |
| Min. Ambient Temperature of Stages | | | -25 °C (valid only without optional extra, C315/C316 on request) | | | | | | | | | | | | | | | | |
| Max. Ambient Temperature of Stages ^{5,7} open at 100 % I_U/I_{th} enclosed at 100 % I_{the} | | | 55 °C during 24 hours with peaks up to 60 °C | | | | | | | | | | | | | | | | |
| | | | 35 °C during 24 hours with peaks up to 40 °C | | | | | | | | | | | | | | | | |

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44 ¹Valid for lines with grounded common neutral termination, overvoltage category III, pollution degree 3. Values for other supply systems on request. ²Valid for CA4 only. ³International Standards and Approvals, refer to page 43. ⁴For electromagnetic optional extras see additional data in Catalog 101. ⁵Storage temperature: -40 °C to 85 °C (in case of temperature below -5 °C no shock load permissible).