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Miniature Circuit Breaker and Residual Current Protection Devices

2012



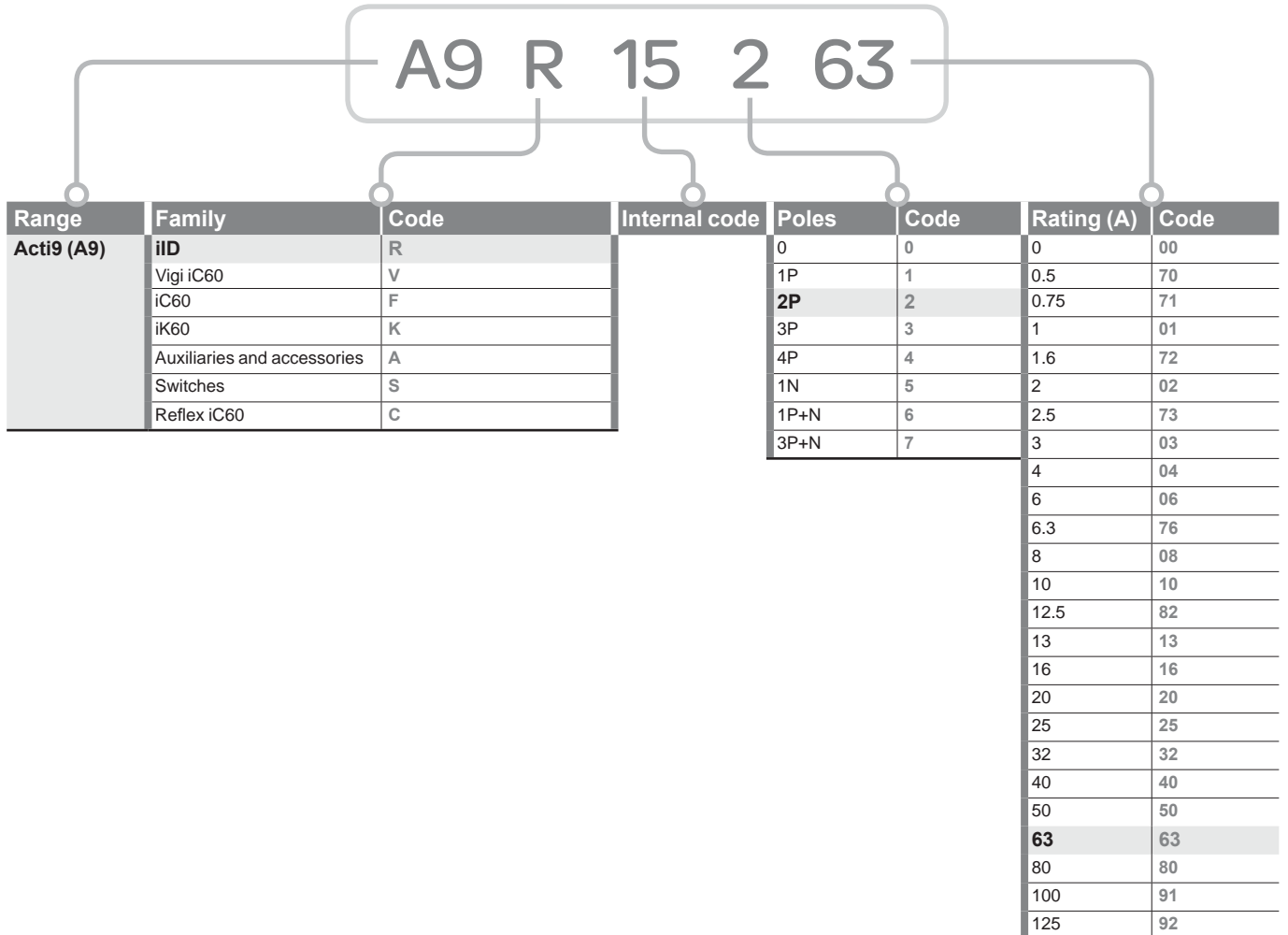
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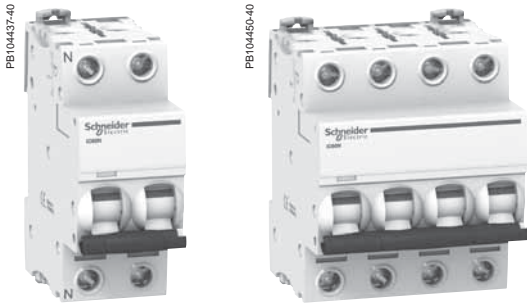
Contents

| | |
|--|-----------|
| Principle of catalogue numbers ······ | 1 |
| iID, iC60, iK60, Vigi iC60, Reflex iC60 | |
| iC60 circuit breakers ······ | 2 |
| Reflex iC60N ······ | 11 |
| RCA remote controls ······ | 18 |
| For iC60 circuit breakers | |
| Choice of earth leakage protection devices ······ | 23 |
| Vigi iC60 add-on residual current devices ······ | 25 |
| iID residual current circuit breakers ······ | 31 |
| ARA automatic reclosers ······ | 37 |
| For iC60 circuit breakers and iID residual current circuit breakers | |
| Residual current devices iDPN Vigi ······ | 42 |
| Electrical auxiliaries ······ | 44 |
| For iC60, iID, iSW-NA, RCA and ARA | |
| Accessories ······ | 48 |
| For iC60, iID, iSW-NA, Reflex iC60, RCA and ARA | |
| iK60N circuit breakers ······ | 52 |
| (curve C) | |
| iID K residual current circuit breakers ······ | 55 |
| Multiclip 80 A splitter block ······ | 57 |
| Earth leakage protection ······ | 59 |
| Response time of medium-sensitivity residual current devices | |
| Tripping curves ······ | 63 |
| Short-circuit current limiting ······ | 71 |

Description



iC60N circuit breakers (curve B, C, D)



IEC/EN 60947-2 IEC/EN 60898-1



- iC60N circuit breakers are multi-standard circuit breakers which combine the following functions:
 - circuit protection against short-circuit currents,
 - circuit protection against overload currents,
 - suitable for industrial isolation according to IEC/EN 60947-2, standard.
 - fault tripping indication by a red mechanical indicator in circuit breaker front face.

| Alternating current (AC) 50/60 Hz | | | | | | |
|---|--------------------|--------------|--------------|-------|-------|---------------------------------|
| Breaking capacity (Icu) according to IEC/EN 60947-2 | | | | | | Service breaking capacity (Ics) |
| | Voltage (Ue) | | | | | |
| Ph/Ph (2P, 3P, 4P) | 12 to 133 V | 220 to 240 V | 380 to 415 V | 440 V | | 100 % of Icu |
| Ph/N (1P, 1P+N) | 12 to 60 V | 100 to 133 V | 220 to 240 V | - | | |
| Rating (In) | 0.5 to 4 A | 50 kA | 50 kA | 50 kA | 25 kA | 75 % of Icu |
| | 6 to 63 A | 36 kA | 20 kA | 10 kA | 6 kA | |
| Breaking capacity (Icn) according to IEC/EN 60898-1 | | | | | | |
| | Voltage (Ue) | | | | | |
| Ph/Ph | 400 V | | | | | |
| Ph/N | 230 V | | | | | |
| Rating (In) | 0.5 to 63 A 6000 A | | | | | |

| Direct current (DC) | | | | | | |
|---|--------------|-------|----------------|----------------|----------------|---------------------------------|
| Breaking capacity (Icu) according to IEC/EN 60947-2 | | | | | | Service breaking capacity (Ics) |
| | Voltage (Ue) | | | | | |
| Between +/- | 12 to 48 V | 72 V | 100 to 133 V | | 220 to 250 V | 100 % of Icu |
| Number of poles | 1P | | 2P (in series) | 3P (in series) | 4P (in series) | |
| Rating (In) | 1 to 63 A | 15 kA | 6 kA | 6 kA | 15 kA | 6 kA |

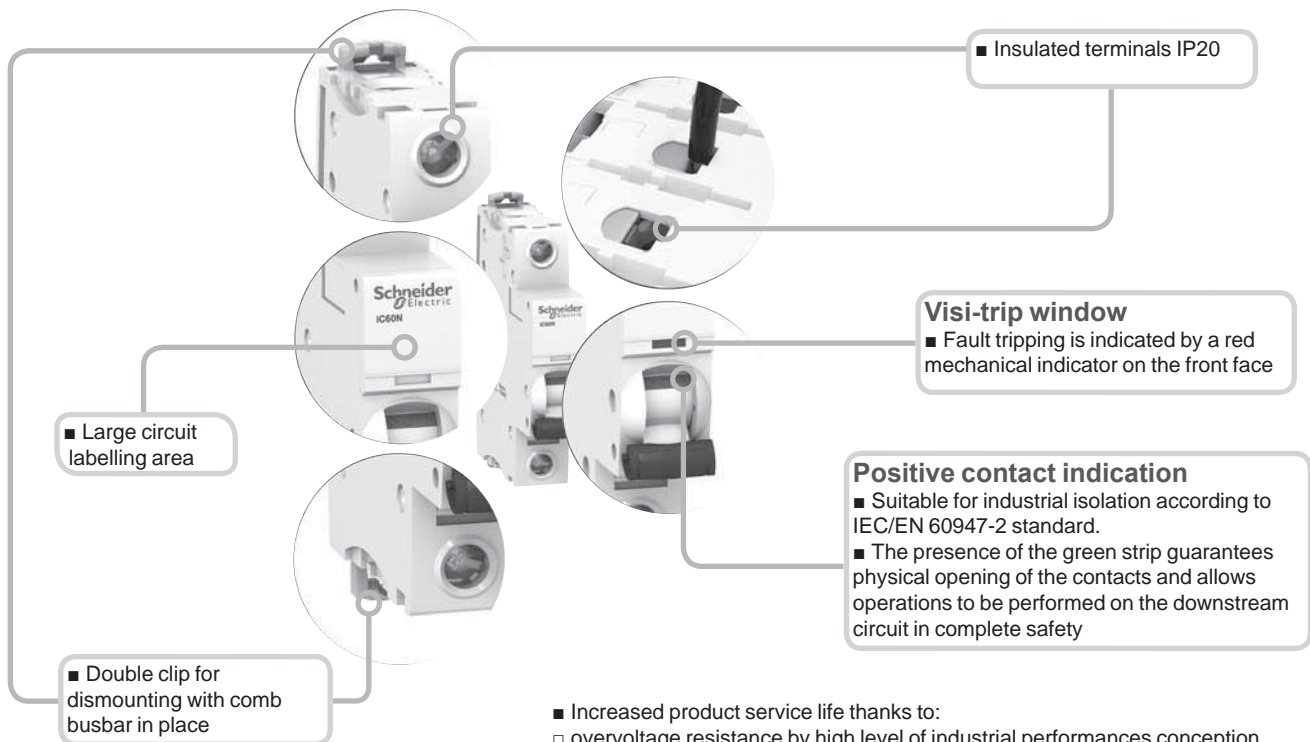
Catalogue numbers

iC60N circuit breaker

| Type | 1P | | | 2P | | |
|-----------------------|---|----------|----------|--|----------|----------|
| |  | | |  | | |
| Rating (In) | Curve | | | | | |
| | B | C | D | B | C | D |
| 1 A | A9F73101 | A9F74101 | A9F75101 | A9F73201 | A9F74201 | A9F75201 |
| 2 A | A9F73102 | A9F74102 | A9F75102 | A9F73202 | A9F74202 | A9F75202 |
| 3 A | A9F73103 | A9F74103 | A9F75103 | A9F73203 | A9F74203 | A9F75203 |
| 4 A | A9F73104 | A9F74104 | A9F75104 | A9F73204 | A9F74204 | A9F75204 |
| 6 A | A9F73106 | A9F74106 | A9F75106 | A9F73206 | A9F74206 | A9F75206 |
| 10 A | A9F73110 | A9F74110 | A9F75110 | A9F73210 | A9F74210 | A9F75210 |
| 13 A | A9F73113 | A9F74113 | A9F75113 | A9F73213 | A9F74213 | A9F75213 |
| 16 A | A9F73116 | A9F74116 | A9F75116 | A9F73216 | A9F74216 | A9F75216 |
| 20 A | A9F73120 | A9F74120 | A9F75120 | A9F73220 | A9F74220 | A9F75220 |
| 25 A | A9F73125 | A9F74125 | A9F75125 | A9F73225 | A9F74225 | A9F75225 |
| 32 A | A9F73132 | A9F74132 | A9F75132 | A9F73232 | A9F74232 | A9F75232 |
| 40 A | A9F73140 | A9F74140 | A9F75140 | A9F73240 | A9F74240 | A9F75240 |
| 50 A | A9F73150 | A9F74150 | A9F75150 | A9F73250 | A9F74250 | A9F75250 |
| 63 A | A9F73163 | A9F74163 | A9F75163 | A9F73263 | A9F74263 | A9F75263 |
| Width in 9-mm modules | 2 | | | 4 | | |

iC60N circuit breakers (curve B, C, D) (cont.)

PE104434-40



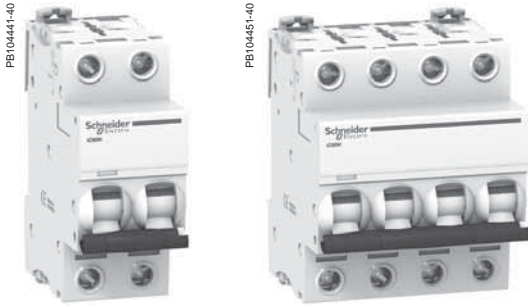
- Increased product service life thanks to:
 - overvoltage resistance by high level of industrial performances conception (pollution degree, rated impulse withstand voltage and insulation voltage),
 - high performance limitation (see limitation curves),
 - fast closing independent of the speed of actuation of the toggle.
- Remote indication, open/closed/tripped, by optional auxiliary contacts.
- Top or bottom electrical feeding.

| 3P | | | 4P | | |
|----------|----------|----------|----------|----------|------------------|
| | | | | | |
| Curve | | | Curve | | |
| B | C | D | B | C | D ⁽¹⁾ |
| A9F73301 | A9F74301 | A9F75301 | A9F73401 | A9F74401 | A9F75401 |
| A9F73302 | A9F74302 | A9F75302 | A9F73402 | A9F74402 | A9F75402 |
| A9F73303 | A9F74303 | A9F75303 | A9F73403 | A9F74403 | A9F75403 |
| A9F73304 | A9F74304 | A9F75304 | A9F73404 | A9F74404 | A9F75404 |
| A9F73306 | A9F74306 | A9F75306 | A9F76406 | A9F77406 | A9F75406 |
| A9F73310 | A9F74310 | A9F75310 | A9F76410 | A9F77410 | A9F75410 |
| A9F73313 | A9F74313 | A9F75313 | A9F73413 | A9F74413 | A9F75413 |
| A9F73316 | A9F74316 | A9F75316 | A9F76416 | A9F77416 | A9F75416 |
| A9F73320 | A9F74320 | A9F75320 | A9F76420 | A9F77420 | A9F75420 |
| A9F73325 | A9F74325 | A9F75325 | A9F76425 | A9F77425 | A9F75425 |
| A9F73332 | A9F74332 | A9F75332 | A9F76432 | A9F77432 | A9F75432 |
| A9F73340 | A9F74340 | A9F75340 | A9F76440 | A9F77440 | A9F75440 |
| A9F73350 | A9F74350 | A9F75350 | A9F76450 | A9F77450 | A9F75450 |
| A9F73363 | A9F74363 | A9F75363 | A9F76463 | A9F77463 | A9F75463 |
| 6 | | | 8 | | |

iC60H circuit breakers (curve B, C, D)



Country approval pictograms



IEC/EN 60947-2 IEC/EN 60898-1

■ iC60H circuit breakers are multi-standard circuit breakers which combine the following functions:

- circuit protection against short-circuit currents,
- circuit protection against overload currents,
- suitable for industrial isolation according to IEC/EN 60947-2, standard.
- fault tripping indication by a red mechanical indicator in circuit breaker front face.

Alternating current (AC) 50/60 Hz

Breaking capacity (Icu) according to IEC/EN 60947-2

| Ph/Ph (2P, 3P, 4P) | Voltage (Ue) | | | | Service breaking capacity (Ics) | |
|--------------------|--------------|--------------|--------------|-------|---------------------------------|--------------|
| | 12 to 133 V | 220 to 240 V | 380 to 415 V | 440 V | | |
| Ph/N (1P, 1P+N) | 12 to 60 V | 100 to 133 V | 220 to 240 V | - | | |
| Rating (In) | 0.5 to 4 A | 70 kA | 70 kA | 70 kA | 50 kA | 100 % of Icu |
| | 6 to 40 A | 42 kA | 30 kA | 15 kA | 10 kA | 50 % of Icu |
| | 50/63 A | 42 kA | - | 15 kA | 10 kA | 50 % of Icu |

Breaking capacity (Icn) according to IEC/EN 60898-1

| Ph/Ph | Voltage (Ue) | |
|-------------|--------------|---------|
| | 400 V | 230 V |
| Ph/N | 230 V | |
| Rating (In) | 0.5 to 63 A | 10000 A |



Direct current (DC)

Breaking capacity (Icu) according to IEC/EN 60947-2

| Between +/- | Voltage (Ue) | | | | Service breaking capacity (Ics) | |
|-----------------|--------------|-------|----------------|----------------|---------------------------------|--------------|
| | 12 to 48 V | 72 V | 100 to 133 V | 220 to 250 V | | |
| Number of poles | 1P | | 2P (in series) | 3P (in series) | 4P (in series) | |
| Rating (In) | 1 to 63 A | 20 kA | 10 kA | 10 kA | 10 kA | 100 % of Icu |

Catalogue numbers

iC60H circuit breaker

| Type | 1P | | | 2P | | |
|-----------------------|---|----------|----------|--|----------|----------|
| |  | | |  | | |
| Rating (In) | Curve | | | Curve | | |
| | B | C | D | B | C | D |
| 1 A | A9F83101 | A9F84101 | A9F85101 | A9F83201 | A9F84201 | A9F85201 |
| 2 A | A9F83102 | A9F84102 | A9F85102 | A9F83202 | A9F84202 | A9F85202 |
| 3 A | A9F83103 | A9F84103 | A9F85103 | A9F83203 | A9F84203 | A9F85203 |
| 4 A | A9F83104 | A9F84104 | A9F85104 | A9F83204 | A9F84204 | A9F85204 |
| 6 A | A9F83106 | A9F84106 | A9F85106 | A9F83206 | A9F84206 | A9F85206 |
| 10 A | A9F83110 | A9F84110 | A9F85110 | A9F83210 | A9F84210 | A9F85210 |
| 13 A | A9F83113 | A9F84113 | A9F85113 | A9F83213 | A9F84213 | A9F85213 |
| 16 A | A9F83116 | A9F84116 | A9F85116 | A9F83216 | A9F84216 | A9F85216 |
| 20 A | A9F83120 | A9F84120 | A9F85120 | A9F83220 | A9F84220 | A9F85220 |
| 25 A | A9F83125 | A9F84125 | A9F85125 | A9F83225 | A9F84225 | A9F85225 |
| 32 A | A9F83132 | A9F84132 | A9F85132 | A9F83232 | A9F84232 | A9F85232 |
| 40 A | A9F83140 | A9F84140 | A9F85140 | A9F83240 | A9F84240 | A9F85240 |
| 50 A | A9F83150 | A9F84150 | A9F85150 | A9F83250 | A9F84250 | A9F85250 |
| 63 A | A9F83163 | A9F84163 | A9F85163 | A9F83263 | A9F84263 | A9F85263 |
| Width in 9-mm modules | 2 | | | 4 | | |

iC60H circuit breakers (curve B, C, D) (cont.)

PE104435-40

■ Insulated terminals IP20

Visi-trip window
■ Fault tripping is indicated by a red mechanical indicator on the front face

Positive contact indication
■ Suitable for industrial isolation according to IEC/EN 60947-2 standard.
■ The presence of the green strip guarantees physical opening of the contacts and allows operations to be performed on the downstream circuit in complete safety

■ Large circuit labelling area

■ Double clip for dismantling with comb busbar in place

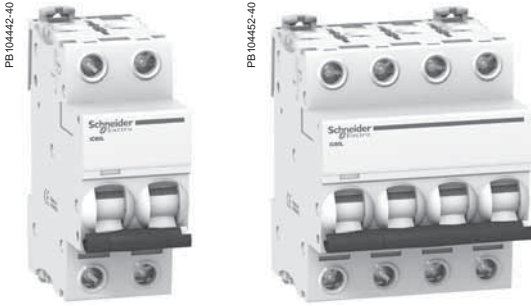
- Increased product service life thanks to:
 - overvoltage resistance by high level of industrial performances conception (pollution degree, rated impulse withstand voltage and insulation voltage),
 - high performance limitation (see limitation curves),
 - fast closing independent of the speed of actuation of the toggle.
- Remote indication, open/closed/tripped, by optional auxiliary contacts.
- Top or bottom electrical feeding.

| 3P | | | 4P | | | |
|----------|----------|----------|----------|----------|----------|----------|
| | | | | | | |
| Curve | | | Curve | | | |
| B | C | D | B | C | K | Z |
| A9F83301 | A9F84301 | A9F85301 | A9F93401 | A9F94401 | A9F95401 | A9F92401 |
| A9F83302 | A9F84302 | A9F85302 | - | - | A9F95472 | A9F92472 |
| A9F83303 | A9F84303 | A9F85303 | A9F93402 | A9F94402 | A9F95402 | A9F92402 |
| A9F83304 | A9F84304 | A9F85304 | A9F93403 | A9F94403 | A9F95403 | A9F92403 |
| A9F83306 | A9F84306 | A9F85306 | A9F93404 | A9F94404 | A9F95404 | A9F92404 |
| A9F83310 | A9F84310 | A9F85310 | A9F93406 | A9F94406 | A9F95406 | A9F92406 |
| A9F83313 | A9F84313 | A9F85313 | A9F93410 | A9F94410 | A9F95410 | A9F92410 |
| A9F83316 | A9F84316 | A9F85316 | A9F93416 | A9F94416 | A9F95416 | A9F92416 |
| A9F83320 | A9F84320 | A9F85320 | A9F93420 | A9F94420 | A9F95420 | A9F92420 |
| A9F83325 | A9F84325 | A9F85325 | A9F93425 | A9F94425 | A9F95425 | A9F92425 |
| A9F83332 | A9F84332 | A9F85332 | A9F93432 | A9F94432 | A9F95432 | A9F92432 |
| A9F83340 | A9F84340 | A9F85340 | A9F93440 | A9F94440 | A9F95440 | A9F92440 |
| A9F83350 | A9F84350 | A9F85350 | A9F93450 | A9F94450 | A9F95450 | A9F92450 |
| A9F83363 | A9F84363 | A9F85363 | A9F93463 | A9F94463 | A9F95463 | A9F92463 |

6

6

iC60L circuit breakers (curve B, C, K, Z)



IEC/EN 60947-2 IEC/EN 60898-1 up to 40 A

- iC60L circuit breakers are multi-standard circuit breakers which combine the following functions:
 - circuit protection against short-circuit currents,
 - circuit protection against overload currents,
 - suitable for industrial isolation according to IEC/EN 60947-2, standard.
 - fault tripping indication by a red mechanical indicator in circuit breaker front face.

| Alternating current (AC) 50/60 Hz | | | | | | |
|---|--------------|--------------|--------------|--------|--------------|---------------------------------|
| Breaking capacity (Icu) according to IEC/EN 60947-2 | | | | | | Service breaking capacity (Ics) |
| Ph/Ph (2P, 3P, 4P) | Voltage (Ue) | | | | 100 % of Icu | |
| | 12 to 133 V | 220 to 240 V | 380 to 415 V | 440 V | | |
| Ph/N (1P) | 12 to 60 V | 100 to 133 V | 220 to 240 V | - | | |
| Rating (In) | 0.5 to 4 A | 100 kA | 100 kA | 100 kA | 70 kA | |
| | 6 to 25 A | 70 kA | - | 25 kA | 20 kA | |
| | 32 / 40 A | 70 kA | - | 20 kA | 15 kA | |
| | 50 / 63 A | 70 kA | - | 15 kA | 10 kA | |

| Breaking capacity (Icn) according to IEC/EN 60898-1 | |
|---|--------------|
| Ph/Ph | Voltage (Ue) |
| | 400 V |
| Ph/N | 230 V |
| Rating (In) | 0.5 to 40 A |
| | 15000 A |

| Direct current (DC) | | | | | | |
|---|--------------|-------|----------------|----------------|----------------|---------------------------------|
| Breaking capacity (Icu) according to IEC/EN 60947-2 | | | | | | Service breaking capacity (Ics) |
| Between +/- | Voltage (Ue) | | | | 100 % of Icu | |
| | 12 to 48 V | 72 V | 100 to 144 V | | | 220 to 250 V |
| Number of poles | 1P | | 2P (in series) | 3P (in series) | 4P (in series) | |
| Rating (In) | 1 to 63 A | 25 kA | 15 kA | 15 kA | 15 kA | |

Catalogue numbers

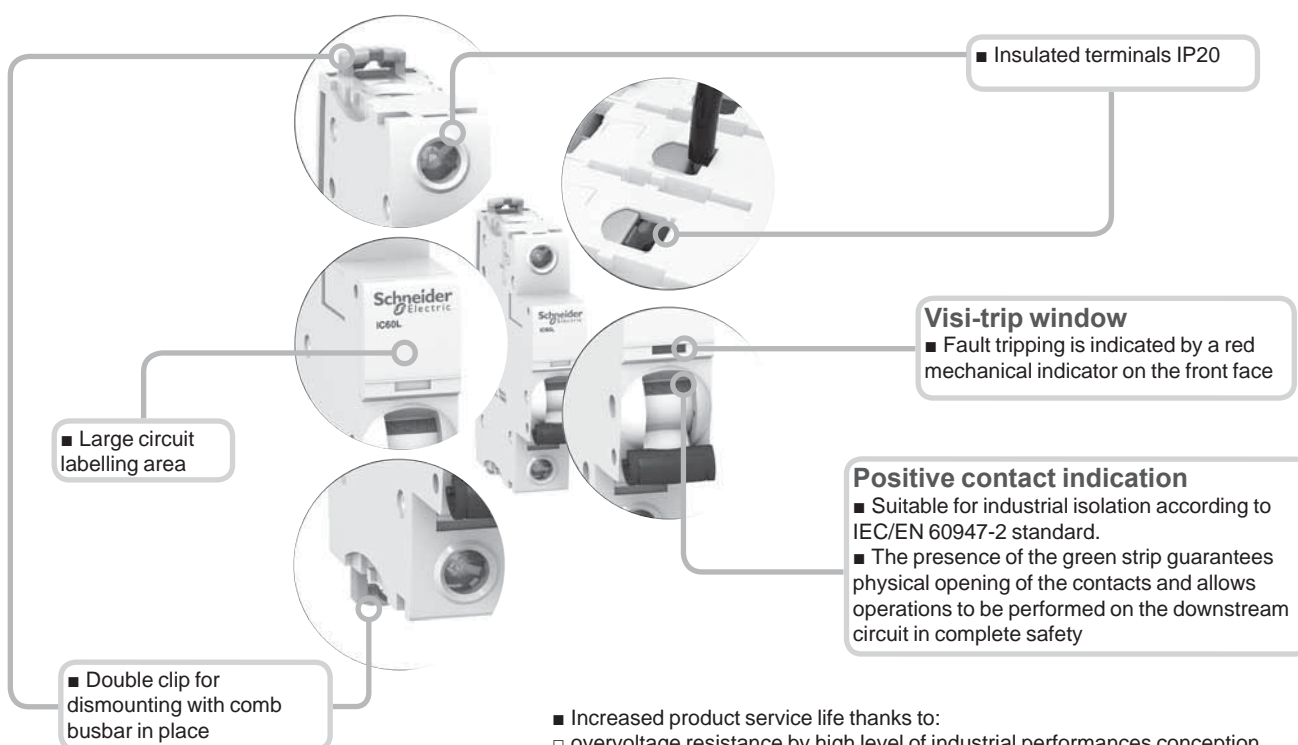
iC60L circuit breaker

| Type | 1P | | | | 2P | | | | |
|-----------------------|-------------|-------------------|----------|-------------------------|----------|----------|----------|----------|----------|
| | Rating (In) | Quality label (2) | Curve | | | | Curve | | |
| | | B | C | K | Z | B | C | K | Z |
| 0.5 A | | A9F93170 | A9F94170 | A9F95170 | A9F92170 | A9F93270 | A9F94270 | A9F95270 | A9F92270 |
| 1 A | | A9F93101 | A9F94101 | A9F95101 | A9F92101 | A9F93201 | A9F94201 | A9F95201 | A9F92201 |
| 2 A | | A9F93102 | A9F94102 | A9F95102 | A9F92102 | A9F93202 | A9F94202 | A9F95202 | A9F92202 |
| 3 A | | A9F93103 | A9F94103 | A9F95103 | A9F92103 | A9F93203 | A9F94203 | A9F95203 | A9F92203 |
| 4 A | | A9F93104 | A9F94104 | A9F95104 | A9F92104 | A9F93204 | A9F94204 | A9F95204 | A9F92204 |
| 6 A | | A9F93106 | A9F94106 | A9F95106 | A9F92106 | A9F93206 | A9F94206 | A9F95206 | A9F92206 |
| 10 A | | A9F93110 | A9F94110 | A9F95110 | A9F92110 | A9F93210 | A9F94210 | A9F95210 | A9F92210 |
| 16 A | | A9F93116 | A9F94116 | A9F95116 | A9F92116 | A9F93216 | A9F94216 | A9F95216 | A9F92216 |
| 20 A | | A9F93120 | A9F94120 | A9F95120 | A9F92120 | A9F93220 | A9F94220 | A9F95220 | A9F92220 |
| 25 A | | A9F93125 | A9F94125 | A9F95125 | A9F92125 | A9F93225 | A9F94225 | A9F95225 | A9F92225 |
| 32 A | | A9F93132 | A9F94132 | A9F95132 | A9F92132 | A9F93232 | A9F94232 | A9F95232 | A9F92232 |
| 40 A | | A9F93140 | A9F94140 | A9F95140 | A9F92140 | A9F93240 | A9F94240 | A9F95240 | A9F92240 |
| 50 A | | A9F93150 | A9F94150 | A9F95150 ⁽³⁾ | A9F92150 | A9F93250 | A9F94250 | A9F95250 | A9F92250 |
| 63 A | | A9F93163 | A9F94163 | A9F95163 ⁽³⁾ | A9F92163 | A9F93263 | A9F94263 | A9F95263 | A9F92263 |
| Width in 9-mm modules | | 2 | | | | 4 | | | |

(1) 100 % of Icu for ratings 6 to 25 A under Ue 100 to 133 V AC Ph/Ph and Ue 12 to 60 V AC Ph/N.
 (2) Information to be provided by the country.
 (3) Without approval.

iC60L circuit breakers (curve B, C, K, Z) (cont.)

PB10443E-40



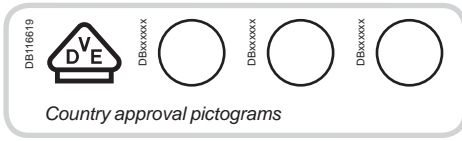
- Increased product service life thanks to:
 - overvoltage resistance by high level of industrial performances conception (pollution degree, rated impulse withstand voltage and insulation voltage),
 - high performance limitation (see limitation curves),
 - fast closing independent of the speed of actuation of the toggle.
- Remote indication, open/closed/tripped, by optional auxiliary contacts.
- Top or bottom electrical feeding.

| 3P | | | | 4P | | | |
|----------|----------|----------|----------|----------|----------|----------|----------|
| | | | | | | | |
| Curve | | | | Curve | | | |
| B | C | K | Z | B | C | K | Z |
| A9F93370 | A9F94370 | A9F95370 | A9F92370 | A9F93470 | A9F94470 | A9F95470 | A9F92470 |
| A9F93301 | A9F94301 | A9F95301 | A9F92301 | A9F93401 | A9F94401 | A9F95401 | A9F92401 |
| A9F93302 | A9F94302 | A9F95302 | A9F92302 | A9F93402 | A9F94402 | A9F95402 | A9F92402 |
| A9F93303 | A9F94303 | A9F95303 | A9F92303 | A9F93403 | A9F94403 | A9F95403 | A9F92403 |
| A9F93304 | A9F94304 | A9F95304 | A9F92304 | A9F93404 | A9F94404 | A9F95404 | A9F92404 |
| A9F93306 | A9F94306 | A9F95306 | A9F92306 | A9F93406 | A9F94406 | A9F95406 | A9F92406 |
| A9F93310 | A9F94310 | A9F95310 | A9F92310 | A9F93410 | A9F94410 | A9F95410 | A9F92410 |
| A9F93316 | A9F94316 | A9F95316 | A9F92316 | A9F93416 | A9F94416 | A9F95416 | A9F92416 |
| A9F93320 | A9F94320 | A9F95320 | A9F92320 | A9F93420 | A9F94420 | A9F95420 | A9F92420 |
| A9F93325 | A9F94325 | A9F95325 | A9F92325 | A9F93425 | A9F94425 | A9F95425 | A9F92425 |
| A9F93332 | A9F94332 | A9F95332 | A9F92332 | A9F93432 | A9F94432 | A9F95432 | A9F92432 |
| A9F93340 | A9F94340 | A9F95340 | A9F92340 | A9F93440 | A9F94440 | A9F95440 | A9F92440 |
| A9F93350 | A9F94350 | A9F95350 | A9F92350 | A9F93450 | A9F94450 | A9F95450 | A9F92450 |
| A9F93363 | A9F94363 | A9F95363 | A9F92363 | A9F93463 | A9F94463 | A9F95463 | A9F92463 |

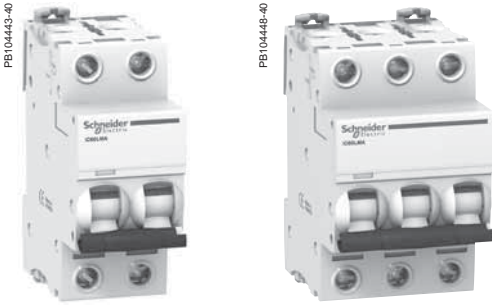
4

6

iC60L circuit breakers instantaneous circuit breakers (ICB) (curve MA)



IEC/EN 60947-2



- iC60L curve MA circuit breakers combine the following functions:
 - circuit protection against short-circuit currents,
 - suitability for industrial isolation according to IEC/EN 60947-2, standard,
 - fault tripping indication by a red mechanical indicator in circuit breaker front face,
 - to be associated with overload protection for motor.

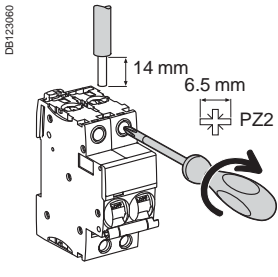
| Alternating current (AC) 50/60 Hz | | | | |
|---|--------------|--------------|-------|---------------------------------|
| Breaking capacity (Icu) according to IEC/EN 60947-2 | | | | Service breaking capacity (Ics) |
| Ph/Ph (2P, 3P) | Voltage (Ue) | | | |
| | 220 to 240 V | 380 to 415 V | 440 V | |
| Rating (In) | 1.6 to 16 A | 40 kA | 20 kA | 15 kA |
| | 25 à 40 A | 30 kA | 15 kA | 10 kA |
| | | | | 50 % of Icu |
| | | | | 50 % of Icu |





Catalogue numbers

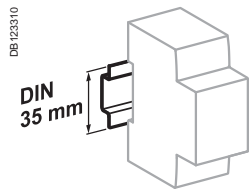
| iC60L instantaneous trip circuit breaker | | |
|--|------------------------------|----------|
| Type | 2P | 3P |
| | | |
| Rating (In) | Quality label ⁽¹⁾ | Curve MA |
| 1.6 A | | A9F90272 |
| 2.5 A | | A9F90273 |
| 4 A | | A9F90204 |
| 6.3 A | | A9F90276 |
| 10 A | | A9F90210 |
| 12.5 A | | A9F90282 |
| 16 A | | A9F90216 |
| 25 A | | A9F90225 |
| 40 A | | A9F90240 |
| Width in 9-mm modules | 4 | 6 |

(1) Information to be provided by the country.

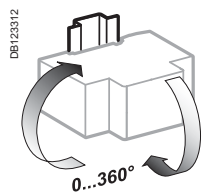
Connection



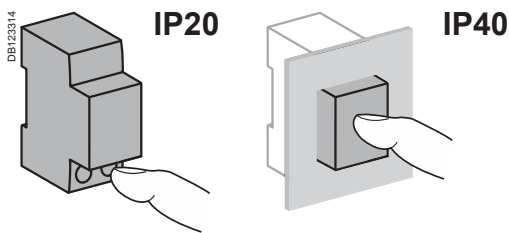
| Rating | Tightening torque | Without accessory | | With accessories | | | |
|-------------|-------------------|---|---|---|---|------------------------|------------------------|
| | | Copper cables | | 50 mm ² Al terminal | Screw-on connection for ring terminal | Multi-cables terminal | |
| | | Rigid | Flexible or ferrule | | | Rigid cables | Flexible cables |
| 0.5 to 25 A | 2 N.m |  |  |  |  | - | - |
| 32 to 63 A | 3.5 N.m | 1 to 25 mm ² | 1 to 16 mm ² | - | Ø 5 mm | - | - |
| | | 1 to 35 mm ² | 1 to 25 mm ² | 50 mm ² | | 3 x 16 mm ² | 3 x 10 mm ² |



Clip on DIN rail 35 mm.



Indifferent position of installation.



Technical data

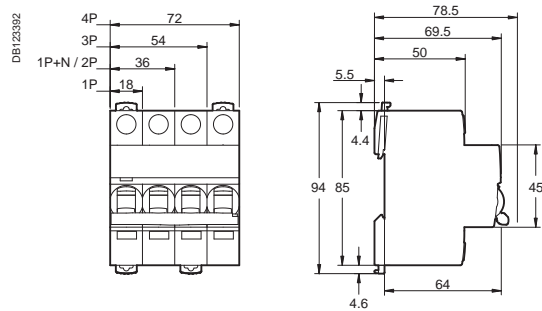
| Main characteristics | | |
|---|-----------------------------|--|
| According to IEC/EN 60947-2 | | |
| Insulation voltage (U _i) | | 500 V AC |
| Pollution degree | | 3 |
| Rated impulse withstand voltage (U _{imp}) | | 6 kV |
| Thermal tripping | Reference temperature | 50 °C |
| | Temperature derating | See module CA908007 |
| Magnetic tripping | B curve | 4 I _n ± 20 % |
| | C curve | 8 I _n ± 20 % |
| | D curve | 12 I _n ± 20 % |
| Utilization category | | A |
| According to IEC/EN 60898-1 | | |
| Limitation class | | 3 |
| Rated making and breaking capacity of an individual pole (I _{cn1}) | | I _{cn1} = I _{cn} |
| Additional characteristics | | |
| Breaking capacity under 1 pole with IT 380-415 V isolated neutral system (case of double fault) | 40 A | 4 kA |
| | 50/63 A | 3 kA |
| Degree of protection (IEC 60529) | Device only | IP20 |
| | Device in modular enclosure | IP40 Insulation classe II |
| Endurance (O-C) | Electrical | 10,000 cycles |
| | Mechanical | 20,000 cycles |
| Overvoltage category (IEC 60364) | | IV |
| Operating temperature | | -35°C to +70°C |
| Storage temperature | | -40°C to +85°C |
| Tropicalization (IEC 60068-1) | | Treatment 2 (relative humidity 95 % to 55°C) |

iC60 circuit breakers (cont.)

Weight (g)

| Circuit-breaker | |
|-----------------|-------|
| Type | iC60N |
| 1P | 125 |
| 2P | 250 |
| 3P | 375 |
| 4P | 500 |

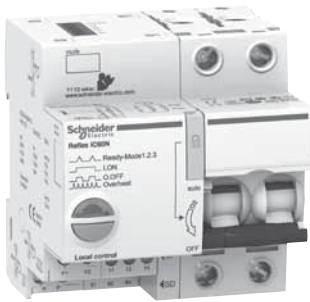
Dimensions (mm)



Control, remote control
Integrated control circuit
breakers

Reflex iC60N, iC60H (curves B, C, D)

PE106238-40



PE106238-40



IEC/EN 60947-2

The Reflex iC60 devices are integrated control circuit breakers which combine the following main functions in a single device:

- Remote control by latched and/or impulse-type order according to the 3 operating modes to be chosen by the user.
- Circuit breaker, to provide:
 - circuit protection against short-circuit currents,
 - circuit protection against overload currents,
 - disconnection in the industrial sector.

Resetting after a fault is performed manually, by the resetting handle.

The version with Ti24 allows direct interfacing of the Reflex iC60 with a PLC, to:

- Execute remote control (Y3).
- Indicate the state of the control circuit (OF) or circuit-breaker tripping (SD).

The iMDU auxiliary allows the Reflex iC60 to be controlled in 24/48 V AC/DC.

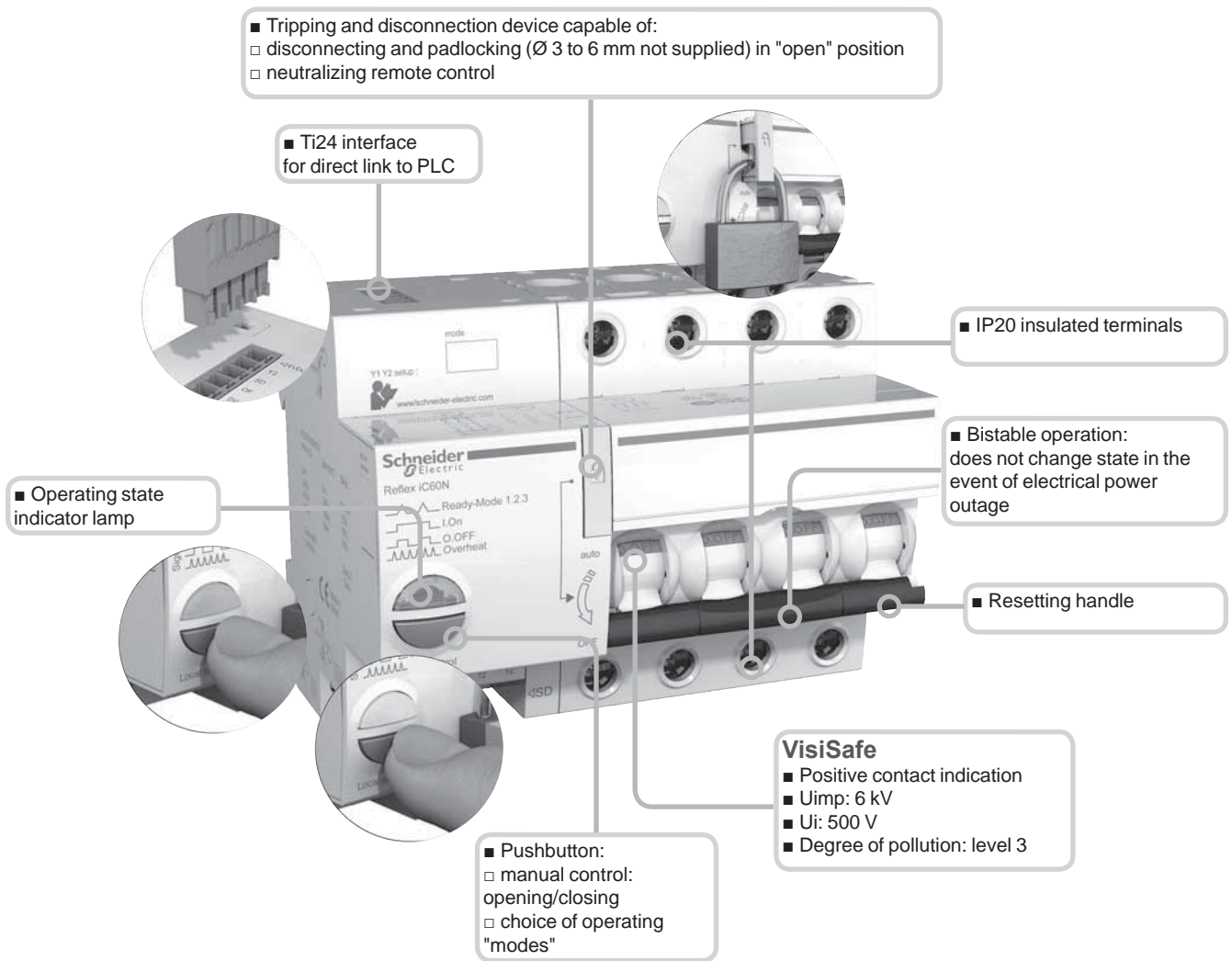
| Alternating current (AC) 50 Hz | | | | |
|--|--------------|--------------|-------|---------------------------------|
| Ultimate breaking capacity (Icu) as per IEC/EN 60947-2 | | | | Service breaking capacity (Ics) |
| Ph/Ph (2P, 3P, 4P) | Voltage (Ue) | | | |
| | 220 to 240 V | 380 to 415 V | | |
| Reflex iC60N | | | | |
| Rating (In) | 10 to 40 A | 20 kA | 10 kA | 75 % of Icu |
| | 63 A | 20 kA | 10 kA | 50 % of Icu |
| Reflex iC60H | | | | |
| Rating (In) | 10 to 40 A | 30 kA | 15 kA | 50 % of Icu |

Catalogue numbers

| Reflex iC60 circuit breaker | | | | | | | | | |
|-----------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Type | 2P | | | 3P | | | 4P | | |
| | Curve | | | Curve | | | Curve | | |
| Rating (In) | B | C | D | B | C | D | B | C | D |
| Reflex iC60N | | | | | | | | | |
| With Ti24 interface | | | | | | | | | |
| 10 A | A9C61210 | A9C62210 | A9C63210 | A9C61310 | A9C62310 | A9C63310 | A9C61410 | A9C62410 | A9C63410 |
| 16 A | A9C61216 | A9C62216 | A9C63216 | A9C61316 | A9C62316 | A9C63316 | A9C61416 | A9C62416 | A9C63416 |
| 25 A | A9C61225 | A9C62225 | A9C63225 | A9C61325 | A9C62325 | A9C63325 | A9C61425 | A9C62425 | A9C63425 |
| 40 A | A9C61240 | A9C62240 | - | A9C61340 | A9C62340 | - | A9C61440 | A9C62440 | - |
| 63 A | A9C61263 | A9C62263 | - | A9C61363 | A9C62363 | - | A9C61463 | A9C62463 | - |
| Without Ti24 interface | | | | | | | | | |
| 10 A | - | A9C52210 | - | - | A9C52310 | - | - | A9C52410 | - |
| 16 A | - | A9C52216 | - | - | A9C52316 | - | - | A9C52416 | - |
| 25 A | - | A9C52225 | - | - | A9C52325 | - | - | A9C52425 | - |
| 40 A | - | A9C52240 | - | - | A9C52340 | - | - | A9C52440 | - |
| 63 A | - | A9C52263 | - | - | A9C52363 | - | - | A9C52463 | - |
| Reflex iC60H | | | | | | | | | |
| With Ti24 interface | | | | | | | | | |
| 10 A | A9C64210 | A9C65210 | A9C66210 | A9C64310 | A9C65310 | A9C66310 | A9C64410 | A9C65410 | A9C66410 |
| 16 A | A9C64216 | A9C65216 | A9C66216 | A9C64316 | A9C65316 | A9C66316 | A9C64416 | A9C65416 | A9C66416 |
| 25 A | A9C64225 | A9C65225 | A9C66225 | A9C64325 | A9C65325 | A9C66325 | A9C64425 | A9C65425 | A9C66425 |
| 40 A | A9C64240 | A9C65240 | - | A9C64340 | A9C65340 | - | A9C64440 | A9C65440 | - |
| Width in 9 mm modules | 9 | | | 11 | | | 13 | | |

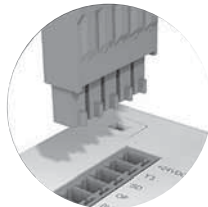
Reflex iC60N, iC60H (curves B, C, D) (cont.)

PB 1 05980 70



- Longer product service life thanks to:
 good overvoltage withstand capacity: products designed to provide a high industrial performance level (degree of pollution, rated impulse withstand voltage and insulation voltage),
 high limitation performances,
 fast closure independent of the speed of resetting of the operating handle.

DB123765



DB123516

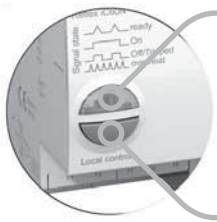


Legend

| Ti24 interface | |
|----------------|---|
| +24VDC | V DC power supply |
| Y3 | Remote control by latched order |
| SD | Circuit-breaker tripping information |
| OF | Control circuit state information (open/closed) |
| 0 V | V DC power supply |

| | |
|----|---|
| Y1 | Latched order control |
| Y2 | Control by impulse-type |
| N | 230 V AC power supply |
| P | |
| OF | Control circuit state indication contact |
| | |
| SD | Circuit-breaker tripping indication contact |
| | |

DB123517

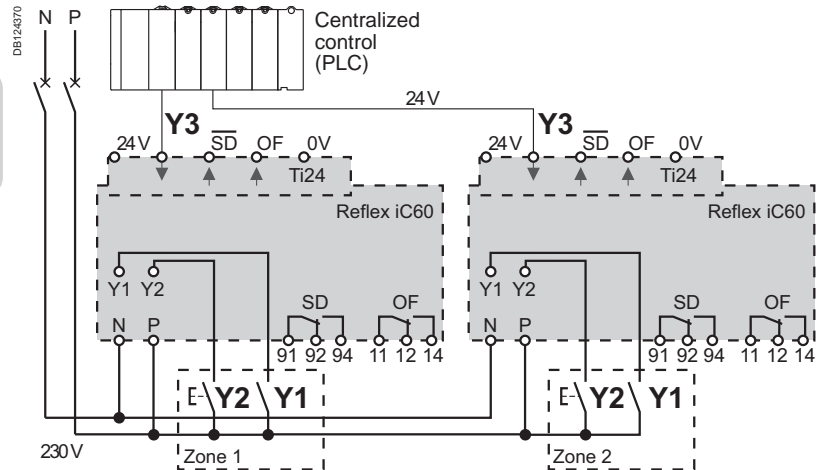


■ Operating state indicator lamp

■ Pushbutton for:
□ "mode" selection
□ opening/closing manual control

Remote control is possible by 3 operating modes to be set using the pushbutton on the front panel.

Three types of control: Y1, Y2, Y3



Operating modes

Mode 1: Reflex iC60 opening/closing, locally or centrally controlled

- The opening/closing orders come from various control points, and they are taken into account in their order of arrival
- Y1: latched order local control
- Y2: impulse-type local control
- Y3: latched order centralized control

Mode 2: Reflex iC60 opening/closing, possible inhibition of local impulse-type control

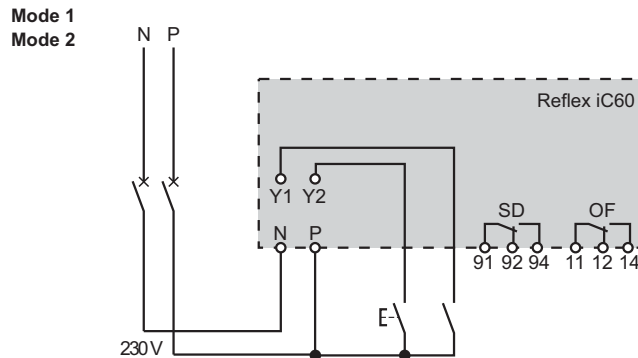
- Y1 is used to inhibit Y2
- Y1: local opening/Y2 inhibition latched order control
- Y2: impulse-type local opening/closing control
- Y3: latched order centralized opening/closing control

Mode 3: Reflex iC60 opening/closing, possible inhibition of centralised latched order control

- Y1 is used to inhibit Y3
- Y3 inhibition local latched order control
- Y2: impulse-type local opening/closing control
- Y3: latched order centralized opening/closing control

Reflex iC60 without Ti24 interface

DB124371



Reflex iC60 with Ti24 interface

DB124372

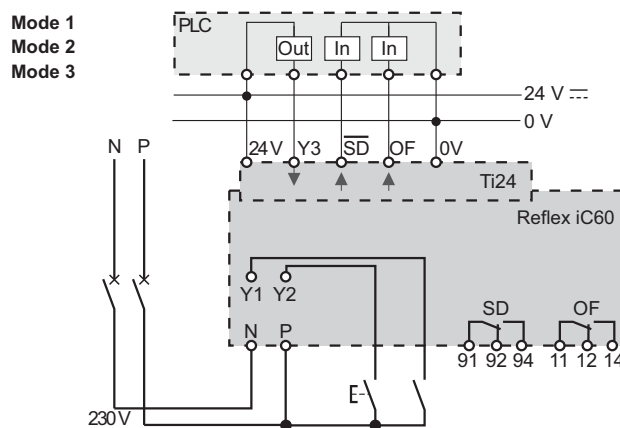
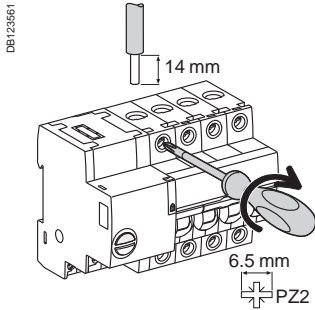


Table of modes

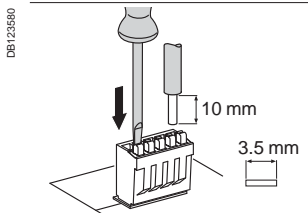
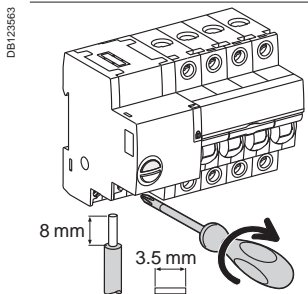
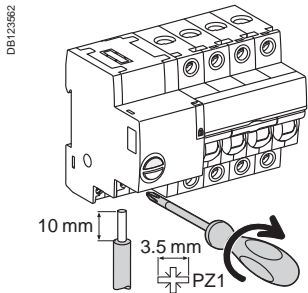
| | Mode 1 | Mode 2 | Mode 3 |
|------------------------------------|-----------------|-----------------|----------------|
| Reflex iC60 without interface Ti24 | ■ Default mode | ■ Possible mode | – |
| Reflex iC60 with interface Ti24 | ■ Possible mode | ■ Possible mode | ■ Default mode |

Power connection

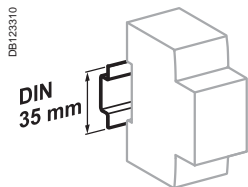


| Terminal | Rating | Tightening torque | Without accessories | | With accessories | | | |
|----------|------------|-------------------|-------------------------------------|-------------------------------------|-----------------------------------|--|-----------------------------------|------------------------|
| | | | Copper cables | | Al terminal 50 mm ² | Screw-on connection for ring terminal | Multi-cable terminal | |
| | | | Rigid | Flexible or with ferrule | | | Rigid cables | Flexible cables |
| Power | 10 to 25 A | 2 N.m | DB122945 1 to 25 mm ² | DB122946 1 to 16 mm ² | DB11789 50 mm ² | DB11678 Ø 5 mm | DB11677 3 x 16 mm ² | 3 x 10 mm ² |
| | 40 to 63 A | 3.5 N.m | 1 to 35 mm ² | 1 to 25 mm ² | | | | |

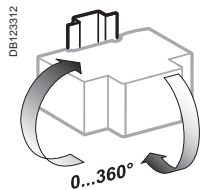
Control connection



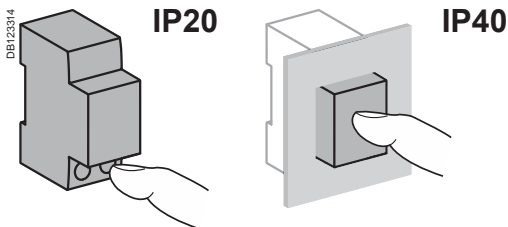
| Terminal | Tightening torque | Without accessories | | |
|--------------------------------------|----------------------------|-------------------------------------|------------------------------------|------------------------------------|
| | | Rigid | Flexible | Flexible with ferrule |
| Power supply (N/P) Inputs (Y1/Y2) | 1 N.m | DB122945 1 to 10 mm ² | DB123653 1 to 6 mm ² | DB123654 1 to 4 mm ² |
| Outputs (OF/SD) | 0.7 N.m | 1 to 2.5 mm ² | 1 to 2.5 mm ² | 1 to 1.5 mm ² |
| Ti24 interface | Spring-loaded terminals | 0.5 to 1.5 mm ² | 0.5 to 1.5 mm ² | 0.5 to 1.5 mm ² |



Clip on DIN rail 35 mm.



Indifferent position of installation.



Technical data

| Control circuit | | |
|---|----------------------------------|---|
| Supply voltage (Ue) (N/P) | | 230 V AC - 50 Hz |
| Control voltage (Uc) | Inputs (Y1/Y2) | 230 V AC - 5 mA (24...48 V AC/DC, with iMDU auxiliary) |
| | Input (Y3) | 24 V DC - 5.5 mA |
| Min. duration of control impulse (Y2) | | ≥ 250 ms |
| Response time (Y2) | | ≤ 200 ms |
| Consumption | | ≤ 1 W |
| Inrush consumption | | < 1000 VA |
| Length of control wires | Inputs (Y1/Y2) | Cable: 100 m Wires in a sheath: 500 m |
| | Input (Y3) | 500 m |
| Inrush current at 230 V - 50 Hz | 2P | 4.2 Å |
| | 3P | 8.2 Å |
| | 4P | 16.2 Å |
| Power circuit | | |
| Max. working voltage (Ue) | | 400 V AC |
| Insulation voltage (Ui) | | 500 V |
| Rated impulse withstand voltage (Uimp) | Set to Disconnected | 6 kV |
| | Set to Ready | 4 kV |
| Thermal tripping | Reference temperature | 50°C |
| Magnetic tripping | Curve B | 4 In ± 20 % |
| | Curve C | 8 In ± 20 % |
| | Curve D | 12 In ± 20 % |
| Overvoltage category (IEC 60364) | | IV |
| Temperature derating | | See module CA908007 |
| Indication / Remote control | | |
| Potential-free changeover contact outputs (OF/SD) | Min. | 24 V DC - 100 mA |
| | Max | 230 V AC - 1 A |
| Ti24 interface (as per IEC 61131) | | |
| Outputs (OF/SD) | Ti24 interface | 24 V DC - 100 mA max |
| Endurance (O-C) | | |
| Electrical | AC1 - AC7a | Up to 50,000 cycles ⁽¹⁾ |
| | AC5a - AC5b | Up to 15,000 cycles ⁽¹⁾ |
| | AC7c | Up to 20,000 cycles ⁽¹⁾ |
| Mechanical | | 50,000 cycles |
| Additional characteristics | | |
| Degree of protection (IEC 60529) | Device only | IP20 |
| | Device in a modular enclosure | IP40 Insulation class II |
| Degree of pollution | | 3 |
| Operating temperature | | -25°C to +60°C |
| Storage temperature | | -40°C to +85°C |
| Tropicalization | | Treatment 2 (relative humidity of 93 % at 40°C) |
| Immunity to voltage dips | | IEC 61000-4-11 class III |
| Immunity to power supply frequency variations | | IEC 61000-4-28 and IACS E10 |
| Immunity to harmonics | | IEC 61000-4-13 class 2 |
| Immunity to electrostatic discharges | Air | 8 kV, IEC 61 000-4-2 |
| | Contacts | 4 kV, IEC 61 000-4-2 |
| Immunity to stray magnetic fields | | 10 V/m up to 3 GHz, IEC 61000-4-3 |
| Immunity to fast transients | | 4 kV from 5 to 100 kHz, IEC 61000-4-4 |
| Immunity to shock waves | | IEC 61000-4-5 |
| Immunity to power frequency magnetic fields | | 10 V from 150 kHz to 80 MHz, IEC 61000-4-6 |
| Immunité aux champs magnétiques à la fréquence du réseau | | Level 4 30 A/m to IEC 61000-4-8 and IEC 61000-4-9 |
| Conducted emissions | | CISPR 11/22 |
| Radiated emissions | | CISPR 11/22 |

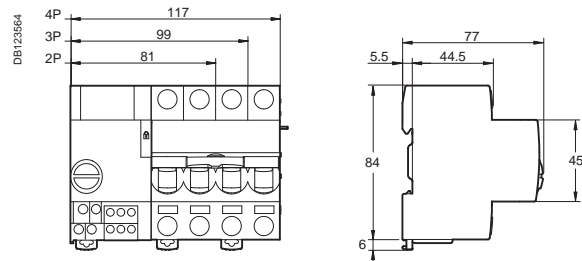
(1) See the derating table according to the load types and ratings

Reflex iC60N, iC60H (curves B, C, D) (cont.)

Weight (g)

| Circuit breaker | |
|-----------------|-------------|
| Type | Reflex iC60 |
| 2P | 480 |
| 3P | 620 |
| 4P | 750 |

Dimensions (mm)



iMDU electrical auxiliary for Reflex iC60



A9C18195

The voltage matching module allows safety voltages of 24 and 48 V AC/DC to be used on the control inputs.

- Only connects to the Reflex iC60 circuit breakers remote controlled by a 220-240 V control voltage
- Galvanic isolation 6000 V
- Maximum combined power between terminals P and Y1/Y2: 100 mA at 230 V and 25°C.

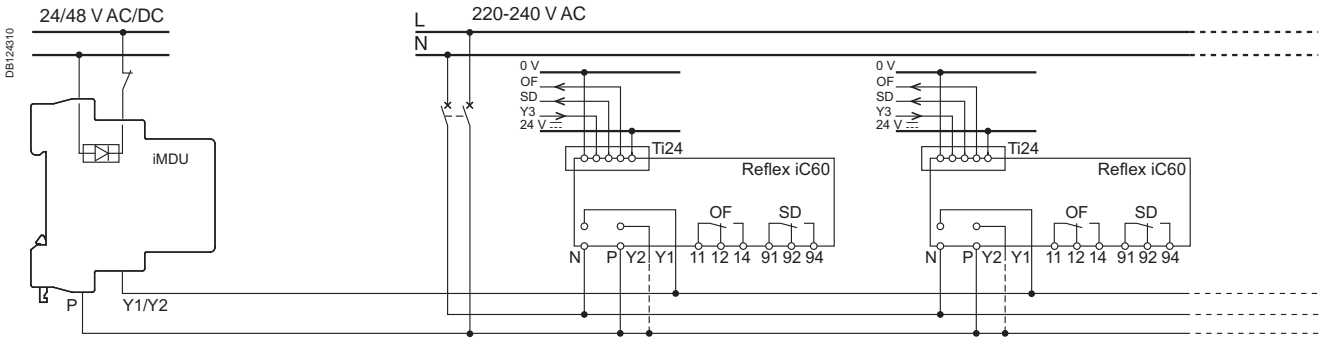
Catalogue numbers

Electrical auxiliary for Reflex iC60

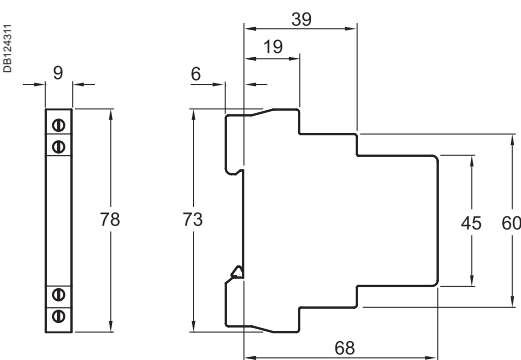
| Type | Width in 9 mm modules |
|------|-----------------------|
| iMDU | A9C18195 1 |

Diagram

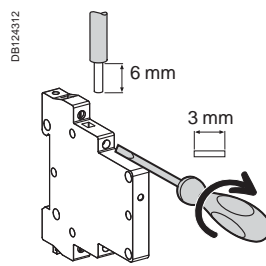
An iMDU electrical auxiliary allows up to a maximum of five Reflex iC60 to be controlled simultaneously at the same input.



Dimensions (mm)



Connection



| Type | Tightening torque | Copper cables | |
|------|-------------------|---------------------|--------------------------|
| | | Rigid | Flexible or with ferrule |
| iMDU | 1 N.m | 1.5 mm ² | 1.5 mm ² |

Technical data

| Main characteristics | | |
|----------------------------------|-----------------------------|---|
| Control circuit voltage | | 24...48 V AC/DC |
| Insulation voltage (Ui) | | 500 V |
| Additional characteristics | | |
| Degree of protection (IEC 60529) | Device only | IP20 |
| | Device in modular enclosure | IP40 Insulation class II |
| Operating temperature | | -20°C to +60°C |
| Storage temperature | | -40°C to +80°C |
| Tropicalisation | | Treatment 2 (relative humidity 95 % at 55°C) |
| Weight | | 53 g |

RCA remote controls

For iC60 circuit breakers

PB100253-40



The RCA remote control system allows:

- Remote electrical control (opening and closing) of circuit breakers with or without Vigi add-on RCD, with or without auxiliary.
- Circuit-breaker resetting after tripping, in accordance with safety principles and the regulations in force.
- Local control by operating handle.
- Circuit placing in safety configuration by padlocking.

2 choices of operation after tripping:

- A: Enabling of remote circuit-breaker resetting;
- B: Inhibition of remote resetting.

The version with Ti24 interface allows:

- Direct interfacing of remote control with a programmable logic controller (PLC), a supervision system and any other communication device, having inputs/outputs in 24 V DC (control, OF and SD indications).
- Remote indication by "OF" potential-free contact.
- Provision of 2 operating modes, "1 and 3".

The iMDU auxiliary allows RCA control in 24/48 V AC/DC.

Catalogue numbers

| RCA remote control | | | |
|------------------------------------|-----------------|-----------------|-----------------------|
| Type | | | Width in 9 mm modules |
| For circuit breakers | Voltage | | |
| 1P, 1P+N, 2P | | | |
| Without Ti24 interface | 230 V AC, 50 Hz | A9C70112 | 7 |
| With Ti24 interface | 230 V AC, 50 Hz | A9C70122 | 7 |
| For 3P, 4P circuit breakers | | | |
| Without Ti24 interface | 230 V AC, 50 Hz | A9C70114 | 7 |
| With Ti24 interface | 230 V AC, 50 Hz | A9C70124 | 7 |

DB123813



Without Ti24 interface

DB123572



DB123573

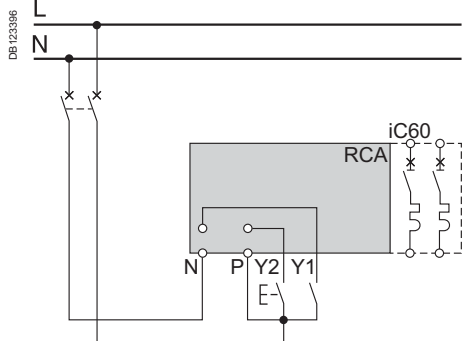


With Ti24 interface

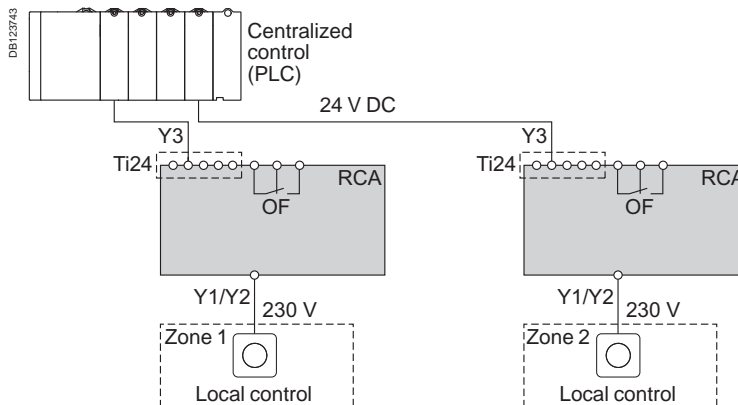
| Legend | |
|------------------------------|---|
| Type | Application |
| OFF | All remote control inhibited |
| auto | |
| A | Circuit breaker remote reclosing after tripping allowed |
| B | Circuit breaker remote reclosing after tripping inhibited |
| Green indicator lamp | Remote control possible |
| Orange indicator lamp | Remote control impossible |
| 1 (Ti24) | Mode 1 |
| 3 (Ti24) | Mode 3 |
| Y1 | Latched order local control |
| Y2 | Impulse-type or latched order local control (depending on mode) |
| Y3 | Latched order centralized control |

Standard RCA

- The orders received on terminals Y1 and Y2 are taken into account progressively in their order of arrival.



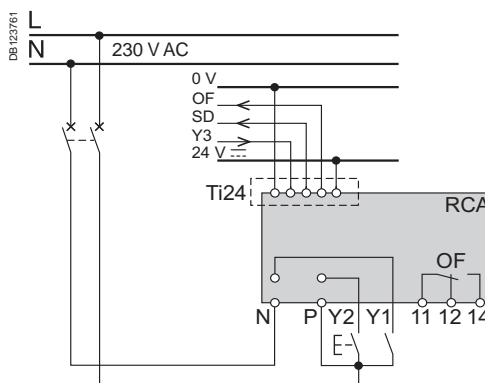
RCA Ti24



Mode 1: Locally or centrally controlled circuit-breaker opening/closing

- The orders come from various control points, and they are taken into account in their order of arrival
- Y1: Latched order local control
- Y2: Impulse-type local control
- Y3: Latched order centralized control

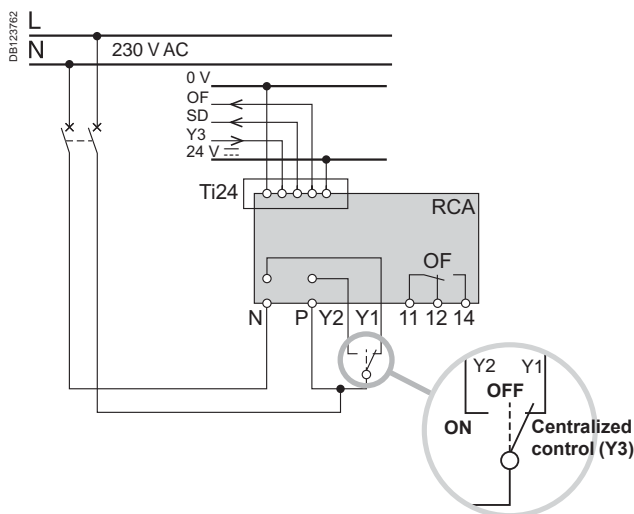
RCA Ti24 mode 1



Mode 3: Centrally controlled opening/closing + local override

- 3 positions allowing a choice between override and centralized control:
- Y1: Latched order local control
- Y2: Latched order local control
- Y3: Latched order centralized control

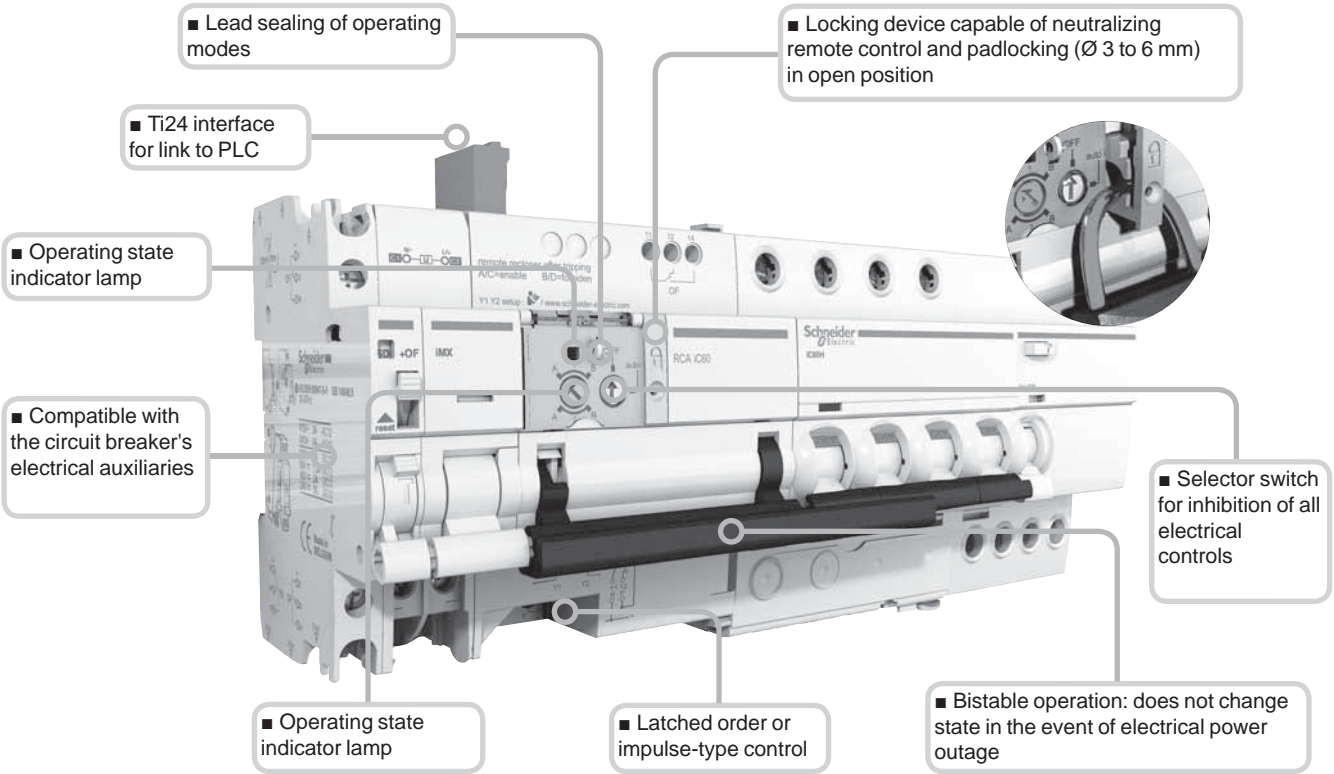
RCA Ti24 mode 3



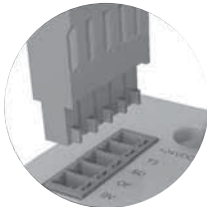
RCA remote controls (cont.)

For iC60 circuit breakers

DB123576



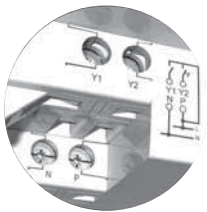
DB123763



DB123576



DB123579

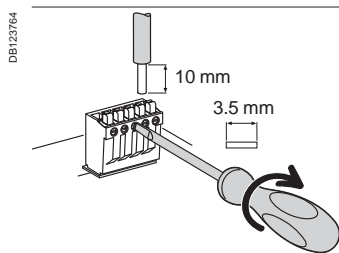
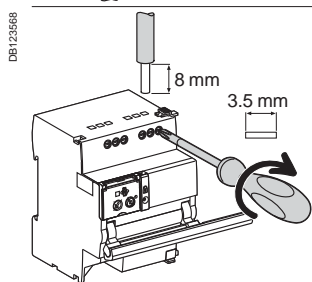
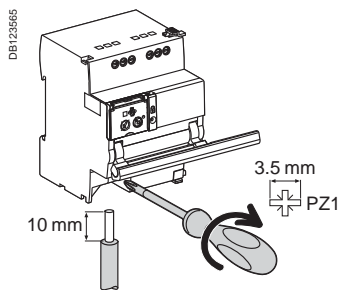


| Legend | |
|---------------|---|
| Type | Application |
| +24VDC | V DC power supply |
| Y3 | Latched order centralized control |
| SD | Circuit-breaker tripping information |
| OF | Control circuit state information (open/closed) |
| 0 V | V DC power supply |
| Y1 | Latched order local control |
| Y2 | Impulse-type or latched order local control (depending on mode) |
| N | 230 V AC, 50 Hz power supply |
| P | |
| OF | Circuit-breaker state indication contact (open/closed) |

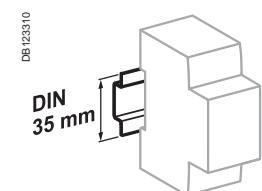


| Indication auxiliaries | Tripping auxiliaries | RCA remote control | iC60 circuit breaker | Vigi iC60 add-on RCD |
|------------------------|-----------------------------|--------------------|----------------------|----------------------|
| | | | | |
| No | 1 (iSD or iOF or iOF/SD+OF) | | | |
| 1 iOF | 1 (iSD or iOF or iOF/SD+OF) | No | | |
| | | | | |

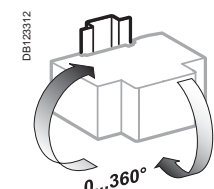
Connection



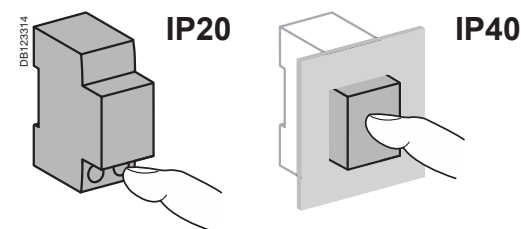
| Terminal | Tightening torque | Without accessories | | |
|--------------------------------------|-------------------------|--|--|--|
| | | Copper cables | | |
| | | Rigid | Flexible | Flexible with ferrule |
| Power supply (N/P) Inputs (Y1/Y2) | 1 N.m | 0.5 to 10 mm ² 2 x 0.5 to 2 x 2.5 mm ² | 0.5 to 6 mm ² 2 x 0.5 to 2 x 2.5 mm ² | 0.5 to 4 mm ² 2 x 0.5 to 2 x 2.5 mm ² |
| Outputs (OF) | 0.7 N.m | 0.5 to 2.5 mm ² 2 x 0.5 to 2 x 1.5 mm ² | 0.5 to 2.5 mm ² 2 x 0.5 to 2 x 1.5 mm ² | 0.5 to 1.5 mm ² 2 x 0.5 to 2 x 1.5 mm ² |
| Ti24 interface | Spring-loaded terminals | 0.5 to 1.5 mm ² | 0.5 to 1.5 mm ² | - |



Clip on DIN rail 35 mm.



Indifferent position of installation.



Technical data

Control circuit

| | |
|--|-------------------------------|
| Supply voltage (Ue) (N/P) | 230 V AC, 50 Hz |
| Control voltage (Uc) Type 1 inputs (Y1/Y2) | 230 V AC (as per IEC 61131-2) |
| Min. duration of control order (Y2) | ≥ 200 ms |
| Response time (Y2) | < 500 ms |
| Consumption | ≤ 1 W |

Thermal self-protection with automatic Reset against overheating of the control circuit due to an abnormal number of operations

Endurance (O-C) (RCA combined with a circuit breaker)

| | |
|-----------------------|---------------|
| Electrical/Mechanical | 10,000 cycles |
|-----------------------|---------------|

Indication / Remote control

| | | |
|---|----------|-------------------|
| Potential free changeover contact output (OF) | Min. | 24 V AC/DC, 10 mA |
| | Max. | 230 V AC, 1 A |
| Input (Y1/Y2) | 230 V AC | 5 mA |

Ti24 interface (as per IEC 61131)

| | | |
|--------------------|---------|-----------------|
| Type 1 input (Y3) | 24 V DC | 5.5 mA |
| Output (OF and SD) | 24 V DC | In max.: 100 mA |

Additional characteristics

| | | |
|--|-------------------------------|---|
| Degree of protection (IEC 60529) | Device only | IP20 |
| | Device in a modular enclosure | IP40 Insulation class II |
| Insulation voltage (Ui) | | 400 V |
| Degree of pollution (IEC 60947) | | 3 |
| Rated impulse withstand voltage (Uimp) | | 6 kV |
| Operating temperature | | -25°C to +60°C |
| Storage temperature | | -40°C to +70°C |
| Tropicalization | | Treatment 2 (relative humidity of 93 % at +40°C) |

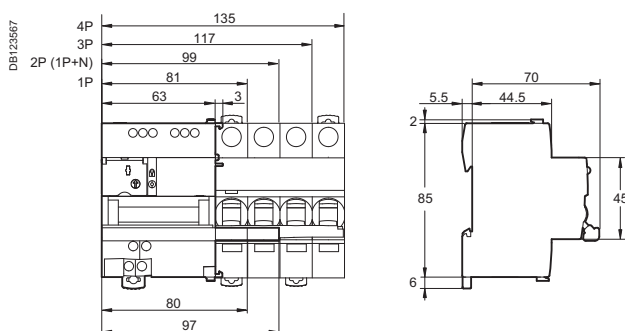
RCA remote controls (cont.)

For iC60 circuit breakers

Weight (g)

| Remote controls | |
|-----------------------------------|-----|
| Type | RCA |
| For 1P, 1P+N, 2P circuit breakers | 400 |
| For 3P, 3P+N, 4P circuit breakers | 430 |

Dimensions (mm)






Choice of sensitivity

The sensitivity of an earth leakage protection device depends mainly on the function it has to perform:

- Protection from electric shock by direct contact.
- Protection from electric shock by indirect contact.
- Protection from fire due to current leakage.

The following table gives a reminder of:








- The circuits that must be protected against these various risks (obligation or recommendation).
- The type of earth leakage protection device to be used in each case, its sensitivity, and its location in the distribution diagram.

| Type of protection | Obligations | | Recommended by Schneider Electric | Sensitivity (I Δ n) | | | |
|--|---|--|--|---|--|--------------------|--|
| | National standard <i>To be filled in according to the country standard</i> | International standard IEC 60364 | | 30 mA (*) | 100 mA to 3000 mA (depending on the earthing system) | 300 mA (or 500 mA) | |
| Protection from electric shock by direct contact  | <i>To be filled in according to the country standard</i> | Power supply for <ul style="list-style-type: none"> ■ General-purpose power sockets, up to 20 A ■ Appliances in the vicinity of a bathtub, shower, pond or swimming pool ■ Portable appliances for outdoor use, up to 32 A ■ Lighting for exhibition stands and shows ■ Outdoor lighting <i>To be modified according to national obligations (above)</i> | <ul style="list-style-type: none"> ■ Lighting in the home | Setup in final distribution switchboard <ul style="list-style-type: none"> ■ Residual current device protecting a circuit ■ Residual current circuit breaker protecting a group of circuits | | | |
| Protection from electric shock by indirect contact  | <i>To be filled in according to the country standard</i> | The entire power distribution system, except for devices: <ul style="list-style-type: none"> ■ With class II insulation ■ Operating at Safety Extra Low Voltage (class III) <i>To be modified according to national obligations (above)</i> | – | | Setup in final distribution switchboard <ul style="list-style-type: none"> ■ Residual current circuit breaker or device, on incoming feeder Setup in subdistribution board or main switchboard <ul style="list-style-type: none"> ■ Residual current device protecting a circuit ■ Residual current device or circuit breaker protecting a group of circuits ■ On incoming feeder: residual current circuit breaker or device | | |
| Protection from fire due to current leakage  | <i>To be filled in according to the country standard</i> | <ul style="list-style-type: none"> ■ High-risk premises: <ul style="list-style-type: none"> □ explosion (BE3) □ fire (BE2) ■ Agricultural and horticultural buildings ■ Equipment for fairs, exhibitions and shows ■ Temporary outdoor recreational installations <i>To be modified according to national obligations (above)</i> | <ul style="list-style-type: none"> ■ Dilapidated buildings or electrical installations ■ Humid atmospheres: agricultural buildings, public swimming pools ■ Presence of chemical agents | | Setup in final distribution switchboard <ul style="list-style-type: none"> ■ Residual current circuit breaker or device, on incoming feeder Setup in subdistribution board or main switchboard <ul style="list-style-type: none"> ■ Residual current device protecting each circuit to a high-risk zone ■ Residual current device or circuit breaker protecting a group of circuits ■ On incoming feeder: residual current circuit breaker or device | | |

(*) The 10 mA sensitivity is useful for certain very specific applications, where there is a risk that someone could sustain a non-dangerous current (10 to 30 mA) without being able to get free. Example: healthcare equipment for hospital beds. Generally, devices with this very high sensitivity are liable to cause frequent tripping, due to the natural leakage currents of the installation.

Interference immunity

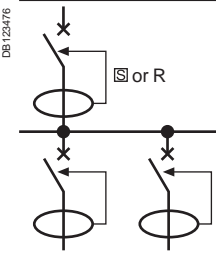
Schneider Electric provides various equipment technologies capable of overcoming the consequences of interference of all kinds.

| Operating conditions | | Examples | Types | | | | |
|--|---|---|---|---|-------|---|---|
| | | | AC | A | A si | B | |
| Loads | | | | | |     | |
|  | With no special characteristics | <ul style="list-style-type: none"> General-purpose power sockets Incandescent lighting Household appliances: microwave oven, dishwasher, clothes dryer Electric heating, water heater | ■ | ■ | ■ | ■ | |
| | Including a rectifier | Single phase | <ul style="list-style-type: none"> Household appliances: induction cooking appliances, washing machines (variable speed) Single-phase variable speed drives | - | ■ | ■ | - |
| | | Three phase | <ul style="list-style-type: none"> Three-phase variable speed industrial drives Three-phase uninterruptible power supplies | - | - | - | ■ |
| | Generating high-frequency interference (current peaks, harmonics) | | <ul style="list-style-type: none"> Fluorescent lighting powered by extra low voltage transformer, by electronic ballast Variable luminosity lighting Powerful IT equipment Single-phase variable speed industrial drives Air conditioning Telecommunications equipment Capacitor banks | - | - | ■ | ■ |
| | Including an anti-harmonic filter in the power supply | | <ul style="list-style-type: none"> Microcomputer systems Computer peripherals (printers, scanners, etc.) | - | - | ■ | ■ |
| Electrical environment | | | | | | | |
|  | Vicinity of equipment generating transient overvoltages | <ul style="list-style-type: none"> High-powered switching devices Reactive energy compensation banks | - | - | ■ | ■ | |
| | Circuits powered by an uninterruptible power supply "Isolated neutral" (IT) earthing system | <ul style="list-style-type: none"> Backed-up networks | - | - | ■ | ■ | |
| | Major risk of lightning strokes | <ul style="list-style-type: none"> Buildings protected by a lightning protection system Mountainous or humid regions Regions with high keraunic level | - | - | ■ | ■ | |
| Atmosphere | | | | | | | |
|  | Ambient temperature which could be less than -5°C | | - | ■ | ■ | ■ | |
| | Presence of corrosive agents (AF2 to AF4) or dust | <ul style="list-style-type: none"> Indoor swimming pools Yacht harbours, marinas, camping grounds Water treatment Chemical industries, heavy industries, paper mills Mines and cellars, road tunnels Markets, stock raising, food processing industries | - | - | ■ (1) | - | |

(1) SiE for C120 and NG125 circuit-breakers

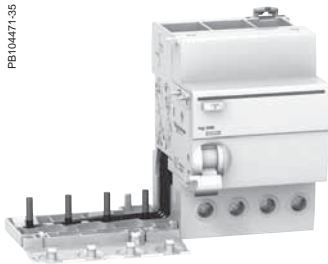
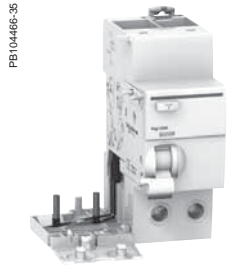
Discrimination

Residual current devices of average sensitivity (100 mA and more) are available in a selective (S) and delayed (R) version. This option ensures that, in the event of an earth fault downstream of the installation, only the defective part is switched off. The table below shows (in green) which upstream/downstream equipment combinations provide this discrimination.

| Sensitivity (mA) - Downstream | | Sensitivity (mA) - Upstream | | | | | | | | | | | | |
|--|---------------|-----------------------------|-----|-----|-----|------|------|-------------|-----|-----|------|------|------|-----------|
| | | Instantaneous | | | | | | Selective S | | | | | | Delayed R |
| | | 30 | 100 | 300 | 500 | 1000 | 3000 | 100 | 300 | 500 | 1000 | 3000 | 1000 | 3000 |
|  | Instantaneous | 30 | - | - | - | - | - | - | - | - | - | - | - | - |
| | | 100 | - | - | - | - | - | - | - | - | - | - | - | - |
| | | 300 | - | - | - | - | - | - | - | - | - | - | - | - |
| | | 500 | - | - | - | - | - | - | - | - | - | - | - | - |
| | | 1000 | - | - | - | - | - | - | - | - | - | - | - | - |
| | | 3000 | - | - | - | - | - | - | - | - | - | - | - | - |
| Selective S | 100 | - | - | - | - | - | - | - | - | - | - | - | - | |
| | 300 | - | - | - | - | - | - | - | - | - | - | - | - | |
| | 500 | - | - | - | - | - | - | - | - | - | - | - | - | |
| | 1000 | - | - | - | - | - | - | - | - | - | - | - | - | |
| | 3000 | - | - | - | - | - | - | - | - | - | - | - | - | |
| Delayed R | 1000 | - | - | - | - | - | - | - | - | - | - | - | - | |
| | 3000 | - | - | - | - | - | - | - | - | - | - | - | - | |

Vigi iC60 add-on residual current devices (AC type)

IEC/EN 61009-1



- Combined with iC60 circuit breaker, the Vigi iC60 provide:
 - protection of persons against electric shock by direct contact (≤ 30 mA),
 - protection of persons against electric shock by indirect contact (≥ 100 mA),
 - protection of installations against the risk of fire (300 mA or 500 mA).

Catalogue numbers

| Vigi iC60 add-on residual current devices | | | | | | | | | |
|---|--|-------|-----------------------|-----------------------|-----------------------|-----------------------|----------------------|----------------------|-----------------------|
| Type | AC | | | | | | | | Width in 9 mm modules |
| Product | Vigi iC60 | | | | | | | | |
| Auxiliaries | Without auxiliaries | | | | | | | | |
| 2P DB104465-3S | Sensitivity | 10 mA | 30 mA | 100 mA | 300 mA | 500 mA | 300 mA | 1000 mA | |
| | Rating | 25 A | A9V41225 A9V01225* | A9V12225 | A9V44225 A9V04225* | A9V16225 | - | - | 3 |
| | | 40 A | - | A9V41240 A9V01240* | - | A9V44240 A9V04240* | A9V16240 | - | 4 |
| | | 63 A | - | A9V41263 A9V01263* | A9V12263 | A9V44263 A9V04263* | A9V16263 | A9V15263 A9V19263 | 4 |
| 3P DB122463 | Sensitivity | 10 mA | 30 mA | 100 mA | 300 mA | 500 mA | 300 mA | 1000 mA | |
| | Rating | 25 A | - | A9V41325 | - | A9V44325 | A9V16325 | - | 6 |
| | | 40 A | - | A9V41340 | - | A9V44340 | A9V16340 | - | 7 |
| | 63 A | - | A9V41363 | - | A9V44363 | A9V16363 | A9V15363 A9V19363 | 7 | |
| 4P DB122464 | Sensitivity | 10 mA | 30 mA | 100 mA | 300 mA | 500 mA | 300 mA | 1000 mA | |
| | Rating | 25 A | - | A9V41425 | A9V12425 | A9V44425 | A9V16425 | - | 6 |
| | | 40 A | - | A9V41440 | - | A9V44440 | A9V16440 | - | 7 |
| | 63 A | - | A9V41463 | A9V12463 | A9V44463 | A9V16463 | A9V15463 A9V19463 | 7 | |
| Voltage rating (Ue) | 230 - 240 V, 400 - 415 V Except * 130 V | | | | | | | | |
| Operating frequency | 50/60 Hz | | | | | | | | |

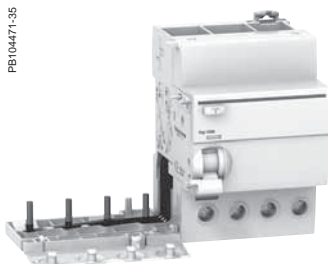
Vigi iC60 add-on residual current devices (A type)

IEC/EN 61009-1

PB104486-35


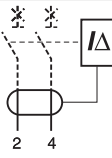


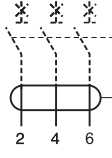


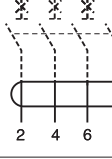




PB104471-35



- Combined with iC60 circuit breaker, the Vigi iC60 provide:
 - protection of persons against electric shock by direct contact (30 mA),
 - protection of persons against electric shock by indirect contact (≥ 100 mA),
 - protection of installations against the risk of fire (300 mA or 500 mA).

Catalogue numbers

| Vigi iC60 add-on residual current devices | | | | | | | | | | |
|---|---|--------------------------|----------|----------|----------|--|---|-----------------------|---|--|
| Type | A  | | | | | | | Width in 9 mm modules | | |
| Product | Vigi iC60 | | | | | | | | | |
| Auxiliaries | Without auxiliaries | | | | | | | | | |
| DB122462  | Sensitivity Rating | 30 mA | 100 mA | 300 mA | 500 mA | 300 mA  | 1000 mA  | | | |
| | | 25 A | A9V51225 | A9V22225 | A9V54225 | A9V26225 | - | - | 3 | |
| | | 63 A | A9V51263 | A9V22263 | A9V54263 | A9V26263 | A9V25263 | A9V29263 | 4 | |
| DB122463  | Sensitivity Rating | 30 mA | 100 mA | 300 mA | 500 mA | 300 mA  | 1000 mA  | | | |
| | | 25 A | A9V51325 | A9V22325 | A9V54325 | A9V26325 | - | - | 6 | |
| | | 63 A | A9V51363 | - | A9V54363 | A9V26363 | A9V25363 | A9V29363 | 7 | |
| DB122464  | Sensitivity Rating | 30 mA | 100 mA | 300 mA | 500 mA | 300 mA  | 1000 mA  | | | |
| | | 25 A | A9V51425 | A9V22425 | A9V54425 | A9V26425 | - | - | 6 | |
| | | 63 A | A9V51463 | A9V22463 | A9V54463 | A9V26463 | A9V25463 | A9V29463 | 7 | |
| Voltage rating (Ue) | | 230 - 240 V, 400 - 415 V | | | | | | | | |
| Operating frequency | | 50/60 Hz | | | | | | | | |

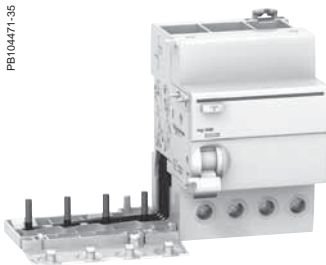
Vigi iC60 add-on residual current devices (Asi type)

IEC/EN 61009-1

PB104466-35




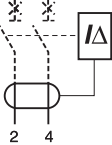


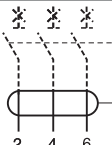


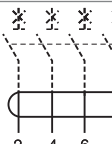


PB104471-35



- Combined with iC60 circuit breaker, the Vigi iC60 provide:
 - protection of persons against electric shock by direct contact (≤ 30 mA),
 - protection of persons against electric shock by indirect contact (≥ 300 mA),
 - protection of installations against the risk of fire (300 mA).

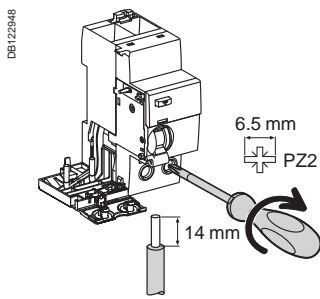
The Asi type provides increased immunity from electrical interference and polluted or corrosive environments.

Catalogue numbers

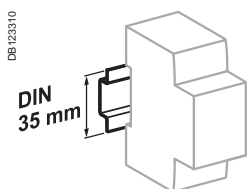
| Vigi iC60 add-on residual current devices | | | | | | | |
|---|---|-------------|--------------------------|-----------------|--|---|-----------------------|
| Type | Asi  | | | | | | Width in 9 mm modules |
| Product | Vigi iC60 | | | | | | |
| Auxiliaries | Without auxiliaries | | | | | | |
| 2P  | Rating | Sensitivity | 10 mA | 30 mA | 300 mA  | 1000 mA  | |
| | | 25 A | A9V30225 | A9V61225 | - | - | 3 |
| | | 40 A | - | A9V61240 | - | - | 4 |
| | | 63 A | - | A9V61263 | A9V65263 | A9V39263 | 4 |
| 3P  | Rating | Sensitivity | 10 mA | 30 mA | 300 mA  | 1000 mA  | |
| | | 25 A | - | A9V61325 | - | - | 6 |
| | | 40 A | - | A9V61340 | - | - | 7 |
| | | 63 A | - | A9V61363 | A9V65363 | A9V39363 | 7 |
| 4P  | Rating | Sensitivity | 10 mA | 30 mA | 300 mA  | 1000 mA  | |
| | | 25 A | - | A9V61425 | - | - | 6 |
| | | 40 A | - | A9V61440 | - | - | 7 |
| | | 63 A | - | A9V61463 | A9V65463 | A9V39463 | 7 |
| Voltage rating (Ue) | | | 230 - 240 V, 400 - 415 V | | | | |
| Operating frequency | | | 50/60 Hz | | | | |

Vigi iC60 add-on residual current devices (AC, A, Asi types)

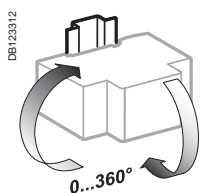
Connection



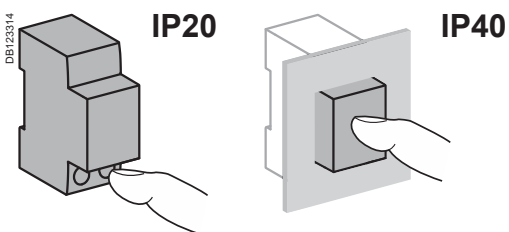
| Type | Rating | Tightening torque | Copper cables | |
|-----------|------------|-------------------|-------------------------|-------------------------|
| | | | Rigid | Flexible or ferrule |
| Vigi iC60 | 25 A | 2 N.m | 1 to 25 mm ² | 1 to 16 mm ² |
| | 40 to 63 A | 3.5 N.m | 1 to 35 mm ² | 1 to 25 mm ² |



Clip on DIN rail 35 mm.



Indifferent position of installation.



Technical data

Main characteristics

According to IEC 60947-2

| | |
|---|-------|
| Insulation voltage (U _i) | 500 V |
| Pollution degree | 3 |
| Rated impulse withstand voltage (U _{imp}) | 6 kV |

According to IEC/EN 61009-1

| | | |
|--|--|-------|
| Surge current withstand (8/20 μs) without tripping | AC and A types (no selective \square) | 250 Å |
| | AC, A types (selective \square) | 3 kÅ |
| | Asi type | 3 kÅ |

Additional characteristics

| | | |
|-----------------------|-----------------------------|------------------------------|
| Degree of protection | Device only | IP20 |
| | Device in modular enclosure | IP40 Insulation classe II |
| Operating temperature | AC type | -5°C to +60°C |
| | A and Asi types | -25°C to +60°C |
| Storage temperature | | -40°C to +85°C |

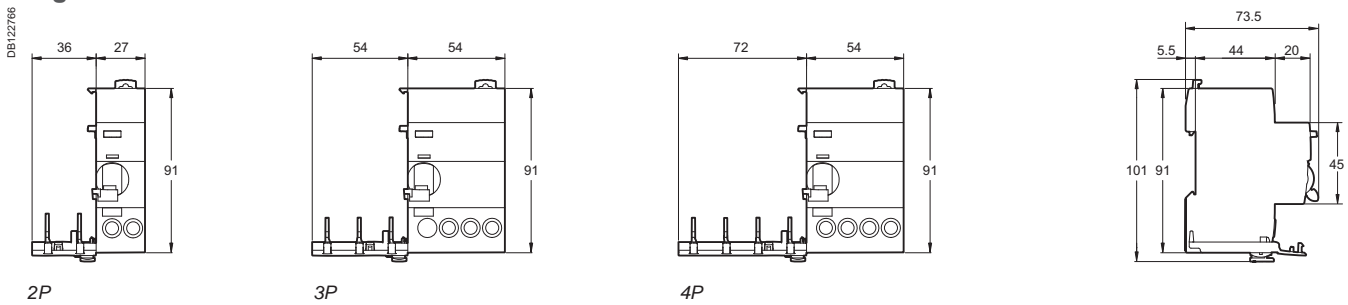
Vigi iC60 add-on residual current devices (AC, A, Asi types) (cont.)

Weight (g)

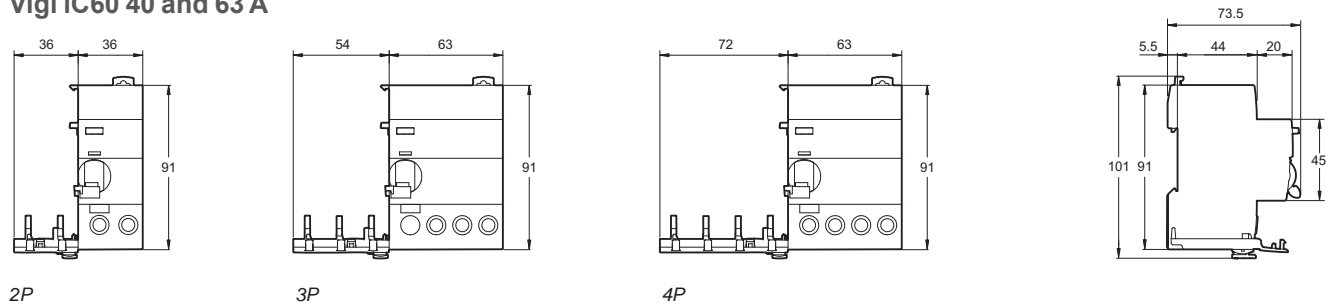
| Add-on residual current devices | |
|---------------------------------|-----------|
| Type | Vigi iC60 |
| 2P | 165 |
| 3P | 210 |
| 4P | 245 |

Dimensions (mm)

Vigi iC60 25 A

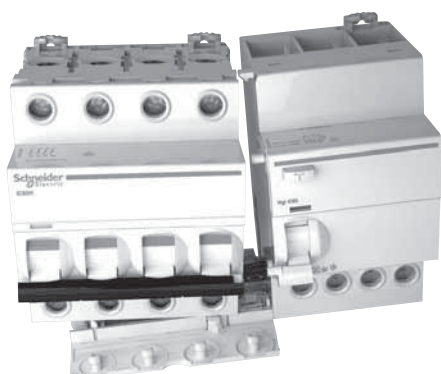


Vigi iC60 40 and 63 A



Vigi iC60 add-on residual current devices (AC, A, Asi types) (cont.)

PB104466-51



Association iC60a, N, H, L + Vigi iC60

| iC60 | Vigi iC60 25 A | Vigi iC60 40 A | Vigi iC60 63 A |
|---------------|----------------|----------------|----------------|
| 0.5 A to 25 A | ■ | ■ | ■ |
| 32 A - 40 A | NO | ■ | ■ |
| 50 A - 63 A | NO | NO | ■ |

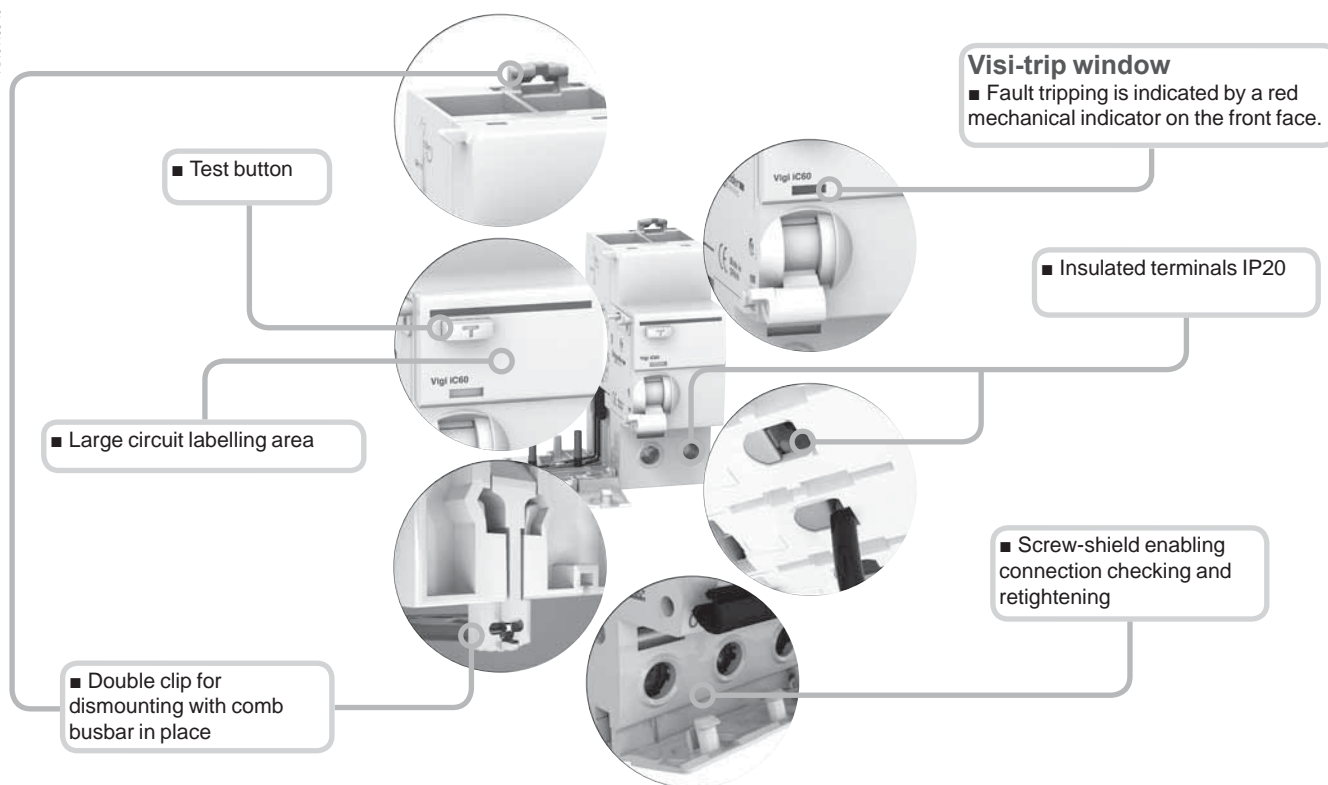
Association iC60L-MA + Vigi iC60

| iC60 | Vigi iC60 25 A | Vigi iC60 40 A | Vigi iC60 63 A |
|---------------|----------------|----------------|----------------|
| 1.6 A to 16 A | ■ | ■ | ■ |
| 25 A | NO | ■ | ■ |
| 40 A | NO | NO | ■ |



Combining iC60 L-MA units with Vigi modules of higher rating.

PB104466-40



Asi type

The Asi type provides increased immunity from electrical interference and polluted or corrosive environments.

iID residual current circuit breakers (AC type)



IEC/EN 61008-1

PB104472-40



PB104473-40



- The iID residual current circuit breakers provide:
 - protection of persons against electric shock by direct contact (≤ 30 mA),
 - protection of persons against electric shock by indirect contact (≥ 100 mA),
 - protection of installations against the risk of fire (300 mA or 500 mA).

Catalogue numbers

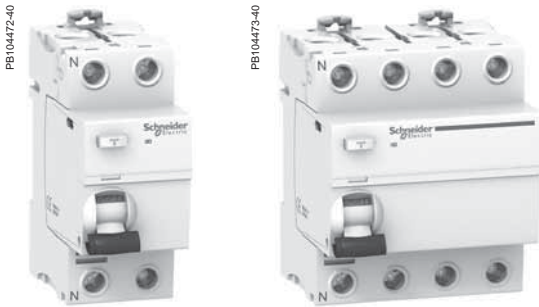
iID residual current circuit breakers

| Type | AC | Width in 9 mm module | | | | | | | |
|---------------------|-------------|----------------------|----------|----------|----------|----------|----------|----------|----------|
| Product | iID | | | | | | | | |
| 2P | Sensitivity | 10 mA | 30 mA | 100 mA | 300 mA | 500 mA | 300 mA | 500 mA | |
| | Rating | 16 A | A9R10216 | - | - | - | - | - | 4 |
| | | 25 A | A9R10225 | A9R71225 | - | A9R74225 | A9R16225 | - | |
| | | 40 A | - | A9R71240 | A9R12240 | A9R74240 | A9R16240 | - | |
| | | 63 A | - | A9R71263 | A9R12263 | A9R74263 | A9R16263 | A9R15263 | - |
| | | 80 A | - | A9R11280 | A9R12280 | A9R14280 | - | A9R15280 | - |
| | | 100 A | - | A9R11291 | A9R12291 | A9R14291 | - | A9R15291 | - |
| | Rating | 25 A | - | A9R71425 | - | A9R74425 | A9R16425 | - | 8 |
| | | 40 A | - | A9R71440 | A9R12440 | A9R74440 | A9R16440 | A9R15440 | A9R17440 |
| | | 63 A | - | A9R71463 | A9R12463 | A9R74463 | A9R16463 | A9R15463 | A9R17463 |
| | | 80 A | - | A9R11480 | A9R12480 | A9R14480 | A9R16480 | A9R15480 | A9R17480 |
| | | 100 A | - | A9R11491 | A9R12491 | A9R14491 | - | A9R15491 | - |
| | | | | | | | | | |
| Voltage rating (Ue) | 2P | 230 - 240 V | | | | | | | |
| | 4P | 400 - 415 V | | | | | | | |
| Operating frequency | 50/60 Hz | | | | | | | | |

iID residual current circuit breakers (A type)



IEC/EN 61008-1



- The iID residual current circuit breakers provide:
 - protection of persons against electric shock by direct contact (≤ 30 mA),
 - protection of persons against electric shock by indirect contact (≥ 100 mA),
 - protection of installations against the risk of fire (300 mA or 500 mA).

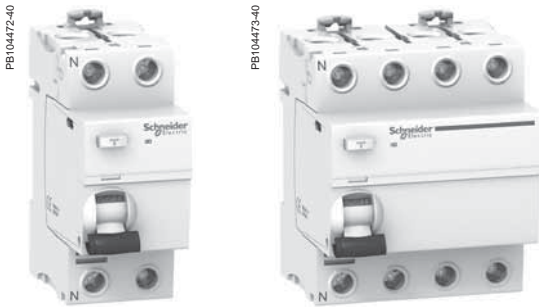
Catalogue numbers

| iID residual current circuit breakers | | A iID | | | | | | | Width in 9 mm module |
|---------------------------------------|----------|-------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|----------------------|
| Type | Product | Sensitivity | 10 mA | 30 mA | 100 mA | 300 mA | 500 mA | 300 mA | |
| 2P | Rating | 16 A | A9R20216 | - | - | - | - | - | 4 |
| | | 25 A | A9R20225 | A9R51225 | - | A9R54225 | - | - | |
| | | 40 A | - | A9R51240 | - | A9R54240 | - | A9R25240 | |
| | | 63 A | - | A9R51263 | - | A9R54263 | - | A9R25263 | |
| | | 100 A | - | A9R21291 | - | A9R24291 | - | A9R25291 | |
| 4P | Rating | 25 A | - | A9R51425 | - | A9R54425 | - | - | 8 |
| | | 40 A | - | A9R51440 | A9R22440 | A9R54440 | A9R26440 | A9R25440 | |
| | | 63 A | - | A9R51463 | A9R22463 | A9R54463 | A9R26463 | A9R25463 | |
| | | 80 A | - | A9R21480 | - | A9R24480 | - | A9R25480 | |
| | | 100 A | - | A9R21491 | - | A9R24491 | A9R26491 | A9R25491 | |
| Voltage rating (Ue) | 2P | 230 - 240 V | | | | | | | |
| | 4P | 400 - 415 V | | | | | | | |
| Operating frequency | 50/60 Hz | | | | | | | | |

iID residual current circuit breakers (Asi type)



IEC/EN 61008-1



- The iID residual current circuit breakers provide:
 - protection of persons against electric shock by direct contact (≤ 30 mA),
 - protection of persons against electric shock by indirect contact (≥ 300 mA),
 - protection of installations against the risk of fire (300 mA or 500 mA).

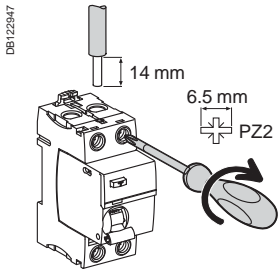
The Asi type provides increased immunity from electrical interference and polluted or corrosive environments.

Catalogue numbers

| iID residual current circuit breakers | | | | | | | |
|---------------------------------------|-------------|-------------|-----------------|-----------------|-----------------|-----------------|----------------------|
| Type | Asi | | | | | | Width in 9 mm module |
| Product | iID | | | | | | |
| | Sensitivity | 10 mA | 30 mA | 300 mA | 300 mA | 500 mA | |
| 2P | Rating | 16 A | - | - | - | - | 4 |
| | | 25 A | A9R30225 | A9R91225 | - | - | |
| | | 40 A | - | A9R91240 | - | A9R35240 | |
| | | 63 A | - | A9R91263 | - | A9R35263 | |
| | | 100 A | - | - | - | A9R35291 | |
| 4P | Rating | 25 A | - | A9R91425 | - | - | 8 |
| | | 40 A | - | A9R91440 | - | A9R35440 | |
| | | 63 A | - | A9R91463 | A9R34463 | A9R35463 | |
| | | 80 A | - | A9R31480 | - | A9R35480 | |
| | | 100 A | - | A9R31491 | A9R34491 | A9R35491 | |
| Voltage rating (Ue) | 2P | 230 - 240 V | | | | | |
| | 4P | 400 - 415 V | | | | | |
| Operating frequency | 50/60 Hz | | | | | | |

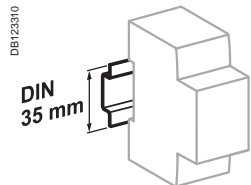
iID residual current circuit breakers (AC, A, Asi types)

Connection

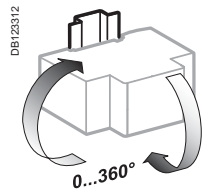


| Type | Tightening torque | Without accessory | | With accessories* | | | |
|------|-------------------|-------------------------|-------------------------|--------------------------------|---------------------------------------|------------------------|------------------------|
| | | Copper cables | | 50 mm ² Al terminal | Screw-on connection for ring terminal | Multi-cables terminal | |
| | | Rigid | Flexible or ferrule | | | Rigid cables | Flexible cables |
| iID | 3.5 N.m | 1 to 35 mm ² | 1 to 25 mm ² | 50 mm ² | Ø 5 mm | 3 x 16 mm ² | 3 x 10 mm ² |

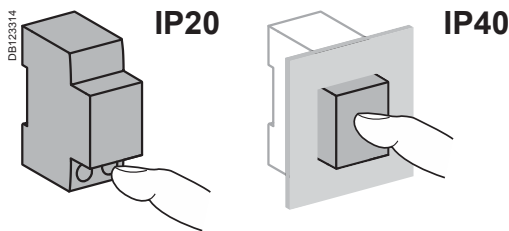
* See module CA907000



Clip on DIN rail 35 mm.



Indifferent position of installation.



Technical data

Main characteristics

According to IEC 60947

| | |
|---|-------|
| Insulation voltage (U _i) | 500 V |
| Pollution degree | 3 |
| Rated impulse withstand voltage (U _{imp}) | 6 kV |

According to IEC/EN 61008-1

| | | |
|---|--|------------------------------------|
| Making and breaking capacity (I _m /I _{Δm}) | 1500 A | |
| Surge current withstand (8/20 μs) without tripping | AC and A types (no selective \square) | 250 kA |
| | AC, A types (selective \square) | 3 kA |
| | Asi type | 3 kA |
| Conditional rated short circuit current (I _{nc} /I _{Δc}) | With iC60N/H/L | Equal to breaking capacity of iC60 |
| | With fuse | 10,000 A |

Additional characteristics

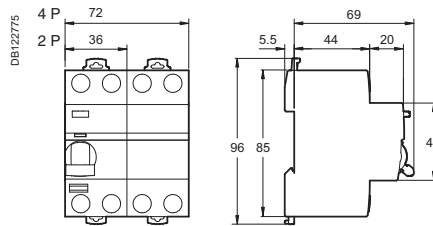
| | | | |
|-----------------------|-----------------------------|------------------------------|----------------|
| Degree of protection | Device only | IP20 | |
| | Device in modular enclosure | IP40 Insulation classe II | |
| Endurance (O-C) | Electrical (AC1) | 16 to 63 A | 15,000 cycles |
| | | 80 to 100 A | 10,000 cycles |
| | Mechanical | | 20,000 cycles |
| Operating temperature | AC type | | -5°C to +60°C |
| | A and Asi types | | -25°C to +60°C |
| Storage temperature | | | -40°C to +85°C |

iID residual current circuit breakers (AC, A, Asi types) (cont.)

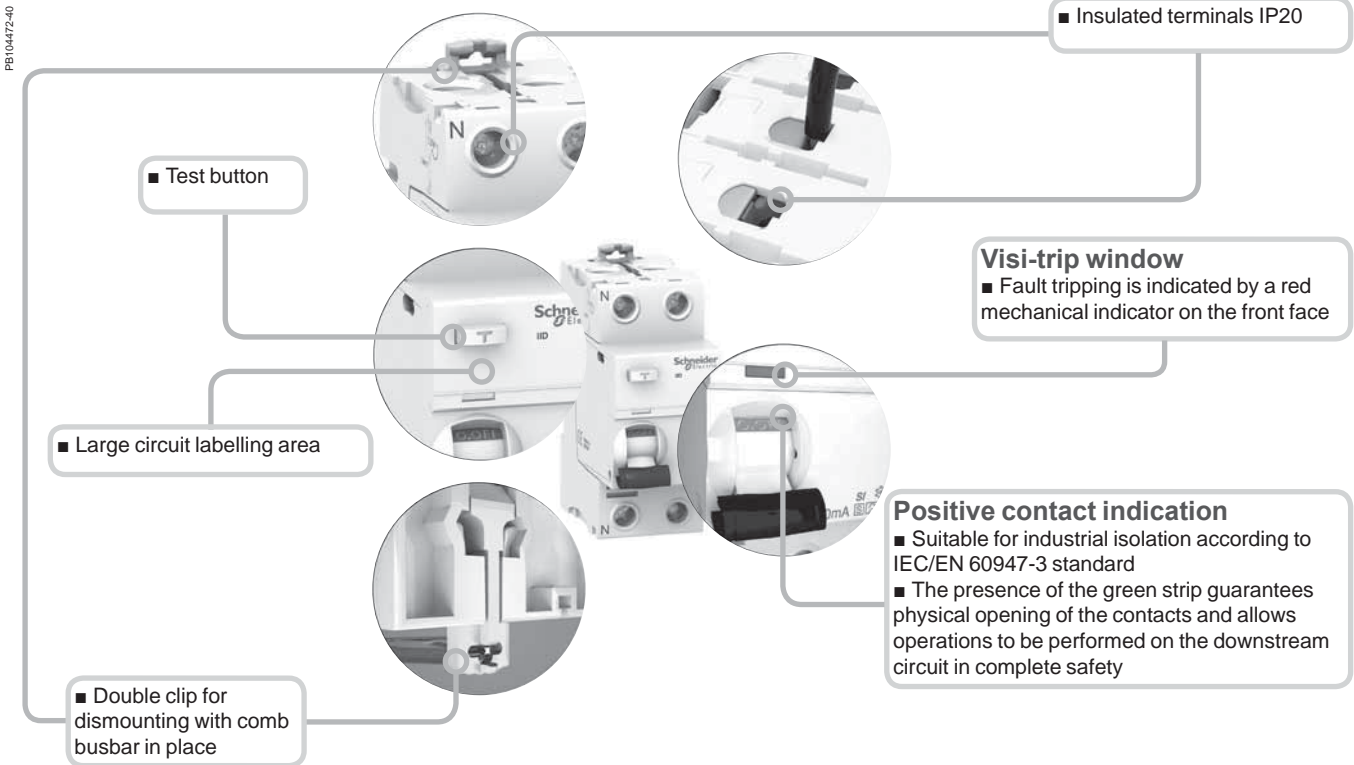
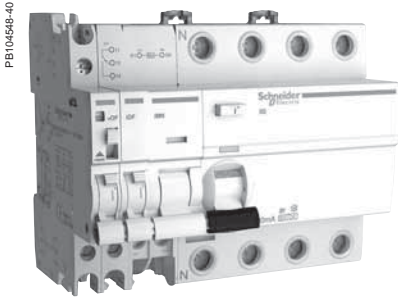
Weight (g)

| Residual current circuit breakers | |
|-----------------------------------|-----|
| Type | iID |
| 2P | 210 |
| 4P | 370 |

Dimensions (mm)



iID residual current circuit breakers (AC, A, Asi types) (cont.)

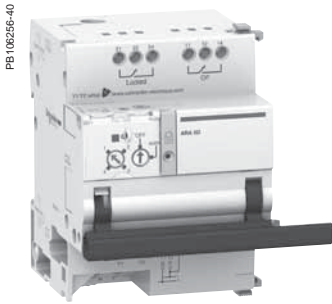


Asi type

The Asi type provides increased immunity from electrical interference and polluted or corrosive environments.

ARA automatic reclosers

For iC60 circuit breakers and iLD residual current circuit breakers



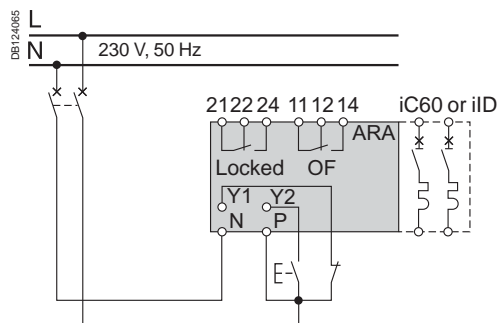
The ARA reclosing auxiliary can:

- Perform automatic reclosing of the associated protection device, after tripping.
- Increase the availability of installations without supervision, isolated, hard of access and demanding very great availability (mobile telephony systems, motorways, pumping stations, airports, railways, meteorological stations, service stations, automatic teller machines, public lighting, tunnels, etc.), by restoring them to operation without intervention by personnel in the event of a transient fault (atmospheric disturbances, industrial overvoltages, etc.).
- The operator can choose predefined reclosing program which allows the safety and availability of facilities to be reconciled taking into account the facility's environment.
- The circuit is placed in safety configuration by the padlocking device.

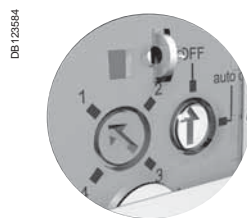
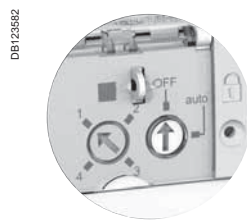
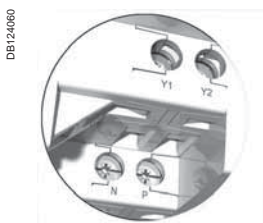
Catalogue numbers

| ARA iC60 | | | | |
|--------------------------------------|--------------------|-----------------|----------|-----------------------|
| For circuit breaker | | | | Width in 9 mm modules |
| 1P, 1P+N, 2P | Number of programs | Voltage | | |
| | 4 | 230 V AC, 50 Hz | A9C70132 | 7 |
| 3P, 4P | Number of programs | Voltage | | |
| | 4 | 230 V AC, 50 Hz | A9C70134 | 7 |
| ARA iLD | | | | |
| For residual current circuit breaker | | | | Width in 9 mm modules |
| 2P | Number of programs | Voltage | | |
| | 1 | 230 V AC, 50 Hz | A9C70342 | 7 |
| | 4 | 230 V AC, 50 Hz | A9C70332 | |
| 4P | Number of programs | Voltage | | |
| | 4 | 230 V AC, 50 Hz | A9C70334 | 7 |

Diagram



| Legend | | |
|----------------|----------------|---|
| Type | | Application |
| 1 | 2 | Choice of program |
| 4 | 3 | |
| Y1 | | |
| Y2 | | "Remote" inhibition of automatic reclosing |
| N | | Remote control of final reclosing |
| P | | 230 V power supply |
| Locked | | Automatic recloser inhibition indication contact |
| OF | | Indicates the state of the circuit breaker or residual current circuit breaker (opened or closed) |
| Indicator lamp | Flashing green | Normal operation |
| | Flashing red | Reclosing cycle in progress |
| | Fixed red | Automatic recloser inhibited |



ARA automatic reclosers (cont.)

For iC60 circuit breakers and iID residual current circuit breakers

Operating principle

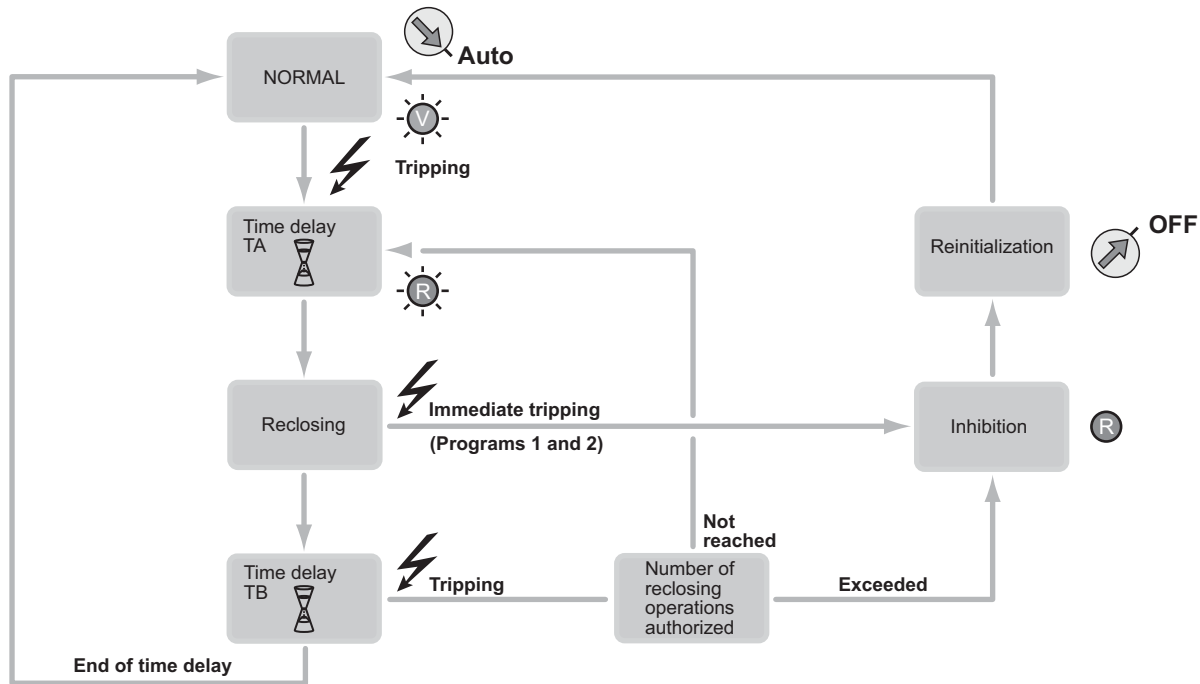
The ARA automatic recloser makes a number of attempts at reclosing depending on the program chosen by the user.

The program includes the following settings:

- A time delay before reclosing (TA).
- A reinitialization time delay (TB).
- A maximum number of reclosing attempts.

If, following these attempts, the fault is still present, the device places itself in waiting for manual reclosing, or final remote reclosing (Y2).

DB124062



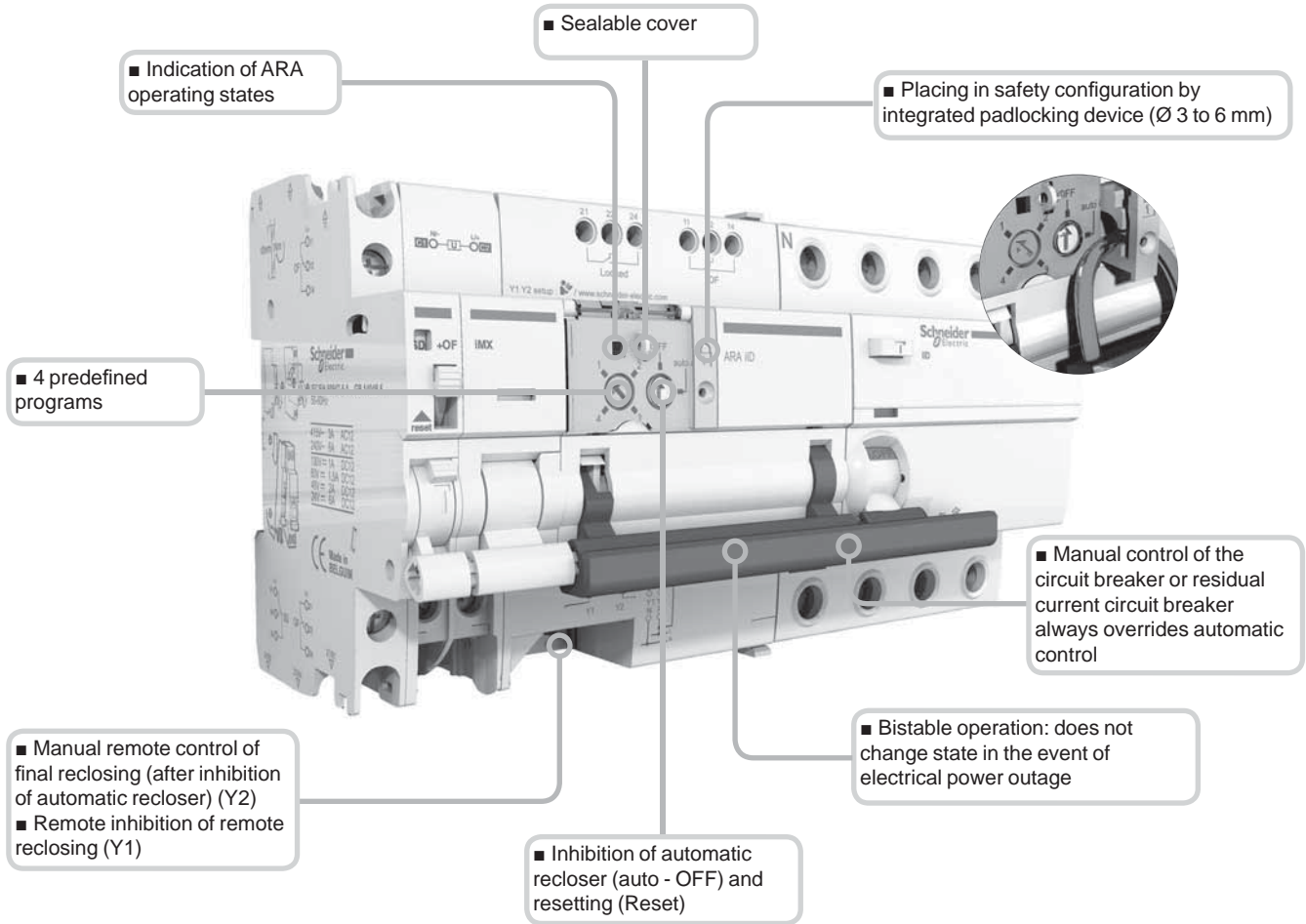
DB124061
DB124062
DB124063
DB124064
DB124063
DB124064

| | iC60 1P, 1P+N, 2P: A9C70132 3P, 4P: A9C70134 | iID | | Number of reclosing attempts | Delay before reclosing TA | Check time TB | Final reclosing Y2 |
|-----------------------------|--|--------------|------------------------------|------------------------------------|--|--|--------------------------|
| | | 2P: A9C70342 | 2P: A9C70332 4P: A9C70334 | | | | |
| 1 2 4 3 ↻ | ■ | - | ■ | 1 | 60 s | 6 min. | Once after inhibition |
| 1 2 4 3 ↻ | ■ | - | ■ | 3 | 60 s 3 min. 3 min. | 2 min. 6 min. 6 min. | |
| 1 2 4 3 ↻ | ■ | - | - | 5 | 60 s 3 min. 3 min. 3 min. | 2 min. 6 min. 6 min. 6 min. | |
| 1 2 4 3 ↻ | ■ | - | - | 5 | 60 s 3 min. 4 min. 5 min. 6 min. | 2 min. 6 min. 8 min. 10 min. 12 min. | Once per cycle |
| 1 2 4 3 ↻ | - | - | ■ | 5 | 60 s 4 min. 10 min. 1 h 6 h | 2 min. 3 min. 6 min. 10 min. 10 min. | |
| 1 2 4 3 ↻ | - | - | ■ | 15 | 20 s 40 s 3 min. 3 min. ... | 30 min. 30 min. ... | |
| Only 1 program available | - | ■ | - | | | | |

ARA automatic reclosers (cont.)

For iC60 circuit breakers
and iID residual current circuit breakers

PB106950-78

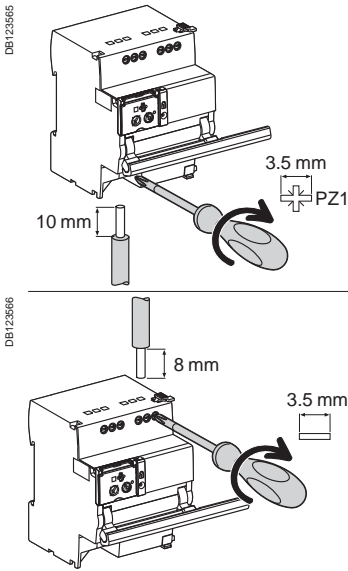


| Indication auxiliaries | Tripping auxiliaries | ARA remote control | iC60 or iID device | Vigi iC60 add-on RCD |
|------------------------|-----------------------------|---------------------|--------------------|----------------------|
| | | | | |
| No | 1 (iSD or iOF or iOF/SD+OF) | 1 (iMX or iMN) max. | | |
| 1 iOF | 1 (iSD or iOF or iOF/SD+OF) | No | <p>ARA</p> | <p>Vigi iC60</p> |
| | | | <p>iC60</p> | |
| | | | <p>iID</p> | |

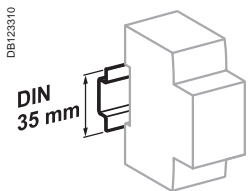
ARA automatic reclosers (cont.)

For iC60 circuit breakers
and iID residual current circuit breakers

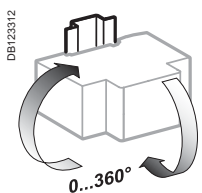
Connection



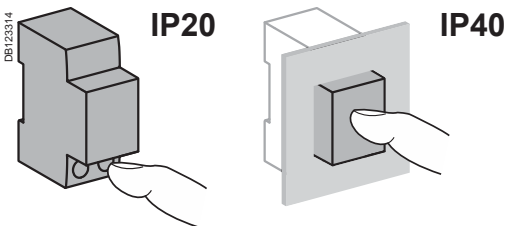
| Terminal | Tightening torque | Without accessories | | |
|--------------------------------------|-------------------|--|--|--|
| | | Copper cables Rigid | Flexible | Flexible with ferrule |
| Power supply (N/P) Inputs (Y1/Y2) | 1 N.m | 0.5 to 10 mm ² 2 x 0.5 to 2 x 2.5 mm ² | 0.5 to 6 mm ² 2 x 0.5 to 2 x 2.5 mm ² | 0.5 to 4 mm ² 2 x 0.5 to 2 x 2.5 mm ² |
| Outputs (OF/Locked) | 0.7 N.m | 0.5 to 2.5 mm ² 2 x 0.5 to 2 x 1.5 mm ² | 0.5 to 2.5 mm ² 2 x 0.5 to 2 x 1.5 mm ² | 0.5 to 1.5 mm ² 2 x 0.5 to 2 x 1.5 mm ² |



Clip on DIN rail 35 mm.



Indifferent position of installation.



Technical data

| Control circuit | | |
|---|---|-------------------------------|
| Supply voltage (Ue) (N/P) | 230 V AC, 50 Hz | |
| Control voltage (Uc) | Type 1 inputs (Y1/Y2) | 230 V AC (as per IEC 61131-2) |
| Min. duration of control order (Y2) | ≥ 200 ms | |
| Response time (Y2) | < 500ms | |
| Consumption | ≤ 1 W | |
| Thermal self-protection with automatic Reset against overheating of the control circuit due to an abnormal number of operations | | |
| Endurance (O-C) (ARA combined with a circuit breaker) | | |
| Electrical | 5000 cycles | |
| Indication / Remote control | | |
| Potential-free changeover contact output (OF/Locked) | Min. | 24 V AC/DC, 10 mA |
| | Max. | 230 V AC, 1 A |
| Input (Y1/Y2) | 230 V AC | 5 mA |
| Additional characteristics | | |
| Degree of protection (IEC 60529) | Device only | IP20 |
| | Device in a modular enclosure | IP40 Insulation class II |
| Insulation voltage (Ui) | 400 V | |
| Degree of pollution (IEC 60947) | 3 | |
| Rated impulse withstand voltage (Uimp) | 6 kV | |
| Operating temperature | -25°C to +60°C | |
| Storage temperature | -40°C to +70°C | |
| Tropicalization | Treatment 2 (relative humidity of 93 % at +40°C) | |

ARA automatic reclosers (cont.)

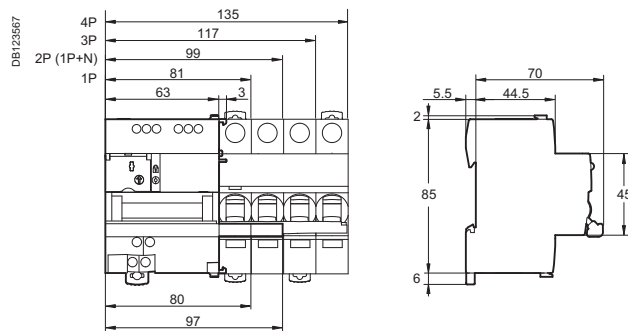
For iC60 circuit breakers

and iLD residual current circuit breakers

Weight (g)

| Automatic reclosers | |
|--|-----|
| Type | ARA |
| For 1P, 1P+N, 2P circuit breakers or iLD 2P residual current circuit breaker | 440 |
| For 3P, 4P circuit breakers or iLD 4P residual current circuit breaker | 470 |

Dimensions (mm)



Residual current devices iDPN Vigi



IEC/EN 61009



iDPNa Vigi



iDPN H Vigi

- The iDPN Vigi residual current device provide complete protection for final circuits (against overcurrents and insulation faults):
 - protection for users against electric shocks by direct contacts (y 30 mA),
 - protection for users against electric shocks by indirect contacts (300 mA),
 - protection of the installations against fire risks (300 mA).

- The *SI* range has been designed to maintain a network with optimum safety and continuity of service in installations disturbed by:
 - extreme atmospheric conditions,
 - harmonic generating loads,
 - transient operating currents.

iDPN N Vigi 6000

| Type | | AC | | A | | | SI | | | Width in 9 mm modules | | |
|---------------------|-------------|---------------------|----------|----------|----------|----------|----------|----------|----------|-----------------------|----------|--------|
| 1P+N | Curve B | Sensitivity | 30 mA | 300 mA | 10 mA | 30 mA | 100 mA | 300 mA | 30 mA | | 100 mA | 300 mA |
| | Rating (In) | 4 A | A9D55604 | A9D68604 | - | A9D56604 | A9D60604 | A9D69604 | - | - | - | 4 |
| | | 6 A | A9D55606 | A9D68606 | - | A9D56606 | A9D60606 | A9D69606 | - | - | - | |
| | | 10 A | A9D55610 | A9D68610 | A9D08610 | A9D56610 | A9D60610 | A9D69610 | - | - | - | |
| | | 13 A | - | - | - | A9D56613 | A9D60613 | A9D69613 | - | - | - | |
| | | 16 A | A9D55616 | A9D68616 | A9D08616 | A9D56616 | A9D60616 | A9D69616 | - | - | - | |
| | | 20 A | A9D55620 | A9D68620 | - | A9D56620 | A9D60620 | A9D69620 | - | - | - | |
| | | 25 A | A9D55625 | A9D68625 | - | A9D56625 | A9D60625 | A9D69625 | - | - | - | |
| | | 32 A | A9D55632 | A9D68632 | - | A9D56632 | A9D60632 | A9D69632 | - | - | - | |
| | | 40 A | A9D55640 | A9D68640 | - | A9D56640 | A9D60640 | A9D69640 | - | - | - | |
| | Rating (In) | 6 A | A9D31606 | A9D41606 | - | A9D32606 | A9D52606 | A9D42606 | A9D33606 | A9D53606 | A9D43606 | 4 |
| | | 10 A | A9D31610 | A9D41610 | A9D02610 | A9D32610 | A9D52610 | A9D42610 | A9D33610 | A9D53610 | A9D43610 | |
| | | 13 A | - | - | - | A9D32613 | A9D52613 | A9D42613 | A9D33613 | A9D53613 | A9D43613 | |
| | | 16 A | A9D31616 | A9D41616 | A9D02616 | A9D32616 | A9D52616 | A9D42616 | A9D33616 | A9D53616 | A9D43616 | |
| | | 20 A | A9D31620 | A9D41620 | - | A9D32620 | A9D52620 | A9D42620 | A9D33620 | A9D53620 | A9D43620 | |
| | | 25 A | A9D31625 | A9D41625 | - | A9D32625 | A9D52625 | A9D42625 | A9D33625 | A9D53625 | A9D43625 | |
| | | 32 A | A9D31632 | A9D41632 | - | A9D32632 | A9D52632 | A9D42632 | A9D33632 | A9D53632 | A9D43632 | |
| | | 40 A | A9D31640 | A9D41640 | - | A9D32640 | A9D52640 | A9D42640 | A9D33640 | A9D53640 | A9D43640 | |
| | | Voltage rating (Ue) | | 230 V AC | | | | | | | | |
| Operating frequency | | 50 Hz | | | | | | | | | | |

iDPN H Vigi 10000

| Type | | A | | SI | | Width in 9 mm modules | |
|---------------------|-------------|-------------|----------|----------|----------|-----------------------|--------|
| 1P+N | Curve B | Sensitivity | 30 mA | 300 mA | 30 mA | | 300 mA |
| | Rating (In) | 6 A | A9D07606 | - | - | - | 4 |
| | | 10 A | A9D07610 | - | - | - | |
| | | 16 A | A9D07616 | - | - | - | |
| | | 20 A | A9D07620 | - | - | - | |
| | | 25 A | A9D07625 | - | - | - | |
| | | 32 A | A9D07632 | - | - | - | |
| | Rating (In) | 6 A | A9D37606 | A9D47606 | A9D38606 | A9D48606 | 4 |
| | | 10 A | A9D37610 | A9D47610 | A9D38610 | A9D48610 | |
| | | 16 A | A9D37616 | A9D47616 | A9D38616 | A9D48616 | |
| | | 20 A | A9D37620 | A9D47620 | A9D38620 | A9D48620 | |
| | | 25 A | A9D37625 | A9D47625 | A9D38625 | A9D48625 | |
| | | 32 A | A9D37632 | A9D47632 | A9D38632 | A9D48632 | |
| Voltage rating (Ue) | | 230 V AC | | | | | |
| Operating frequency | | 50 Hz | | | | | |

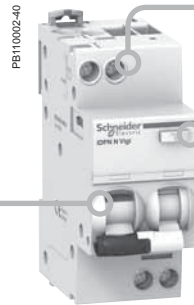
Residual current devices iDPN Vigi (cont.)

■ Fast contact closure

■ Insulated terminals IP20

Visi-trip double window

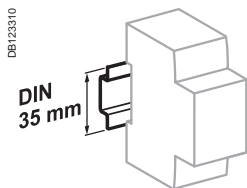
- Fault tripping circuit breaker is indicated by a red mechanical indicator on the front face.
- Earth fault is indicated by a red mechanical indicator on the front face



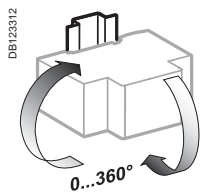
■ Test button

Positive contact indication

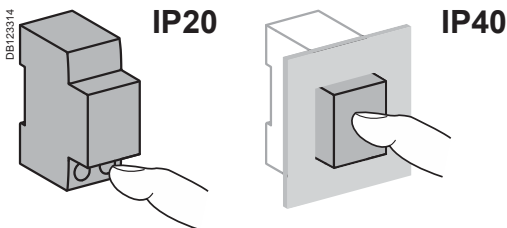
- A green strip on the toggle guarantees opening of all the poles in safety conditions (padlocking possible) for work to be carried out on live parts



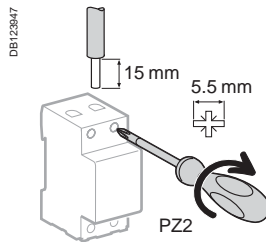
Clip on DIN rail 35 mm.



Indifferent position of installation.



Connection



| Rating | Tightening torque | Copper cables | |
|-----------|-------------------|-------------------------|-------------------------|
| | | Rigid | Flexible or ferrule |
| 4 to 40 A | 3.5 N.m | 1 to 16 mm ² | 1 to 10 mm ² |

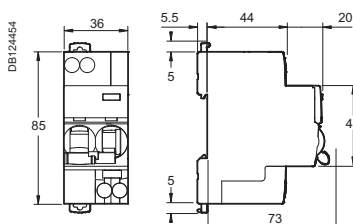
Technical data

| Main characteristics | | | |
|--|--|---------------------------------|---------------|
| | iDPN a Vigi | iDPN N Vigi | iDPN H Vigi |
| Insulation voltage (U _i) | 400 V AC | | |
| Pollution degree | 3 | | |
| Rated impulse withstand voltage (U _{imp}) | 4 kV | | |
| Setting temperature for ratings | 30°C | | |
| Magnetic tripping | Curve B | Between 3 and 5 I _n | |
| | Curve C | Between 5 and 10 I _n | |
| According to EN 61009 | | | |
| Limitation class | 3 | | |
| Rated breaking capacity (I _{cn}) | 4500 A | 6000 A | 10,000 A |
| Rated residual breaking and making capacity (I _{Δm}) | 4500 A | 6000 A | 10,000 A |
| 8/20 μs impulse withstand | Type AC | 250 Å | 250 Å |
| | Type A | 250 Å | 250 Å |
| | Type SI | - | 3 kÅ |
| Additional characteristics | | | |
| Earth leakage protection with instantaneous tripping | 10, 30, 300 mA | 10, 30, 100, 300 mA | 30, 300 mA |
| Degree of protection (IEC 60529) | Device only | IP20 | |
| | Device in modular enclosure | IP40 Insulation classe II | |
| Endurance (O-C) | Electrical | ≤ 20 A | 20,000 cycles |
| | | ≥ 25 A | 10,000 cycles |
| | Mechanical | 20,000 cycles | |
| Overvoltage category (IEC 60364) | III | | |
| Operating temperature | Type AC | -5°C to +60°C | |
| | Type A, SI | -25°C to +60°C | |
| Storage temperature | -40°C to +85°C | | |
| Topicalization (IEC 60068-1) | Treatment 2 (relative humidity 95 % to 55°C) | | |

Weight (g)

| Residual current device | |
|-------------------------|-----------|
| Type | iDPN Vigi |
| 1P+N | 125 |

Dimensions (mm)



Electrical auxiliaries for iC60, iID, iSW-NA, RCA and ARA

■ The electrical auxiliaries are combined with iC60 circuit breakers, iID residual current circuit breakers, remote tripping switch disconnectors iSW-NA, RCA remote controls and ARA automatic reclosers; they enable tripping or remote indication of their position (open/closed/tripped) upon a fault.

■ They are fastened by clips (without tools) to the left side of the breaker.

■ The iOF/SD+OF auxiliary is a 2-in-1 product: via a mechanical selector switch, it provides two contacts, OF+SD or OF+OF.

IEC/EN 60947-1

■ Tripping auxiliaries:

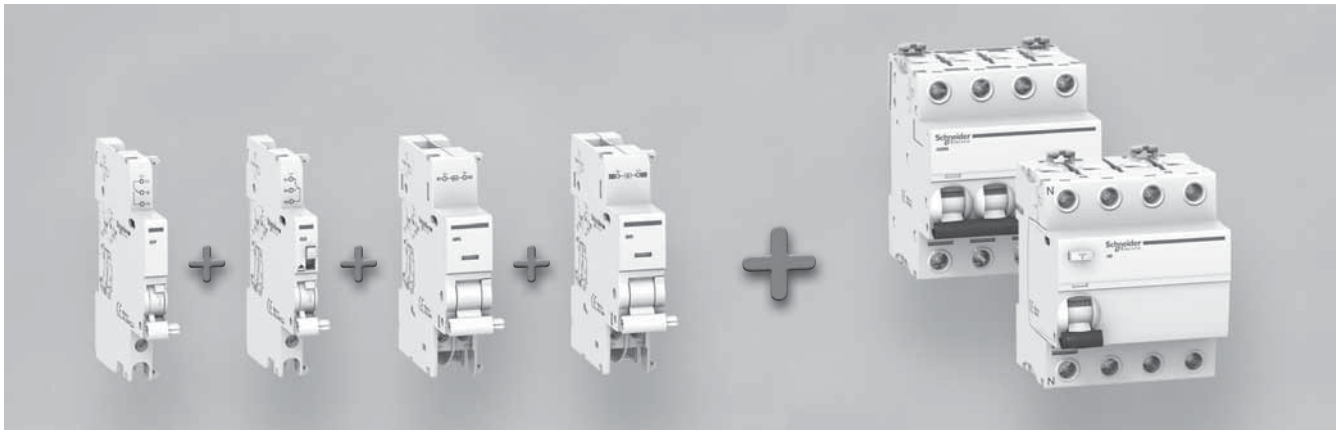
- iMN: undervoltage release
- iMNs: delayed undervoltage release
- iMNx: undervoltage release, independant from supply voltage
- iMSU: overvoltage release
- iMX: shunt release
- iMX+OF: shunt release with open/close contact.

IEC/EN 60947-5-1

■ Indication auxiliaries:

- iOF: open/close contact
- iSD: fault indicating contact
- iOF/SD+OF: open/close contact and switchable OF or SD contact.



















DB123545



Protection
Circuit protection
Earth leakage protection

Electrical auxiliaries for iC60, iID, iSW-NA, RCA and ARA (cont.)

Combination table

| Electrical auxiliaries | | | Remote control | Devices | |
|------------------------|-------------------------------|--|---|--|--|
| Indication auxiliaries | | Tripping auxiliaries | ARA automatic recloser or RCA remote control | iC60/iID/ iSW-NA* | Vigi |
| Position | | Max quantity | | | |
| Left | Right | | | | |
| 1 iOF/SD+OF | + 1 iOF/SD+OF | + 1 (iMN, iMNs, iMNx or iMX, iMX+OF or iMSU) | - |  PB104440-25 |  PB104466-25 |
| Or 1 iOF | + 1 (iSD or iOF or iOF/SD+OF) | + 2 (iMN, iMNs, iMNx or iMX, iMX+OF or iMSU) | |  PB104440-25 |  PB104466-25 |
| Or None | + None | + 3 x iMSU | |  PB104440-25 |  PB104466-25 |
| None | + 1 (iSD or iOF or iOF/SD+OF) | + 1 (iMN, iMNs, iMNx or iMX, iMX+OF or iMSU) |  PB106256-25 |  PB104440-25 |  PB104466-25 |
| Or 1 iOF | + 1 (iSD or iOF or iOF/SD+OF) | + None |  PB106253-25 |  PB104440-25 |  PB104466-25 |
| None | + 1 (iSD or iOF or iOF/SD+OF) | + 1 (iMN, iMNs, iMNx or iMX, iMX+OF or iMSU) |  PB106253-25 |  PB104440-25 |  PB104466-25 |
| Or 1 iOF | + 1 (iSD or iOF or iOF/SD+OF) | + None |  PB106253-25 |  PB104440-25 |  PB104466-25 |

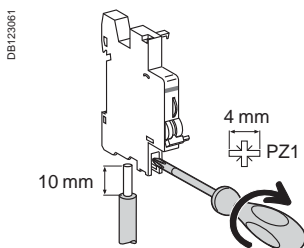
Other possible associations: see technical pages







Tripping devices must be mounted first.

*iSW-NA : the iSD auxiliary contact must be associated with an auxiliary (iMN, iMX, iMX+OF); it indicates that the remote tripping switch disconnector has been tripped open.

Connection






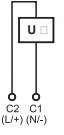
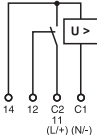

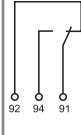
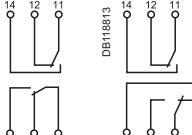


| Type | Tightening torque | Copper cables | | Multi-cables terminal | |
|------------------------|-------------------|---|---|---|---|
| | | Rigid | Flexible | Rigid | With ferrule |
| Indication auxiliaries | 1 N.m |  DB122345 |  DB123007 |  DB123011 |  DB123008 |
| Tripping auxiliaries | 1 N.m | 1 to 4 mm ² | 0.5 to 2.5 mm ² | 2 x 2.5 mm ² | 2 x 1.5 mm ² |
| | | 1 to 6 mm ² | 0.5 to 4 mm ² | 2 x 2.5 mm ² | 2 x 2.5 mm ² |



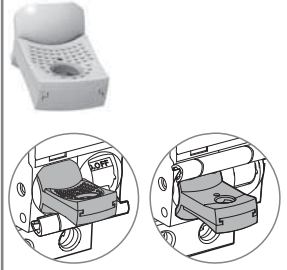
Electrical auxiliaries for iC60, iID, iSW-NA, RCA and ARA (cont.)

| | | Tripping | | | | | | | |
|---------------------------------|------|---|-----------------|---|-----------------|--|-----------------|--|-----------------|
| Auxiliaries | | iMN | | iMNs | | iMNx | | iMSU | |
| Type | | Undervoltage release | | | | | | Overvoltage release | |
| | | Instantaneous | | Delayed | | Independent of the supply voltage | | | |
| | | | | | | | | | |
| Function | | <ul style="list-style-type: none"> Trips the device with which it is combined when its input voltage decreases (between 70 % and 35 % U_n). Prevents device closing again until its input voltage is restored | | | | | | <ul style="list-style-type: none"> Switches off the power supply by opening the breaker with which it is combined, in the event that the phase/neutral voltage is exceeded (loss of neutral). For a four-phase network, use three iMSU tripping auxiliaries | |
| | | | | <ul style="list-style-type: none"> Not tripping on transient voltage dip (up to 0.2 s) | | <ul style="list-style-type: none"> Separate input and power supply | | <ul style="list-style-type: none"> Tripping voltage: 275 V AC Tripping voltage: 255 V AC | |
| Wiring diagrams | | | | | | | | | |
| Use | | <ul style="list-style-type: none"> Emergency stoppage by normally closed push button Ensures the safety of power supply circuits for several machines by preventing "uncontrolled" restarting | | | | <ul style="list-style-type: none"> Emergency stoppage with fail-safe principle Insensitive to control circuit voltage variation to increase service continuity | | <ul style="list-style-type: none"> Protection of equipment against overvoltages on the electrical network (neutral conductor break) Voltage monitoring between phase and neutral conductors | |
| Catalogue numbers | | A9A26960 | A9A26961 | A9A26959 | A9A26963 | A9A26969 | A9A26971 | A9A26979 | A9A26479 |
| Technical specifications | | | | | | | | | |
| Rated voltage (U_e) | V AC | 220...240 | 48 | 115 | 220...240 | 220...240 | 380...415 | 230 | 230 |
| | V DC | – | 48 | – | – | – | – | – | – |
| Operating frequency | Hz | 50/60 | 400 | 50/60 | 50/60 | 50/60 | – | 50/60 | – |
| | | – | – | – | – | – | – | – | – |
| Red mechanical indicator | | On front face | | | On front face | | On front face | | On front face |
| Test function | | – | | | – | | – | | – |
| Width in 9 mm modules | | 2 | | | 2 | | 2 | | 2 |
| Operating current | | – | | | – | | – | | – |
| Number of contacts | | – | | | – | | – | | – |
| Operating temperature | °C | -35...+70 | | | -35...+70 | | -35...+70 | | -35...+70 |
| | | – | | | – | | – | | – |
| Storage temperature | °C | -40...+85 | | | -40...+85 | | -40...+85 | | -40...+85 |
| | | – | | | – | | – | | – |







Electrical auxiliaries for iC60, iID, iSW-NA, RCA and ARA (cont.)

| | | | Indication | | | | | | |
|---|---|-----------------------------------|--|------------------------------|---|---|---|---------------|--|
| iMX | | | iMX+OF | iOF | iSD | iOF/SD+OF | | | |
| Shunt release | | | | Open/close auxiliary contact | Fault indicating contact | Double open/close or fault indicating contact | | | |
| | | With Open/Close auxiliary contact | | | | | | | |
| PB104496-35 |  | PB104497-35 |  | PB104474-35 |  | PB104476-35 |  | PB104475-35 |  |
| <ul style="list-style-type: none"> Trips the breaker when powered | | | <ul style="list-style-type: none"> Changeover contact indicates "open" or "closed" position of the breaker | | <ul style="list-style-type: none"> Changeover contact indicates position of the breaker; upon: <ul style="list-style-type: none"> electrical fault action on tripping auxiliary Same indication as VISI-TRIP | | <ul style="list-style-type: none"> The iOF/SD+OF auxiliary is a 2-in-1 product: via a mechanical selector switch, it provides two contacts, OF+SD or OF+OF | | |
| | | | <ul style="list-style-type: none"> Includes an open/close contact (OF) to indicate the "open" or "closed" position of the breaker | | | | | | |
| DB123012 |  | DB118808 |  | DB118810 |  | DB118811 |  | DB118812 |  |
| | | | | | | | OF position | | SD position |
| <ul style="list-style-type: none"> Emergency stoppage by normally open push button | | | <ul style="list-style-type: none"> Emergency stoppage by normally open push button Remote indication of the position of the associated breaker | | <ul style="list-style-type: none"> Remote indication of the position of the associated breaker | | <ul style="list-style-type: none"> Remote indication of tripping upon a fault of the associated breaker | | <ul style="list-style-type: none"> Remote indication of position and/or tripping upon a fault of the associated breaker |
| A9A26476 | A9A26477 | A9A26478 | A9A26946 | A9A26947 | A9A26948 | A9A26924 | A9A26927 | A9A26929 | |
| 100...415 | 48 | 12...24 | 100...415 | 48 | 12...24 | 240...415 | 240...415 | 240...415 | |
| 110...130 | 48 | 12...24 | 110...130 | 48 | 12...24 | 24...130 | 24...130 | 24...130 | |
| 50/60 | | | 50/60 | | | 50/60 | | 50/60 | |
| On front face | | | On front face | | | On front face | | On front face | |
| - | | | - | | | On toggle | | On toggle | |
| 2 | | | 2 | | | 1 | | 1 | |
| - | | | y 24 V DC | | 6 A | 24 V DC | | 6 A | |
| - | | | 48 V DC | | 2 A | 48 V DC | | 2 A | |
| - | | | y 130 V DC | | 1 A | 60 V DC | | 1.5 A | |
| - | | | y 240 V AC | | 6 A | 130 V DC | | 1 A | |
| - | | | 415 V AC | | 3 A | 240 V AC | | 6 A | |
| - | | | | | | 415 V AC | | 3 A | |
| - | | | 1 NO/NC | | | 1 NO/NC | | | |
| -35...+70 | | | -35...+70 | | | -35...+70 | | -35...+70 | |
| -40...+85 | | | -40...+85 | | | -40...+85 | | -40...+85 | |

Accessories for iC60, iID, iSW-NA, Reflex iC60, RCA and ARA

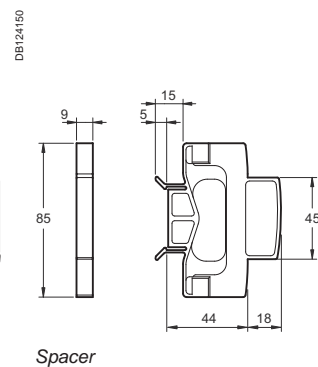
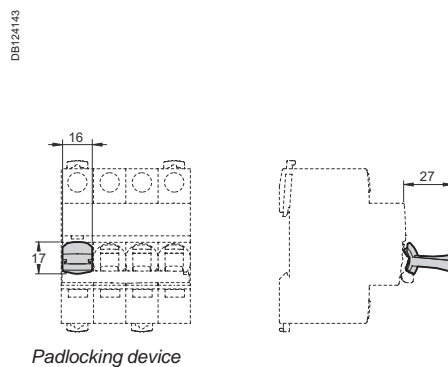
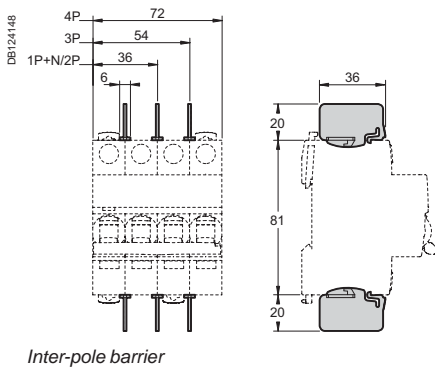
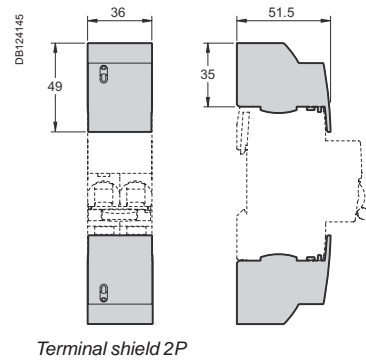
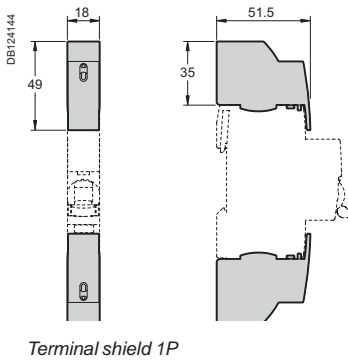
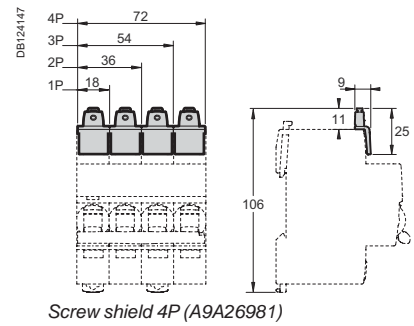
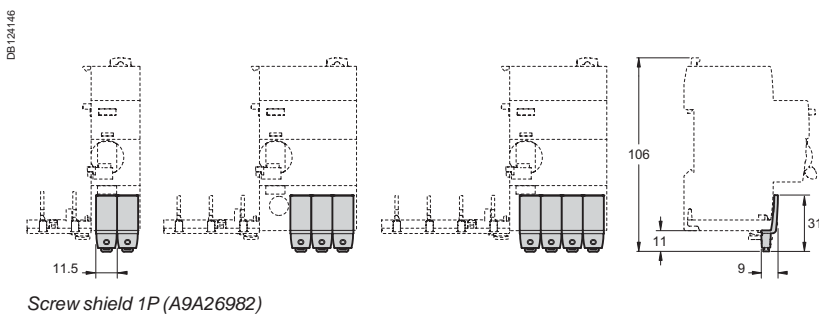
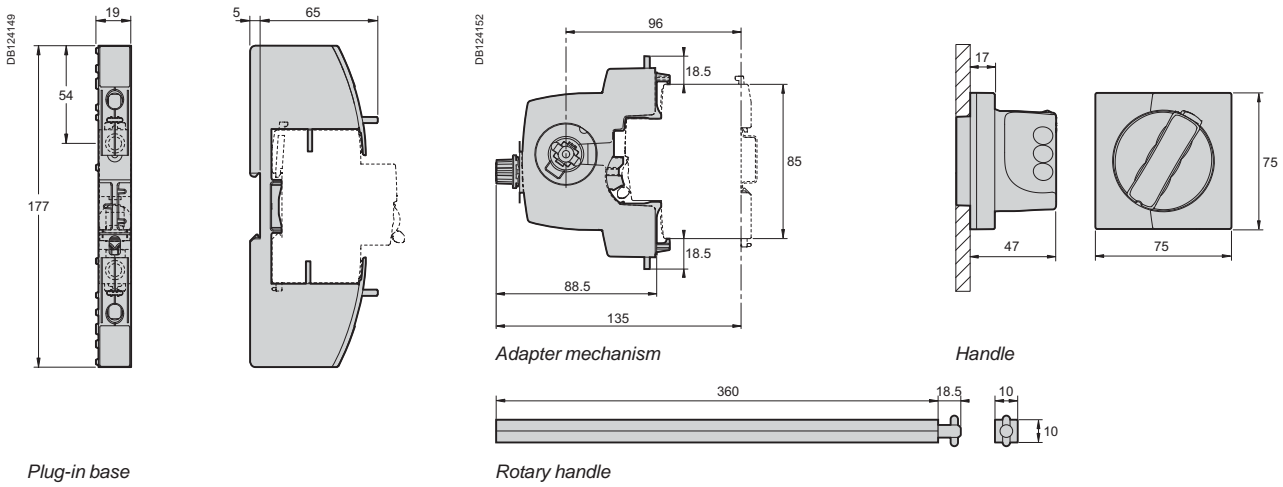
| | | | | Mounting | | | |
|-------------------------------------|---|-------------------------------|------------------------------|--|--|---|--|
| Accessories | Rotary handle | | | Plug-in base | Padlocking device | | |
| |  | | |  |  | | |
| Function | <p>Front or side-mounted control</p> <ul style="list-style-type: none"> ■ Degree of protection: IP55 rotary handle ■ Installation: <ul style="list-style-type: none"> □ the control mechanism is mounted on the device □ the rotary handle is fixed to the front or side of the enclosure ■ Front-mounted (on door or faceplate) ■ Prevents the door from opening when the device is in the ON position (can be deactivated) ■ Can be padlocked when the device is in the "open" position (can be padlocked with the device in the "closed" position subject to adaptation) ■ Can be locked by padlock of (dia. 5 to 8 mm), not supplied with the device ■ Pushbutton: iID test available in the front face of the rotary handle | | | <ul style="list-style-type: none"> ■ The Laser Square tool brings the accuracy to align the circuit breaker and the rotary handle | <p>Allows a breaker to be removed or replaced quickly, without handling the connections</p> <ul style="list-style-type: none"> ■ Degree of protection: IP20 ■ Consists of: <ul style="list-style-type: none"> □ a base to be fastened on a rail (or panel) □ 2 "blades" to be fastened in the device's terminals ■ Connection: tunnel terminals for cable up to 35 mm² rigid, 25 mm² flexible, ■ Installation: <ul style="list-style-type: none"> □ in universal enclosure □ on horizontal rail ■ Height: 178 mm ■ Not compatible with Vigi iC60 and auxiliaries ■ Can be locked by padlock of (dia. 6 mm), not supplied with the device | <p>Used to padlock breaker in open or closed position</p> <ul style="list-style-type: none"> ■ Padlock diameter: 3 to 6 mm ■ Sealable (max. diameter: 1.2 mm) ■ Locking in ON position does not prevent tripping of the breaker in the event of faults ■ Suitable for IEC/EN 60947-2 compliant disconnection | |
| Catalogue numbers | A9A27005 black handle | A9A27006 red handle | A9A27008 no handle | GVP01 | A9A27003 (1 per pole) | A9A26970 | |
| Set of | 1 | 1 | 1 | 1 | 1 | 10 | |
| Suitability | | | | | | | |
| iC60 | ■ 2P, 3P, 4P | | | | | ■ | |
| iC60 + Vigi iC60 | ■ 2P, 3P, 4P | | | | | ■ | |
| iID | ■ | | | | ■ ≤ 63 A | ■ | |
| Reflex iC60 or RCA+iC60 or ARA+iC60 | - | | | | | ■ | |
| ARA+iID | - | | | | | ■ | |
| iSW-NA | ■ | | | | ■ | ■ | |

Accessories for iC60, iID, iSW-NA, Reflex iC60, RCA and ARA (cont.)

| | | Security | | | | | |
|-------------------------------------|--|---|---|---|---|---|---|
| Accessories | | Screw shield | | Terminal shield | | Inter-pole barrier | Spacer |
| | |  |  |  |  |  |  |
| Function | | Prevents any contact with the connecting screws <ul style="list-style-type: none"> Upgrades degree of protection to IP20D Sealable, max. diameter 1.2 mm | | Prevents any contact with the terminals <ul style="list-style-type: none"> Upgrades degree of protection to IP20D Sealable, max. diameter 1.2 mm Set of two, for upstream and downstream terminals For 3 poles: A9A26975 + A9A26976 For 4 poles: 2 X A9A26976 | | Enhances insulation between connections: cables, terminals, lugs, etc | <ul style="list-style-type: none"> Used to: <ul style="list-style-type: none"> complete rows separate devices. Width: 1 x 9 mm module Allows cable routing from one row to another, (above and below), up to 6 mm² |
| Catalogue numbers | | A9A26982 | A9A26981 | A9A26975 | A9A26976 | A9A27001 | A9A27062 |
| Set of | | 12 x 1 pole | 20 x 4 poles (splittable) | 2 x 1 pole | 2 x 2 poles | 10 | 5 |
| Suitability | | | | | | | |
| iC60 | | – | ■ | ■ | ■ | ■ | ■ |
| Vigi iC60 | | ■ | – | – | – | – | ■ |
| iID | | – | ■ | – | ■ | ■ | ■ |
| Reflex iC60 or RCA+iC60 or ARA+iC60 | | – | ■ | ■ | ■ | ■ | ■ |
| ARA+iID | | – | ■ | – | ■ | ■ | ■ |
| iSW-NA | | – | ■ | – | ■ | ■ | ■ |

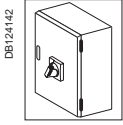
Accessories for iC60, iLD, iSW-NA, Reflex iC60, RCA and ARA (cont.)

Dimensions (mm)

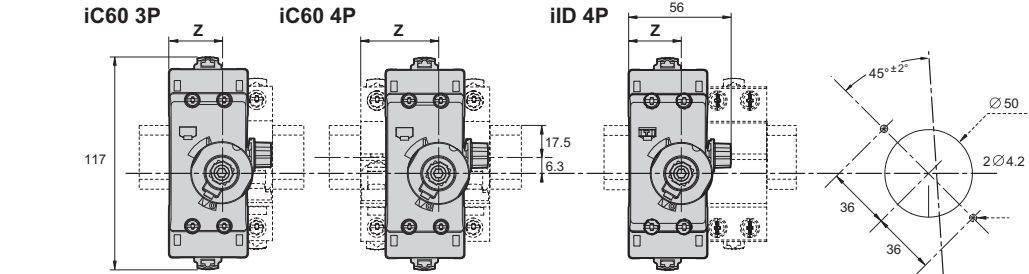


Rotary handle installation

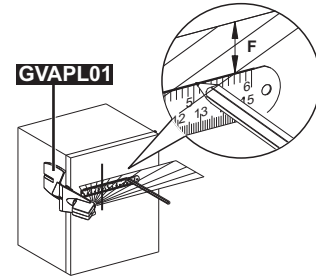
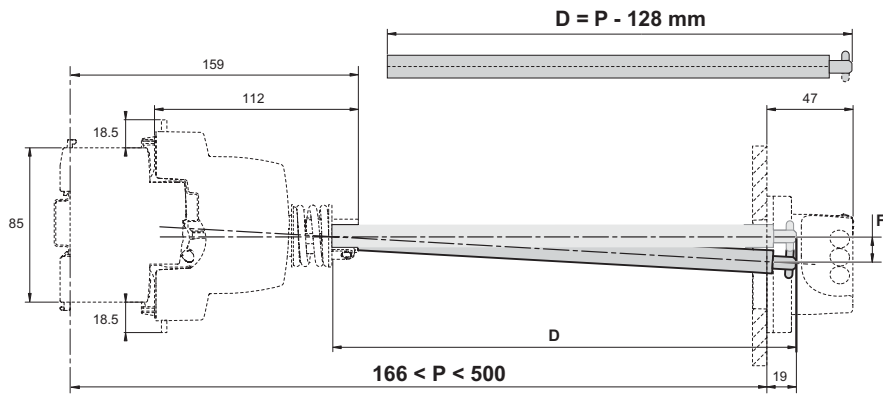
Dimensions (mm)



| iC60 | Z (mm) |
|-----------|--------|
| 2P | 25.3 |
| 2P + Vigi | 25.3 |
| 3P | 25.3 |
| 3P + Vigi | 43 |
| 4P | 43 |
| 4P + Vigi | 43 |

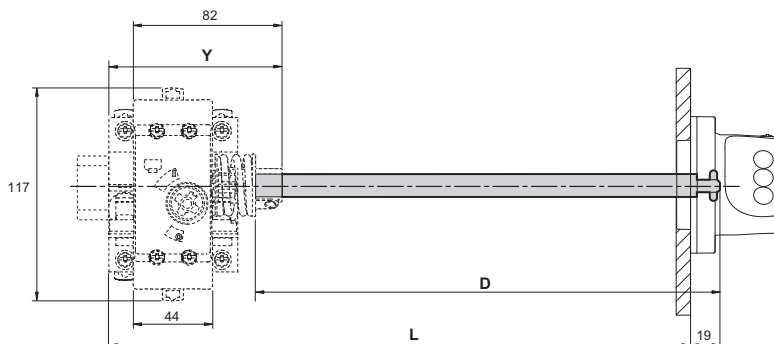
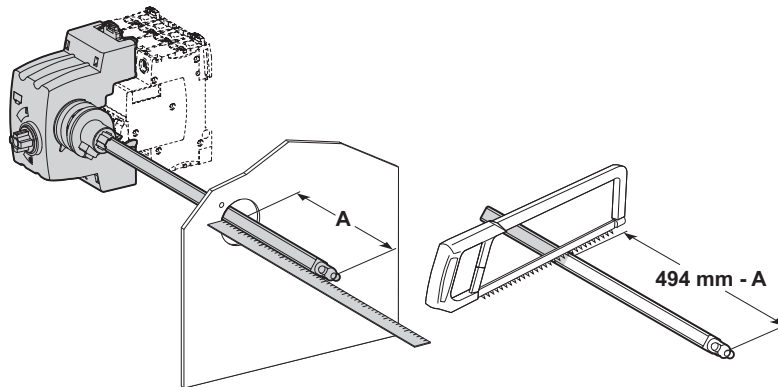
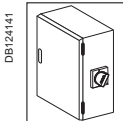


| iID | Z (mm) |
|-----|--------|
| 2P | 25.3 |
| 4P | 25.3 |



| P (mm) | F (mm) |
|--------|--------|
| 300 | 5 |
| 500 | 11 |

Rotary handle: front mounted control



| iC60 | X (mm) | Y (mm) |
|-----------|--------|--------|
| 2P | 44.5 | 76.8 |
| 2P + Vigi | 44.5 | 76.8 |
| 3P | 44.5 | 76.8 |
| 3P + Vigi | 62 | 94.5 |
| 4P | 62 | 94.5 |
| 4P + Vigi | 62 | 94.5 |

| iID/iSW-NA | X (mm) | Y (mm) |
|------------|--------|--------|
| 2P | 44.5 | 76.8 |
| 4P | 44.5 | 76.8 |

Rotary handle: side mounted control

iK60N circuit breakers (curve C)



IEC/EN 60898-1

PB104469-40



PB104463-40



- iK60N circuit breakers are circuit breakers which combine the following functions:
 - circuit protection against short-circuit currents,
 - circuit protection against overload currents,
 - disconnection, opening and closing.

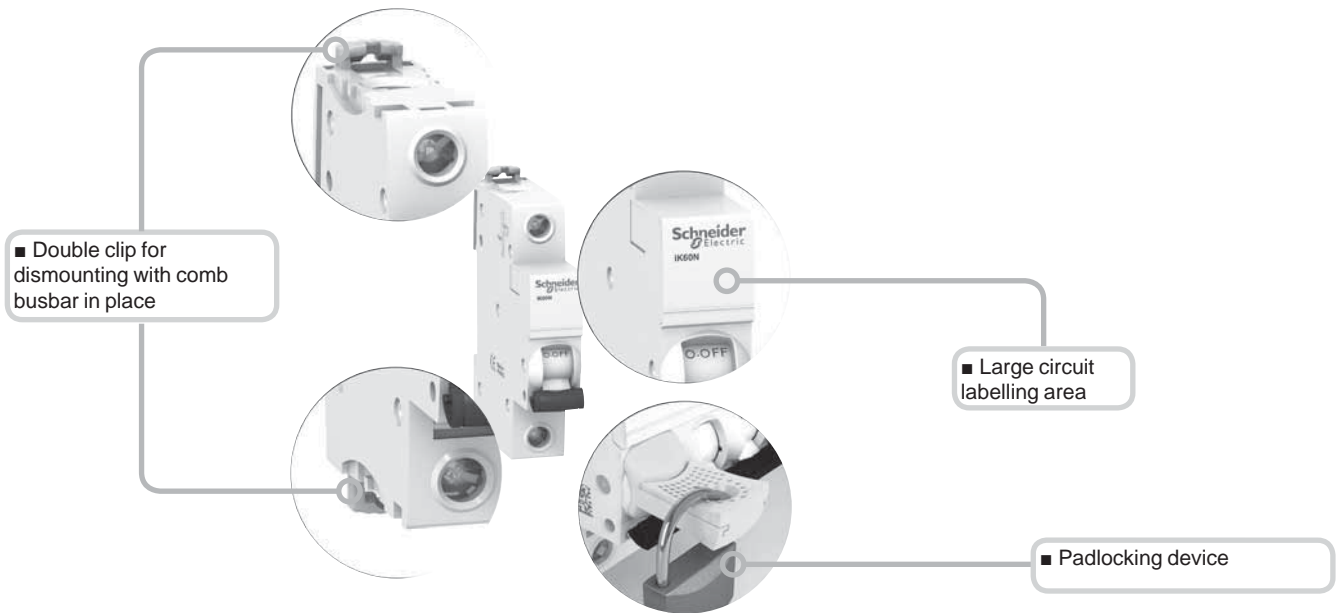
| iK60N circuit breaker 50/60 Hz | | Service breaking capacity (Ics) 100 % of Icn |
|--|--------|---|
| Breaking capacity in short circuit (Icn) as per IEC/EN 60898-1 | | |
| Ph/Ph | 400 V | |
| Ph/N | 230 V | |
| Rating (In) 6 to 32 A | 6000 A | |

Catalogue numbers

| iK60N circuit breakers | | | | |
|------------------------|------------|------------|------------|------------|
| Type | 1P | 2P | 3P | 4P |
| | | | | |
| Rating (In) | Curve C | Curve C | Curve C | Curve C |
| 6 A | A9K27106 | A9K27206 | A9K24306 | A9K24406 |
| 10 A | A9K27110 | A9K27210 | A9K24310 | A9K24410 |
| 16 A | A9K27116 | A9K27216 | A9K24316 | A9K24416 |
| 20 A | A9K27120 | A9K27220 | A9K24320 | A9K24420 |
| 25 A | A9K27125 | A9K27225 | A9K24325 | A9K24425 |
| 32 A | A9K27132 | A9K27232 | A9K24332 | A9K24432 |
| Operating frequency | 50/60 Hz | 50/60 Hz | 50/60 Hz | 50/60 Hz |
| Width in 9-mm modules | 2 | 4 | 6 | 8 |

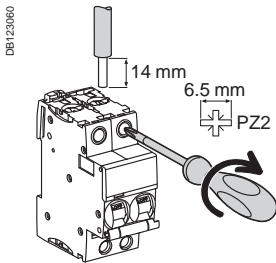
iK60N circuit breakers (curve C) (cont.)



PB104934-40



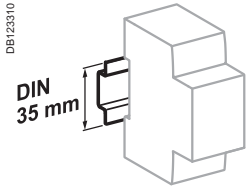
- Fast closing independent of the speed of actuation of the toggle.
- Top or bottom electrical feeding.

Connection

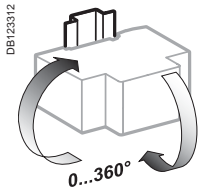


| Type | Rating | Tightening torque | Without accessory | |
|---------|------------|-------------------|---|---|
| | | | Copper cables | |
| | | | Rigid | Flexible or ferrule |
| C curve | 1 to 32 A | 2 N.m 3.5 N.m | DB122945  | DB122946  |
| | 40 to 63 A | | 1 to 25 mm ² 1 to 35 mm ² | 1 to 16 mm ² 1 to 25 mm ² |

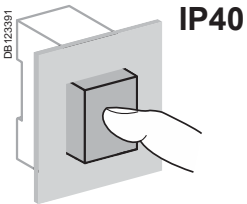
iK60N circuit breakers (curve C) (cont.)



Encliquetage sur rail DIN de 35 mm.



Position d'installation indifférente.



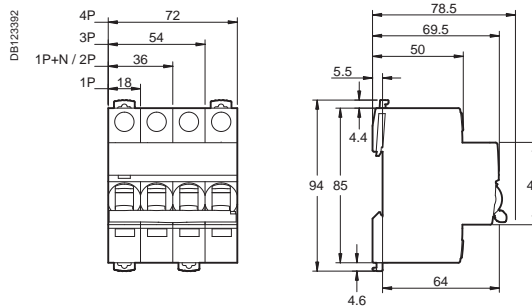
Technical data

| Main characteristics | | |
|--|-----------------------------|------------------------------------|
| According to IEC/EN 60898-1 | | |
| Insulation voltage (U _i) | | 440 V AC |
| Pollution degree | | 2 |
| Rated impulse withstand voltage (U _{imp}) | | 4 kV |
| Thermal tripping | Reference temperature | 30°C |
| | Temperature derating | See module CA908007 |
| Magnetic tripping | C curve | 5 to 10 I _n |
| Limitation class | | 3 |
| Rated making and breaking capacity of an individual pole (I _{cn1}) | | I _{cn1} = I _{cn} |
| Additional characteristics | | |
| Degree of protection (IEC 60529) | Device in modular enclosure | IP40 Insulation class II |
| Endurance (O-C) | Electrical | 10,000 cycles |
| | Mechanical | 20,000 cycles |
| Overvoltage category (IEC 60364) | | III |
| Operating temperature | | -25°C to +60°C |
| Storage temperature | | -40°C to +85°C |

Weight (g)

| Circuit-breaker | |
|-----------------|-------|
| Type | iK60N |
| 1P | 100 |
| 2P | 200 |
| 3P | 300 |
| 4P | 400 |

Dimensions (mm)



iID K residual current circuit breakers



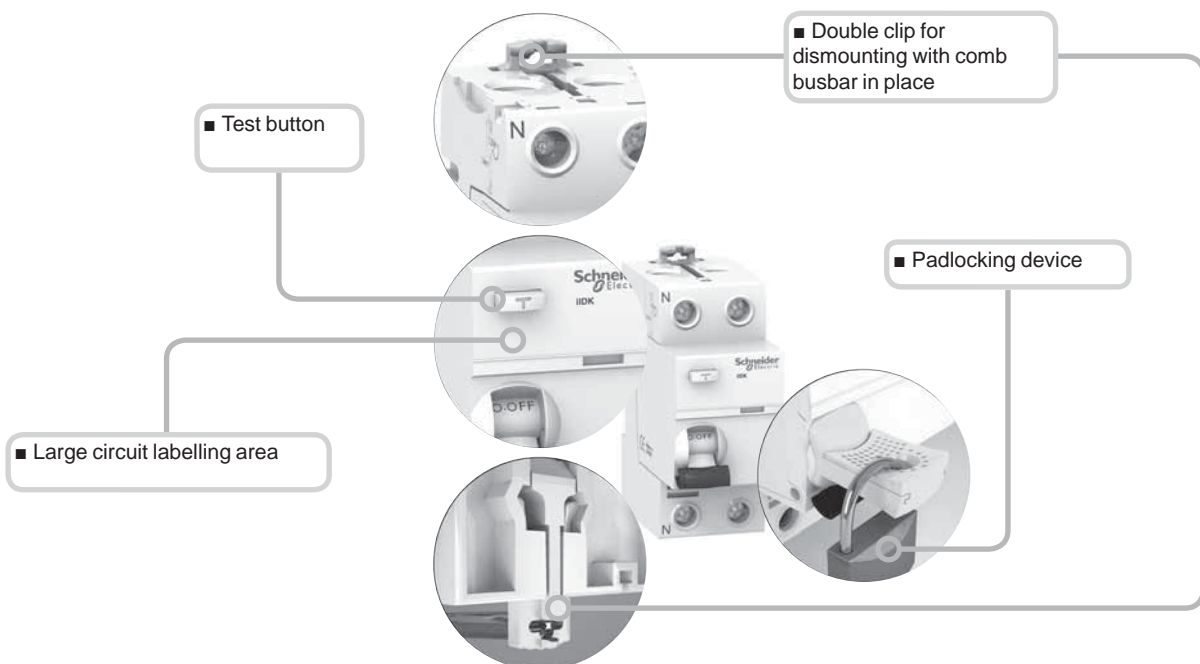
IEC/EN 61008-1

- The iID K residual current circuit breakers provide:
 - protection of persons against electric shock by direct contact (30 mA),
 - protection of persons against electric shock by indirect contact (300 mA)
 - protection of installations against the risk of fire (300 mA).



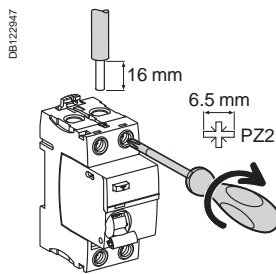
Catalogue numbers

| iID K residual current circuit breakers | | | | | | |
|---|-----------------------|---------------------|----------|----------|-----------------------|--|
| Type | | AC | | | Width in 9-mm modules | |
| Product | | iID K | | | | |
| Auxiliaries | | Without auxiliaries | | | | |
| 2P | Rating Sensitivity | 30 mA | 300 mA | | 4 | |
| | | 25 A | A9R50225 | A9R75225 | | |
| | | 40 A | A9R50240 | A9R75240 | | |
| 4P | Rating Sensitivity | 30 mA | 300 mA | | 8 | |
| | | 25 A | A9R50425 | A9R75425 | | |
| | | 40 A | A9R50440 | A9R75440 | | |
| 63 A | A9R70463 | A9R75463 | | | | |
| Voltage rating (Ue) | 2P | 230 - 240 V | | | | |
| | 4P | 400 - 415 V | | | | |
| Operating frequency | | | 50/60 Hz | | | |

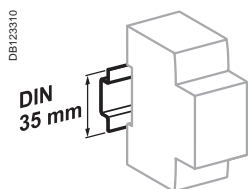


iID K residual current circuit breakers (cont.)

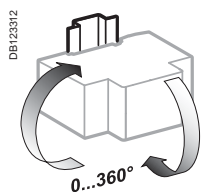
Connection



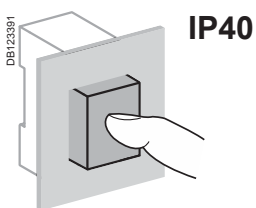
| Type | Tightening torque | Without accessory | |
|-------|-------------------|-------------------------|-------------------------|
| | | Copper cables Rigid | Flexible or ferrule |
| iID K | 3.5 N.m | 1 to 35 mm ² | 1 to 25 mm ² |



Clip on DIN rail 35 mm.



Indifferent position of installation.



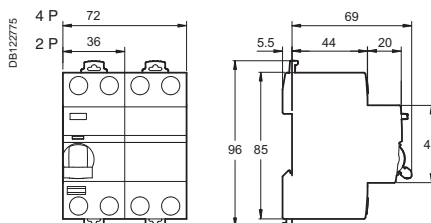
Technical data

| Main characteristics | | |
|---|-----------------------------|-------------------|
| According to IEC/EN 61008-1 | | |
| Insulation voltage (U _i) | | 440 V |
| Pollution degree | | 2 |
| Rated impulse withstand voltage (U _{imp}) | | 4 kV |
| Making and breaking capacity (I _m /I _{Δm}) | 25 to 40 A | 500 A |
| | 63 A | 630 A |
| Surge current withstand (8/20 μs) without tripping | | Up to 200 Å |
| Conditional rated short circuit current (I _{nc} /I _{Δc}) | With iC60N/H/L, iK60N | 6000 A |
| | With fuse | 4500 A |
| Additional characteristics | | |
| Degree of protection | Device in modular enclosure | IP40 |
| Endurance (O-C) | Electrical | 2000 cycles (AC1) |
| | Mechanical | 5000 cycles |
| Operating temperature | | -5°C to +60°C |
| Storage temperature | | -40°C to +85°C |

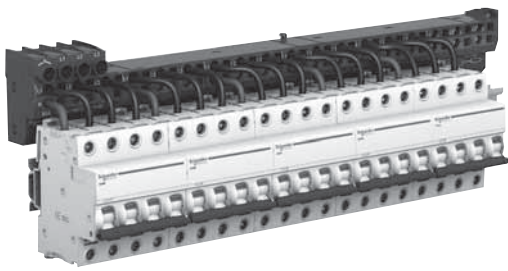
Weight (g)

| Residual current circuit breakers | |
|-----------------------------------|-------|
| Type | iID K |
| 2P | 210 |
| 4P | 370 |

Dimensions (mm)



PE104507-35

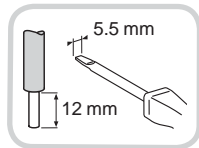
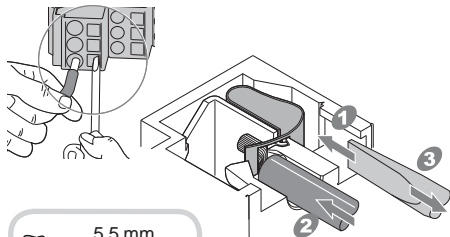


IEC/EN 60947-7-1.
IEC/EN 61439-2.

Description

- Multiclip 80 A is a four-pole splitter block 24 modules wide installable on a standard DIN rail.
- Outgoing feeders are connected at the front, without screws, in spring terminals.
- The spring contact pressure adapts automatically to the cross section of the conductor. It is independent of the operator.
- Supplied with 12 black and 12 blue pre-stripped 6 mm² cables.

DB122626



Advantages

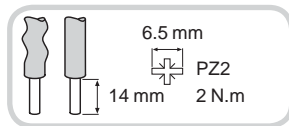
- Very fast connection.
- Very simple phase rebalancing.
- In the event of an extension to or modification of the switchboard, connection is very easy.
- Compatible with inter-rows of 150 mm.

Technical data

| Main characteristics | |
|---|---|
| Cat. no | 04000 |
| According to IEC/EN 60947-7-1 | |
| Rated current at 40°C (I _n) | 80 A |
| Maximum operated voltage (U _e) | 440 V AC |
| Operating frequency | 50/60 Hz |
| Rated insulation voltage (U _i) | 500 V AC |
| Pollution degree | 3 |
| Rated impulse withstand voltage (U _{imp}) | 6 kV |
| Degree of protection | IP20 |
| Short-circuit current withstand | Up to breaking capacity of Schneider Electric outgoing circuit breakers, even when reinforced by cascading implementation |
| Width in 9-mm modules | 48 |

Power supply

- Four-pole tunnel terminals with screw clamping.
- The tunnel terminals are located to facilitate the insertion of cables and clamping by screws.
- One cable per connection point:
 - flexible from 6 to 25 mm²
 - rigid from 10 to 35 mm².



PE104501-45

Installation

- Clip-on mounted Pragma and Prisma DIN rails.
- Screwed on all other symmetric rail.



Distribution

- Connection to spring terminals through the front.
- 2 rows of terminals:
 - 18 connection points for phases (L1, L2, L3)
 - 18 connection points for neutral.
- A single cable per connection point: flexible (without ferrule) or rigid from 1 to 6 mm².
- Maintenance-free (tightness guaranteed over time). Insensitive to vibrations and thermal variations.

Multiclip 80 A splitter block (cont.)

PB 104905-50



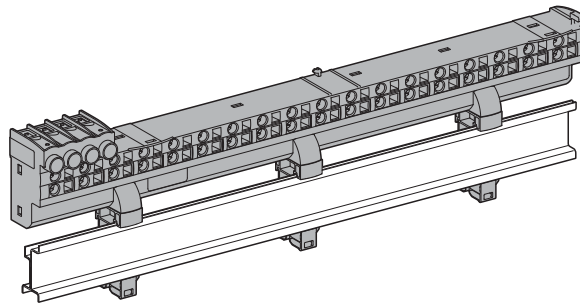
Additional characteristics

According to IEC/EN 61439-2

| | |
|-----------------------|----------------|
| Operating temperature | -25°C to +60°C |
| Storage temperature | -40°C to +85°C |
| Colour | RAL 7016 |

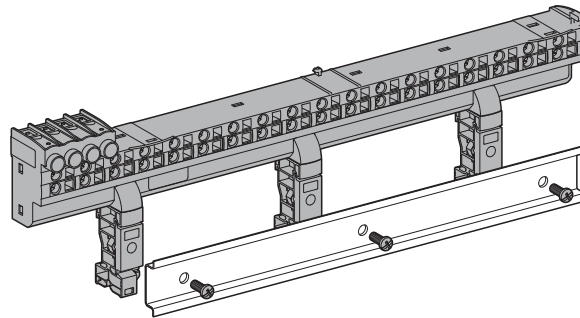
Installation

DB123198



On Pragma and Prisma rails

DB123199



On other symmetric rails

Weight (g)

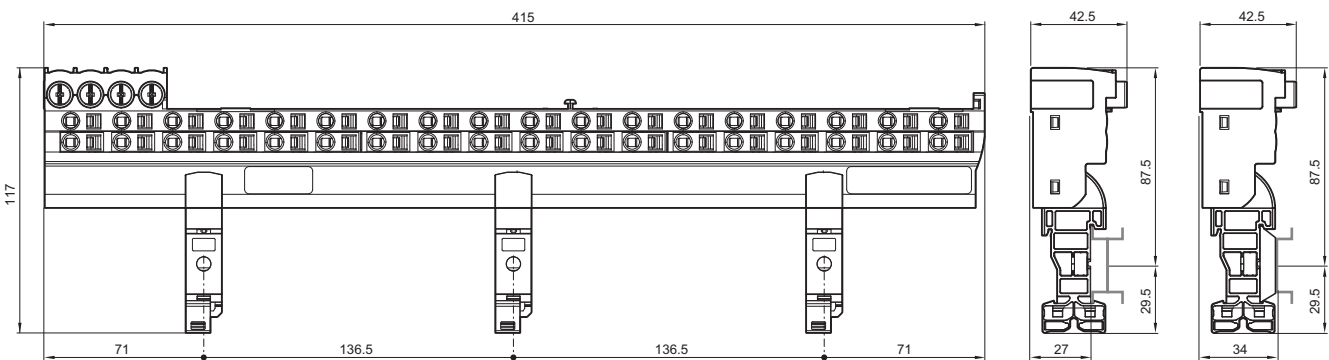
Splitter block

Type

| | |
|-----------|-----|
| Multiclip | 640 |
|-----------|-----|

Dimensions (mm)

DB123200



Earth leakage protection

Response time of medium-sensitivity residual current devices

Response time of iC60 Vigi and iID60 residual current devices

The medium-sensitivity residual current devices (100...1000 mA) in the Acti9 range conform to IEC/EN 61008 and 61009:

- their response time guarantees personal protection against indirect contacts and fire risks
- in the case of selective versions (S), a "non-tripping time" guarantees discrimination with the residual current devices installed downstream.

Instantaneous residual current devices

| | | Sensitivity (I Δ n) | | | |
|--------------------|------------------|----------------------------|--------|--------|-------------|
| | | 100 mA | 300 mA | 500 mA | |
| Fault current (mA) | I Δ n/2 | 50 | 150 | 250 | No tripping |
| | | Max. response time | | | |
| | I Δ n | 100 | 300 | 500 | 300 ms |
| | 2 x I Δ n | 200 | 600 | 1000 | 150 ms |
| | 5 x I Δ n | 500 | 1500 | 2500 | 40 ms |
| | 500 A | | | | 40 ms |

Selective (S) and time-delayed (R) residual current devices

| Residual current device | Sensitivity (I Δ n) | Sensitivity (I Δ n) | | | | Type | | | |
|-------------------------|----------------------------|----------------------------|--------|--------|---------|-------------------|---------------|-------------------|---------------|
| | | 100 mA | 300 mA | 500 mA | 1000 mA | Selective (S) | | Time-delayed (R) | |
| Fault current (mA) | I Δ n/2 | 50 | 150 | 250 | 500 | No tripping | | No tripping | |
| | | | | | | Non-tripping time | Response time | Non-tripping time | Response time |
| | I Δ n | 100 | 300 | 500 | 1000 | 130 ms | 500 ms | 300 ms | 1000 ms |
| | 2 x I Δ n | 200 | 600 | 1000 | 2000 | 60 ms | 200 ms | 150 ms | 500 ms |
| | 5 x I Δ n | 500 | 1500 | 2500 | 5000 | 50 ms | 150 ms | 150 ms | 300 ms |
| | 500 A | | | | 40 ms | 150 ms | 150 ms | 300 ms | |

Definitions

Response time

Time between the appearance of a hazardous leakage current and circuit power down.

Non-tripping time

For selective and time-delayed devices, the non-tripping time is the time between the appearance of a hazardous leakage current and the device tripping.

If the leakage current disappears before this time, the device does not trip.

This fast disappearance of the leakage current can be due to:

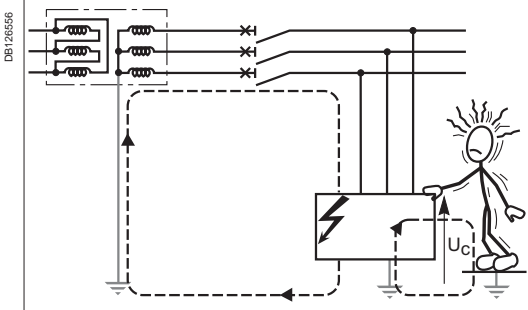
- the transient nature of the fault (e.g. the current generated by a switching surge)
- the interruption of the fault current by another faster residual current device situated downstream.

Selective and time-delayed devices therefore afford the user:

- better immunity against nuisance tripping
- total discrimination between residual current devices.

Earth leakage protection

Response time of medium-sensitivity residual current devices



Protection against indirect contacts

The response times of residual current devices guarantee personal protection against indirect contacts, in conformance with the requirements of the installation standards (IEC 60364 or equivalent).

Indirect contacts

A person who comes into contact with an accidentally live frame caused by an insulation fault experiences an indirect contact: the contact voltage U_c creates a current that passes through the human body.

Maximum breaking time

The maximum breaking time required by the installation standards, in the event of an insulation fault, depends on:

- the network voltage
- the earthing system.

Maximum breaking time for terminating circuits (ms)

| Earthing system | Network phase/neutral voltage | | | |
|-----------------|-------------------------------|------------|------------|---------|
| | 50...120V | 120...230V | 230...400V | > 400 V |
| TN or IT | 800 | 400 | 200 | 100 |
| TT | 300 | 200 | 70 | 40 |

Note: a breaking time of no more than 5 s is permitted for distribution circuits to ensure discrimination with the devices installed on the terminating circuits. This time should be reduced to the essential minimum.

These times are based on the maximum prospective values of the contact voltage U_c and on the contact times authorised by technical report IEC 60479.

Example

On a three-phase phase/neutral voltage network $U_0 = 230$ V in a TT system:

- the resistance of the neutral earth connection R_n is 10 Ω ,
- the resistance of the operating frame earth connection R_A is 100 Ω .

In the event of an insulation fault, the leakage current I_d is equal to: $U_0 / (R_A + R_n)$
i.e. $230 \text{ V} / 110 \Omega = 2.1 \text{ A}$.

The contact voltage U_c is therefore $I_d \times R_A$ i.e. $2.1 \text{ A} \times 100 \Omega = 210 \text{ V}$.

■ Protection sensitivity

The residual current device must trip as soon as the leakage current corresponds to a hazardous situation, i.e. a contact voltage of 50 V (in a dry atmosphere). Hence, $I_{\Delta n} = 50 \text{ V} / R_A$, i.e. $50 \text{ V} / 100 \Omega = 500 \text{ mA}$.

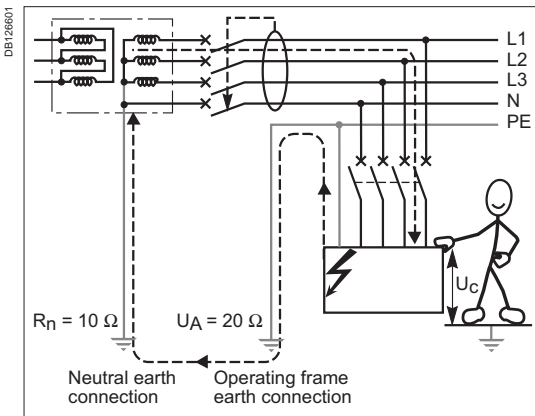
■ Maximum breaking time

For a 230 V phase/neutral voltage network in a TT system, the IEC 60364 standard requires a maximum breaking time of 200 ms.

For the 2.1 A leakage current:

- an instantaneous residual current device with a sensitivity of 300 mA will power down the circuit in less than 40 ms,
- an instantaneous residual current device with a sensitivity of 500 mA will power down the circuit in less than 60 ms.

Note: For well-designed and regularly maintained electrical installations, the resistance of the operating frame earth connection can be less than 100 Ω .



Use of the time-delayed residual current devices

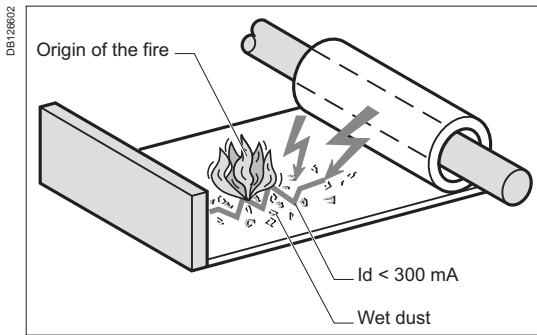
In accordance with the breaking times required by the installation standards (above), the selective and time-delayed residual current devices can be used in the following cases:

| Circuit | Network voltage (phase/neutral) | Residual current device | | |
|-----------------------------|---------------------------------|-------------------------|-------------|----------------|
| | | Instantaneous I | Selective S | Time-delayed R |
| Terminating circuit | $\leq 230 \text{ V}$ | ■ | ■ | (1) |
| | $> 230 \text{ V}$ | ■ | | |
| Sub-distribution or general | | ■ | ■ | ■ |

(1) Only in a TN system for a phase/neutral voltage < 120 V.

Earth leakage protection

Response time of medium-sensitivity residual current devices



The response times of residual current devices with a sensitivity of 300 mA guarantee protection against fires generated by leakage currents

Protection against fire hazards

Most fires of electrical origin are caused by the creation and propagation of electric arcs in building materials, in the presence of moisture, dust, pollution, etc. These arcs appear and develop due to the wear and tear or ageing of the insulating materials. The fire risk occurs when the leakage currents reach a few hundred milliamps for a few seconds.

For fault currents of this magnitude, residual current devices with a sensitivity of 300 or 500 mA trip in less than a second, whether they be instantaneous, selective or time-delayed.

IEC 60364-4-42 (subclause 422.3.10) states that it is mandatory to install a residual current device with a sensitivity less than or equal to 500 mA:

- on premises with a risk of explosion (BE3)
- on premises with a risk of fire (BE2)
- in agricultural and horticultural buildings
- for circuits supplying fair, exhibition and entertainment equipment
- on temporary outdoor leisure facilities.

In certain countries, the installation rules and/or local safety regulations require a sensitivity of 300 mA.

Earth leakage protection

Response time of medium-sensitivity residual current devices

Discrimination of residual current devices

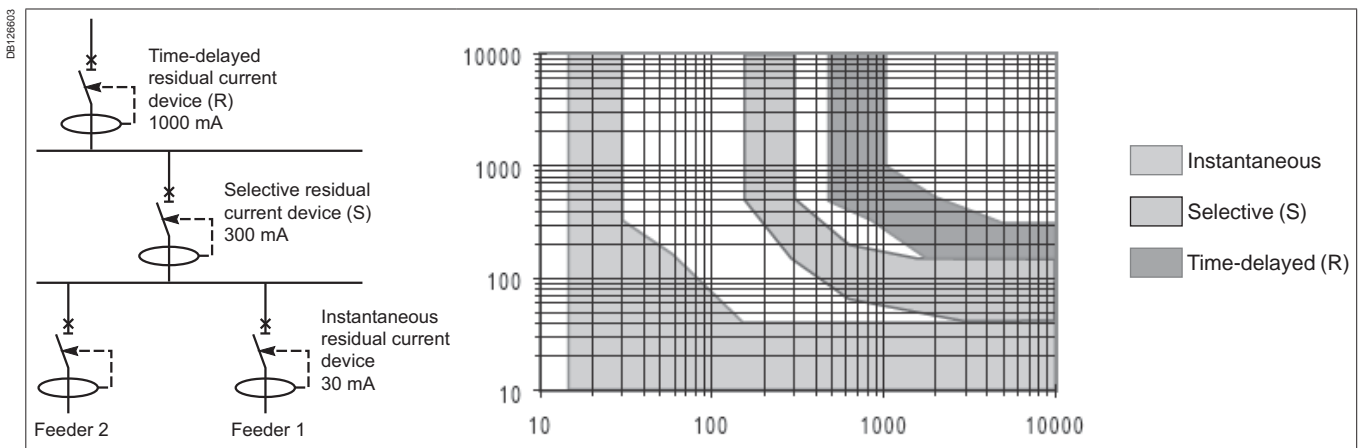
The non-tripping times of type (S) and (R) residual current devices ensure discrimination with the residual current devices located downstream.

Combination rules

To ensure discrimination between two cascading residual current devices, the following two conditions must be met simultaneously:

- the sensitivity of the upstream device must be at least 3 times the sensitivity of the downstream residual current device
- the upstream residual current device must be one of the following types:
 - Selective (S) if the downstream residual current device is instantaneous,
 - Time-delayed (R) if the downstream residual current device is selective (S).

The figure below shows how compliance with these rules provides discrimination on three levels: whatever the value of the fault current, it will be interrupted by the device situated immediately upstream of the fault and only by this device.

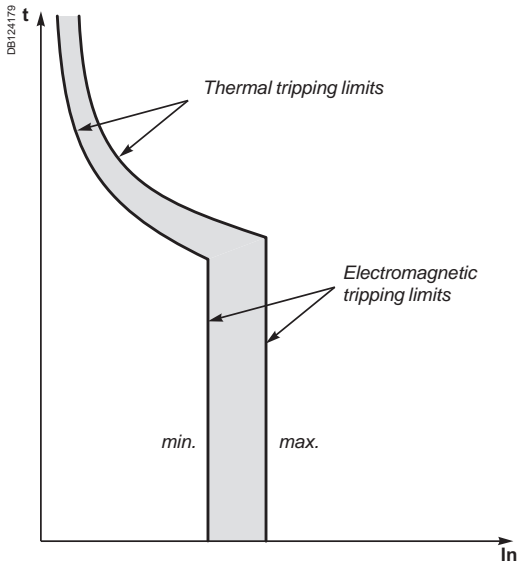


Example:

In the above diagram for a fault current of 1000 mA:

- if the fault occurs downstream of the 30 mA residual current device, the latter will interrupt the current in less than 40 ms, whereas type S and R devices "wait" for 80 ms and 200 ms respectively. Therefore, neither of the two devices trips.
- if the fault occurs downstream of the type S residual current device, the latter will interrupt the current in less than 175 ms, whereas the type R device "wait" for 200 ms and therefore does not trip.

If these cascading combination rules are complied with, the level of continuity of service provided to the user depends on the way in which the "horizontal discrimination" is implemented: the terminal feeders must be divided into as many circuits as necessary, each protected by a residual current device.



The following curves show the total fault current breaking time, depending on its amperage. For example: based on the curve on page 3, an iC60 circuit breaker of curve C, 20 A rating, will interrupt a current of 100 A (5 times the rated current I_n) in:

- 2 seconds at least
- 7 seconds at most.

The circuit breakers' tripping curves consist of two parts:

- tripping of overload protection (thermal tripping device): the higher the current, the shorter the tripping time
- tripping of short-circuit protection (magnetic tripping device): if the current exceeds the threshold of this protection device, the breaking time is less than 10 milliseconds. For short-circuit currents exceeding 20 times the rated current, the time-current curves do not give a sufficiently precise representation. The breaking of high short-circuit currents is characterized by the current limiting curves, in peak current and in energy. The total breaking time can be estimated at 5 times the value of the ratio $(I^2t)/(\hat{I})^2$.

Verification of the discrimination between two circuit breakers

By superimposing the curve of a circuit breaker on that of the circuit breaker installed upstream, one can check whether this combination will be discriminating in cases of overload (discrimination for all current values, up to the magnetic threshold of the upstream circuit breaker). This verification is useful when one of the two circuit breakers has adjustable thresholds; for fixed-threshold devices, this information is provided directly by the discrimination tables.

To check discrimination on short circuit, the energy characteristics of the two devices must be compared.

Tripping curves

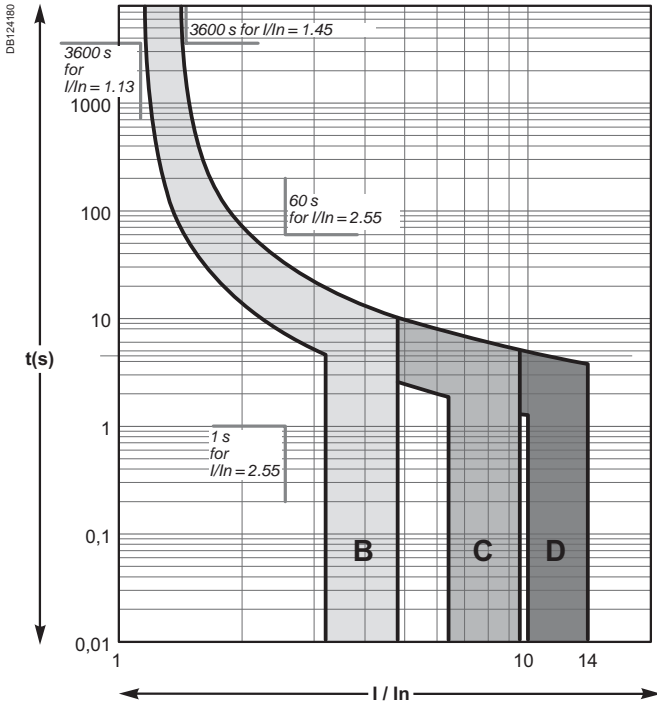
According to IEC/EN 60898 standards

Alternative current 50/60 Hz

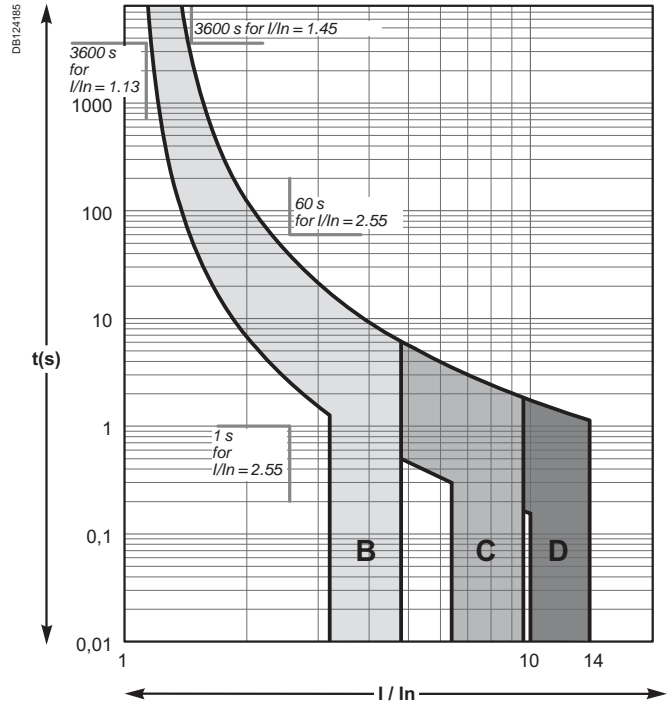
iC60a/N/H/L

According to IEC/EN 60898 (reference temperature 30°C)

Curves B, C, D rating up to 4 A



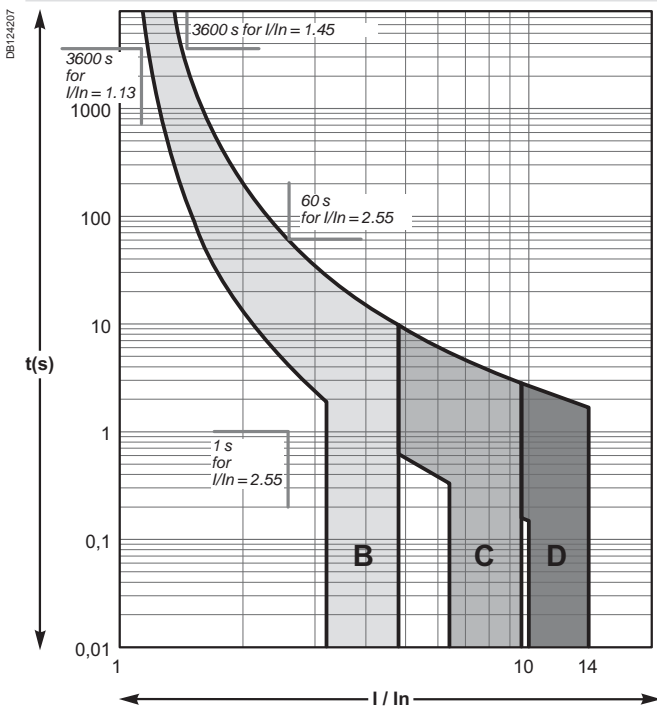
Curves B, C, D rating 6 A to 63 A



C120N/H

According to IEC/EN 60898 (reference temperature 30°C)

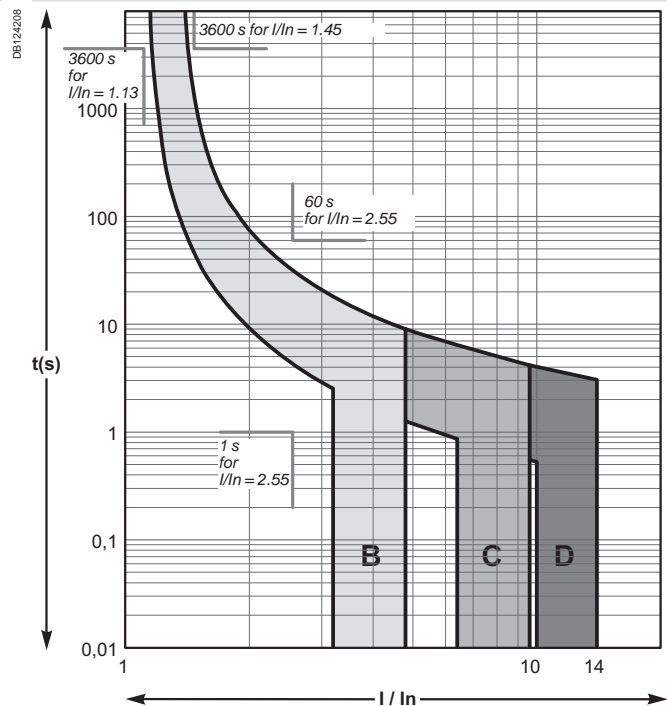
Curves B, C, D



DPNa/N

According to IEC/EN 60898 (reference temperature 30°C)

Curves B, C, D

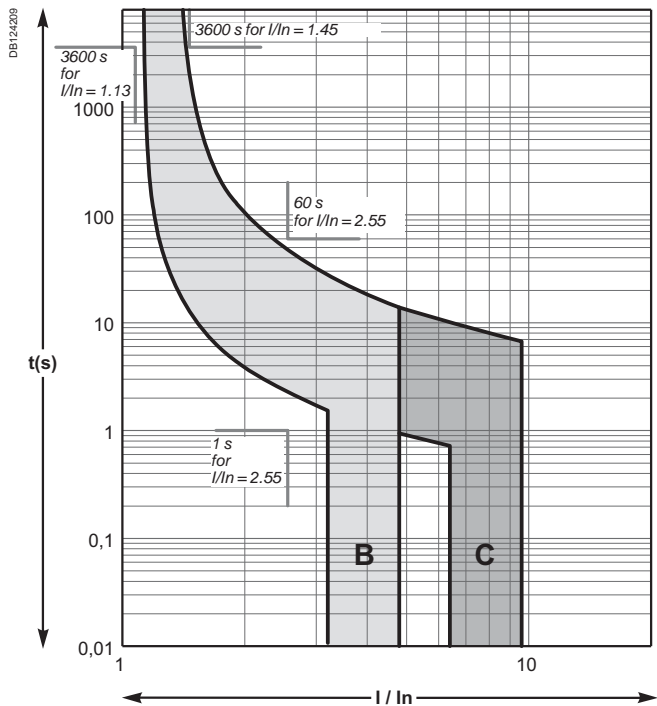


Alternative current 50/60 Hz

iK60

According to IEC/EN 60898 (reference temperature 30°C)

Curves B, C



Tripping curves

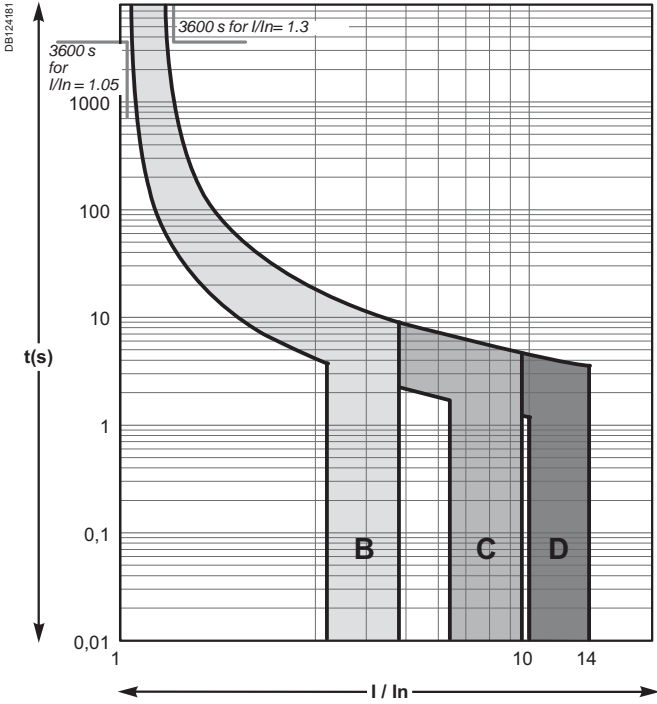
According to IEC/EN 60947-2 standards

Alternative current 50/60 Hz

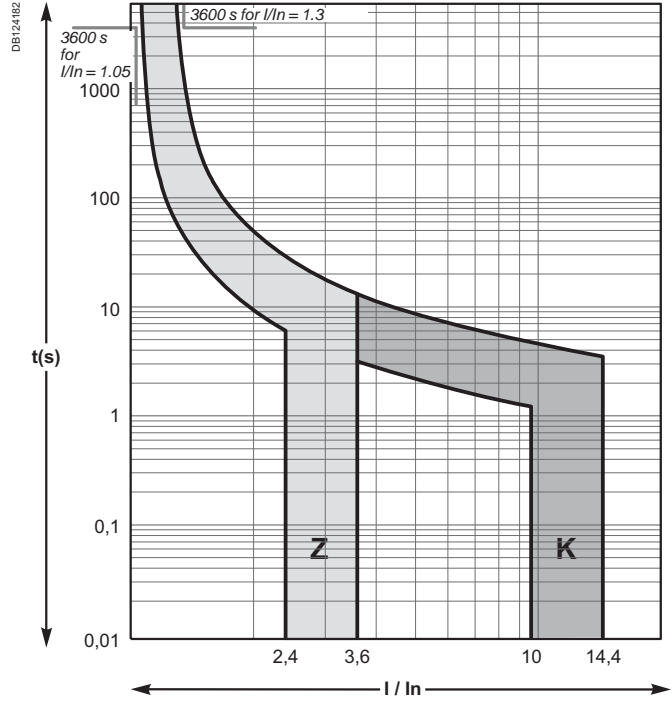
iC60N/H/L

According to IEC/EN 60947-2 (reference temperature 50°C)

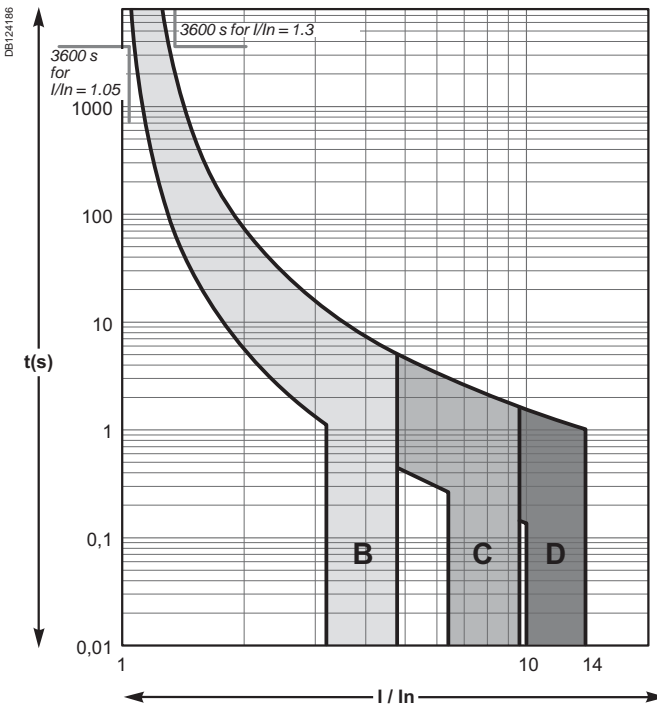
Curves B, C, D rating up to 4 A



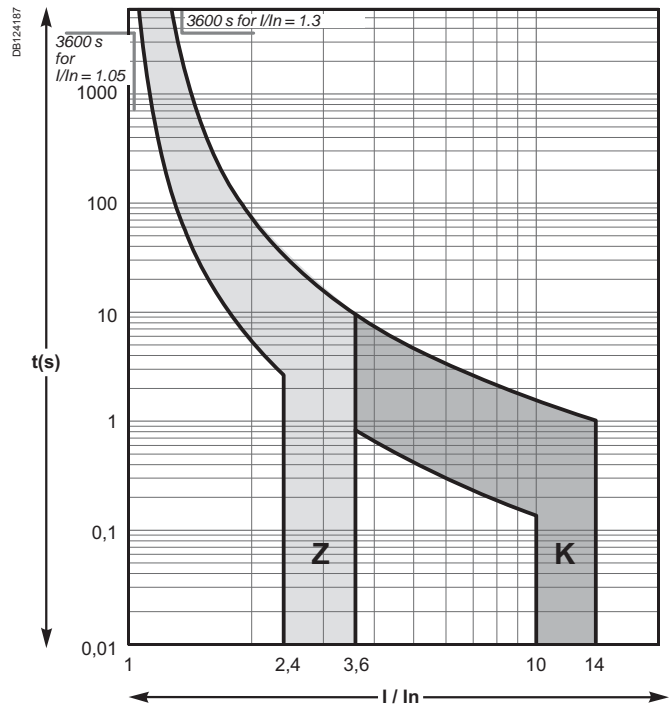
Curves Z, K rating up to 4 A



Curves B, C, D rating 6 A to 63 A



Curves Z, K rating 6 A to 63 A



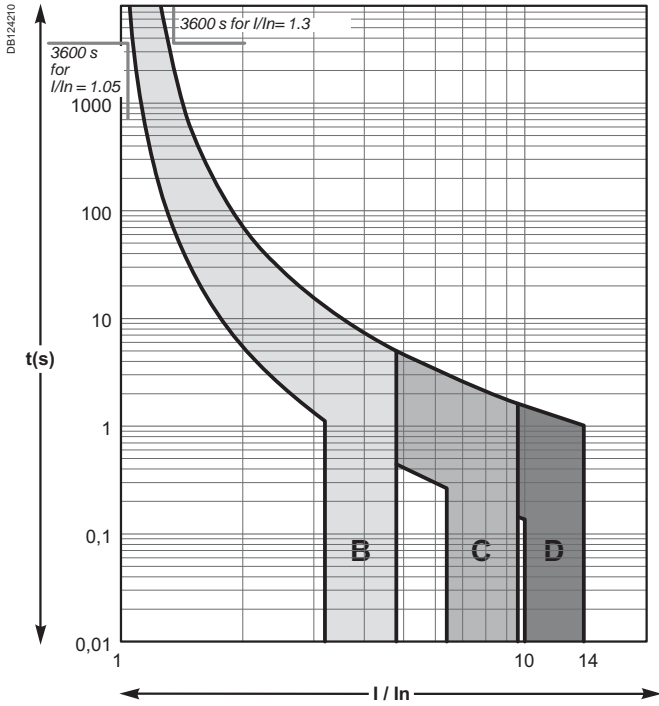
Tripping curves

According to IEC/EN 60947-2 standards

Alternative current 50/60 Hz

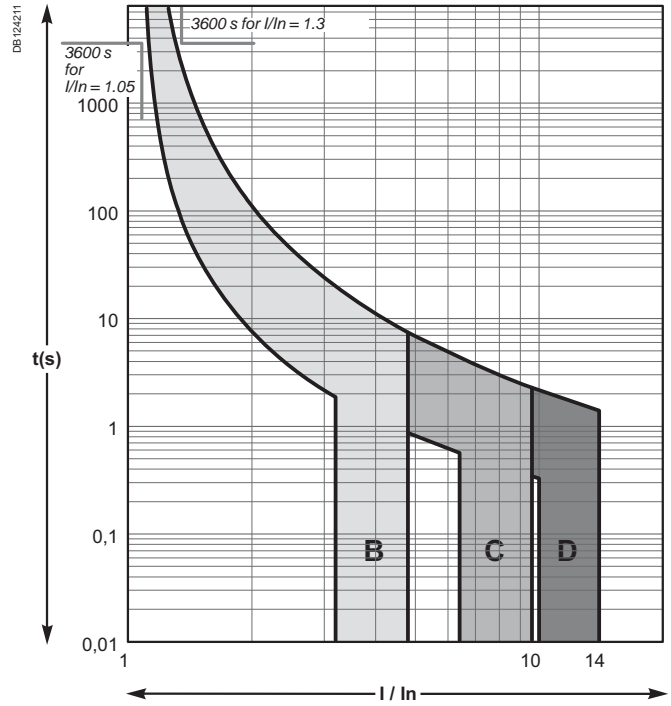
Reflex iC60N/H
According to IEC/EN 60947-2 (reference temperature 50°C)

Curves B, C, D



NG125a/N/H/L
According to IEC/EN 60947-2 (reference temperature 50°C)

Curves B, C, D



Tripping curves

According to IEC/EN 60947-2 standards

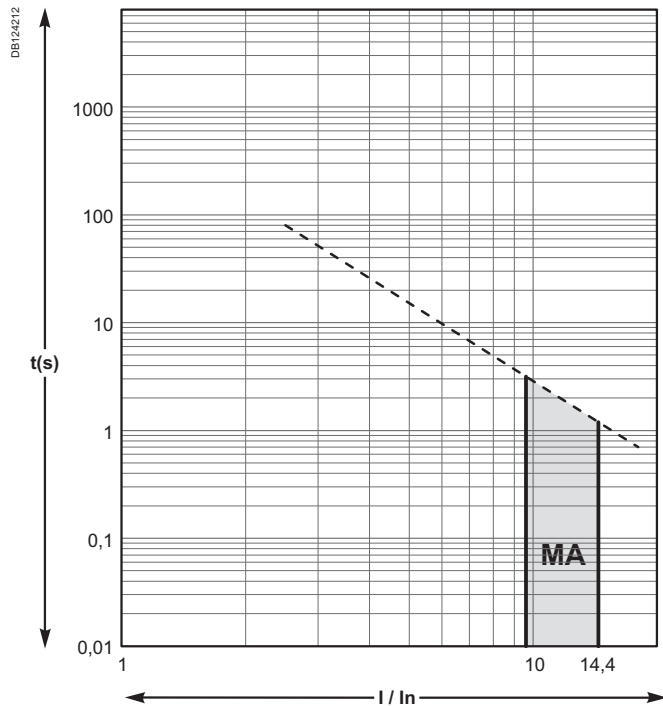
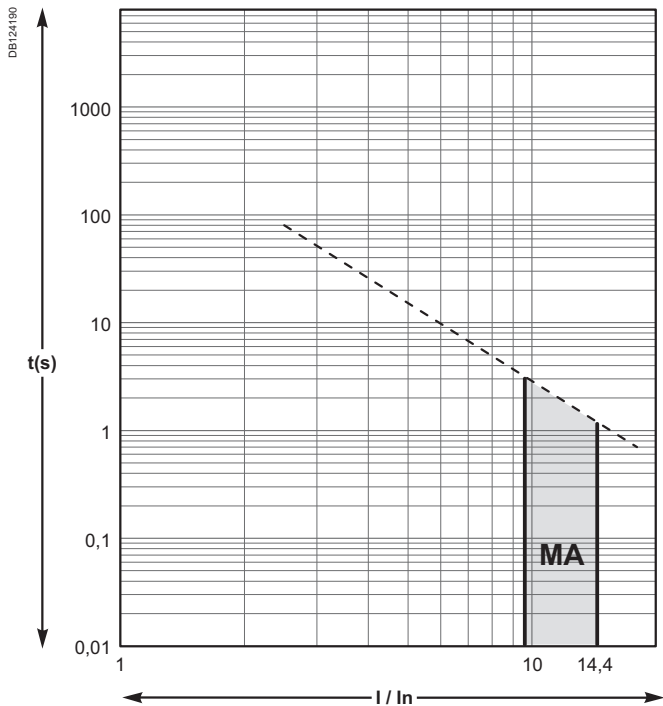
Motor curve

iC60L-MA
According to IEC/EN 60947-2

NG125L-MA
According to IEC/EN 60947-2 (reference temperature 50°C)

Curve MA

Curve MA



Tripping curves

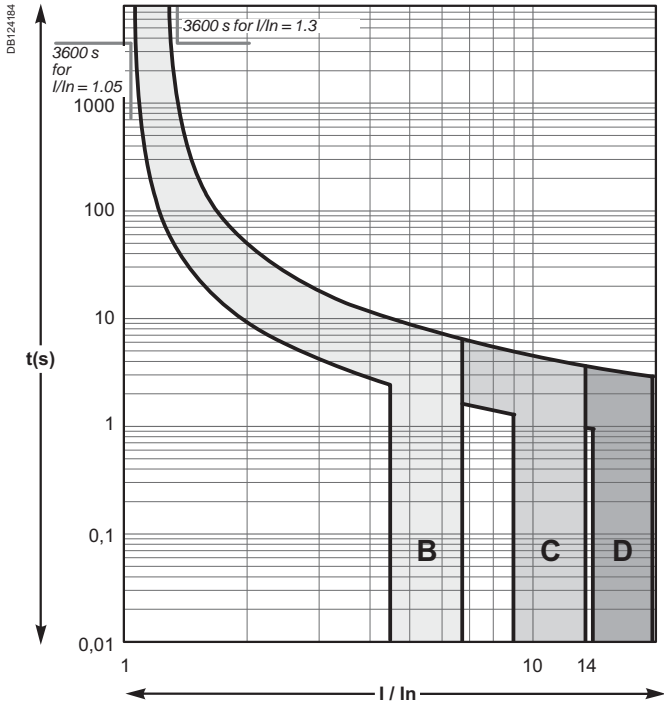
According to IEC/EN 60947-2 standards

Direct current

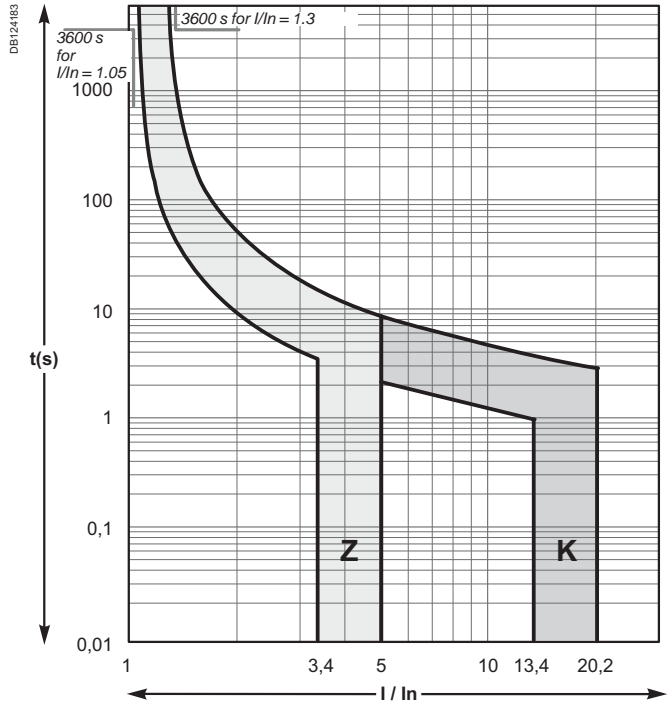
iC60N/H/L

According to IEC/EN 60947-2 (reference temperature 50°C)

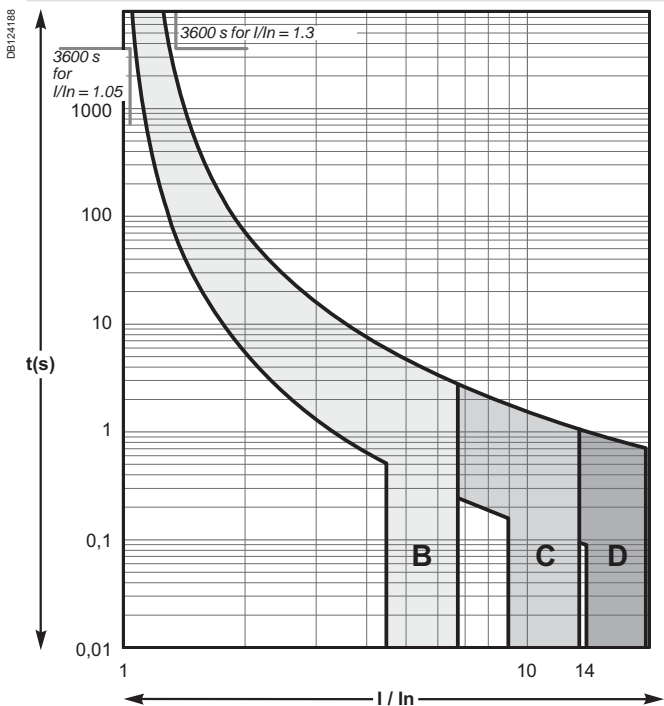
Curves B, C, D rating up to 4 A



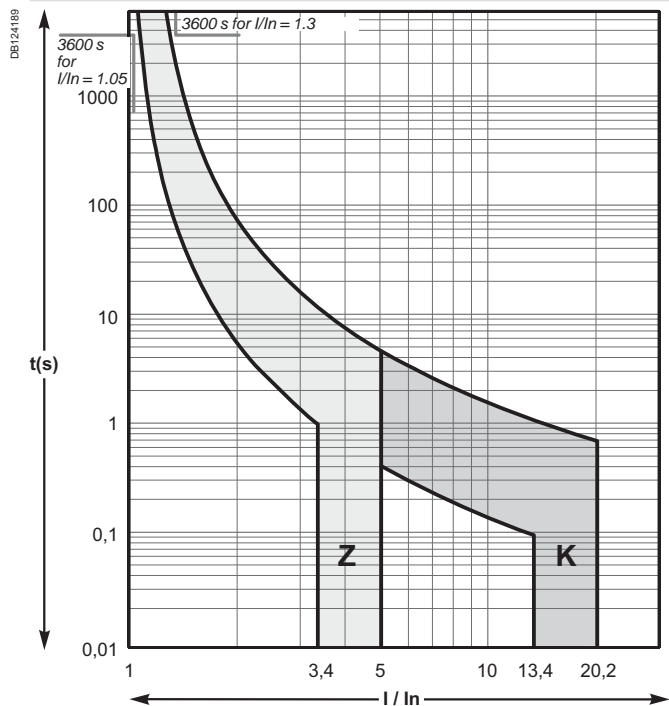
Curves Z, K rating up to 4 A



Curves B, C, D rating 6 A to 63 A



Curves Z, K rating 6 A to 63 A

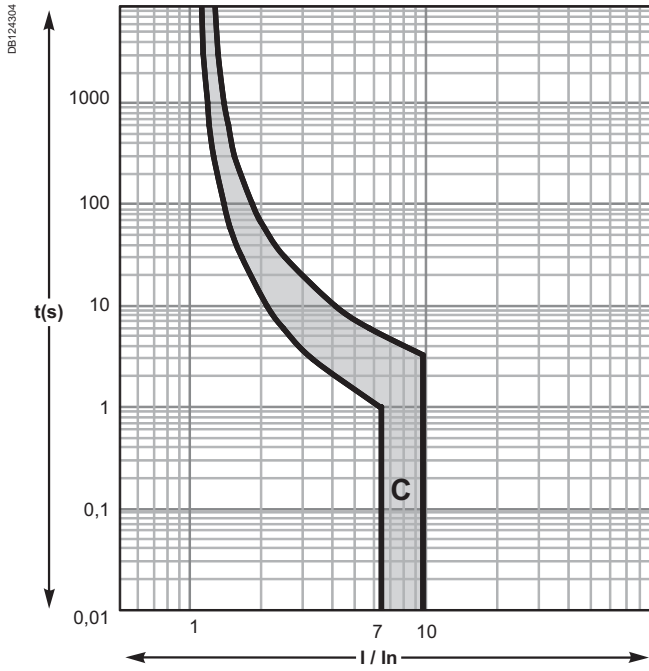


Direct current

C60H-DC

According to IEC/EN 60947-2 (reference temperature 25°C)

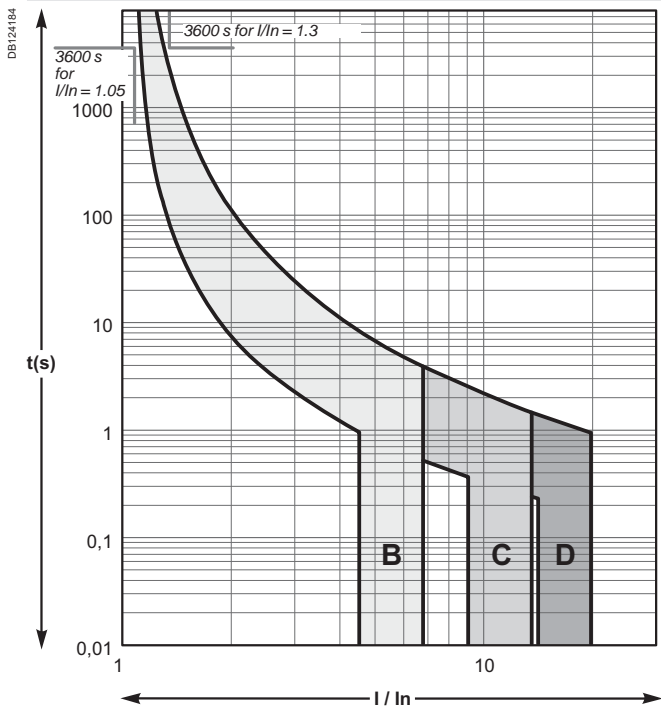
Curve C

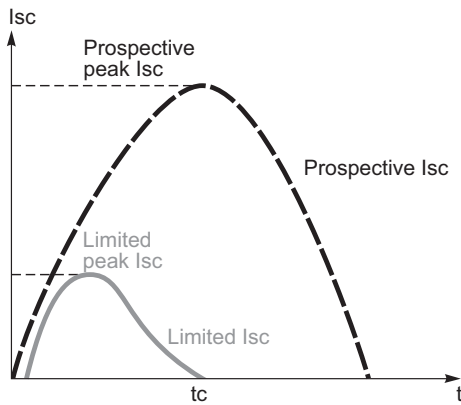


NG125a/N/H/L

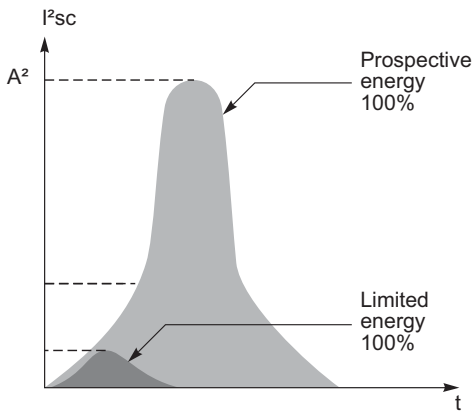
According to IEC/EN 60947-2 (reference temperature 50°C)

Curves B, C, D





Prospective current and real limit current.



Definition

The limiting capacity of a circuit breaker is its ability to lessen the effects of a short circuit on an electrical installation by reducing the current amplitude and the dissipated power.

Benefits of limiting

Long installation service life

Thermal effects

Lower temperature rise at the conductor level, hence increased service life for cables and all components that are not self-protected (e.g. switches, contactors, etc.)

Mechanical effects

Lower electrodynamic repulsion forces, hence less risk of deformation or breakage of electrical contacts and busbars.

Electromagnetic effects

Less interference on sensitive equipment located in the vicinity of an electric circuit.

Savings through cascading

Cascading is a technique derived directly from current limiting: downstream of a current-limiting circuit breaker it is possible to use circuit breakers of breaking capacity lower than the prospective short-circuit current (in line with the cascading tables). The breaking capacity is heightened thanks to current limiting by the upstream device. Substantial savings can be achieved in this way on switchgear and enclosures.

Discrimination of protection devices

The circuit breakers' current limiting capacity improves discrimination with the protection devices located upstream: this is because the required energy passing through the upstream protection device is greatly reduced and can be not enough to cause it to trip. Discrimination can thus be natural without having to install a time-delayed protection device upstream.

Acti9 circuit breaker current limiting

Profiting from Schneider Electric's experience and expertise in the field of short-circuit current breaking, the circuit breakers of the Acti9 range have a top-level current limiting characteristic for modular devices.

This assures them of optimal protection of the entire power distribution system.

Short-circuit current limiting (cont.)

Representation: Current limiting curves

The current limiting capacity of a circuit breaker is reflected by 2 curves which give, as a function of the prospective short-circuit current (current which would flow in the absence of a protection device):

- the real peak current (limited)
- the thermal stress (in A²s), this value, multiplied by the resistance of any element through which the short-circuit current passes, gives the power dissipated by this element.

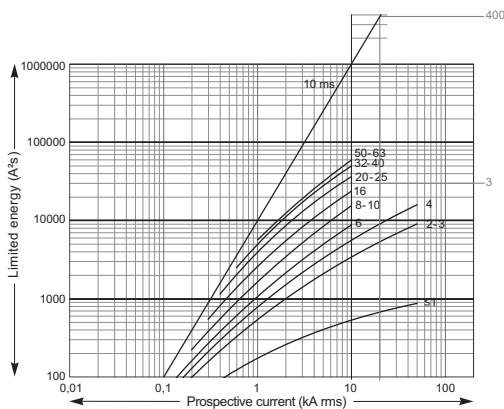
The straight line "10 ms" representing the energy A²s of a prospective short-circuit current of a half-period (10 ms) indicates the energy that would be dissipated by the short-circuit current in the absence of limiting by the protection device (see example).

Example

What is the energy limited by an iC60N 25 A circuit breaker for a prospective short-circuit current of 10 kA rms. What is the quality of current limiting?

> as shown in the graph opposite:

- this short-circuit current (10 kA rms) is likely to dissipate up to 1,000 kA²s
- the iC60N circuit breaker reduces this thermal stress to: 45 kA²s, which is 22 times less.



Example of use: Stresses acceptable by the cables

The following table shows the thermal stresses acceptable by the cables depending on their insulation, their composition (Cu or Al) and their cross section. Cross-section values are expressed in mm² and stresses in A²s.

| S (mm ²) | | 1.5 | 2.5 | 4 | 6 | 10 |
|----------------------|----|------------------------|------------------------|------------------------|------------------------|------------------------|
| PVC | Cu | 2.97 x 10 ⁴ | 8.26 x 10 ⁴ | 2.12 x 10 ⁵ | 4.76 x 10 ⁵ | 1.32 x 10 ⁶ |
| | Al | | | | | 5.41 x 10 ⁵ |
| PRC | Cu | 4.10 x 10 ⁴ | 1.39 x 10 ⁵ | 2.92 x 10 ⁵ | 6.56 x 10 ⁵ | 1.82 x 10 ⁶ |
| | Al | | | | | 7.52 x 10 ⁵ |

| S (mm ²) | | 16 | 25 | 35 | 50 |
|----------------------|----|------------------------|------------------------|------------------------|------------------------|
| PVC | Cu | 3.4 x 10 ⁶ | 8.26 x 10 ⁶ | 1.62 x 10 ⁷ | 3.21 x 10 ⁷ |
| | Al | 1.39 x 10 ⁶ | 3.38 x 10 ⁶ | 6.64 x 10 ⁶ | 1.35 x 10 ⁷ |
| PRC | Cu | 4.69 x 10 ⁶ | 1.39 x 10 ⁷ | 2.23 x 10 ⁷ | 4.56 x 10 ⁷ |
| | Al | 1.93 x 10 ⁶ | 4.70 x 10 ⁶ | 9.23 x 10 ⁶ | 1.88 x 10 ⁷ |

Example

Is a Cu/PVC cable of cross section 10 mm² protected by a NG125L device?

The above table shows that the acceptable stress is 1.32 x 10⁶ A²s. Any short-circuit current at the point where a NG125L device (I_{cu} = 25 kA) is installed will be limited, with a thermal stress of less than 2.2 x 10⁵ A²s. (Curve on page <?> - <?>).

The cable is therefore always protected up to the breaking capacity of the circuit breaker.

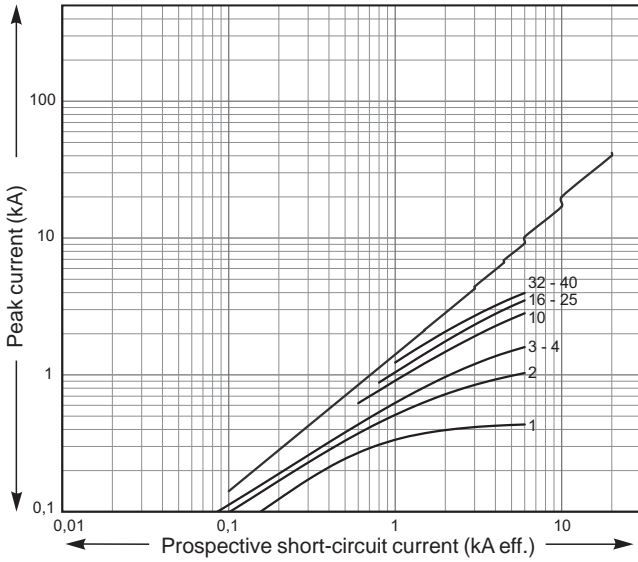
Short-circuit current limiting (cont.)

Limitation curves for 240 V network

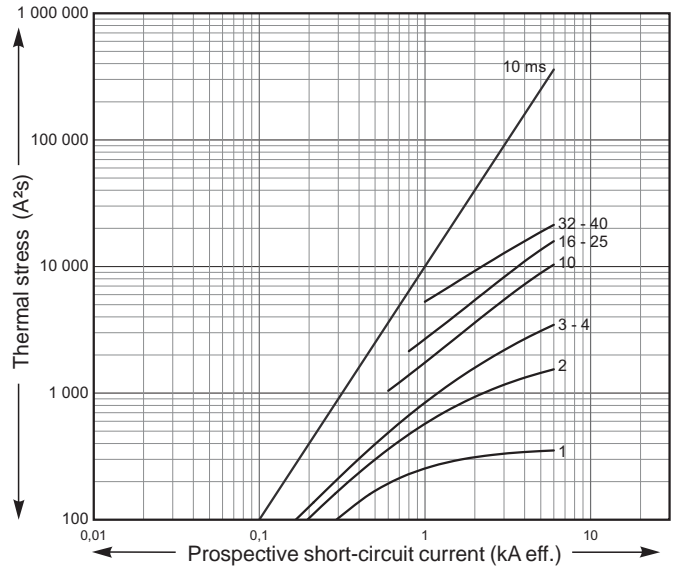
iDPN

1P+N / 3P / 3P+N circuit breakers

Peak current



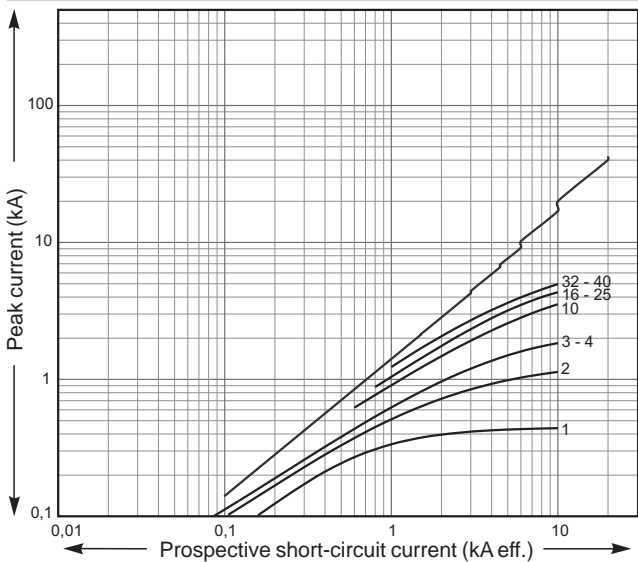
Thermal stress



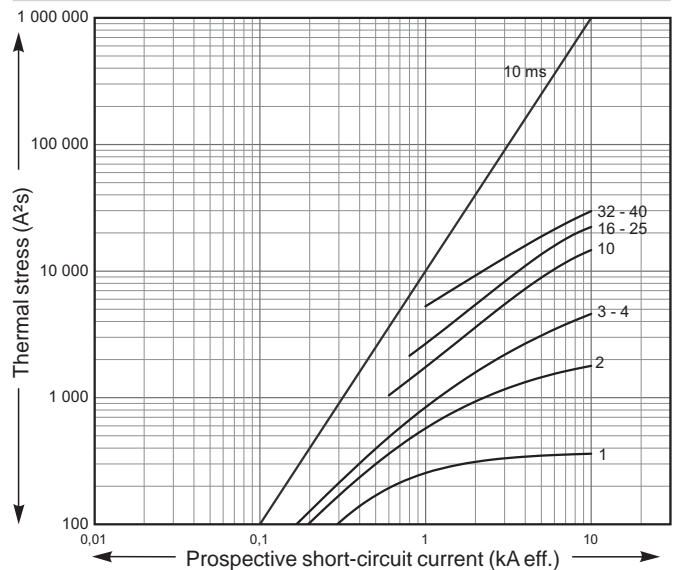
iDPN N

1P+N / 3P / 3P+N circuit breakers

Peak current



Thermal stress



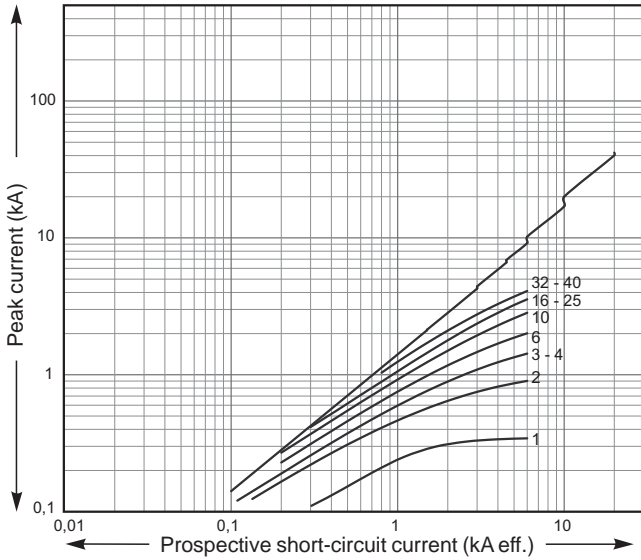
Short-circuit current limiting (cont.)

Limitation curves for 415 V network

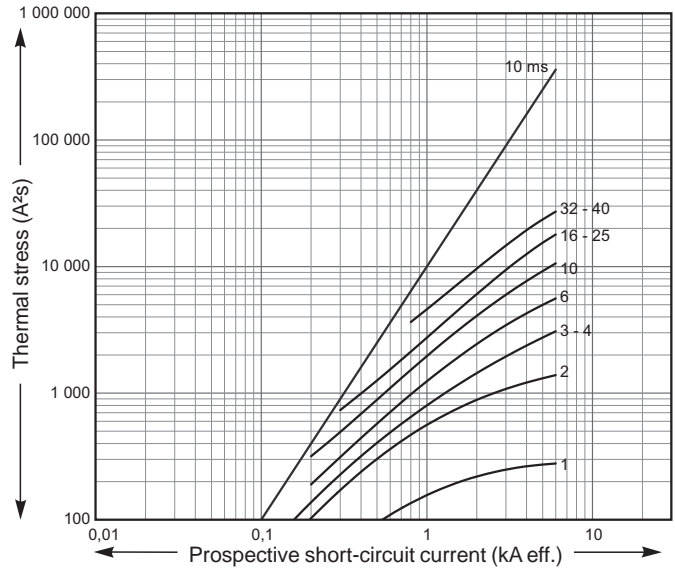
iDPN

1P+N / 3P / 3P+N circuit breakers

Peak current



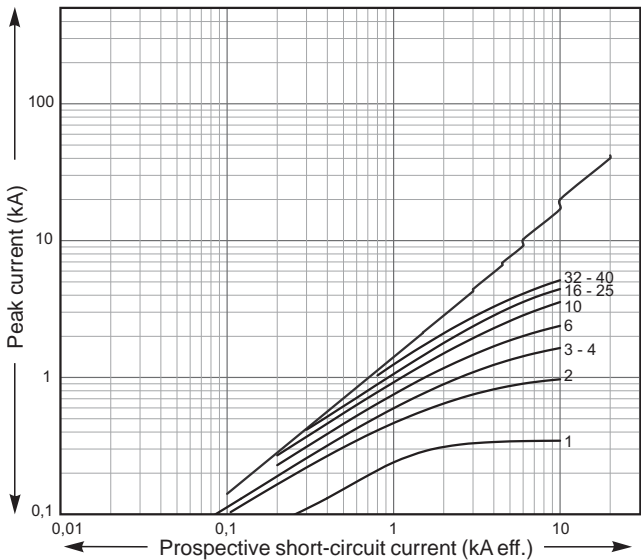
Thermal stress



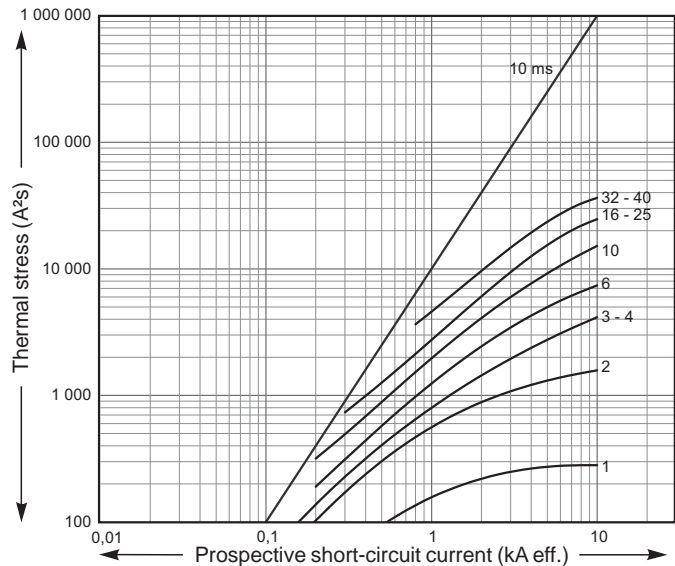
iDPN N

1P+N / 3P / 3P+N circuit breakers

Peak current



Thermal stress

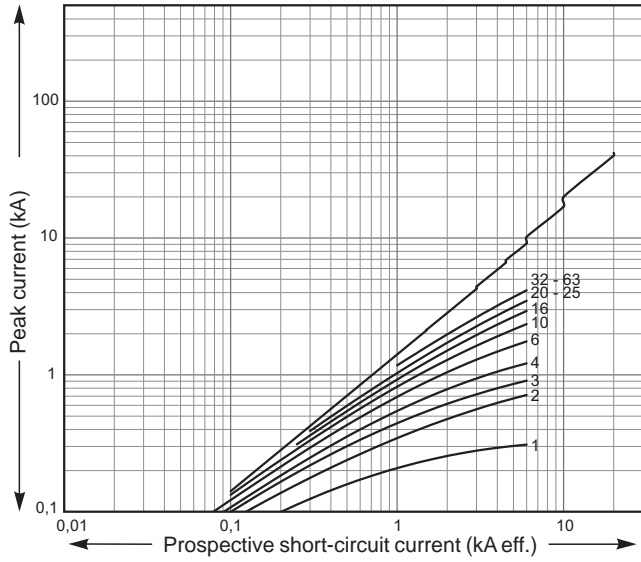


Short-circuit current limiting (cont.)

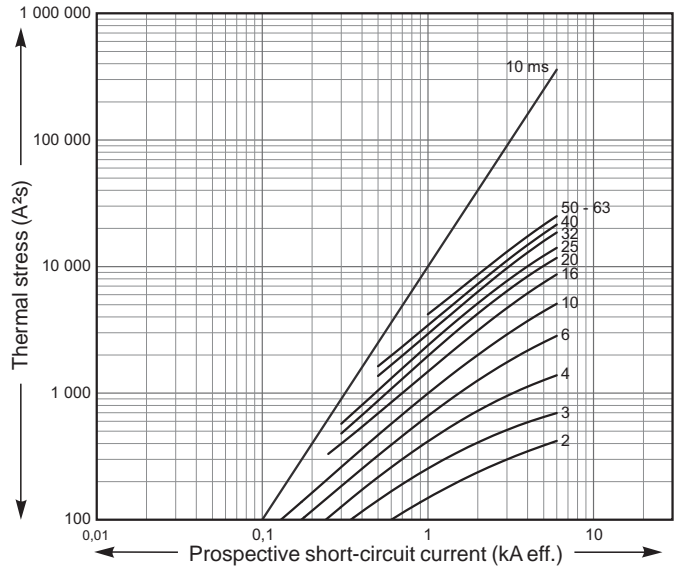
Limitation curves for 240 V network

iK60N 2P curve B

2P circuit breaker
Peak current

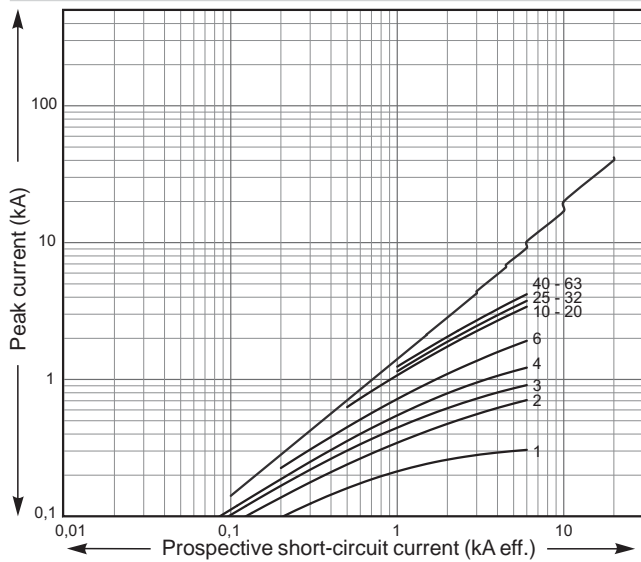


Thermal stress

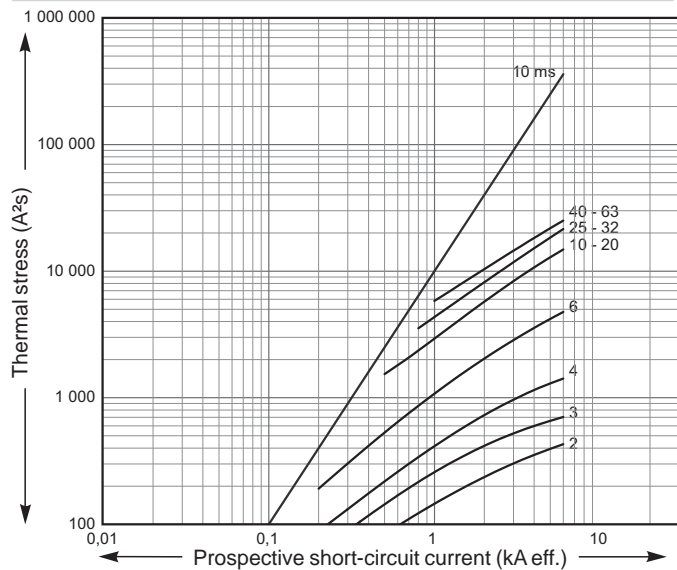


iK60N 2P curve C

2P circuit breaker
Peak current



Thermal stress

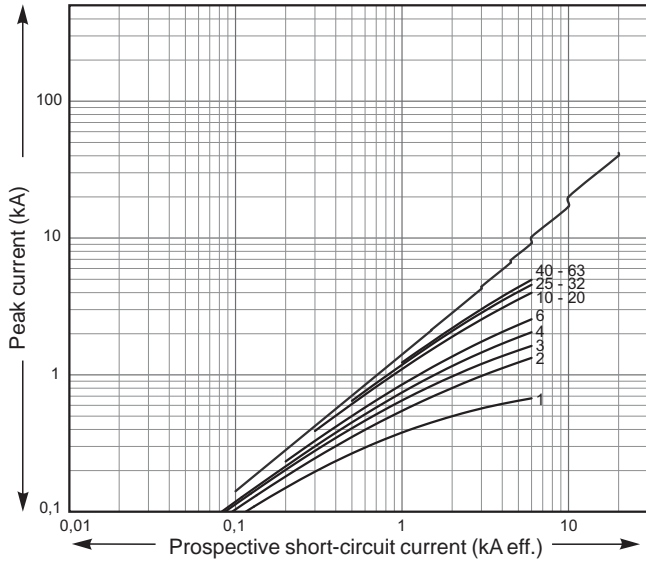


Short-circuit current limiting (cont.)

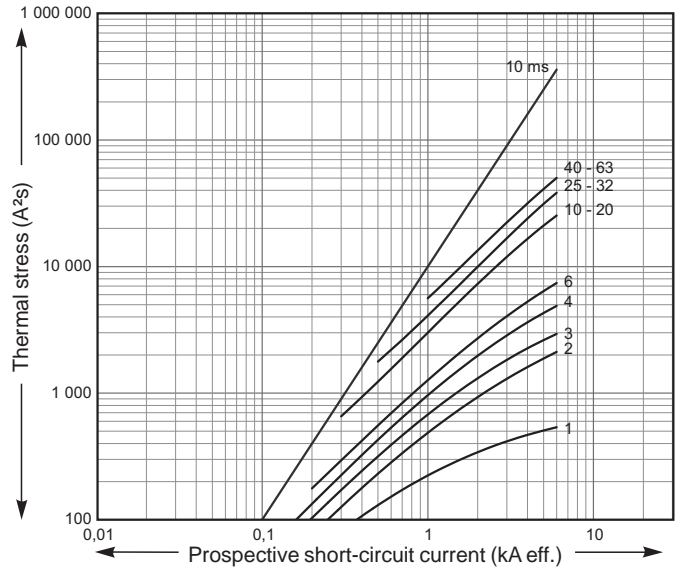
Limitation curves for 415 V network

iK60N 3P curve B

2P / 3P / 4P circuit breakers
Peak current

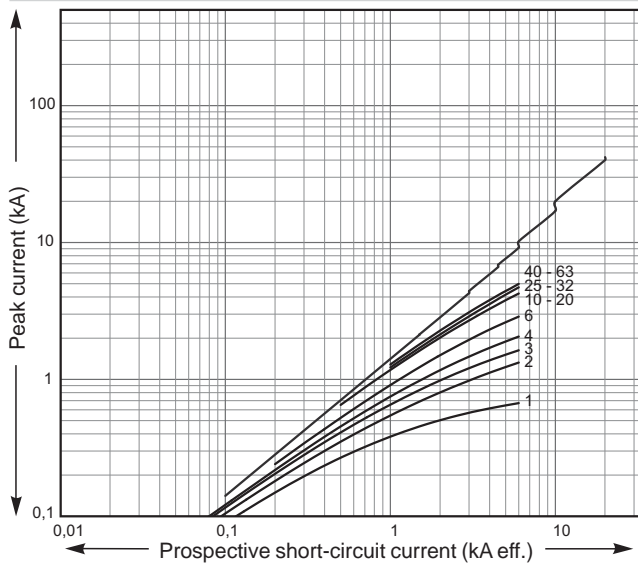


Thermal stress

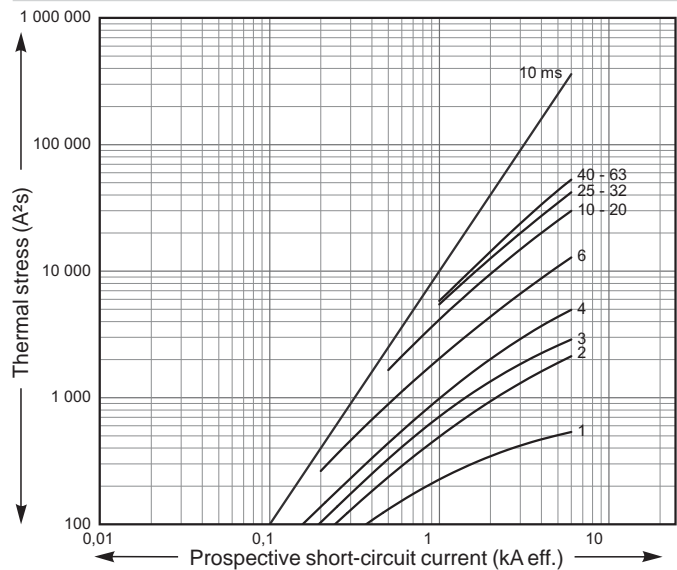


iK60N 3P curve C

2P / 3P / 4P circuit breakers
Peak current



Thermal stress

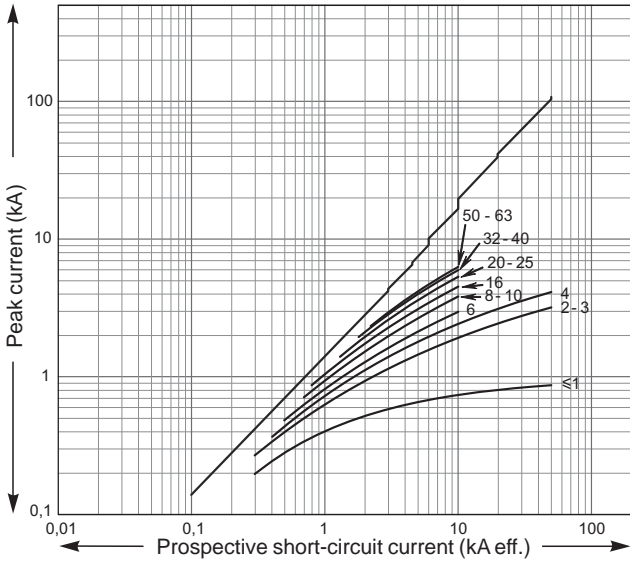


Short-circuit current limiting (cont.)

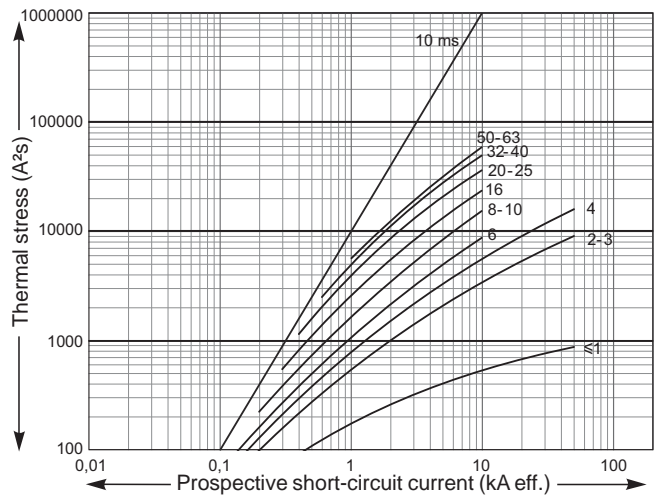
Limitation curves for 230 V single-phase or 400 V three-phase network (TN or TT earthing system)

iC60N

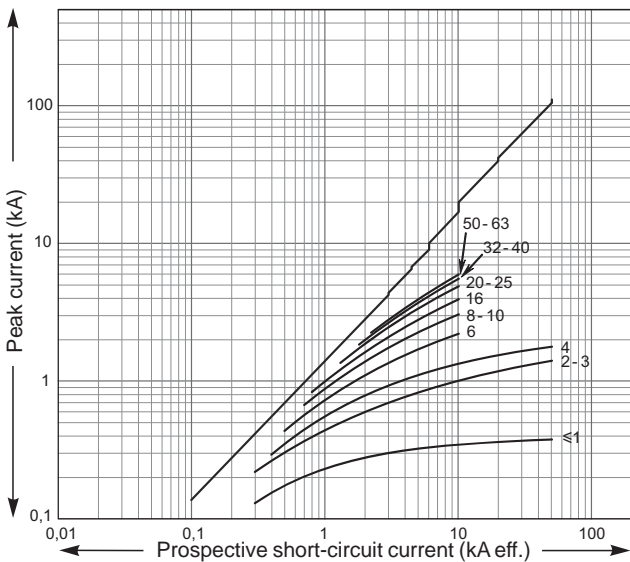
1P / 3P / 4P circuit breakers
Peak current



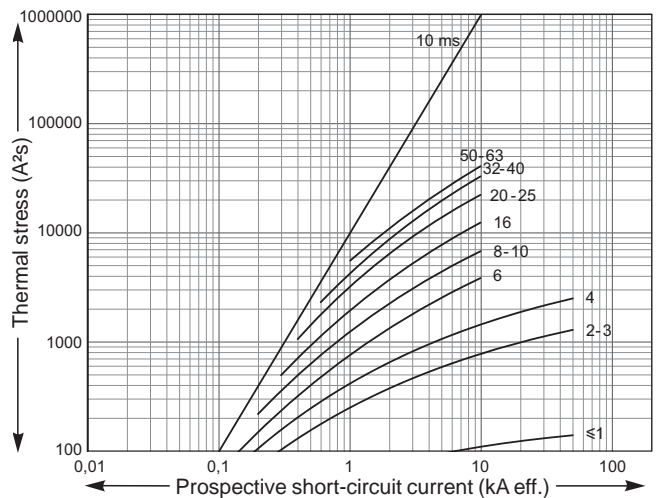
Thermal stress



1P+N / 2P circuit breakers
Peak current



Thermal stress



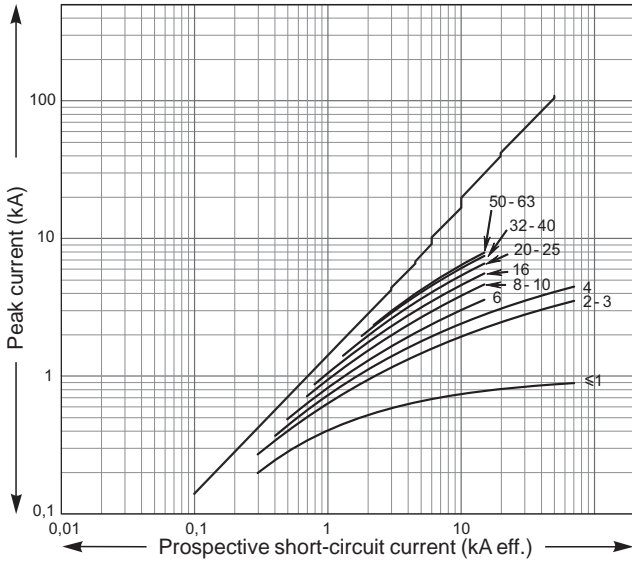
Note: these values are also the limitation values obtained with an iC60N three- or four-pole circuit breaker operating on a 230 V phase-to-phase network.

Short-circuit current limiting (cont.)

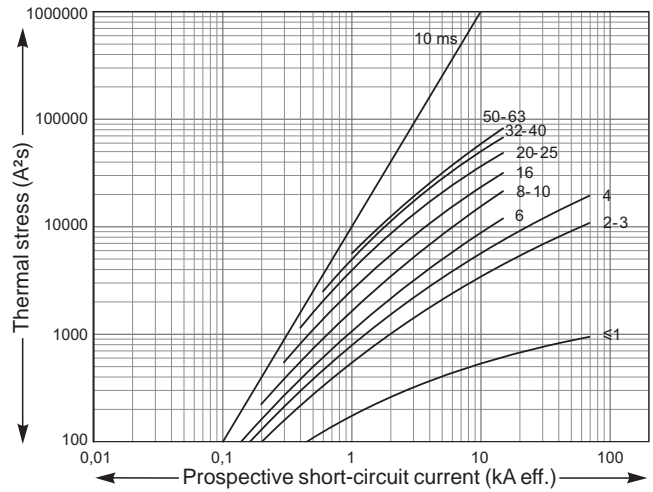
iC60H

1P / 3P / 4P circuit breakers

Peak current

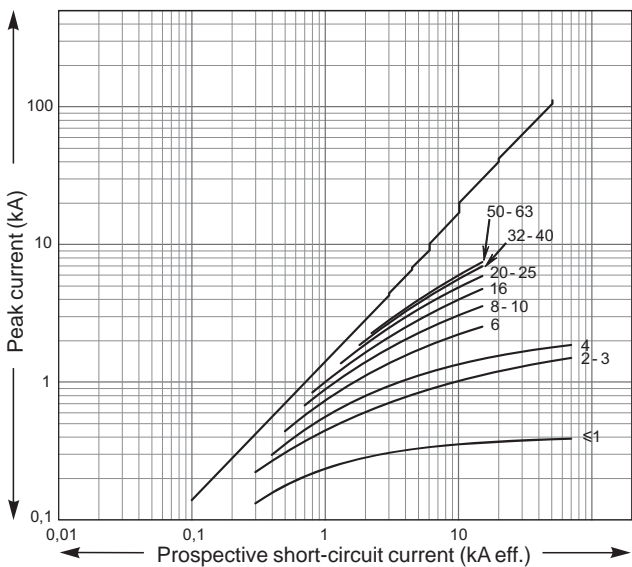


Thermal stress

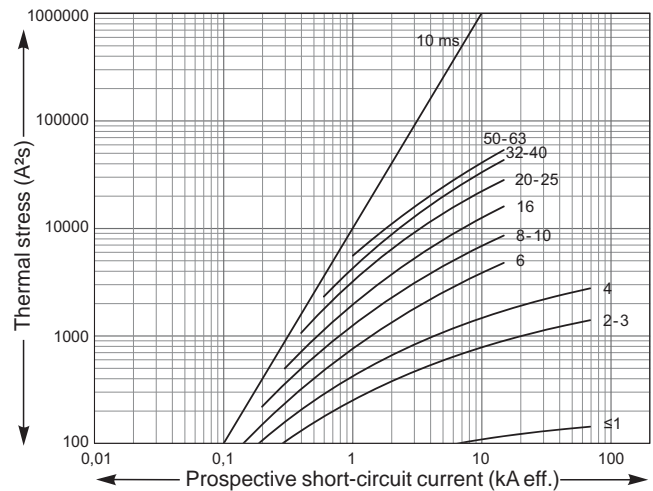


1P+N / 2P circuit breakers

Peak current



Thermal stress



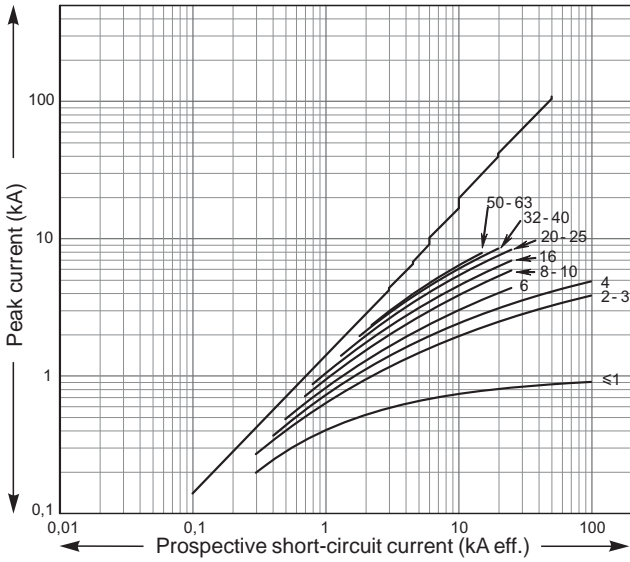
Note: these values are also the limitation values obtained with an iC60H three- or four-pole circuit breaker operating on a 230 V phase-to-phase network.

Short-circuit current limiting (cont.)

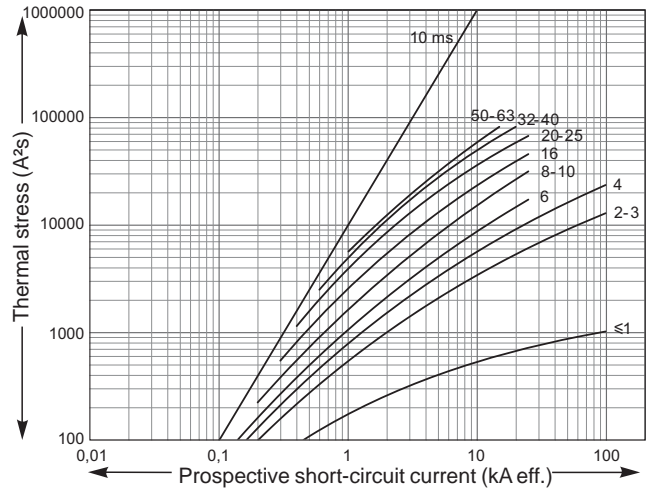
iC60L

1P / 3P / 4P circuit breakers

Peak current

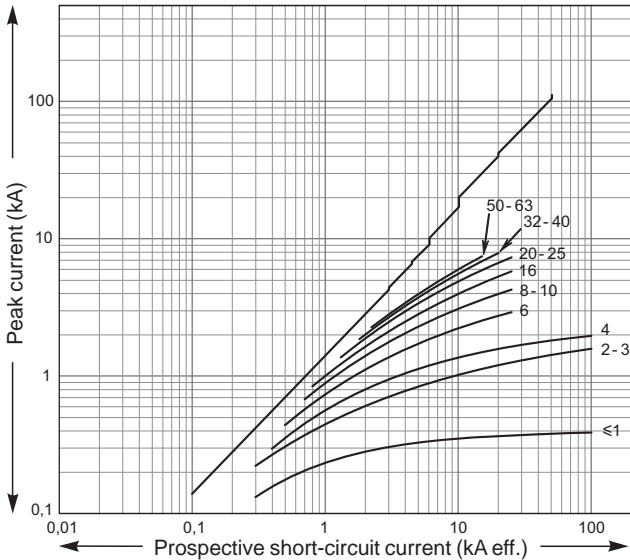


Thermal stress

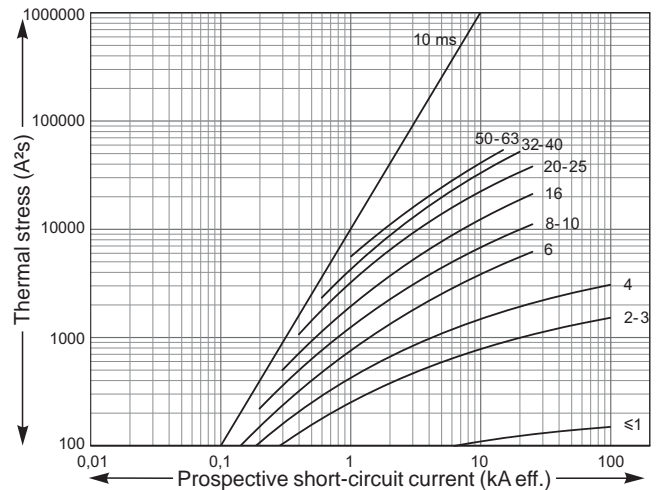


1P+N / 2P circuit breakers

Peak current



Thermal stress



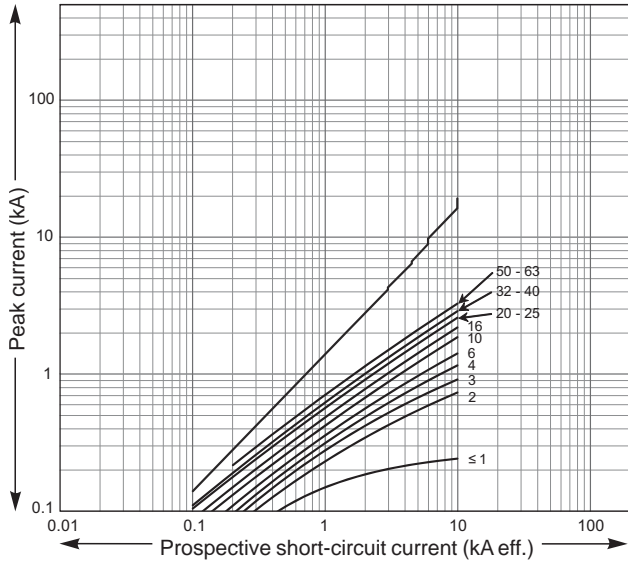
Note: these values are also the limitation values obtained with an iC60L three- or four-pole circuit breaker operating on a 230 V phase-to-phase network.

Short-circuit current limiting (cont.)

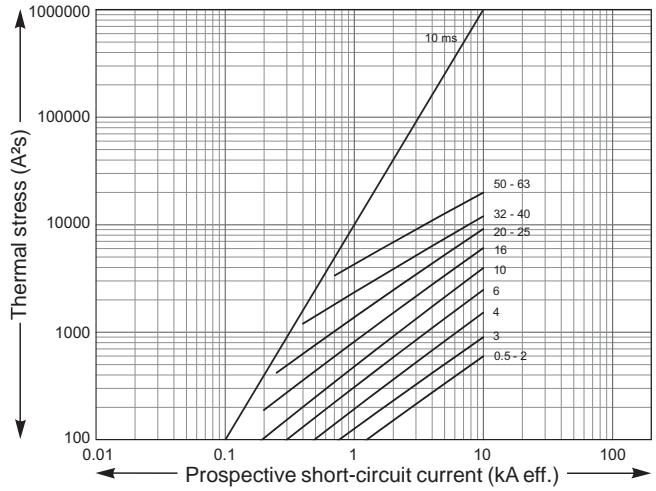
Limitation curves for 220/440 V network

C60H-DC curve C

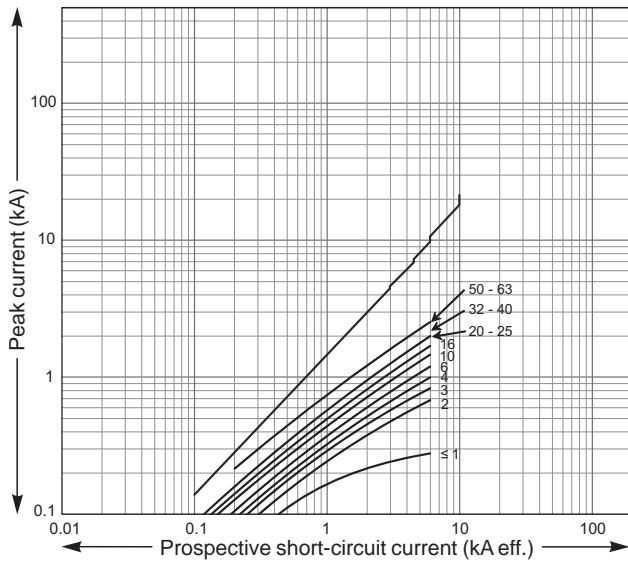
Circuit-breakers: 1P (220 V) - 2P (440 V)
Peak current



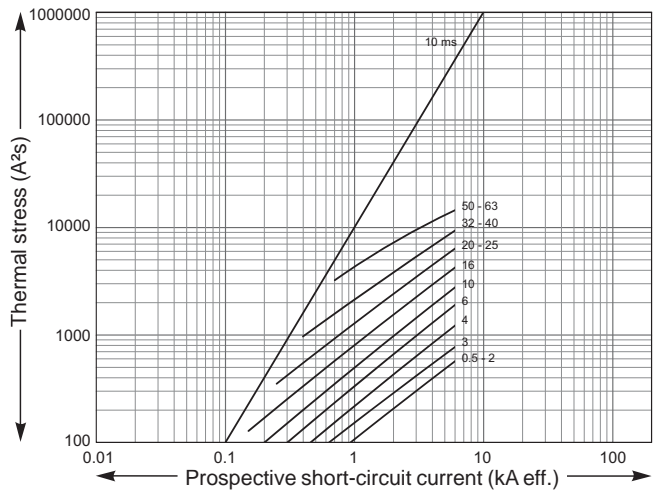
Thermal stress



Circuit-breakers: 1P (250 V) - 2P (500 V)
Peak current



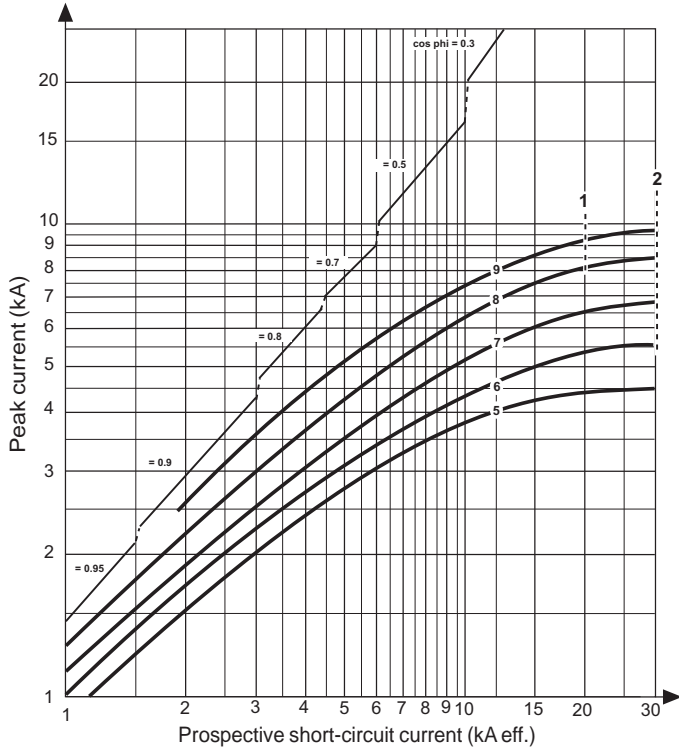
Thermal stress



Limitation curves for 240 V network

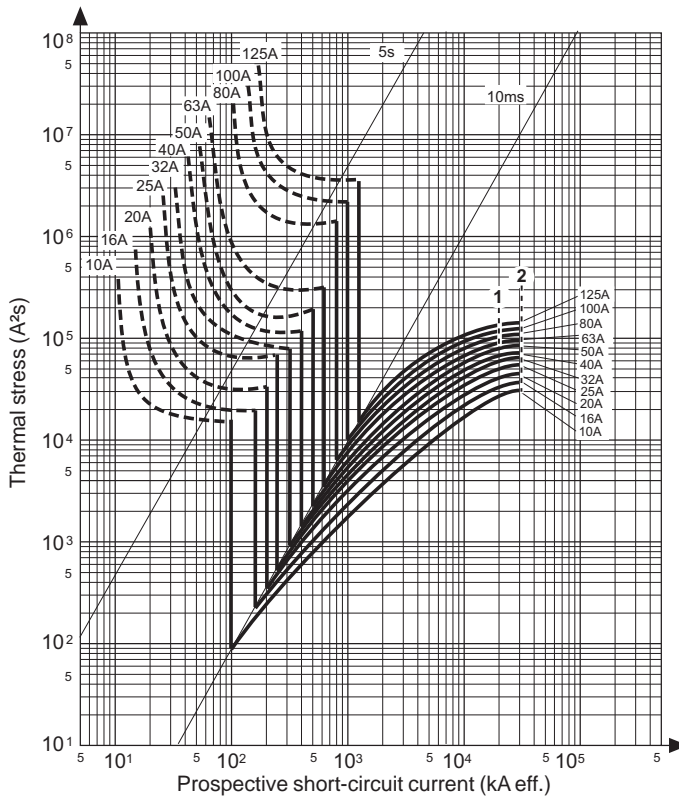
C120N, H curve C

2P / 3P / 4P circuit-breakers Peak current



- Circuit breaker type in accordance with the mark:
- 1: C120N,
- 2: C120H,
- 5: 10-16 A,
- 6: 20-25 A,
- 7: 32-40 A,
- 8: 50-63 A,
- 9: 80-100-125 A.

2P / 3P / 4P circuit-breakers Thermal stress



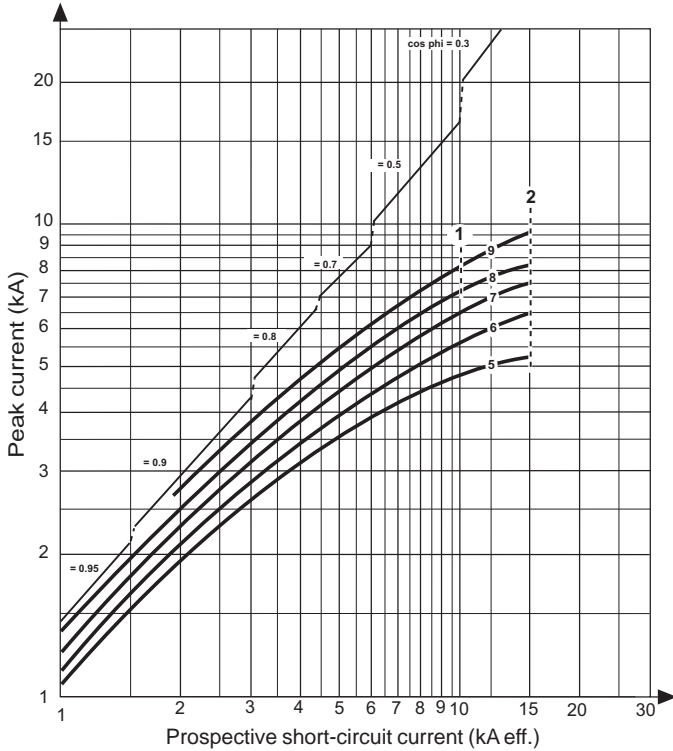
- Circuit breaker type in accordance with the mark:
- 1: C120N,
- 2: C120H.

Short-circuit current limiting (cont.)

Limitation curves for 240/415 V network

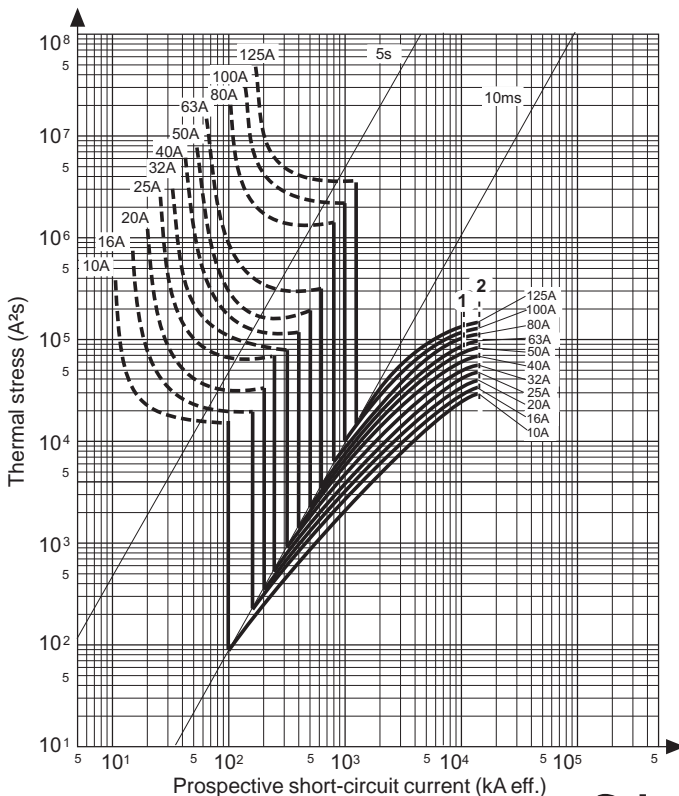
C120N, H curve C

Circuit-breakers: 1P (240 V) - 2P / 3P / 4P (415 V)
Peak current



- Circuit breaker type in accordance with the mark:
- 1: C120N,
- 2: C120H,
- 5: 10-16 A,
- 6: 20-25 A,
- 7: 32-40 A,
- 8: 50-63 A,
- 9: 80-100-125 A.

Circuit-breakers: 1P (240 V) - 2P / 3P / 4P (415 V)
Thermal stress

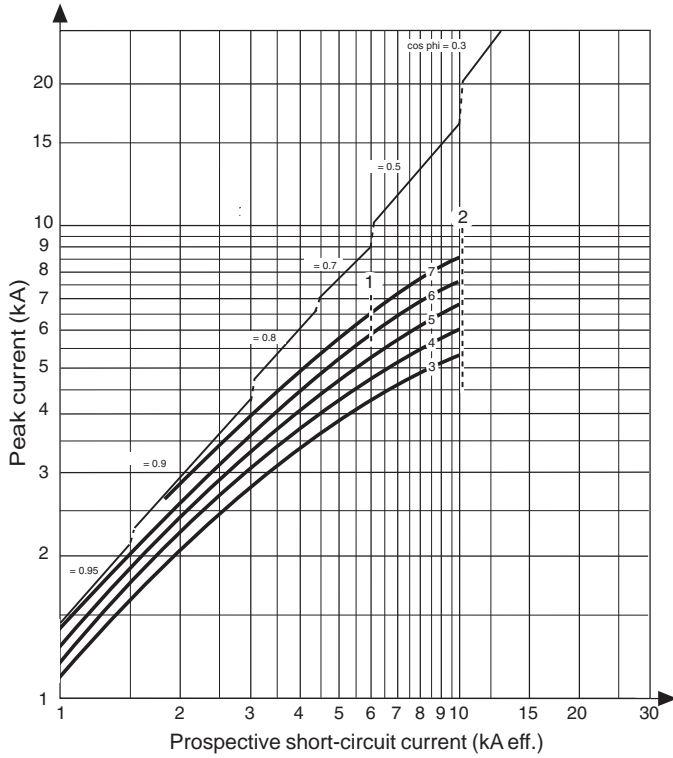


- Circuit breaker type in accordance with the mark:
- 1: C120N,
- 2: C120H.

Limitation curves for 440 V network

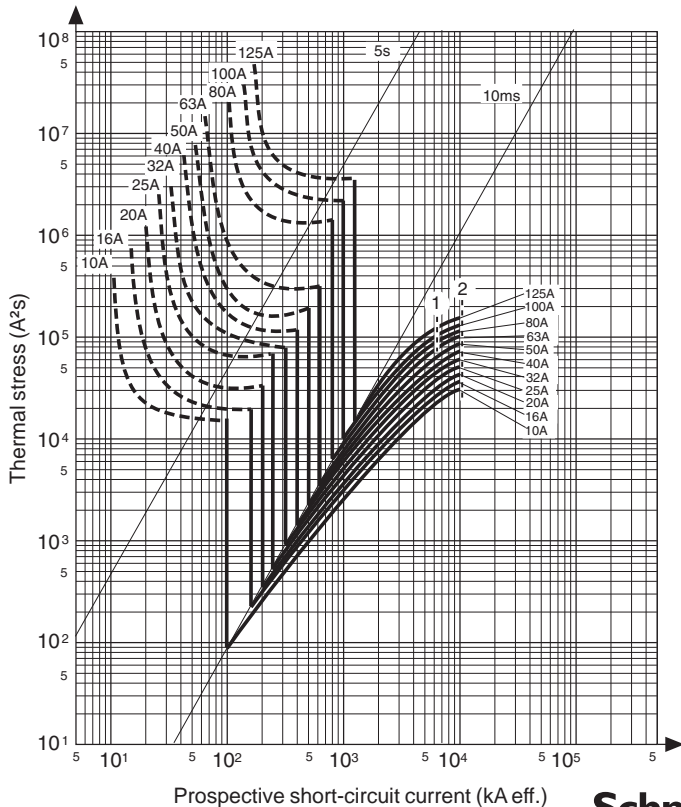
C120N, H curve C

2P / 3P / 4P circuit-breakers Peak current



- Circuit breaker type in accordance with the mark:
- 1: C120N calibres 63 à 125 A,
- 2: C120H calibres 10 à 125 A.

2P / 3P / 4P circuit-breakers Thermal stress



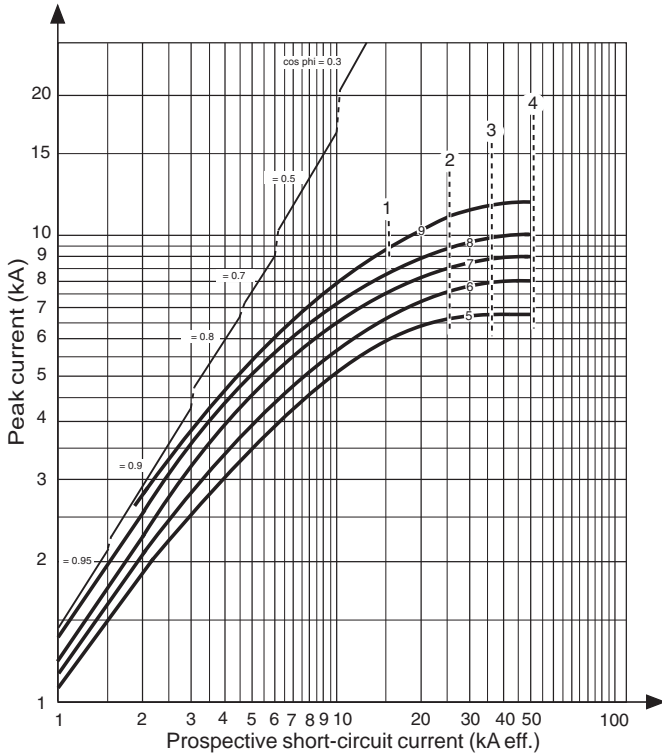
- Circuit breaker type in accordance with the mark:
- 1: C120N,
- 2: C120H.

Short-circuit current limiting (cont.)

Limitation curves for 240 V network

NG125a, N, H, L curve C

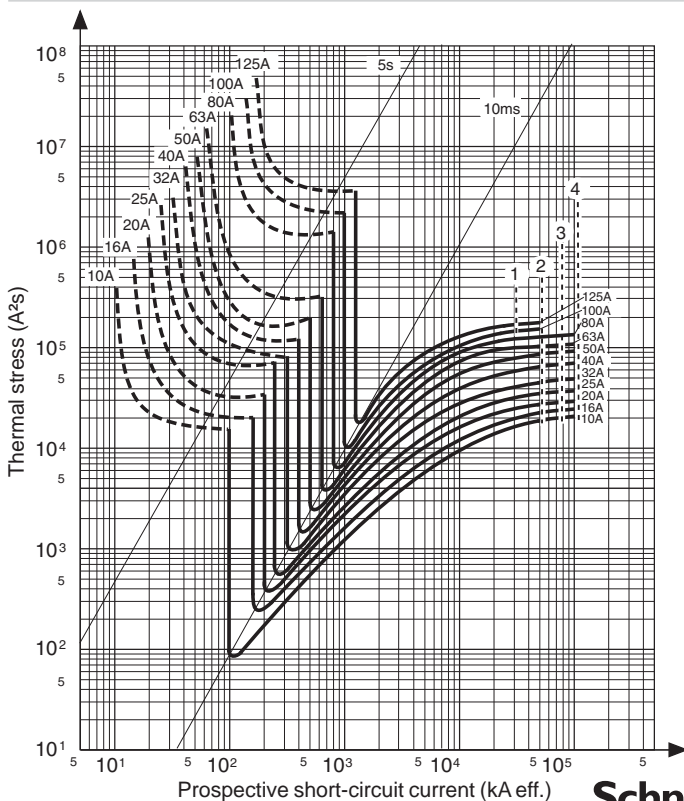
2P / 3P / 4P circuit-breakers Peak current



■ Circuit breaker type in accordance with the mark:

- 1: NG125a,
- 2: NG125N,
- 3: NG125H,
- 4: NG125L,
- 5: 10-16 A,
- 6: 20-25 A,
- 7: 32-40 A,
- 8: 50-63 A,
- 9: 80-100-125 A.

2P / 3P / 4P circuit-breakers Thermal stress



■ Circuit breaker type in accordance with the mark:

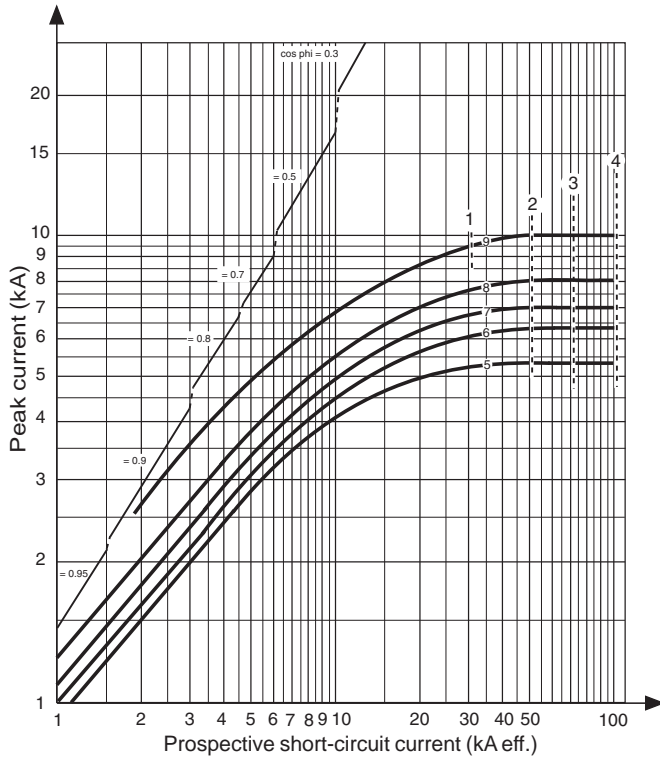
- 1: NG125a 80-100-125 A,
- 2: NG125N,
- 3: NG125H,
- 4: NG125L.

Short-circuit current limiting (cont.)

Limitation curves for 240/415 V network

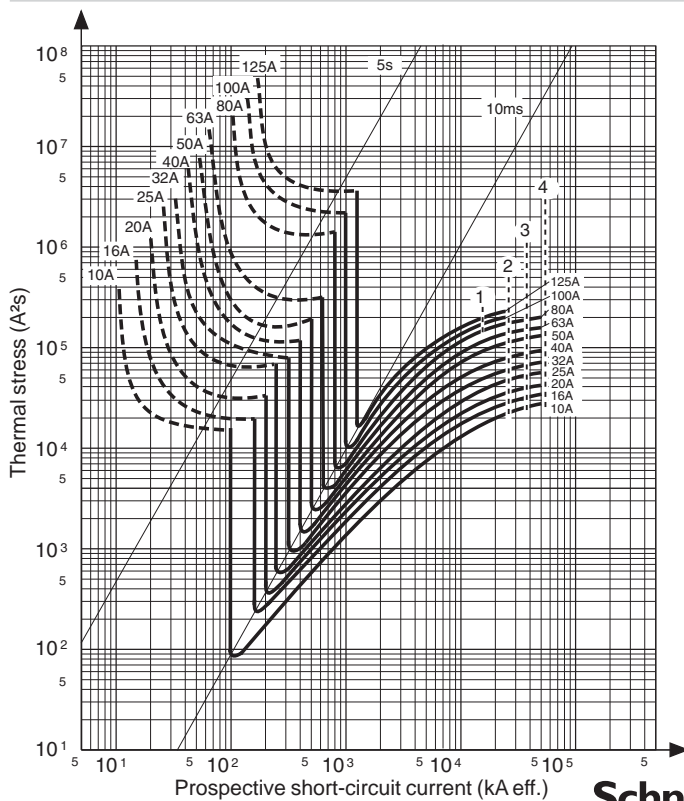
NG125a, N, H, L curve C

Circuit-breakers: 1P (240 V) - 2P / 3P / 4P (415 V)
Peak current



- Circuit breaker type in accordance with the mark:
- 1: NG125a,
- 2: NG125N,
- 3: NG125H,
- 4: NG125L,
- 5: 10-16 A,
- 6: 20-25 A,
- 7: 32-40 A,
- 8: 50-63 A,
- 9: 80-100-125 A.

Circuit-breakers: 1P (240 V) - 2P / 3P / 4P (415 V)
Thermal stress



- Circuit breaker type in accordance with the mark:
- 1: NG125a 80-100-125 A,
- 2: NG125N,
- 3: NG125H,
- 4: NG125L.

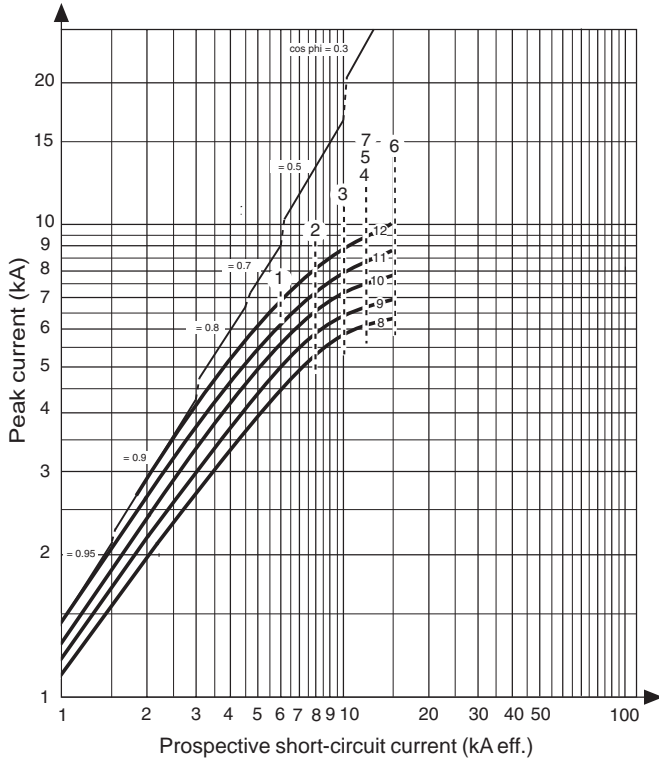
Short-circuit current limiting (cont.)

Limitation curves for 525 V network

NG125a, N, H, L curve C

2P / 3P / 4P circuit-breakers

Peak current

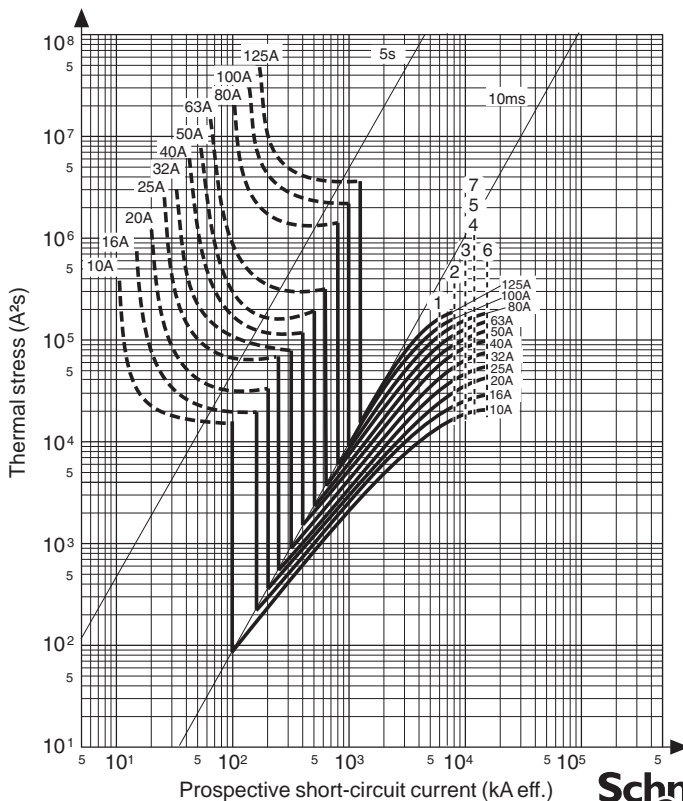


■ Circuit breaker type in accordance with the mark:

- 1: NG125a 3, 4P,
- 2: NG125N 2, 3, 4P,
- 3: NG125H 3, 4P,
- 4-5: NG125H 2P/NG125L 3, 4P,
- 6: NG125L 2P,
- 7: NG125 LMA 2, 3, 4P.

2P / 3P / 4P circuit-breakers

Thermal stress



■ Circuit breaker type in accordance with the mark:

- 1: NG125a 3, 4P,
- 2: NG125N 2, 3, 4P,
- 3: NG125H 3, 4P,
- 4-5: NG125H 2P/NG125L 3, 4P,
- 6: NG125L 2P,
- 7: NG125LMA 2, 3, 4P.

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