

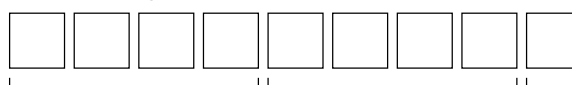


## P012... / P016... / P020... PX12... / PX16... / PX20...

### CAM SWITCHES SIZES: 12 A / 16 A / 20 A

|                           | P012...<br>P016...<br>P020...                                                              | PX12...<br>PX16...<br>PX20...                                                              |
|---------------------------|--------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| Specifications            | p.2                                                                                        | p.2                                                                                        |
| Terminal protection class | <br>IP20 | <br>IP10 |

#### Code reading



Cam switch  
electrical scheme  
(see p.9)

Cam switch series  
(this datasheet)

#### **R** Rear panel mounting



p.5



p.6

#### **B** Base mounting DIN rail mounting



p.7

-

#### **D** DIN mounting 46 mm with actuator (equipped with typical actuator p.n. 027/....)

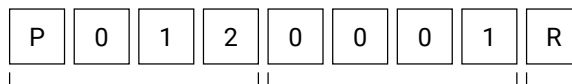


p.8

-

Cam switch mounting type

#### Code example



Cam switch series

Cam switch electrical scheme

Cam switch mounting type

**SEE AVAILABLE ACTUATORS ON p.16**

# SPECIFICATIONS

## General characteristics

|                               |                         |                                     |                                                                                                                      |              |
|-------------------------------|-------------------------|-------------------------------------|----------------------------------------------------------------------------------------------------------------------|--------------|
| Protection class              | control                 | EN 60529<br>UL50 / NEMA             | IP65<br>Type 1 - 4 - 4X                                                                                              |              |
|                               | control with knob only  |                                     | IP40                                                                                                                 |              |
|                               | terminals               |                                     | P012... / P016... / P020...<br>PX12... / PX16... / PX20...                                                           | IP20<br>IP10 |
| Material group                |                         | EN 60947-1                          | II                                                                                                                   |              |
| Pollution grade               |                         | EN 60947-1                          | 3                                                                                                                    |              |
| Flammability                  |                         | UL94                                | V0 (live electrical parts)                                                                                           |              |
| Ambient temperature           | operating               |                                     | -40 ... +85°C                                                                                                        |              |
|                               | storage                 |                                     | -40 ... +70°C                                                                                                        |              |
| Climate withstand             |                         | IEC 68 part 2-3<br>IEC 68 part 2-30 | damp heat, steady state<br>damp heat, cyclic                                                                         |              |
| Terminal screw identification | conforming to           |                                     | EN50013                                                                                                              |              |
| Connections                   | terminal block caliber  | EN60947-1                           | A3                                                                                                                   |              |
|                               | terminal screw          |                                     | M3.5                                                                                                                 |              |
|                               | tightening torque       | EN60947-1<br>UL508                  | 0.8 N·m (7.2 lb·in)<br>7.5 lb·in (0.85 N·m)                                                                          |              |
| Connectable section           | flexible conductors     |                                     | 1 × 0.75 ... 4 mm² or 2 × 0.75 ... 2.5 mm²<br>AWG 18 ... 10                                                          |              |
|                               | solid conductors        |                                     | 1 × 0.75 ... 4 mm² or 2 × 0.75 ... 2.5 mm²<br>AWG 18 ... 10                                                          |              |
| Contacts                      |                         |                                     | double breaking                                                                                                      |              |
| Opening angles                |                         |                                     | 30° - 45° - 60° - 90°                                                                                                |              |
| Mechanical lifetime           | @ 120 operations / hour |                                     | 1 million cycles                                                                                                     |              |
| Electrical lifetime           | @ 120 operations / hour |                                     | P012... / PX12... 1 million cycles<br>P016... / PX16... 0.75 million cycles<br>P020... / PX20... 0.75 million cycles |              |

## EN 60947-3 characteristics

|                                               |      | P012... / PX12... | P016... / PX16... | P020... / PX20... |
|-----------------------------------------------|------|-------------------|-------------------|-------------------|
| Rated operating voltage                       | Ue   | 690 V             | 690 V             | 690 V             |
| Rated insulation voltage                      | Ui   | 690 V             | 690 V             | 690 V             |
| Rated impulse withstand voltage (sectionable) | Uimp | 4 kV              | 4 kV              | 4 kV              |
| Rated thermal current                         | Ith  | 16 A              | 20 A              | 25 A              |
| Rated enclosed thermal current                | Ithe | 12 A              | 16 A              | 20 A              |
| Frequency                                     |      | 50/60 Hz          | 50/60 Hz          | 50/60 Hz          |

## Alternate current

| Rated operating current         |                                                                                | I <sub>e</sub>     |       | P012... / PX12... |         | P016... / PX16... |        | P020... / PX20... |         |
|---------------------------------|--------------------------------------------------------------------------------|--------------------|-------|-------------------|---------|-------------------|--------|-------------------|---------|
| AC-21A                          | Switching of resistive loads, including moderate overloads                     |                    | 690 V | 12 A              |         | 16 A              |        | 20 A              |         |
| AC-22A                          | Switching of mixed resistive and inductive loads, including moderate overloads |                    | 690 V | 12 A              |         | 16 A              |        | 20 A              |         |
| AC-23A                          | Switching of motor loads or other highly inductive loads                       | 1 phase - 1 pole   | 110 V | 12 A              | 1.1 kW  | 14 A              | 1.5 kW | 18 A              | 2 kW    |
|                                 |                                                                                |                    | 230 V | 12 A              | 2.2 kW  | 14 A              | 3 kW   | 18 A              | 4 kW    |
|                                 |                                                                                | 3 phases - 3 poles | 230 V | 10 A              | 3 kW    | 14 A              | 3 kW   | 16 A              | 5 kW    |
|                                 |                                                                                |                    | 400 V | 10 A              | 5.5 kW  | 14 A              | 7.5 kW | 16 A              | 9 kW    |
|                                 |                                                                                |                    | 500 V | 10 A              | 7.5 kW  | 14 A              | 10 kW  | 16 A              | 11 kW   |
|                                 |                                                                                |                    | 690 V | 10 A              | 7.5 kW  | 14 A              | 10 kW  | 16 A              | 12.5 kW |
| AC-3                            | Squirrel-cage motors: starting, switches off motors during running time        | 1 phase - 1 pole   | 110 V | 10 A              | 0.75 kW | 12 A              | 1.1 kW | 16 A              | 1.5 kW  |
|                                 |                                                                                |                    | 230 V | 10 A              | 2 kW    | 12 A              | 2.2 kW | 16 A              | 3.5 kW  |
|                                 |                                                                                | 3 phases - 3 poles | 230 V | 8 A               | 2.2 kW  | 10 A              | 3 kW   | 12 A              | 4 kW    |
|                                 |                                                                                |                    | 400 V | 8 A               | 4 kW    | 10 A              | 5 kW   | 12 A              | 6 kW    |
|                                 |                                                                                |                    | 500 V | 8 A               | 5.5 kW  | 10 A              | 7.5 kW | 12 A              | 8 kW    |
|                                 |                                                                                |                    | 690 V | 6 A               | 5.5 kW  | 8 A               | 7.5 kW | 10 A              | 9 kW    |
| AC-23A                          | Nominal breaking capacity (cosφ 0.45)                                          | 230 V              | 80 A  |                   | 104 A   |                   | 128 A  |                   |         |
|                                 |                                                                                | 400 V              | 80 A  |                   | 104 A   |                   | 128 A  |                   |         |
|                                 |                                                                                | 500 V              | 80 A  |                   | 112 A   |                   | 128 A  |                   |         |
|                                 |                                                                                | 690 V              | 80 A  |                   | 112 A   |                   | 128 A  |                   |         |
| Power dissipation for each pole |                                                                                |                    | 0.3 W |                   | 0.35 W  |                   | 0.4 W  |                   |         |

## Direct current

| Rated operating current |                                                | I <sub>e</sub> |      | P012... / PX12... |  | P016... / PX16... |  | P020... / PX20... |  |
|-------------------------|------------------------------------------------|----------------|------|-------------------|--|-------------------|--|-------------------|--|
| DC-21A                  | Switching resistive loads with light overloads | 1 phase        | 50 V | 10 A              |  | 12 A              |  | 16 A              |  |
| DC-22A                  | Switching resistive loads with light overloads | 1 phase        | 30 V | 8 A               |  | 10 A              |  | 12 A              |  |

## Short circuit characteristics

|                                                        |                 | P012... / PX12... | P016... / PX16... | P020... / PX20... |
|--------------------------------------------------------|-----------------|-------------------|-------------------|-------------------|
| Rated short-time short circuit withstand current (1 s) | I <sub>cn</sub> | 300 A             | 300 A             | 300 A             |
| Rated short circuit making capacity                    | I <sub>cm</sub> | 1200 A            | 1200 A            | 1200 A            |
| Conditional rated short circuit withstand current      |                 | 5 kA              | 5 kA              | 5 kA              |
| Fuse rating (type gG)                                  | 690 V           | 20 A              | 20 A              | 20 A              |

## UL 508 characteristics

|                     |                    |          | P012... / PX12... | P016... / PX16... | P020... / PX20... |
|---------------------|--------------------|----------|-------------------|-------------------|-------------------|
| General use         |                    | 600 V AC | 12 A              | 16 A              | 20 A              |
| Standard motor load | 1 phase - 2 poles  | 120 V AC | 0.5 HP            | 1 HP              | 1.5 HP            |
|                     |                    | 240 V AC | 9.8 FLA           | 16 FLA            | 20 FLA            |
|                     | 3 phases - 3 poles |          | 1 HP              | 1.5 HP            | 2 HP              |
|                     |                    |          | 8 FLA             | 10 FLA            | 12 FLA            |
|                     |                    | 200 V AC | 1.5 HP            | 3 HP              | 5 HP              |
|                     |                    | 240 V AC | 6.9 FLA           | 11.04 FLA         | 17.5 FLA          |
|                     |                    |          | 3 HP              | 5 HP              | 7.5 HP            |
|                     |                    |          | 9.6 FLA           | 15.2 FLA          | 20 FLA            |
|                     |                    | 480 V AC | 5 HP              | 7.5 HP            | 10 HP             |
|                     |                    |          | 7.6 FLA           | 11 FLA            | 14 FLA            |
|                     |                    | 600 V AC | 5 HP              | 7.5 HP            | 10 HP             |
|                     |                    |          | 6.1 FLA           | 9 FLA             | 11 FLA            |

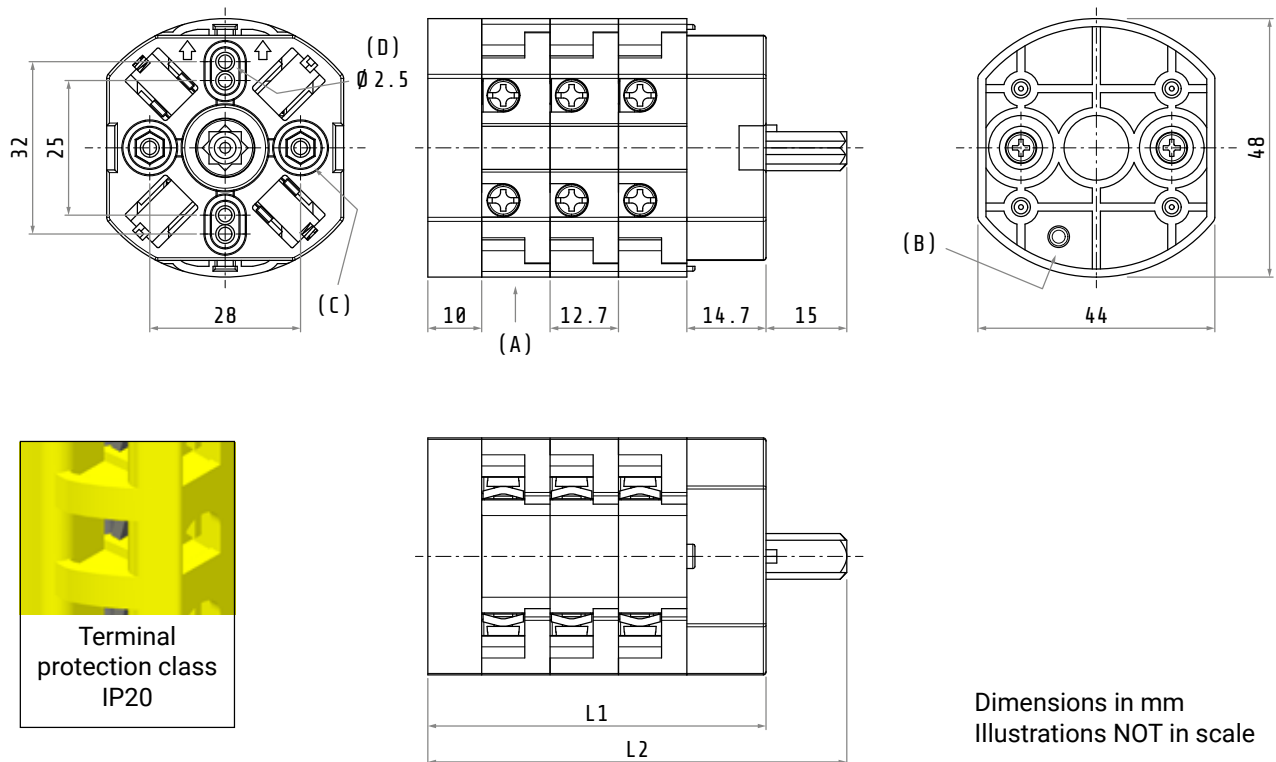
## Marking

|                                                                                     |                                                                                                                                                                                                                                                                                                                                                     |
|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Compliance by passed test                                                           | Approved                                                                                                                                                                                                                                                                                                                                            |
|  |     |

# OVERALL DIMENSIONS

Rear panel mounting

P012... / P016... / P020...



(A) wafer (thickness = 12.7 mm)

(B) reference notch

(C) metric screw (M3) fixing hole

(D) self tapping screw (Ø 3.2) fixing hole

Some dimensions depend on the number of wafers of the cam switch and can be calculated with these formulas:

$$L1 \text{ [mm]} = 10 + (12.7 \times n. \text{ of wafers}) + 14.7$$

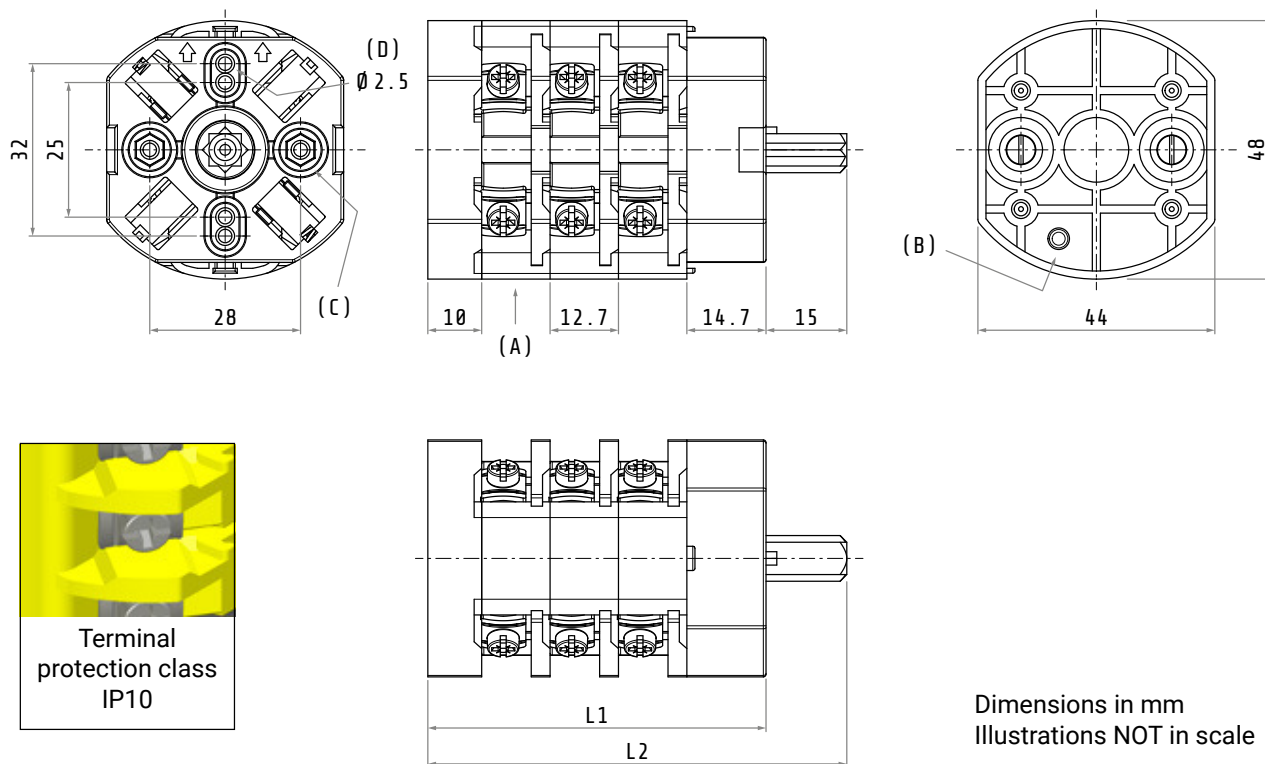
$$L2 \text{ [mm]} = L1 + 15$$

Examples:

| n. of wafers | 1    | 2    | 3    | 4    | 5     | 6     |
|--------------|------|------|------|------|-------|-------|
| L1 [mm]      | 37.4 | 50.1 | 62.8 | 75.5 | 88.2  | 100.9 |
| L2 [mm]      | 52.4 | 65.1 | 77.8 | 90.5 | 103.2 | 115.9 |

## Rear panel mounting

PX12... / PX16... / PX20...



Dimensions in mm  
Illustrations NOT in scale

(A) wafer (thickness = 12.7 mm)

(B) reference notch

(C) metric screw (M3) fixing hole

(D) self tapping screw (Ø 3.2) fixing hole

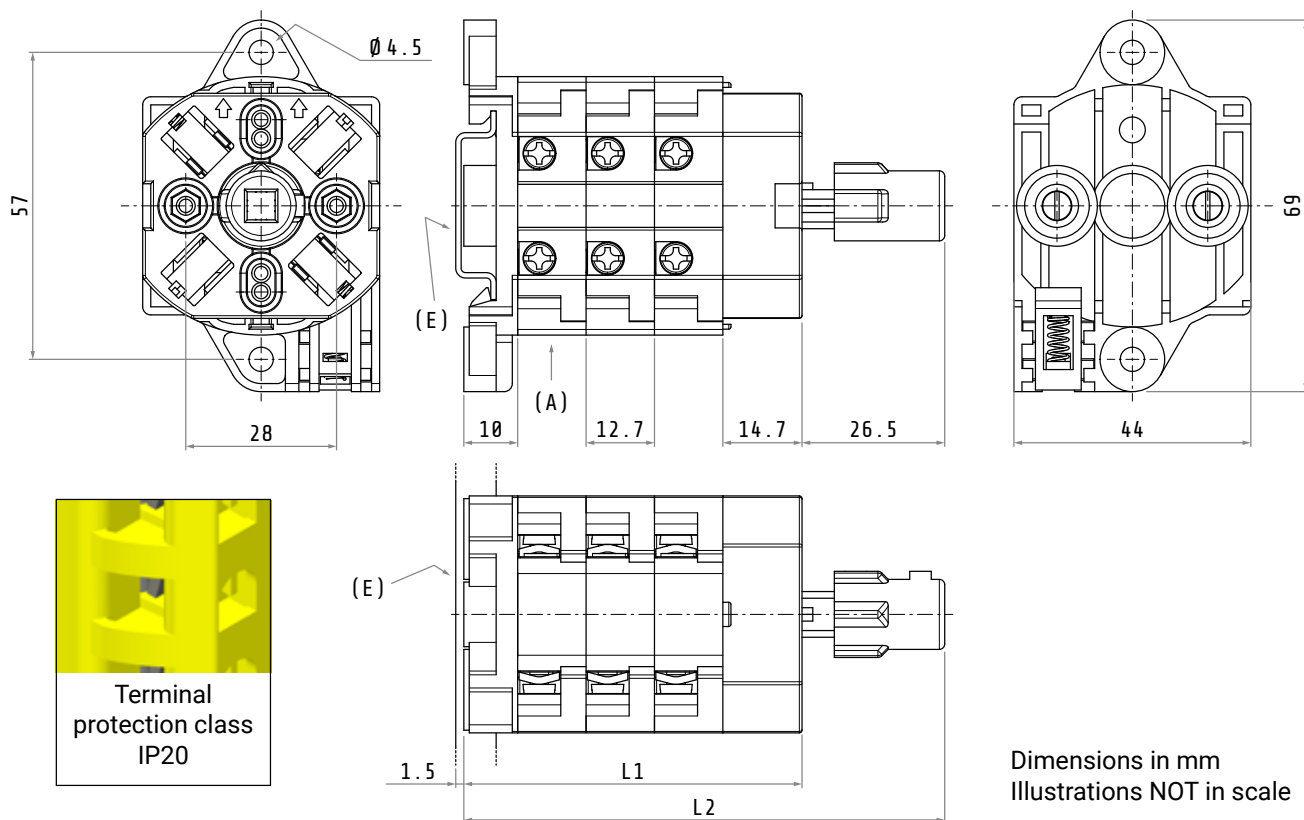
Some dimensions depend on the number of wafers of the cam switch and can be calculated with these formulas:

$$L1 \text{ [mm]} = 10 + (12.7 \times \text{n. of wafers}) + 14.7$$

$$L2 \text{ [mm]} = L1 + 15$$

Examples:

| N. of wafers | 1    | 2    | 3    | 4    | 5     | 6     |
|--------------|------|------|------|------|-------|-------|
| L1 [mm]      | 37.4 | 50.1 | 62.8 | 75.5 | 88.2  | 100.9 |
| L2 [mm]      | 52.4 | 65.1 | 77.8 | 90.5 | 103.2 | 115.9 |



(A) wafer (thickness = 12.7 mm)

(E) DIN rail 35 mm (EN 46277/3)

Some dimensions depend on the number of wafers of the cam switch and can be calculated with these formulas:

$$L1 \text{ [mm]} = 10 + (12.7 \times \text{n. of wafers}) + 14.7$$

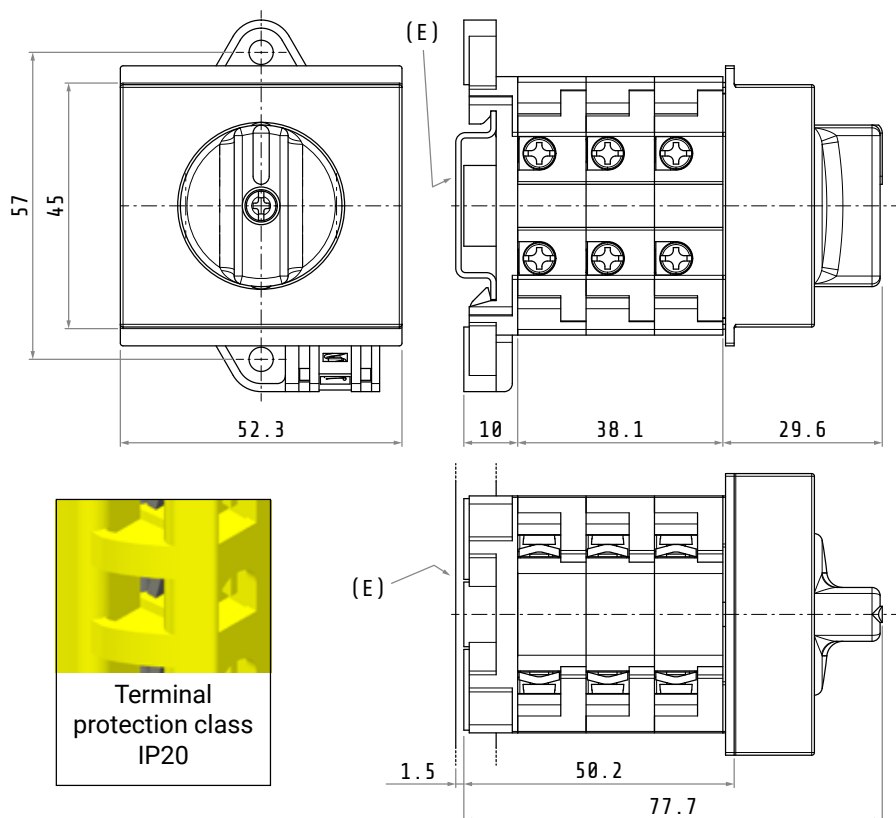
$$L2 \text{ [mm]} = L1 + 26.5$$

Examples:

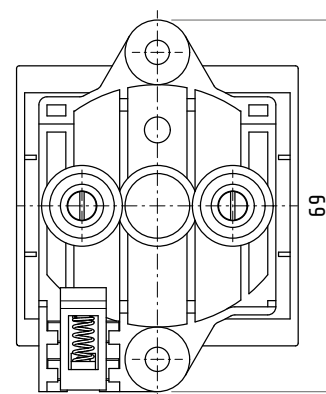
| N. of wafers | 1    | 2    | 3    | 4    | 5     | 6     |
|--------------|------|------|------|------|-------|-------|
| L1 [mm]      | 37.4 | 50.1 | 62.8 | 75.5 | 88.2  | 100.9 |
| L2 [mm]      | 63.9 | 76.6 | 89.3 | 102  | 114.7 | 127.4 |

#### Please note

This configuration allows both base mounting and DIN mounting.



Terminal  
protection class  
IP20



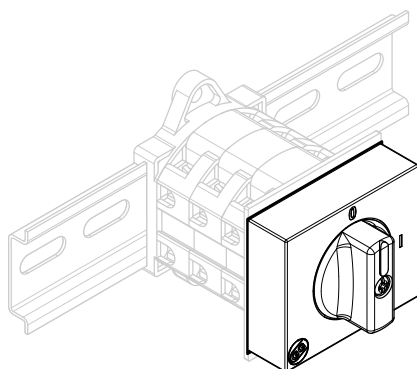
Dimensions in mm  
Illustrations NOT in scale

(E) DIN rail 35 mm (EN 46277/3)

#### Please note

The standard cam switches for DIN mounting with actuator are built with 3 wafers.

The standard cam switches for DIN mounting with actuator are typically equipped with actuator p.n. 027/.... (separated and to be assembled).



This installation implies DIN rails in 46 mm standard boxes like in the picture on the left.

# ELECTRICAL SCHEMES

Code checking pattern

|  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|
|  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|

Series

Function

Mounting

Example: cam switch  
on catalog

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| P | 0 | 1 | 2 | 0 | 0 | 0 | 1 | R |
|---|---|---|---|---|---|---|---|---|

Example: cam switch  
NOT on catalog

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| P | 0 | 1 | 2 | 0 | 0 | 0 | 1 | B |
|---|---|---|---|---|---|---|---|---|



|             |      |      |
|-------------|------|------|
| P012 / PX12 | P012 | P012 |
| P016 / PX16 | P016 | P016 |
| P020 / PX20 | P020 | P020 |

| Function                                                        | N. of wafers | R | B | D |
|-----------------------------------------------------------------|--------------|---|---|---|
| ON-OFF switches 0-1 p.10                                        |              |   |   |   |
| 0001 ON-OFF switch 1 pole                                       | 1            | x | - | x |
| 0002 ON-OFF switch 2 poles                                      | 1            | x | x | x |
| 0003 ON-OFF switch 3 poles                                      | 2            | x | x | x |
| 0004 ON-OFF switch 4 poles                                      | 2            | x | x | x |
| 0005 ON-OFF switch 5 poles                                      | 3            | x | - | x |
| 0006 ON-OFF switch 6 poles                                      | 3            | x | x | x |
| 0007 ON-OFF switch 3 poles with spring return to zero           | 2            | x | - | - |
| Changeover switches 1-0-2 p.10                                  |              |   |   |   |
| 0008 Changeover switch 1 pole                                   | 1            | x | x | x |
| 0009 Changeover switch 2 poles                                  | 2            | x | x | x |
| 0010 Changeover switch 3 poles                                  | 3            | x | x | x |
| 0011 Changeover switch 4 poles                                  | 4            | x | x | - |
| Motor switches p.11                                             |              |   |   |   |
| 0012 Reversing switch 3 poles                                   | 3            | x | - | - |
| 0013 Reversing switch 3 poles with spring return to zero        | 3            | x | - | - |
| 0014 Dahlander pole changing two speed switch                   | 4            | x | - | - |
| 0015 Star-delta starter switch                                  | 4            | x | - | - |
| 0016 Reversing switch single phase with centrifugal cut-out     | 3            | x | - | - |
| 0031 Reversing-dahlander pole changing two speed switch         | 6            | x | - | - |
| 0017 Starter switch single phase with auxiliary phase           | 2            | x | - | - |
| 0018 Reversing-starter switch single phase with auxiliary phase | 3            | x | - | - |
| Ammeter and voltmeter switches p.12                             |              |   |   |   |
| 0019 Ammeter selector switch 1 pole for 3 current transformers  | 3            | x | - | x |
| 0020 Voltmeter selector switch phase-neutral                    | 2            | x | - | x |
| 0021 Voltmeter selector switch phase-phase                      | 2            | x | - | x |
| 0022 Voltmeter selector switch phase-phase for two circuits     | 4            | x | - | - |
| 0023 Voltmeter selector switch phase-phase and phase-neutral    | 3            | x | - | x |
| 0024 Voltmeter selector switch phase-phase and 1 phase-neutral  | 3            | x | - | x |
| Step switches p.13                                              |              |   |   |   |
| 0025 Step switch 1-2 positions without zero 1 pole              | 1            | x | - | - |
| 0026 Step switch 1-2 positions without zero 2 poles             | 2            | x | - | - |
| 0027 Step switch 1-2 positions without zero 3 poles             | 3            | x | - | - |
| 0038 Step switch 1-2-3 positions without zero 1 pole            | 2            | x | - | - |
| 0039 Step switch 1-2-3 positions without zero 2 poles           | 3            | x | - | - |
| 0040 Step switch 1-2-3 positions without zero 3 poles           | 5            | x | - | - |
| 0041 Step switch 1-2-3-4 positions without zero 1 pole          | 2            | x | - | - |
| 0042 Step switch 1-2-3-4 positions without zero 2 poles         | 4            | x | - | - |
| 0043 Step switch 1-2-3-4 positions without zero 3 poles         | 6            | x | - | - |
| 0028 Step switch 0-1-2 positions with zero 1 pole               | 1            | x | - | - |
| 0032 Step switch 0-1-2 positions with zero 2 poles              | 2            | x | - | - |
| 0033 Step switch 0-1-2 positions with zero 3 poles              | 3            | x | - | - |
| 0029 Step switch 0-1-2-3 positions with zero 1 pole             | 2            | x | - | - |
| 0034 Step switch 0-1-2-3 positions with zero 2 poles            | 3            | x | - | - |
| 0035 Step switch 0-1-2-3 positions with zero 3 poles            | 5            | x | - | - |
| 0030 Step switch 0-1-2-3-4 positions with zero 1 pole           | 2            | x | - | - |
| 0036 Step switch 0-1-2-3-4 positions with zero 2 poles          | 4            | x | - | - |
| 0037 Step switch 0-1-2-3-4 positions with zero 3 poles          | 6            | x | - | - |

## ON-OFF switches 0-1

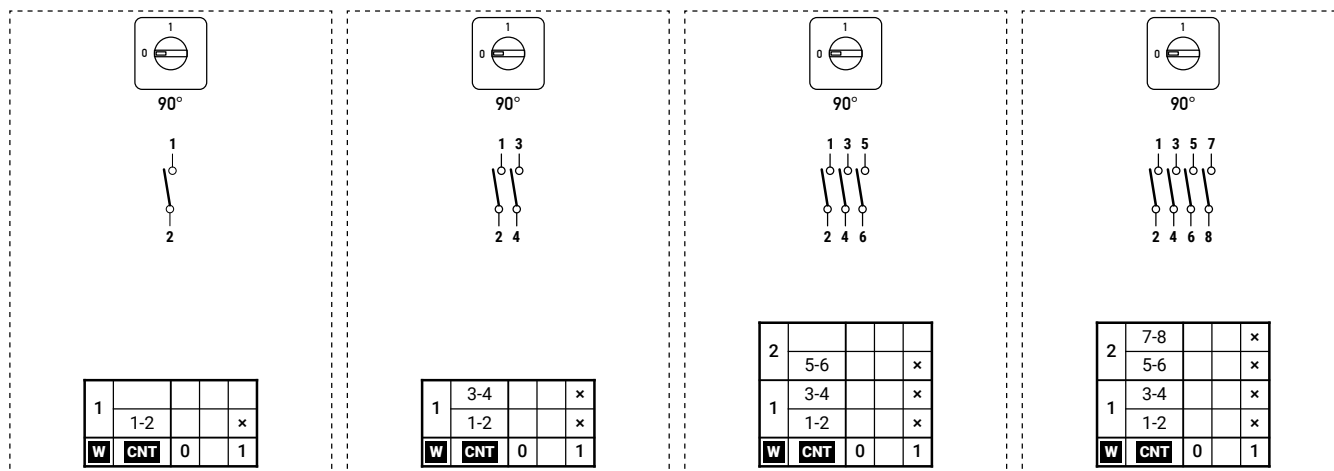
1/1

0001 • 1 pole

0002 • 2 poles

0003 • 3 poles

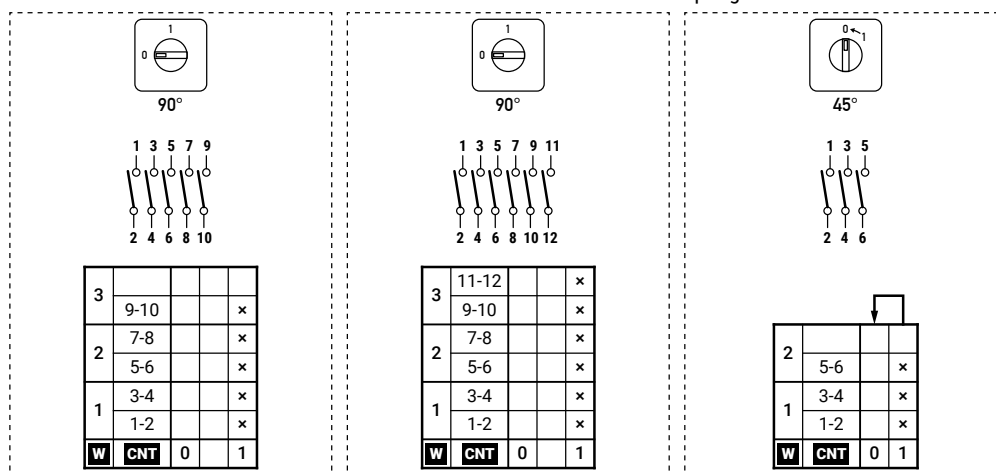
0004 • 4 poles



0005 • 5 poles

0006 • 6 poles

0007 • 3 poles with  
spring return to zero



## Changeover switches 1-0-2

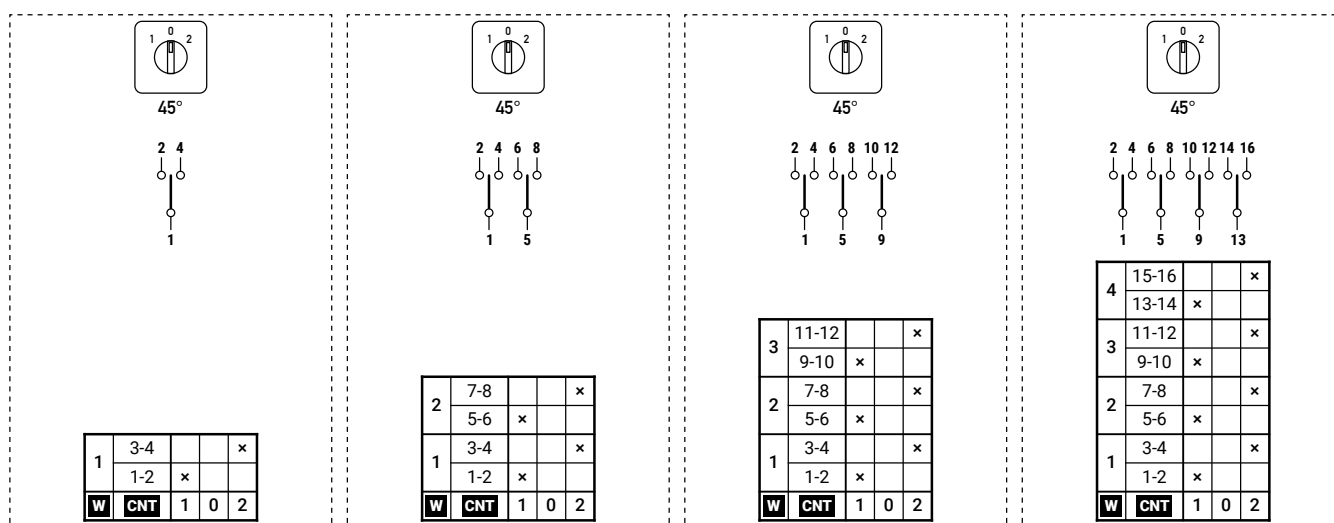
1/1

0008 • 1 pole

0009 • 2 poles

0010 • 3 poles

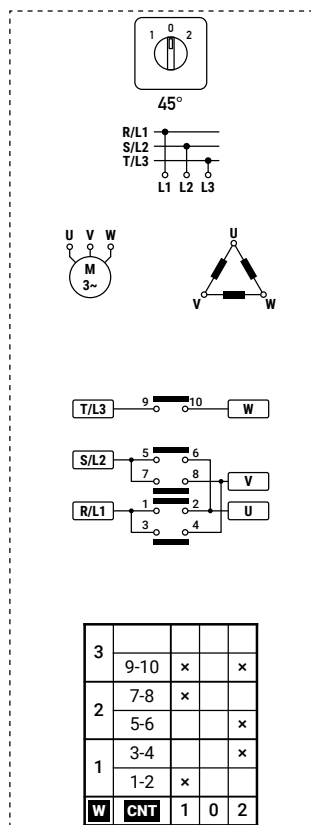
0011 • 4 poles



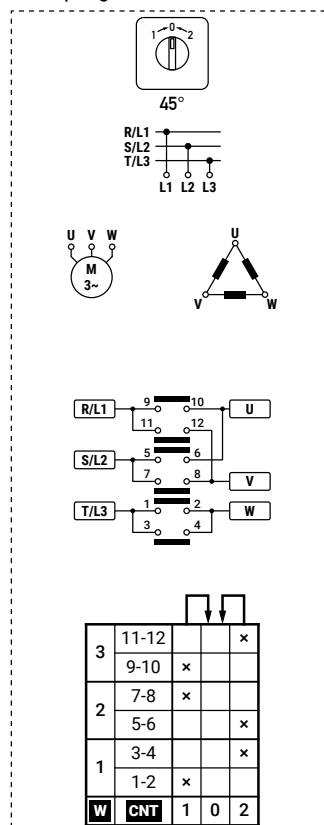
## Motor switches

1/1

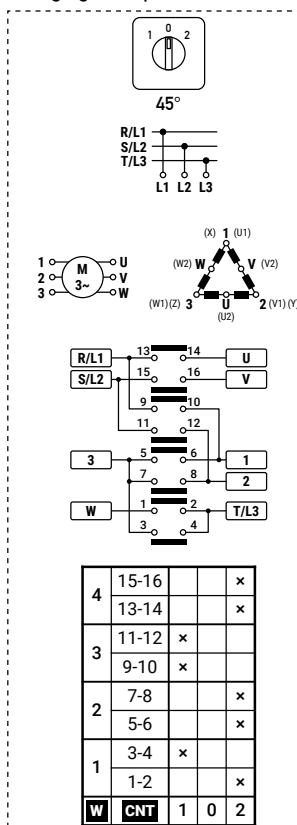
**0012 • Reversing switch 3 poles**



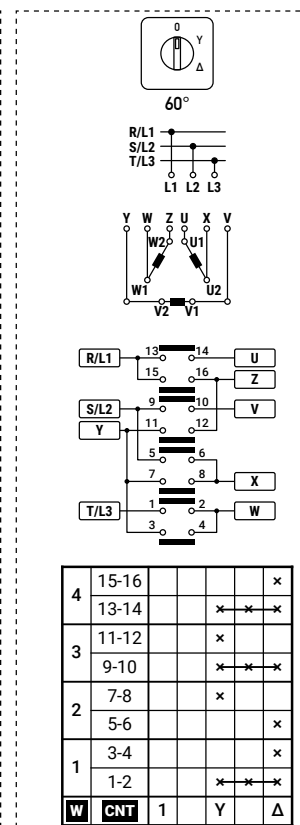
**0013 • Reversing switch 3 poles with spring return to zero**



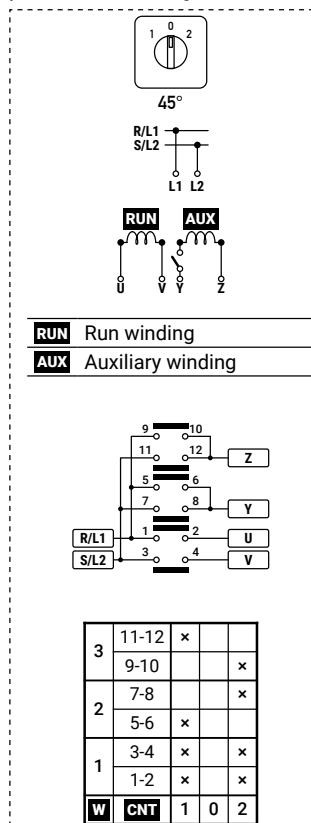
**0014 • Dahlander pole changing two speed switch**



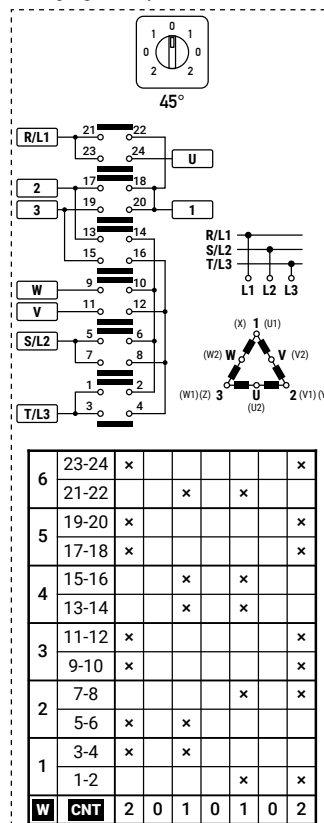
**0015 • Star-Delta starter switch**



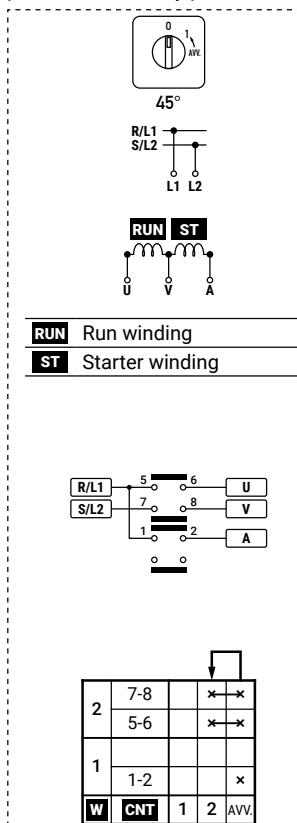
**0016 • Reversing switch single phase with centrifugal cut-out**



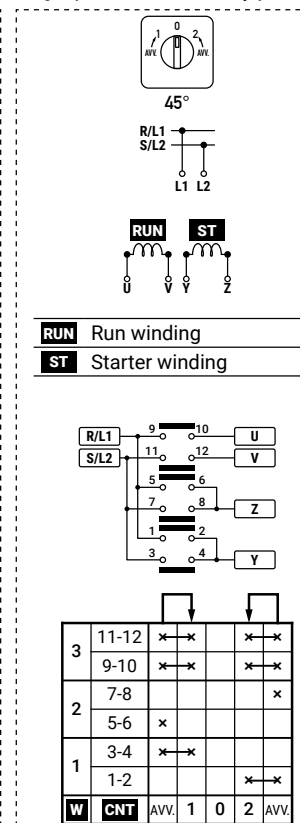
**0031 • Reversing-Dahlander pole changing two speed switch**



**0017 • Starter switch single phase with auxiliary phase**



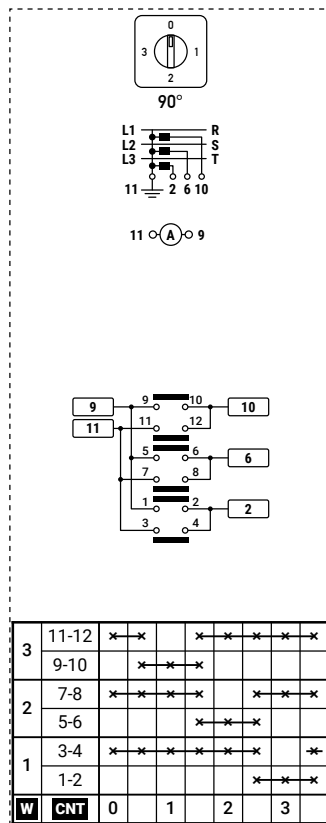
**0018 • Reversing-starter switch single phase with auxiliary phase**



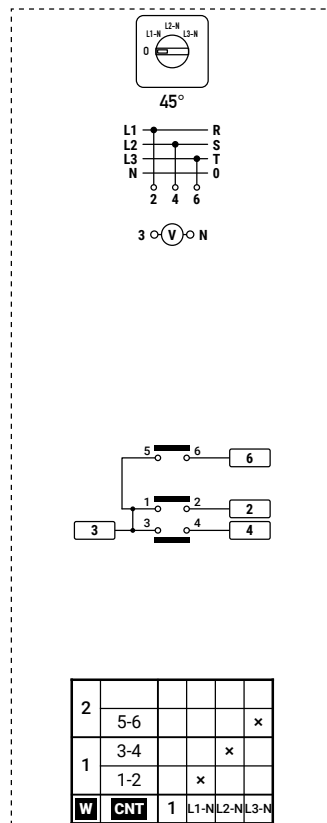
## Ammeter and voltmeter switches

1/1

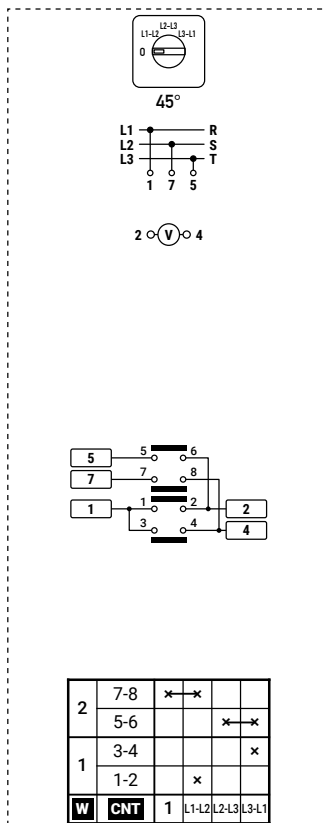
**0019 • Ammeter selector switch**  
1 pole for 3 current transformers



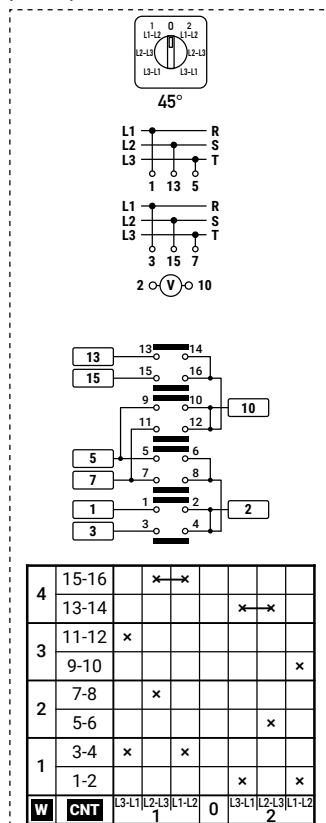
**0020 • Voltmeter selector switch**  
switch phase-neutral



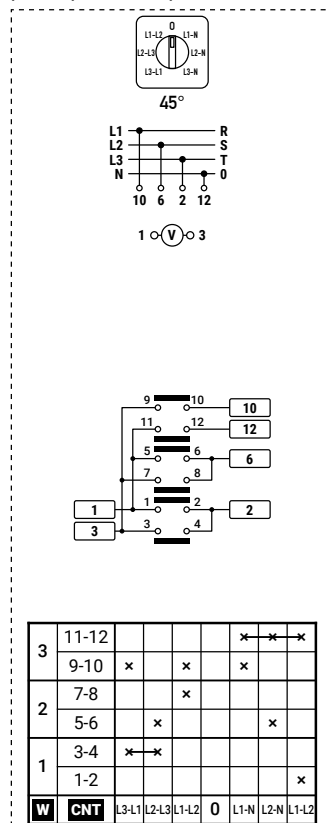
**0021 • Voltmeter selector switch**  
switch phase-phase



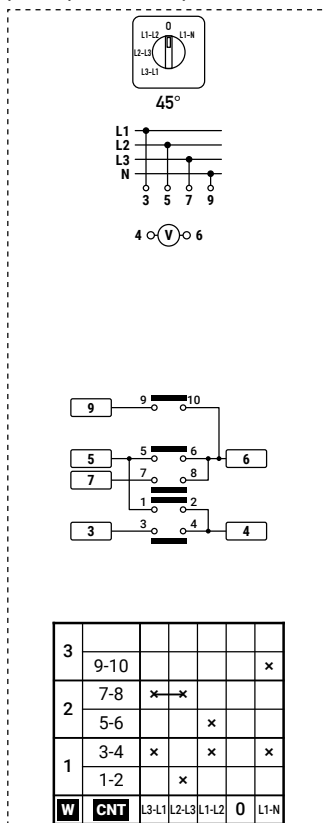
**0022 • Voltmeter selector switch**  
phase-phase for two circuits



**0023 • Voltmeter selector switch**  
phase-phase and phase-neutral



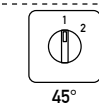
**0024 • Voltmeter selector switch**  
phase-phase and 1 phase-neutral



## Step switches

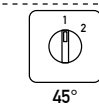
1/3

**0025 • Step switch 1-2 positions without zero 1 pole**



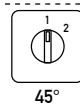
|          |            |   |   |
|----------|------------|---|---|
| 1        | 3-4        |   | x |
|          | 1-2        | x |   |
| <b>W</b> | <b>CNT</b> | 1 | 2 |

**0026 • Step switch 1-2 positions without zero 2 poles**



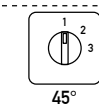
|          |            |   |   |
|----------|------------|---|---|
| 2        | 7-8        |   | x |
|          | 5-6        | x |   |
| 1        | 3-4        |   | x |
|          | 1-2        | x |   |
| <b>W</b> | <b>CNT</b> | 1 | 2 |

**0027 • Step switch 1-2 positions without zero 3 poles**



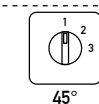
|          |            |   |   |
|----------|------------|---|---|
| 3        | 11-12      |   | x |
|          | 9-10       | x |   |
| 2        | 7-8        |   | x |
|          | 5-6        | x |   |
| 1        | 3-4        |   | x |
|          | 1-2        | x |   |
| <b>W</b> | <b>CNT</b> | 1 | 2 |

**0038 • Step switch 1-2-3 positions without zero 1 pole**



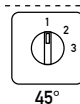
|          |            |   |   |   |
|----------|------------|---|---|---|
| 2        | 5-6        |   |   | x |
| 1        | 3-4        |   | x |   |
|          | 1-2        | x |   |   |
| <b>W</b> | <b>CNT</b> | 1 | 2 | 3 |

**0039 • Step switch 1-2-3 positions without zero 2 poles**



|          |            |   |   |   |
|----------|------------|---|---|---|
| 3        | 11-12      |   |   | x |
|          | 9-10       | x |   |   |
| 2        | 7-8        | x |   |   |
|          | 5-6        |   |   | x |
| 1        | 3-4        |   | x |   |
|          | 1-2        | x |   |   |
| <b>W</b> | <b>CNT</b> | 1 | 2 | 3 |

**0040 • Step switch 1-2-3 positions without zero 3 poles**

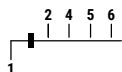


|          |            |   |   |   |
|----------|------------|---|---|---|
| 5        | 17-18      |   |   | x |
| 4        | 15-16      |   | x |   |
|          | 13-14      | x |   |   |
| 3        | 11-12      |   |   | x |
|          | 9-10       | x |   |   |
| 2        | 7-8        | x |   |   |
|          | 5-6        |   |   | x |
| 1        | 3-4        |   | x |   |
|          | 1-2        | x |   |   |
| <b>W</b> | <b>CNT</b> | 1 | 2 | 3 |

## Step switches

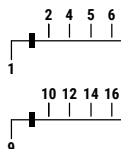
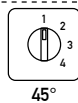
2/3

**0041** • Step switch 1-2-3-4 positions without zero 1 pole



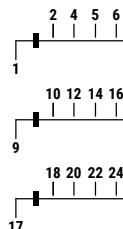
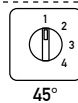
|   |     |   |   |   |   |
|---|-----|---|---|---|---|
| 2 | 7-8 |   |   |   | x |
|   | 5-6 |   |   | x |   |
| 1 | 3-4 |   | x |   |   |
|   | 1-2 | x |   |   |   |
| W | CNT | 1 | 2 | 3 | 4 |

**0042** • Step switch 1-2-3-4 positions without zero 2 poles



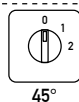
|   |       |   |   |   |   |
|---|-------|---|---|---|---|
| 4 | 15-16 |   |   |   | x |
|   | 13-14 |   |   | x |   |
| 3 | 11-12 |   | x |   |   |
|   | 9-10  | x |   |   |   |
| 2 | 7-8   |   |   |   | x |
|   | 5-6   |   |   | x |   |
| 1 | 3-4   |   | x |   |   |
|   | 1-2   | x |   |   |   |
| W | CNT   | 1 | 2 | 3 | 4 |

**0043** • Step switch 1-2-3-4 positions without zero 3 poles



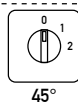
|   |       |   |   |   |   |
|---|-------|---|---|---|---|
| 6 | 23-24 |   |   |   | x |
|   | 21-22 |   |   | x |   |
| 5 | 19-20 |   | x |   |   |
|   | 17-18 | x |   |   |   |
| 4 | 15-16 |   |   |   | x |
|   | 13-14 |   |   | x |   |
| 3 | 11-12 |   | x |   |   |
|   | 9-10  | x |   |   |   |
| 2 | 7-8   |   |   |   | x |
|   | 5-6   |   |   | x |   |
| 1 | 3-4   |   | x |   |   |
|   | 1-2   | x |   |   |   |
| W | CNT   | 1 | 2 | 3 | 4 |

**0028** • Step switch 0-1-2 positions with zero 1 pole



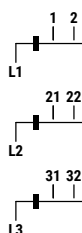
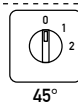
|          |            |   |   |   |
|----------|------------|---|---|---|
| 1        | 3-4        |   |   | x |
|          | 1-2        |   | x |   |
| <b>W</b> | <b>CNT</b> | 0 | 1 | 2 |

**0032** • Step switch 0-1-2 positions with zero 2 poles



|          |            |   |   |   |
|----------|------------|---|---|---|
| 2        | 7-8        |   |   | x |
|          | 5-6        |   | x |   |
| 1        | 3-4        |   |   | x |
|          | 1-2        |   | x |   |
| <b>W</b> | <b>CNT</b> | 0 | 1 | 2 |

**0033** • Step switch 0-1-2 positions with zero 3 poles

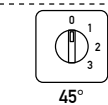


|          |            |   |   |   |
|----------|------------|---|---|---|
| 3        | 11-12      |   |   | x |
|          | 9-10       |   | x |   |
| 2        | 7-8        |   |   | x |
|          | 5-6        |   | x |   |
| 1        | 3-4        |   |   | x |
|          | 1-2        |   | x |   |
| <b>W</b> | <b>CNT</b> | 0 | 1 | 2 |

## Step switches

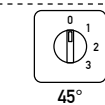
3/3

**0029** • Step switch 0-1-2-3 positions with zero 1 pole



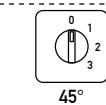
|          |            |   |   |   |   |
|----------|------------|---|---|---|---|
| 2        | 7-8        |   |   |   | x |
|          | 5-6        |   | x |   |   |
| 1        |            |   |   |   |   |
|          | 1-2        |   |   | x |   |
| <b>W</b> | <b>CNT</b> | 0 | 1 | 2 | 3 |

**0034** • Step switch 0-1-2-3 positions with zero 2 poles



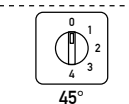
|          |            |   |   |   |   |
|----------|------------|---|---|---|---|
| 3        | 11-12      |   |   |   | x |
|          | 9-10       |   | x |   |   |
| 2        | 7-8        |   |   | x |   |
|          | 5-6        |   |   | x |   |
| 1        | 3-4        |   |   |   | x |
|          | 1-2        |   | x |   |   |
| <b>W</b> | <b>CNT</b> | 0 | 1 | 2 | 3 |

**0035** • Step switch 0-1-2-3 positions with zero 3 poles



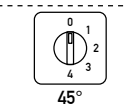
|          |            |   |   |   |   |
|----------|------------|---|---|---|---|
| 5        | 19-20      |   |   |   | x |
|          | 15-16      |   |   |   | x |
| 4        | 13-14      |   | x |   |   |
|          | 11-12      |   |   |   | x |
| 3        | 9-10       |   | x |   |   |
|          | 7-8        |   |   | x |   |
| 2        | 5-6        |   |   | x |   |
|          | 3-4        |   |   |   | x |
| 1        | 1-2        |   | x |   |   |
| <b>W</b> | <b>CNT</b> | 0 | 1 | 2 | 3 |

**0030** • Step switch 0-1-2-3-4 positions with zero 1 pole



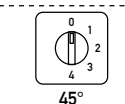
|   |     |   |   |   |   |   |
|---|-----|---|---|---|---|---|
| 2 | 7-8 |   |   |   | x |   |
|   | 5-6 |   | x |   |   |   |
| 1 | 3-4 |   |   |   |   | x |
|   | 1-2 |   |   | x |   |   |
| W | CNT | 0 | 1 | 2 | 3 | 4 |

**0036** • Step switch 0-1-2-3-4 positions with zero 2 poles



|   |       |   |   |   |   |   |
|---|-------|---|---|---|---|---|
| 4 | 15-16 |   |   |   | x |   |
|   | 13-14 |   | x |   |   |   |
| 3 | 11-12 |   |   |   |   | x |
|   | 9-10  |   |   | x |   |   |
| 2 | 7-8   |   |   |   | x |   |
|   | 5-6   |   | x |   |   |   |
| 1 | 3-4   |   |   |   |   | x |
|   | 1-2   |   |   | x |   |   |
| W | CNT   | 0 | 1 | 2 | 3 | 4 |

**0037** • Step switch 0-1-2-3-4 positions with zero 3 poles



|   |       |   |   |   |   |   |
|---|-------|---|---|---|---|---|
| 6 | 23-24 |   |   |   | x |   |
|   | 21-22 |   | x |   |   |   |
| 5 | 19-20 |   |   |   | x |   |
|   | 17-18 |   |   | x |   |   |
| 4 | 15-16 |   |   |   | x |   |
|   | 13-14 |   | x |   |   |   |
| 3 | 11-12 |   |   |   | x |   |
|   | 9-10  |   |   | x |   |   |
| 2 | 7-8   |   |   |   | x |   |
|   | 5-6   |   | x |   |   |   |
| 1 | 3-4   |   |   |   | x |   |
|   | 1-2   |   |   | x |   |   |
| W | CNT   | 0 | 1 | 2 | 3 | 4 |

# ACTUATORS

## Cam switches / actuators matrix

Check the "Operation schemes matrix" (p.17) to identify the available operation scheme for each operator.



| Series and size           |                              | P012<br>P016<br>P020 | PX12<br>PX16<br>PX20 | P012<br>P016<br>P020 | P012<br>P016<br>P020 |
|---------------------------|------------------------------|----------------------|----------------------|----------------------|----------------------|
| Terminal protection class |                              | IP20                 | IP10                 | IP20                 | IP20                 |
| Mounting type             |                              | R                    |                      | B                    | D                    |
| <b>48×48</b>              | Grey/Black                   |                      |                      |                      | -                    |
| screw                     | IP65                         | 001/...              |                      | 020/...              | -                    |
| Ø 22                      | IP65                         | 056X/...             |                      | 095/...              | -                    |
| <b>48×48</b>              | Yellow/Red                   |                      |                      |                      | -                    |
| screw                     | IP65                         | 002/...              |                      | 030/...              | -                    |
| Ø 22                      | IP65                         | 058X/...             |                      | 070/...              | -                    |
| <b>48×48</b>              | Grey/Black<br>padlock in 0   |                      |                      |                      | -                    |
| screw                     | IP65 / 4-4X                  | 003/...              |                      | 005/...              | -                    |
| Ø 22                      | IP65 / 4-4X                  | -                    |                      | 077/...              | -                    |
| Ø 22                      | IP65                         | 059X/...             |                      | -                    | -                    |
| <b>48×48</b>              | Yellow/Red<br>padlock in 0   |                      |                      |                      | -                    |
| screw                     | IP65 / 4-4X                  | 004/...              |                      | 006/...              | -                    |
| Ø 22                      | IP65 / 4-4X                  | -                    |                      | 069/...              | -                    |
| Ø 22                      | IP65                         | 060X/...             |                      | -                    | -                    |
| <b>ring</b>               | Grey/Black<br>with knob      |                      |                      | -                    | -                    |
| Ø 22                      | IP65                         | 028X *               |                      | -                    | -                    |
| <b>ring</b>               | Grey/Black<br>with key       |                      |                      | -                    | -                    |
| Ø 22                      | IP65                         | 029X *               |                      | -                    | -                    |
| <b>ring</b>               | Grey/Black<br>with key       |                      |                      | -                    | -                    |
| <b>48×48</b>              | IP65                         | 057X/...             |                      | -                    | -                    |
| Ø 22                      |                              |                      |                      |                      |                      |
| <b>45×52</b>              | Grey/Black                   | -                    |                      | -                    |                      |
| screw                     | -                            | -                    |                      | -                    | 027/...              |
| <b>67×67</b>              | Grey/Black<br>max 3 padlocks |                      |                      |                      | -                    |
| screw                     | IP65 / 4-4X                  | 009/...              |                      | 011/...              | -                    |
| Ø 22                      | IP65 / 4-4X                  | -                    |                      | 063/...              | -                    |
| Ø 22                      | IP65                         | 061X/...             |                      | -                    | -                    |
| <b>67×67</b>              | Yellow/Red<br>max 3 padlocks |                      |                      |                      | -                    |
| screw                     | IP65 / 4-4X                  | 010/...              |                      | 012/...              | -                    |
| Ø 22                      | IP65 / 4-4X                  | -                    |                      | 064/...              | -                    |
| Ø 22                      | IP65                         | 062X/...             |                      | -                    | -                    |

\* These actuators do not have any operation scheme on the "Operation schemes matrix".

|          | ON-OFF switches 0-1 |        |      | Changeover switches 1-0-2 / Motor switches |      |         |      |      |      |      |         | Step switches |         |      |      |      | Anmmeter switches | Voltmeter switches |      |      |      |  |
|----------|---------------------|--------|------|--------------------------------------------|------|---------|------|------|------|------|---------|---------------|---------|------|------|------|-------------------|--------------------|------|------|------|--|
|          |                     |        |      |                                            |      |         |      |      |      |      |         |               |         |      |      |      |                   |                    |      |      |      |  |
| 001/...  | 0001                | 0001-1 | 0007 | 0008                                       | 0017 | 0013    | 0015 | 0018 | 0031 | 0025 | 0028    | 0038          | 0029    | 0041 | 0030 | 0019 | 0020              | 0021               | 0022 | 0023 | 0024 |  |
| 002/...  | 0001                | 0001-1 | 0007 | 0008                                       | 0017 | 0013    | 0015 | 0018 | 0031 | -    | -       | -             | -       | -    | -    | -    | -                 | -                  | -    | -    | -    |  |
| 003/...  | 0001                | 0001-1 | 0007 | 0008                                       | 0017 | 0013    | 0015 | 0018 | 0031 | -    | -       | -             | -       | -    | -    | -    | -                 | -                  | -    | -    | -    |  |
| 004/...  | 0001                | 0001-1 | 0007 | 0008                                       | 0017 | 0013    | 0015 | 0018 | 0031 | -    | -       | -             | -       | -    | -    | -    | -                 | -                  | -    | -    | -    |  |
| 005/...  | 0001                | 0001-1 | -    | 0008                                       | -    | -       | -    | -    | -    | -    | -       | -             | -       | -    | -    | -    | -                 | -                  | -    | -    | -    |  |
| 006/...  | 0001                | 0001-1 | -    | 0008                                       | -    | -       | -    | -    | -    | -    | -       | -             | -       | -    | -    | -    | -                 | -                  | -    | -    | -    |  |
| 007/...  | 0001                | 0001-1 | 0007 | 0008                                       | -    | 0013    | 0015 | -    | 0031 | 0025 | 0028    | 0038          | 0029    | 0041 | 0030 | -    | -                 | -                  | -    | -    | -    |  |
| 008/...  | 0001                | 0001-1 | 0007 | 0008                                       | -    | -       | 0015 | -    | 0031 | -    | -       | -             | -       | -    | -    | -    | -                 | -                  | -    | -    | -    |  |
| 009/...  | 0001                | 0001-1 | -    | 0008                                       | 0017 | 0013    | 0015 | 0018 | 0031 | -    | -       | -             | -       | -    | -    | -    | -                 | -                  | -    | -    | -    |  |
| 010/...  | 0001                | 0001-1 | 0007 | 0008                                       | 0017 | 0013    | 0015 | 0018 | 0031 | -    | -       | -             | -       | -    | -    | -    | -                 | -                  | -    | -    | -    |  |
| 011/...  | 0001                | 0001-A | -    | 0008                                       | -    | -       | -    | -    | -    | -    | -       | -             | -       | -    | -    | -    | -                 | -                  | -    | -    | -    |  |
| 012/...  | 0001                | 0001-2 | -    | 0008                                       | -    | -       | -    | -    | -    | -    | -       | -             | -       | -    | -    | -    | -                 | -                  | -    | -    | -    |  |
| 020/...  | 0001                | -      | -    | 0008                                       | -    | -       | -    | -    | -    | -    | -       | -             | -       | -    | -    | -    | -                 | -                  | -    | -    | -    |  |
| 027/...  | -                   | 0001   | -    | 0008                                       | -    | -       | -    | -    | -    | -    | -       | -             | -       | -    | -    | 0019 | 0020              | 0021               | -    | 0023 | 0024 |  |
| 030/...  | 0001                | -      | -    | 0008                                       | -    | -       | -    | -    | -    | -    | -       | -             | -       | -    | -    | -    | -                 | -                  | -    | -    | -    |  |
| 056X/... | 0001                | 0001-1 | 0007 | 0008                                       | 0017 | 0013    | 0015 | 0018 | 0031 | 0025 | 0028    | 0038          | 0029    | 0041 | 0030 | 0019 | 0020              | 0021               | 0022 | 0023 | 0024 |  |
| 057X/... | 0001                | 0001-1 | 0007 | 0008-CA                                    | -    | 0013-CA | -    | -    | -    | -    | 0028-CA | -             | 0029-CA | -    | -    | -    | -                 | -                  | -    | -    | -    |  |
| 058X/... | 0001                | 0001-1 | 0007 | 0008                                       | -    | 0013    | -    | -    | -    | -    | -       | -             | -       | -    | -    | -    | -                 | -                  | -    | -    | -    |  |
| 059X/... | 0001                | 0001-1 | -    | 0008                                       | -    | 0013    | -    | -    | -    | -    | -       | -             | -       | -    | -    | -    | -                 | -                  | -    | -    | -    |  |
| 060X/... | 0001                | 0001-1 | -    | 0008                                       | -    | 0013    | -    | -    | -    | -    | -       | -             | -       | -    | -    | -    | -                 | -                  | -    | -    | -    |  |
| 061X/... | 0001                | 0001-1 | 0007 | 0008                                       | -    | 0013    | -    | -    | -    | -    | -       | -             | -       | -    | -    | -    | -                 | -                  | -    | -    | -    |  |
| 062X/... | 0001                | 0001-1 | 0007 | 0008                                       | -    | 0013    | -    | -    | -    | -    | -       | -             | -       | -    | -    | -    | -                 | -                  | -    | -    | -    |  |
| 063/...  | 0001                | 0001-1 | -    | 0008                                       | -    | -       | -    | -    | -    | -    | -       | -             | -       | -    | -    | -    | -                 | -                  | -    | -    | -    |  |
| 064/...  | 0001                | 0001-1 | -    | 0008                                       | -    | -       | -    | -    | -    | -    | -       | -             | -       | -    | -    | -    | -                 | -                  | -    | -    | -    |  |
| 069/...  | 0001                | -      | -    | 0008                                       | -    | -       | -    | -    | -    | -    | -       | -             | -       | -    | -    | -    | -                 | -                  | -    | -    | -    |  |
| 070/...  | 0001                | -      | -    | 0008                                       | -    | -       | -    | -    | -    | -    | -       | -             | -       | -    | -    | -    | -                 | -                  | -    | -    | -    |  |
| 077/...  | 0001                | -      | -    | 0008                                       | -    | -       | -    | -    | -    | -    | -       | -             | -       | -    | -    | -    | -                 | -                  | -    | -    | -    |  |
| 095/...  | 0001                | -      | -    | 0008                                       | -    | -       | -    | -    | -    | -    | -       | -             | -       | -    | -    | -    | -                 | -                  | -    | -    | -    |  |



Area with horizontal dashed lines for writing.



Area with horizontal dashed lines for writing.

