



Kraus & Naimer

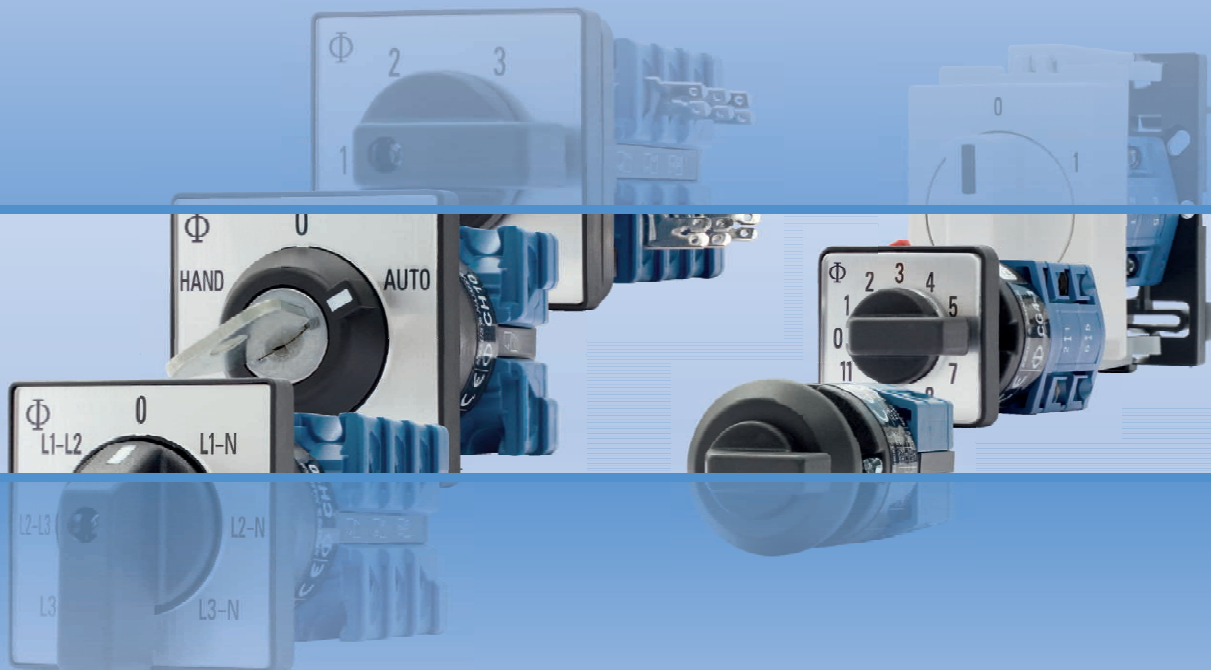
BLUE LINE switchgear

since 1907

Catalog 120 Control Switches

03/2011

CG, CH and CHR type up to 25 A



Kraus & Naimer

The development of the Blue Line rotary switch, contactor and motor starter product ranges is based on more than hundred years experience by Kraus & Naimer in the design and manufacture of electrical switchgear. Kraus & Naimer pioneered the introduction of the cam operated rotary switch and continues to be recognized as the world leader in that product field.

BLUE LINE

Blue Line products are protected by numerous patents throughout the industrial world. They are built to national and international standards and designed to withstand adverse temperatures and climates.

Blue Line products are accepted and universally recognized for their quality and workmanship. They are supported by a worldwide sales and service organization.

The Kraus & Naimer Registered Trademark



WORLDWIDE SYMBOL
FOR QUALITY SWITCHGEAR

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

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Construction Data

Cam switches of the CG, CH and CHR-series are designed for universal application and may ideally be used for control switches, instrumentation switches and motor control switches. Different contact designs, contact materials and terminals allow the use as well as in electronic circuitry and in aggressive environments in accordance with IEC 60947-3, EN 60947-3, VDE 0660 part 107, UL and cUL (cUR).

The stage is the basis for all switches and can be supplied with a maximum of 2 contacts. All switches of this series are supplied with open terminals which are accessible while the switch is installed. The terminals are protected against accidental finger contact according to EN 50274, VDE 0660 part 514 and BGV A3. Captive plus-minus terminal screws and integrated screwdriver guides facilitate wiring. Due to the particular arrangement of the terminals of the CG switches, it is possible

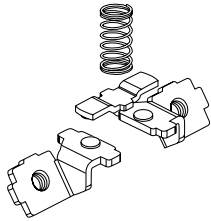
to install the switches closely, side by side, or to mount them directly at the cable trays. The contact terminal numbers are easy to read, even if the switch is installed.

The captive plus-minus screws of the CH and CHR-series are located about 90° apart from the terminal direction. This allows for connecting wires without any interference with the terminal screws.

For connection with ring type terminals the CHR-series were designed. The switches are supplied with large open terminals. This allows for connection without removing the screws.

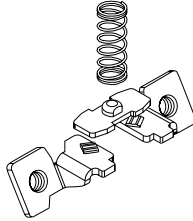
3 different Contact Systems are available

CG6 to
CHR16B



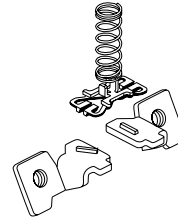
A rigid, double-break bridge with silver alloy contacts provides high making and breaking capabilities for regular control applications.

CG4 and
CG4-1



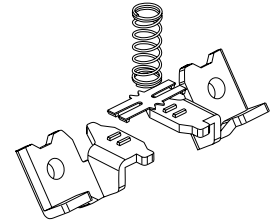
High contact reliability by multiple cross-point contacts, CG4 with 1 μ and CG4-1 with 35 μ gold plating.

CGD4-1



High contact reliability by H-bridge design with "cross-wire" contacts. The contact system with gold-plated contacts (CH12/CHR12 with silver contact) allows for low voltages, electronic compatible.

CH11/CHR11
CH12/CHR12

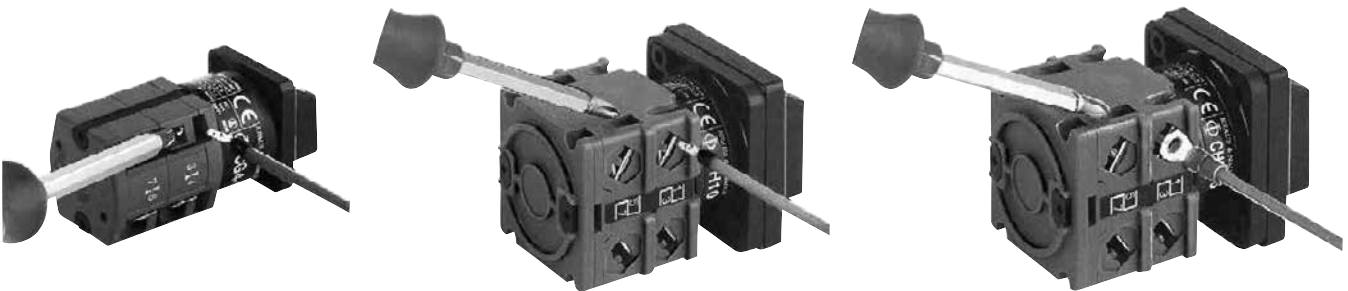


| Type | Size | Possible Switching Angles | Max. No. of Stages |
|--------------|------|---------------------------|--------------------|
| CG4-CGD4-1 | S00 | 30°, 45°, 60°, 90° | 8 |
| CG6-CHR6 | S00 | 30°, 45°, 60°, 90° | 4 |
| CG8-CHR16 | S0 | 30°, 45°, 60°, 90° | 12 |
| CG8B | S1 | 30°, 45°, 60°, 90° | 12 |
| CH10B-CHR16B | S1 | 30°, 45°, 60°, 90° | 12 |
| CG8S | S0 | 60° | on request |

CG-series

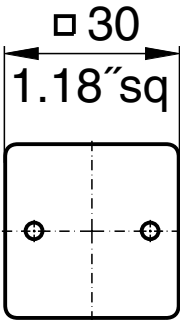
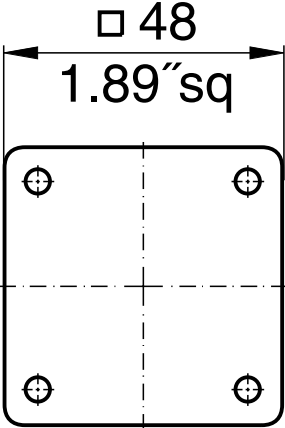
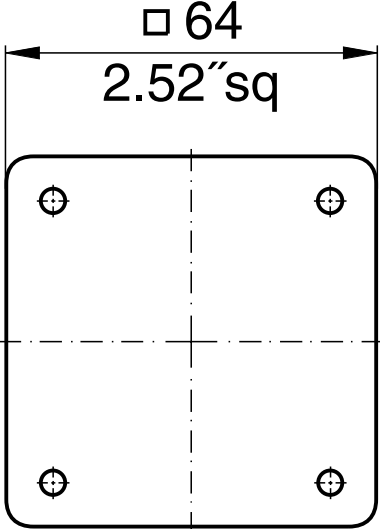
CH-series

CHR-series



Above illustrates the standard terminal positions.

Nominal Ratings

| Switch Size | Type | According to IEC 60947-3, EN 60947-3, VDE 0660 part 107 | | | |
|--|---------------|---|---|--|-----|
| | | Operational Voltage ¹ U_e V | Thermal Current I_u/I_{th} A | Motor Rating 3 x 380 V-440 V AC-23A AC-3 kW kW | |
| S00  | CG4 | 440 | 10 | 3 | 2,2 |
| | CG4-1 | 440 | 10 | 3 | 2,2 |
| | CGD4-1 | 440 | 5 | - | - |
| | CG6 | 690 | 20 | 7,5 | 5,5 |
| | CH6 | 690 | 20 | 7,5 | 5,5 |
| | CHR6 | 690 | 20 | 7,5 | 5,5 |
| S0  | CG8 | 690 | 20 | 7,5 | 5,5 |
| | CH10 | 690 | 20 | 7,5 | 5,5 |
| | CH11 | 600 | 6 | - | - |
| | CH12 | 600 | 6 | - | - |
| | CH16 | 690 | 25 | 11 | 7,5 |
| | CHR10 | 690 | 20 | 7,5 | 5,5 |
| | CHR11 | 600 | 6 | - | - |
| | CHR12 | 600 | 6 | - | - |
| | CHR16 | 690 | 25 | 11 | 7,5 |
| S1  | CH10B | 690 | 20 | 7,5 | 5,5 |
| | CH16B | 690 | 25 | 11 | 7,5 |
| | CHR10B | 690 | 20 | 7,5 | 5,5 |
| | CHR16B | 690 | 25 | 11 | 7,5 |

For further technical details, refer to pages 34-36.

¹Valid for lines with grounded common neutral termination, overvoltage category III, pollution degree 3. Values for other supply systems 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 3 which shows the thermal current, power rating and dimensions of each switch. For further technical details, refer to pages 34-36. Variations of contacts and terminals are shown below.

2. Switch Function

The code numbers for standard switches shown on pages 6-23 indicate the switch function, escutcheon plate, handle and any optional extras.

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

3. Type of Mounting

Types of mounting are shown on pages 24-29. Catalog **101** describes enclosures and optional extras.

Specify the mounting code to indicate required mounting.

CH10

A202-600

VE

Type of Switch

Extending the switch type coding the following combinations will define:

| Amendment | Definition | For switch types |
|-----------------|---|---|
| -1 | with gold contacts ¹ | CH6, CHR6, CH10, CHR10, CH10B, CHR10B |
| -4 ² | with quick connects (nickel-plated) | CH6, CH10, CH16, CH10B, CH16B |
| -6 ² | with angled quick connects (nickel-plated) | CH6, CH10, CH16, CH10B, CH16B |
| B | S0 switches with latching mechanism size S1 | CG8, CH10, CH16, CHR10, CHR16 for four hole panel mounting |
| L | with lockout-relay w/o manual release | CG8, CH10, CH16, CHR10, CHR16 |
| M | with lockout-relay with manual release | CG8, CH10, CH16, CHR10, CHR16 |
| X | with power failure release | CG8, CH10, CH16, CHR10, CHR16 |
| R | with spring return latching mechanism | CG8, CH10, CH16 |
| S | with snap action | CG8, CH10, CH16, CHR10, CHR16 with 60° or 90° switching |

Example: Coding for switch type **CH10** with latching mechanism size S1 is **CH10B**.

Modification of Switches

The part number for switch function and options may be modified in cases where items are required other than standard. The modification may involve the escutcheon plate inscription, color combination of escutcheon plate and handle, type of escutcheon plate and handle or the optional extra.

| Switch Size | Escutcheon Plate Frame | Handle | Escutcheon Plate Backing | Escutcheon Plate Lettering | Dash Number |
|-------------|------------------------|--------------|--------------------------|----------------------------|-------------|
| S0, S1 | electro-gray | electro-gray | brushed alu | black | -100 |
| S0, S1 | electro-gray | electro-gray | black | mat silver | -500 |
| S00, S0, S1 | black | black | brushed alu | black | -600 |
| S00, S0, S1 | black | black | black | mat silver | -700 |

How to order

Modification of Switches

The standard switch consists of a transparent escutcheon plate with brushed aluminum backing and black inscription. The escutcheon plate frame is black as well as the handle. Page 4 shows further color combinations of escutcheon plate and handle which are available. The appropriate dash number must be substituted in the switch function coding to specify other color combinations as required.

Example: The complete coding for switch type CG8 with a 3 pole ON/OFF switch function, electro-gray handle and electro-gray escutcheon plate frame with brushed aluminum backing and black inscription which reads 0-1 is as follows: **CH10 A202-100 E**.

The following is a list of special programs for escutcheon plate and handle combinations. They may be obtained by specifying any one of the following two (2) digit dash numbers as a part of the overall dash number. It is still necessary to prefix these two digit numbers with the first digit which represents the color combination desired.

Special programs for escutcheon plate and handle combinations

- **.00** = without escutcheon plate, without handle
- **.01** = without escutcheon plate
- **.02** = without handle
- **.03** = with square escutcheon plate without lettering
- **.04** = with rectangular escutcheon plate without lettering
- **.05** = with square escutcheon plate without lettering and without handle
- **.06** = with rectangular escutcheon plate without lettering and without handle
- **.07** = standard escutcheon plate, without lettering on rectangular section
- **.08** = with F-handle
- **.09** = with P-handle
- **.10** = escutcheon plate frame and fixation ring only (if using switches with single hole mounting: - **.16**)
- **.11** = without escutcheon plate, but with handle bearing plate
- **.12** = with yellow escutcheon plate backing and red handle
- **.14** = with B-handle
- **.16** = escutcheon plate frame and fixation ring only if using switches with single hole mounting
- **.17** = standard escutcheon plate and rectangular add-on escutcheon plate if using switches with single hole mounting FT2

Example: The complete coding for switch type CG8 with a 3 pole ON/OFF switch function with electro-gray escutcheon plate frame, square escutcheon plate without lettering, brushed aluminum plate backing and electro-gray handle reads as follows: **CH10 A202-103 E**.

Handles, Escutcheon Plates and Optional Extras

The handles for standard switches shown on pages 6-23 are suitable for mounting units with four hole mounting. Alternative types of handles available are illustrated on pages 24-29.

When a handle, escutcheon 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 escutcheon plates is illustrated on pages 30-32. Non-standard or special escutcheon plate engravings are available at extra cost. The large number of optional extras and enclosures is covered in Catalog **101**.

Switch Size

CG, CH and CHR switches are available in sizes S00, S0 and S1. These size codes indicate the dimension of the mounting, the escutcheon plate and the handle, as well as the size of optional devices and enclosures. Page 3 lists these sizes and the various switch types they include.

Ordering of Special Switches and Escutcheon Plates

When ordering special switches and escutcheon plates it is advisable to use our order form, as illustrated. The customer's requirements are shown in blue as an example.

For technical reasons, it may not be possible to follow the sequence of contacts requested by the customer. The final contact development which is sent with every switch will show the customer's original terminal markings.

| ESCUTCHEON PLATE | CONTACTS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | SWITCH |
|------------------|----------|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|--------|-----------------|
| MOTOR 1 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | CH16 |
| POSITIONS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | MOUNTING |
| O | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | VE |
| H | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | OPTIONAL EXTRAS |
| A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | M004 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | DATE | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | SIGNED | |

Order forms are available on request.

| Function | Escutch. Plate | Type/Handle | | | | Code | Stages | Connection Diagram |
|----------|----------------|----------------|--------------|-----------------------|------------------|------|--------|--------------------|
| | | CG4- CGD4-1 | CG6- CHR6 | CG8 CH10- CHR16 | CH10B- CHR16B | | | |

ON/OFF Switches with 60° Switching

| | | | | | | | | |
|---|--|--|--|--|--|--|--|--|
| 1 pole 2 pole 3 pole 3 pole with red handle 4 pole 4 pole 1 pole preclose 6° ¹ 5 pole 6 pole 7 pole 8 pole 8 pole 2 pole preclose 6° ¹ 9 pole 10 pole 11 pole 12 pole | | | | | | A200-600 A201-600 A202-600 A202-626 A203-600 WAA653 WAA341 A342-600 A343-600 A344-600 WAA654 WAA345 A346-600 WAA347 A348-600 | 1 1 2 2 2 2 3 3 4 4 4 4 5 5 6 6 | |
| 1 pole 2 pole 3 pole 4 pole 4 pole 1 pole preclose 6° ¹ 5 pole 6 pole 7 pole 8 pole 8 pole 2 pole preclose 6° ¹ 9 pole 10 pole 11 pole 12 pole | | | | | | A200-620 A201-620 A202-620 A203-620 WAA653 WAA341 A342-620 A343-620 A344-620 WAA654 WAA345 A346-620 WAA347 A348-620 | 1 1 2 2 2 3 3 4 4 4 4 5 5 6 6 | |
| 1 pole 2 pole 3 pole 4 pole 4 pole 1 pole preclose 6° ¹ 5 pole 6 pole | | | | | | A200-621 A201-621 A202-621 A203-621 WAA653 WAA341 A342-621 | 1 1 2 2 2 3 3 | |
| 1 pole 2 pole 3 pole 4 pole 4 pole 1 pole preclose 6° ¹ 5 pole 6 pole | | | | | | A200-622 A201-622 A202-622 A203-622 WAA653 WAA341 A342-622 | 1 1 2 2 2 3 3 | |
| 1 pole 2 pole 3 pole 4 pole 4 pole 1 pole preclose 6° ¹ 5 pole 6 pole | | | | | | A200-623 A201-623 A202-623 A203-623 WAA653 WAA341 A342-623 | 1 1 2 2 2 3 3 | |
| 1 pole 2 pole 3 pole 4 pole 4 pole 1 pole preclose 6° ¹ 5 pole 6 pole | | | | | | A200-624 A201-624 A202-624 A203-624 WAA653 WAA341 A342-624 | 1 1 2 2 2 3 3 | |
| 1 pole 2 pole 3 pole 4 pole 4 pole 1 pole preclose 6° ¹ 5 pole 6 pole | | | | | | A200-625 A201-625 A202-625 A203-625 WAA653 WAA341 A342-625 | 1 1 2 2 2 3 3 | |

¹For use in a three phase four-wire system with switched neutral.

| Function | Escutch. Plate | Type/Handle | | | | Code | Stages | Connection Diagram |
|----------|----------------|----------------|--------------|----------------|------------------|------|--------|--------------------|
| | | CG4- CGD4-1 | CG6- CHR6 | CH10- CHR16 | CH10B- CHR16B | | | |

ON/OFF Switches with 90° Switching

| | | | | | | | | |
|---|------|--|--|--|--|--|--------------------------------------|--|
| 1 pole contacts 2 pole preclose 30° 3 pole 4 pole 4 pole 1 pole preclose 60° ¹ 4 pole 3 pole preclose 30° 5 pole contacts 6 pole preclose 30° | | | | | | A290-600 A291-600 A292-600 A324-600 A293-600 WAA327 WAA325 A326-600 | 1 1 2 2 2 2 3 3 | 1, 2, 3, 4, 5 and 6 pole |
| 1 pole contacts 2 pole preclose 30° 3 pole 4 pole 4 pole 1 pole preclose 60° ¹ 4 pole 3 pole preclose 30° 5 pole contacts 6 pole preclose 30° | | | | | | A290-620 A291-620 A292-620 A324-620 A293-620 WAA327 WAA325 A326-620 | 1 1 2 2 2 2 3 3 | 4 pole 1 pole preclose 60° 4 pole 3 pole preclose 30° |
| 3 pole 360° rotation | | | | | | WAA208 WAA208 | 2 2 | 1, 2, 3, 4, 5, 6 |
| 3 pole for foot operation | | | | | | WAA386 | 2 | 1, 2, 3, 4, 5, 6 |

ON/OFF Switches with 30° Switching

| | | | | | | | | |
|--|--|--|--|--|--|--|------------------|--------------|
| 1 pole 2 pole 3 pole 4 pole | | | | | | WAA100 WAA101 WAA102 WAA103 | 1 1 2 2 | 1-4 pole |
| 1 pole with spring return 2 pole with spring return 3 pole with spring return 4 pole with spring return | | | | | | A204-600 A205-600 WAA206 WAA207 | 1 1 2 2 | 1-4 pole |
| 1 pole with spring return 2 pole with spring return 3 pole with spring return 4 pole with spring return | | | | | | A204-620 A205-620 WAA206 WAA207 | 1 1 2 2 | 1-4 pole |

¹For use in a three phase four-wire system with switched neutral. ²available as switch types CH16B and CHR16B

| Function | Escutch. Plate | Type/Handle | | | | Code | Stages | Connection Diagram ² |
|----------|----------------|----------------|--------------|----------------|------------------|------|--------|---------------------------------|
| | | CG4- CGD4-1 | CG6- CHR6 | CH10- CHR16 | CH10B- CHR16B | | | |

Double-throw Switches without „OFF“ 60° Switching

| | | | | | | | | |
|--|--------|----------|----|--|--|----------|---|--|
| 1 pole | | | | | | A220-600 | 1 | |
| 2 pole | | A221-600 | 2 | | | | | |
| 3 pole | | A222-600 | 3 | | | | | |
| 4 pole | | A223-600 | 4 | | | | | |
| 4 pole 1 pole preclose 6° ¹ | | WAA673 | 4 | | | | | |
| 5 pole | | A369-600 | 5 | | | | | |
| 6 pole | | A370-600 | 6 | | | | | |
| 7 pole | | A371-600 | 7 | | | | | |
| 8 pole | | A372-600 | 8 | | | | | |
| 8 pole 2 pole preclose 6° ¹ | | WAA972 | 8 | | | | | |
| 9 pole | | WAA373 | 9 | | | | | |
| 10 pole | | WAA374 | 10 | | | | | |
| 11 pole | WAA375 | 11 | | | | | | |
| 12 pole | WAA376 | 12 | | | | | | |

Double-throw Switches without „OFF“ with electrically isolated contacts

| | | | | | | | | |
|--|--------|----------|---|--|--|----------|---|--|
| 1 pole | | | | | | A720-600 | 1 | |
| 2 pole | | A721-600 | 2 | | | | | |
| 3 pole | | A722-600 | 3 | | | | | |
| 4 pole 1 pole preclose 6° ¹ | | A723-600 | 4 | | | | | |
| 4 pole 1 pole preclose 6° ¹ | WAA973 | 4 | | | | | | |
| 1 pole with spring return | | | | | | A795-600 | 1 | |

Double-throw Switches without „OFF“ 30° Switching

| | | | | | | | | |
|---------------------------|--|----------|---|--|--|----------|---|--|
| 1 pole | | | | | | WAA120 | 1 | |
| 2 pole | | WAA121 | 2 | | | | | |
| 3 pole | | WAA122 | 3 | | | | | |
| 4 pole | | WAA123 | 4 | | | | | |
| 1 pole with spring return | | | | | | A295-600 | 1 | |
| 2 pole with spring return | | A296-600 | 2 | | | | | |
| 3 pole with spring return | | WAA297 | 3 | | | | | |
| 1 pole with spring return | | | | | | A295-620 | 1 | |
| 2 pole with spring return | | A296-620 | 2 | | | | | |
| 3 pole with spring return | | WAA297 | 3 | | | | | |

¹For use in a three phase four-wire system with switched neutral. ²Connection diagrams for CHR switches on request.

| Function | Escutch. Plate | Type/Handle | | | | Code | Stages | Connection Diagram ² |
|----------|----------------|----------------|--------------|------------------------|------------------|------|--------|---------------------------------|
| | | CG4- CGD4-1 | CG6- CHR6 | CG8- CH10- CHR16 | CH10B- CHR16B | | | |

Double-throw Switches with Center „OFF“ 60° Switching

| | | | | | | | | |
|--|--|--|--|--|--|--|--|--|
| 1 pole 2 pole 3 pole 4 pole 4 pole 1 pole preclose 6° ¹ 5 pole 6 pole 7 pole 8 pole 8 pole 2 pole preclose 6° ¹ | | | | | | A210-600 A211-600 A212-600 A213-600 WAA913 A361-600 A362-600 WAA363 WAA364 WAA664 | 1 2 3 4 4 5 6 7 8 8 | |
| 1 pole 2 pole 3 pole 4 pole 4 pole 1 pole preclose 6° ¹ 5 pole 6 pole 7 pole 8 pole 8 pole 2 pole preclose 6° ¹ | | | | | | A210-620 A211-620 A212-620 A213-620 WAA913 A361-620 A362-620 WAA363 WAA364 WAA664 | 1 2 3 4 4 5 6 7 8 8 | |
| 1 pole 2 pole 3 pole | | | | | | A210-621 A211-621 A212-621 | 1 2 3 | |
| 1 pole 2 pole 3 pole | | | | | | A210-622 A211-622 A212-622 | 1 2 3 | |
| 1 pole 2 pole 3 pole | | | | | | A210-623 A211-623 A212-623 | 1 2 3 | |
| 1 pole 2 pole 3 pole 4 pole 4 pole 1 pole preclose 6° ¹ | | | | | | A210-624 A211-624 A212-624 A213-624 WAA913 | 1 2 3 4 4 | |

Double-throw Switches with Center „OFF“ 90° Switching

| | | | | | | | | |
|--|--|--|--|--|--|--|------------------|--|
| 1 pole 2 pole 3 pole 4 pole 1 pole preclose 6° ¹ | | | | | | A218-600 A219-600 WAA299 WAA294 | 1 2 3 4 | |
| 1 pole 2 pole 3 pole 4 pole 1 pole preclose 6° ¹ | | | | | | A218-620 A219-620 WAA299 WAA294 | 1 2 3 4 | |

Double-throw Switches with Center „OFF“ and electrically isolated contacts

| | | | | | | | | |
|--|--|--|--|--|--|--|-----------------------|--|
| 1 pole 2 pole 3 pole 4 pole 4 pole 1 pole preclose 6° ¹ | | | | | | A710-600 A711-600 A712-600 A713-600 WAA963 | 1 2 3 4 4 | |
| 1 pole with spring return 2 pole to center | | | | | | A714-600 A715-600 | 1 2 | |

¹For use in a three phase four-wire system with switched neutral. ²Connection diagrams for CHR switches on request.

| Function | Escutch. Plate | Type/Handle | | | | Code | Stages | Connection Diagram ¹ |
|----------|----------------|----------------|--------------|----------------|------------------|------|--------|---------------------------------|
| | | CG4- CGD4-1 | CG6- CHR6 | CH10- CHR16 | CH10B- CHR16B | | | |

Double-throw Switches with Spring Return to Center

| | | | | | | | | |
|---|--|--|--|--|--|----------------------------------|-------------|-----------------|
| 1 pole with spring return to center | | | | | | A214-600 A215-600 A216-600 | 1 2 3 | <p>1-3 pole</p> |
| 2 pole with spring return to center | | | | | | A214-620 A215-620 A216-620 | 1 2 3 | |
| 3 pole with spring return to center | | | | | | A214-620 A215-620 A216-620 | 1 2 3 | |
| 1 pole with spring return from left to center | | | | | | A320-600 A321-600 A322-600 | 1 2 3 | <p>1-3 pole</p> |
| 2 pole with spring return from left to center | | | | | | A320-600 A321-600 A322-600 | 1 2 3 | |
| 3 pole with spring return from left to center | | | | | | A320-600 A321-600 A322-600 | 1 2 3 | |
| 1 pole | | | | | | A320-621 A321-621 A322-621 | 1 2 3 | <p>1-3 pole</p> |
| 2 pole | | | | | | A320-621 A321-621 A322-621 | 1 2 3 | |
| 3 pole | | | | | | A320-621 A321-621 A322-621 | 1 2 3 | |

General Application Switches

| | | | | | | | | | |
|--|--|--|--|--------|--------------------------------|--------------------------------|---------------|---|---------------|
| 1 pole 2 Gang | | | | | | A310-600 A312-600 WAA314 | 1 2 3 | <p>1 pole</p> | |
| 2 pole | | | | | | | | | <p>2 pole</p> |
| 3 pole | | | | | | | | | |
| 1 pole | | | | | A310-620 A312-620 WAA314 | 1 2 3 | <p>1 pole</p> | | |
| 2 pole | | | | | | | | <p>2 pole</p> | |
| 3 pole | | | | | | | | | <p>3 pole</p> |
| 1 pole 3 Gang | | | | | A311-600 WAA313 WAA315 | 2 3 5 | <p>1 pole</p> | | |
| 2 pole | | | | | | | | <p>2 pole</p> | |
| 3 pole | | | | | | | | | <p>3 pole</p> |
| 1 pole | | | | | A311-620 WAA313 WAA315 | 2 3 5 | <p>1 pole</p> | | |
| 2 pole | | | | | | | | <p>2 pole</p> | |
| 3 pole | | | | | | | | | <p>3 pole</p> |
| 1 pole 2 Gang | | | | | WAA330 WAA331 WAA332 | 1 2 3 | <p>1 pole</p> | | |
| 2 pole | | | | | | | | <p>2 pole</p> | |
| 3 pole | | | | | | | | | <p>3 pole</p> |
| 1 pole | | | | | WAA330 WAA331 WAA332 | 1 2 3 | <p>1 pole</p> | | |
| 2 pole | | | | | | | | <p>2 pole</p> | |
| 3 pole | | | | | | | | | <p>3 pole</p> |
| 2 pole 2 Gang | | | | | WAA339 | 2 | <p>2 pole</p> | | |
| Series-parallel Switching | | | | | | | | <p>Switching sequence: 0, A+B series, A, A+B parallel</p> | <p>2 pole</p> |
| Switching sequence: 0, A+B series, A, A+B parallel | | | | WAA339 | 2 | <p>2 pole</p> | | | |

¹Connection diagrams for CHR switches on request.

| Function | Escutch. Plate | Type/Handle | | | | Code | Stages | Connection Diagram |
|----------|----------------|----------------|--------------|--------------|------------------|------|--------|--------------------|
| | | CG4- CGD4-1 | CG6- CHR6 | CH11 CH12 | CH10B- CHR16B | | | |

Coding Switches/Binary Code

| | | | | | | | |
|--------------------------------------|--|--|--|--|----------|---|--|
| 0 - 7 360° rotation | | | | | A540-600 | 2 | |
| 0 - 7 complement 360° rotation | | | | | WAA541 | 2 | |
| 0 - 7 + complement 360° rotation | | | | | WAA542 | 3 | |
| 0 - 9 | | | | | A550-600 | 2 | |
| 0 - 9 complement | | | | | WAA551 | 2 | |
| 0 - 9 + complement | | | | | WAA552 | 4 | |
| 0 - 11 360° rotation | | | | | WAA543 | 2 | |
| 0 - 11 + complement 360° rotation | | | | | WAA545 | 4 | |

| Function | Escutch. Plate | Type/Handle | | | | Code | Stages | Connection Diagram ¹ |
|----------|----------------|----------------|--------------|-----------------------|------------------|------|--------|---------------------------------|
| | | CG4- CGD4-1 | CG6- CHR6 | CG8 CH10- CHR16 | CH10B- CHR16B | | | |

Multi-step Switches without „OFF“

| | | | | | | | | |
|--|--|--|--|--|--|--|------------------------------|--|
| 1 pole 2 pole 3 pole 4 pole 5 pole 6 pole | | | | | | A230-600 A250-600 A270-600 A476-600 WAA484 WAA489 | 2 3 5 6 8 9 | |
| 1 pole 2 pole 3 pole 4 pole 5 pole 6 pole | | | | | | A231-600 A251-600 A271-600 A477-600 WAA485 WAA490 | 2 4 6 8 10 12 | |
| 1 pole 2 pole 3 pole 4 pole | | | | | | A232-600 A252-600 WAA272 WAA478 | 3 5 8 10 | |
| 1 pole 2 pole 3 pole | | | | | | A233-600 WAA253 WAA273 | 3 6 9 | |
| 1 pole 2 pole 3 pole | | | | | | WAA234 WAA254 WAA274 | 4 7 11 | |
| 1 pole 2 pole 3 pole | | | | | | WAA235 WAA255 WAA275 | 4 8 12 | |
| 1 pole | | | | | | WAA236 | 5 | |
| 1 pole | | | | | | WAA237 | 5 | |
| 1 pole | | | | | | WAA238 | 6 | |
| 1 pole 1 pole 360° rotation | | | | | | WAA239 WAA639 | 6 6 | |

¹Connection diagrams for CHR switches on request.

| Function | Escutch. Plate | Type/Handle | | | | Code | Stages | Connection Diagram ¹ |
|----------|----------------|----------------|--------------|----------------|------------------|------|--------|---------------------------------|
| | | CG4- CGD4-1 | CG6- CHR6 | CH10- CHR16 | CH10B- CHR16B | | | |

Multi-step Switches without „OFF“ with electrically isolated contacts

| | | | | | | | | |
|---------------|--|--|--|--|--|----------|---|------------|
| 1 pole 3 Step | | | | | | A730-600 | 2 | 1 pole |
| 2 pole | | | | | | A750-600 | 3 | 2 pole |
| 1 pole 4 Step | | | | | | A731-600 | 2 | 1 pole |
| 2 pole | | | | | | A751-600 | 4 | 2 pole |

Multi-step Switches with „OFF“

| | | | | | | | | | |
|---------------|--|--|--|--|--|----------|---|------------------|--------|
| 1 pole 2 Step | | | | | | A240-600 | 1 | 1-6 pole | |
| 2 pole | | | | | | A260-600 | 2 | | |
| 3 pole | | | | | | A280-600 | 3 | | |
| 4 pole | | | | | | WAA480 | 4 | | |
| 5 pole | | | | | | WAA486 | 5 | | |
| 6 pole | | | | | | WAA491 | 6 | | |
| 1 pole | | | | | | A240-620 | 1 | 1-6 pole | |
| 2 pole | | | | | | A260-620 | 2 | | |
| 3 pole | | | | | | A280-620 | 3 | | |
| 4 pole | | | | | | WAA480 | 4 | | |
| 5 pole | | | | | | WAA486 | 5 | | |
| 6 pole | | | | | | WAA491 | 6 | | |
| 1 pole 3 Step | | | | | | A241-600 | 2 | 1 and 2 pole | |
| 2 pole | | | | | | A261-600 | 3 | | |
| 3 pole | | | | | | A281-600 | 5 | | |
| 4 pole | | | | | | WAA481 | 6 | | |
| 5 pole | | | | | | WAA487 | 8 | | |
| 1 pole | | | | | | A241-620 | 2 | | 3 pole |
| 2 pole | | | | | | A261-620 | 3 | | |
| 3 pole | | | | | | A281-620 | 5 | | |
| 4 pole | | | | | | WAA481 | 6 | | |
| 5 pole | | | | | | WAA487 | 8 | | |
| 1 pole | | | | | | A241-621 | 2 | 4 pole | |
| 2 pole | | | | | | A261-621 | 3 | | |
| | | | | | | | | 5 pole | |

¹Connection diagrams for CHR switches on request.

| Function | Escutch. Plate | Type/Handle | | | | Code | Stages | Connection Diagram ¹ |
|----------|----------------|----------------|--------------|-----------------------|------------------|------|--------|---------------------------------|
| | | CG4- CGD4-1 | CG6- CHR6 | CG8 CH10- CHR16 | CH10B- CHR16B | | | |

Multi-step Switches with „OFF“

| | | | | | | | | |
|-----------------------------|--|--|--|--|--|--|------------------|---------------|
| 1 pole 4 Step | | | | | | A242-600 WAA262 WAA282 WAA482 | 2 4 6 8 | |
| 1 pole 2 pole 3 pole 4 pole | | | | | | A242-620 WAA262 WAA282 WAA482 | 2 4 6 8 | 1-4 pole |
| 1 pole 5 Step | | | | | | A243-600 WAA263 WAA283 | 3 5 8 | |
| 1 pole 2 pole 3 pole | | | | | | A243-620 WAA263 WAA283 | 3 5 8 | 1-3 pole |
| 1 pole 6 Step | | | | | | A244-600 WAA264 WAA284 | 3 6 9 | |
| 1 pole 2 pole 3 pole | | | | | | A244-620 WAA264 WAA284 | 3 6 9 | 1-3 pole |
| 1 pole 7 Step | | | | | | WAA245 WAA265 | 4 7 | |
| 1 pole 2 pole | | | | | | WAA245 WAA265 | 4 7 | 1 pole 2 pole |
| 1 pole 8 Step | | | | | | WAA246 | 4 | |
| 1 pole | | | | | | WAA246 | 4 | |
| 1 pole 9 Step | | | | | | WAA247 | 5 | |
| 1 pole | | | | | | WAA247 | 5 | |
| 1 pole 10 Step | | | | | | WAA248 | 5 | |
| 1 pole | | | | | | WAA248 | 5 | |
| 1 pole 11 Step | | | | | | WAA249 WAA649 | 6 6 | |
| 1 pole 360° rotation | | | | | | WAA249 WAA649 | 6 6 | |

¹Connection diagrams for CHR switches on request.

Switch Function and Configuration

CG, CH, CHR Switches

| Function | Escutch. Plate | Type/Handle | | | | Code | Stages | Connection Diagram ¹ |
|----------|----------------|----------------|--------------|----------------|------------------|------|--------|---------------------------------|
| | | CG4- CGD4-1 | CG6- CHR6 | CH10- CHR16 | CH10B- CHR16B | | | |

Voltmeter Switches without „OFF“

| | | | | | | | | |
|--|--|--|--|--|--|----------|---|--|
| 3 phase 3 wire | | | | | | A023-600 | 2 | |
| | | | | | | A023-620 | 2 | |
| 3 phase 3 wire 3 phase to phase and phase to neutral | | | | | | A025-600 | 3 | |
| | | | | | | A025-620 | 3 | |

Voltmeter Switches with „OFF“

| | | | | | | | | |
|-------------------------|--|--|--|--|--|----------|---|--|
| 2 pole 360° rotation | | | | | | WAA002 | 1 | |
| 3 phase 3 wire | | | | | | A004-600 | 2 | |
| | | | | | | A004-620 | 2 | |
| | | | | | | A004-621 | 2 | |
| | | | | | | A004-622 | 2 | |
| | | | | | | A004-623 | 2 | |
| | | | | | | A004-624 | 2 | |
| | | | | | | WAA011 | 2 | |

¹Connection diagrams for CHR switches on request.

| Function | Escutch. Plate | Type/Handle | | | | Code | Stages | Connection Diagram ¹ |
|----------|----------------|----------------|--------------|----------------|------------------|------|--------|---------------------------------|
| | | CG4- CGD4-1 | CG6- CHR6 | CH10- CHR16 | CH10B- CHR16B | | | |

Voltmeter Switches with „OFF“

| | | | | | | | | |
|---|--|--|--|--|--|----------|---|---|
| 3 phase to neutral | | | | | | WAA005 | 2 | <p>L1 R L2 S L3 T N O</p> <p>3 1 5 7</p> <p>2 — (V) — 8</p> |
| | | | | | | WAA005 | 2 | |
| | | | | | | WAA005 | 2 | |
| | | | | | | WAA005 | 2 | |
| | | | | | | WAA005 | 2 | |
| 3 phase to phase and 3 phase to neutral | | | | | | A007-600 | 3 | <p>L1 R L2 S L3 T N O</p> <p>10 6 2 12</p> <p>1 — (V) — 3</p> |
| | | | | | | A007-620 | 3 | |
| | | | | | | A007-621 | 3 | |
| | | | | | | A007-622 | 3 | |
| | | | | | | A007-623 | 3 | |
| | | | | | | A007-624 | 3 | |
| 2 separate 3 phase with center „OFF“ | | | | | | WAA008 | 4 | <p>L1 R L2 S L3 T</p> <p>3 15 7</p> <p>2 — (V) — 10</p> |
| | | | | | | WAA008 | 4 | |
| | | | | | | WAA008 | 4 | |
| | | | | | | WAA008 | 4 | |

¹Connection diagrams for CHR switches on request.

| Function | Escutch. Plate | Type/Handle | | | | Code | Stages | Connection Diagram ¹ |
|----------|----------------|----------------|--------------|----------------|------------------|------|--------|---------------------------------|
| | | CG4- CGD4-1 | CG6- CHR6 | CH10- CHR16 | CH10B- CHR16B | | | |

Voltmeter Switches with „OFF“

| | | | | | | | | |
|--------------------------------|--|--|--|--|--|--------|---|--|
| 3 phase and 1 phase to neutral | | | | | | WAA010 | 3 | |
| | | | | | | WAA010 | 3 | |
| | | | | | | WAA010 | 3 | |
| | | | | | | WAA010 | 3 | |

Ammeter Switches

| | | | | | | | | |
|--|--|--|--|--|--|----------|---|--|
| Single pole with one current transformer | | | | | | WAA046 | 1 | |
| | | | | | | WAA046 | 1 | |
| | | | | | | WAA046 | 1 | |
| Single pole with 3 current transformers without „OFF“ | | | | | | A017-600 | 3 | |
| | | | | | | A017-620 | 3 | |
| Single pole with 3 current transformers with „OFF“ 360° rotation | | | | | | A048-600 | 3 | |
| | | | | | | A048-620 | 3 | |
| | | | | | | A048-621 | 3 | |
| | | | | | | A048-622 | 3 | |
| | | | | | | A048-623 | 3 | |

¹Connection diagrams for CHR switches on request.

| Function | Escutch. Plate | Type/Handle | | | | Code | Stages | Connection Diagram ¹ |
|----------|----------------|----------------|--------------|----------------|------------------|------|--------|---------------------------------|
| | | CG4- CGD4-1 | CG6- CHR6 | CH10- CHR16 | CH10B- CHR16B | | | |

Ammeter Switches

| | | | | | | | | |
|--|--|--|--|--|--|----------|---|--|
| Single pole with 2 current transformers (3 readings) | | | | | | A021-600 | 2 | |
| | | | | | | A021-620 | 2 | |
| Single pole with 4 current transformers | | | | | | WAA036 | 4 | |
| | | | | | | WAA036 | 4 | |
| 2 pole 2 current transformers | | | | | | WAA037 | 3 | |
| | | | | | | WAA037 | 3 | |
| | | | | | | WAA037 | 3 | |
| 2 pole 3 current transformers | | | | | | WAA019 | 5 | |
| | | | | | | WAA019 | 5 | |
| 2 pole | | | | | | A038-600 | 5 | |
| | | | | | | A038-620 | 5 | |
| | | | | | | A038-621 | 5 | |
| 2 pole 4 current transformers | | | | | | WAA039 | 6 | |
| | | | | | | WAA039 | 6 | |

¹Connection diagrams for CHR switches on request.

Switch Function and Configuration

CG, CH, CHR Switches

| Function | Escutch. Plate | Type/Handle | | | | Code | Stages | Connection Diagram ¹ |
|----------|----------------|----------------|--------------|----------------|------------------|------|--------|---------------------------------|
| | | CG4- CGD4-1 | CG6- CHR6 | CH10- CHR16 | CH10B- CHR16B | | | |

Volt-ammeter Switches

| | | | | | | | | |
|--|--|--|--|--|--|--------|---|--|
| 3 phase - phase to phase 3 current | | | | | | WAA027 | 6 | |
| | | | | | | WAA028 | 7 | |
| 3 phase voltage 3 phase current 4 wire | | | | | | WAA033 | 5 | |
| 3 phase voltage 3 phase current 3 wire | | | | | | WAA035 | 5 | |

Control Switches

| | | | | | | | | |
|---|--|--|--|--|--|----------|---|--|
| Stop switch | | | | | | WAA174 | 1 | |
| Start switch | | | | | | A175-600 | 1 | |
| Stop start switch single pole | | | | | | A176-600 | 1 | |
| Stop start switch 2 pole | | | | | | WAA183 | 2 | |
| Stop start switch with spring return from start to run | | | | | | A178-600 | 1 | |
| | | | | | | A178-620 | 1 | |
| Stop start switch with spring return to run for 2 units | | | | | | WAA177 | 2 | |
| | | | | | | WAA177 | 2 | |

¹Connection diagrams for CHR switches on request.

| Function | Escutch. Plate | Type/Handle | | | | Code | Stages | Connection Diagram |
|----------|----------------|----------------|--------------|----------------|------------------|------|--------|--------------------|
| | | CG4- CGD4-1 | CG6- CHR6 | CH10- CHR16 | CH10B- CHR16B | | | |

Control Switches

| | | | | | | | | |
|---|--|--|--|--|--|--------|---|--|
| Stop start switch with spring return to run with contactor interlock contactors for 2 units | | | | | | WAA182 | 2 | |
| | | | | | | WAA182 | 2 | |
| Motor voltage control switch | | | | | | WAA150 | 2 | |

Control Switches with electrically isolated contacts

| | | | | | | | | |
|---|--|--|--|--|--|----------|---|--|
| Stop start switch 1 pole | | | | | | A789-600 | 1 | |
| Stop start switch with spring return to 1 | | | | | | A791-600 | 1 | |
| Stop start switch with spring return to run for 2 units | | | | | | WAA790 | 2 | |
| Contactor control with spring return to „OFF“ | | | | | | WAA179 | 2 | |
| | | | | | | WAA179 | 2 | |
| Circuit breaker control | | | | | | WAA537 | 2 | |

Control and Alarm Switches¹

| | | | | | | | | |
|---|--|--|--|--|--|--------|----------------|--|
| With slip clutch and without indicator device | | | | | | WAA190 | 5 ² | |
| Without indicator device | | | | | | WAA192 | 2 | |

¹Advise the indicator device, described in Catalog 101, page 7. ²incl. slip clutch

| Function | Escutch. Plate | Type/Handle | | | | Code | Stages | Connection Diagram ¹ |
|----------|----------------|----------------|--------------|----------------|------------------|------|--------|---------------------------------|
| | | CG4- CGD4-1 | CG6- CHR6 | CH10- CHR16 | CH10B- CHR16B | | | |

Motor Reversing Switches

| | | | | | | | | |
|--|--|--|--|--|--|----------|---|--|
| 2 pole | | | | | | A400-600 | 2 | |
| | | | | | | A400-620 | 2 | |
| | | | | | | A400-621 | 2 | |
| 3 pole | | | | | | A401-600 | 3 | |
| | | | | | | A401-620 | 3 | |
| | | | | | | A401-621 | 3 | |
| 3 pole with spring return to „OFF“ | | | | | | A228-600 | 3 | |
| | | | | | | A228-620 | 3 | |
| 3 pole for use with reversing contactors | | | | | | WAA402 | 4 | |

Motor Control Switches

| | | | | | | | | |
|-------------------------------------|--|--|--|--|--|--------|---|--|
| 2 speed 2 winding 0-A-BY or Δ | | | | | | WAA451 | 3 | |
| | | | | | | WAA451 | 3 | |
| 3 speed 2 winding 0-AΔ-BY-AΥ | | | | | | WAA457 | 6 | |
| | | | | | | WAA457 | 6 | |

¹Connection diagrams for CHR switches on request.

| Function | Escutch. Plate | Type/Handle | | | | Code | Stages | Connection Diagram ¹ |
|----------|----------------|----------------|--------------|----------------|------------------|------|--------|---------------------------------|
| | | CG4- CGD4-1 | CG6- CHR6 | CH10- CHR16 | CH10B- CHR16B | | | |

Motor Control Switches

| | | | | | | | | |
|---|--|--|--|--|--|----------|-----------------|--|
| 2 speed single winding | | | | | | A440-600 | 4 | |
| | | | | | | A440-620 | 4 | |
| 2 speed single winding without „OFF“ | | | | | | A466-600 | 4 | |
| 2 speed single winding with center „OFF“ | | | | | | A441-600 | 4 | |
| | | | | | | A441-620 | 4 | |
| 2 speed single winding reversing | | | | | | A442-600 | 6 | |
| | | | | | | A442-620 | 6 | |
| 2 speed single winding for use with contactors | | | | | | WAA444 | 5 | |
| | | | | | | WAA444 | 5 | |
| 2 speed reversing for 2 way operation with slip clutch for „OFF“ load use | | | | | | WAA468 | 10 ² | |
| | | | | | | WAA468 | 10 ² | |

¹Connection diagrams for CHR switches on request. ²incl. slip clutch

| Function | Escutch. Plate | Type/Handle | | | | Code | Stages | Connection Diagram ¹ |
|----------|----------------|----------------|--------------|----------------|------------------|------|--------|---------------------------------|
| | | CG4- CGD4-1 | CG6- CHR6 | CH10- CHR16 | CH10B- CHR16B | | | |

Star-delta Switches




| | | | | | | | | |
|---|--|--|--|--|--|----------|---|--|
| OFF-star-delta | | | | | | A410-600 | 4 | |
| | | | | | | A410-620 | 4 | |
| Reversing | | | | | | WAA413 | 5 | |
| With auxiliary contact closed in „OFF“ position | | | | | | WAA416 | 5 | |
| For use with reversing contactors | | | | | | A419-600 | 4 | |

Start and Run Switches




| | | | | | | | | |
|--|--|--|--|--|--|----------|---|--|
| Split-phase start | | | | | | A425-600 | 2 | |
| | | | | | | A425-620 | 2 | |
| Split-phase start reversing | | | | | | WAA426 | 3 | |
| | | | | | | WAA426 | 3 | |
| Split-phase reversing auto cutout of start field winding | | | | | | WAA622 | 3 | |

¹Connection diagrams for CHR switches on request.



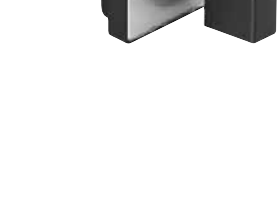



| Two or Four Hole Panel Mounting | Terminals rotated 90° | Code | CG4-CHR6 | CG8-CHR16 | CH10B-CHR16B |
|---------------------------------|-----------------------|------|----------|-----------|--------------|
|---------------------------------|-----------------------|------|----------|-----------|--------------|

| | | | | | |
|--|---|--------------|--------|--------|--------|
|  <p>Panel mounting</p> | | | | | |
| <p>Two hole panel mounting</p> | ● | E E-V | ● ● | | |
| <p>Two hole panel mounting, protection IP 66</p> | ● | EF EF-V | ● ● | | |
|  <p>Four hole panel mounting</p> | ● | E E-V | ● ● | ● ● | ● ● |
| <p>Four hole panel mounting, protection IP 66</p> | ● | EF EF-V | ● ● | ● ● | ● ● |
| <p>Two hole panel mounting, protection IP 65</p> | ● | E22 E22-V | ● ● | | |
|  <p>Panel mounting using larger escutcheon plate and handle and with heavy duty latching</p> | | | | | |
| <p>Four hole panel mounting</p> | | EG | ● | | |
| <p>Four hole panel mounting, protection IP 66</p> | | EGF | ● | | |

| | | |
|--|------|----------|
| Two Hole Panel Mounting or Mosaic Mounting | Code | CG4-CHR6 |
|--|------|----------|

| | | | |
|---|--|-----|---|
|  | <p>Panel mounting with round shaft for combining with commercial radio knobs</p> <p>Two hole panel mounting Shaft diam. 6 mm/.24 inch</p> <p>Two hole hole panel mounting Shaft diam. 6,35 mm/.25 inch</p> | E9 | ● |
| | Mosaic mounting | E91 | ● |
|  | <p>For Siemens-Mosaic 30 mm grid depth</p> | E92 | ● |
|  | <p>For Subklew-, Kreutzenbeck-, Symo-Mosaic 28 mm 25 mm 25 mm grid depth</p> <p>For Mauell-Mosaic 30 mm grid depth</p> | E93 | ● |
| | | E94 | ● |





| | | | |
|--|-------------|-----------|--------------|
| Two or Four Hole Panel Mounting | Code | CG8-CHR16 | CH10B-CHR16B |
|--|-------------|-----------|--------------|

| | | | | |
|--|---|------|-----------|---|
|  | <p>Panel mounting with heavy duty latching and metal shaft</p> <p>Four hole panel mounting Mounting plate, escutcheon plate and handle of size S0</p> | KN2 | ● | |
|  | <p>Four hole panel mounting Mounting plate, escutcheon plate and handle of size S1</p> | KN1 | ● | ● |
|  | <p>Four hole panel mounting Mounting plate, escutcheon plate and handle of size S1 and 6 mm square metal shaft</p> | KD1 | ● | ● |
|  | <p>Panel mounting with protective cover</p> <p>Four hole panel mounting Protection front IP 40 rear IP 30</p> | EC | CH CHR | ● |
|  | <p>Four hole panel mounting with additional shaft seal Protection front IP 65 rear IP 30</p> | ED | CH CHR | ● |
|  | <p>Four hole panel mounting Protection front IP 40 rear IP 42</p> <p>Four hole panel mounting with additional shaft seal Protection front IP 65 rear IP 42</p> <p>Two hole panel mounting Protection front IP 65 rear IP 42</p> | EC1 | | ● |
| | | ED1 | | ● |
| | | ED22 | ● | |

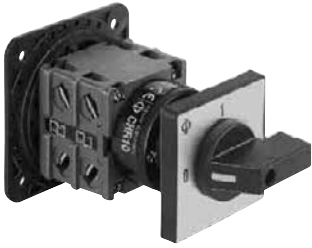


Mounting

CG, CH, CHR Switches



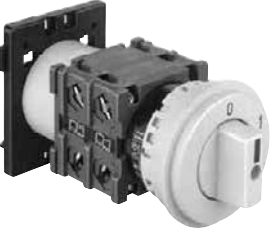
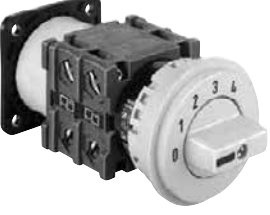
| | | | | |
|----------------------|-----------------------|-------------|----------|-----------|
| Single Hole Mounting | Terminals rotated 90° | Code | CG4-CHR6 | CG8-CHR16 |
|----------------------|-----------------------|-------------|----------|-----------|

| | | | Code | mm | mm |
|---|---|---|--|----------------|----------------------------|
|  | With locking nut and shaft seal, protection IP 66 Without escutcheon plate | <ul style="list-style-type: none"> ● ● ● | FS1 FS1-V FT1 FT1-V FT3 FT3-V | 16/22 16/22 | 22 22 22/30 22/30 |
|  | With square escutcheon plate | <ul style="list-style-type: none"> ● ● ● | FS2 FS2-V FT2 FT2-V FT4 FT4-V | 16/22 16/22 | 22 22 22/30 22/30 |
| | With size S1 square escutcheon plate and heavy duty latching | <ul style="list-style-type: none"> ● | FH3 FH3-V | | 22 22 |
|  | With rectangular escutcheon plate | <ul style="list-style-type: none"> ● ● | FS4 FS4-V FT6 FT6-V | 16/22 16/22 | 22 22 |
| | With size S1 rectangular escutcheon plate and heavy duty latching | <ul style="list-style-type: none"> ● | FH4 FH4-V | | 22 22 |
|  | Mounting key for locking nut | | S00 T170 09 | | |

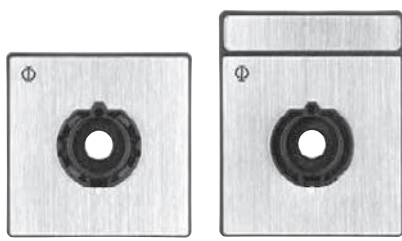
| | | | | |
|---------------|-----------------------|------|----------------|---------------|
| Base Mounting | Terminals rotated 90° | Code | CG4- CGD4-1 | CG8- CHR16 |
|---------------|-----------------------|------|----------------|---------------|

| | | | | | |
|--|---|-------------------|---|---------------------------|-------------------------------------|
|  | <p>Base mounting</p> <p>Base mounting - four hole</p> <p>For four hole base mounting and with integrated simplified door clutch, protection IP 65</p> | <p>●</p> <p>●</p> | <p>VE VE-V</p> <p>VF VF-V</p> | | <p>●</p> <p>●</p> <p>●</p> <p>●</p> |
|  | <p>For two hole base mounting</p> <p>For two hole base mounting and with integrated simplified door clutch, protection IP 65</p> | <p>●</p> <p>●</p> | <p>VE22 VE22V</p> <p>VF22 VF22V</p> | | <p>●</p> <p>●</p> <p>●</p> <p>●</p> |
|  | <p>Snap-on base mounting for track EN 60715.</p> <p>Snap-on base mounting for track EN 60715. Escutcheon plate can be fastened by screws at the switch.</p> <p>Snap-on base mounting for track EN 60715. Escutcheon plate fastened by single hole mounting at the switch e.g. for combining with key-lock device.</p> | | <p>VE1</p> <p>VE1E</p> <p>VE1F</p> | <p></p> <p>●</p> <p>●</p> | <p>●</p> <p>●</p> <p>●</p> |

| | | | |
|----------------------|-------------|----------------|---------------|
| Base Mounting | Code | CG4- CGD4-1 | CG8- CHR16 |
|----------------------|-------------|----------------|---------------|

| Base mounting | | | | |
|---|--|------|---|---|
|  | <p>Snap-on base mounting for track EN 60715 with rectangular escutcheon plate for 45 mm standard knock-out.</p> | VE2 | | ● |
|  | <p>Snap-on base mounting for track EN 60715. Both the escutcheon plate for 45 mm standard knock-out and the handle are adjustable in height.</p> | VE21 | ● | ● |
|  | <p>Snap-on base mounting for track EN 60715 with circular escutcheon plate for 46 mm standard knock-out.</p> | VE3 | | ● |
|  | <p>Base mounting - four hole - for circular escutcheon plate with 46 mm knock-out.</p> | VE4 | | ● |

Escutcheon Plates



Square and rectangular escutcheon plates are available for each size of switch. The escutcheon plate consists of a frame and a faceplate having the switch positions which is then embossed with hot-foil backing. The escutcheon plate frame is an essential part of the switch and serves as a bearing surface for the handle. If the switch is to be mounted without an escutcheon plate we would recommend for size S1, S2 and S3 the handle bearing plate T100-04.

Standard Letterings Available

(Over 500 standard letterings, special letterings upon request.)

30° switching

| | | | | | | | | | | | | | | | | | |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| F022 | F141 | F158 | F703 | F023 | F137 | F142 | F159 | F701 | F704 | F152 | F709 | F026 | F035 | F153 | F169 | F024 | F143 |
| F160 | F221 | F222 | F224 | F025 | F034 | F036 | F037 | F038 | F039 | F139 | F144 | F147 | F149 | F150 | F151 | F219 | F258 |
| F259 | F273 | F280 | F329 | F384 | F708 | F053 | F161 | F297 | F298 | F306 | F307 | F001 | F040 | F052 | F229 | F355 | F018 |
| F019 | F029 | F030 | F154 | F155 | F165 | F166 | F183 | F184 | F301 | F302 | F321 | F332 | F333 | F334 | F335 | F374 | F711 |
| F712 | F002 | F021 | F033 | F041 | F055 | F305 | F319 | F054 | F003 | F042 | F138 | F255 | F299 | F308 | F353 | F350 | F351 |
| F004 | F014 | F017 | F020 | F027 | F028 | F031 | F032 | F043 | F049 | F135 | F156 | F157 | F162 | F167 | F168 | F187 | F189 |
| F303 | F304 | F336 | F337 | F347 | F348 | F710 | F713 | F714 | F734 | F005 | F044 | F136 | F140 | F702 | F006 | F010 | F045 |
| F015 | F050 | F007 | F011 | F046 | F008 | F012 | F047 | F016 | F051 | F009 | F013 | F048 | F748 | | | | |

45° switching

| | | | | | | | | | | | | | | | | | |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| F747 | F295 | F742 | F743 | F215 | F216 | F738 | F744 | F746 | F792 | F793 | F107 | F109 | F114 | F115 | F212 | F213 | F214 |
| F217 | F267 | F289 | F330 | F375 | F376 | F383 | F408 | F409 | F410 | F411 | F412 | F413 | F426 | F427 | F430 | F729 | F752 |
| F775 | F776 | F777 | F778 | F779 | F780 | F781 | F796 | F797 | F798 | F105 | F108 | F112 | F113 | F117 | F118 | F293 | F429 |
| F739 | F741 | F419 | F789 | F790 | F791 | F794 | F795 | F110 | F106 | F116 | F294 | F317 | F414 | F415 | F416 | F417 | F418 |
| F782 | F783 | F784 | F785 | F786 | F787 | F788 | F799 | F111 | F210 | F211 | F284 | F285 | F296 | F322 | F727 | F740 | |

Escutcheon Plates

60° switching

| | | | | | | | | | | | | | | | | | |
|------|------|------|------|------|------|------|----------------------|------|------|------|------|------|------|----------------------|----------------------|------|------|
| F070 | F087 | F088 | F089 | F133 | F197 | F198 | SYNCHROSCOPE F232 | F243 | F247 | F263 | F268 | F310 | F311 | HUVUDBRYTARE F323 | HUVUDBRYTARE F328 | F352 | F367 |
| F379 | F380 | F470 | F754 | F072 | F163 | F164 | F192 | F193 | F196 | F230 | F231 | F234 | F244 | F257 | F262 | F264 | F282 |
| F288 | F291 | F313 | F382 | F441 | F705 | F721 | F722 | F750 | F757 | F758 | F075 | F076 | F098 | F220 | F223 | F356 | F357 |
| F377 | F723 | F071 | F073 | F080 | F081 | F085 | F086 | F090 | F091 | F092 | F093 | F094 | F104 | F194 | F235 | F237 | F239 |
| F240 | F241 | F249 | F260 | F269 | F274 | F281 | F290 | F292 | F312 | F314 | F315 | F316 | F324 | F331 | F344 | F354 | F358 |
| F359 | F364 | F370 | F371 | F373 | F381 | F385 | F442 | F444 | F469 | F732 | F735 | F759 | F077 | F100 | F101 | F102 | F309 |
| F342 | F343 | F361 | F362 | F363 | F365 | F366 | F078 | F191 | F325 | F326 | F720 | F074 | F082 | F096 | F097 | F195 | F724 |
| F256 | F079 | F083 | F084 | F095 | F099 | F185 | F190 | F199 | F233 | F236 | F238 | F242 | F283 | F725 | F730 | F731 | F736 |
| F737 | | | | | | | | | | | | | | | | | |

90° switching

| | | | | | | | | | | | | | | | | | |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| F056 | F063 | F068 | F134 | F201 | F251 | F252 | F346 | F456 | F058 | F065 | F069 | F177 | F178 | F182 | F208 | F253 | F254 |
| F340 | F360 | F378 | F458 | F443 | F700 | F743 | F057 | F061 | F064 | F067 | F171 | F181 | F205 | F207 | F209 | F320 | F349 |
| F437 | F445 | F715 | F719 | F059 | F060 | F062 | F066 | F170 | F172 | F173 | F174 | F175 | F176 | F179 | F180 | F186 | F188 |
| F202 | F204 | F206 | F250 | F265 | F266 | F286 | F318 | F327 | F338 | F339 | F425 | F716 | F717 | F718 | F726 | F733 | F751 |
| F755 | F756 | | | | | | | | | | | | | | | | |

Miscellaneous


| | | | | | | | | | | | | | | | | | |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-------------------|-------------------|-------------------|
| F119 | F130 | F122 | F126 | F125 | F129 | F225 | F248 | F246 | F261 | F341 | F345 | F287 | F123 | F127 | F145 | F146 | F148 |
| F706 | F707 | F245 | F120 | F124 | F128 | F131 | F121 | F132 | F749 | F990 | F991 | F801 | F802 | F803 | F804 | | |
| F805 | F806 | F807 | F808 | F809 | F810 | F811 | F812 | F813 | F814 | F815 | F816 | F817 | F818 | F819 | F820 | F821 | F822 |
| F823 | F824 | F825 | F826 | F827 | F828 | F829 | F830 | F831 | F832 | F833 | F834 | F835 | F837 | F838 | F839 ¹ | F840 ² | F841 ³ |


¹INTERRUPTEUR PRINCIPAL, OUVERTURE EN POSITION 0 ²INTERRUPTORE GENERALE, APRIRE SOLO CON MANIGLIA SU 0
³INTERRUPTOR PRINCIPAL, ABRIR ARMARIO SOLO EN POS. "0"

Handles


| Type | Color | Code | Size | | |
|------|-------|------|------|----|----|
| | | | S00 | S0 | S1 |


| Type | Color | Code | Size | | |
|------|-------|------|------|----|----|
| | | | S00 | S0 | S1 |

| | | | | | |
|---|--------------|------|---|---|---|
| <p>R-Handle</p>  | black | G001 | — | ● | ● |
| | red | G002 | — | ● | ● |
| | white | G003 | — | ● | ● |
| | electro-gray | G007 | — | ● | ● |

| | | | | | |
|--|--------------|------|---|---|---|
| <p>I-Handle</p>  | black | G251 | ● | ● | ● |
| | red | G252 | ● | ● | ● |
| | white | G253 | ● | ● | ● |
| | electro-gray | G257 | ● | ● | ● |


| | | | | | |
|--|--------------|------|---|---|---|
| <p>F-Handle</p>  | black | G221 | ● | ● | ● |
| | red | G222 | ● | ● | ● |
| | white | G223 | ● | ● | ● |
| | electro-gray | G227 | ● | ● | ● |

| | | | | | |
|---|--------------|------|---|---|---|
| <p>B-Handle</p>  | black | G521 | — | ● | ● |
| | red | G522 | — | ● | ● |
| | white | G523 | — | ● | ● |
| | electro-gray | G527 | — | ● | ● |

| | | | | | |
|---|--------------|------|---|---|---|
| <p>S-Handle</p>  | black | G301 | — | ● | ● |
| | red | G302 | — | ● | ● |
| | white | G303 | — | ● | ● |
| | electro-gray | G307 | — | ● | ● |
















| | | | | | |
|---|--------------|------|---|---|---|
| <p>L-Handle</p>  | black | G501 | — | — | ● |
| | red | G502 | — | — | ● |
| | white | G503 | — | — | ● |
| | electro-gray | G507 | — | — | ● |

| | | | | | |
|---|--------------|------|---|---|---|
| <p>P-Handle</p>  | black | G211 | — | ● | ● |
| | red | G212 | — | ● | ● |
| | white | G213 | — | ● | ● |
| | electro-gray | G217 | — | ● | ● |

| | | | | | |
|---|--------------|------|---|---|---|
| <p>K-Handle</p>  | black | G411 | — | — | ● |
| | red | G412 | — | — | ● |
| | white | G413 | — | — | ● |
| | electro-gray | G417 | — | — | ● |

| | | | | | |
|---|--------------|------|---|---|---|
| <p>O-Handle</p>  | black | G321 | — | — | ● |
| | red | G322 | — | — | ● |
| | white | G323 | — | — | ● |
| | electro-gray | G327 | — | — | ● |

International Standards and Approvals

| Country | Authority | Mark or Standard | | | | | CH6 | | CHR6 | |
|--|--|--|-----|-----------------|-----|-----|-------------------------------|---------------|-----------------------------------|-----------------|
| | | | CG4 | CG4-1 CGD4-1 | CG6 | CG8 | CH10 CH11 CH12 CH10B | CH16 CH16B | CHR10 CHR11 CHR12 CHR10B | CHR16 CHR16B |
| USA | Underwriters Laboratories |  ¹ | | | | | | ● | ● | |
| | |  ² ₃ | ● | ● | ● | ● | ● | ● | | |
| Canada | Canadian Standards Association |  ⁶ | ● | CG4-1 | ● | ● | ● | ● | ● | |
| | |  ¹ c. | | | | | | ● | ● | |
| | |  ² ₃ | ● | ● | | | ● | ● | | |
| Switzerland | Schweizerischer Elektrotechnischer Verein |  | ● | + | + | + | + | + | + | |
| Denmark | Danmarks Elektriske Materielkontrol |  | + | + | + | + | + | + | + | |
| Norway | Norges Elektriske Materielkontrol |  | + | + | + | + | + | + | + | |
| Sweden | Svenska Elektriska Materielkontrollanstalten |  | + | + | + | + | + | + | + | |
| Finland | Sähkötar-kastuskeskus |  | + | + | + | + | + | + | + | |
| Austria | Österreichischer Verband für Elektrotechnik |  | + | + | + | + | + | + | + | |
| Federal Republic of Germany | Verband Deutscher Elektrotechniker | VDE 0660 ⁴ | + | + | + | + | + | + | + | |
| Great Britain | British Standards Institution | BS EN 60947 ⁴ | + | + | + | + | + | + | + | |
| International Electrical Commission (IEC) Recommendation | | IEC 60947 ⁵ | + | + | + | + | + | + | + | |
| China | China Quality Certification Centre |  ⁷ GB14048.3 | ● | CG4-1 | | | CH10 CH10B | ● | CHR10 CHR10B | |
| Russian Federation | GOST |  ⁷ CH01 | ● | ● + | ● | ● | ● | ● | ● | |
| Germanischer Lloyd | |  | + | + | + | + | + | + | + | |
| Lloyds Register EMEA | |  | + | + | + | + | CH10 CH10B | ● | + | |

● Switch approved + Switch conforms to requirements

¹Approved under the "Component Program" (UL-Recognized Industrial Component). File No. E35541, Category Control No. NLRV2 (U.S.) resp. NLRV8 (Canada).

²Approved under the "Listing Program". File No. E35541, Category Control No. NLRV (U.S.) resp. NLRV7 (Canada).

³Switch types CGD4-1, CH11, CH12, CHR11, CHR12 approved under the "Listing Program". File No. E60262, Category Control No. NRNT (U.S.) resp. NRNT7 (Canada).

⁴It is not required for Industrial Switchgear to bear a symbol but must conform to requirements. By stating the specific standard no. on the product the manufacturer declares that all requirements of the product standard are met.

⁵IEC does not operate an approval scheme.

⁶File No. 13002, Class No. 3211-05 resp. 4652-04.

⁷If this approval is required, please request when ordering.

| | | | | | | |
|-----------------------|-------|-----|---------------|-----------------|---------------|-----------------|
| Selection Data | CG4 | CG6 | CH6 | CHR6 | | |
| | CG4-1 | CG8 | CH10 CH10B | CHR10 CHR10B | CH16 CH16B | CHR16 CHR16B |

| | | | | | | | | | |
|--|--|------|--|--------------------------|--------------------------------------|----------------------|-------------------------|---------------|-----------------|
| Rated Insulation Voltage U_e | IEC 60947-3, EN 60947-3 ¹ VDE 0660 part 107 ¹ | V | 440 | 690 | 690 | 690 | 690 | 690 | |
| | SEV max. | V | 400 | 690 | – | – | – | – | |
| | UL/Canada ² | V | 300 | 300 | 600 | 600 | 600 | 600 | |
| | CEE 24 | V | 380 | 380 | – | – | – | – | |
| | min. voltage | V | | | on request | | | | |
| Rated Impulse Withstand Voltage U_{imp}¹ | | kV | 4 | 6 | 6 | 6 | 6 | 6 | |
| Rated Thermal Current I_U/I_{th} | IEC 60947-3, EN 60947-3 VDE 0660 part 107 | A | 10 | 20 | 20 | 20 | 25 | 25 | |
| | SEV max. | A | 10 | 20 | – | – | – | – | |
| | UL/Canada | A | 10 | 16 | 20 | 20 | 25 | 25 | |
| Rated Operational Current I_e | | | | | | | | | |
| AC-21A Switching of resistive loads, including moderate overloads | IEC 60947-3, EN 60947-3 VDE 0660 part 107 | A | 10 | 20 | 20 | 20 | 25 | 25 | |
| | SEV 400 V 500 V 600 V | A | 10 | – | – | – | – | – | |
| | | A | – | – | – | – | – | – | |
| A | | – | – | – | – | – | – | | |
| AC-22A Switching of combined resistive or low inductive loads including moderate overloads | IEC 60947-3 VDE 0660, part 107 | A | 10 | 20 | 20 | 20 | 25 | 25 | |
| | 220 V-440 V 500 V | A | – | 20 | 20 | 20 | 25 | 25 | |
| | 660 V-690 V | A | – | 16 | 16 | 16 | 25 | 25 | |
| AC-15 Switching of control devices, contactors, valves etc. | IEC 60947-5-1 VDE 0660, part 200 | A | 2,5 | 6 | 5 | 5 | 8 | 8 | |
| | 110 V 220 V-240 V | A | 2,5 | 5 | 5 | 5 | 8 | 8 | |
| | 380 V-440 V | A | 1,5 | 4 | 4 | 4 | 5 | 5 | |
| Pilot Duty | UL/Canada ² Heavy | | A300 | A300 | A600 | A600 | A600 | A600 | |
| Ampere Rating Resistive or low inductive loads | UL/Canada ² | A | 10 | 16 (150 V) 10 (300 V) | 20 | 20 | 25 | 25 | |
| Resistive load/Motor load | CEE 24 ² NEMKO/FI ² | A | 4/2 | 10/6 | – | – | – | – | |
| | | A | 6/4 ⁴ | 10/6 | – | – | – | – | |
| Breaking capacity | 220 V-240 V | A | 50 | 150 | 150 | 150 | 200 | 200 | |
| | 380 V-440 V | A | 50 | 150 | 150 | 150 | 200 | 200 | |
| | 660 V-690 V | A | – | 80 | 80 | 80 | 125 | 125 | |
| Power loss per contact at I_U Resistance to vibration Resistance to shock | | W | 0,4/0,7 | 0,8 | 1,4 on request min. 5 g, 30 ms | 1,4 | 2,3 | 2,3 | |
| Short Circuit Protection | Max. fuse size (gL-characteristic) | A | 10 | 25 | 25 | 25 | 35 | 35 | |
| | Rated short-time withstand current (1s-current) | A | 90 | 140 | 200 | 200 | 250 | 250 | |
| DC Switching Capacity⁶ | | | | | | | | | |
| No. of series contacts | 1 2 3 4 5 6 8 | | | | | | | | |
| | Voltage V | | | | | | | | |
| Resistive loads $T \leq 1$ ms | 24 48 70 95 120 145 190 | A | CG4 CG4-1 | CG6 CG8 | CG8S ³ | CH6 CH10 CH10B | CHR6 CHR10 CHR10B | CH16 CH16B | CHR16 CHR16B |
| | 48 95 140 190 240 290 350 | | 10 | 20 | 20 | 20 | 20 | 25 | 25 |
| | 60 120 180 240 300 360 450 | | 6 | 12 | 16 | 12 | 12 | 20 | 20 |
| | 110 220 330 440 550 660 – | | 2,5 | 4,5 | 8 | 4,5 | 4,5 | 7,5 | 7,5 |
| | 220 440 660 – – – – | | 0,7 | 1 | 2 | 1 | 1 | 1,5 | 1,5 |
| | 440 660 – – – – | | 0,3 | 0,4 | 0,6 | 0,4 | 0,4 | 0,5 | 0,5 |
| 0,2 | 0,27 | 0,35 | 0,27 | 0,27 | 0,3 | 0,3 | 0,3 | | |
| Inductive loads $T = 50$ ms | 24 48 70 95 120 145 190 | A | CG4 CG4-1 | CG6 CG8 | CG8S ³ | CH6 CH10 CH10B | CHR6 CHR10 CHR10B | CH16 CH16B | CHR16 CHR16B |
| | 30 60 90 120 150 180 240 | | 6 | 12 | 20 | 12 | 12 | 20 | 20 |
| | 48 95 140 190 240 290 350 | | 3 | 5 | 13 | 5 | 5 | 9 | 9 |
| | 60 120 180 240 300 360 450 | | 1 | 2 | 6 | 2 | 2 | 3 | 3 |
| | 110 220 330 440 550 660 – | | 0,7 | 1 | 3 | 1 | 1 | 1,5 | 1,5 |
| | | | 0,3 | 0,4 | 1 | 0,4 | 0,4 | 0,5 | 0,5 |
| 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 | | | | | | |

¹Valid for lines with grounded common neutral termination, overvoltage category III, pollution degree 3. Values for other supply systems on request. ²International Standards and Approvals, refer to page 33. ³Valid only for max. 4 simultaneously opening contacts. ⁴Valid for CG4 only. ⁵For electromagnetic optional extras see additional data in Catalog 101. ⁶Values for switches with spring return on request. ⁷Storage temperature: -40 °C to 85 °C (in case of temperature below -5 °C no shock load permissible).

| Selection Data | CG4 | CG6 | CH6 | CHR6 | CH16 | CHR16 |
|----------------|-------|-----|---------------|-----------------|-------|--------|
| | CG4-1 | CG8 | CH10 CH10B | CHR10 CHR10B | CH16B | CHR16B |

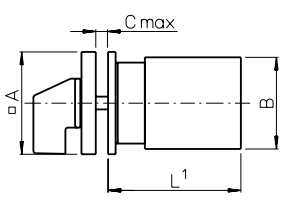
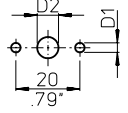
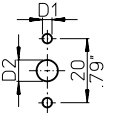
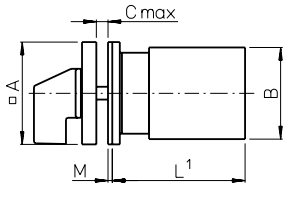
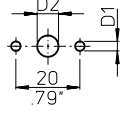
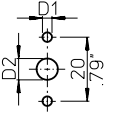
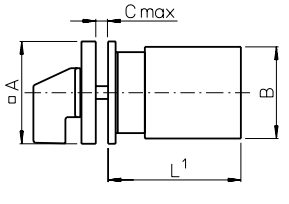
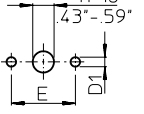
| Rated Utilization Category | | IEC 60947-3, EN 60947-3 VDE 0660 part 107 | | | | | | | | | |
|--|--|--|-------------|-----------------|----------|------------|------------|------|------------|------|------|
| AC-2 | Slip ring motor starting, reversing and plugging, star-delta starting (CG4-CHR10B) | 3 phase | 220 V-240 V | kW | 2,5 | 4 | 4 | 4 | 5,5 | 5,5 | |
| | | 3 pole | 380 V-440 V | | 4,5 | 7,5 | 7,5 | 7,5 | 11 | 11 | |
| | | | 500 V | | – | 10 | 10 | 10 | 15 | 15 | |
| | | | 660 V-690 V | | – | 10 | 10 | 10 | 13 | 13 | |
| AC-3 | Direct-on-line starting, star-delta starting (CH16-CHR16B) | 3 phase | 220 V-240 V | kW | 1,5 | 3 | 3 | 3 | 4 | 4 | |
| | | 3 pole | 380 V-440 V | | 2,2 | 5,5 | 5,5 | 5,5 | 7,5 | 7,5 | |
| | | | 500 V | | – | 5,5 | 5,5 | 5,5 | 7,5 | 7,5 | |
| | | | 660 V-690 V | | – | 5,5 | 5,5 | 5,5 | 7,5 | 7,5 | |
| | | 1 phase | 110 V-120 V | kW | 0,3 | 0,6 | 0,6 | 0,6 | 1,5 | 1,5 | |
| | 2 pole | 220 V-240 V | 0,55 | | 2,2 | 2,2 | 2,2 | 3 | 3 | | |
| | | 380 V-440 V | 0,75 | | 3 | 3 | 3 | 3,7 | 3,7 | | |
| | | 500 V | – | | – | 3 | 3 | 4 | 4 | | |
| | | 660 V-690 V | – | – | 3 | 3 | 3,7 | 3,7 | | | |
| AC-4 | Direct-on-line starting, reversing, plugging and inching | 3 phase | 220 V-240 V | kW | 0,37 | 0,55 | 0,55 | 0,55 | 1,5 | 1,5 | |
| | | 3 pole | 380 V-440 V | | 0,55 | 1,5 | 1,5 | 1,5 | 3 | 3 | |
| | | | 500 V | | – | 1,5 | 1,5 | 1,5 | 3 | 3 | |
| | | | 660 V-690 V | – | 1,5 | 1,5 | 1,5 | 3 | 3 | | |
| | | 1 phase | 110 V-120 V | kW | 0,15 | 0,3 | 0,3 | 0,3 | 0,45 | 0,45 | |
| | 2 pole | 220 V-240 V | 0,25 | | 0,75 | 0,75 | 0,75 | 1,1 | 1,1 | | |
| | 380 V-440 V | 0,5 | 1,5 | | 1,5 | 1,5 | 2,2 | 2,2 | | | |
| AC-23A | Frequent switching of motors or other high inductive loads | 3 phase | 220 V-240 V | kW | 1,8 | 3,7 | 3,7 | 3,7 | 5,5 | 5,5 | |
| | | 3 pole | 380 V-440 V | | 3 | 7,5 | 7,5 | 7,5 | 11 | 11 | |
| | | | 500 V | | – | 7,5 | 7,5 | 7,5 | 11 | 11 | |
| | | | 660 V-690 V | – | 7,5 | 7,5 | 7,5 | 11 | 11 | | |
| | | 1 phase | 110 V-120 V | kW | 0,37 | 0,75 | 0,75 | 0,75 | 1,5 | 1,5 | |
| | 2 pole | 220 V-240 V | 0,75 | | 2,5 | 2,5 | 2,5 | 3 | 3 | | |
| | 380 V-440 V | 1,1 | 3,7 | | 3,7 | 3,7 | 5,5 | 5,5 | | | |
| | | 500 V | – | – | 4 | 4 | 4 | 5,5 | 5,5 | | |
| | | 660 V-690 V | – | – | 4 | 4 | 4 | 5,5 | 5,5 | | |
| Ratings | Standard motor load DOL-Rating (similar AC-3) | 3 phase | 110 V-120 V | HP | 0,75 | 1,5 | 1,5 | 1,5 | 2 | 2 | |
| | | 3 pole | 220 V-240 V | | 1 | 1 | 3 | 3 | 5 | 5 | |
| | | | 440 V-600 V | | – | – | 5 | 5 | 10 | 10 | |
| | | | 1 phase | 110 V-120 V | HP | 0,33 | 0,5 | 0,5 | 0,5 | 1 | 1 |
| | | 2 pole | 220 V-240 V | 0,75 | | 1 | 1 | 1 | 2 | 2 | |
| | | | 277 V | 0,75 | | 1 | 2 | 2 | 3 | 3 | |
| | | | 440 V-600 V | – | – | 2 | 2 | 5 | 5 | | |
| | Heavy motor load Reversing-Rating (similar AC-4) | 3 phase | 110 V-120 V | HP | – | 0,5 | 0,5 | 0,5 | 1 | 1 | |
| | | 3 pole | 220 V-240 V | | – | 1 | 1 | 1 | 2 | 2 | |
| | | | 440 V-600 V | | – | – | 3 | 3 | 5 | 5 | |
| | | | 1 phase | 110 V-120 V | HP | – | 0,17 | 0,17 | 0,17 | 0,33 | 0,33 |
| | | 2 pole | 220 V-240 V | – | | 0,5 | 0,5 | 0,5 | 0,75 | 0,75 | |
| | | 277 V | – | 0,5 | | 0,6 | 0,6 | 1 | 1 | | |
| | | 440 V-600 V | – | – | 1,5 | 1,5 | 2 | 2 | | | |
| Max. Permissible Wire Gage - Use copper wire only | | | | | | | | | | | |
| Single-core or stranded wire | | | | mm ² | 2x1,5 | 2x2,5 | 2x4 | | 2x4 | | |
| | | | | AWG | 2x14 | 2x12 | 2x10 | | 2x10 | | |
| Flexible wire (sleeving in accordance with DIN 46228) | | | | mm ² | 2x1,5(1) | 2x2,5(2,5) | 2x2,5(2,5) | | 2x2,5(2,5) | | |
| Flexible AWG wires (without sleeve) | | | | AWG | 2x16 | 2x14 | 2x12 | | 2x12 | | |
| Connection with insulated ring and fork type terminals | | | | | | | | | | | |
| Internal diameter | | | | mm | | | | ≥3,6 | | ≥3,6 | |
| External diameter | | | | mm | | | | ≤8,6 | | ≤8,6 | |
| Connection with quick connect terminations | | | | mm | | | | 6,3 | | 6,3 | |

| | | | | | |
|-----------------------|--------|------|-------|------|-------|
| Selection Data | CGD4-1 | CH11 | CHR11 | CH12 | CHR12 |
|-----------------------|--------|------|-------|------|-------|

| | | | | | | | | | |
|---|--|--|-----------------|--|----------------|----------------|------------|----------|----------|
| Rated Insulation Voltage U_e | | IEC 60947-3, EN 60947-3 ¹ VDE 0660 part 107 ¹ | V | 440 | 600 | 600 | 600 | 600 | |
| North America | | | V | 300 | 300 | 300 | 300 | 300 | |
| min. voltage | | | V | 1 ⁴ | 1 ⁴ | 1 ⁴ | 6 | 6 | |
| Rated Impulse Withstand Voltage U_{imp} | | | | on request | | | | | |
| Rated Thermal Current I_U/I_{th} | | IEC 60947-3, EN 60947-3 VDE 0660 part 107 | A | 5 | 6 | 6 | 6 | 6 | |
| North America | | | A | 5 | 6 | 6 | 6 | 6 | |
| Rated Operational Current I_e | | IEC 60947-3, EN 60947-3 VDE 0660 part 107 | | | | | | | |
| AC-21A | Switching of resistive loads, including moderate overloads | North America ² | 1 V/6 V | A | 5/2 | 6/3 | 6/3 | -/6 | -/6 |
| | | | 12 V/24 V | A | 1,2/0,7 | 2/1 | 2/1 | 6/5 | 6/5 |
| | | | 48 V/60 V | A | 0,45/- | 0,8/0,7 | 0,8/0,7 | 4/3,5 | 4/3,5 |
| | | | 110 V | A | 0,25 | 0,4 | 0,4 | 3 | 3 |
| | | | 240 V | A | 0,15 | 0,2 | 0,2 | 1,8 | 1,8 |
| | | | 300 V | A | 0,13 | 0,13 | 0,13 | 1,3 | 1,3 |
| | | | 440 V | A | 0,1 | 0,1 | 0,1 | 1 | 1 |
| | | | 500 V | A | - | 0,08 | 0,08 | 0,8 | 0,8 |
| | | | 600 V | A | - | 0,05 | 0,05 | 0,5 | 0,5 |
| Power loss per contact at I_u | | | W | 0,4 | 0,4 | 0,4 | 0,2 | 0,2 | |
| Short Circuit Protection | | | | | | | | | |
| Max. fuse size | | (glass-tube, quick) | A | 5 | 6 | 6 | 6 | 6 | |
| Rated short-time withstand current | | (1s-current) | A | 30 | 35 | 35 | 50 | 50 | |
| DC Switching Capacity⁵ | | IEC 60947-3, EN 60947-3 VDE 0660 part 107 | | | | | | | |
| DC-21B | Resistive load $T \leq 1$ ms | North America ² | 1 V/6 V | A | 3/1,2 | 4/2,5 | 4/2,5 | -/4 | -/4 |
| | | | 12 V/24 V | A | 0,7/0,4 | 1,5/0,8 | 1,5/0,8 | 3/2,2 | 3/2,2 |
| | | | 48 V/60 V | A | 0,25/0,2 | 0,3/0,27 | 0,3/0,27 | 1,2/1 | 1,2/1 |
| | | | 110 V/240 V | A | 0,13/0,08 | 0,2/0,1 | 0,2/0,1 | 0,6/0,3 | 0,6/0,3 |
| | | | 300 V/440 V | A | 0,07/0,05 | 0,07/0,05 | 0,07/0,05 | 0,2/0,15 | 0,2/0,15 |
| | | | 500 V/600 V | A | - | 0,03/0,02 | 0,03/0,02 | 0,1/0,1 | 0,1/0,1 |
| Max. Permissible Wire Gage - Use copper wire only | | | | | | | | | |
| Single-core or stranded wire | | | mm ² | 2x1,5 | 2x4 | | 2x4 | | |
| | | | AWG | 2x14 | 2x10 | | 2x10 | | |
| Flexible wire (sleeving in accordance with DIN 46228) | | | mm ² | 2x1,5(1) | 2x2,5(2,5) | | 2x2,5(2,5) | | |
| Flexible AWG wires (without sleeve) | | | AWG | 2x16 | 2x12 | | 2x12 | | |
| Connection with insulated ring and fork type terminals | | | mm | | | ≥3,6 | | ≥3,6 | |
| Internal diameter | | | mm | | | ≤8,6 | | ≤8,6 | |
| External diameter | | | mm | | | 6,3 | | 6,3 | |
| Connection with quick connect terminations | | | mm | | | | | | |
| Ambient Temperature of Stages^{3, 6} | | 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 | | | | | |

¹Valid for lines with grounded common neutral termination, overvoltage category III, pollution degree 3. Values for other supply systems on request.
²max. 300 V. ³For electromagnetic optional extras see additional data in Catalog 101. ⁴Values for lower voltages on request. ⁵Values for switches with spring return on request. ⁶Storage temperature: -40 °C to 85 °C (in case of temperature below -5 °C no shock load permissible).

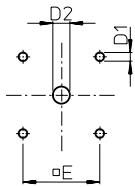
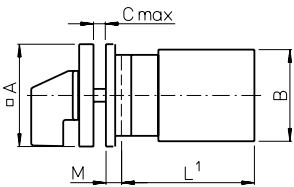
Two or Four Hole Panel Mounting

|  <p>E for CG4-CGD4-1 CH6/CHR6 E-V for CG6</p>  <p>E-V</p>  <p>E for CG6</p> |  <p>EF for CG4-CGD4-1 CH6/CHR6 EF-V for CG6</p>  <p>EF-V</p>  <p>EF for CG6</p> |  <p>E22 for CG E22-V for CH/CHR</p>  <p>E22-V for CG E22 for CH/CHR</p> | <table border="1"> <thead> <tr> <th></th> <th>CG4 CG4-1 CGD4-1</th> <th>CG6</th> <th>CG8</th> <th>CH6 CHR6</th> <th>CH10- CHR16</th> <th>CH10B- CHR16B</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>30 1.18</td> <td>30 1.18</td> <td>48 1.89</td> <td>30 1.18</td> <td>48 1.89</td> <td>64 2.52</td> </tr> <tr> <td>B</td> <td>28 1.10</td> <td>38 1.50</td> <td>38 1.50</td> <td>46 1.81</td> <td>46 1.81</td> <td>56 2.20</td> </tr> <tr> <td>C</td> <td>4 .16</td> <td>4 .16</td> <td>4 .16</td> <td>4 .16</td> <td>4 .16</td> <td>4 .16</td> </tr> <tr> <td>D1</td> <td>3,2 .13</td> <td>3,2 .13</td> <td>5 .20</td> <td>3,2 .13</td> <td>5 .20</td> <td>5 .20</td> </tr> <tr> <td>D2</td> <td>8-11 .31-.43</td> <td>8-11 .31-.43</td> <td>8-15 .31-.59</td> <td>8-11 .31-.43</td> <td>8-15 .31-.59</td> <td>10-15 .39-.59</td> </tr> <tr> <td>E</td> <td>-</td> <td>-</td> <td>36 1.42</td> <td>-</td> <td>36 1.42</td> <td>48 1.89</td> </tr> </tbody> </table> | | CG4 CG4-1 CGD4-1 | CG6 | CG8 | CH6 CHR6 | CH10- CHR16 | CH10B- CHR16B | A | 30 1.18 | 30 1.18 | 48 1.89 | 30 1.18 | 48 1.89 | 64 2.52 | B | 28 1.10 | 38 1.50 | 38 1.50 | 46 1.81 | 46 1.81 | 56 2.20 | C | 4 .16 | 4 .16 | 4 .16 | 4 .16 | 4 .16 | 4 .16 | D1 | 3,2 .13 | 3,2 .13 | 5 .20 | 3,2 .13 | 5 .20 | 5 .20 | D2 | 8-11 .31-.43 | 8-11 .31-.43 | 8-15 .31-.59 | 8-11 .31-.43 | 8-15 .31-.59 | 10-15 .39-.59 | E | - | - | 36 1.42 | - | 36 1.42 | 48 1.89 | <table border="1"> <thead> <tr> <th></th> <th>CG4 CG4-1 CGD4-1</th> <th>CG6</th> <th>CG8</th> <th>CH6 CHR6</th> <th>CH10- CHR16</th> <th>CH10B- CHR16B</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>30 1.18</td> <td>30 1.18</td> <td>48 1.89</td> <td>30 1.18</td> <td>48 1.89</td> <td>64 2.52</td> </tr> <tr> <td>B</td> <td>28 1.10</td> <td>38 1.50</td> <td>38 1.50</td> <td>46 1.81</td> <td>46 1.81</td> <td>56 2.20</td> </tr> <tr> <td>C</td> <td>4 .16</td> <td>4 .16</td> <td>4 .16</td> <td>4 .16</td> <td>4 .16</td> <td>4 .16</td> </tr> <tr> <td>D1</td> <td>3,2 .13</td> <td>3,2 .13</td> <td>5 .20</td> <td>3,2 .13</td> <td>5 .20</td> <td>5 .20</td> </tr> <tr> <td>D2</td> <td>8-11 .31-.43</td> <td>8-11 .31-.43</td> <td>15-19 .59-.75</td> <td>8-11 .31-.43</td> <td>15-19 .59-.75</td> <td>19-22 .75-.87</td> </tr> <tr> <td>E</td> <td>-</td> <td>-</td> <td>36 1.42</td> <td>-</td> <td>36 1.42</td> <td>48 1.89</td> </tr> <tr> <td>M</td> <td>1 .04</td> <td>1 .04</td> <td>-</td> <td>1 .04</td> <td>-</td> <td>-</td> </tr> </tbody> </table> | | CG4 CG4-1 CGD4-1 | CG6 | CG8 | CH6 CHR6 | CH10- CHR16 | CH10B- CHR16B | A | 30 1.18 | 30 1.18 | 48 1.89 | 30 1.18 | 48 1.89 | 64 2.52 | B | 28 1.10 | 38 1.50 | 38 1.50 | 46 1.81 | 46 1.81 | 56 2.20 | C | 4 .16 | 4 .16 | 4 .16 | 4 .16 | 4 .16 | 4 .16 | D1 | 3,2 .13 | 3,2 .13 | 5 .20 | 3,2 .13 | 5 .20 | 5 .20 | D2 | 8-11 .31-.43 | 8-11 .31-.43 | 15-19 .59-.75 | 8-11 .31-.43 | 15-19 .59-.75 | 19-22 .75-.87 | E | - | - | 36 1.42 | - | 36 1.42 | 48 1.89 | M | 1 .04 | 1 .04 | - | 1 .04 | - | - | <table border="1"> <thead> <tr> <th></th> <th>CG8</th> <th>CH10- CHR16</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>48 1.89</td> <td>48 1.89</td> </tr> <tr> <td>B</td> <td>38 1.50</td> <td>46 1.81</td> </tr> <tr> <td>C</td> <td>4 .16</td> <td>4 .16</td> </tr> <tr> <td>D1</td> <td>5 .20</td> <td>5 .20</td> </tr> <tr> <td>E</td> <td>30 1.17</td> <td>30 1.17</td> </tr> </tbody> </table> | | CG8 | CH10- CHR16 | A | 48 1.89 | 48 1.89 | B | 38 1.50 | 46 1.81 | C | 4 .16 | 4 .16 | D1 | 5 .20 | 5 .20 | E | 30 1.17 | 30 1.17 |
|--|--|---|---|-----------------|------------------------|------------------|-----|-------------|----------------|------------------|----------|------------|------------|------------|------------|------------|------------|----------|------------|------------|------------|------------|------------|------------|----------|----------|----------|----------|----------|----------|----------|-----------|------------|------------|----------|------------|----------|----------|-----------|-----------------|-----------------|-----------------|-----------------|-----------------|------------------|----------|---|---|------------|---|------------|------------|--|--|------------------------|-----|-----|-------------|----------------|------------------|----------|------------|------------|------------|------------|------------|------------|----------|------------|------------|------------|------------|------------|------------|----------|----------|----------|----------|----------|----------|----------|-----------|------------|------------|----------|------------|----------|----------|-----------|-----------------|-----------------|------------------|-----------------|------------------|------------------|----------|---|---|------------|---|------------|------------|----------|----------|----------|---|----------|---|---|--|--|-----|----------------|----------|------------|------------|----------|------------|------------|----------|----------|----------|-----------|----------|----------|----------|------------|------------|
| | CG4 CG4-1 CGD4-1 | CG6 | CG8 | CH6 CHR6 | CH10- CHR16 | CH10B- CHR16B | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| A | 30 1.18 | 30 1.18 | 48 1.89 | 30 1.18 | 48 1.89 | 64 2.52 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| B | 28 1.10 | 38 1.50 | 38 1.50 | 46 1.81 | 46 1.81 | 56 2.20 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C | 4 .16 | 4 .16 | 4 .16 | 4 .16 | 4 .16 | 4 .16 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D1 | 3,2 .13 | 3,2 .13 | 5 .20 | 3,2 .13 | 5 .20 | 5 .20 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D2 | 8-11 .31-.43 | 8-11 .31-.43 | 8-15 .31-.59 | 8-11 .31-.43 | 8-15 .31-.59 | 10-15 .39-.59 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| E | - | - | 36 1.42 | - | 36 1.42 | 48 1.89 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | CG4 CG4-1 CGD4-1 | CG6 | CG8 | CH6 CHR6 | CH10- CHR16 | CH10B- CHR16B | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| A | 30 1.18 | 30 1.18 | 48 1.89 | 30 1.18 | 48 1.89 | 64 2.52 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| B | 28 1.10 | 38 1.50 | 38 1.50 | 46 1.81 | 46 1.81 | 56 2.20 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C | 4 .16 | 4 .16 | 4 .16 | 4 .16 | 4 .16 | 4 .16 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D1 | 3,2 .13 | 3,2 .13 | 5 .20 | 3,2 .13 | 5 .20 | 5 .20 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D2 | 8-11 .31-.43 | 8-11 .31-.43 | 15-19 .59-.75 | 8-11 .31-.43 | 15-19 .59-.75 | 19-22 .75-.87 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| E | - | - | 36 1.42 | - | 36 1.42 | 48 1.89 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M | 1 .04 | 1 .04 | - | 1 .04 | - | - | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | CG8 | CH10- CHR16 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| A | 48 1.89 | 48 1.89 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| B | 38 1.50 | 46 1.81 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C | 4 .16 | 4 .16 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D1 | 5 .20 | 5 .20 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| E | 30 1.17 | 30 1.17 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

¹see page 43

Four Hole Panel Mounting or Mosaic Mounting

**EG
EGF**

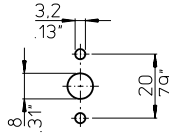
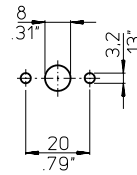
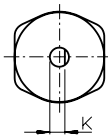
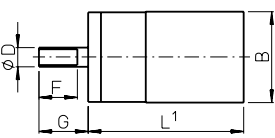


| | CG8 | CH10- CHR16 |
|-----------|------------------|------------------|
| A | 64 2.52 | 64 2.52 |
| B | 38 1.50 | 46 1.81 |
| C | 4 .16 | 4 .16 |
| D1 | 5 .20 | 5 .20 |
| D2 | 10-15 .39-.59 | 10-15 .39-.59 |
| E | 48 1.89 | 48 1.89 |
| M | 6.7 .26 | 6.7 .26 |

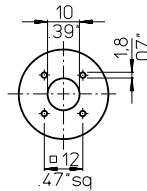
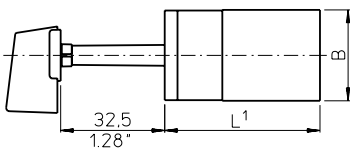
**E9
E91**

for
CG4-CGD4-1
CH6/CHR6

for
CG6



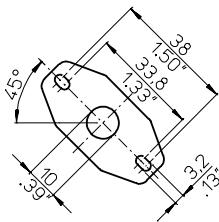
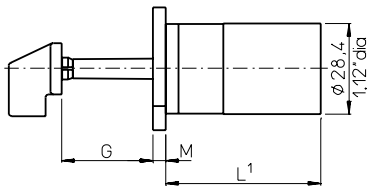
E92



CG4
CG4-1
CGD4-1 CG6 CH6
CHR6

| B | 28 1.10 | 38 1.50 | 46 1.81 |
|----------|------------|------------|------------|
|----------|------------|------------|------------|

**E93
E94**



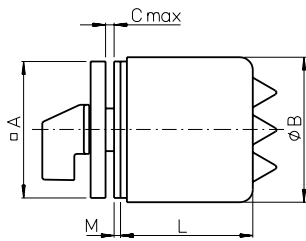
CG4
CG4-1
CGD4-1
CG6
CH6
CHR6

| | E9 | E91 | E92 | E93 | E94 |
|----------|-------------|-------------|--------------|--------------|--------------|
| D | 6 .24 | 6.35 .25 | - | - | - |
| F | 12 .47 | 12.8 .50 | - | - | - |
| G | 15.4 .61 | 17.4 .69 | 32.5 1.28 | 28.5 1.12 | 32.5 1.28 |
| K | 4.7 .19 | 5.5 .22 | - | - | - |
| M | - | - | - | 4 .16 | - |

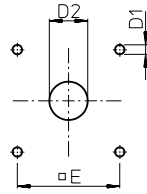
¹see page 43

Dimensions mm
inch

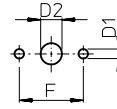
Two or Four Hole Panel Mounting



**EC
ED
EC1
ED1**



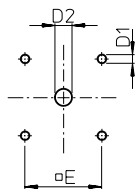
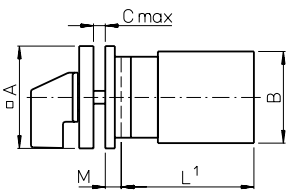
ED22



| | | CH10- CHR16 | | CH10B- CHR16B | | |
|-------------|-----------|----------------|----------|------------------|----------|------------|
| | | ED22 | EC ED | ED22 | EC ED | EC1 ED1 |
| A | | 48 | 64 | 48 | 64 | 64 |
| | | 1.89 | 2.52 | 1.89 | 2.52 | 2.52 |
| B | | 74 | 68 | 74 | 68 | 74 |
| | | 2.91 | 2.68 | 2.91 | 2.68 | 2.91 |
| EC/EC1 | C | - | 4 | - | 4 | 4 |
| | | - | .16 | - | .16 | .16 |
| ED/ED1/ED22 | C | 4 | 2 | 4 | 4 | 4 |
| | | .16 | .08 | .16 | .16 | .16 |
| D1 | | 5 | 5 | 5 | 5 | 5 |
| | | .20 | .20 | .20 | .20 | .20 |
| EC/EC1 | D2 | - | 8-15 | - | 10-15 | 10-15 |
| | | - | .31-.59 | - | .39-.59 | .39-.59 |
| ED/ED1/ED22 | D2 | 11-15 | 18-22 | 11-15 | 22-25 | 19-22 |
| | | .43-.59 | .71-.87 | .43-.59 | .87-.98 | .75-.87 |
| E | | - | 48 | - | 48 | 48 |
| | | - | 1.89 | - | 1.89 | 1.89 |
| F | | 30 | - | 30 | - | - |
| | | 1.17 | - | 1.17 | - | - |
| ED/ED1/ED22 | M | 1,5 | 2 | 1,5 | 2 | - |
| | | .06 | .08 | .06 | .08 | - |
| Stages L | 1 | 74,3 | - | 74,3 | - | 72,7 |
| | | 2.93 | - | 2.93 | - | 2.86 |
| 2 | | 74,3 | - | 74,3 | - | 72,7 |
| | | 2.93 | - | 2.93 | - | 2.86 |
| 3 | | 94,3 | - | 94,3 | - | 92,7 |
| | | 3.71 | - | 3.71 | - | 3.65 |
| 4 | | 94,3 | 103 | 94,3 | 114,5 | - |
| | | 3.71 | 4.06 | 3.71 | 4.51 | - |
| 5 | | 94,3 | - | - | 127 | - |
| | | 3.71 | - | - | 5.00 | - |
| 6 | | - | - | - | 139,5 | - |
| | | - | - | - | 5.49 | - |
| 7 | | - | - | - | 164,5 | - |
| | | - | - | - | 6.48 | - |
| 8 | | - | - | - | 177 | - |
| | | - | - | - | 6.97 | - |
| 9 | | - | - | - | - | - |
| | | - | - | - | - | - |
| 10 | | - | - | - | - | - |
| | | - | - | - | - | - |

Four Hole Panel Mounting or Single Hole Mounting

**KN1
 KD1
 KN2**

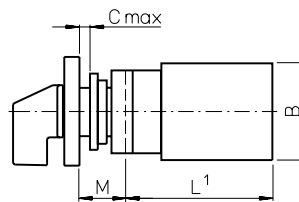
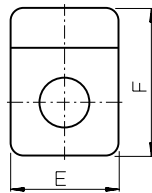
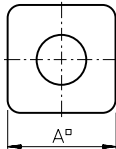
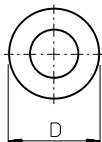


| | KN2 | | KN1 KD1 | | |
|-----------|-----------------|-----------------|--------------------|------------------|------------------|
| | CG8 | CH10- CHR16 | CG8 | CH10- CHR16 | CH10B- CHR16B |
| A | 48 1.89 | 48 1.89 | A | 64 2.52 | 64 2.52 |
| B | 38 1.50 | 46 1.81 | B | 38 1.50 | 46 1.81 |
| C | 4 .16 | 4 .16 | C | 4 .16 | 4 .16 |
| D1 | 5 .20 | 5 .20 | D1 | 5 .20 | 5 .20 |
| D2 | 8-15 .31-.59 | 8-15 .31-.59 | D2 | 10-15 .39-.59 | 10-15 .39-.59 |
| E | 36 1.42 | 36 1.42 | E | 48 1.89 | 48 1.89 |
| M | 5,2 .20 | 5,2 .20 | M | 4,7 .19 | 7 .28 |

**FS1...
 FT1...
 FT3...**

**FH3...
 FS2...
 FT2...
 FT4...**

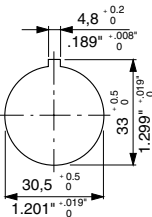
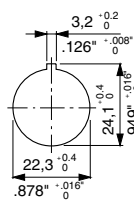
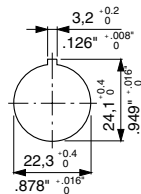
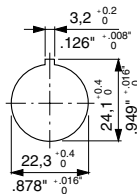
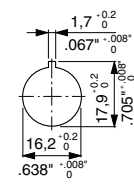
**FH4...
 FS4...
 FT6...**



**FS1...
 FS2...
 FS4...**

**FH3...
 FH4...
 FT1...
 FT2...
 FT6...**

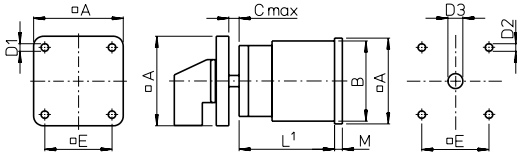
**FT3...
 FT4...**



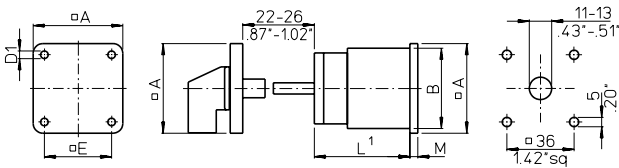
| | CG4 | | CH6 | | CH10- CHR16 |
|---------------|-----------------|--------------|--------------|--------------|------------------------|
| | CG4-1 CGD4-1 | CG6 | CG8 | CHR6 | CHR16 |
| A/E | 30 1.18 | 30 1.18 | 48 1.89 | 30 1.18 | 48 1.89 |
| FH3... | - | - | 64 | - | 64 |
| FH4... | - | - | 2.52 | - | 2.52 |
| B | 28 1.10 | 38 1.50 | 38 1.50 | 46 1.81 | 46 1.81 |
| C | 5 .20 | 5 .20 | 6 .24 | 5 .20 | 6 .24 |
| D | 29,5 1.16 | 29,5 1.16 | 39 1.54 | 29,5 1.16 | 39 1.54 |
| F | 39 1.54 | 39 1.54 | 59 2.32 | 39 1.54 | 59 2.32 |
| FH4... | - | - | 78,5 3.09 | - | 78,5 3.09 |
| M | 12,5 .49 | 12,5 .49 | 18,2 .72 | 12,5 .49 | 18,2 .72 |
| FH3... | - | - | 25,2 .99 | - | 25,2 .99 |
| FH4... | - | - | 25,2 .99 | - | 25,2 .99 |

Base Mounting

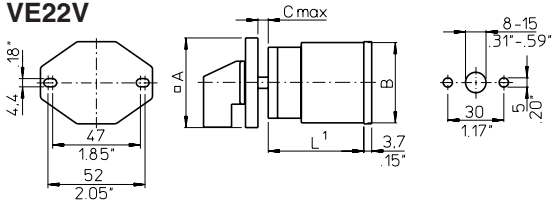
**VE
VE-V**



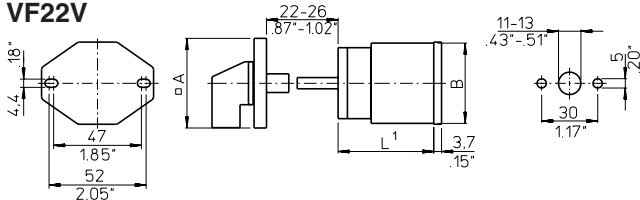
**VF
VF-V**



**VE22
VE22V**



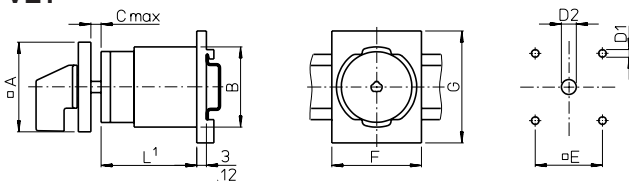
**VF22
VF22V**



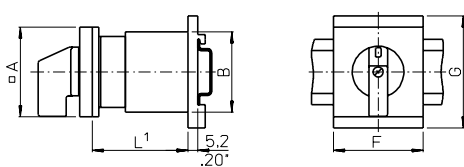
| | CG8 | CH10- CHR16 |
|----------------------|-----------------|------------------------|
| A² | 48 1.89 | 48 (64) 1.89 (2.52) |
| B | 38 1.50 | 46 1.81 |
| C | 10,5 .41 | 10,5 .41 |
| D1 | 4,1 .16 | 4,1 .16 |
| D2 | 5 .20 | 5 .20 |
| D3 | 8-15 .31-.59 | 8-15 .31-.59 |
| E² | 36 1.42 | 36 (48) 1.42 (1.89) |
| M | 2,2 .09 | 5,2 .20 |

²Dimensions in () for revertive mounting plate

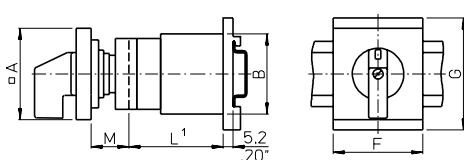
VE1



VE1E



VE1F

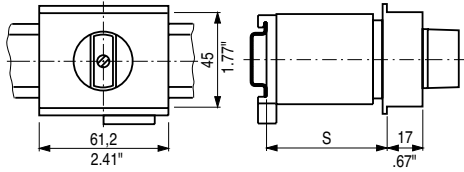


| | CG4 CG4-1 CGD4-1 | CG8 | CH10- CHR16 |
|-----------|------------------------|-----------------|-----------------|
| A | 30 1.18 | 48 1.89 | 48 1.89 |
| B | 28 1.10 | 38 1.50 | 46 1.81 |
| C | - | 10,5 .41 | 10,5 .41 |
| D1 | - | 5 .20 | 5 .20 |
| D2 | - | 8-15 .31-.59 | 8-15 .31-.59 |
| E | - | 36 1.42 | 36 1.42 |
| F | 35,5 1.40 | 48 1.89 | 48 1.89 |
| G | 60 2.36 | 60 2.36 | 60 2.36 |
| M | 12,5 .49 | 20 .79 | 20 .79 |

¹see page 43

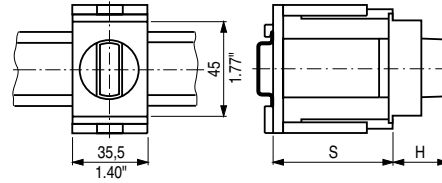
Base Mounting and Escutcheon Plates

VE2

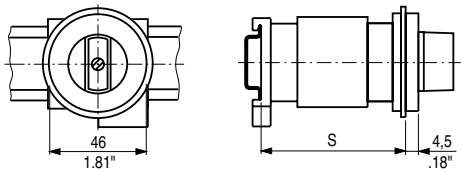


VE21

for CG4-CGD4-1

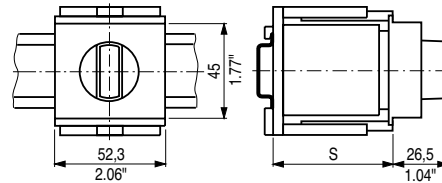


VE3

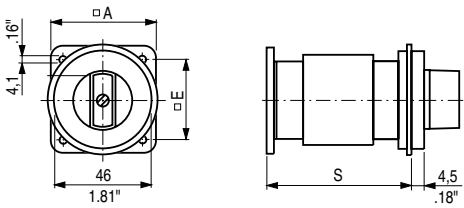


VE21

for CG8-CHR16



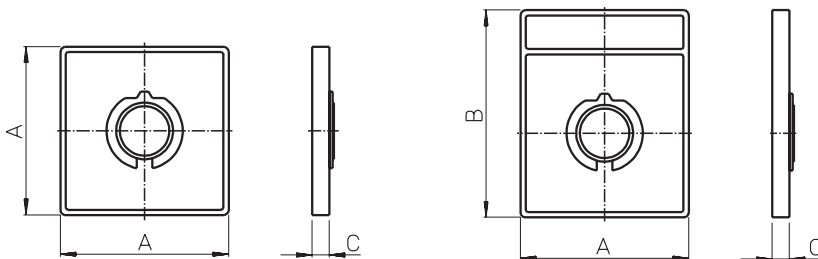
VE4



| | VE2 | | VE3 | | VE4 | |
|-----------------------|--------------------|------------|--------------------|------------|--------------------|------------|
| | CG8 | CH10-CHR16 | CG8 | CH10-CHR16 | CG8 | CH10-CHR16 |
| | Max. no. of stages | | Max. no. of stages | | Max. no. of stages | |
| S = 46 1.81 | 1 | 1 | - | - | 1 | - |
| S = 50 1.97 | 2 | 2 | 1 | 1 | 1 | - |
| S = 61 2.40 | 3 | 2 | 2 | 1 | 2 | 1 |
| S = 67 2.64 | 3 | 3 | 2 | 2 | 2 | 2 |
| S = 69 2.70 | 3 | 3 | 2 | 2 | 2 | 2 |
| A | | | | | 48 1.89 | 64 2.52 |
| E | | | | | 36 1.42 | 48 1.89 |

| VE21 | | CG4-CGD4-1 | CG8 | CH10-CHR16 |
|-------------------------|--------------|------------|-----|------------|
| S_{min.} | H | | | |
| 44 1.73 | 21 .83 | 1 | 1 | 1 |
| 46 1.81 | 26.5 1.04 | 2 | 2 | - |
| 50 1.97 | - | - | - | 2 |
| 54 2.13 | - | - | - | - |
| 60 2.36 | - | - | 3 | - |
| 62 2.44 | 26.5 1.04 | 3 | - | - |
| 64 2.52 | - | - | - | 3 |
| 72 2.83 | - | - | 4 | - |

Escutcheon plates for mounting E, EF, EG, EGF, KN1, KD1, KN2, EC, EC1, ED, ED1, VE, VE1, VF



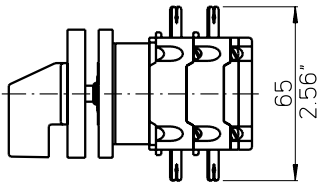
| Size | A | B | C |
|------------|------------|------------|------------|
| S00 | 30 1.18 | 39 1.54 | 5.5 .22 |
| S0 | 48 1.89 | 59 2.32 | 6.7 .26 |
| S1 | 64 2.52 | 78 3.07 | 7.4 .29 |

Additional Lengths

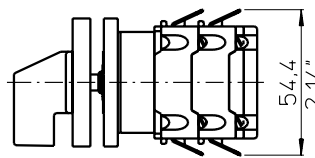
Additional lengths for amendment (page 4)

| | CG8 | CH10 CH16 | CHR10 CHR16 |
|-------------|-------------|--------------|----------------|
| B | 6,2 .24 | 6,2 .24 | 6,2 .24 |
| S | 17,3 .68 | 17,3 .68 | 17,3 .68 |
| L, M | 24,8 .98 | 24,8 .98 | 24,8 .98 |
| X | 23,3 .92 | 23,3 .92 | 23,3 .92 |

Quick connect terminations (plug 2,8 mm or 6,35 mm) for CH switches (page 4)



with quick connects



with angled quick connects

Length L

| Stages | CG4 | | CG8 | CH6 CHR6 | CH10 | CHR10 | CH10B CHR10B | CHR16B CHR16B |
|-----------|-------|------|-------|-------------|-------|-------|-----------------|------------------|
| | CG4-1 | | | | CH12 | CHR11 | | |
| | CG4-1 | CG6 | | | CH16 | CHR16 | | |
| 1 | 38,5 | 43,2 | 40,7 | 46 | 43,5 | 43,5 | 48,9 | 48,9 |
| | 1.52 | 1.70 | 1.60 | 1.81 | 1.71 | 1.71 | 1.93 | 1.93 |
| 2 | 50,5 | 55,9 | 53,4 | 60 | 57,5 | 57,5 | 62,9 | 62,9 |
| | 1.99 | 2.20 | 2.10 | 2.36 | 2.26 | 2.26 | 2.48 | 2.48 |
| 3 | 62,5 | 68,6 | 66,1 | 74 | 71,5 | 71,5 | 76,9 | 76,9 |
| | 2.46 | 2.70 | 2.60 | 2.91 | 2.81 | 2.81 | 3.03 | 3.03 |
| 4 | 74,5 | 81,3 | 78,8 | 88 | 85,5 | 85,5 | 90,9 | 90,9 |
| | 2.93 | 3.20 | 3.10 | 3.46 | 3.37 | 3.37 | 3.58 | 3.58 |
| 5 | 86,5 | - | 91,5 | - | 99,5 | 99,5 | 104,9 | 104,9 |
| | 3.41 | - | 3.60 | - | 3.92 | 3.92 | 4.13 | 4.13 |
| 6 | 98,5 | - | 104,2 | - | 113,5 | 113,5 | 118,9 | 118,9 |
| | 3.88 | - | 4.10 | - | 4.47 | 4.47 | 4.68 | 4.68 |
| 7 | 110,5 | - | 116,9 | - | 127,5 | 127,5 | 132,9 | 132,9 |
| | 4.35 | - | 4.60 | - | 5.02 | 5.02 | 5.23 | 5.23 |
| 8 | 122,5 | - | 129,6 | - | 141,5 | 141,5 | 146,9 | 146,9 |
| | 4.82 | - | 5.10 | - | 5.57 | 5.57 | 5.78 | 5.78 |
| 9 | - | - | 142,3 | - | 155,5 | 155,5 | 160,9 | 160,9 |
| | - | - | 5.60 | - | 6.12 | 6.12 | 6.34 | 6.34 |
| 10 | - | - | 155 | - | 169,5 | 169,5 | 174,9 | 174,9 |
| | - | - | 6.10 | - | 6.67 | 6.67 | 6.89 | 6.89 |
| 11 | - | - | 167,7 | - | 183,5 | 183,5 | 188,9 | 188,9 |
| | - | - | 6.60 | - | 7.22 | 7.22 | 7.44 | 7.44 |
| 12 | - | - | 180,4 | - | 197,5 | 197,5 | 202,9 | 202,9 |
| | - | - | 7.10 | - | 7.77 | 7.77 | 7.99 | 7.99 |

The Range of “Blue Line” Switchgear

Technical literature covering the following products is available on request.

| | Catalog Number |
|--|-------------------|
| Main Switches and Main Switches with Emergency Function 16 A-315 A Maintenance Switches 20 A-315 A Switch Disconnectors 20 A-315 A According to IEC 60947-3, EN 60947-3, VDE 0660 part 107, IEC 60204, EN 60204 and VDE 0113 | 500 |
| CL Switches 10 A-20 A C, CA and CAD Switches 10 A-315 A and L Switches 350 A-2400 A C, CA and CAD switches are designed for universal application. They are recommended for instrument, isolator, double-throw and motor control. L switches are designed for load and off-load applications. They are used to switch resistive or low inductive loads. | 100 |
| Optional Extras and Enclosures The complete product line, a large number of optional extras is available, including door interlocks, push-pull devices, cylinder and padlock attachments, control and indicator devices, AC motor drives, as well as enclosures, both insulated and metal. | 101 |
| A and AD Switches 6 A-25 A A and AD switches have 4 contacts in each switching stage. These switches provide an extensive range of switch functions and require a minimum mounting depth. Up to 24 switching positions are possible, with availability of 48 contacts per 12 stage switch column. | 110 |
| CG, CH and CHR Switches 10 A-25 A Ultra compact CG, CH and CHR switches are ideally suited for control and instrumentation applications. Switch terminals are “finger-proof” and conveniently accessible for wiring and are delivered open. All CG4 switches offer specially designed gold plated contacts or H-bridges with “cross-wire” contact systems, which facilitates their use in electronic circuitry and chemically aggressive environments. | 120 |
| DH, DHR, DK and DKR Switches 6 A-16 A DH, DHR, DK and DKR switches incorporate unique corrosion resistant contacts that permit operation on system voltage as low as 1 V. They have fully enclosed and protected contacts which can be operated either by rotary and/or lateral handle movement. D switches are used in calibration and semiconductor circuits. They are also used for relay and contactor control. | 130 |
| X Switches 200 A-630 A X switches can be applied for load, tap and gang switching duties. They incorporate 6 contacts in each switching stage. Their compact design provides a minimum length dimension for mounting purposes. | 140 |
| KG Switches 20 A-315 A and KH and KHR Switches 16 A-80 A KG, KH and KHR switches are excellent circuit interruptors. They have high through fault and fault making capacities and are especially designed for use as isolators and safety switches for machine tools, distribution panels and switchboards. KG ON/OFF switches offer unusually high dimensioned air and creepage distances between terminals which are designed for time saving “straight-line” wiring. ON/OFF switches are available with up to 8 poles and double-throw switches are available with up to 4 poles. | 150 |
| Push Buttons and Pilot Lights, 22,5 mm Ø A complete range of state-of-the-art push buttons and pilot lights represent an ideal combination of functional security and economical efficiency in a modular design. | 302 |

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